PERFORMANCE AND MANAGEMENT STUDY OF THE PORTLAND FIRE DEPARTMENT PORTLAND, MAINE

Prepared by:
Public Safety Solutions, Inc.
Public Safety Management Consultants
Fire & EMS Division
106 Schooner Way, Suite 110
Chester, Maryland 21619
(301-580-1900)

PUBLIC SAFETY SOLUTIONS, INC.

PSSi
PUBLIC SAFETY SOLUTIONS, INC.

106 Schooner Way, Suite 110
Chester, Maryland 21619
410.604.0650
240.595.6220 fax

March 27, 2013

Mr. Mark Rees
City Manager
City of Portland
389 Congress Street
Portland, Maine 04101

Dear Mr. Rees:

I am pleased to submit with this letter our Report on the Performance and Management Study of the Portland Fire Department.

The Study Team would like to acknowledge the excellent cooperation that we received from City officials and the members of the Portland Fire Department. If you have any questions relative to this Performance and Management Study, please contact my office.

Sincerely,

Leslie D. Adams
President

CONTENTS

LIST OF FIGURES……..……xiii
ACKNOWLEDGMENTS……xviii
EXECUTIVE SUMMARY……....ES-1

CHAPTER ONE -- INTRODUCTION
THE SETTING.....1
History of the City.....1
Portland Today.....1
Demographics 3
CITY GOVERNANCE 3
PORTLAND FIRE DEPARTMENT 4
Mission Statement.....4
Fire Chief 5
Current Position Structure.....5
PFD Staffing 6
Fire Department Budget Totals.....7
REVENUE.....8
Grant.....8
CURRENT FIRE STATIONS 9
Current Mainland Fire Stations.....9
Island Fire Stations.....10
PFD Apparatus.....12
DETERMINATION OF THE NUMBER OF STAFF NEEDED.....12
Fire Costs Per Capita – U.S. Municipalities 12
Firefighter Staffing Per Capita – U.S. Municipalities 13
PRIOR FIRE STUDIES 15
STUDY METHODOLOGY.....16
Fire Department Accreditation 16
Standards and Accepted Practices 17
PERCEPTIONS IN PORTLAND 18
Stakeholder and Employee Input.....18

CHAPTER TWO – ORGANIZATION & ADMINISTRATION

OVERVIEW 24
ACCEPTED PRINCIPLES AND PRACTICES—ORGANIZATION 25
NFPA 1201 - Standard for Developing Fire Protection Services 25
CFAI Governance and Administration Criteria 26
LEGAL AUTHORITY 27
State of Maine 27
Code of the City of Portland 27
BRIEF PFD HISTORY 29
PFD MISSION, VISION AND VALUES 31
Mission Statement Revision 31
Vision Development 33
Values Development 34
ORGANIZATION STRUCTURE 36
Current Ranks and Position Titles 36
Uniformed Workforce 36
Civilian Workforce 37
Current Organization Chart 37
Aspects of Existing Organization Chart 37
ORGANIZATIONAL OBSERVATIONS 39
ORGANIZATIONAL ALTERNATIVES 41
Input From Stakeholders and Services Providers 41
Organizational Issues 42
Fire Chief's Span of Control 43
Emergency Management 43
Administrative Support 44
Platoon Deputy Chiefs - "Four Ways to Do Things" 44
Organization of Fire Prevention Functions 45
1983 O'Hagan Fire Study 45
Fire Alarm 46
No EMS-Qualified Field Supervision 47
Station Assignment of Functions 47
Cross-Functional Teams - Committees 48
Alternative Organization Chart 49
PFD POLICIES & PROCEDURES (P & P) 50
NAME OF PORTLAND FIRE & EMS DELIVERY AGENCY 50

FIRE DEPARTMENT ACCREDITATION 50
SUMMARY 53
RECOMMENDATIONS 53

CHAPTER THREE – FIRE AND EMS STAFFING
APPARATUS STAFFING GENERALLY 56
Firefighter Utilization 58
Driver/Operator 58
Officer 58
Third Person 58
MEDCU Staffing 59
Island Volunteer Staffing 59
APPARATUS STAFFING GOALS 60
PFD SHIFT STAFFING 62
Current Total Shift Operations Staffing 62
Forty-Two-Hour Work Week—Current Hours 63
Current Seven-Station Model with Air Rescue & Marine Units 64
Calculated Platoon Staffing 65
EXPENDITURE OF OVERTIME FUNDS 65
Expenditure of Overtime Funds 66
Actual Overtime Expenditures 66
Overtime Expenditures by Month 67
Nine-Year Comparison 67
Fiscal Year 2012 Overtime (OT 68
Various OT Causal Factors 69
Potential Excessive OT Staffing of Apparatus 70
Options for OT Reduction 70
DEPLOYMENT OF A DOUBLE ENGINE COMPANY 71
1983 O'Hagan Fire Study 71
PLATOON SHIFT WORK SCHEDULE 72
24-Hour Schedule 72
Current PFD 24-Hour Schedule 73
Possible Alternative Work Schedule 74
24-72 Schedule 75

LABOR – MANAGEMENT RELATIONS 75
Background 75
OBSERVATIONS/LABOR AGREEMENTS 77
Bid System 77
Substitutions 78
Compensation Approaches 78
CIVIL SERVICE COMMISSION 78
AUTOMATION SUPPORT 78
Automated Work Schedule Management 79
PERFORMANCE EVALUATION 80
Observations/Current System 82
SUMMARY 82
RECOMMENDATIONS 83

CHAPTER FOUR – RISK ALANYSIS AND FACILITIES

CFAI FIXED FACILITIES CRITERIA 85
CURRENT FIRE STATION LOCATIONS 86
Mainland Fire Stations 86
Island Fire Stations 86
Portland Fire Museum 86
SERVICE AREA DESCRIPTION 87
POPULATION & HOUSING 89
FIRE STATION AND APPARATUS DISTRIBUTION 94
STATION LOCATION CRITERIA 99
ISO Criteria 99
Community Risk Criteria 101
Response Time Capability Criteria 106
Fire-Related Response Time Considerations 106
EMS-Based Response Time Considerations 107
NFPA 1710 Standard 108
CURRENT SERVICE DEMAND ANALYSIS 121
RESPONSE TIME ANALYSIS 138
FUTURE TRENDS 144
New Residential & Commercial Development 144

Transportation Improvements 144
Population Projections 145
Workload Projections 146
CONDITION OF CURRENT PFD FACILITIES 147
General Condition of Portland Fire Stations 151
Condition of Furnishings Generally 152
SUMMARY 152
RECOMMENDATIONS 153

CHAPTER FIVE – FIRE AND EMS APPARATUS

COMMISSION ON FIRE ACCREDITATION INTERNATIONAL (CFAI) 154
APPARATUS AND EQUIPMENT ADMINISTRATION 156
Portland Fire Department 156
Fleet Services Division 156
Jetport International Airport 156
CURRENT APPARATUS AND VEHICLE INVENTORY 157
APPARATUS REPLACEMENT SCHEDULE 159
Average Apparatus Service Life 162
Portland Fire Department Apparatus Replacement Process 165
APPARATUS AND EQUIPMENT MAINTENANCE 167
In-Station Maintenance 168
Central Facility Maintenance 168
Marine Division Maintenance 169
TOOLS, APPLIANCES AND EQUIPMENT ACQUISTION & MAINTENANCE 172
APPARATUS AND EQUIPMENT POLICIES AND PROCEDURES 174
SUMMARY 175
RECOMMENDATIONS 176

CHAPTER SIX – EMERGENCY MEDICAL SERVICES

OVERVIEW 177
COMMISSION ON FIRE ACCREDITATION INTERNATIONAL (CFAI) 179
HISTORY OF EMS IN THE FIRE SERVICE 180
THE MODERN EMS AGENCY 182
THE IDEAL CHAIN OF SURVIVAL EVENTS 183

EMS IN MAINE 184
EMS IN PORTLAND 187
Public Education and Early Recognition 187
EMS System Access 189
Bystander Action 189
911 Call-Taking and Dispatch 190
EMS Provider Response and Patient Transport 191
EMS-Based Response Time Considerations 196
NFPA 1710 Standard 196
RESPONSE TIME ANALYSIS 200
Service Demand 203
Hospital Interface & Medical Control 215
Billing and Records 216
Funding of EMS in Portland 218
Quality Assurance 218
STEMIs and Cardiac Arrests 219
PORTLAND EMS ISSUES 220
The Merger 221
Rotation of Personnel 222
Certification ALS Providers 223
ALS Engine and Ladder Companies 224
Car 10 225
A Fifth Full-time MEDCU & MEDCU 6 225
NET Team 226
EMS Staffing on Peaks Island 227
EMS Training 228
EMS Committee 230
OPTIONAL APPROACH TO EMS DELIVERY 231
SUMMARY 234
RECOMMENDATIONS 235

CHAPTER SEVEN – OPERATIONS & COMMUNICATIONS

INTRODUCTION 239
THE FIRE PROBLEM 240
A Look At National Fire Data 241
MAINE FIRE PROBLEM 242
PORTLAND FIRE DEPARTMENT WORKLOAD ANALYSIS 243
PRE-FIRE PLANNING 248
MARINE FIRE/EMS SERVICES 252
Fireboats Generally 252
History of Fireboats 253
U. S. Cities With Fireboats 253
Portland Fireboat History 254
Fireboat Budget and Staffing 256
Fireboat Staffing 256
Fireboat Responses 257
Workload 261
Future Fireboat Decisions 261
Is a Fireboat Needed? 261
Fireboat Fleet Configuration 265
Fireboat Quarters 266
Staffing of The Fireboat And Islands 267
JETPORT AIR RESCUE 267
Air Rescue History 268
Air Rescue Workload 269
Current Staffing 270
Jetport Fire Staffing Options 271
SPECIAL OPERATIONS SERVICES 271
Overview of Special Operations Services 272
Hazardous Materials Response 273
Hazardous Materials Response in Maine 275
Hazardous Materials Response in the City of Portland 275
Vehicle Extrication Service 279
Technical Rescue Services 280
Confined-Space Rescue 280
Trench Collapse Rescue 281
Summary of Special Operations 281

COMMUNICATIONS AND DISPATCH 282
Overview Of Public Safety Answering Point Operations 282
Communication Center Objectives 283
CASCADE OF EVENTS AND PERFORMANCE MEASURES 285
ORGANIZATION AND MANAGEMENT 289
Approaches to Model Dispatch Center Organization 289
COMPUTER AIDED DISPATCHING 290
Typical Features of CAD 291
CAD / 9-1-1 Systems Interface 292
Documentation of Incidents 293
MOBILE DATA COMPUTERS 293
TIME SYNCHRONIZATION 294
TRAINING OF DISPATCHERS 295
Dispatcher Training Model 295
Basic Dispatcher Training 295
Internship 296
Probationary Performance Standards 296
Continuing In-Service Training 296
Supervisory Training 297
Quality Assurance 297
RADIO SYSTEMS - GENERALLY 297
Typical Radio System Configurations 298

CHAPTER EIGHT – ISLAND VOLUNTEER FIRE/EMS SERVICE
OVERVIEW OF VOLUNTEERISM 310
ISLANDS FIRE VOLUNTEER FIREFIGHTERS 311
RECRUITMENT OF VOLUNTEERS 311
Current Recruitment Efforts 312
RETENTION OF VOLUNTEERS 312
Length of Service Benefit Program 314
PUBLIC AWARENESS 315
RECRUITMENT AND RETENTION PLAN 315
SUMMARY 315
RECOMMENDATIONS 316

CHAPTER NINE – HEALTH AND SAFETY

OVERVIEW 317
Commission on Fire Accreditation International (CFAI) 318
Criterion 7F: Risk Management and Personnel Saf 318
NATIONAL FALLEN FIREFIGHTER SAFETY INITIATIVES 319
NATIONAL STANDARDS AND REGULATIONS 321
OSHA Regulations 321
National Standards 322
PORTLAND FD —COMPLIANCE WITH STANDARDS AND REGULATIONS 322
NFPA 1500 323
Fire Department Administration 324
Training and Education 330
Fire Apparatus, Equipment and Driver/Operators 332
Protective Clothing and Equipment 333
Emergency Operations 335
Facility Safety 338
Medical and Physical Requirements 340
Member Assistance and Wellness Program 343
Other Concerns 344
SUMMARY 346
RECOMMENDATIONS 347

CHAPTER TEN – FIRE AND RESCUE TRAINING

OVERVIEW OF FIRE SERVICES TRAINING 351
Commission on Fire Accreditation International (CFAI) 353
NATIONAL TRAINING STANDARDS AND PROGRAMS 355
National Professional Qualifications System 355
National Fire Academy 356
STATE TRAINING PROGRAMS 357
Pro Board Certification 358
Instructor Training 358
EMS Training 358
PORTLAND FIRE DEPARTMENT TRAINING 359
PFD Training Officer 359
Training Records 361

Training Certifications 361
Firefighter Training 364
Incident Management Training 367
Skill Maintenance Training 368
Interoperability Training 369
Driver Operator Training 369
Training Facilities 370
Proposed Regional Training Center 373
Location 373
Suggested Shared Uses of a New Training Facility 374
Training Center Grounds and Apparatus Bays 374
Interior 375
SUMMARY 375
RECOMMENDATIONS 376

CHAPTER ELEVEN – FIRE PREVENTION PROGRAMS
BACKGROUND 380
CFAI FIRE PREVENTION/LIFE SAFETY CRITERIA 382
LEGAL AUTHORITY FOR FIRE PREVENTION 382
State of Maine 382
Portland Life Safety Code 383
PFD FIRE CODE ENFORCEMENT 385
Permit Fees Required 385
PFD BUILDING PLANS REVIEW 386
BUILDING FIRE CODE INSPECTIONS 388
Portland Fire Code – Inspections 388
PFD Property Inspections 388
PFD FIRE PREVENTION DATA COLLECTION AND ANALYSIS 392
FIRE INVESTIGATION 393
CFAI Fire Investigation Criteria 393
Portland Fire Code - Investigations 394
LIFE AND FIRE SAFETY PUBLIC EDUCATION 399
CFAI Public Education Criteria 399
Portland Fire Code – Public Education 399
Public Education - Generally 400
PFD Life and Fire Safety Education Program 400

Public Fire and Life Safety Education 401
School Fire Safety Classes 401
Out-of-School Programs 402
Business Fire Safety Education Program 402
ORGANIZATION OF FIRE PREVENTION/RISK REDUCTION 403
Deputy Chief-Fire Marshal 406
Plans Review 406
Inspections 407
Fire Investigations 407
Public Education 408
SUMMARY 408
RECOMMENDATIONS 409

CHAPTER TWELVE – COOPERATIVE SERVICES PROVISION
POTENTIAL REGIONALIZATION BENEFITS 412
FUNCTIONAL CONSOLIDATION 413
Common Dispatching 414
Hazardous Materials Service Provision 414
Fire Prevention Functions 415
Provision of Incident Command 415
Standard Incident Operating Procedures 416
Apparatus Dispatch Assignments 416
Availability of Reserve Apparatus 416
Apparatus Type 417
Cooperative Provision of Training 417
Pre-Fire Plan Development and Use 418
Fire Safety Education 418
Joint Purchasing in Quantity 419
FULL FIRE SERVICES DELIVERY AGENCY CONSOLIDATION 419
Fiscal Impact — Savings 419
FIRE SERVICES IMPROVEMENT BENEFITS 420
SUMMARY 420
RECOMMENDATIONS 421

CHAPTER THIRTEEN – VISION FOR THE FUTURE
TIMING 422
REVIEW OF REPORT 423
PORTLAND FIRE DEPARTMENT AT A CROSSROADS 423
IMPLEMENTATION OBSTACLES 424
ORGANIZATIONAL CHANGE 424
Programs to be Added or Deleted 425
Responsiveness to the Community 425
POTENTIAL BENEFITS 425
FISCAL IMPACTS 427
CUSTOMER ORIENTATION 428
FIRE DEPARTMENT ACCREDITATION 428
UPDATING THE PLAN 430

STUDY RECOMMENDATIONS 436

APPENDIX A – POLICIES AND PROCEDURES TEMPLATE A-1

APPENDIX B – POLICIES AND PROCEDURES POLICY B-1

TABLE OF FIGURES

CHAPTER ONE — INTRODUCTION

Figure 1.1: City of Portland Fire Dept. Study Base Map 2
Figure 1.2: Portland Fire Department 6
Figure 1.3: PFD Approved Budgets (2008-2013) 7
Figure 1.4: PFD Overtime Expenditures for the Past 9 Years 7
Figure 1.5: PFD Revenue from Various Sources 8
Figure 1.6: Portland Fire Department, Grants - FY2000 to FY2005 9
Figure 1.7: Mainland Fire Station Locations Map 10
Figure 1.8: Island Fire Station Locations Map 11
Figure 1.9: Summary by Apparatus Type 12

CHAPTER TWO — ORGANIZATION & ADMINISTRATION

Figure 2.1: Current Organizational Chart 38
Figure 2.2: Alternative Organization Chart 49

CHAPTER THREE — FIRE AND EMS SERVICES STAFFING

Figure 3.1: Total Platoon Firefighter/Officer Complement 63
Figure 3.2: Formula-Based – Overtime Neutral 65
Figure 3.3: PFD Overtime Expenditures for the Past 9 Years 66
Figure 3.4: Portland Fire Department Overtime Expenditure Analysis, Fiscal Years 2005 Through 2013 68
Figure 3.5: Actual PFD Overtime Expenditures, Fiscal Year 2012 68

CHAPTER FOUR — RISK ANALYSIS AND FACILITIES

Figure 4.1: City of Portland Fire Department Study Base Map 88
Figure 4.2: Population Growth History 89
Figure 4.3: Population Density 90
Figure 4.4: Current Population by Age Group 91
Figure 4.5: Population Change 92
Figure 4.6: Housing by Occupancy 93
Figure 4.7: Housing Occupancy Changes 93
Figure 4.8: Mainland Fire Stations 95
Figure 4.9: MEDCU Stations 96
Figure 4.10: Mainland Apparatus Distribution 97
Figure 4.11: Island Fire Stations 98

Figure 4.12: Island Apparatus Distribution 99
Figure 4.13: ISO Engine Distance 100
Figure 4.14: ISO Truck Distance 101
Figure 4.15: Comparative Response by Risk 102
Figure 4.16: Mainland Zoning Risk 103
Figure 4.17: Islands Area Zoning Risk 104
Figure 4.18: Target Risks 105
Figure 4.19: Flashover Comparison 107
Figure 4.20: City Fire Travel Time Extent 110
Figure 4.21: Closet Station Response Area 111
Figure 4.22: Fire Ems Boat Travel Time Extent 113
Figure 4.23: MEDCU Travel Time Extent 114
Figure 4.24: Travel Time Extent from Hospitals 116
Figure 4.25: Current First Alarm Force 118
Figure 4.26: Alternative First Alarm Assembly 120
Figure 4.27: Service Demand 122
Figure 4.28: Historic Service Demand 123
Figure 4.29: Department Workload By Month of Year 124
Figure 4.30: Island Workload By Month 125
Figure 4.31: Department Workload By Day of Week 126
Figure 4.32: Island Workload by Day of Week 127
Figure 4.33: Workload by Day of Week 128
Figure 4.34: Concurrent Calls 129
Figure 4.35: Chance of Concurrent Medical Calls 130
Figure 4.36: 2004 Unit Workload 131
Figure 4.37: 2008 Unit Workload 132
Figure 4.38: 2012 Unit Workload 133
Figure 4.39: Airport Unit Demand 134
Figure 4.40: Fire EMS Boat Unit Demand 135
Figure 4.41: Unit Commit Ratios 136
Figure 4.42: Turnaround Time Performance 138
Figure 4.43: Response Time Performance 139
Figure 4.44: Mainland Hourly Response Time 140
Figure 4.45: MEDCU Response Time Performance 142
Figure 4.46: First Arriving Apparatus 143
Figure 4.47. Population Projections 146
Figure 4.48: Estimated Future Workload 147

CHAPTER FIVE — FIRE AND EMS APPARATUS

Figure 5.1: Portland Fire Department Fire and EMS Apparatus and Vehicle Fleet 158
Figure 5.2: City Manager's Recommended General Fund Capital, Fire Department Vehicle Projects, 2013-2017 164
Figure 5.3: Illustrative Engine, Ladder, Rescue, MEDCU Life Expectancy and Replacement Cost Chart 166
Figure 5.4: Portland Fire Department Marine Division Maintenance and Repair Budget, FY11-FY13 169
Figure 5.5: Portland Fire Department Fleet Maintenance, Costs & Labor Hours, January 01, 2008 - December 31, 2012 170
Figure 5.6: Portland Fire Department Fuel Consumption and Cost, January 01, 2008 - December 31, 2012 171
Figure 5.7: Required Apparatus, Tools and Hose Tests 173
Figure 5.8: Standard Operating Guidelines for Apparatus and Equipment 174

CHAPTER SIX — EMERGENCY MEDICAL SERVICES

Figure 6.1: Full-Time MEDCU Locations 192
Figure 6.2: Engine Company and MEDCU Crews Provide ALS Care at One of Their Many Runs During a 24-Hour Shift 193
Figure 6.3: City Fire Travel Time Extent 198
Figure 6.4: MEDCU Travel Time Extent 199
Figure 6.5: Travel Time Extent from Hospitals 200
Figure 6.6: Response Time Performance 201
Figure 6.7: MEDCU Response Time Performance 202
Figure 6.8: First Arriving Apparatus 203
Figure 6.9: Historic Service Demand 204
Figure 6.10: Department Workload by Month of Year 205
Figure 6.11: Island Workload by Month 206
Figure 6.12: Department Workload by Day of Week 206
Figure 6.13: Workload by Day of Week 207
Figure 6.14: Chance of Concurrent Medical Calls 208
Figure 6.15: 2004 Unit Workload 209
Figure 6.16: 2008 Unit Workload 210
Figure 6.17: 2012 Unit Workload 211
Figure 6.18: Unit Commit Ratios 212

Figure 6.19: Turn Around Time Performance 214
Figure 6.20: FY13 Division of Emergency Medical Services Budget 218

CHAPTER SEVEN — OPERATIONS AND COMMUNICATIONS

Figure 7.1: Historic Service Demand 243
Figure 7.2: Department Workload by Month of Year 244
Figure 7.3: Island Workload by Month 245
Figure 7.4: Department Workload by Day of Week 246
Figure 7.5: Island Workload by Day of Week 247
Figure 7.6: Workload by Hour of Day 248
Figure 7.7: Past Portland Fireboats – 1894, 1906 and 1959 255
Figure 7.8: Current Portland Fire Boat – 2009 with EMS Patient Treatment Area 255
Figure 7.9: Summary Fireboat Budget – 2013 256
Figure 7.10: Fire Ems Boat Travel Time Extent 259
Figure 7.11: Fire Ems Boat Unit Demand 260
Figure 7.12: Portland Waterfront 262
Figure 7.13: Existing Grand Trunk RR Fire Piers 264
Figure 7.14: Maine State Pier Fire 1947 with 5 Fireboats 265
Figure 7.15: Jetport Suppression Unit 269
Figure 7.16: Airport Unit Demand 270
Figure 7.17: Response Teams 276
Figure 7.18: PFD Hazmat Vehicles 277
Figure 7.19: Time vs. Products of Combustion 286
Figure 7.20: Cascade of Events When Responding to a Fire or Medical Emergency 287

CHAPTER NINE — HEALTH AND SAFETY

Figure 9.1: PFD Apparatus Collisions (2011 and 2012) 326
Figure 9.2: PFD Apparatus Collision by Unit Type (2011 and 2012) 327
Figure 9.3: First Report of Injury Reporting 328
Figure 9.4: Lost Time Injuries: Activity at Time of Injury 328

CHAPTER TEN — FIRE AND RESCUE TRAINING

Figure 10.1: Percent of PFD Officers with Firefighter I & II and Fire Officer I & II certifications 362
Figure 10.2: Trainees from the 2012 Fire Academy Practice Their Power Saw Skills at a Vacant Property in the City 365
Figure 10.3: PFD's EMSs Providers Attend a Lecture at the Department's Leased Classroom in the Stevens Avenue Armory 371

Figure 10.4: The Training Division's Leased Office Space at the Stevens Avenue Armory 371

CHAPTER ELEVEN — FIRE PREVENTION PROGRAMS

Figure 11.1: Permit Fees Required by the Portland Fire Prevention Code 386
Figure 11.2: Fire Code Inspections Completed by the Portland Fire Department (2008-2012) 392
Figure 11.3: Number of Incidents by Type; Fire Loss by Year (2009-2011) 397
Figure 11.4: Fire Investigation Team Origin and Cause Determinations (2010-2012) 398
Figure 11.5: Summary of PFD Interface with the CFAI Accreditation Criteria 403
Figure 11.6: Suggested Fire Prevention/Risk Reduction Organization Baseline 405

CHAPTER THIRTEEN — VISION FOR THE FUTURE

Figure 13.1: Portland Fire Department; Alternative Staffing Model 431

ACKNOWLEDGMENTS

The Study Team extends genuine appreciation to City of Portland officials and staff and members of the Portland Fire Department for their cooperation and assistance in conducting this Study to develop this Performance Management Study of the Portland Fire Department.

This project was unique given the extensive support and assistance provided to the Study Team by Portland project members. A sincere "thank-you" to these individuals for their contribution to the completion of this Study through their support and assistance.

EVALUATION METHODOLOGY

This Study (also called Plan) was developed through a process of interviews, data collection, research, literature review, on-site observations, analysis of data and comparative evaluations with "Best Business" practices and standards in fire protection and emergency medical services. The Study Team's experiences as fire and EMS officials in Maryland and fire and EMS consultants in every region of the U.S. were incorporated as appropriate.

STRUCTURE OF THE STUDY REPORT/PLAN

This report contains 13 chapters. To assist the reader, the Study Team has included detailed background information on state-of-the-art fire and EMS practices and standards to assist in understanding the basis for some conclusions and suggestions.

In Chapters Two through Twelve, there are recommendations at the end of each chapter. The recommendations are numbered to correspond with the subject matter in the chapter.

Chapter Thirteen contains a suggested Vision for the Future with abbreviated recommendations from preceding chapters and a suggested timeline for consideration.

For the reader, it is important to note that there are different terms for agencies providing fire and EMS in Portland, such as department, platoon, companies, team and staff. These terms are used interchangeably or as specifically appropriate in the report for ease of reading.

STUDY TEAM MEMBERS

This Study of the fire protection services in City of Portland was conducted by four consultants and three office staff of Public Safety Solutions, Inc. (PSSi). The consultants each have more than 20 years of fire and EMS experience, and they have supervised and served as fire and EMS services providers. Three of the four consultants have worked as a "Study Team" for more than 15 years. One has served as a Peer Assessor with the Commission on Fire Accreditation International (CFAI). They are hereinafter referred to as the Study Team.

Leslie D. Adams

Mr. Les Adams, Public Safety Solutions, Inc. (PSSi) President, served as the full-time project director. Mr. Adams, the former Deputy Fire Chief of the Montgomery County, Maryland Fire and Rescue Department, has 28 years of fire/EMS management experience. He has served as the operations deputy fire chief of a combined fire department that serves 850,000 residents. As a practitioner in the fire service, Mr. Adams has managed fire operations with 33 fire stations, 818 firefighters, 31 engines, 14 ladder trucks, 35 Basic Life Support units, 13 Advanced Life Support units and 120 paramedics. He has been responsible for all duties of fire services, including personnel management, planning and research, facilities, apparatus, training, dispatch, administration, and operations.

Mr. Adams has served as a paid firefighter/officer for 23 years and as a firefighter for more than 30 years. He has served as a fire/EMS consultant with Public Safety Solutions, Inc. for 19 years. Additionally, he is a certified peer fire department assessor with the Commission on Fire Accreditation International and **Mr Adams was qualified as an expert witness in the Rhode Island Superior Court regarding all facets of the Performance Study**.

He has taught at the National Fire Academy on modern techniques in fire services operations and has been on the faculty of Montgomery Community College teaching Fire Science Administration.

Mr. Adams has served as the Chairman of the International Association of Fire Chiefs (IAFC) Personnel Management Committee.

He holds a B.S. in Business Administration from the Columbia Union College, and a Masters degree in General Administration.

Mark Davis

Mr. Mark Davis has 21 years of fire, EMS and special services experience. He has served as a battalion fire/EMS chief, station commander and unit officer in a fire department with paid and volunteer personnel. Mr. Davis has been a member of a number of special operations teams, including Hazmat. He has served as an active volunteer member and officer of a number of volunteer fire departments in two states, including, Pennsylvania where he started his fire and rescue training in the Montgomery County Fire Training Academy.

As a Level II Instructor and Fire Officer II, Mr. Davis developed instructor and fire officer training programs, as well as field operations and special operations training programs. Further, he has significant EMS operations experience as an EMT-B and former nationally certified paramedic.

As a fire/EMS officer, Mr. Davis participated in the planning and implementing of fire and EMS service delivery improvements for multiple fire agencies, including successful merger initiatives.

Mr. Davis has 14 years experience as a fire/EMS consultant conducting fire and EMS company/department assessments and providing a broad range of related specialized and industrial training and certification programs.

Mr. Davis holds a B.S. degree in Fire Science Education and an M.A. degree in State and Local Government.

John M. Best

Mr. John Best served as assistant project director. He is the former fire chief of an Orlando, Florida, fire, rescue and EMS department serving a diverse area, including Walt Disney World. As fire chief, he was responsible for the administration, management and fiscal control of a progressive fire services delivery agency with a $17 million budget and 165 employees. Additionally, he previously served as the deputy chief of administration, fire marshal and arson investigations chief of a 600 square mile urban/suburban/rural county adjacent to Washington, D.C.

Throughout his fire and EMS career he served as firefighter/paramedic, unit officer, station commander, captain, battalion chief and deputy fire chief. During his tenure as deputy chief Mr. Best was responsible for training, communications and dispatch, fire prevention and arson investigations, budget management, personnel and procurement. As a volunteer in a combination paid/volunteer system he was an active operational member and officer in one of the busiest volunteer fire departments in Maryland.

As a consultant, Mr. Best provided public safety services to local governments involving fire, rescue and EMS management, organization, code application and enforcement. He also is a recognized strategic planning expert having completed more than 40 public safety agency analysis and strategic plans nation-wide.

He has lectured as an adjunct faculty member of John J. College in New York City extensively in fire services curricula including emergency management planning and response, risk analysis and management, fire prevention and education, administration and contemporary fire protection issues.

Robert K. McNally

Mr. McNally provided the operational data & geographic information system (GIS) analysis for the project. He was integral in the planning of future deployment strategies. Mr. McNally has consulted to over 110 municipalities of all sizes across the United States and Canada.

Mr. McNally has a Masters Degree from the University of North Carolina-Charlotte in Urban/Regional Planning. The emphasis of his academic research has been on the

application of geographic information systems (GIS) in public safety and homeland security sectors. As an award-winning researcher, Mr. McNally has been a speaker at several academic conferences and industry seminars. In addition, he has been published in several academic journals and reports based upon his collegiate work that helped earn him the prestigious Graduate Research Award from the North Carolina Association of GIS. Earlier, he graduated magna cum laude from Kean University with a BA in Public Administration

Robert has been involved in emergency services for over 20 years. Beginning in the volunteer ranks as a firefighter, his experience includes 14 years of urban emergency medical services (EMS) as a paramedic in Metropolitan Newark, New Jersey. He also served as an EMS manager in suburban New Jersey and as an EMS training officer in Charlotte, North Carolina. Mr. McNally has been the recipient of several professional awards in excellence for his EMS professional work.

EXECUTIVE SUMMARY

THE SETTING

Portland is the largest city in the State of Maine. It is located in the southern part of the State and is the county seat of Cumberland County. It is a port city located on a peninsula at the mouth of the Fore River and in the Casco Bay on the Gulf of Maine and the Atlantic Ocean.

History of the City

Portland has a rich and colorful history. The Portland peninsula was originally called "Machigonne" by Native Americans. It was first permanently settled in 1633 as a fishing and trading village called Casco. In 1786, the citizens of Falmouth formed a separate town in Falmouth Neck and named it Portland. In 1820, Maine became a state with Portland as its capital, but in 1832 the capital was moved to Augusta. In 1899, Portland annexed the neighboring City of Deering.

The City is bordered by the following municipalities:

- City of South Portland;
- City of Westbrook; and
- Town of Falmouth.

Demographics

The population of the City includes 69,194 residents according to the 2010 U.S. decennial census. This is an increase of approximately 3% from a decade earlier when the residential population was 64,249. The Greater Portland area includes a population of over 500,000, more than one-third of Maine's total population.

City Governance

As stated, in part, on the City's website:

The City of Portland operates under a Council-Manager form of government with a nine-member City Council, comprised of a popularly elected Mayor, five district Councilors

and three at-large members. The City's five voting districts each elect one Council member to represent their district and three at-large members are elected citywide.

The City Charter grants to the City Council all powers to enact, amend, or repeal rules, ordinances and resolutions relating to the City's property, affairs and government, to preserve the public peace, health and safety, to establish personnel policies and giving effect to any vote of the City and to authorize the issuance of debt. The Council adopts an annual budget for both municipal and school operations and provides for an annual audit. The Council appoints the City Manager, Corporation Counsel and City Clerk.

The Mayor serves as the official head of the City.

The City Manager oversees the day-to-day operations of the City, serves as the administrative head of the City and is responsible to the Council for the administration and management of all departments. The City Manager in consultation with the Mayor prepares the annual budget and presents it to the Council for approval. The City Manager appoints the Fire Chief.

PORTLAND FIRE DEPARTMENT

For budget and organizational purposes, the Portland Fire Department (PFD) consists of ten divisions: Administration, Special Services, Firefighting, Jetport Air Rescue, Fireboat, EMS, Hydrants, Building Maintenance, Fire Alarm, and Islands.

Mission Statement

The mission of the Portland Fire Department, as state on its webpage is as follows:

> "Our mission is to deliver emergency services to the City of Portland and protect its well-being through preparedness, prevention and education."

For the reader, the mission and goals statements of fire departments are typically included as part of a fire department policy that adopts and indicates the purpose and use of these statements to the fire department staff.

PFD ORGANIZATION

To attain the delivery of optimum fire and emergency medical service, it is essential that local government recognize and accept responsibility and fulfill their obligation to provide appropriate guidance and direction in order to:

- Oversee the formation process of the organization of fire and EMS services;
- Ensure that the fire/EMS organization reflects the public interest;
- Protect the service from undesirable external interference;
- Determine basic policies for providing services; and,
- Legally define the duties and responsibilities of service providers.

Organizing fire and EMS services within a community so as to provide the most efficient and cost-effective delivery of quality service is one of the most important functions of local government. Historically, many fire services have been developed and organized on the basis of local neighborhood need and initiative and, in many instances, volunteer fire and EMS companies were formed—as was the case with the initial organization of the Portland Fire Department.

Fire Chief

The primary roles and responsibilities of the Fire Chief are delineated in Portland Code. They City Code states that the Chief of the Fire Department shall:

1. Be the administrative head of the fire department responsible for the supervision of all matters relating to fires in the City;
2. Promulgate and from time to time amend, rules and regulations;
3. Have the care and control of all equipment assigned to the fire department;
4. Have responsibility for having knowledge of all telegraph, telephone, electric light and power lines within the City;
5. Provide certain medical and transportation services through a medical crisis unit; and,
6. Have the care and control of all fire alarm, police signal and radio electrical systems belonging to the City, and shall perform all functions of public safety with regard to communications except the supervision of police communications operators and dispatchers.

In reviewing the Code relative to the Fire Chief's current duties and responsibilities it is clear that this statement of the role of the Fire Chief is not consistent with the current expectations of the City in 2013. The City Code regarding the duties and responsibilities of the Fire Chief seems outdated both in terms of stated job functions and wording utilized. The City is encouraged to appropriately revise this section of the Code.

The Fire Department has a Mission Statement that reads as follows:

> "Our mission is to deliver emergency services to the City of Portland and protect its well being through preparedness, prevention and education."

Current Position Structure

The Portland Fire Department has uniformed and non-uniformed positions.

The uniformed positions are:

1. Fire Chief
2. Deputy Chief
3. Captain
4. Lieutenant
5. Firefighter / Paramedic

The non-uniformed positions are:

1. Principal Financial Officer
2. Executive Assistant
3. Fire Alarm Supervisor
4. Fire Alarm Technician

Organizational Issues

During the Study Team's interviews and discussions, a number of reasons were cited as justifying the need to upgrade the organization of the Portland Fire Department, including:

- City Code related to the Portland Fire Department and the Fire Chief is outdated;
- Outdated organization chart that does not reflect the actual day-to-day reporting relationships;

- Increasing cost to the City for funding the PFD;
- Significant number of fire house facilities needing renovation, major repairs and/or replacement;
- Span of control that seems out of balance;
- Seemingly inadequate staffing of some functions;
- Functions not provided with adequate oversight;
- Work schedule that does not seem conducive to managing properly;
- Unclear day-to-day program reporting relationships;
- Functions not properly located in the organization chart;
- Insufficient marketing of the PFD;
- Important functions not staffed;
- No "voice" of the PFD;
- No sense of direction / no short or long range plan;
- Lack of discipline and accountability;
- No professional development;
- Limited officer oversight and follow-through;
- Lack of policies and procedures and standard operating procedures;
- There are "four separate fire departments";
- Platoon shift inconsistencies;
- No asset planning;
- Fire and EMS still not fully merged;
- Aging radio system;
- No EMS field supervisor, no accountability; and,
- Consistently inconsistent.

Fire Chief's Span of Control

The PFD organization charts and the Study Team's discussions with officials and staff indicate that an extraordinary number of major PFD functions report at various times directly to the Fire Chief. These functions/officers include:

1. On-duty platoon operations;
2. Administration/Finance;
3. Personnel deputy chief;
4. Apparatus deputy chief;

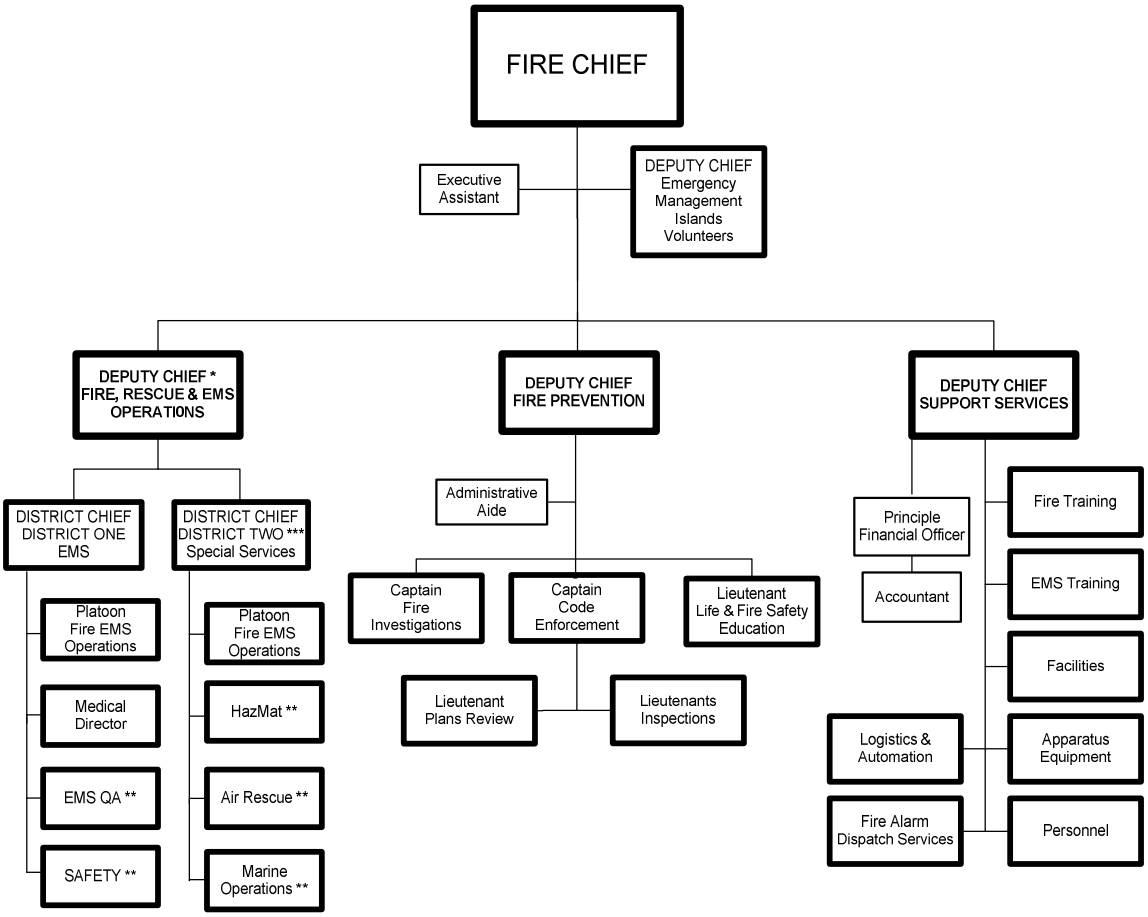
5. Hazmat functions;
6. Special operations;
7. Facilities deputy chief;
8. Equipment/uniforms deputy chief;
9. Risk Reduction – various fire prevention staff;
10. Emergency Management;
11. Jetport air rescue operations; and,
12. Marine operations.

The result is an excessive workload and span of control issue that has created a "stove top" effect in the organization with all reports and issues going directly to the Fire Chief. Clearly, a reorganization of relative roles and responsibilities leading to a more effective and timely decision making process needs to be implemented.

The organization options and recommendations include:

1. Updating City Code relating to the duties and responsibilities of the Fire Chief;
2. Updating the PFD organization chart;
3. Upgrading the PFD mission statement and developing vision and values;
4. Providing the PFD with adequate civilian administrative support staff;
5. Refocusing the Fire Alarm staff to future high tech systems;
6. Phasing out the antiquated fire box alarm systems;
7. Assigning deputy chiefs to daywork;
8. Reducing the complement of deputy chiefs by two positions;
9. Implementing non-union district chief positions for platoon command;
10. Designating the Bramhall Fire Station as the special services fire station;
11. Assigning field EMS and special services oversight functions to district chiefs;
12. Creating comprehensive state-of-the-art policies and procedures; and,
13. Pursuing fire department accreditation with the Commission.

The following alternative organization chart is suggested for consideration.



Notes: * Further details of Fire, Rescue & EMS Operations organization later in the Report.
** Specialty assigned to a district chief.
*** Bramhall Fire Station to serve as Special Services specialty station.

The key organizational changes that are reflected in this alternative suggested Portland Fire Department organization are as follows:

- Four deputy chiefs reporting to the Fire Chief, all on daywork;
- Deputy Chief for Emergency Management, Islands and Volunteers;
- Deputy Chief, Fire Marshal, for fire Prevention responsible for Investigations, Code Enforcement (Plans Review and Inspections) and Life & Fire Safety Education;
- Deputy Chief for Support Services responsible for Finance, Fire and EMS Training, Facilities, Apparatus, Personnel, Logistics/automation and Fire Alarm;
- Deputy Chief for Fire, Rescue and EMS Operations,
- Two shift work platoon district chiefs reporting each day to the Deputy Chief of Fire, Rescue and EMS Operations;

- District Chief One would be responsible for EMS each day; and,
- District Chief Two would be responsible for Special Services; Hazmat, Air Rescue and Marine operations each day.

PFD STAFFING

Decisions made regarding the staffing of fire and EMS apparatus have a direct impact on the level of fire and EMS service delivered to the community. These decisions also have an impact on the relative safety of firefighters as they perform the many dangerous tasks associated with extinguishing fires and dealing with medical and other emergencies, such as hazardous materials incidents.

Additionally, decisions regarding staffing of fire and EMS apparatus have significant fiscal implications since the major cost of a career fire department is salaries and wages for the personnel. For that reason, staffing levels become a crucial budget and service level issue in municipalities and their fire departments.

The City of Portland Fiscal Year 2013 approved budget includes a total of 234 employee positions, including 229 uniformed and five non-uniformed civilian employees, as illustrated in the following table.

PORTLAND FIRE DEPARTMENT
FY 2013 STAFFING SUMMARY

Position/Org. Element	Number
Uniformed	
Fire Chief	1
Deputy Chief	6
Fire Captain	17
Fire Lieutenant	47
Firefighter & Firefighter/EMT	157
Paramedic	1
Sub-Total Uniformed	**229**

Non-Uniformed	
Principal Financial Officer	1
Executive Assistant	1
Fire Alarm Supervisor	1
Fire Alarm Technician	2
Subtotal - Non-Uniformed	**5**
TOTAL EMPLOYEES	**234**

Source: Portland FY 2013 approved budget.
Notes: Includes 12 SAFER Grant funded positions.

It should be noted that that the non-uniformed complement incudes an accountant/payroll position.

Expenditure of Overtime

The Study Team was apprised of the fact that a substantial amount of overtime is being expended each pay period by the Fire Department primarily for apparatus staffing requirements. Reportedly, the overtime expenditure is estimated at $1.8 million in the past fiscal year. A substantial portion of this overtime is likely due to staffing above the budgeted funding levels.

For the future, with a complete determination of time "off the floor," including vacation, sick, training, on the job injuries, and details, for example, the City and the PFD may determine what its budgetary firefighter and officer position requirements are from year to year. This would also assist in assuring that the budgeted overtime requirements are appropriately funded for the PFD.

The overtime expenditures related to the Portland Fire Department over the last 9 years are illustrated in the following table.

PFD OVERTIME EXPENDITURES FOR THE PAST 9 YEARS

Fiscal Year	Overtime Expenditures
FY 2013	$1,087,500*
FY 2012	$1,855,158
FY 2011	$1,584,951
FY 2010	$1,494,107
FY 2009	$1,213,864
FY 2008	$1,639,173
FY 2007	$1,297,132
FY 2006	$1,210,783
FY 2005	$1,251,783

*Budgeted overtime amount.

In the experience of the Study Team, these levels of overtime expenditures seem unusually high for a fire department the size of Portland's and related recommendations for reduction will be made in this report to attain substantial reductions. Although stated in the public media, it should be noted that PFD overtime expenditures have not exceeded $2 million in the last nine budget years.

The Study Team typically utilizes a nationally recognized formula to assist in its determination of the adequacy of the total apparatus staffing of fire departments. That formula can provide a measure of budgetary accuracy in determining the actual number of firefighters and officers required to staff the fire and EMS apparatus, given the minimum staffing levels approved by the municipality.

Various OT Causal Factors

In the analysis of the data, review of applicable documents, and discussions with City and PFD officials and firefighters, the factors that result in the expenditure of overtime funds are numerous and varied. They include, for example, maintaining approved minimum staffing levels when the following would result in lower than approved apparatus staffing levels:

- Use of sick leave;
- Use of vacation time;
- Use of bereavement leave;
- Use of family sick leave;

- Holiday leave; and
- On the job injury.

Likewise, the following activities generated overtime income paid to off-duty firefighters, and officers directly in that the off-duty service provider was paid overtime compensation in a pay check:

- Training activities to take place;
- SCBA maintenance;
- EMS supplies work;
- Hazmat team response;
- Maintain Island staffing;
- EMS QA meeting;
- Staff meetings, captains, chiefs, etc.;
- Perform admin duties; and,
- Call back for major incidents.

Potential Negative Aspects of Excessive OT Staffing

Previously in this Chapter the extent of fire and EMS apparatus staffing via OT was discussed and illustrated. There are a number of potential negative aspects or side effects of the excessive use of OT in the staffing of fire and EMS apparatus that may result. These include:

- Increasing potential burnout;
- Reduced fire and EMS unit teamwork and cohesiveness;
- Excessive use of OT in the course of providing services;
- Increased cost to the taxpayer for services provision;
- Reduced management and oversight of activities and tasks;
- Increasing philosophy that working for the PFD is a “part time job”;
- Reduce ability of supervisors to provide consistent employee oversight;
- Reduce pride and commitment to the organization;
- Reduced accountability of staff; and,
- Decreased discipline levels.

Options for OT Reduction

There seems to be the opinion that OT is limitless and that is the way to do things. In the opinion of the Study Team, the following approaches may result in a reduction in future annual overtime costs.

- Overtime Policy and Procedure: Develop and implement a PFD policy and procedure relating to the authorization, process for documentation and payment of overtime funds;
- Staffing Calculation Formula: Consider increasing budgeted unit staffing to reduce OT based on the formula;
- PFD Reorganization: Consider implementing the PFD reorganization involving daytime Deputy Chiefs;
- Revise Hazmat Team Deployment: Revise the method used to assign and deploy the Hazmat Team, as discussed in the Operations Chapter of this Study report;
- Deployment of Paramedics: Consider revising the approach to the deployment of paramedics by increased staffing suppression units with paramedics, as discussed in the EMS Chapter of this report.
- MEDCU EMS Staff Burnout: Take actions to reduce burnout of MEDCU staff potentially reducing use of sick leave;
- Add a Fifth MEDCU: Consider adding a fifth MEDCU, reduce OT, burnout and use of sick leave;
- Increase Reliance on Mutual Aid: Take action to increase reliance on automatic mutual aid support and reducing reliance on PFD personnel callback;
- Conduct Administrative Duties while On-duty: Conducting administrative activities on duty rather than off-duty;
- Train while On-Duty: Conducting more training on duty;
- Tracking Sick Leave Usage: Strengthening and upgrading a sick leave usage monitoring program to identify and take action related to follow-up on misuse;
- State-of-the-Art Scheduling Program: Implementing state-of-the-art automated fire and EMS personnel scheduling program, e.g., Telestaff; and,
- State of the Art Payroll Program: Fully automate the payroll processing system to provide comprehensive analysis of causes to support identification of solutions.

Implementing these and other staffing enhancement approaches will assist the PFD in reducing the use of OT as an approach to unit and function staffing, as well as, project accomplishment.

The staffing options and recommendations include:

1. Adopting the suggested staffing formula for determining needed staffing;
2. Developing and implementing an overtime reduction plan;
3. Redeploying the staffing from duplicate Engine 6 to higher priority needs;
4. Re-implementing the use of personnel evaluations;
5. Implementing a revised 24-hour shift with fewer regular consecutive days off;
6. Implementing revisions to the use of the bid process for transfers;
7. Consulting with the Civil Service Commission regarding HR recommendations;
8. Implementing a state-of-the-art firefighter scheduling software program; and,
9. Consider NFPA 1710 four person staffing, as funding permits.

RISK ANALYSIS AND FIRE STATIONS

The following sections list the mainland and island fire stations, their locations and assigned primary fire and EMS apparatus.

Current Mainland Fire Stations

1. Munjoy Hill Station – 134 Congress Street / Engine 1, Ladder 1
2. Central Fire Station – 380 Congress Street / Engine 5, MEDCU 5, MEDCU 6
3. Bramhall Station – 784 Congress Street / Engine 4, Engine 6, Ladder 6, Rescue 1
4. Rosemont Station – 212 Stevens Avenue / Ladder 3, MEDCU 3
5. East Deering Station – 474 Ocean Avenue / Engine 11
6. Northgate Station – 380 Allen Avenue / Ladder 4, MEDCU 4
7. Riverton Station – 1592 Forest Avenue / Engine 9, Wheelchair Unit*
8. Marine Division – 56 Commercial Street / Marine 1, Marine 2, Marine 3
9. Air Rescue Station – 1005 Westbrook Street / Red 2, Red 3, Red 4, Red 5

* Explained in detail in Chapter Six – Emergency Medical Services.

Current Island Fire Stations

The PFD fire stations located on various Portland islands in Cosco Bay are as follows:

1. Peaks Island – 129 Island Avenue / Engine 12, Tank 12, Ladder 12 & MEDCU 12
2. Cliff Island – 108 Church Road / Engine 13, Tank 13, MEDCU 13, & Forestry 13
3. Cushing Island - 1 Spring Cove Ave. / Engine 14 & Tank 14
4. Great Diamond Island - 251 Diamond Ave. / Engine 15, Tank 15, Truck 15, MEDCU 15 & ATV Unit
5. Little Diamond Island - Cart

The number and type of fire, rescue and EMS risks, as well as workload, in a municipality typically drives the number and location of stations. As a general rule, response times are utilized in locating fire and rescue stations. In some instances, availability of land and funding have a major bearing on locations of stations.

The fire and EMS facilities options and recommendations include:

1. Adopting a closest station response area for unit dispatch purposes;
2. Considering a railway crossing to assist apparatus response between Northgate and Riverton Fire Stations;
3. Adopting initial response policy that dictates lights and siren use; on "hot" incidents only;
4. Placing higher priority on provision and maintenance of facilities and equipment;
5. Upgrading Central Fire Station for use as headquarters and full service fire prevention functions.

APPARATUS

There are four basic types of fire rescue apparatus:

1. Pumpers deliver water from an internal tank, pressurized system, or static source (river, canal or pond) to the fire scene;
2. Aerial devices are vehicles with long extension ladders or platforms;
3. Specialized rescue trucks with equipment for extricating individuals from vehicles, underground entrapment, high locations, entanglement in machinery, and difficult transportation accidents; and,

4. EMS transport units (MEDCUs or ambulances) with basic and/or advanced life support supplies and equipment.

An apparatus replacement schedule to provide for long-term scheduling of fire and rescue apparatus replacement was reviewed and suggested for consideration.

The current primary fire and EMS apparatus included in the fleet of the Portland Fire Department are illustrated in the following table.

SUMMARY BY APPARATUS TYPE

APPARATUS	NUMBER
Engines	15
Ladder Trucks	6
Rescue	1
MEDCUs	10
Fire EMS Boats	3
Total	35

Source: PFD.
Note: Includes island and reserve units.

The vehicular apparatus options and recommendations include:

1. Developing/implementing optimal replacement cycles policy for each type of apparatus replacement;
2. Developing/implementing optimal replacement cycle policies for required tools, appliances and equipment;
3. Developing a policy for the conservation of fuel;
4. Conducting aerial ladder tests in compliance with NFPA 1911;
5. Assuring that fire apparatus equipment inventory complies with NFPA 1901; and,
6. Assigning responsibility for apparatus to a senior officer on daywork.

EMERGENCY MEDICAL SERVICES

To quote the PFD's Medical Director, "There are great people working at PFD. The department needs to capture, mentor, and grow the superstars!" After the Study Team completed its interview sessions it was quite apparent that the PFD has talent and is quite capable of moving its service delivery to the next level—especially in the area of EMS. In essence, the PFD MEDCU program is net neutral in relation to revenue and cost of services provided.

With over 100 certified EMT-Intermediates and EMT-Paramedics, four full-time ALS equipped transport units, and ALS-equipped engine and ladder companies, PFD's full-service EMS system provides a much higher level of service than many traditional fire department first responder services. The PFD must be commended for its efforts to provide this valuable service. **Further, although precise EMS costs are not easily determined at this time, it should be noted that in FY2013 the cost of the PFD providing EMS services is projected to be exceeded by revenue from EMS patient billing by potentially as much as $600,000.**

The emergency medical services options and recommendations include:

1. Increasing public education efforts with delivery of CPR training;
2. Initiating involvement in the State's Child Passenger Safety program;
3. Fully implementing EMD operations to allow dispatch of closest EMS unit/s;
4. Including the Medical Director position in the PFD organization chart;
5. Upgrading the ePCR software to enable station officers to query the system;
6. Developing a QI plan for approval by the Maine EMS Board;
7. Working on improved teamwork between EMS and fire services providers;
8. Revising the transfer bid system to the station level;
9. Implementing dedicated ALS delivery using fire apparatus;
10. Assigning EMS responsibilities to platoon district chiefs;
11. Requiring platoon district chiefs with EMS responsibility to be ALS providers;
12. Implementing a fifth MEDCU as a BLS transport unit coinciding with full implementation of EMD;
13. Staffing MEDCU 5 and MEDCU 6 with EMT-Bs coinciding with making Engine 5, a dedicated paramedic engine;
14. Implementing one of three options relating to NET Team; abolished, dedicated to non-emergency transports or daytime MEDCU 7 peak demand BLS unit;

15. Implementing firefighter/EMT-P as minimum staffing for Peaks Island;
16. Implementing EMT-P certification as part of the hiring requirement;
17. Implementing a Field Training Educator on each platoon;
18. Implementing an ALS internship program with field training officers;
19. Creating an EMS Committee; and,
20. Continuing to fund/support delivery of EMS with the fire-based EMS approach.

OPERATIONS & SPECIAL OPERATIONS

Decisions made at the emergency scene may be irreversible and the consequences of error can be disastrous. Errors can lead to further property loss, as well as injury or death to civilians and firefighters. Successful fire operations require thorough pre-incident planning; knowledge of the nature and location of buildings; interior contents; and built-in systems.

Each fire department should have a set of rules and regulations that outline performance expectations for its members, the standard operating procedures for the department, and disciplinary actions that can be taken against personnel not following the regulations. The Study Team found a serious need for an up-to-date, comprehensive policies and procedure manual within the PFD.

Pre-fire planning and building fire inspections performed by firefighters and officers can improve firefighting service. The increased knowledge by firefighting personnel of the buildings and other occupancies in their service area can be very beneficial towards reduction in loss to property and increased safety for the firefighters. Additionally, these activities can result in more productive use of staff time and improve public relations.

The operations & special operations options and recommendations include:

1. Assigning a platoon district chiefs the responsibility for special operations;
2. Implementing a comprehensive computerized pre-fire planning program;
3. Requiring personnel providing vehicle extrication services to be certified under NFPA and/or State programs;
4. Designating the Bramhall Fire Station as the special services station;
5. Revising the staffing and deployment approach utilized for the Hazmat Team; and
6. Assigning a second strategically located engine with extrication services.

MARINE - FIRE EMS BOAT

A **fireboat** is a specialized watercraft with pumps and nozzles designed for fighting shoreline and shipboard fires. The first fireboats, dating to the late 18th century, were tugboats, retrofitted with firefighting equipment. The first fireboat was placed in service in 1894 by the PFD. Initially, the fireboats were used largely for fighting fires in the Cosco Bay, islands and Portland waterfront areas.

Currently, the PFD boat fleet includes three boats that are reportedly largely utilized as follows:

- 65′ Ranger 2000 Class boat with 3000 gpm water pump utilized for fire and EMS/rescue services;
- 42′ Duffy and Duffy w/o pump utilized for EMS/rescue service; and,
- 20′ Pacific Skiff 2025 aluminum workboat with a 140 HP Suzuki outboard utilized to access shallow areas the other boats are unable navigate.

Today, the fireboats further provide emergency medical services treatment and transportation for island residents and visitors and training for the island volunteer firefighter EMT call forces. The Marine Division boat crew conducts life and fire safety inspections of waterfront facilities and harbor patrols as required.

The following are examples of the types of work activities that the PFD Fireboats are involved in:

- Approximately 350+ responses per year, fire and EMS;
- On-going training (PFD, US Coast Guard, Island resources);
- On-going maintenance of marine fleet and associated equipment;
- Apparatus checks for Island resources;
- Hose testing for Island resources;
- Water front life and fire safety inspections; and,
- Waterfront special events.

Regarding the provision of emergency medical service the PFD fireboats are responding to the various islands or boats in Cosco Bay or other waterways to provide medical patient care and transport back to the mainland for transport to the hospital for definitive care. Since there is no other means for someone with a medical emergency to obtain

treatment and transport to the mainland there does not seem to be any serious question being raised regarding the need for the PFD to operate a boat for that purpose. Any of the three PFD boats are capable of providing this EMS staff services, although only the 42′ *Joseph C. Cavallaro. Jr*. and the 65′ *City of Portland* are capable of providing EMS care and **transport** effectively.

Regarding the provision of fire protection, there is only one PFD boat that is capable of pumping water and carrying foam to extinguish fire; the Fireboat *City of Portland*. For nearly 130 years a Portland Fireboat has responded to extinguish fires in a number of primary areas, as follows:

1. On the mainland to support vehicular fire apparatus to suppress fires by providing needed water supply as backup to the fire hydrant system;
2. On the mainland waterfront areas to deliver water and foam on the sides of wharfs and other buildings and structures where land-based fire apparatus is unable to gain access;
3. To support fire protection to the various islands;
4. To extinguish fires on boats and other watercraft in the various bays and waterways; and,
5. To assist other adjacent and other area municipalities to extinguish fires in and along their waterfronts.

Although the use of *City of Portland* to extinguish fires in the above areas is very important, clearly, in the Study Team's view, the most important area for the City where a fully functional fireboat is needed to provide fire suppression services is to the City's waterfront areas.

The marine & fire EMS boat options and recommendations include:

1. Continuing to maintain a substantial fire protection capability to the waterfront;
2. Implementing the revised term of Fire EMS Boat for the PFD boats;
3. Implementing a two-boat approach to marine services delivery; a boat that provides fire and EMS services and a quick-response inflatable RIB type enclosed rescue boat for EMS transport and shallow access areas;
4. Continuing the implementation of the renovation of the current crew quarters to provide safe quarters;
5. Maintaining Fire EMS Boat staffing each day at three (3) uniformed personnel;

6. For the long-term, co-locating the Marine Division, Engine 5 and MEDCU 5 (from Central) to provide continued rapid response of the Fire EMS Boats and the potential for cross-staffing at a fire EMS station in the central waterfront area.

AIR RESCUE - JETPORT

The City of Portland's Airport has been an Index C airport. Recently, it was changed to an Index B airport. Fire protection, along with annual training required at all US Airports, is governed by the FAA's part 139.

The special airport-related training required consists of 12 different categories, including:

1. Airport Familiarization;
2. Emergency Communications and Alarms;
3. Aircraft Familiarization, Application of Extinguishing Agents;
4. Hoses/Nozzles/Turrets;
5. Personal Safety;
6. Water Rescue/ Ballistic Parachutes/Low Visibility Conditions;
7. Adapting Structural Equipment;
8. Cargo Hazards;
9. Firefighting Operations;
10. Aircraft Evacuation Assistance; and,
11. Firefighter Duties under the AEP.

The Air Rescue Station has always had 3 vehicles. An officer was always in charge of the shift and a driver was assigned for each big crash truck. Another big crash truck was/is on hand as a spare in case one of the two front-line crash trucks needs to be serviced. There are 2 radios in all the vehicles: one radio is for communications with the Air Traffic Control Tower and the other radio is the Portland Fire Department radio.

With the recent change in the Jetport index from Index C to Index B there is a need to determine means for providing PFD services to the Jetport with as limited cost in services provision as possible relating to staffing.

The air rescue - Jetport **options** include:

1. Providing one (1) coverage (fill-in) person assigned per shift;
2. Providing 20-hour per day (0500-0100 hours) coverage (7,300 hours per year), with two firefighters on each platoon with a daywork Captain;
3. Providing 20-hour per day (0500-0100 hours) coverage (7,300 hours per year), with one firefighter on each platoon with a daywork captain; or,
4. Providing the level of staffing and hours of daily coverage desired by the Jetport on an overtime basis.

With these Jetport staffing options, there would be other savings in other cost categories, depending on the optional staffing approach determined appropriate. Likewise, there would continue to be certain costs for training, for example, that would be associated with the selected optional staffing approach.

EMERGENCY COMMUNICATIONS

A Public Safety Answering Point (PSAP), also commonly referred to as the 9-1-1 center, is a call center responsible for answering calls to an emergency telephone number for police, fire and emergency medical services. In October 1999, the Federal Wireless Communications and Public Safety Act of 1999 (9-1-1 Act) took effect with the purpose of improving public safety by encouraging and facilitating the prompt deployment of a nationwide, seamless communications infrastructure for emergency services. One provision of the 9-1-1 Act directed the Federal Communications Commission (FCC) to make 9-1-1 the universal emergency number for all telephone services.

Trained telephone operators/dispatchers, known as telecommunicators, are responsible for obtaining pertinent information from callers and dispatching the appropriate emergency services to calls for help. Modern PSAPs and 9-1-1 systems automatically report the telephone number and location of 9-1-1 calls made from wireline or landline phones, a capability called Enhanced 9-1-1 or E9-1-1. The FCC also requires wireless telephone carriers to provide 9-1-1 and E9-1-1 capability, where a PSAP requests it. Once it is implemented fully, wireless E9-1-1 will provide an accurate location for 9-1-1 calls from wireless phones.

A commonly held belief of the public is that public safety providers are as close as a telephone. While this is generally true of public safety service provision, members of the general public have a significant misunderstanding and lack of knowledge of the myriad functions which cause public safety officers to arrive where needed in a timely manner. Given the vast array of technological and human functions which must be carefully, accurately, and quickly executed to ensure a proper response to a demand for service, it is amazing to many, upon learning the sequence of actions, that existing dispatching systems work as well as they do. Without the ability to receive calls, gather necessary preliminary information, transmit that information, and dispatch appropriate resources in such a manner to ensure a timely response, any system is doomed to failure. While there are a variety of methods in use across the country today, each must be considered individually for applicability to the needs, capabilities, and technologies of the jurisdiction being served.

The communications options and recommendations include:

1. Abolishing and removing the antiquated, essentially unused (for emergency dispatch purposes) various components of the fire alarm box system/s;
2. Reallocating the Fire Alarm staffing to high technology dispatch systems;
3. Planning and replacing the current 800MHz radio system to current state-of-the-art digital trunking system standards and full interoperability with surrounding counties; and,
4. Continuing to monitor the viability of the current SunGard computer aided dispatch system in order to properly plan for and implement a replacement, when needed.

ISLAND VOLUNTEER FIRE/EMS SERVICES

The Study Team's experiences in volunteer fire and EMS service reflect various approaches and reasons for volunteer participation. This experience is useful in explaining some opinions of volunteer service constraints and benefits.

Nationally, some volunteer fire departments seem to have a continual supply of individuals who want to and can volunteer their services. Others, however, have problems trying to recruit enough volunteers to maintain minimal staffing of units and subsequently may have difficulty retaining those members and developing qualified

volunteer leaders. The key seems to be meeting the needs or expectations of the volunteers, which are different in many respects from paid personnel.

Through the years, the Portland islands have been provided fire and EMS by PFD firefighters and officers augmented by services of volunteer members at the following four volunteer fire associations:

1. Peaks Island Volunteer Fire upgraded 1938 to engine with 500 GPM pump;
2. Cushing Island Volunteer;
3. Cliff Island Volunteer Company, established in 1952; and,
4. Great Diamond Island Fire Company, established in 1949;
5. Little Diamond Island Fire Company.

The concern expressed to the Study Team by a number of island volunteers was the need to take actions to maintain and enhances fire and EMS volunteerism on Portland's islands.

The island volunteer options and recommendations include:

1. Providing media coverage of Portland's island volunteer fire and EMS activity;
2. Implementing a comprehensive volunteer recruitment and retention program;
3. Providing support and financial assistance to the island volunteer efforts; and,
4. Assigning permanent firefighter/paramedic staffing to support firefighting and EMS provision activities on the islands.

HEALTH AND SAFETY

The health and safety of firefighters and EMS personnel should be a major concern of those responsible for delivering the services, those receiving the services, and those helping to pay for the services.

Individuals working in public safety, particularly firefighting and EMS personnel, perform one of the most physically demanding and mentally stressful occupations in the nation. Quite often, fire and emergency medical personnel are subjected to environments that require rapid, physical, and mental responses with a minimum of preparation. The Portland Fire Department lacks a comprehensive safety and health program and falls short in many areas of compliance with NFPA 1500. Many professionals in the fire service say that safety is an attitude that must be believed in, that must be communicated,

and most importantly, must be enacted. Much work is needed in order for the PFD to attain that position.

The health and safety options and recommendations include:

1. Developing a risk management plan;
2. Developing a written safety and health policy and implement an organized and effective safety and health program;
3. Developing an injury reporting and investigation program meeting NFPA 1500;
4. Implementing a comprehensive driver training program;
5. Developing a post incident analysis policy and procedure;
6. Resolving the life safety code issues involving the Central Station and Fire EMS Boat crew quarters;
7. Ensuring that every fire station dormitory is equipped with smoke detectors;
8. Continuing to encourage physical fitness and supporting the Stair Climb and Firefighter Combat Challenge programs;
9. Ceasing the practice of assigning inexperienced crew to Peaks Island; and,
10. Implementing a process to revise the transfer bid process in order to permit rotation of in-station riding assignments.

FIRE AND RESCUE TRAINING

The main objective of the fire service is to prevent injury and loss of life and to protect property and the environment. Training is a key element to successful emergency scene operations and organizational effectiveness. Training in the fire, rescue, and EMS disciplines is also a career-long venture, starting with recruit and basic training programs and progressing to more sophisticated advanced training and participation in higher educational opportunities. Between formal training programs and educational courses there must be ongoing reinforcement of knowledge and hands-on skills provided to all ranks.

It is very apparent from speaking with PFD officers and firefighters that they are committed to providing good service to their customers. It is also important for PFD to remember that its members and employees are its customers as well. Like many other fire departments across the United States, there are some serious shortfalls in training within PFD primarily involving company-level training, the duties and

responsibilities of the Division of Training, and the lack of training certification requirements at the officer ranks.

The fire and rescue training options and recommendations include:

1. Updating the job description of the Training Officer and retitle it to "Fire Training Coordinator";
2. Updating the job description of the EMS Training Officer and retitle it to "EMS Training Coordinator";
3. Retaining the Fire Training Coordinator as captain with added requirement of Fire Instructor II;
4. Retaining the EMS Training Coordinator as captain with added training requirement of EMT-Paramedic Instructor Coordinator III.
5. Implementing minimum training and certification requirements for PFD officers as suggested in the Study report;
6. Developing a delivery plan for the recommended added training requirements;
7. Establishing an officer continuing education program for PFD officers;
8. Reviewing the minimum training requirements and delivery methods for islands volunteer responders;
9. Implementing a comprehensive Probationary Firefighter Training Manual / Program that provide/evaluates the needed knowledge, skills and abilities;
10. Implementing a command officer professional development program that includes training on incident command and incident scene safety; and,
11. Initiating the planning process for the design and construction of a fire / rescue / EMS training facility, potentially regional.

FIRE PREVENTION – LIFE SAFETY

The funding and organizational culture of the Portland Fire Department, with regard to fire prevention and community risk reduction, is focused operationally on mandated new construction plans review, inspections and tests with an ancillary approach to fire investigation and maintenance inspections of existing properties.

The current resources made available to the new construction plans review, inspection and test responsibilities of the Fire Prevention Bureau continue to foster backlogs and prioritizations in attempts to "catch up" with their workload. The Bureau consumes the

majority of the State mandated, 32-day turnaround time limit in the City's development authorization review process.

"In-service" fire companies complete the bulk of the fire prevention code inspections of existing properties. This process and the fire company's interaction with the current *Naviline* software program needs review so that all existing inspectable properties may be inspected annually with Bureau personnel completing more frequent inspection of target hazards.

The Fire Investigation Team organization, in cooperation with the Portland Police Department, is doing an admirable job in their origin and cause determinations of fires, explosions and other related incidents.

The priority of Life and Fire Safety Education in the Department wanes. While enabled in the adopted City Code, this effort is not mentioned in the Department's budget, annual reports or organizational makeup.

To address the City's fire issues in a coordinated effort, the plans review, inspection, fire protection system test and fire investigation and life & fire safety education entities of the Portland Fire Department need to be organized in a manner complemented by fire suppression forces and community coalitions.

This coordinated effort must include, among a number of things, the collection and analysis of all pertinent data resulting in regular management reports for the use of PFD policy makers in determining activities, trends and planning for all aspects of the Department.

The Department needs to "redesign" its fire prevention and risk reduction culture and organization to engage the Portland community as partners in life and fire safety.

The fire prevention life safety options and recommendations include:

1. Elevating and centralizing the Fire Prevention Bureau to the Fire Prevention/Risk Reduction Division with oversight by a dedicated Deputy Chief- Fire Marshal;
2. Redesigning the mission of the Fire Prevention/Risk Reduction program to reflect the mission of the PFD;
3. Identifying the number of inspectable properties in the City;
4. Dedicating the current plans review lieutenant to the PFD plans review activity;

5. Increasing the full-time inspection staff by two inspectors to support "in-service" fire company inspectors and support the new construction tests and inspections;
6. Assigning the Fire Investigations program to the Deputy Chief – Fire Marshal;
7. Establishing a Life and Fire Safety education program supervised by a lieutenant;
8. Causing to implement a program where "in-service" fire companies efficiently complete maintenance inspections of all inspectable properties annually;
9. Completing an assessment of the current *Naviline* system as it relates to the fire code inspection process;
10. Documenting the number of plans review completed;
11. Initiating a policy of fire company officers completing NFPA 1031 for inspectors;
12. Initiating a policy of fire investigators completing NFPA 1033;
13. Developing a fire investigator callout policy; and,
14. Completing an analysis of the fire protection system actuations to determine how they may be reduced.

REGIONALIZATION & MERGER

Regionalization and consolidation initiatives and successes are a national trend in the provision of public safety services. The Study Team has extensive knowledge and experience with the consolidation and regionalization options and related benefits available to cities and towns for consolidation and regionalization of various functions, including fire and emergency medical services. It is for that reason that a full chapter of this Report is dedicated to this subject for consideration by City of Portland officials, services providers, and taxpayers.

There are a many benefits that may be attained through fire, emergency medical, and dispatch services consolidation and regionalization, including:

1. Increased efficiency;
2. Improved effectiveness;
3. Seamless delivery of services;
4. Elimination of overlaps in positions;
5. Elimination of duplicate equipment;
6. Reduced response time for units dispatched;
7. Increased opportunity for staff specialization;
8. Upgrading recruit training programs;

9. Opportunity for increased promotional selectivity;
10. Increased promotional opportunity for personnel;
11. Potential revised perspective/outlook of personnel;
12. Enhanced or expanded services;
13. Improved safety of customers and services providers;
14. Reduced costs;
15. Improved incident command coverage;
16. Improved allocation and utilization of staffing;
17. Cost avoidance;
18. Coordination of planning;
19. Standardization of services and programs;
20. Improved and more effective training;
21. Potential improve ISO rating; and,
22. Impact on future state and federal grant funding.

This Report outlines a number of fire, emergency medical, and dispatch options available to the City for consideration.

The regionalization & merger options and recommendations include:

1. Considering implementing an appropriate form of regionalization of fire protection services;
2. Considering implementing an appropriate form of regionalization of EMS;
3. Considering implementing an appropriate form of expanded regionalization of emergency dispatch.

REVENUES

The City of Portland has received a substantial amount of revenue that offset the annual PFD budget as illustrated in Figure 1.5.

PFD REVENUE FROM VARIOUS SOURCES

FISCAL YEAR	FIRE ADMIN.	AIR RESCUE	FIRE FIGHTING	EMS	FY TOTAL	NET TOTAL	TOTAL BUDGET
FY 2013	$314,146	$1,174,417	$459,285*	$3,039,900	**$4,987,748**	$11,013,748	$16,000,838
FY 2012	$314,645	$1,122,629	N/A	$2,658,800	**$4,515,699**	$10,738,640	$15,254,339
FY 2011	$306,791	$1,235,647	N/A	$2,434,000	**$3,976,438**	$11,270,965	$15,247,403
FY 2010	$239,535	$1,141,739	N/A	$2,394,500	**$3,775,774**	$11,086,060	$14,861,834
FY 2009	$242,293	$1,119,127	N/A	$2,730,500	**$4,091,920**	$10,425,653	$14,517,573

*SAFER GRANT.

These revenues from MEDCU patient transport billing, grants and Jetport reimbursements for services are a significant offset to the funds that, to a large extent, would have to otherwise be funded through City property taxpayers.

DETERMINATION OF THE NUMBER OF STAFF NEEDED

Fire Costs Per Capita – U.S. Municipalities

In a comparison of national data for average fire costs among cities within different population ranges, the International City/County Management Association (ICMA) publishes police and fire data in the ICMA Year Book. According to the ICMA *Municipal Year Book, 2012***,** the average per capita costs in 2011 for fire services were as follows:

City Classification	Per Capita Costs
40 cities of all sizes in New England:	$196.01
18 cities with population range of 100,000-249,999	$169.19
45 cities with a population range of 50,000 to 99,999:	$184.91
106 cities with a population range of 25,000 to 49,999:	$173.81

City of Portland Data:

For FY 2012: ($15,254,339 ÷ 69,000)	$221.07
For FY 2012: ($12,508,762 ÷ 69,000)	$181.28*
For FY 2012: ($9,854,024 ÷ 69,000)	$142.81**

*Not including Fire/EMS Boat, Air Rescue, Hydrants, Fire Alarm & Islands.
**Not including Fire/EMS Boat, Air Rescue, Hydrants, Fire Alarm, Islands & EMS.

According to the ICMA, its data includes retirement, hospitalization, and 'other' costs. The reader should note that the Portland data is net of revenue and does not include benefits-related expenditures. Officials are encouraged to exercise caution in interpreting the comparative data and are encouraged to verify published data before making any decisions on the data. **Caution is required in the interpretation of any comparative data.**

Firefighter Staffing Per Capita – U.S. Municipalities

The ICMA also publishes uniformed sworn fire staffing data by population range and number of cities reporting in each population range calculated on per 1,000 basis. **Caution is required in the interpretation of these data.**

City Classification	Uniformed/Sworn
51 cities in New England	1.77
9 cities with a population range of 500,000 to 1 million:	1.43
9 cities with a population range of 250,000 to 499,999:	1.34
47 cities with a population range of 100,000 to 249,999:	1.38
95 cities with a population range of 50,000 to 99,999:	1.52
193 cities with a population range of 25000 to 49,999:	1.63

City of Portland Data:

FY 2012 Data (194 uniformed ÷ 69):	2.81*
FY 2012 Data (162 uniformed ÷ 69)	2.34**

*Not including Fire/EMS Boat, Air Rescue & Fire Alarm.
**Not including Fire/EMS Boat, Air Rescue, Fire Alarm & EMS.

These comparative analyses are provided for information purposes for the reader. It is the Study Team's experience, and that of many professional public safety services planners, that police agencies use population ratios heavily to justify their police staffing needs. However, although used for informational comparisons by some, firefighters per

thousand population is not utilized as a major consideration for determining and justifying fire department uniformed sworn staffing levels.

There are many varied considerations that, either directly or indirectly, enter into any analysis and resulting plan involving a determination of the total number of firefighters and officers needed to staff a fire department. These may include:

1. The public's fire services delivery expectations of the fire department, as determined by municipal or other decision makers;
2. How soon after arrival at the scene of a fire is the fire department to initiate interior firefighting, e.g., immediately or when the second fire unit arrives.
3. Geographic layout of the fire services area;
4. Geographic barriers to apparatus response, e.g., bays, lakes, rivers and creeks;
5. Age of the community and building stock;
6. Density of population and development;
7. Level of consistency with national standards/guidelines and accepted practices;
8. Number of fire stations in the service area;
9. Distance between fire stations;
10. Roadways and their design;
11. Type and age of fire apparatus;
12. General fiscal condition of the municipality;
13. Community water supply;
14. Type of staffing approach, paid, volunteer or combination;
15. Actual and projected response times of apparatus;
16. Availability of mutual aid fire apparatus response;
17. Unique aspects of the service area, e.g., waterfront, island services delivery;
18. Current and projected call workload;
19. Quality of dispatch agency;
20. Relative level of training of personnel;
21. Is the fire department to provide emergency medical first responder and/or transport services;
22. Is the fire department to provide unique services, e.g., boat service, airport rescue;
23. Is the fire department to provide light (vehicle extrication) and/or heavy rescue services;
24. Labor contract provisions;
25. Is the fire department to provide a level of fire prevention services, e.g., building inspections, fire investigations, building plans review and public fire education;
26. Is the fire department responsible for its own apparatus repair and maintenance;

27. Is the fire department responsible for its own radio maintenance and repair; and,
28. Is there street fire alarm box system that the fire department is responsible for maintaining.

The reader will come to understand, as this Report is reviewed, how these and other considerations enter into the determination of a fire department's uniformed and civilian staffing levels. Further, the reader will come to understand that decisions regarding the overall staffing of a fire department are driven by many factors and considerations that are largely based on the nature of the service area, the type and quality of services to be delivered and relative cost of fire and EMS services delivery. For these reasons, it should be understood there is no single factor in determining the appropriate overall staffing of a fire department and that municipal decision makers have a complex job to perform in determining the appropriate level of staffing for their fire and EMS department. **A major goal of this Performance and Management Study is to provide decision makers and services providers with the information and tools with which to make informed decisions**.

POTENTIAL BENEFITS

In upgrading the personnel, operations, management and administration of a fire department, it is not possible to delineate all the positive outcomes. Improving the quality of life in a community and saving lives do not necessarily involve quantitative analysis.

A number of the anticipated returns on investment for the operations and management recommendations in this Study include:

1. Improved management of the Portland Fire Department by upgrading the senior uniformed staffing through programmatic oversight;
2. Improve platoon management through implementation of two district chiefs;
3. Increased pride in the organization;
4. Improved services to the island via dedicated staff assignment and upgraded boat services;
5. Upgraded utilization of special services capabilities through focused use of resources at the Bramhall Fire Station;

6. Decreased apparatus response time through sending closest units;
7. Reduced loss of time on the job through comprehensive firefighter safety programs;
8. Improved cost effectiveness through program revisions and reductions;
9. Improved EMS provision through increased number of MEDCUs;
10. Enhanced fire protection of buildings through fire prevention program improvements;
11. Improved responsiveness of PFD senior management via schedule changes;
12. Enhanced management of human resources;
13. Upgraded teamwork within the PFD via completion of EMS merger;
14. Improved cost effective service through automatic mutual aid;
15. Improved firefighter effectiveness through upgraded training;
16. Increased awareness, planning for major fire incidents, and improved effective use of firefighters through implementation of pre-fire planning by firefighters and officers in the fire stations;
17. Improved morale within the PFD;
18. Improved image of the PFD through program upgrades and accreditation;
19. Improved incident scene accountability;
20. More effective use of key senior staff members; and,
21. Enhanced status of the City being served by an accredited fire agency.

FISCAL IMPACTS

The non-personnel related fiscal impacts will depend on which, if any, recommendations are implemented by the City of Portland. The primary areas related to costs and savings (cost avoidance) include:

1. Upgrading the PFD fire station facilities;
2. Reducing the fire apparatus fleet;
3. Enhancing the fire and EMS services to the waterfront;

4. Implementing a two-boat fleet;
5. Reducing the number of emergency communications centers utilized and maintained;
6. Upgrading the officer development programs;
7. Implementing a two-district chief model;
8. Implementing an appropriate form of regionalization of EMS services;
9. Implementing an appropriate form of fire protection regionalization of services;
10. Implementing fire training program upgrades;
11. Implementing EMS training and certification program upgrades; and,
12. Implementing fire training program upgrades to National/State certification requirements.

Once the City decides on a specific course, internal finance personnel should be consulted to assess the fiscal impacts of any changes.

TIMELINE FOR DECISIONS AND ACTIONS

This comprehensive assessment of the Portland Fire Department should be considered as a strategic planning tool for the future. Additional issues may need consideration in the future. The plan should be used as a flexible guide for decisions relative to the organization, management, and provision of fire/EMS services by the Portland Fire Department.

UPDATING THE PLAN

The City of Portland is encouraged to update this assessment plan each year with internal staff. The update should include progress, obstacles, fiscal impacts, workload analysis, and anticipated outcomes.

CHAPTER ONE
INTRODUCTION

This Chapter provides a brief overview of the City of Portland; the organization, staffing and budget of the Portland Fire Department; overtime; grant funding, revenue sources; comparative costs; comparative staffing; prior fire studies and perceptions of stakeholders and employees.

This Chapter also summarizes the methodology for conducting this Performance and Management Study, referred to as the Study in this report.

THE SETTING

Portland is the largest city in the State of Maine. It is located in the southern part of the State and is the county seat of Cumberland County. It is a port city located on a peninsula at the mouth of the Fore River and in the Casco Bay on the Gulf of Maine and the Atlantic Ocean.

History of the City

Portland has a rich and colorful history. The Portland peninsula was originally called "Machigonne" by Native Americans. It was first permanently settled in 1633 as a fishing and trading village called Casco. In 1786, the citizens of Falmouth formed a separate town in Falmouth Neck and named it Portland. In 1820, Maine became a state with Portland as its capital, but in 1832 the capital was moved to Augusta. In 1899, Portland annexed the neighboring City of Deering.

Portland Today

Portland is organized into neighborhoods that are generally recognized by residents, but with no legal or political authority. The neighborhoods include:

Arts District	East Bayside	Morrill's Corner	Riverton Park
Bayside	East End	Munjoy Hill	Rosemont
Bradley's Corner	Eastern Cemetery	Nason's Corner	Stroudwater
Deering Center	Highlands	North Deering	West End
Deering Highlands	Kennedy Park	Oakdale	Woodford's Corner
Downtown	Libbytown	Old Port	
East Deering	Lunt's Corner	Parkside	

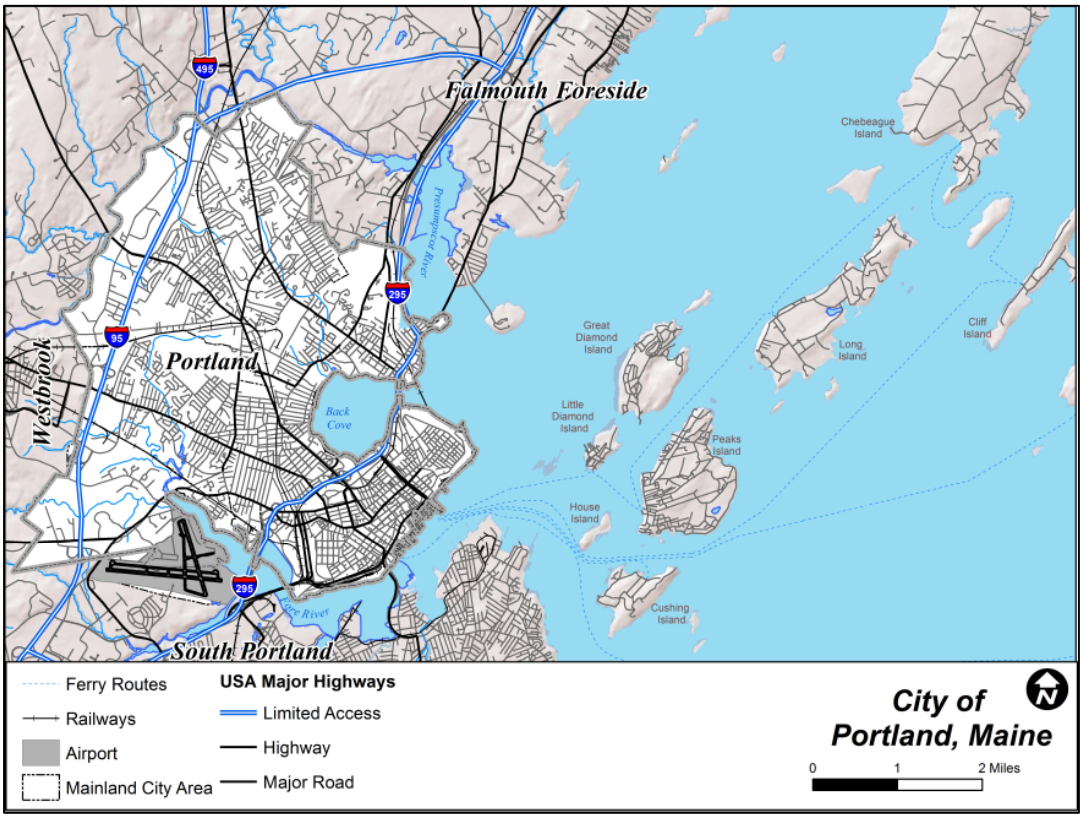
A number of island neighborhoods are located in the Cosco Bay part of Portland, including:

- Cushing's Island
- Great Diamond Island
- Little Diamond
- Peaks Island

As illustrated in Figure 1.1, the City is bordered by the following municipalities:

- City of South Portland;
- City of Westbrook; and
- Town of Falmouth.

Figure 1.1
CITY OF PORTLAND FIRE DEPT. STUDY BASE MAP



Demographics

The population of the City includes 69,194 residents according to the 2010 U.S. decennial census. This is an increase of approximately 3% from a decade earlier when the residential population was 64,249. The Greater Portland area includes a population of over 500,000, more than one-third of Maine's total population.

Below are other statistics for the City of Portland from the 2010 U.S. decennial census:

- There were 33,836 housing units at an average density of 1,587.8 per square mile. The racial makeup of the City was 85.0% White, 7.1% African American, 0.5% Native American, 3.5% Asian, 1.2% from other races, and 2.7% from two or more races. Hispanics or Latinos of any race were 3.0% of the population.
- There were 30,725 households out of which 20.7% had children under the age of 18 living with them, 29.7% were married couples living together, 10.1% had a female householder with no husband present, 3.6% had a male householder with no wife present, **and 56.6% were non-families. 40.5% of all households were made up of individuals and 11.4% had someone living alone who was 65 years of age or older.** The average household size was 2.07 and the average family size was 2.88.
- The median age in the City was 36.7 years. 17.1% of residents were under the age of 18; 11.4% were between the ages of 18 and 24; 33.1% were from 25 to 44; 25.9% were from 45 to 64; and 12.6% were 65 years of age or older. The gender makeup of the City was 48.8% male and 51.2% female.

CITY GOVERNANCE

As stated, in part, on the City's website:

The City of Portland operates under a Council-Manager form of government with a nine-member City Council, comprised of a popularly elected Mayor, five district Councilors and three at-large members. The City's five voting districts each elect one Council member to represent their district and three at-large members are elected citywide.

The City Charter grants to the City Council all powers to enact, amend, or repeal rules, ordinances and resolutions relating to the City's property, affairs and government, to preserve the public peace, health and safety, to establish personnel policies and giving

effect to any vote of the City and to authorize the issuance of debt. The Council adopts an annual budget for both municipal and school operations and provides for an annual audit. The Council appoints the City Manager, Corporation Counsel and City Clerk.

The Mayor serves as the official head of the City. The Mayor provides community leadership and develops policies to guide the City by setting strategic goals and priorities for the City with the Council. The Mayor provides guidance to the City Manager for preparation of City budgets and capital improvement plans and has veto authority over the municipal budget, which is subject to Council override by a vote of at least six members. The Mayor appoints Council standing committees and serves as Chair of the Council.

The City Manager oversees the day-to-day operations of the City, serves as the administrative head of the City and is responsible to the Council for the administration and management of all departments. The City Manager in consultation with the Mayor prepares the annual budget and presents it to the Council for approval. The City Manager appoints the Fire Chief. The Council confirms the Fire Chief appointment.

PORTLAND FIRE DEPARTMENT

For budget and organizational purposes, the Portland Fire Department (PFD) consists of ten divisions: Administration, Special Services, Firefighting, Jetport Air Rescue, Fireboat, EMS, Hydrants, Building Maintenance, Fire Alarm, and Islands.

Mission Statement

The mission of the Portland Fire Department, as state on the its webpage is as follows:

> "Our mission is to deliver emergency services to the City of Portland and protect its well-being through preparedness, prevention and education."

For the reader, the mission and goals statements of fire departments are typically included as part of a fire department policy that adopts and indicates the purpose and use of these statements to the fire department staff.

Fire Chief

The primary roles and responsibilities of the Fire Chief are delineated in Portland Code. The City Code states that the Chief of the Fire Department shall:

1. Be the administrative head of the fire department responsible for the supervision of all matters relating to fires in the City;
2. Promulgate and from time to time amend, rules and regulations;
3. Have the care and control of all equipment assigned to the fire department;
4. Have responsibility for having knowledge of all telegraph, telephone, electric light and power lines within the City;
5. Provide certain medical and transportation services through a medical crisis unit; and,
6. Have the care and control of all fire alarm, police signal and radio electrical systems belonging to the City, and shall perform all functions of public safety with regard to communications except the supervision of police communications operators and dispatchers.

Current Position Structure

The Portland Fire Department has uniformed and non-uniformed positions.

In rank order in the chain-of-command, the uniformed positions are:

1. Fire Chief
2. Deputy Chief
3. Captain
4. Lieutenant
5. Firefighter / Paramedic

The non-uniformed positions are:

1. Principal Financial Officer
2. Executive Assistant
3. Fire Alarm Supervisor
4. Fire Alarm Technician

PFD Staffing

The City of Portland Fiscal Year 2013 approved budget includes a total of 234 employee positions, including 229 uniformed and five non-uniformed civilian employees.

Figure 1.2
PORTLAND FIRE DEPARTMENT
FY 2013 STAFFING SUMMARY

Position/Org. Element	Number
Uniformed	
Fire Chief	1
Deputy Chief	6
Fire Captain	17
Fire Lieutenant	47
Firefighter	157
Paramedic	1
Sub-Total Uniformed	**229**
Non-Uniformed	
Principal Financial Officer	1
Executive Assistant	1
Fire Alarm Supervisor	1
Fire Alarm Technician	2
Subtotal - Non-Uniformed	**5**
TOTAL EMPLOYEES	**234**

Source: Portland FY 2013 approved budget.
Notes: Includes 12 SAFER Grant funded positions.

It should be noted that that the non-uniformed complement incudes an accountant/payroll position.

Fire Department Budget Totals

The PFD approved budgets for the last 6 years is shown in Figure 1.3.

Figure 1.3
PFD APPROVED BUDGETS FOR PAST 6 YEARS

Fiscal Year	Approved Budget
FY 2013	$16,000,838*
FY 2012	$15,254,339
FY 2011	$15,247,403
FY 2010	$14,832,834
FY 2009	$14,517,573
FY 2008	$14,644,504

* Includes 12 SAFER Grant funded positions and related funding.

The overtime expenditures related to the Portland Fire Department over the last 9 years is illustrated in Figure 1.4.

Figure 1.4
PFD OVERTIME EXPENDIRURES FOR THE PAST 9 YEARS

Fiscal Year	Overtime Expenditures
FY 2013	$1,087,500*
FY 2012	$1,855,158
FY 2011	$1,584,951
FY 2010	$1,494,107
FY 2009	$1,213,864
FY 2008	$1,639,173
FY 2007	$1,297,132
FY 2006	$1,210,783
FY 2005	$1,251,783

*Budgeted overtime amount.

Although, in the experience of the Study Team, these levels of overtime expenditures seem unusually high for a fire department the size of Portland's and related recommendations for reduction will be made in this report to attain substantial

reductions, it should be noted that PFD overtime expenditures have not exceeded $2 million in the last nine budget years.

REVENUES

The Portland Fire Department has received a substantial amount of revenue that offsets the annual PFD budget as illustrated in Figure 1.5.

Figure 1.5
PFD REVENUE FROM VARIOUS SOURCES

FISCAL YEAR	FIRE ADMIN.	AIR RESCUE	FIRE FIGHTING	EMS	FY TOTAL	NET TOTAL	TOTAL BUDGET
FY 2013	$314,146	$1,174,417	$459,285*	$3,039,900	**$4,987,748**	$11,013,748	$16,000,838
FY 2012	$314,645	$1,122,629	N/A	$2,658,800	**$4,515,699**	$11,013,090	$15,254,339
FY 2011	$63,872	$1,235,647	N/A	$2,434,000	**$3,976,438**	$11,270,965	$15,247,403
FY 2010	$239,535	$1,141,739	N/A	$2,394,500	**$3,775,774**	$11,086,060	$14,861,834
FY 2009	$242,293	$1,119,127	N/A	$2,730,500	**$4,091,920**	$10,425,653	$14,517,573

*SAFER GRANT.

These revenues from MEDCU patient transport billing, grants and Jetport reimbursements for services are a significant offset to the funds that, to a large extent, would have to be funded through City property taxpayers.

Grant

The Portland Fire Department has received a substantial number of grants to fund various initiatives. Figure 1.6 contains a listing of a number of grant awards information provided to the Study Team.

Figure 1.6
PORTLAND FIRE DEPARTMENT
GRANTS - FY2000 TO FY2005

Grant Title	Grant Award
FEMA SAFER Grant	$ 1,047,362
DHS-Fire Training	$ 119,457
Port Security Recovery Grant*	$ 225,000
Port Security Round 8*	$ 1,122,025
Port Security Round 9*	$ 1,137,543
FY10 Port Security Grant*	$ 1,027,985
FY 11 Port Security Grant*	$ 1,000,777
Public Safety Interoperability Communications*	$ 236,250
HHS-Homeland Security*	$ 40,600
Homeland Security FY09*	$ 629,420
Homeland Security FY10*	$ 664,306
Homeland Security FY11*	$ 460,597

Source: City of Portland.
Note: Grants involved a combination of Police & Fire funding.

CURRENT FIRE STATIONS

The following sections list the mainland and island fire stations, their locations and assigned primary fire and EMS apparatus.

Current Mainland Fire Stations

1. Munjoy Hill Station – 134 Congress Street / Engine 1, Ladder 1
2. Central Fire Station – 380 Congress Street / Engine 5, MEDCU 5, MEDCU 6
3. Bramhall Station – 784 Congress Street / Engine 4, Engine 6, Ladder 6, Rescue 1
4. Rosemont Station – 212 Stevens Avenue / Ladder 3, MEDCU 3
5. East Deering Station – 474 Ocean Avenue / Engine 11, MEDCU 7
6. Northgate Station – 380 Allen Avenue / Ladder 4, MEDCU 4
7. Riverton Station – 1592 Forest Avenue / Engine 9, Wheelchair Unit
8. Marine Division – 56 Commercial Street / Marine 1, Marine 2, Marine 3
9. Air Rescue Station – 1005 Westbrook Street / Red 1, Red 2, Red 3, Red 4, Red 5

Island Fire Stations

The PFD fire stations located on various Portland islands in Cosco Bay are as follows:

1. Peaks Island – 129 Island Avenue / Engine 12, Tank 12, Ladder 12 & MEDCU 12
2. Cliff Island – 108 Church Road / Engine 13, Tank 13, MEDCU 13, & Forestry 13
3. Cushing Island- 1 Spring Cove Ave. / Engine 14 & Tank 14
4. Great Diamond Island - 251 Diamond Ave. / Engine 15, Tank 15, Truck 15, MEDCU 15 & ATV Unit
5. Little Diamond Island / Cart

Figures 1.7 and 1.8 illustrate the mainland and island fire station locations (respectively).

Figure 1.7
MAINLAND FIRE STATION LOCATIONS MAP

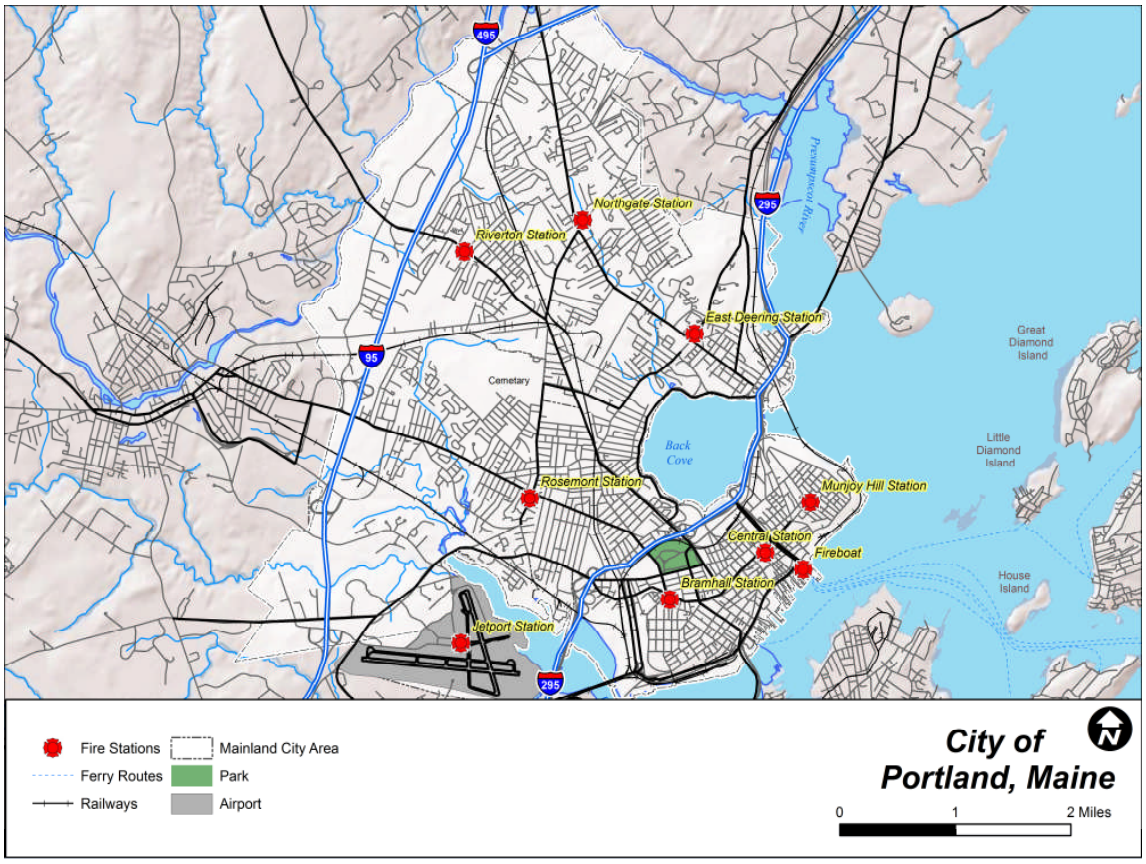
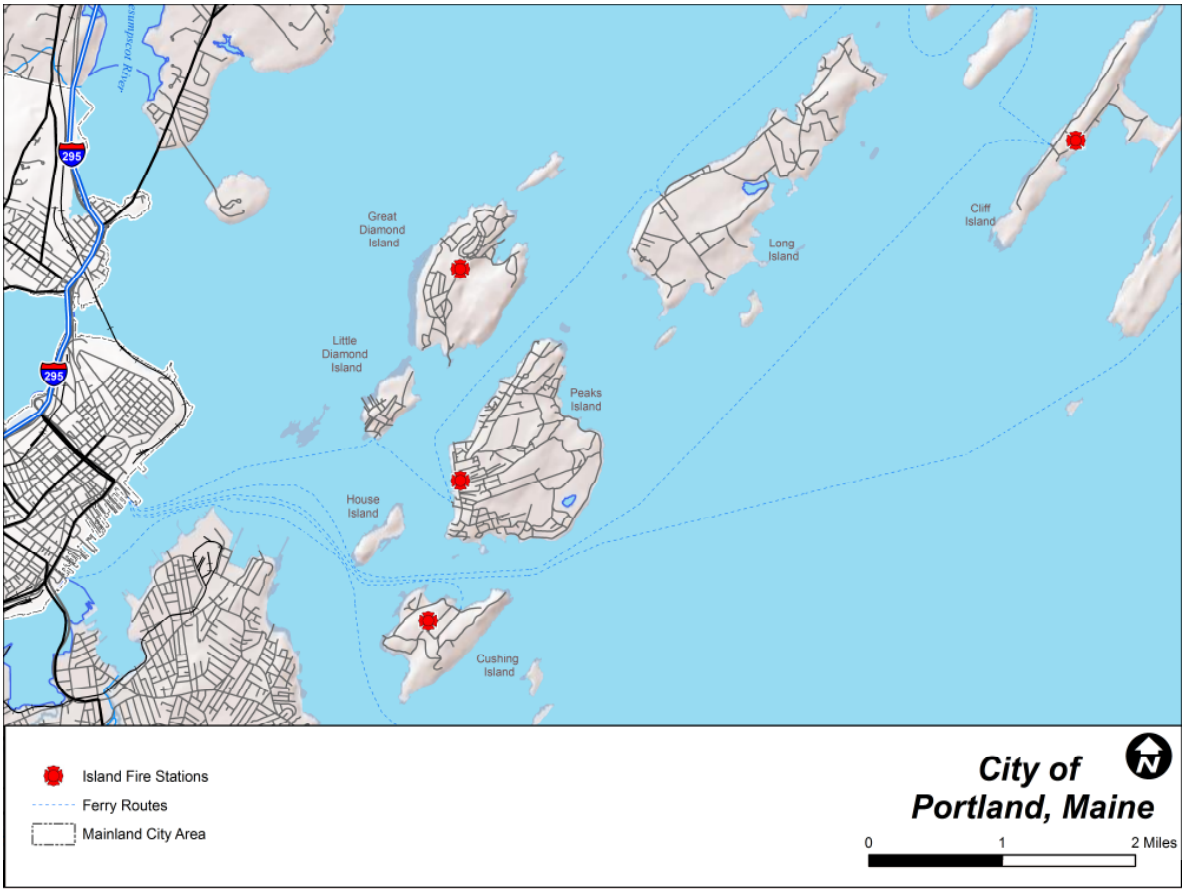


Figure 1.8
ISLAND FIRE STATION LOCATIONS MAP



PFD Apparatus

The current major fire and EMS apparatus included in the fleet of the Portland Fire Department are illustrated in Figure 1.9.

Figure 1.9
SUMMARY BY APPARATUS TYPE

APPARATUS	NUMBER
Engines	15
Ladder Trucks	6
Rescue	1
MEDCUs	10
Fire EMS Boats1	3
Total	35

Source: PFD.
Note: Includes island and reserve units.

DETERMINATION OF THE NUMBER OF STAFF NEEDED

Fire Costs Per Capita – U.S. Municipalities

In a comparison of national data for average fire costs among cities within different population ranges, the International City/County Management Association (ICMA) publishes police and fire data in the ICMA Year Book. According to the ICMA *Municipal Year Book, 2012***,** the average per capita costs in 2011 for fire services were as follows:

City Classification	Per Capita Costs
40 cities of all sizes in New England:	$196.01
18 cities with population range of 100,000-249,999	$169.19
45 cities with a population range of 50,000 to 99,999:	$184.91
106 cities with a population range of 25,000 to 49,999:	$173.81

City of Portland Data:

For FY 2012: ($15,254,339 ÷ 69,000)	$221.07
For FY 2012: ($12,508,762 ÷ 69,000)	$181.28*
For FY 2012: ($9,854,024 ÷ 69,000)	$142,81**

*Not including FireEMS Boat, Air Rescue, Hydrants, Fire Alarm & Islands.
**Not including FireEMS Boat, Air Rescue, Hydrants, Fire Alarm, Islands & EMS.

According to the ICMA, its data include retirement, hospitalization, and 'other' costs. The reader should note that the Portland data is net of revenue and does not include benefits-related expenditures. Officials are encouraged to exercise caution in interpreting the comparative data and are encouraged to verify published data before making any decisions on the data. **Caution is required in the interpretation of any comparative data.**

Firefighter Staffing Per Capita – U.S. Municipalities

The ICMA also publishes uniformed sworn fire staffing data by population range and number of cities reporting in each population range calculated on per 1,000 basis. **Caution is required in the interpretation of these data.**

City Classification	Uniformed/Sworn
51 cities in New England	1.77
9 cities with a population range of 500,000 to 1 million:	1.43
9 cities with a population range of 250,000 to 499,999:	1.34
47 cities with a population range of 100,000 to 249,999:	1.38
95 cities with a population range of 50,000 to 99,999:	1.52
193 cities with a population range of 25000 to 49,999:	1.63

City of Portland Data:

FY 2012 Data (194 uniformed ÷ 69):	2.81*
FY 2012 Data (162 uniformed ÷ 69)	2.34**

*Not including FireEMS Boat, Air Rescue & Fire Alarm.
**Not including FireEMS Boat, Air Rescue, Fire Alarm & EMS.

These comparative analyses are provided for information purposes for the reader. It is the Study Team's experience, and that of many professional public safety services planners, that police agencies use population ratios heavily to justify their police staffing needs. However, although used for informational comparisons by some, firefighters per

thousand population is not utilized as a major consideration for determining and justifying fire department uniformed sworn staffing levels.

There are many varied considerations that, either directly or indirectly, enter into any analysis and resulting plan involving a determination of the total number of firefighters and officers needed to staff a fire department. These may include:

1. The public's fire services delivery expectations of the fire department, as determined by municipal or other decision makers;
2. How soon after arrival at the scene of a fire is the fire department to initiate interior firefighting, e.g., immediately or when the second fire unit arrives.
3. Geographic layout of the fire services area;
4. Geographic barriers to apparatus response, e.g., bays, lakes, rivers and creeks;
5. Age of the community and building stock;
6. Density of population and development;
7. Level of consistency with national standards/guidelines and accepted practices;
8. Number of fire stations in the service area;
9. Distance between fire stations;
10. Roadways and their design;
11. Type and age of fire apparatus;
12. General fiscal condition of the municipality;
13. Community water supply;
14. Type of staffing approach, paid, volunteer or combination;
15. Actual and projected response times of apparatus;
16. Availability of mutual aid fire apparatus response;
17. Unique aspects of the service area, e.g., waterfront, island services delivery;
18. Current and projected call workload;
19. Quality of dispatch agency;
20. Relative level of training of personnel;
21. Is the fire department to provide EMS first responder and/or transport services;
22. Is the fire department to provide unique services, e.g., boat service, airport rescue;
23. Is the fire department to provide light (auto extrication) and/or heavy rescue services;
24. Labor contract provisions;
25. Is the fire department to provide a level of fire prevention services, e.g., building inspections, fire investigations, building plans review and public fire education;
26. Is the fire department responsible for its own apparatus repair and maintenance;
27. Is the fire department responsible for its own radio maintenance and repair; and,

28. Is there street fire alarm box system that the fire department is responsible for maintaining.

The reader will come to understand, as this Report is reviewed, how these and other considerations enter into the determination of a fire department's uniformed and civilian staffing levels. Further, the reader will come to understand that decisions regarding the overall staffing of a fire department are driven by many factors and considerations that are largely based on the nature of the service area, the type and quality of services to be delivered and relative cost of fire and EMS services delivery. For these reasons, it should be understood there is no single factor in determining the appropriate overall staffing of a fire department and that municipal decision makers have a complex job to perform in determining the appropriate level of staffing for their fire and EMS department. **A major goal of this Performance and Management Study is to provide decision makers and services providers with the information and tools with which to make informed decisions**.

PRIOR FIRE STUDIES

The Study Team requested a copy of any prior fire studies. A copy of a number of Portland Fire Department studies were provided, including:

- The Final Report and Recommendations to the Portland Fire Department by The Greenshoe Group, December 1995, focused on the integration of emergency medical services delivery into the PFD.
- The Portland Fire Department Report by John T. O'Hagan Associates, 1983.
  The highest priority recommendations of this report included:
  1. The start of a management enrichment program and the practice of management functions;
  2. Expansion of the training program;
  3. Development of policies regarding strategy and tactics on the fireground;
  4. Elimination of two engine companies and strengthening of the manning of the remaining companies;
  5. The introduction of a cyclical code enforcement inspections program using in-service fire companies;
  6. Removal of the second engine assigned to Bramhall Fire Station; and,

7. The reorientation of the deputy chief's schedule and responsibilities due to the problematic shift schedule rotation that had them only available two out of eight days in the rotation.

STUDY METHODOLOGY

In conducting this Study for the City of Portland, the Study Team utilized a proven and consistent approach to conduct and complete fire department analysis. This methodology incorporates eight distinct but interrelated phases: data collection; interviews with key individuals; on-site observation; analysis of data; comparative analysis (which included the computerized fire station location analysis); alternatives and recommendations; submission of a written Study; and an oral briefing.

In addition, the following Study guides were considered.

Fire Department Accreditation

The framework for this analysis incorporated the model developed by the Accreditation Committee of the International Association of Fire Chiefs (IAFC) [now the Commission on Fire Accreditation International (CFAI)].

The Commission on Accreditation of Law Enforcement Agencies (CALEA) had previously developed a police department accreditation process for use by police departments. The Commission on Fire Accreditation International developed a similar analysis model for fire department use on a voluntary basis. Inclusion of this model as a framework for this Portland Study will assure that the "latest thinking" is considered in this Study.

There are ten major analysis categories included in this CFAI accreditation model. The analysis categories included in this CFAI accreditation model are as follows:

1. Governance and Administration
2. Assessment and Planning
3. Goals and Objectives
4. Financial Resources
5. Programs
6. Physical Resources

7. Human Resource
8. Training and Competency
9. Essential Resources
10. External Systems Relations

Within each of these categories, there are specific criteria and considerations weighed by the Study Team in the process of conducting this Portland analysis.

The applicable performance indicators associated with these categories and criteria were considered and addressed where appropriate in this Study.

The CFAI's manual, entitled "Creating and Evaluating Standards of Response Coverage for Fire Departments," provides guidance and direction on the conduct of fire rescue station, apparatus, staffing, and related risk assessment studies. The Study Team utilized the latest (4th Edition) of this CFAI guide in the performance of this Performance and Management Study for the City of Portland.

The reader will note that many of the chapters and sections of this Study report include performance indicators for the respective subject covered in the material following the CFAI reference.

Standards and Accepted Practices

The Study Team also utilized published fire protection standards and information on accepted principles and practices for the operations and management of fire services as background and guidelines for the conduct of this Portland Study.

Some of the key organizations with standards and publications that were utilized as part of this Study are the following:

- National Fire Protection Association (NFPA)
- ISO Commercial Risk Services, Inc. (ISO)
- International Association of Fire Chiefs (IAFC)
- American Heart Association (AHA)
- American Medical Association (AMA)

The National Fire Protection Association follows a nationally recognized process for the establishment of many standards that are applicable to fire protection operations and administration. In many jurisdictions, some of the NFPA standards have been adopted and fully implemented while in others NFPA standards are utilized as general guidelines for pursuing further improvement in safety and services.

The following list includes some of the key NFPA standards utilized by the Study Team in conducting this Study for Portland.

Name of Standard	**NFPA Number**
Standard for Fire Fighter Professional Qualifications	1001
Standard for Fire Officer Professional Qualifications	1021
Developing Fire Protection Services for the Public	1201
Fire Department Occupational Safety and Health Program	1500
Standard for the Organization and Deployment of Fire Ops.	1710

These and other written standards and nationally recognized documents, such as the *NFPA Fire Protection Handbook*, were utilized by the Study Team as reference materials.

PERCEPTIONS IN PORTLAND

Stakeholder and Employee Input

During project interviews comments pertaining to positive, problematic and suggested improvement areas were identified by the Study Team in the course of conducting interviews of stakeholders, sworn and civilian fire employees interviews. The comments identified may not be factual, but leave no doubt that they are perceived as important problem areas.

On the positive strengths side, the comments included:

- Talented personnel
- Passionate people in key positions
- Transition period – the department is in transition (EMS merger)
- Good core of officers
- Good at fire control
- Technology utilization

- Stair climb competition winners
- Hazmat team winners
- MDA support
- Have their own Burn foundation
- Good Training program
- Good EMS Division
- Good recruit school
- Decent equipment (rigs/apparatus)
- Good water supply
- Citizens support the FD
- Good at handling problems
- Get the job done
- Make a difference
- Internal opportunity in FD
- Cardiac arrest saves
- Increased the Requirements of drill school
- Hazmat response
- Other FDs depend on PFD more than PFD depends on them (mutual aid)
- Self-sufficient (fire)
- Networking / interoperability with mutual aid companies
- Staffing
- Quick response times
- Equipment (tools, rigs)
- Cross trained staff
- Fire based EMS (provide our own)
- ALS providers on fire trucks
- Good training, run own fire academy, recurrent training
- Progressive (CPR/CA saves)
- EMS supplies (Central Fire Station)
- Professional
- History
- Technology
- Response times
- Apparatus /rigs/equipment
- Fleet condition

- Pride
- Staffing (OK)
- EMS delivery
- Tactically effective
- Full service organization
- Drill school

On the weaknesses side, the comments included:

- Lack of training resources to run training programs
- Not enough done to market the FD
- No one assigned to Public Ed
- No officer development program
- No driver/operator training program
- No "voice" of the FD
- No sense of direction / no short or long range plan
- Lack of discipline / accountability / all levels / also at incident scenes
- EMS COC / officer oversight – follow through
- Unit hour utilization (60%) EMS transport
- Lack of SOGs / policies
- Issues w/ notices / general orders
- Ineffective use of good people
- Four sets of ways to do stuff
- No support for professional development
- No FD IT person
- Lack of Fitness equipment / program
- Citywide = preparing people for next level
- Lack of succession planning
- No on-duty EMS support staff
- EMS merger is not complete – not one organization
- Peaks Island (new person often works there)
- Poor marketing of organization (poor PR)
- No probationary training
- EMT-P field training officer issues
- Four separate FDs (no uniformity)
- DFC – tied up with stuff all day long (EMS, Admin, etc.)

- Span of control
- Lack of redundancy (multiple issues – relates to more than one fire)
- No strategic plan (short / long)
- No training facility
- ALS - call volume / burnout
- Lack of support / grief counseling/CA families
- Public relations / not proactive
- No public fire education officer
- Inconsistent CISD
- No plan to recognize/prevent/treat burnout
- No EMT-I to Paramedic process with FD support - the same for EMT-B to I and B to P
- Inconsistent PIA (critique)
- Shift inconsistencies
- Lack of field training support
- Street readiness
- Peaks Island Staffing
- No EMS supervisor , no accountability
- Communications
    - SOG – not updated
    - Notices
    - EMS (not assigned)
    - Pass-on info
    - Radios
    - Laptops
- No field support of EMS
- High mileage staff vehicles
- No asset planning
- EMS skill loss
- Pre-integration promotability
- Cross-skills exposure
- Possible quality care issues due to call volume
- Radio system
- Lack of officer training / development
- Interdepartmental communications
- Consistently inconsistent

- One incident City
- Understanding all parts of EMS delivery
- Merger not done
- High call volume EMS
- Ambiguous discipline / not the same across the board
- SOG lack
- Lack of P/P
- Four departments
- Lack of command staff
- Lack of training for command staff
- Loss of Car 10
- Reduced marine division staffing
- Island staffing / training

On the suggested improvement side, the comments included:

- Clear, consistent expectation and hold accountable
- The need for an Ops chief
- Need Training Facility
- Unit resource allocation (MEDCU 6, Ladder 3 bad locations)
- Officer on MEDCU Unit (3 person EMS units) could function as a fire unit on a fire
- Need FD Safety/Health and Wellness Officer
- NIMS / ICS Training
- SOG Training
- EMS COC / Field Training Officers
- Car 10
- Need more ambulances
- Need more efficient support staff (Car 10)
- Need to take ownership of new employees (probation)
- Improve the marketing of the FD (business, neighborhood groups, etc.)
- More community education / presence
- Strategic planning / people and process
- Better data collection / software / trend analysis
- Conference call with officers
- EMS field supervisor
- Model - tiered system ALS/BLS based on results

- Strategic plan
- Consistency across the board w/expectations
- Invest in service provider education
- Reduce license (EMS)
- Truly follow Emergency Medical Dispatch
- EMS LT on transport units
- Additional transport units
- Fix run assignments / dispatch
- Better supervision of ambulances
- More ALS fire companies
- More Transport units
- Four person staffing on units
- Crew rotation ALS
- Improve NFIRS reporting
- Improve use of MDC
- Strategic plan
- Ops chief
- Make island a bid position
- Fix pay scale compression
- Examine EMS permitted service in lieu of licensed service

It is not unusual for personnel to mention more opportunities for improvement than strengths in an agency. Personnel assigned to the various functions indicated that, clearly, a number of areas have been upgraded and the PFD is ahead of many fire departments in various areas; however, some of the problems in the Department are attributed to either inadequacies with current automated systems or the absence of systems support.

CHAPTER TWO
ORGANIZATION & ADMINISTRATION

This Chapter includes a review of general aspects of the organization of the Portland Fire Department (PFD), including history, legal authority, mission, and the current structure of the PFD. Options and recommendations suggested by the Study Team are included.

OVERVIEW

Organizing fire and emergency services within a community to provide the most efficient and cost effective delivery of quality service is one of the most important functions of local government. Historically, many fire/EMS services were developed and organized on the basis of local neighborhood need and initiative and, in many instances, volunteer fire departments were initially formed. However, as communities have become increasingly urban, calls for service have increased resulting in the need for increased coordination and direction of fire and rescue services and resources through paid services.

A key fire and EMS organizational principle relates to the basic responsibility for public safety within the community. In most areas of North America, it is widely accepted that the provision of fire and EMS service is considered to be a local government responsibility. Local government is broadly interpreted to include municipalities, such as cities, towns, villages, and townships.

To attain the delivery of optimum fire and emergency medical service, it is essential that local government recognize and accept that responsibility and fulfill that obligation to provide appropriate guidance and direction in order to:

- Oversee the formation process of the organization of fire and EMS services;
- Ensure that the fire/EMS organization reflects the public interest;
- Protect the service from undesirable external interference;
- Determine basic policies for providing services; and,
- Legally define the duties and responsibilities of service providers.

Identification of this authority and responsibility is addressed in Section 3-1 of NFPA 1201, Developing Fire Protection Services for the Public, as follows:

> "The government agency responsible for establishment and operation of the fire department shall adopt a formal statement (bylaw, statute) of purpose and policies for the fire department that includes the type and levels of services that are to be provided, the area to be served, and the delegation of authority to the fire chief and other officers to manage and operate the fire department."

ACCEPTED PRINCIPLES AND PRACTICES—ORGANIZATION

Both the National Fire Protection Association (NFPA) standards and Commission on Fire Accreditation International (CFAI) criteria provide guidance to municipalities and fire departments relating to organization structure.

NFPA 1201 - Standard for Developing Fire Protection Services

NFPA 1201 provisions relate further to the organization structure of fire departments providing guidance to this Performance and Management Study as follows:

> **"Chapter 5: Organizational Structure of the Fire Department**
>
> 5-1 Purpose. The fire department shall have an organizational structure that facilitates efficient and effective management of its resources to carry out its mandate.
>
> 5-2 Management/Fire Chief.
>
> > 5-2.1 The manager of the fire department shall be the fire chief. The fire chief shall be governed in the development of regulations and orders by the provisions of all applicable laws or ordinances and shall maintain a file of such documents.
> >
> > 5-2.2 The fire chief shall be appointed on the basis of merit and ability.
> >
> > 5-2.3 The fire chief shall communicate closely with the local government chief executive and governing body.

5-2.4 The governing body shall establish only the primary policies of the fire department and shall not act as an administrative agency or direct day-to-day management of the department."

CFAI Governance and Administration Criteria

The CFAI accreditation criteria related to fire department organization governance and administration that is relevant to this Performance and Management Study is as follows:

Performance Indicators

The governing Board and/or agency manager has been legally established to provide general policies to guide the agency, approved programs and services, and appropriated financial resources.

1. The agency has been legally established.
2. The governing body having jurisdiction over the fire service organization or agency periodically reviews and approves programs and ensures compliance with basic agency policies.
3. The governing body approves the administrative structure that carries out the agency's mission.

There is an established administrative structure and environment for achievement of the agency's mission, purpose, goals, strategies and objectives.

1. There exists an administrative structure which reflects the agency's mission, goals, objectives, size and complexity.
2. Allocation of resources reflects the agency's mission, goals and objectives.
3. The agency administration demonstrates compliance with legal requirements of local, state, and federal governments.
4. Personnel functions, roles and responsibilities are defined in writing and a current organization chart exists.

The Study Team considered these criteria as the organization of the PFD was reviewed as part of this Performance and Management Study.

The remainder of this Chapter addresses current legal authority to operate fire and emergency medical services in the City of Portland, current organization of the PFD and appropriate conclusions and recommendations.

LEGAL AUTHORITY

This section of the Performance and Management Study outlines the legal authority under which the PFD is organized and operates.

The following sections address legal references in the Code of the City of Portland relative to the organization of the fire protection related services.

State of Maine

The State of Maine established the authority of the fire chief relating to municipal fire protection as outlined in the following section of State Statute.

> Chapter 153: MUNICIPAL FIRE PROTECTION HEADING: PL 1987
>
> §3153. Fire chiefs
> 3. Powers. The fire chief may:
> B. With the approval of the municipal officers, adopt administrative regulations relating to municipal fire protection, consistent with this chapter and municipal ordinances;

Code of the City of Portland

The City of Portland established in the Code of Ordinances the authority of the Chief of the Department relating to fire prevention as outlined below:

> DIVISION 1. GENERALLY
> Sec. 2-17. Additional duties assigned.
> (b) Chief of Fire Department:

Fire Chief

The primary roles and responsibilities of the Fire Chief are delineated in Portland Code. City Code states, in summary, that the Chief of the Fire Department shall:

1. Be the administrative head of the fire department responsible for the supervision of all matters relating to fires in the city;
2. Promulgate and from time to time amend, rules and regulations;
3. Have the care and control of all equipment assigned to the fire department;
4. Have responsibility for having knowledge of all telegraph, telephone, electric light and power lines within the city;
5. Provide certain medical and transportation services through a medical crisis unit; and,
6. Have the care and control of all fire alarm, police signal and radio electrical systems belonging to the city, and shall perform all functions of public safety with regard to communications except the supervision of police communications operators and dispatchers.

In reviewing the Code relative to the Fire Chief's current duties and responsibilities it is clear that this statement of the role of the Fire Chief is not consistent with the current expectations of the City in 2013. Both in terms of stated job functions and wording utilized in the City Code regarding the Fire Chief seems outdated. A number of the points needing revision and/or clarification includes the Fire Chief's roles and responsibilities for the following:

1. Operations head of the fire department;
2. Pre-hospital EMS services delivery;
3. Fire prevention, including building inspections, fire code enforcement, building plans review related to the fire code, fire investigations and public fire education;
4. Clarification of fire alarm, police signal and radio electric light and power lines in the City;
5. Marine services delivery;
6. Jetport fire protection;
7. Special operations, including light and heavy rescue, hazardous material mitigation and other technical rescue services; and,
8. Emergency Management.

The City is encouraged to appropriately revise this section of the Code.

BRIEF PFD HISTORY

The Study Team has come to know that the members of the Portland Fire Department are very proud, as they should be, of their long history providing fire and related protection services to the Portland area. An example of that pride is the comprehensive Portland Fire Museum established and maintained in a retired PFD fire house.

As stated on the PFD website the following are some of the key aspects of the colorful and active history of the Fire Department.

> *Fire protection started in Portland back in 1768 with the appointment of seven "Fire Wards." These men had Police powers and had the authority to order citizens to help at Fire scenes. As the city grew so did the Fires, and the Fire Department. In 1787 Portland's first organized Fire Company was formed and was named the "Neptune". More companies followed: "Vigilant" in 1794, "Cataract", "Portland", "Extinguisher", and later the "Alert". Hand Engines came into service starting with the "Deluge" in 1827 and the "Hydraulion" and "Niagra" in 1830. And in 1827 the "Washington Hook and Ladder" became the City's first Ladder Company.*
>
> *In 1831 the Portland Fire department was officially established by the Legislature. With increasing fires the Fire Companies became better organized leading to a numbering system starting in 1835.*
>
> *In November 1859 Portland's "Machigonne 1," a First-size Amoskeag, became the first steam engine in the City. On November 21 it also became the first Engine to respond as a permanent manned piece. A second steam Engine was placed in service in 1861, the "Falmouth Steam Fire Engine 2" and assigned to Congress St. at Smith St., but do to its weight and mechanical problems it was out of service more often than in service. In 1862 the "Cumberland Steam Fire Engine No.3" became the next commissioned steamer for the City of Portland and stationed in the City's West End at 176 Brackett St. The Portland Co. built the next steamer in 1864, which was placed in service on Congress St. along with Ladder 1 as the "Casco Steam Fire Engine No.5". The Steam Engines proved very useful to the*

PFD with Companies requiring only 15-20 men per company as compared to the 60 needed for the Hand Tubs. Even though the Steam Engines were well built, they required mechanically skilled Engineers at the Stations 24 hours a day.

1915 brought change to the PFD again. This time it was motorized equipment. Chief Butler began with a motorized Chief's car followed by a Deputy Chief's car in 1916. 1916 also brought the first motorized apparatus, Hose 8. Ladder 5 and Engine 1 in 1917, Chemical 1 in 1918, Ladder 3 in 1919, and Engine 4 in 1920. 14 years after it began the PFD became completely motorized with the purchase of Engine 6, a 1929 Mack triple combination pumper.

The 1930s through the 1960s brought steady change for the PFD. Engine 7 Fireboat was replaced with a new "City of Portland" which had a pumping capacity of 6,000 GPM. Ladder 3 became the PFD's first steel Aerial in 1936. 1938 saw the creation of the Fire Prevention Bureau. Rescue 1 went into service in 1943. And in 1963 Portland's Bravest were the stars in a movie about Firefighters called "24 Hours".

The 1970s and 1980s were a busy time for the PFD, as it was for many Fire Departments across the Country. With fire calls up the PFD put its first Snorkel into service in 1970. Air Rescue units were added in 1973. And in 1975 the Medical Crisis Unit (Medcu) was formed as a part of the Fire Department to handle the increasing need for EMS in Portland.

In 1990, the PFD added a third Medcu unit, and in 1993 the "Joseph C. Cavallaro.", a 42 ft. Duffy, went into service as a Rescue boat for the waterfront and Portland's Coastal Islands. In 1996 Medcu and the Portland Firefighters became one. Both are grouped into one union, IAFF Local 740. Paramedics are being cross trained into Firefighters. Most Firefighters are now licensed EMTs, and a group of Firefighters that are currently licensed Paramedics will be cross trained to possibly form a Paramedic Engine Company.

The Portland Fire Department is approaching its 240th year of service and protection of the citizens of the City of Portland. Over those years, 20 Firefighters have given their lives for the protection of others.

PFD MISSION, VISION AND VALUES

The Fire Department has a Mission Statement that reads as follows:

> "Our mission is to deliver emergency services to the City of Portland and protect its well being through preparedness, prevention and education."

The Study Team suggests that the Fire Chief conduct a process to revise the Mission Statement and develop a Department vision and set of operating values in the near future to facilitate implementation of the assessment recommendations. The following information is provided to guide the Department in the process.

Mission Statement Revision

In order to evaluate the current mission statement and make revisions, it is important to review some basic principles regarding mission statements.

1. It should summarize the spirit of the organization in a short statement;
2. The statement ideally should be less than 25 words and describe the life and work of the organization. It should be simple enough that it can be easily memorized and recalled;
3. It should describe the what, whom and how of a department and clearly reflect the major services provided and how they relate to the community it services;
4. It should be developed with input from many factions of the organization and have personnel buy-in;
5. Once adopted, the mission statement should be displayed prominently throughout the Department facilities; and,
6. A mission statement is never considered finished. It should be refined every few years to reflect changes in the organization or industry.

The mission statement is intended to describe the overall mission of the Portland Fire Department. The current statement of PFD's mission is consistent with traditional objectives in fire departments. However, it does not appear to reflect the many changes that have taken place in Portland. Changes have taken place in community expectations and funding that have caused the transformation of most fire departments from a strict fire suppression orientation to an organization trained and prepared to provide a broader

range of services to the communities, especially in the area of emergency medical services and prevention.

At one time, fire department services focused on emergency response, but this has broadened to include much more in community service. It is vital that fire service personnel develop excellent interpersonal skills in order to interact well with the public. Customer service, a key to success in business, is an important part of the fire service.

Americans are now looking for satisfaction not only in consumer products, but also in public services that they are funding, such as fire protection. In the future, fire departments will be held more accountable for the services to residents. This concept of accountability is likely to evolve into a quality assurance program, where a fire department's performance will be evaluated and measured against standards set by the community.

The impact of the past fiscal constraint will linger on into the future. Financial constraint has forced local governments to closely examine resources allocated to various services. Managers, including fire service managers, are being challenged with providing better and increased services with fewer resources. Progressive fire service leaders are accepting this challenge by working with government and the community in a partnership to provide necessary (and sometimes expanding) services without an increase in resource allocation.

These trends impacting the fire service today and in the future should result in an improved fire service; safer communities and customer-focused services; and should be considered when revising the mission statement to reflect the contemporary PFD.

It is recommended that the Fire Chief assemble a cross representative group of as many Fire Department personnel as possible to review and revise the Mission Statement. The statement should not be finalized until it has been sent out for review and comment by all PFD personnel, which will ensure buy-in from the Department staff. In conjunction with this process, the group should develop a vision statement for the Department as well as values. Having these in place will provide a stable foundation for the development of the Department's goals and objectives.

Vision Development

While many fire departments have mission statements, very few, such as the PFD, have defined vision statements. Yet, vision statements are common in private industry. Most books and articles on leadership discuss the importance of vision statements. Vision has many definitions. In reference to organizational vision, it is a statement that creates the future from a montage of current facts, hopes, dangers and opportunities.

A department's vision serves many purposes:

- Determines its success or failure;
- Unites its strategy and culture;
- Inspires its personnel;
- Assists the department and its members think in broad terms and achieve more than they imagined possible; and,
- Is motivating and energizing.

An example of a fire department Vision Statement that has proven effective in meeting these purposes is one developed and adopted by the Los Angeles County Fire Department.

> "The Los Angeles County Fire Department will be an exemplary organization acclaimed for our national reputation, our regional strength, and our hometown attentiveness as we provide fire protection and life safety services."

There are ways of acquiring a vision.

1. Impose the personal vision of the leader — This approach has limitations. There is no ownership by the organization because its members had no part in the creation of the vision. The leader has to define why the vision is so compelling that it should be adopted by all.
2. Buy a vision — This will usually get the organization an off-the-rack vision statement. This method also lacks ownership by the people within the organization.

3. Forge a vision together (with the organization's top managers and both formal and informal leaders) — This way probably leads to the most durable and effective results.

The Study Team suggests that the Fire Chief, in concert with his managers and representatives of various organizational elements, consider a Department vision. For the vision statement to be effective, the development team should identify keys to success that will help personnel visualize the meaning of the vision. Once finalized, the vision should be articulated at Department functions and at all levels of the organization. All Department activities and individual actions should be defined in terms of fulfilling the vision. This institutionalizes the vision and keeps the Department focused to make the vision reality.

Values Development

Values are guides for the organization to fulfill its mission. They serve as guiding principles for the daily conduct between department personnel and their customers. The behavior of individual members of an organization in dealing with each other and people outside of the agency should reflect the organization's values.

Values are vital to an organization for several reasons:

1. They provide a guide to employees so the employee knows the organization's expectations and what they can expect from each other;
2. They inspire employees to do their best;
3. They provide a basis for daily communications and decision making; and,
4. They provide guidance for allocating resources, and resolving personnel problems.

If values are new to an organization the department leadership needs to pave the way for acceptance by marketing values. First, the department needs to have an updated mission statement in place for alignment. Next, the importance of values and how they fit into an organization needs to be discussed with key staff members to get their buy-in. The department leader should use success stories of organizations that have adopted values.

Once there is a commitment by the key staff the leadership can work to develop the process for identifying and adopting of the department values. Timing is an important

consideration. The process should be scheduled when staff has time to dedicate attention to the process. It should not be undertaken during a time of crisis in the department. Depending on the size of the organization the process of identifying values and adoption may take as long as 3 to 6 months.

Determining who will be involved in the process is another important decision the leadership must consider in the planning phase. The more inclusive in the process the higher the level of staff ownership will have. There are several ways to conduct the process to provide for mass review at different phases in the development. Fire departments that have history with values may provide insight as to effective ways of gaining input. There are also facilitators who can be brought in to assist with developing and conducting values development processes.

It is recommended that an organization select its top five to seven values. Once the values are identified they should be concisely defined so all personnel have an understanding of the meaning of the values. Like the mission statement the values should be straight forward and easily remembered.

The process does not end with the adoption of a list of values. This is when the most challenging phases of communicating the values throughout the organization and aligning the behavior with the values begins.

Listed are ways of institutionalizing the values:

1. The leadership must model the values in their behavior on a consistent basis.
2. Values should be written and distributed to each member of the department.
3. Values can be printed on wallet cards, made into posters, added to department stationery, and published on department documents.
4. The leadership should use the values in daily communication and make reference to them in talks and correspondence. They should seek to find values in unexpected and critical events and bring them to the attention of staff.
5. The leadership should encourage discussion on ways staff are using the values in their work groups.
6. The leadership should make values part of the reward and recognition system.
7. All new hires should be oriented to the department values during their hiring process and initial training.

The revising of the mission statement and the vision and creating values will lay a solid foundation for the development of goals and objectives based on the recommendations resulting from the PFD Study. Further, this effort may be an important part of the effort to refocus the culture of the Department. The Study Team noted that the current Mission Statement is found on the Fire Department's webpage. Many organizations place their mission statement in the front of the fire department's policy and procedures manual as free-standing sheets of paper with no policy reference or explanation as to their purpose or having been officially adopted. Typically, such organizational statements are included as part of an official fire department policy.

ORGANIZATION STRUCTURE

The following sections outline the current organization structure of the Portland Fire Department.

Current Ranks and Position Titles

The following sections describe the relative uniformed and civilian workforce rank and position titles.

Uniformed Workforce

The primary operations rank structure of the Portland Fire Department includes the following positions:

- Fire Chief
- Deputy Fire Chief
- Captain
- Lieutenant
- Firefighter / Paramedic

Civilian Workforce

At the time this Performance and Management Study was conducted there were civilian staff members in different job title specialties, including:

- Principal Financial Officer
- Executive Assistant
- Fire Alarm Supervisor
- Fire Alarm Technician

Current Organization Chart

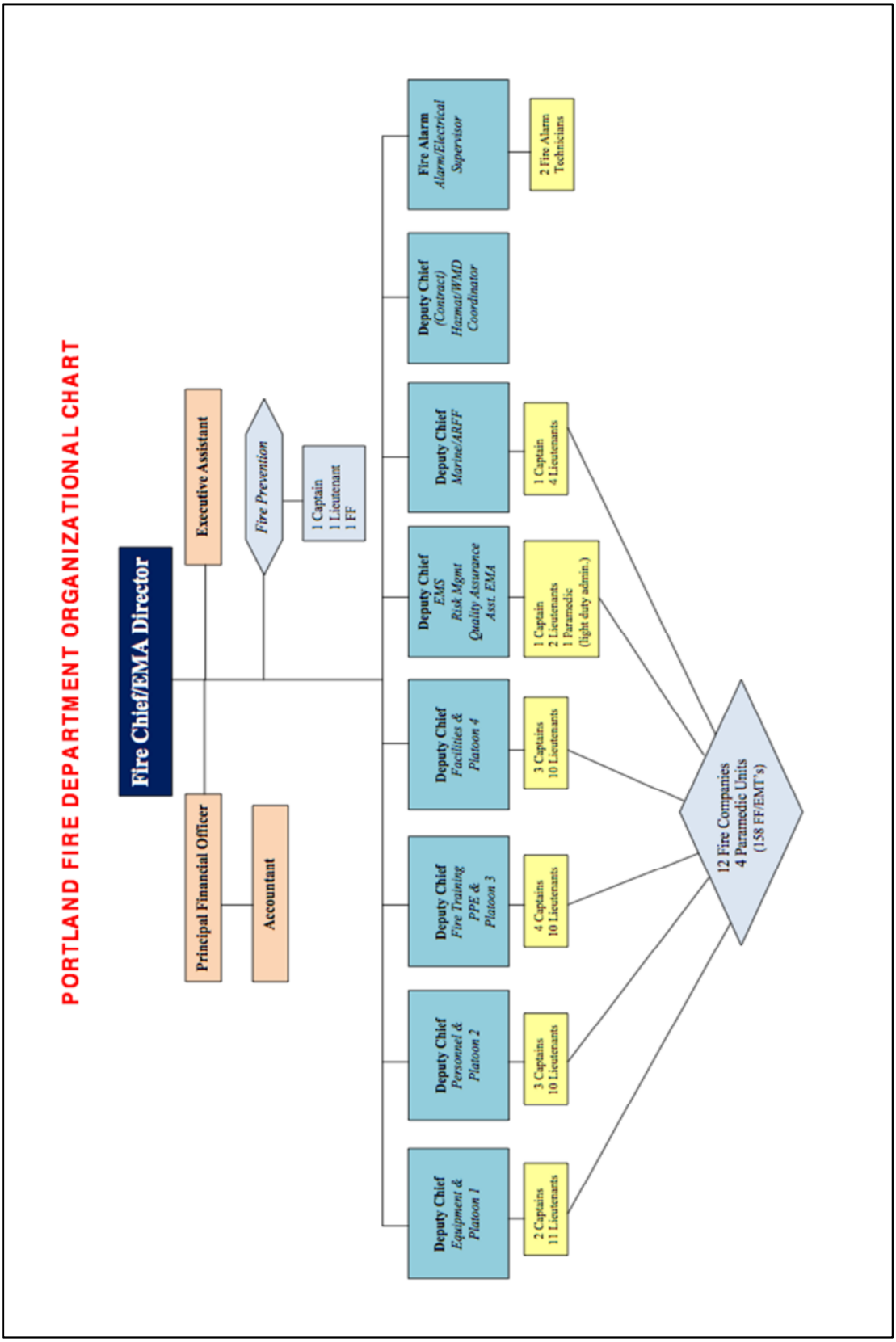
The Study Team was provided the previously produced PFD organization chart to illustrate the Fire Department's organization. See Figure 2.1.

Aspects of Existing Organization Chart

As illustrated, there are a number of primary aspects of the current PFD Organization Chart, which include:

1. Six deputy chief positions are shown, four of whom are on the rotating 24-hour shift and two are on day work who handle EMS and marine and Jetport functions;
2. A seventh deputy chief is shown who is on a contract basis responsible for hazmat and weapons of mass destruction coordination;
3. While on-duty, each of the four deputy chiefs, on the rotating 24-hour shift, are responsible to manage and oversee the on-duty 12 fire companies and 4 Paramedic Units, respond on emergency incidents when dispatched and manage the one or more major administrative functions;
4. The four deputy chiefs are assigned major functional areas of responsibility, including, personnel, apparatus, hazmat, facilities, equipment and uniforms;
5. The functions related to the islands and volunteer on-call staffing are not delineated;
6. Although not illustrated or stated on the chart, the administrative functions assigned to the four platoon deputy chiefs are functions that must continue to be managed when the deputy chief is off duty, which may be as many as 5-6 days in a row; and,
7. Fire Prevention, headed by a captain, is shown reporting to the Fire Chief .

Figure 2.1
CURRENT ORGANIZATION CHART



In conclusion, the Fire Chief should develop a revised PFD organization chart for use by the Department as part of its comprehensive policies and procedures. The revised organization chart should reflect change/s as they are made based on implementation of options and recommendations contained in this Study report and other changes that may be made in the future related to the organization structure of the PFD.

ORGANIZATIONAL OBSERVATIONS

This Section includes a number of the Study Team's general observations regarding the organization and operations of the Portland Fire Department from departmental and organizational perspectives. These observations are based on a review of the organization charts; various PFD documents; general orders; policies and procedures; job descriptions; personnel interviews; and consideration of National trends and principles and practices observed by the Study Team.

The Portland Fire Department is governed by provisions of the Code of the City of Portland, as well as the established policies and procedures.

The Department is an all-paid fire department with all commissioned firefighting and 5 full-time civilian support personnel employed by the City of Portland. The basic chain of command in the Department is similar to that used in other paid fire departments with one fire chief, a number of deputy fire chiefs, four platoons each with a deputy chief and a complement of captains, lieutenants and firefighters/paramedics assigned to the 7 fire houses, the Jetport Air Rescue station, the Fire EMS Boat and Peaks Island.

There are two union labor contracts between the City and IAFF Local 740 for the PFD firefighters and officers and communications dispatchers.

According to the FY 2013 approved budget the PFD consists of ten divisions for budget and organizational purposes, including:

1. Administration is responsible for the planning, organization and day-to-day operations of all fire suppression, emergent medical care, fire prevention, disaster preparedness and terrorism responses within the City;

2. Special Services includes the Fire Prevention Bureau, which is responsible for the review of all building permits for renovation or new construction for structures that house three or more units, and the review of all commercial buildings. Special Services reviews site plans, building permits, sprinkler system permits, fire alarm system permits, as well as the installation of above ground and underground storage tanks, and liquefied petroleum gas tanks. The Bureau administers the Fire Prevention Code, N.F.P.A 101 Life Safety Code, the State Laws of the Fire Service and the National Fire Codes, food and liquor code requirements and fuel inspections. Codes are updated throughout the year and educational seminars are conducted. The division is also responsible for the development of skill sets for the entire Department. Training evolutions are conducted daily to ensure proficiency in the delivery of EMS and firefighting. Responsibilities also include ensuring compliance with state mandated EMS and basic and advanced firefighting requirements.

3. Firefighting Division personnel are responsible for carrying out suppression and emergency medical calls and field safety inspections. Fire prevention is maintained through routine field safety inspections and by assisting Special Services with code enforcement.

4. Jetport Air Rescue Division provides aircraft rescue and firefighting for the City's airport. Efforts are also placed on fire prevention measures and fire safety at the aircraft loading areas.

5. Fireboat Division provides firefighting capabilities for the waterfront area, islands and all marine craft in the Portland Harbor and Casco Bay areas. Emergency medical treatment and transport for residents and visitors to the islands, as well as fire and EMS training for the island volunteer firefighter call forces.

6. Emergency Medical Services Division's primary responsibility is to provide advanced life support to the City's residents and substantial visitor population. Services provided range from basic patient assessments and CPR to sophisticated advanced life support intervention, such as airway management and complex drug therapies. This Division also provides EMS in-service training for all Fire Department members.

7. Hydrants System Division is the backbone of the fire suppression efforts of the PFD. The Department is charged by the Portland Water District to ensure that the 1,620 hydrants in the City are properly maintained for use.

8. Building maintenance Division provides for operation of the City's nine fire stations and the fire museum. The Division maintains fire station heating and plumbing systems and makes necessary building repairs, including preventative maintenance for boilers, emergency generators and compressors.

9. Fire Alarm Division maintains the City's fire alarm system and emergent and non-emergent radio systems, and supports the 911/Portland Regional Communications Center's core equipment.

10. Islands Division provides fire protection for citizens and visitors of the Casco Bay islands associated with the City, primarily Peaks Island, Cliff Island, Cushing Island, House Island and Great and Little Diamond Islands. The Division is responsible for maintaining adequate resources for fire suppression and life safety, including fire equipment and personnel, both paid and volunteer on call staff.

ORGANIZATIONAL ALTERNATIVES

The following sections discuss the possible need for change and organizational alternatives that could be considered by Portland officials.

Input From Stakeholders and Services Providers

During the interview and survey process the Study Team elicited comments from stakeholders, City officials, and Fire Department officials and firefighters in the fire stations and other work locations (dispatch, training center, etc.) on the subject of the organization and administration of the fire protection service in the City of Portland.

These individuals were asked their opinions on major problem areas and ways to improve the organization of the Portland fire service. Their input was considered by the Study Team in developing the conclusions and recommendations in this Chapter.

Organizational Issues

During the Study Team's interviews and discussions, a number of reasons were cited as justifying the need to upgrade the organization of the Portland Fire Department, including:

- City Code related to the Portland Fire Department and the Fire Chief is outdated;
- Outdated organization chart that does not reflect the actual day-to-day reporting relationships;
- Increasing cost to the City for funding the PFD;
- Fire house facilities needing renovation and major repairs (see Chapter Four – Risk Analysis and Facilities);
- Span of control that seems out of balance;
- Seemingly inadequate staffing of some functions;
- Functions not provided with adequate oversight;
- Work schedule that does not seem conducive to managing properly (see Chapter Three – Fire and EMS Services Staffing);
- Unclear day-to-day program reporting relationships;
- Functions not properly located in the organization chart;
- Insufficient marketing of the PFD;
- Important functions not staffed;
- No "voice" of the PFD;
- No sense of direction / no short or long range plan;
- Lack of discipline and accountability;
- No professional development;
- Limited officer oversight and follow-through;
- Lack of policies and procedures and standard operating procedures;
- There are "four separate fire departments";
- Platoon shift inconsistencies;
- No asset planning;
- Fire and EMS still not fully merged (see Chapter Six – Emergency Medical Services);
- Aging radio system (see Chapter Seven – Operations and Communications);
- No EMS field supervisor, no accountability (see Chapter Six – Emergency Medical Services); and,
- "Consistently inconsistent".

Fire Chief's Span of Control

The PFD organization charts and the Study Team's discussions with officials and staff indicate that an extraordinary number of major PFD functions report at various times directly to the Fire Chief. These functions/officers include:

1. On-duty platoon operations;
2. Personnel deputy chief;
3. Apparatus deputy chief;
4. HazMat functions;
5. Special operations;
6. Facilities deputy chief;
7. Equipment/uniforms deputy chief;
8. Risk Reduction – various fire prevention staff;
9. Emergency Management;
10. Jetport air rescue operations; and,
11. Marine operations.

The result is an excessive workload and span of control issue that has created a "stove top" effect in the organization with all reports and issues going directly to the Fire Chief. Clearly, a reorganization of relative roles and responsibilities leading to a more effective and timely decision making process needs to be implemented.

Emergency Management

The Fire Chief is responsible for emergency management functions within the City of Portland. Given the many functions of the PFD that report directly to the Fire Chief, an emphasis on the disaster and emergency management functional area has reportedly been difficult. A reduction in the Fire Chief's direct span of control and the assignment of a senior staff member to that function would be beneficial, allowing for essential emergency management exercises to be held and for the needed Portland Emergency Operations Center for handling disaster management during major emergencies to become a reality.

Administrative Support

The Portland Fire Department, which includes more than 234 employees, operates from eleven facilities, and was budgeted more than $16 million for FY2013, functions at this time with only three full-time civilian administrative and financial support staff personnel—the Executive Assistant in the Office of the Fire Chief, Principal Financial Officer and Accountant / payroll clerk.

The Study Team has never seen a fire department the size of Portland's with such a limited number of civilian administrative and support personnel.

The result of this apparent inadequacy is uniformed personnel are required to perform functions that they are not trained or intended to perform, and chiefs, captains and other senior uniformed staff must do personnel, budget, automation, contracting, records management, and other related work that would be done more appropriately by civilian staff. Either the uniformed staff members perform this work or it does not get done. The other result is that the existing small number of administrative staff is likely working out of their classification and may not be appropriately compensated to get the essential work accomplished due to their dedication to the Department and the City.

Platoon Deputy Chiefs - "Four Ways to Do Things"

A number of issues seem to exist involving the platoon deputy chiefs that create a substantial reduction in organizational effectiveness. These issues do not involve the individual deputy chiefs as important leaders within the PFD. **The Study Team found the deputy chiefs to be a dedicated, well qualified and VERY hard working group of leaders of the Portland Fire Department.**

The issues involve the following:

- The administrative functions assigned, e.g., personnel, apparatus, facilities which are nearly impossible to properly carry out while on the current rotating 24-hour work shift that includes regular periodic rotations of 5-6 days off;
- The fact that platoon deputy chiefs, when on-duty, are also responsible for managing the assigned 55+/- firefighters, paramedics and officers; and,

- While on-duty the platoon deputy chief must respond on emergency incidents to provide overall command.

The end result of these issues involving the platoon deputy chiefs is that the administrative functions may not be handled or are not handled in a timely manner; the personnel assigned to each deputy chief may not receive the needed oversight and guidance; and, due to their dedication and commitment to the City and PFD, the deputy chiefs work a substantial amount of time during their scheduled days off. This situation creates the fact many times there are "four ways to do things" as viewed by many in the PFD.

In the view of the Study Team, alternative means of assigning functions and scheduling on-duty work time need to be considered and implemented.

Organization of Fire Prevention Functions

The Study Team considers the function of the provision of fire prevention services within a fire department to be extremely important to the overall control of the fire problem with any community.

1983 O'Hagan Fire Study

As reviewed in Chapter One: Introduction, John T. O'Hagan Associates conducted an assessment of the Portland Fire Department in 1983. Chief O'Hagen was a highly decorated and internationally recognized Fire Commissioner of the New York City Fire Department and fire services expert. The conclusions and recommendations of his Portland report included the following related to the organization of the PFD:

> *"The City must support the fire prevention program if it is to keep the fire risk in the City of Portland within the capabilities of its fire department."*
>
> *"The best opportunity for a productivity gain is in that area of fire prevention."*
>
> *"A Deputy Chief should be assigned responsibility for planning and directing the Fire Prevention Program."*

As discussed in the Fire Prevention Programs Chapter, later in this Report, the typical Fire Prevention Bureau within a fire department incorporates a number of functions,

including building inspections, plans review, investigations, and public education. The current official PFD organization chart only reflects inspections, investigations and a juvenile firesetters component of public education in the Fire Prevention Division.

This Study Team suggests that all typical fire prevention functions should be a part of the Fire Prevention Division and report to a Deputy Chief, Fire Marshal. All elements of the Fire Prevention Division should report on a daily basis to the Fire Marshal.

Fire Alarm

The various Fire Alarm-related functions within the PFD have been historic (reportedly as early as 1899) and, as with many other northeastern U.S. municipalities, implemented through the years in response to major fires and conflagrations that occurred. Fire alarm boxes on street corners and near important buildings were, at one time, important technological advances to attain quick reporting of fires. The various Portland fire alarm system components, reportedly including 22,000 miles of underground copper wire, were installed through the years as an important means of reporting and dispatching fire calls.

Cellular telephone technology over the last thirty years has evolved to the point today that nearly everyone has a cell phone. As such, municipalities with historically beneficial fire box alarm systems have come to understand that they are a thing of the past. Portland Regional Communications Center staff has advised the Study Team that they cannot remember the last time a call for fire services has come via the fire alarm system.

With the service demands for emergency communications support moving from the PFD fire alarm function to the 800MHz radio system components the PFD fire alarm division should complete the transition to supporting the current and future state-of-the-art radio systems. This subject is discussed in detail in the Communications Chapter later in this report.

No EMS-Qualified Field Supervision

Reportedly, a number of years ago, the position of on-duty EMS-qualified field supervisor (Car-10) was abolished from the budget due to fiscal constraints. As discussed in detail in the EMS Chapter of this report, the function of providing EMS-qualified field coordination and supervision on each platoon should be reinstated. There are various means of providing that function that are explored in this report and outlined in the suggested alternative organization chart later in this Chapter.

Station Assignment of Functions

The Study Team has also observed that the management of well-organized and managed fire departments also use a comprehensive approach to the accomplishment and distribution of essential fire/EMS tasks within the organization. In many fire departments, the staff of appropriate fire stations are assigned one or more tasks that are essential to the day-to-day delivery of fire and EMS service.

The types of tasks that may be so assigned include:

1. Repairing, issuing and tracking all fire hose;
2. Refilling and tracking EMS oxygen bottles;
3. Replacing EMS oxygen regulators, demand valves, bottle valves, and air powered suction units;
4. Laundering and coordinating the repair of protective clothing;
5. Repairing small hand tools;
6. Filling medical supply orders for all stations;
7. Sewing replacement backboard straps;
8. Managing hazmat supplies, and maintaining hazmat equipment;
9. Testing and maintaining all PFD ground ladders in cooperation with the apparatus maintenance staff
10. Maintaining technical rescue equipment;
11. Conducting all pump tests on apparatus; and,
12. Self-contained breathing apparatus (SCBA) and pass device maintenance, testing, repair and fit tests.

Note: These items are listed as examples and may or may not apply in the PFD.

This is a proven cost-effective and well-managed means of accomplishing essential fire/EMS service delivery tasks. On-duty station firefighters and officers may take these responsibilities seriously and take action to accomplish and improve the handling of their assigned functions. It is a very good use of station staff. In many fire department studied, the labor unions seem to support this approach to task assignments.

The Study Team noted that, for SCBA maintenance, for example, this approach is taken very effectively by the PFD. Such initiatives should be encouraged and implemented with every effort to reduce the amount of overtime required for these functions to be performed.

Cross-Functional Teams - Committees

Nationally, as business and service organizations have worked to "flatten" and break down the functional organizational silos, the more progressive organizations and managers have found the use of cross-functional teams to be a very useful and productive tool. These organizations have found that the development, nurturing, and use of cross-functional teams may be a powerful organizational vehicle that brings together diverse talents to solve organizational issues or problems.

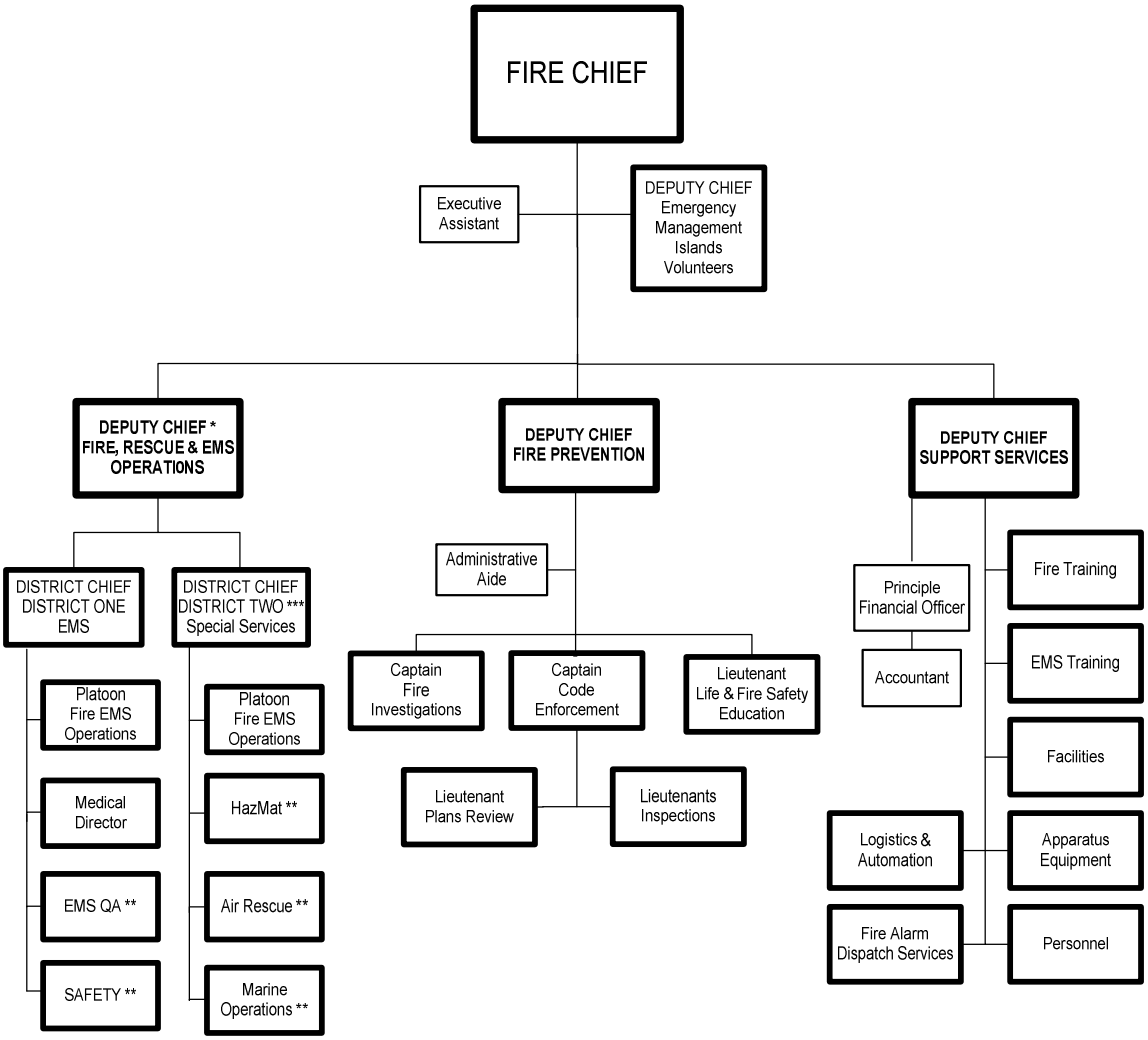
The idea of using cross-functional teams is a highly effective idea to streamline operations and define effective solutions to problems. The cross-functional team is simply a group of people who come from and often represent different parts of the organization and who are committed to a common purpose.

The Study Team was advised by officers and firefighters of the Fire Department of a number of ongoing projects handled in a cross-functional team approach. Reportedly, this approach currently utilizes overtime pay to accomplish. Every effort should be made to accomplish as much of this "committee" work while on duty in order to reduce impact on PFD overtime expenditures.

Alternative Organization Chart

Figure 2.2 illustrates a revised PFD organization chart based on alternatives suggested in this Chapter.

Figure 2.2
ALTERNATIVE ORGANIZATION CHART



Notes: * Further details of Fire, Rescue & EMS Operations organization later in the Report.
** Specialty assigned to a district chief.
*** Bramhall Fire Station to serve as Special Services specialty station.

As illustrated, the district chief positions would be shift positions, one for District One and one for District Two on each platoon.

PFD POLICIES & PROCEDURES (P & P)

The Study Team noted that, although significant efforts have been made to update PFD policies and procedures (P & P) in the past, there is room for improvement, and there are many subjects that remain to be developed and implemented. It was clear to the Team that this matter is a priority for the new Fire Department administration.

For the future, it is suggested that the Fire Chief continue to move ahead with the plan for upgrading PFD's P & P via a committee process. In any fire EMS department, P & P development and implementation is a continuing work in progress with priorities for such work to be set and followed. All P & P documents should be appropriately formatted, signed and dated.

A suggested P & P template format is included as Appendix A and a suggested P & P policy is included as Appendix B for consideration by the Fire Chief.

NAME OF PORTLAND FIRE & EMS DELIVERY AGENCY

The name of the City of Portland's fire and EMS services delivery agency is the Portland Fire Department. However, the name does not reflect the actual services delivered to the public by the organization.

It is suggested that the City consider revising the name of the PFD to include EMS or Emergency Medical Services. Many fire departments have been renamed to more fully recognize the involvement of emergency medical services as a very important function of the department. Examples of other names that could be considered might be: Portland Fire and EMS Department or Portland Fire and Emergency Medical Services Department. These types of changes can have a positive effect on the image of fire departments.

FIRE DEPARTMENT ACCREDITATION

Over a ten-year period, a committee of the IAFC, in cooperation with the International City Management Association, developed an analysis model for self assessment fire departments and services. That fire department self assessment process is now under the auspices of the Commission on Fire Accreditation International. The Study Team

employed portions of this model as a framework for this City of Portland Assessment to provide established criteria for review and provide the reader with information on the latest trends in the fire service.

In years past, standards available to the fire service have been the product of collaborative efforts involving organizations such as the National Fire Protection Association (NFPA). There have been other systems of standards and measurements for the fire and emergency services available. However, they were created to serve interests *relating* to the fire service, but not *specific* to the fire service. A good example of this type of process is the Insurance Services Office (ISO) grading schedule.

In 1988, the International City/County Management Association (ICMA) and the International Association of Fire Chiefs (IAFC) executive boards signed a memorandum of understanding that committed both organizations to the development of a voluntary national fire service accreditation system. Over a period of the intervening years, the framework for a fire department accreditation model was developed, beta test fire department accreditations were conducted and an accreditation model was finalized and implemented under the management of the Commission on Fire Accreditation International.

According to the CFAI website there are currently 98 accredited fire departments in the United States.

The accreditation analysis categories included in the model are as follows:

1. Governance and Administration;
2. Assessment and Planning;
3. Goals and Objectives;
4. Financial Resources;
5. Programs;
6. Physical Resources;
7. Human Resources;
8. Training and Competency;
9. Essential Resources; and,
10. External Systems Relations.

The Study Team has considered appropriate aspects of this CFAI accreditation model for this Assessment. Two members of the Study Team have been involved with the CFAI since its inception and are peer fire department assessors. Additionally, the preparation made by the Portland Fire Department for this Assessment and the data and information collected is very similar to that necessary for the Fire Department to pursue accreditation.

As stated in the CFAI accreditation manual, the City and the Fire Department could accrue a number of important benefits from becoming an accredited fire agency, including:

- Further promotion of excellence in the Fire Department;
- Quality improvement through self-assessment;
- Provision of assurance to peers and the public that the Fire Department has defined missions and objectives and strives to reach beyond them;
- Identification of strengths and weaknesses within the PFD;
- Provision of detailed evaluation of the PFD and its services;
- Establishes a method or system for addressing deficiencies and building on the strong points;
- Growth for the Fire Department and its personnel;
- Establishment of a forum for the communication of management and leadership philosophies;
- National recognition for the PFD by peers and the public;
- Creation of a mechanism for developing concurrent documents, such as strategic and business plans and a "desktop manual" of everything the PFD is involved in; and,
- Further development of pride in the organization, from PFD members, community leaders and citizens.

The Study Team considers the Portland Fire Department to exhibit a number of the characteristics of an excellent fire department. It appears that the City, the Fire Department, and stakeholders could benefit in many ways from the Portland Fire Department becoming an internationally accredited fire and EMS agency with the CFAI.

SUMMARY

Organizing fire and EMS services within a community so as to provide the most efficient and cost-effective delivery of quality service is one of the most important functions of local government. Historically, many fire services have been developed and organized on the basis of local neighborhood need and initiative and, in many instances, volunteer fire and EMS companies were formed—as was the case with the initial organization of the Portland Fire Department.

A number of fire departments have found that an organizational mission statement and broad goals assist in setting a positive tone and atmosphere for the provision of services. The revision and establishment of such mission and goals statements could have a positive impact on the PFD. This should be accomplished through a process of direct and comprehensive PFD employee involvement, along with the establishment of a "customer service" program with a related training effort.

Portland's Fire Department is at a "crossroads" in its history and development. With the continual increase in emergency calls and changes in the PFD that may have been driven in the past by the economic and fiscal conditions of the City and community, the City and the Fire Department have the opportunity to refocus resources and efforts toward saving lives and enhancing the fire and emergency medical services.

RECOMMENDATIONS

2-1 The City is encouraged to update City Code related to the duties and responsibilities of the Fire Chief.

2-2 The Fire Chief should develop an updated organization chart, including revisions made as a result of the implementation of appropriate options and recommendations set forth in this Study report.

2-3 The Fire Chief is encouraged to pursue the implementation of the upgrades in the organization structure of the PFD as outlined in this Study report.

2-4 The Fire Chief should consider the development of a revised mission statement and vision and values for the Portland Fire Department.

2-5 The City should consider providing an appropriate number of civilian administrative support staff to the PFD (at least an additional one for each major

functional area, including operations, fire prevention and support services), as requested by the Fire Chief.

2-6 The Fire Chief should pursue refocusing the workload of the Fire Alarm Division to current and future high tech systems of the PFD and phasing out the antiquated fire box alarm systems throughout the City.

2-7 The Fire Chief should pursue assigning four of the PFD deputy chiefs to daywork assignments as recommended by this Study report; Operations, Fire Prevention, Support Services, and Emergency Management/Islands/Volunteer programs.

2-8 The City is encouraged to reduce the complement of PFD deputy fire chiefs by two positions.

2-9 The City and Fire Chief should implement the recommended non-union shift district chief positions to provide platoon district command in two geographic/functional areas of the City: EMS and special services.

2-10 The Fire Chief is encouraged to designate the Bramhall Fire Station as the special services fire station.

2-11 The Fire Chief should pursue the provision of field EMS supervision as outlined in this Study report.

2-12 The City and the Fire Chief are encouraged to refocus the philosophy and resources of the PFD to the provision of life-saving as the primary service to be delivered, while maintaining a high priority on property protection through other related services, such as fire suppression, EMS, hazmat and code enforcement.

2-13 The Fire Chief is encouraged to establish and enhance the progressive approach to the assignment of important daily tasks to the chiefs and staff members of the fire stations.

2-14 The Fire Chief is encouraged to make full use of committees and cross-functional teams in the planning and implementation of appropriate PFD programs and tasks, with as much of such work as possible being done while on-duty in order to reduce overtime expenditures to the extent possible.

2-15 The Fire Chief should continue and strengthen the effort to development and implement a state-of-the-art policies and procedures for the PFD.

2-16 The City and Fire Chief should consider renaming the Portland Fire Department to the Portland Fire and Emergency Medical Services Department to more fully reflect the service provided today by the Department.

2-17 The City, Fire Chief and the Fire Department are encouraged to pursue accrediting the Portland Fire Department through the Commission on Fire Accreditation International model.

CHAPTER THREE
FIRE AND EMS SERVICES STAFFING

This Chapter provides a review of fire and EMS services staffing practices generally in fire and emergency medical services; current Portland Fire Department staffing and exploration of minimum and maximum/desired staffing of PFD apparatus options; and related suggestions for the City and Fire Department to consider. The reader should note that the Portland Fire Department refers to EMS transport units as "MEDCU" units.

APPARATUS STAFFING GENERALLY

This Section reviews apparatus staffing generally as it relates to the staffing levels of fire and EMS apparatus—engines, ladders, heavy rescue units, and MEDCU patient transport units that support the treatment and transport of patients. The Study Team has developed an overview of fire services staffing based on practical experience and fire and EMS consultant assistance in the United States.

The major cost of a fire rescue department is salaries and wages for the personnel, firefighters, and officers. For that reason, staffing levels become a crucial budget consideration, as well as service level issue, for municipalities and their fire departments. Depending on which of the various fire rescue service models is utilized, staffing has been justified by experts to include from three individuals per piece of apparatus to as many as six. The variables in this decision process involve:

1. The demographics of the community;
2. The numbers of fire and EMS calls to which the units respond;
3. The location of the fire stations and their distance of travel and response time for back-up;
4. The type and age of buildings in the community, as well as the building occupancies—residential, commercial and industrial—which exists within the community; and,
5. The nature of the fire rescue protection and related risks in the service area.

From the perspective of operations, the Study Team believes the minimum staffing of any fire unit (engine, squad, and truck) should be at least three individuals. Specialty or multifunctional units, such as quints (combination pumper/truck units), may require increased staffing to upgrade safely and fully operational.

For water flows of 150 gallons per minute or less, it takes two individuals to maneuver the hose line and one operator at the pumper. For water flows higher than this amount, at least three firefighters are needed to maneuver the hose line into the correct position and hold the hose line in place during suppression activities.

Raising ladders for rescue requires two to three firefighters, depending upon the length of the ladder. Ground ladders longer than 35 feet, such as those carried on an aerial truck, require as many as four firefighters to raise the ladder in place. If a rescue is to be made, these ground ladders must be removed from their storage on the unit, carried to the correct location, and raised in place. Without sufficient personnel, this activity would likely be delayed, resulting in the potential for injury or death to civilians and firefighters.

The key objective is maintaining sufficient personnel on each piece of apparatus in order to use it effectively and safely.

Studies and staffing trials have shown that the performance of critical firefighting tasks can be performed in a safer and quicker manner with an increased number of firefighters and officers. The purpose of one such study, conducted in Milwaukee, was to determine the relative times required to lay and advance a hose line to the fourth floor using three-, four-, five-, and six-member engine companies. That study showed, for example, that it may take 34 percent more time for three firefighters to accomplish the work than it does four firefighters, and it may take 82 percent more time for two firefighters to complete the tasks.

The successful completion of critical tasks during emergency fire and EMS operations has a direct impact on the overall success of incident mitigation (e.g., fire suppression and patient medical care) and upon the level and quality of service delivery to the public. Fire and EMS tasks must be completed in both a timely and safe manner.

For reasons of economics, there are few fire rescue departments in the United States that operate with the optimum apparatus staffing (e.g., 5 or 6 firefighting staff members on engines and ladders). The actual number of firefighters and officers available to staff the fire rescue department apparatus will ultimately be a municipal policy decision and reflected in the fire department's budget allotment for personnel. The fundamental policy decision must determine how many firefighters and officers are to be on duty for each fire and EMS company (engines, ladders, heavy rescue squads, and MEDCUs) every day.

Firefighter Utilization

One might assume that if three personnel are on an engine or truck, all three of those personnel are available for interior fire attack when they arrive on the scene of a working fire. That perception is not accurate because, most often, the unit driver must remain with the unit to operate the pump, the aerial ladder, or set up equipment to support firefighting operations.

In a real situation, using engine operations as an example, the following are the functions initially performed by a crew of three:

Driver/Operator

- Sets and operates the pump
- Develops water supply
- Provides equipment to part of building
- Relays radio communications
- Guides apparatus placement for incoming units

Officer

- Provides initial incident command
- Sizes up the incident
- Performs circle check of building
- Directs crew of one in interior attack
- Is part of two person interior fire attack crew
- Handles radio communications for crew
- Provides interior command as necessary

Third Person

- Lays out supply line
- Pulls and advances hand lines
- Begins interior fire attack with officer as crew of two

This example presumes that there are no immediate incident complexities such as medical or rescue emergencies. A similar example could be outlined for the staffing of a ladder truck.

The purpose of this discussion is to point out the justification of staffing engines and ladder trucks with three personnel as the absolute minimum. Personnel on units staffed by one or two personnel cannot function as independent crews on the scene of emergencies. Personnel responding on units staffed by one or two personnel must join up with other personnel from other units, after arriving on the scene, to develop crews for a fire attack.

Unit staffing of one or two firefighters may seriously hinder successful fire attack operations, in addition to creating significant safety risks for firefighters and increased liability exposure for the fire department and the City.

For these reasons, the Study Team suggests that the City and PFD deploy no less than a total of three firefighters to ensure proper unit staffing of engines and ladders.

Staffing levels should be carefully monitored, with optional firefighter and officer absences (vacation leave, etc.) being controlled in order to maintain minimum staffing levels and assure that an excessive number of personnel are not authorized leave at the same time. This staffing data is invaluable in assessing the level of service.

MEDCU Staffing

The minimum staffing of MEDCU units providing pre-hospital basic or advanced life support services is generally accepted by municipalities and their fire departments to be two qualified personnel. A number of metropolitan fire/EMS services staff their busier units with a minimum of three personnel due to call loads or the generally serious nature of EMS calls being handled. MEDCU units cannot function with less than two personnel.

Island Volunteer Staffing

A number of options and recommendations in this Study Report are focused on the volunteer fire and emergency medical services provision on the Portland islands, including Peaks, Cushing, Cliff, Great Diamond and Little Diamond Islands. The PFD has assigned a firefighter 24-hours per day to support fire and EMS provision by the volunteer members. This Report suggests that the firefighter be upgraded to firefighter paramedic in recognition of the unique services demands.

Further, the suggested organization chart in this Section outlines a deputy chief assigned to the office of the Fire Chief to be, among other things, responsible for PFD island and

volunteer matters. Further, as an indication of the importance of the volunteer component to the PFD and the island services, Chapter Eight – Island Volunteer Fire/EMS Services is included in this Report.

APPARATUS STAFFING GOALS

The standard on Fire Department Deployment and Operations is NFPA 1710, which is discussed in the Fire Services Risks and Deployment Chapter later in this report in relation to response times. It is an industry guideline that serves as a benchmark for the fire department organization and deployment of services.

NFPA 1710 addresses fire, EMS, special, wildland, airport, and marine operations. These various operational areas are addressed with benchmark requirements based on a fire involving a 2,000-square-foot detached single-family occupancy. Fire departments are expected, under the approach taken by 1710, to deploy additional resources according to occupancies and hazards in their jurisdictions.

This NFPA standard, which includes provisions relating to apparatus staffing, has been adopted and implemented, in whole or in part, in a number of cities, counties, and towns. It has also been utilized in many fire departments as a guide for goal planning documents and policies and procedures, due largely to economic impact considerations.

Staffing of fire apparatus is a key component of NFPA 1710. In developing the staffing component of the standard, the NFPA Technical Committee reviewed numerous studies, evaluations, and stakeholder reports containing empirical data on departmental response and mitigation of fire. These studies clearly documented that for safe, effective, and efficient fire suppression, each responding company needs a minimum number of firefighters and officers.

NFPA 1710 specifies the following minimum staffing levels by type of company and function:

1. Engine Companies—Fire companies whose primary functions are to pump and deliver water and perform basic firefighting at fires, including search and rescue, are known as engine companies to be staffed with a minimum of four on-duty personnel.

In jurisdictions with tactical hazards, high-hazard occupancies, high incident frequencies, geographical restrictions, or other pertinent factors are to be staffed with a minimum of five or six on-duty members.

2. Ladder Truck Companies—Fire companies whose primary functions are to perform the variety of services associated with truck work (such as forcible entry, ventilation, search and rescue, aerial operations for water delivery and rescue, utility control, illumination, overhaul and salvage work) are known as ladder or truck companies. Ladder truck companies are to be staffed with a minimum of four on-duty personnel.

   In jurisdictions with tactical hazards, high hazard occupancies, high incident frequencies, geographic restrictions, or other pertinent factors shall be staffed with a minimum of five or six on-duty members.

3. Other Companies (heavy technical rescue squads, etc.)—Other types of companies equipped with specialized apparatus and equipment shall be provided to assist engine and ladder companies (and provide other services, e.g., heavy rescue) deemed necessary as part of standard practice. These units shall be staffed with a minimum number of on-duty personnel required by the tactical hazards, high incident frequencies, geographic restrictions, or other pertinent factors.

4. Quint Apparatus Companies—Fire companies that deploy with quint apparatus, designed to operate either as an engine company or a ladder company shall be staffed with a minimum of four on-duty personnel. If the company is expected to perform multiple roles simultaneously, additional staffing, above the level of four, shall be provided to ensure that those operations can be performed safely, effectively and efficiently.

5. EMS Units (MEDCUs)—On-duty EMS units shall be staffed with the minimum numbers of personnel necessary for emergency medical care relative to the level of EMS delivery provided by the fire department. EMS staffing requirements shall be based on the minimum levels needed to provide patient care and member safety.

6. Advanced Life Support (ALS)—Personnel deployed to ALS emergency responses shall include a minimum of two members trained to the emergency medical technician-paramedic level and two members trained to the emergency medical technician-basic level arriving on the scene within the established response time.

These staffing patterns ensure efficient and effective on-scene operations as evidenced and supported by the American Heart Association and the National Institutes of Health.

Based on these standards and guidelines, the apparent current and future projected nature of Portland's fire and emergency medical risks, tactical hazards, hazard of occupancies, incident frequencies and geographic restrictions the Study Team suggests the following as a possible maximum/desired primary fire rescue per unit apparatus staffing level for the Portland Fire Department.

- 4 Engines—including one paramedic;
- 4 Engine/tankers co-located at a fire station with another major unit (ladder, heavy rescue squad or rescue)—including one paramedic;
- 4 Ladder trucks;
- 5 Quints operating as both engine and ladder;
- 4 Heavy rescue squad providing technical rescue services;
- 3 MEDCU units providing emergency medical transport services with at least two certified paramedics; and,
- 1 Shift command units.

All other fire rescue apparatus (i.e., brush, light, and SCBA air units and boats) would be staffed on a cross-staffed basis by on-duty personnel assigned to primary units.

PFD SHIFT STAFFING

This Section reviews current Portland Fire Department shift staffing.

Current Total Shift Operations Staffing

The Study Team was advised that the current complement of personnel in the Fire Department allocated to shift apparatus staffing is 219. Figure 3.1 outlines total staffing by rank.

Figure 3.1
TOTAL PLATOON FIREFIGHTER/OFFICER COMPLEMENT

RANK	COMPLEMENT
DEPUTY CHIEFS	4
CAPTAINS	13
LIEUTENANTS	44
FIREFIGHTERS	157
PARAMEDIC*	1
TOTAL	219

Source: PFD budgeted for Fiscal Year 2013.
* Paramedic only with no firefighter certification.

A FORMULA FOR CALCULATING STAFFING NEEDS

The Study Team typically utilizes a nationally recognized formula to assist in its determination of the adequacy of the total apparatus staffing of fire departments. That formula can provide a measure of budgetary accuracy in determining the actual number of firefighters and officers required to staff the fire and EMS apparatus, given the minimum staffing levels approved by the municipality.

Forty-Two-Hour Work Week—Current Hours

Using current Portland apparatus minimum staffing levels, that formula is outlined as follows. To staff one position on a 24-hour basis and allow time off for training, vacations and sick leave and on-the-job injuries requires 5.62* employees. The Study Team was provided with actual "time off the floor" hours for all platoon employees in 2012. Based on actual time taken/required for vacation, sick, holiday, on and off the job injury and other similar reasons for firefighters and officers not being available to staff apparatus, the average annual time off "the floor" for firefighters and officers has been determined to be 628 hours. Based on this average number of hours off, the number of personnel required could be calculated as follows for the PFD:

*The 5.62 number is calculated as follows:

Total hours in a year:	8,760
Firefighters work 42 hours × 52 weeks	2,184
Minus average time off "floor"	- 628
TOTAL HOURS AVAILABLE	**1,556**

8,760 (total hrs in a yr) ÷ 1,556 (total hrs is available) = 5.62 staff to cover one 24-hour constant staffed position.

Based on this approach to calculating firefighter and officer staffing requirements for the current fire station and apparatus deployment model it appears that 269.7 firefighters and officers are needed.

Current Seven-Station Model with Air Rescue & Marine Units

The following calculations illustrate the application of this calculated formula to determining fire and EMS operations employment needs.

6 engines × 3 staff × 5.62	=	101.2 staff
4 ladder trucks* × 3 staff × 5.62	=	67.4 staff
1 rescue x 3 staff x 5.62	=	16.9
4 MEDCU units × 2 staff × 5.62	=	45 staff
1 air rescue x 3 staff × 5.62	=	16.9
1 marine unit x 3 staff × 5.62	=	16.9
1 deputy chief × 1 staff × 5.62	=	5.62 staff
TOTAL	**=**	**269.7 staff**

*2 aerial ladder and 2 quint units.

It should be noted that the currently approved Fiscal Year 2013 budget for staffing of the current fire stations and apparatus includes 219 firefighter and officer positions, including deputy chiefs, captains, lieutenants, firefighters and paramedics.

Based on this approach to calculating firefighter and officer staffing requirements for the current fire station and apparatus deployment model it appears that 269.7 firefighters and officers would be needed in order for there to be an **overtime-neutral staffing approach**.

Calculated Platoon Staffing

Figure 3.2 illustrates the full application of the staffing formula for determining the platoons utilizing the budgetary formula.

Figure 3.2
FORMULA-BASED – OVERTIME NEUTRAL
PLATOON FIREFIGHTER/OFFICER COMPLEMENT

RANK	PLATOON 1	PLATOON 2	PLATOON 3	PLATOON 4	CALCULATED COMPLEMENT	FY 2013 COMPLEMENT
PLATOON CHIEFS	1	1	1	1	4	4
CAPTAINS	3	3	4	3	13	13
LIEUTENANTS	11	11	11	11	44	44
FIREFIGHTERS*	52	52	52	52	208	158
TOTAL	67	67	68	67	269	219

Source: PSSi calculations based on full utilization of the formula.
Note: * Firefighters / paramedics.

With the use of this formula, the number of actual firefighters and officers needed to staff the apparatus in the firefighting, EMS, marine and air rescue function each year can be calculated for budget purposes. **This approach to determining the individuals needed to staff the platoons could substantially reduce the City's annual PFD overtime expenditures---possibly by as much as an estimated 75-80 percent.**

EXPENDITURE OF OVERTIME FUNDS

The overtime expenditures related to the Portland Fire Department over the last 9 years is illustrated in Figure 3.3.

Although, in the experience of the Study Team, these levels of overtime expenditures seem unusually high for a fire department the size of Portland's and related recommendations for reduction will be made in this report to attain substantial reductions, it should be noted that **PFD overtime expenditures have not exceeded $2 million in the last nine budget years**.

Figure 3.3
PFD OVERTIME EXPENDITURES FOR THE PAST 9 YEARS

Fiscal Year	Overtime Expenditures
FY 2013	$1,087,500*
FY 2012	$1,855,158
FY 2011	$1,584,951
FY 2010	$1,494,107
FY 2009	$1,213,864
FY 2008	$1,639,173
FY 2007	$1,297,132
FY 2006	$1,210,783
FY 2005	$1,251,783

*Budgeted overtime amount.

Expenditure of Overtime Funds

The Study Team was apprised of the fact that a substantial amount of overtime is being expended each pay period by the Fire Department primarily for apparatus staffing requirements. A substantial portion of this overtime is likely due to staffing at the approved minimum apparatus staffing levels, but above the budgeted funding levels.

For the future, with a complete determination of time "off the floor," including vacation, sick, training, on the job injuries, and details, for example, the City and the PFD should determine what its budgetary firefighter and officer position requirements are from year to year. This would also assist in assuring that the budgeted overtime requirements are appropriately funded for the PFD, or necessary budget or staffing level decisions are made based on a verifiable approach rather than an historical approach to the determination of budget staffing requirements.

Actual Overtime Expenditures

The following sections provide information on the history of PFD overtime (OT) expenditures.

Overtime Expenditures by Month

An analysis conducted by the City concluded that for the five-year period of Fiscal Years 2008 through 2012 generally in the summer/fall months of August through November more than normal overtime was expended by the PFD. On the other hand, lower than normal overtime was expended during the winter/spring months of January through May.

Nine-Year Comparison

Figure 3.4 provides a comparison of Fire Department overtime expenditures and budget categories for the last nine years by organizational element. PFD organizational elements not listed have not had overtime expenses. FY2013 is the approved budget amount. The information in Figure 3.4 was obtained by the Study Team from the FY2013 Portland Budget document.

Figure 3.4
PORTLAND FIRE DEPARTMENT OVERTIME EXPENDITURE ANALYSIS
Fiscal Years 2005 through 2013

ITEM	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13 *
Admin.	$16,404	$24,667	$26,493	$23,017	$3,447	$32,812	$39,484	$39,627	---
Spec Svcs.	$20,800	$15,583	$16,533	$30,285	$20,269	$19,207	24,324	$42,442	$17,000
Firefighting	$587,947	$317,527	$556,121	$796,005	$618,817	$806,523	$806,524	$1,008,964	$555,000
Jetport	$160,157	$132,028	$105,928	$147,653	$81,723	$151,098	$151,098	$134,964	$80,000
Marine	$58,000	$55,944	$61,685	$56,892	$103,417	$122,014	$122,014	$137,689	$85,000
EMS	$404,064	$650,980	$512,187	$556,128	$307,798	$428,475	$428,475	$480,970	$340,000
Alarm	$13,344	$14,054	$18,185	$29,193	$28,393	$13,033	$11,146	$11,146	$10,500
Total OT	$1,251,716	$1,210,783	$1,297,132	$1,639,864	$1,213,864	$1,494,107	$1,584,951	+	$1,087,500
Total Reg. Wages	$10,575,703	$10,935,053	$11,131,050	11,567,651	$11,973,659	11,795,387	$11,728,882	$12,158,196	$12,731,865
OT as % of Reg. Wages	11.8%	11.1%	11.7%	14.2$	10.1%	12.7%	13.5%	14.3%	8.5%

Source: City of Portland annual budget documents.
Note: * FY2013 is budgeted amounts.

The reader will note a number of OT expenditure trends over the years, including:

1. In the Firefighting organizational category, there was a jump from FY07 to FY08 from $556K to $796K;
2. From FY11 to FY12 in the Firefighting category there was a substantial jump from FY11 to FY12; and,
3. The EMS category trended downward to some extent from highs in FY 06, 07 and 08, possibly due to an increase in ALS staff training causing MEDCU staffing overtime expenditures.

It is unclear to the Study Team the reasons for these primary trends. Documentation does not seem to be available to assist in explaining these and other trends in OT expenditure changes through the years.

Fiscal Year 2012 Overtime (OT)

OT hours worked and related funds expended in FY2012 is illustrated in Figure 3.5. The data in this table was obtained by the Study Team from the FY comprehensive 2012 PFD Hour History Detail report that list OT expenditure information detail on an employee-by-employee basis.

Figure 3.5
ACTUAL PFD OVERTIME EXPENDITURES
FISCAL 2012

ORGANIZATIONAL ELEMENT	TOTAL HOURS	OVERTIME EXPENDITURES
Administration	1,051	$34,429
Special Services	1,369	$57,134
Firefighting	33,999	$1,206,498
Air Rescue	4,977	$189,566
Fireboat	1,998	$79,593
EMS	4,638	$150,514
Fire Alarm	106	$3,635
TOTAL	48,138	$1,721,369

Source: Portland Fire Department, Hours History Detail report.

It is unclear as to why there is a difference in the total FY2012 OT reported on the detailed PFD's Hours History Detail report and the City's Budget Documents, although the difference could be net pay and probably Special Duty pay.

It should be noted that, based on the total number of hours of overtime reportedly worked (48,138) and the total overtime expenditures ($1,721,369), the average cost per hour of overtime in FY 2012 was $35.76. As a point of information, according to the pay plan in effect as of January 2013, the following OT rates apply to the rank of the primary OT earners in the PFD:

Firefighter/paramedic:	3-5years, $28.35 / 5-8 years, $29.54
Lieutenant:	2-5 years, $35.35 / 5+ years, $36.40
Captain:	2-5 years, $38.29 / 5+ years, $39.43

Various OT Causal Factors

In the analysis of the data, review of applicable documents, and discussions with City and PFD officials and firefighters, the factors that result in the expenditure of overtime funds are numerous and varied. They include, for example, maintaining approved minimum staffing levels when the following would result in lower than approved apparatus staffing levels:

- Existing vacancies from resignations and/or retirements;
- Use of sick leave;
- Use of vacation time;
- Use of bereavement leave;
- Use of family sick leave;
- Holiday leave; and
- On the job injury.

Likewise, the following activities generated overtime income paid to off-duty firefighters, and officers directly in that the off-duty service provider was paid overtime compensation in a pay check:

- Training activities to take place, including drill school;
- SCBA maintenance;
- EMS supplies work;
- HazMat team response;
- Maintain Island staffing;

- EMS QA meeting;
- Staff meetings, captains, chiefs, etc.;
- Perform admin duties; and,
- Call back for major incidents.

Potential Excessive OT Staffing of Apparatus

Previously in this Chapter the extent of fire and EMS apparatus staffing via OT was discussed and illustrated. There are a number of aspects or side effects of the excessive use of OT in the staffing of fire and EMS apparatus that may result. These include:

- Increasing potential burnout;
- Reduced fire and EMS unit teamwork and cohesiveness;
- Excessive use of OT in the course of providing services;
- Increased cost to the taxpayer for services provision;
- Reduced management and oversight of activities and tasks;
- Increasing philosophy that working for the PFD is a "part time job";
- Reduce ability of supervisors to provide consistent employee oversight;
- Reduced accountability of staff; and,
- Decreased discipline levels.

Options for OT Reduction

There seems to be the opinion that OT is limitless and that is the way to do things. In the opinion of the Study Team, the following approaches may result in a reduction in future annual overtime costs.

- Overtime Policy and Procedure: Develop and implement a PFD policy and procedure relating to the authorization, process for documentation and payment of overtime funds;
- Staffing Calculation Formula: Consider increasing budgeted unit staffing to reduce OT based on the formula;
- PFD Reorganization: Consider implementing the PFD reorganization involving daytime Deputy Chiefs;
- Revise HazMat Team Deployment: Revise the method used to assign and deploy the HazMat Team, as discussed in the Operations Chapter of this Study report;

- Deployment of Paramedics: Consider revising the approach to the deployment of paramedics by increased staffing suppression units with paramedics, as discussed in the EMS Chapter of this report.
- MEDCU EMS Staff Burnout: Take actions to reduce burnout of MEDCU staff potentially reducing use of sick leave;
- Add Fifth MEDCU: Consider adding a fifth MEDCU, reduce OT, burnout and use of sick leave;
- Increase Reliance on Mutual Aid: Take action to increase reliance on automatic mutual aid support and reducing reliance on PFD personnel callback;
- Conduct Administrative Duties while On-duty: Conducting administrative activities on duty rather than off-duty;
- Train while On-Duty: Conducting more training on duty;
- Tracking Sick Leave Usage: Strengthening and upgrading a sick leave usage monitoring program to identify and take action related to follow-up on misuse;
- State-of-the-Art Scheduling Program: Implementing state-of-the-art automated fire and EMS personnel scheduling program, e.g., Telestaff; and,
- State of the Art Payroll Program: Fully automate the payroll processing system to provide comprehensive analysis of causes to support identification of solutions.

Implementing these and other staffing enhancement approaches will assist the PFD in reducing the use of OT as an approach to unit and function staffing as well as project tax accomplishment.

DEPLOYMENT OF A DOUBLE ENGINE COMPANY

This Section reviews the continuing practice by the PFD of deploying double engine companies from the Bramhall Fire Station.

1983 O'Hagan Fire Study

As reviewed in Chapter One of this Study, John T. O'Hagan Associates conducted an assessment of the Portland Fire Department in 1983. Chief O'Hagen was a highly decorated and internationally recognized Fire Commissioner of the New York City Fire Department and a fire services expert. The conclusions and recommendations of his

Portland report included the following related to the deployment of double engine companies by the PFD:

> *"The placement of two engine companies in one fire station does not offer any advantage in terms reducing average response distances(or time) throughout the City."*
>
> *"The added overhead, capital, maintenance and supervisory costs are unnecessary commitments of resources."*
>
> *"All fire stations should be manned by no more than one engine company."*

2013 PSSi PFD Study

Today, thirty years later, the PSSi Study Team agrees with Commissioner O'Hagen. Based on the O'Hagen Study Report and the comprehensive fire station and engine company location analysis contained in Chapter Four, Risk Analysis and Facilities, in this Study report the second engine company, Engine 6, should be eliminated. Using the staffing formula calculation approach, there are nearly 17 work years of staffing (full-time positions and related overtime) and other financial support associated with operating this second engine company. The staffing and related expenses associated with this duplicate engine company can be utilized for higher priority needs in the PFD, as is discussed in a number of other chapters of this Study report.

PLATOON SHIFT WORK SCHEDULE

The following sections review and provide conclusions and recommendations relative to the rotating 24-hour shift work schedule utilized by the firefighters and officers assigned to staff the current four platoons of staff in providing fire, EMS and related services.

24-Hour Schedule

There are a number of variations of the 24-hour schedule in use in fire departments across the U.S. for providing fire staff coverage. There are a number of variables involved in the implementation of 24-hour work schedules, including hours of coverage and number of average hours per week that are worked. There is one constant as it relates to firefighter work schedules: each work schedule variation must meet a number of requirements set forth in the Federal Fair Labor Standards Act.

The Study Team considered the PFD 24-hour work schedule in comparison with other possible schedules and is not suggesting a drastic change in the overall Portland firefighter work schedule, such as a change to the work schedule commonly known as the "10/14" or the "three, three and three". The 10/14 schedule is a four-platoon 42-hour average work week schedule. To work the 10/14 one would work three 10-hour days, be off for three days, switch to nights and work three 14-hour nights and then be off for three days. For those who have worked the 10/14 the positive is that it only requires working three long shifts in a row. On the other hand, the negatives are as follows:

- It involves switching from days to nights between every set of workdays, upsetting circadian rhythms;
- It requires working a portion of the weekend for 9 weeks out of a 12-hour cycle; and,
- It is a work schedule that would not be easily negotiated with a union.

For these reasons the Study Team is not suggesting the 10/14 schedule for Portland.

Likewise, the Study Team considered, but is also not suggesting, a change in the basic number of average hours worked per week. However, an assessment of the specific configuration and rotation of the 24-hour work schedule in use and possible other alternatives seems appropriate.

Current PFD 24-Hour Schedule

Regarding the hours of work and work cycle the Agreement between the City of Portland and Local 740, International Association of Firefighters, AFL-CIO, January 1, 2012 – December 31, 2013 reads:

> "The work cycle shall average not more than forty-two (42) hours per week. Work week sub-cycle shall be: 24 hours on, 24 hours off, 24 hours on, five (5) days off."

In discussions with firefighters and officers of the PFD there were basically two general feelings regarding the current 24-hour schedule. There were those who like it very much and a few who do not.

> One individual (from another fire department) who clearly **likes the schedule** stated *"I like it. Its awesome for people who want a part time gig.... 5 days off is a*

lot. Its like a vacation every time you get done working what we call a tour... your 2 days at work. Only problem is that if you have a rough first day, that middle in-between day sometimes is nothing but sleeping."

There are also those who do not like the schedule. The reasons given by those who do not like the schedule included the following:

- The PFD job has become a "part-time" job;
- The schedule is unproductive from a manager's perspective;
- Many time managers do not see their subordinates for over a week;
- We train less than we used to;
- Members of the public do not understand how someone can work apparently so few days;
- Municipal and business people have difficulty "catching up" with someone who is regularly off for five days in a row; and,
- Five days off causes problems with processing fire company building inspections paperwork, particularly if the paperwork is not submitted until back to work the next time.

Members of the Study Team have worked on a number of firefighter work schedules, including both the 24-hour as well as the 10-14 schedule, which are the predominant work schedules of fire and EMS departments. In the Team's opinion, the current PFD 24-hour work schedule with five days off regularly has the following negative traits:

- Typically less productive than other optional shifts;
- Does not foster teamwork;
- Has a negative impact on public image;
- Is an employee's schedule;
- Is generally utilized by fewer fire departments than other schedules; and
- Causes dedicated employees to do more PFD work when off duty when compared to other shift schedules.

Possible Alternative Work Schedule

This Section provides information relative to primary optional firefighter work schedules that could be considered for use by the PFD. It is suggested that a concerted effort be made to implement an improved work schedule that does not include 4-5 days off at a time.

24-72 Schedule

The 24-72 schedule is likely the most used and popular work schedule. It can be described as a four-platoon schedule that also averages 42 hours per week (7 days) during a 28-day cycle; there are 7 shifts every 28 days totaling 168 hours. This 24-72 schedule is one day on, three days off for 28 days when it repeats, in accordance to the FLSA.

Most firefighters, EMS personnel and officers who work this schedule like it. Reportedly, the benefits of the 24-72 hour schedule include a reduction in overtime usage and shift trades are easier to accomplish within the 28-day cycle

LABOR – MANAGEMENT RELATIONS

Background

The subject of labor management relations covers a wide range of topics including, for example, collective bargaining, contract negotiations, key contract clauses (e.g., no-strike), disciplinary processes, grievance processes, management rights, working conditions, and employee performance standards and expectations. Certainly, it is beyond the scope of this section to explore any of these topics in any depth. What is essential for the reader and fire executive to understand is that the interactions between representatives of labor and management interests are commonly adversarial in nature, where each wants to be in control of the work environment. The degree of oppositional energy evident among the principals will vary substantially from organization to organization. In some public safety departments, most disagreements will be resolved relatively painlessly, while in others the discourse will be very contentious.

The fact that a formal union or recognized bargaining unit does not exist, as is the case in many public safety organizations, does not indicate that there is no need to attend to issues where management and employees differ. Whether a formal labor management relations structure exists or not, controversial matters require discussion and resolution. Issues in dispute, if not resolved to at least some mutually acceptable degree, will be disruptive to the organization and the services it is charged to provide.

Employees, whether organized or not, are primarily concerned with matters of pay and benefits; job security; certain aspects of working conditions (e.g., safety, workload); and disciplinary procedures. Unions have often gone far beyond these concerns to include

operational matters such as staffing levels, work schedules, performance standards, and transfer and promotion practices, for example. Their successful invasion into these areas has often been a result of poor preparation for labor negotiations by management, and local governments' willingness to bargain away management rights in lieu of increases in compensation. Intrusions into management rights areas can and have been devastating to the effective and efficient delivery of public safety services.

Management, on the other hand, is primarily concerned with matters of effective service delivery, efficient service delivery, maintenance of administrative control over departmental operations, and employee accountability and responsibility. A comparison of the matters of concern to employees in contrast to those of management reveals very little commonality. Accordingly, the launching pad for controversy and disagreement is established. For example, while management sets performance standards for its employees, thus evidencing its employee accountability concerns, employees assert violations of past practice, thus evidencing their working conditions concerns.

It is important for labor groups and employees to have a forum for putting forth their concerns to management. Further, it is important for management to sincerely listen to those concerns and address them in a thoughtful and even-handed manner. Finally, it is important for management to maintain basic and critical management rights as those articulated below by a committee of the National Executive Institute:

- To plan, direct, and control all operations, and set departmental policy, goals, and objectives.
- To discipline and fire employees, and establish disciplinary procedures.
- To determine work and performance standards.
- To determine staffing levels.
- To determine work schedules, tours of duty, and daily assignments.
- To determine transfer policies.
- To hire employees and determine selection criteria.
- To promote employees and determine promotional procedures.
- To determine standards of conduct of employees, both on and off duty.
- To educate and train employees and determine criteria and procedures.
- To contract or subcontract out for goods and services.

The compromising of any of these management rights, whether through formal contract negotiations or through their informal surrender by management, will deteriorate the quality of public safety services.

OBSERVATIONS/LABOR AGREEMENTS

The following sections discuss a number of potential opportunities to improve the Agreement between the City of Portland and Local 740, International Association of Firefighters, AFL-CIO, January 1, 2012 – December 31, 2013.

Bid System

The Agreement includes a Transfers section with extensive employee transfer-related provisions that, as stated in the Agreement, provide "…a bid system for permitting qualified employees to transfer to permanent vacancies within the Department based upon seniority."

These bid system provisions are by far the most comprehensive and restrictive seen by the Study Team members who has worked under a number of IAFF agreements and have reviewed and assessed more than 50 firefighter and officer labor-management contracts in more than ten U.S. states. A number of the provisions in this Portland Agreement appear to potentially infringe on management rights, particularly as it relates to the ability of captains and lieutenants (who are also members of the Local) to make day-to-day in-station employee work assignments and for PFD management to select the most qualified employee for important specialty job assignments.

The Study Team believes that the use of seniority in making employee assignments is an important concept and selector for many job assignments, however, a number of provisions in this Transfers section seem to be unnecessarily excessive and restrictive.

In their wisdom, the writers and signors of this Agreement included the following final provision of this Transfer sections:

> *"The City and IAFF 740 acknowledge the above modifications to the transfer language shall be reviewed as to their effectiveness during the life of this Agreement. Either party at the conclusion of this Agreement may seek to modify, amend, or add to any of the above portions through the bargaining process. Any such request shall not be denied by the other party and no argument shall be presented that the above language was intended not to be reviewed and/or subject to modification, if warranted."*

The Study Team suggest that the newly appointed Fire Chief and IAFF 740 leadership work together as soon as possible to develop less restrictive approaches to transfer decisions that are in both the interest of senior employees and the selection of highly qualified employees for appropriate PFD positions. At the latest, these provisions should be modified in a number of key areas with the next bargaining process.

Substitutions

The Agreement includes a Substitutions section. There does not seem to be a maximum number of consecutive work hours that an employee would be allowed to work as a result of substitutions. In the interest of the health and safety of the employee and assuring continued alertness for the performance of hazardous activities, there should be such a restriction, e.g., 36 or 48 consecutive hours.

Compensation Approaches

In reviewing the Agreement, the Study Team noted a substantial number of varied approaches to compensation for different activities and assignments. These are very difficult to manage and implement in the PFD's largely non-automated payroll environment. The implementation of a fully automated payroll system/s approach should improve accuracy and reduce staff time commitment to this critical process.

CIVIL SERVICE COMMISSION

In a number of chapters, this Study report includes recommendations for comprehensive career development and training and certifications and other aspects of human resources management that may be under the purview of the Civil Service Commission. In pursuing implementation of these recommendations the Fire Chief should coordinate with the Commission to assure consistency and proper involvement of the Commission with matters under consideration.

AUTOMATION SUPPORT

There are a number of very important administrative processes that are essential to the effective staffing of the PFD that are currently largely manual in nature. With today's high technology in the workplace there are opportunities to streamline and improve a

number of administrative support functions, while at the same time reducing the time and effort required to perform these functions on the part of senior uniformed and civilian administrative staff. Providing high tech means to improve PFD administrative functions assists in the accomplishment of important tasks with limited personnel.

Automated Work Schedule Management

The daily scheduling process utilized by the PFD is largely manual. Scheduling firefighters and officers in a fire department, such as the PFD, is a multifaceted, time-consuming, error-prone process. Even with the best efforts, mistakes are made that lower productivity, increase costs, and put the City at risk for litigation and fines.

Automated firefighter/officer scheduling programs let managers accurately create schedules that align labor with anticipated demand, while adhering to all department and regulatory scheduling policies consistently. There is no such thing as a static schedule. When an employee unexpectedly calls in sick or needs leave, the automated system and associated mobile technology quickly identifies qualified substitutes, automatically notifies them, and selects one to fill the shift.

PFD platoon commanders spend a considerable amount of time and effort, especially at the beginning of each daily work shift, adjusting the schedule for the day to make sure all slots are filled with qualified available staff. Many U.S. fire departments have found automated schedule management to be very beneficial and cost effective. The PFD is encouraged to implement such a system.

Interfacing an automated schedule management solution with the City's automated payroll system would provide a fully integrated process that would be cost effective and would save time and effort for City and PFD staff.

There are a number of well-established vendors that provide such software solutions for municipalities and fire departments. The Study Team has had a particularly successful experience with the Telestaff product by Kronos. Further, reportedly the Telestaff program is utilized in the Portland Regional Communications Center in recording training information.

PERFORMANCE EVALUATION

In public safety today, formal performance evaluation programs don't seem to work. Although it is common for such evaluations to be conducted on an annual basis, it is also common for employees and management alike to hold such evaluations in low regard. Rarely do employees speak positively about the subject, and management is regularly interested in finding a new way to do it. When asked how formal performance evaluation information is used in the organization, few would say that it has important impact on personnel decisions such as assignment or promotion, for example. Commonly these formal performance evaluations come back to haunt management in disciplinary matters when the record describes the employee as "excellent," "above average," or by some similar characterization. Attorneys just love to put these evaluations in the face of management when defending their clients against termination or some other serious disciplinary action.

The use of the term "formal" is important because it is essential to make the distinction between the formal system in place and the informal awareness of employee performance by management which typically is quite accurate. Management knows who can be counted upon and who can't. Unfortunately, these informal assessments are not in the record, but only in the minds of management. Why is this?

The first explanation for this condition is really quite simple. Most importantly, typically the preponderance of supervisors plainly do not like giving subordinates "average" or low ratings. Unless there is some personality conflict, or the performance is grossly inadequate, ratings will typically be higher than deserved. This is why performance evaluations typically pile up at the higher ends of the rating scales with very little differentiation of performance among subordinates. Job performance is a human behavior, and human behaviors are typically normally distributed. That is, it follows the "bell-shaped curve" with most employees in the middle range of performance with fewer employees at the higher and lower ends. Yet, this is not what we see. What we see is most if not all employees at the upper ends of the performance rating scales.

A second explanation for this situation is that in order to correct it, an enormous amount of attention is required. First-line supervisors must know that what they do in the way of subordinate performance evaluations are important to **their** superiors, and their superiors through the Chief/Director must consider the performance evaluation process to be an essential element of management. This importance must be communicated in a number of

ways including the provision of time for training purposes, the on-going monitoring and insistence on high quality evaluations, and a performance evaluation system that is sound and contemporary. Often, public safety executive personnel are not interested in or prepared to make such a commitment.

The periodic performance evaluation of all employees, regardless of rank/classification, **is** important. Employees must receive feedback from management as to how they are doing on the job because their performance will influence other management decisions which will affect them (e.g., assignment, promotion). To the extent that employees want to influence their future, they need to know how they are perceived by management. Further, they need to understand their strengths and their opportunities for improvement. Supervisors who are confident in their ability to provide negative feedback to subordinates in a constructive and caring way will be more likely to conduct accurate and honest performance evaluations than supervisors who are not comfortable in this role. Supervisors who don't want to convey "bad news" because it will hurt the employee's feelings or is expected to result in some manner of confrontation will simply give higher ratings than deserved.

It is essential then, that supervisors acquire the ability to constructively provide adverse information to subordinates in the course of conducting performance evaluations. **An undeserved high rating may result in the loss of life or property during some future incident.**

The nature of the performance evaluation "form" to be used, although important, is not a very difficult part of the system to be developed. In fact, when public safety people say, "We need a new form" as a way of explaining why the current system is not working, their understanding of the dynamics of performance evaluation is sorely lacking. Briefly described below are the essential elements of a potentially useful and respected performance evaluation system:

1. The identification and definition of those **essential job performances** which are to be evaluated. This information is derived from job analyses and descriptions for each rank/classification. Ordinarily, there would be eight to ten of job performances.
2. Establishment of the **number and definition of ratings points** to be employed in evaluating the essential job performances. Ordinarily, three to five rating points are sufficient to permit meaningful differentiation in job performance quality.
3. Provision of **training** for all personnel in the conduct of performance evaluations.

A minimum of two days of training is necessary, including an assessment and certification of each rater's ability to provide feedback in a constructive manner.

4. Development of **quality controls** to govern operation of the performance evaluation system. These controls include, for example, a provision which requires each level of performance evaluations to be monitored by the next higher level (e.g., captains monitor the evaluations conducted by lieutenants), prior to delivery to the employee and for an appeals process to be in place.
5. Inclusion of a **documentation component** which ensures the objective connection of ratings to observed job performances. Performance notes must be maintained on critical positive and negative performances which accrue throughout an evaluation period.
6. Specification of **operational characteristics** to include: frequency of performance evaluations, forms to be employed, records to be maintained, uses to which evaluations may be put, and any other procedural matters.

Observations/Current System

The Study Team was advised that in the past recruit firefighters, lieutenants, captains and chiefs were periodically evaluated with regard to their job performance. Further, reportedly those evaluation results were used as a basis for promotional decisions. Finally, the Study Team was advised that there came a point when, to a large extent, all evaluations were providing the same results with all those being evaluated being given the highest ratings. In that way the staff evaluation process became essentially useless. So, the process was halted and not revised and/or reinitiated.

SUMMARY

Decisions made regarding the staffing of fire and EMS apparatus have a direct impact on the level of fire and EMS service delivered to the community. These decisions also have an impact on the relative safety of firefighters as they perform the many dangerous tasks associated with extinguishing fires and dealing with medical and other emergencies, such as hazardous materials incidents, that fire/EMS departments are expected to handle.

Additionally, decisions regarding staffing of fire and EMS apparatus have significant fiscal implications since the major cost of a career fire department is salaries and wages

for the personnel. For that reason, staffing levels become a crucial budget and service level issue in municipalities and their fire departments.

A number of optional approaches in apparatus staffing are presented for future consideration by Portland. Further, a formula for determining future position needs, based on approved apparatus and station staffing, is outlined. The objective is to provide options for the safe and cost effective delivery of quality fire and EMS services to the residents and business owners/operators in Portland.

RECOMMENDATIONS

3-1 The City should consider adopting the suggested staffing formula for the determination of current and future staffing requirements for budget preparation purposes.

3-2 The City and Fire Chief should conduct a cost benefit analysis of staffing platoon assigned firefighter and officer positions with fulltime positions vs. overtime.

3-3 The City and Fire Chief should develop and implement an overtime reduction plan based on options and recommendations contained in this Study report.

3-4 The City and Fire Chief should consider conducting a complete determination of time "off the floor," including vacation, sick, training, on the job injuries, and details, for example, and use this data to accurately determine what its budgetary firefighter and officer position requirements are from year to year.

3-5 The City and Fire Chief should consider using the proposed staffing calculations formula for implementing reduced overtime expenditures.

3-6 The City and Fire Chief should consider apparatus staffing options at NFPA 1710 levels, four person engines and ladders, as PFD organizational changes are made and/or fiscal opportunities are available.

3-7 The City and Fire Chief should consider redeploying the staffing and associated capital and other costs from the duplicate engine (Engine 6) housed at the Bramhall Fire Station to higher priority staffing and financial needs of the PFD.

3-8 The Fire Chief is encouraged to evaluate the past personnel evaluation process, its successes and failures, and pursue appropriate revision of the process in order for a state-of-the-art process to be implemented with the resultant benefits for the employees and management.

3-9 The City and IAFF Local 740 are encouraged to implement a revised 24-hour work shift for platoon assigned uniformed personnel in order to attain improved cost effectiveness and reduce the number of regular consecutive days off, as suggested in this Study report.

3-10 The City and IAFF Local 740 are encouraged to make appropriate changes to the Transfers section related to the bid system, as soon as possible, or at the latest with the renegotiation of the Agreement at the end of 2013.

3-11 The City and Fire Chief should assure that there is a restriction (e.g., 36 or 48 consecutive hours) that an employee may be scheduled to work.

3-12 In pursuing implementation of these recommendations the Fire Chief should coordinate with the Civil Service Commission to assure consistency and proper involvement of the Commission with matters under consideration.

3-13 The City and Fire Chief should implement a state-of-the-art firefighter/officer scheduling program that automates the full process.

3-14 The City should integrate the PFD employee scheduling program with its payroll system for an improved, cost effective time-saving process.

3-15 As funding and priorities allow, the City should consider staffing engine and ladder companies to four, as provided in the NFPA 1710.

3-16 The City and IAFF Local 740 should work together to pursue methods to simplify the compensation approach called for in the Labor Agreement.

CHAPTER FOUR
RISK ANALYSIS AND FACILITIES

This Chapter examines the locations of fire stations within the City in relation to geographic distribution, response capability, demographics, and ISO Insurance Rating recommendations. The performance of the respective fire and EMS crews to respond to emergency incidents is assessed based upon time travel and service demand patterns. Additionally, the physical condition of PFD fire station facilities is reviewed. Finally, related conclusions and recommendations are provided for consideration.

CFAI FIXED FACILITIES CRITERIA

The Study Team considered criteria from the Commission on Fire Accreditation International (CFAI) as the PFD facilities were considered as part of this Fire Department Performance and Management Study.

The CFAI accreditation criteria related to fire department fixed facilities are as follows:

Fixed facility resources are designed, maintained, managed and adequate to meet the agency's goals and objectives.

Performance Indicators

1. Space allocations are adequate for agency functions such as operations, fire prevention, training, support services and administration.
2. Buildings and grounds are clean and in good repair. Maintenance is conducted in a systematic and planned fashion.
3. Physical facilities are adequate and properly distributed in accordance with stated service level objectives and standards of cover.
4. Facilities are in compliance with federal, state and local regulations.

CURRENT FIRE STATION LOCATIONS

Currently, the Portland Fire Department provides fire and EMS transport and first responder services from the following fire station facilities:

Mainland Fire Stations

1. Munjoy Hill Station – 134 Congress Street / Engine 1, Ladder 1
2. Central Fire Station – 380 Congress Street / Engine 5, Medcu 5, Medcu 6
3. Bramhall Station – 784 Congress Street / Engine 4, Engine 6, Ladder 6, Rescue 1
4. Rosemont Station – 212 Stevens Avenue / Ladder 3, Medcu 3
5. East Deering Station – 576 Ocean Avenue / Engine 11, Medcu 7
6. Northgate Station – 380 Allen Avenue / Ladder 4, Medcu 4
7. Riverton Station – 1592 Forest Avenue / Engine 9, Wheelchair Unit
8. Marine Division – 56 Commercial Street / Marine 1, Marine 2, Marine 3
9. Air Rescue Station – 1005 Westbrook Street / Red 1, Red 2, Red 3, Red 4, Red 5

Island Fire Stations

The PFD fire stations located on various Portland islands in Cosco Bay are as follows:

1. Peaks Island – 129 Island Avenue / Engine 12
2. Cliff Island – 108 Church Road
3. Cushing Island- 1 Spring Cove Ave.
4. Great Diamond Island- 251 Diamond Ave.
5. Little Diamond Island

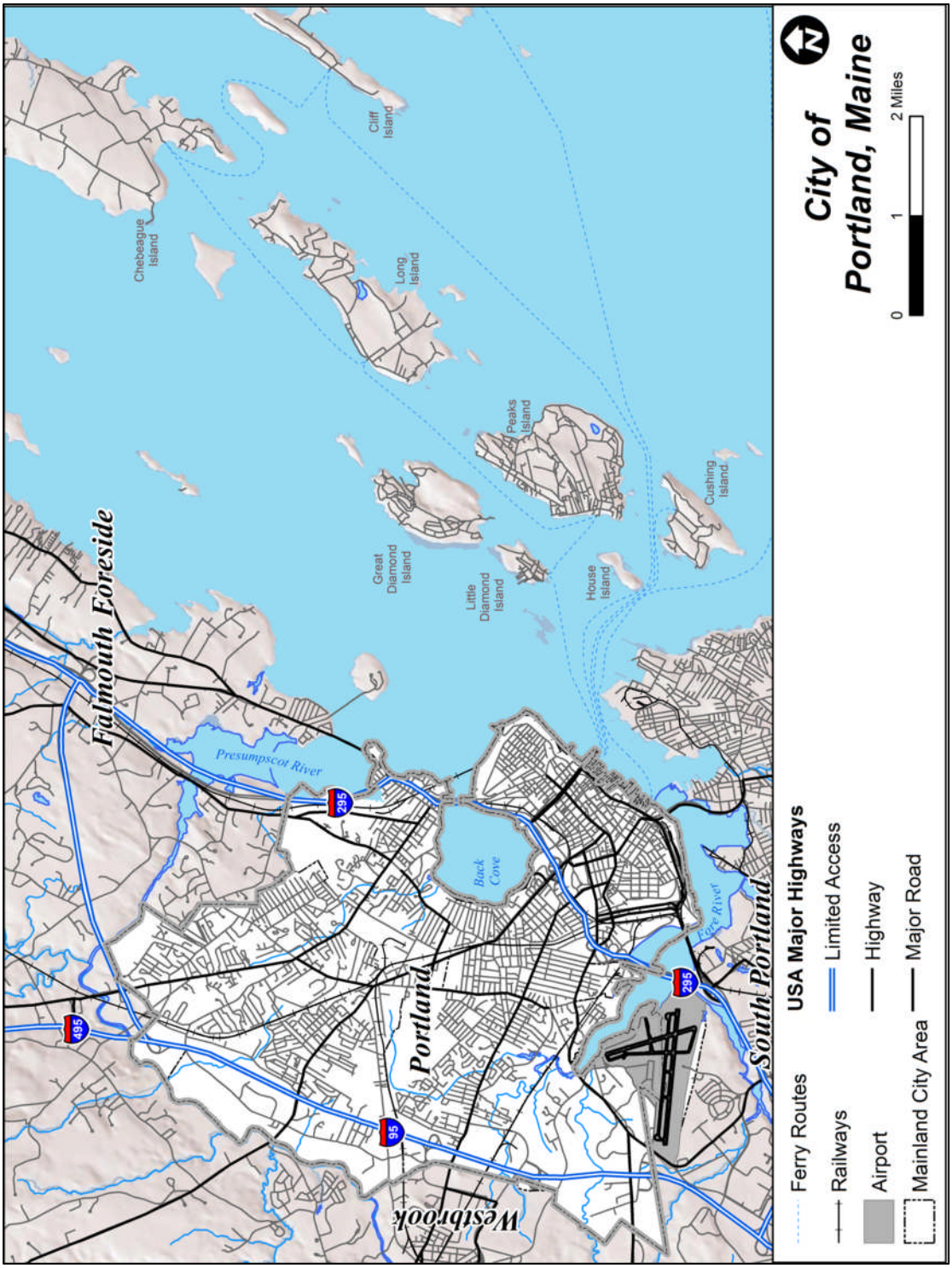
Portland Fire Museum

Additionally, the Study Team was truly impressed with the quality and magnitude of the Portland Fire Museum located at 157 Spring Street in a former Portland fire engine house. It is operated by the Portland Veteran Firemen's Association (PVFA). Clearly the PVFA works very hard to keep the proud history of the Portland Fire Department alive. See www.portlandfiremuseum.com.

SERVICE AREA DESCRIPTION

The City of Portland is a geographically significant place not only in Maine, but in the New England region. The City is a major port destination for goods as well as passenger cruise ship operations. Its waterfront still has its essential commercial facilities, but is also becoming a tourist destination leading to the development of restaurants, art galleries, and hotels. Much of the downtown commercial district is on a small bluff that overlooks the harbor. The harbor's marina is the docking place for many sea-going vessels, tug boats, and pleasure yachts and in the warm weather months many pleasure and work boats are placed on mooring balls or anchored. The City expands west along the Fore River and behind the Back Cove. It is the home to over 69,000 residents within its 21.3 square miles. An international airport is located on the south central side of the City across the Fore River from downtown. The University of Southern Maine calls Portland home as do several major medical centers and minor league sports teams. The City also has jurisdiction over several islands within Casco Bay including Cliff Island, Cushing Island, House Island, Little Diamond and Great Diamond Islands, and Peaks Island. (See Figure 4.1 City of Portland Fire Department Study Base Map.)

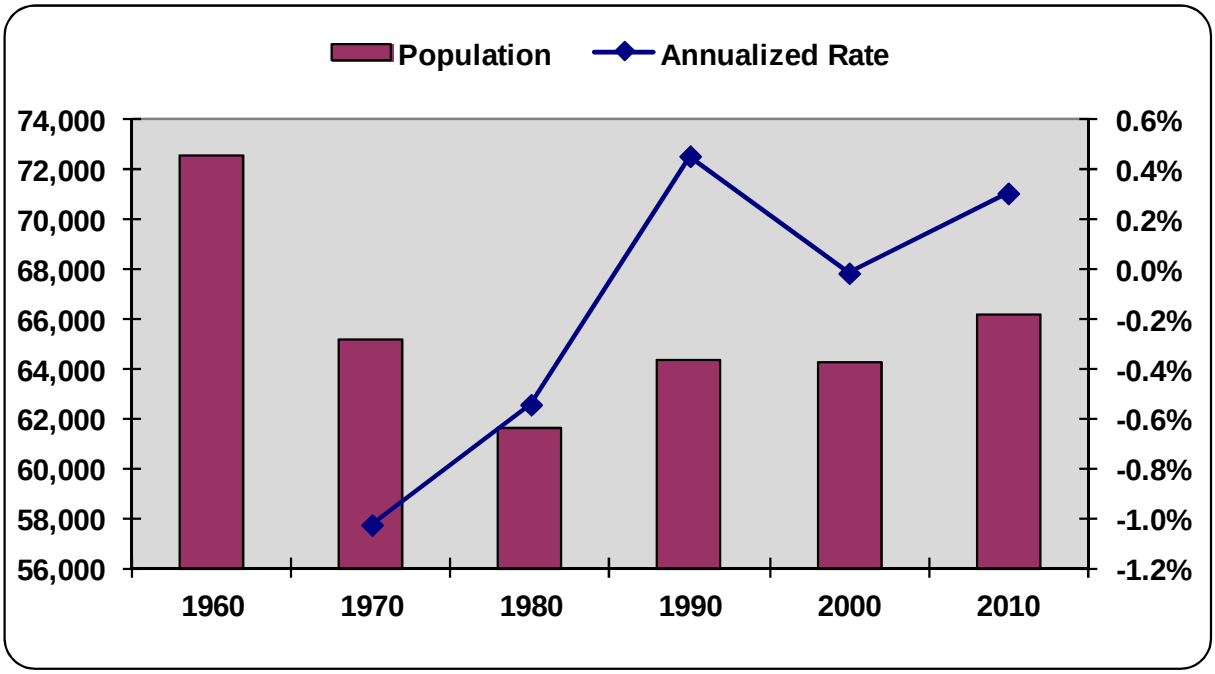
Figure 4.1
CITY OF PORTLAND FIRE DEPARTMENT STUDY BASE MAP



POPULATION & HOUSING

The population of the City includes 69,194 residents according to the 2010 U.S. decennial census. This is an increase of approximately 3% from a decade earlier when the residential population was 64,249 persons. Historically, the City population had been decreasing sharply since 1960, reaching a low point in the 1980 census. Since then, the City's residential population has crept above 1970s level.

Figure 4.2
POPULATION GROWTH HISTORY

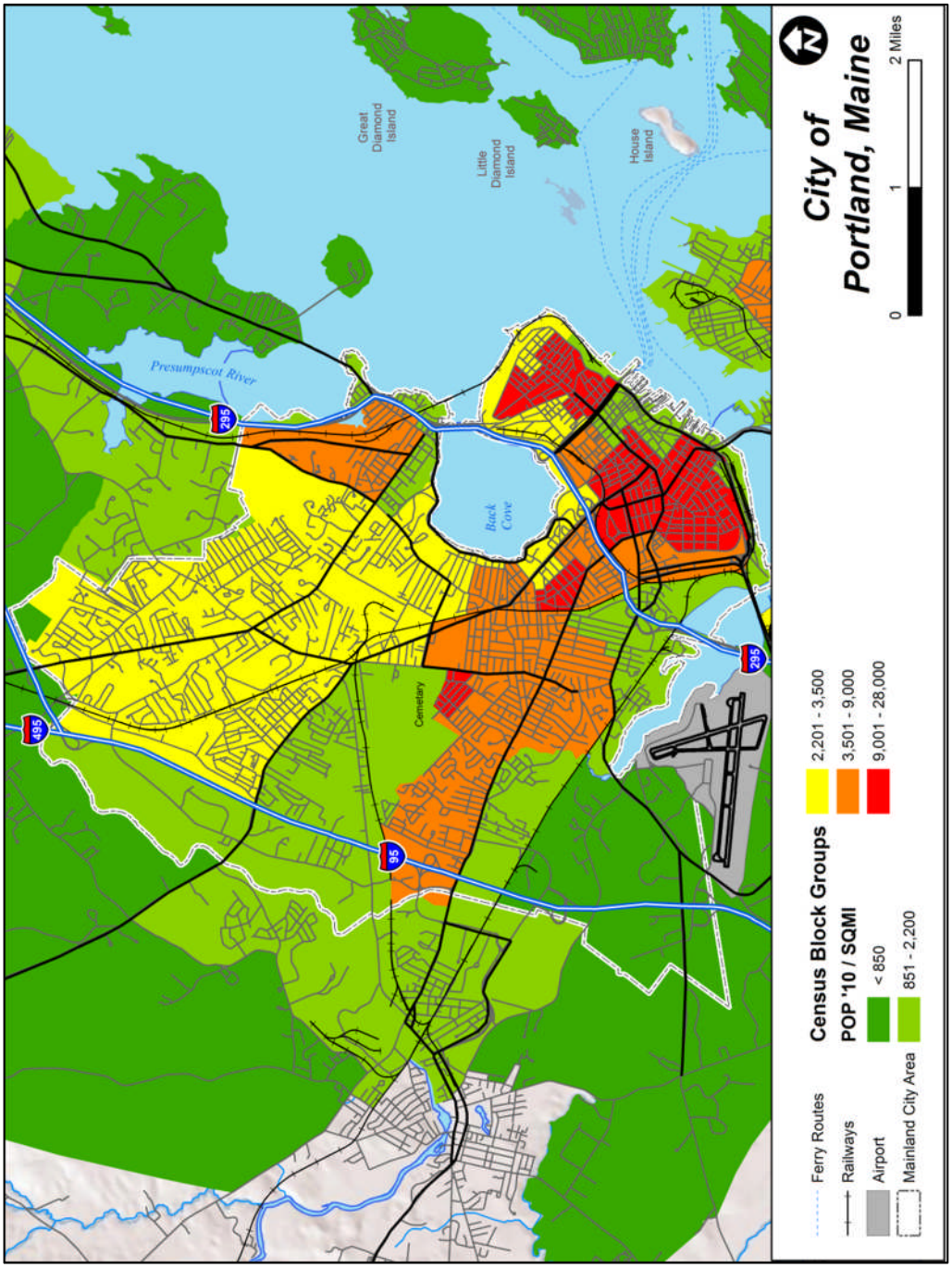


These figures in Figure 4.2 represent residential population and do not account for the variation during the daytime hours for commuters, shoppers, and out-of-area employees. It is estimated (using census data) that approximately an additional 30,000 people commute into Portland for work, increasing the daytime population to about 100,000. Once again, this does not factor flow-through traffic, shoppers, and tourists. The City[1] estimates that four million tourists visit Portland each year. The permanent population on the islands is approximately 1,026 persons, while seasonal estimates exceed 6,500 persons during the summer months. The residential population is also not evenly distributed. It is well understood that demand for emergency services correlate with areas of higher population. Figure 4.3 shows the concentration of residential population by

[1] City website

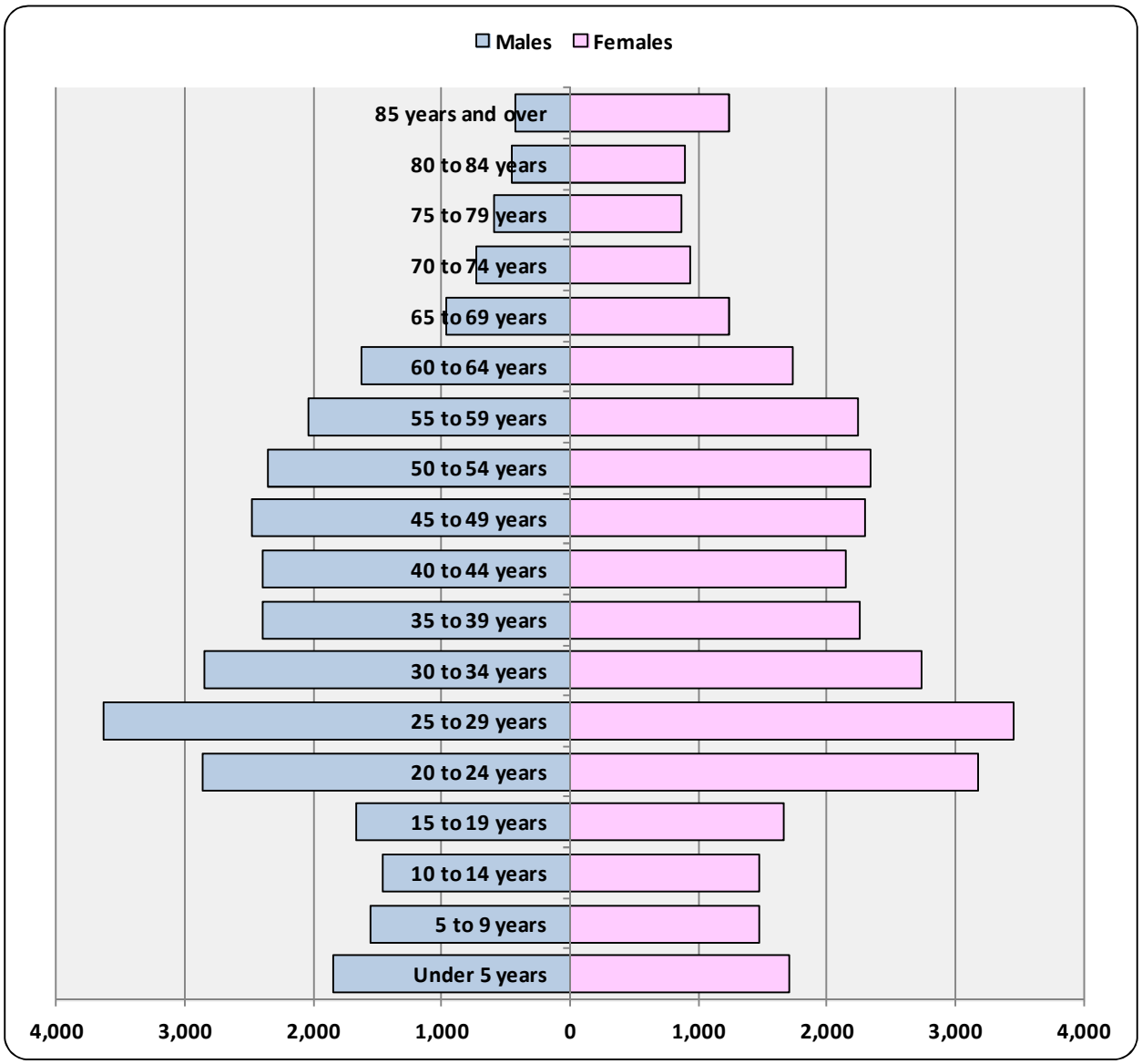
census block group areas. It can be seen Figure 4.3 that the City's population has higher concentrations of population near the downtown area and expanding west and north. The islands have a very low population level as discussed in this section.

Figure 4.3
POPULATION DENSITY



Although general population levels play a role in the geographic distribution of demand for fire and medical services, it is important to examine the composition of the population since the aged and pediatric populations are more prone to serious medical emergencies and to succumb to smoke and fire due to their behavioral tendencies during a fire. Children often hide making an interior search by firefighters more difficult, while mobility issues limit the ability of the aged to escape. Figure 4.4 illustrates the levels of population by age group in Portland.

Figure 4.4
CURRENT POPULATION BY AGE GROUP



Five percent of the City's population is less than five years of age, while 13.6% are school aged (under age 17). An additional 13% are over aged 65, together with the younger population, efforts for fire prevention and fire escape procedures should be emphasized with these groups.

While it is fortunate for the City of Portland to have the largest segment of its population within the 25-44 years of age cohort, a cautionary trend has emerged since the last decennial census. Figure 4.5 details the change in age cohort levels over the previous two census tabulations of residential population.

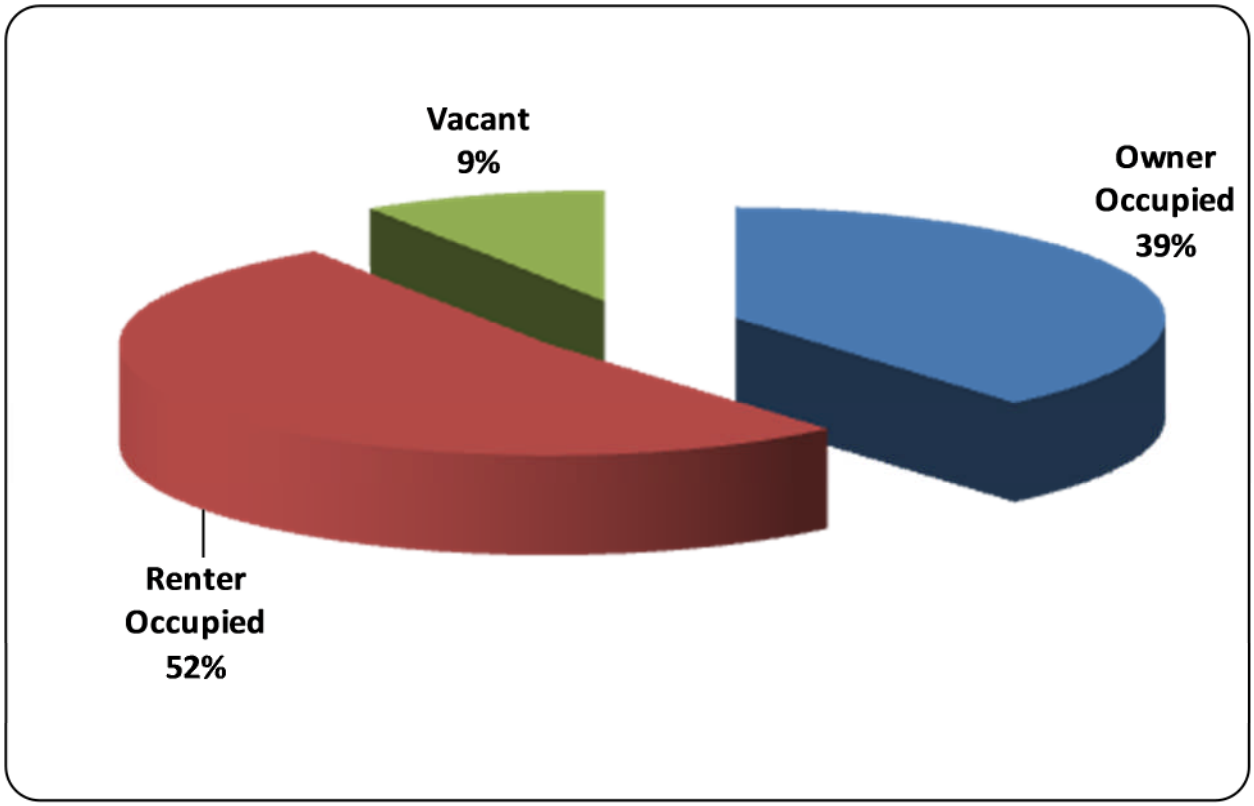
Figure 4.5
POPULATION CHANGE

Demographic Change- 2000 to 2010								
	Total Pop	Age <5	5 to 24	25 to 44	45 to 54	55 to 64	65 to 74	75 and up
2010	66,194	3,558	15,329	21,868	9,470	7,632	3,873	4,464
2000	64,249	3,305	15,627	23,186	8,516	4,706	4,018	4,891
change	3%	8%	-2%	-6%	11%	62%	-4%	-9%

It appears that the most populous cohort has been reducing in number, perhaps moving out of the City or region for work or after finishing college. The older age cohorts (45-54 & 55-64) seem less likely to move and some of the increase in the cohort total population reflects this effect. It should be noted that within the next ten years the bulk of this 'baby boomer' population (those born between 1946 and 1964) are poised to enter the ranks of the 'senior citizen' (generally those above the age of 65). It is expected that demand for medical emergencies will rise significantly and the threat of fatal fire death may also increase based upon the age progression of the population. In addition, expected mortality rates are anticipated to be reduced with medical advances.

In Figure 4.6 housing is examined by occupancy types. It should be noted that, a higher than average national and statewide rate of renter-occupied properties exists. This is important because areas of lower vacancy and rental properties are typically reflective of better economic means that correlate with lower demand for emergency services.

Figure 4.6
HOUSING BY OCCUPANCY



Rental properties and seasonally vacant properties are more numerous in areas such as Portland, not only because of its urban nature, but because of University student housing and island tourism. Figure 4.7 illustrates that all segments of housing have increased since the 2000 U.S. Census.

Figure 4.7
HOUSING OCCUPANCY CHANGES

Housing Information- 2000 to 2010				
	Housing Units	Owner Occupied	Renter Occupied	Vacant
2010	33,836	13,124	17,601	3,111
2000	31,862	12,617	17,097	2,148
change	6%	4%	3%	45%

The increase in vacant units can also be attributed to the recent economic downturn in housing since the 2008 economic crisis in the United States. Housing foreclosures, both in primary residences and secondary vacation homes, increased dramatically during this time and can be reflected in Figure 4.7.

FIRE STATION AND APPARATUS DISTRIBUTION

Because of the unique geographic aspects of the City and fire department operational features, this section will examine the Portland Fire Department's deployment, risks, and performance for the City mainland area, the islands, the use of the Fire EMS Boat, and the airport fire operations.

On the City's mainland area there are nine fire stations. These include the stations for the airport crash vehicles and the Fire EMS Boat on the harbor. The airport station and Fire EMS Boat station will be discussed separately as subsections pertain to them. Figure 4.8 displays the locations of the nine fire stations relative to the City mainland area and roadway network.

Three fire stations are located in the downtown area while four others are located in the western parts of the City serving other neighborhoods. The airport crash trucks do not operate off the airport property and therefore, will not be considered in some areas of this report pertaining to coverage outside the airport fence line. As far as medical calls in the terminal, current policy is for a City engine and MEDCU ambulance to respond as Red 2 assesses the situation and the patient[2]. This is reasonable and should continue in practice.

While each fire station has fire apparatus or fire specialty vehicle, not all have MEDCU ambulances assigned to them. Figure 4.9 illustrates these unit locations in relation to the City and to the receiving hospitals. Note that Central Station has two MEDCU units operating from it.

[2] PFD SOG 8.4.4.9.3

Figure 4.8
MAINLAND FIRE STATIONS

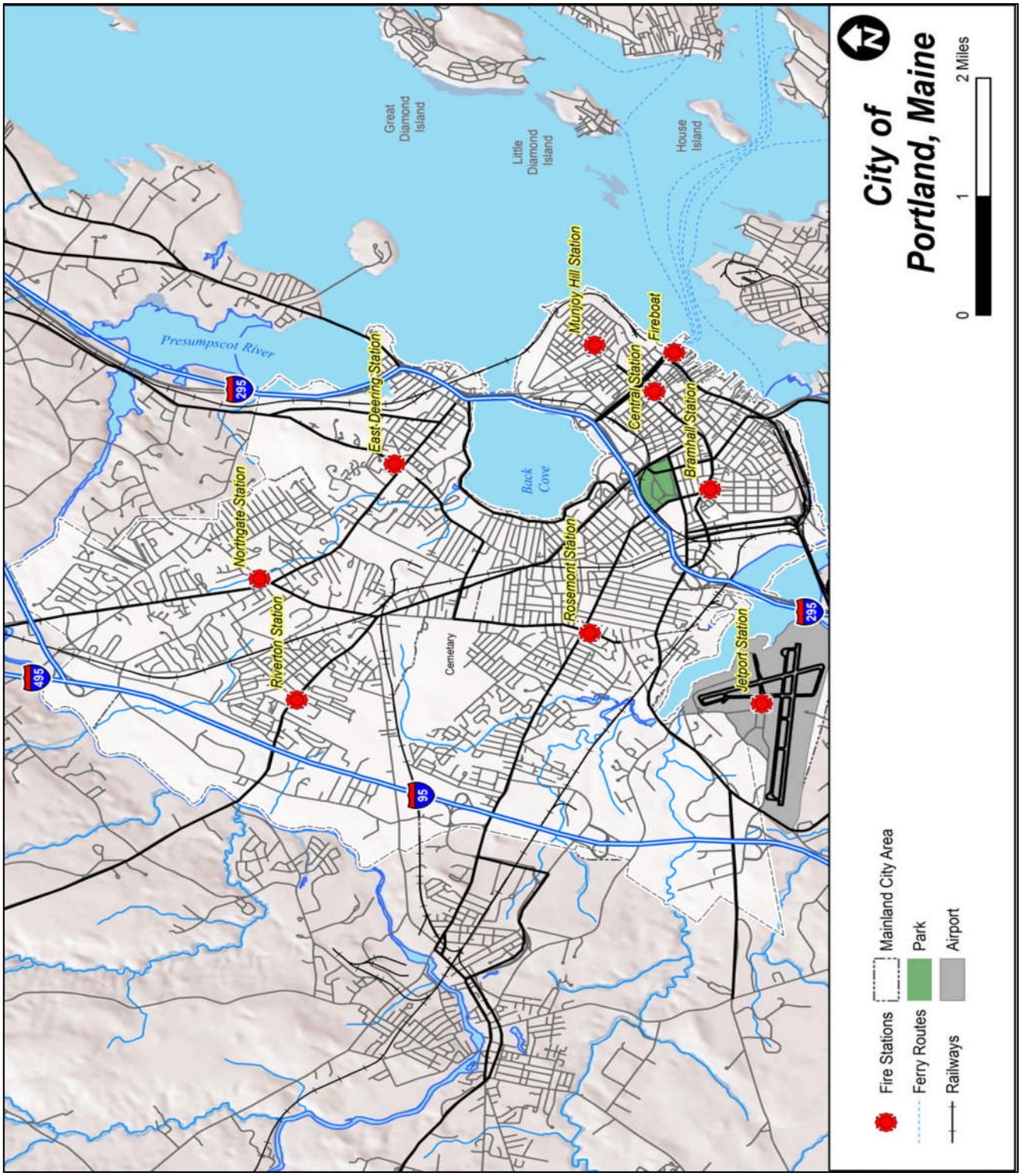


Figure 4.9
MEDCU STATIONS

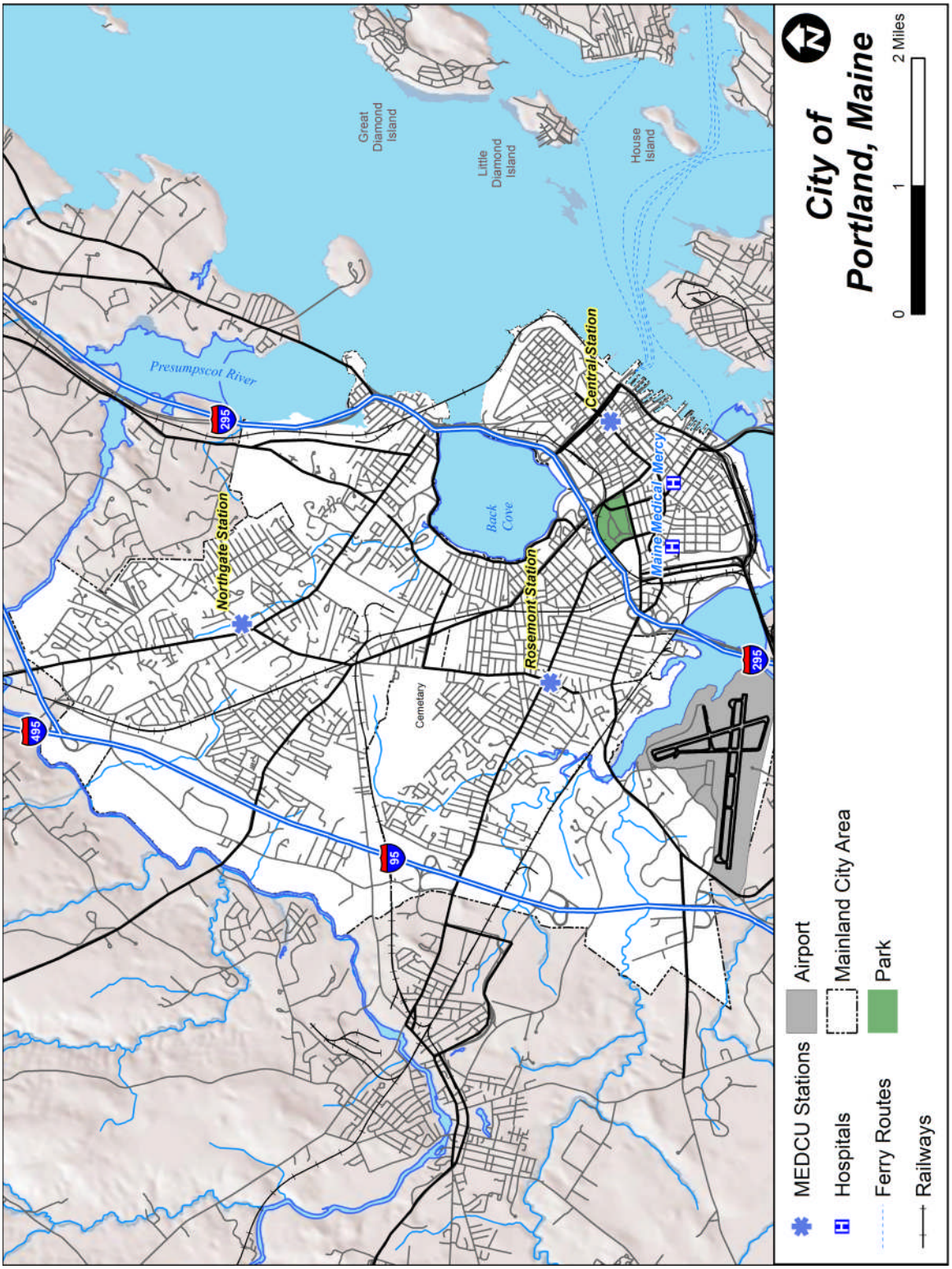


Figure 4.10 details the apparatus distribution in the mainland stations.

Figure 4.10
MAINLAND APPARATUS DISTRIBUTION

Fire Station	Command	Engine	MEDCU	Ladder	Specialty	Rescue
Central (HQ)	DC car	E5	M5,M6			
Bramhall		E4,E6		L6		Rescue 1
Air Rescue	Red 3				Red 1,2,4	
East Deering		E11				
Fire EMS Boat					3 boats	
Munjoy Hill		E1		L1		
Northgate			M4	L4 (Q)		
Riverton		E9				
Rosemont			M3	L3 (Q)		
TOTAL	2	6	3	4	6	1
Q=Quint: Dual Purpose Apparatus (Engine & Ladder)					**HQ=Headquarters**	
E= Engine,	**L= Ladder,**	**Red=Airport**		**M=MEDCU**	**DC=Deputy Chief**	

The islands are served by volunteer fire companies along with the Fire EMS Boat providing fire support, medical care, and transportation to the mainland hospitals. The Fire EMS Boat also serves for fire protection along the waterfront and vessels in the Casco Bay. Figure 4.11 illustrates the fire station locations on the islands.

Figure 4.11
ISLAND FIRE STATIONS

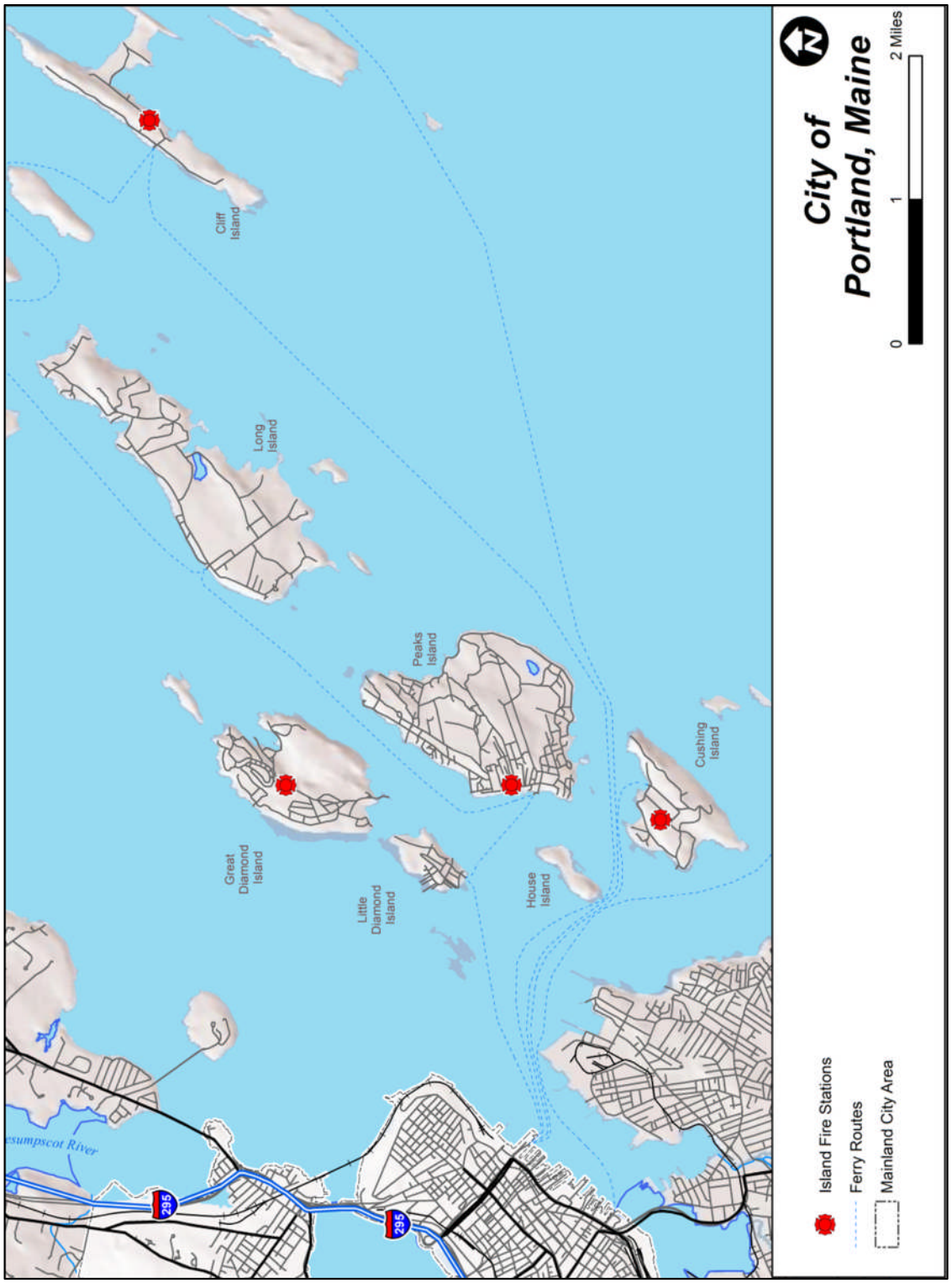


Figure 4.12 details the apparatus distribution in the island stations.

Figure 4.12
ISLAND APPARATUS DISTRIBUTION

Fire Station	Engine	MEDCU	Ladder	Specialty
Peaks Island	E12	M12	L12	T12
Great Diamond	E13	M13		T12, ATV
Cushing Island	E14			T14
Cliff Island	E15	M15		T15, ATV
Little Diamond				Cart
E= Engine, M=MEDCU	L= Ladder, T=Tanker ATV= All Terrain Vehicle			

These essential apparatus are staffed by volunteer members on the islands and supported by members of the PFD during incidents utilizing the Fire EMS Boat as a transporting vehicle. Peaks Island staffing also includes one firefighter assigned from the Fireboat.

STATION LOCATION CRITERIA

The location of a fire station for a specific community depends upon the geography, demographics, and the distribution of commercial, industrial, and residential property. National recognized benchmarks for locating a fire station will be discussed in the sections that follow.

ISO Criteria

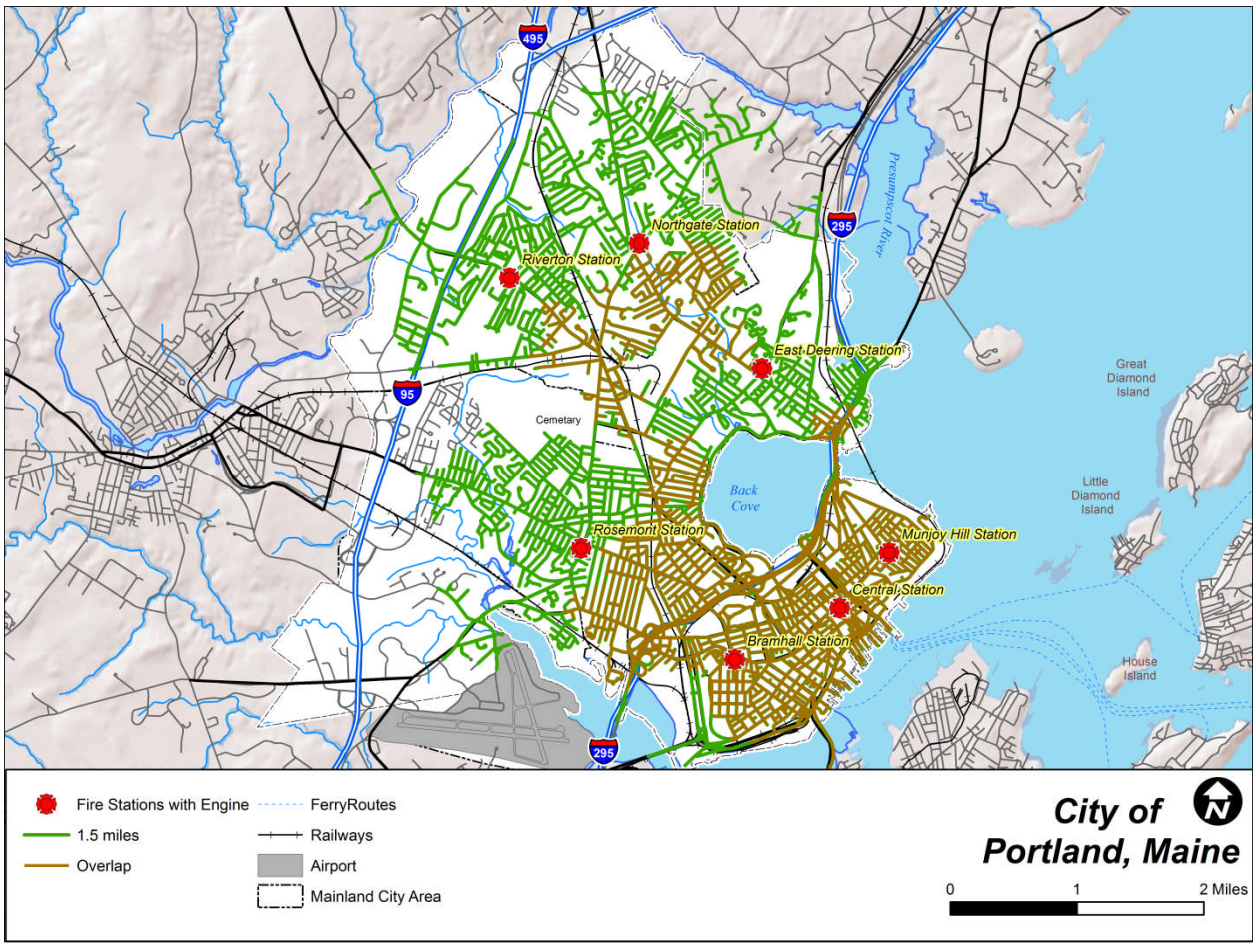
The Fire Suppression Rating Schedule utilized by the Insurance Services Office (ISO) in its evaluation of municipal fire suppression capabilities includes fire station location analysis with objective mileage-based criteria. Item 560 in the *Fire Suppression Grading Schedule*, Edition 6-80, reads as follows:

> "The built-upon area of the City should have a first-due engine company within 1.5 miles and a ladder-service company within 2.5 miles."

The ISO considers the optimum physical location of engine companies and ladder companies essential to earning maximum credits under the Fire Department Item in the Schedule. Obviously, engine companies and ladder companies are placed in fire stations. So it is the location of the fire station that becomes important to the evaluation process used by the ISO. These are very conservative estimates. The problem with using mileage

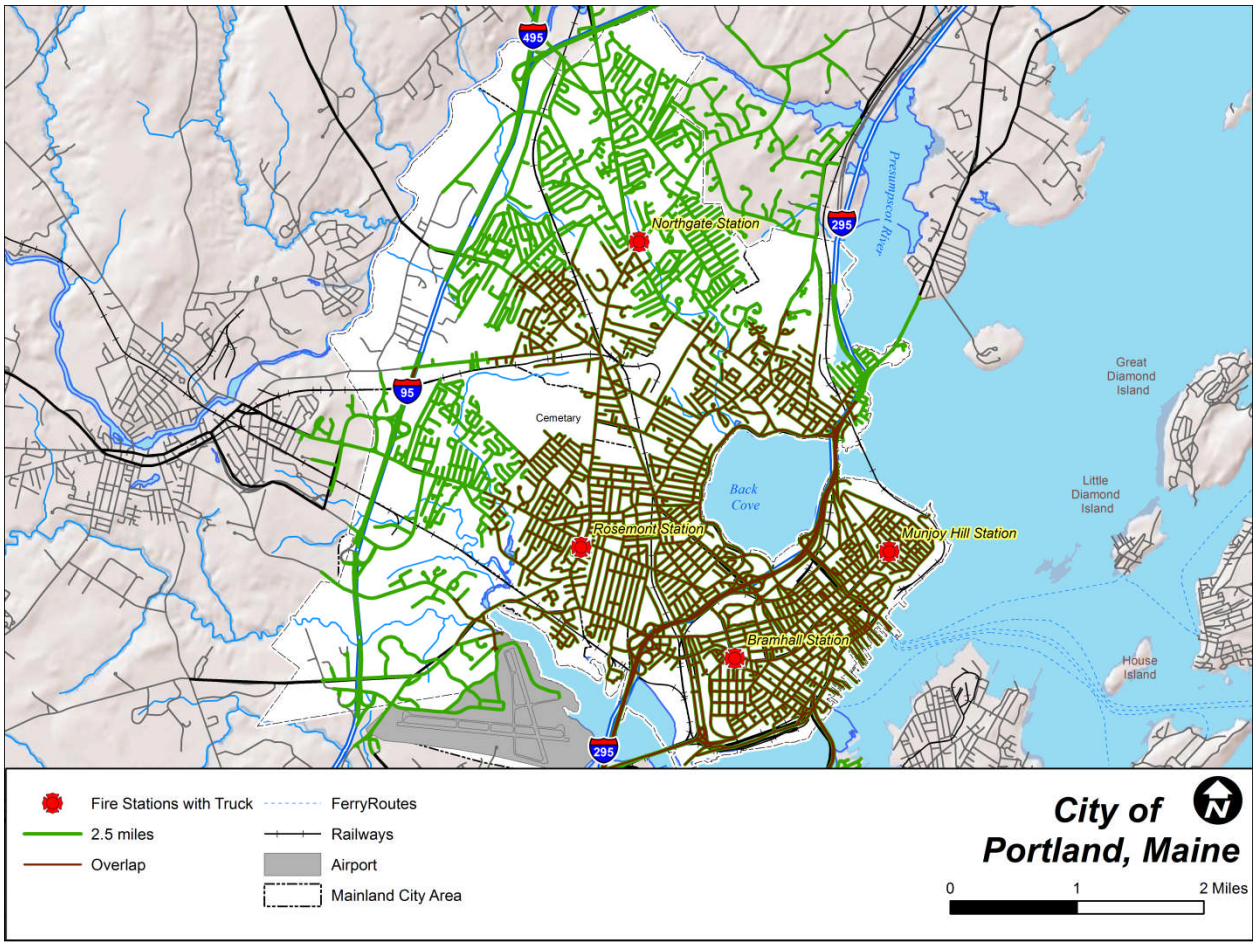
alone is that, speed capability of the road affects the time travelled; the ISO criterion does not take this into account. ISO apparatus distance is only one of many criteria to which the ISO evaluates a department to include equipment, testing, and dispatching. Nonetheless, Figure 4.13 shows the 1.5 mile distance of pumper (engine) company from the stations.

Figure 4.13
ISO ENGINE DISTANCE



Since all of the mainland stations all have an engine (pumper), only the extreme southwest and extreme northern streets are not within the recommended ISO distance. The map also illustrates where the 1.5 miles overlap between the engine distance coverage areas. The streets upon the islands are virtually all within the recommended ISO distance for engine apparatus. Figure 4.14 illustrates the 2.5 mile distance for a ladder truck from the stations that house them. Ladder 4 and Ladder 3 in the Northgate and Rosemont Stations are dual purpose quint-type apparatus (Engine & Truck) and therefore can gain credit as such from the ISO reviewers.

Figure 4.14
ISO TRUCK DISTANCE



Only a few streets on the Westside of town are more than 2.5 miles from a ladder company. Again, there is significant overlap of Ladder Truck ISO distance.

Community Risk Criteria

Another way of approaching this issue is to define levels of land-use risk and assign a response-time requirement to each risk, rather than using straight mileage response. These risks can be defined as follows:

1. Highest - Refineries, large industry, hospitals, school dormitories, lumber yards, and propane storage facilities without built-in suppression or detection systems;
2. High - High-rise hotels and residential buildings, large shopping centers, and industrial complexes;

3. Medium - Commercial and industrial facilities with sprinkler systems, small shopping centers, and high-density, low-rise residential buildings;
4. Low - Single-family dwellings with a separation of at least 100 feet between buildings; and,
5. Minimum - Wide separation of single family dwellings and farm land.

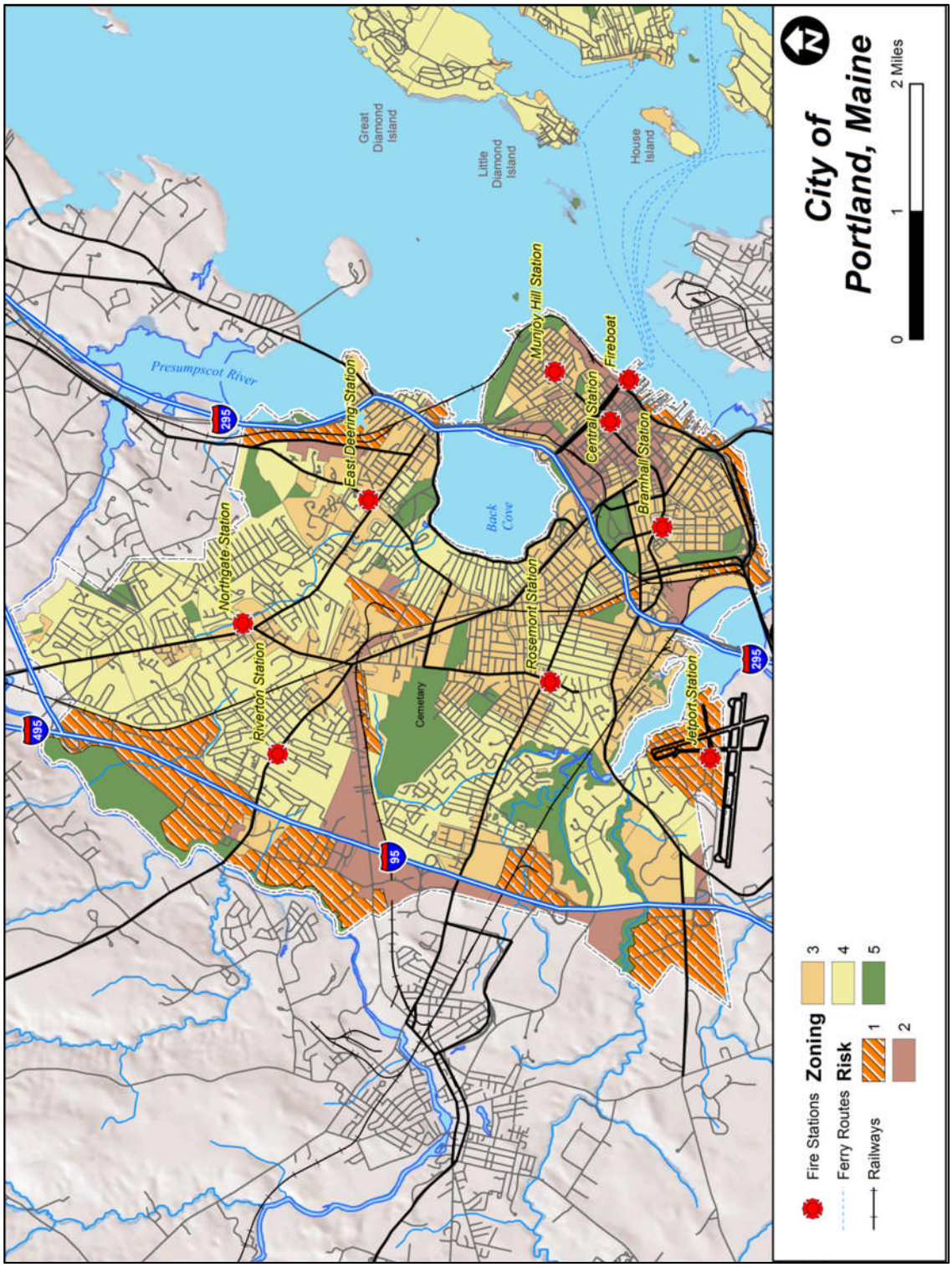
In the International City Management Association's (ICMA) study on *Fire Station Location Analysis: A Comprehensive Approach*, the data inn Figure 4.15 shows the response time requirements of some cities provided in an article by Susan B. Benton and Neal B. Carpenter entitled, "A Computerized Approach to Fire Station Location."

Figure 4.15
COMPARATIVE RESPONSE BY RISK

	Risk Category					
City	1	2	3	4	5	
San Antonio, TX	2.5	3	3.5	4	6	Minutes
Salt Lake City, UT	2.5	3	3.5	4	6	
Lynchburg, VA	3	4	5	6	7	
Memphis, TN	2.3	2.7	3.3	4.3	5.8	
Davenport, IA	3	3.5	4	4.5	5	

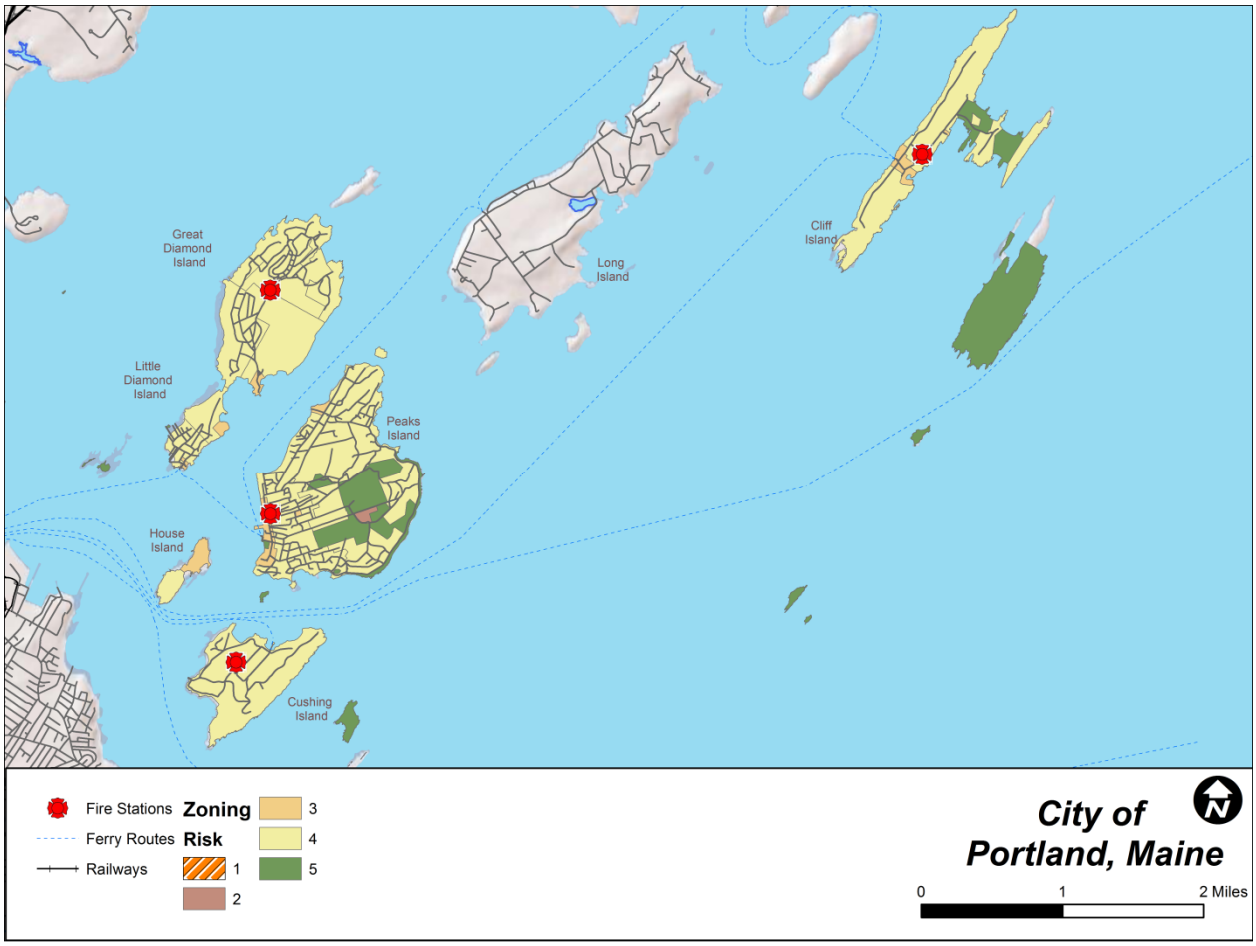
Some of these response time goals are conservative and the pattern of response is unrealistic given the scattered nature of land use risk in most communities. Nonetheless, it is useful to examine Portland's land use risk relative to fire hazard in comparison to the fire station locations. In Figure 4.16, the zoning classifications were re-categorized into the five risk levels described above based upon the descriptions of each zoning code in the City comprehensive plan.

Figure 4.16
MAINLAND ZONING RISK



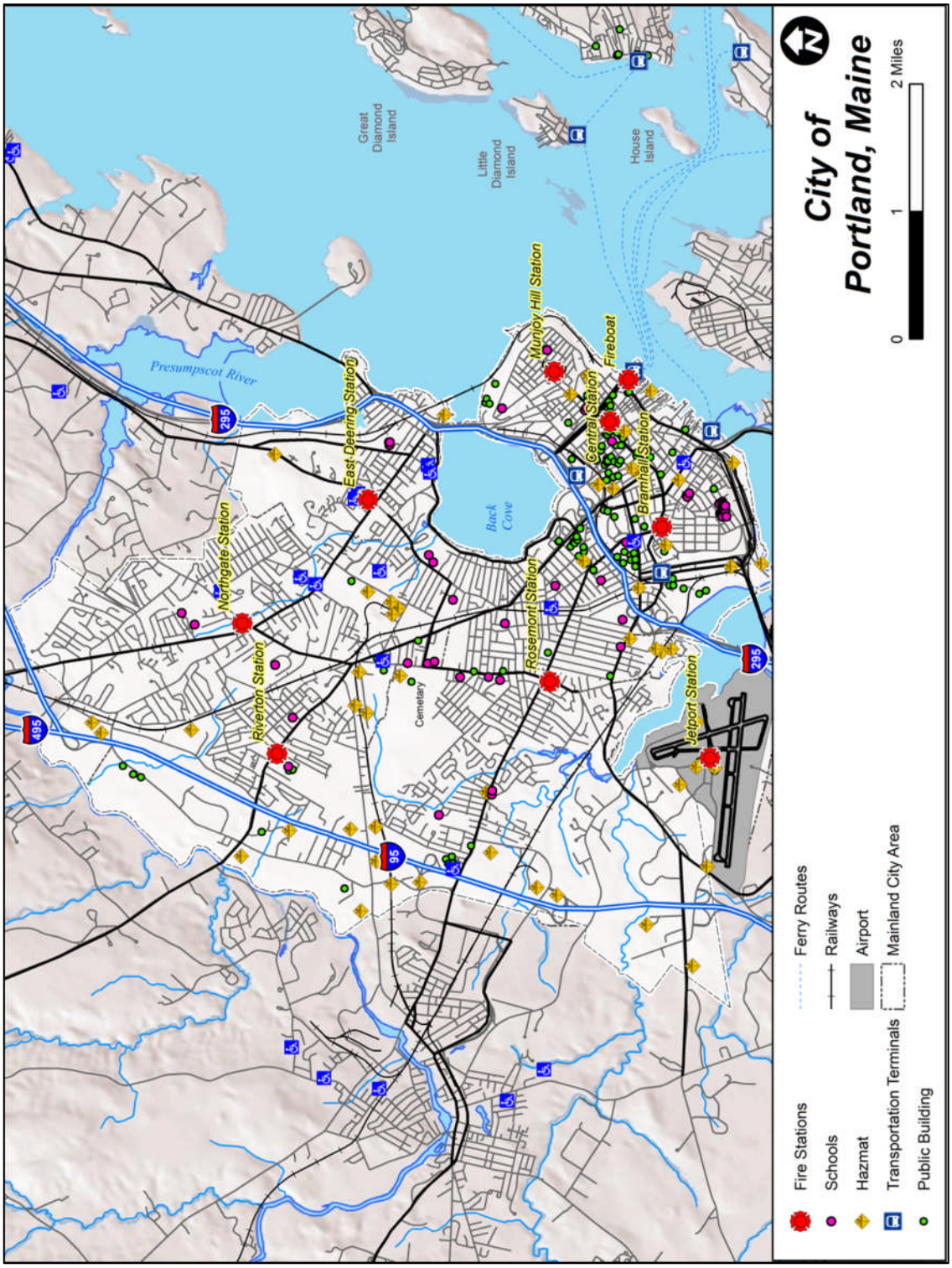
Nearly all of the highest risk areas are along the interstates, railways, and the downtown area. The islands, being mostly residential have a lower risk associated with it zoning codes as shown in Figure 4.17.

Figure 4.17
ISLANDS AREA ZONING RISK



Just as zoning classification brings an associated amount of risk to the fire service, so do certain buildings. Figure 4.18 shows high risk targets due to the materials in use, community significance, or public assembly areas are shown in relation to the current fire stations.

Figure 4.18
TARGET RISKS



As expected, most of the buildings that pose a higher risk for the fire and emergency medical crews are within the downtown area near the hospitals as seen on a previous map. The City offices, County offices, state and Federal buildings, along with several school buildings cluster into the downtown peninsular area. Each island has a transportation terminal where the ferries arrive and depart.

Response Time Capability Criteria

The response time of fire and EMS apparatus to the scene of an emergency incident is an essential determining factor as to the magnitude of the fire or medical emergency the fire department must handle upon arrival on the scene of the incident. The theory is the shorter the response time, the smaller the fire that must be extinguished and the better opportunity for paramedics to save lives.

Time-related criteria for determining and evaluating fire station locations may be viewed from the perspective of two broad categories of types of incidents: fire and emergency medical service related incidents.

Fire-Related Response Time Considerations

One of the key factors to consider in assessing response times to fires is the time from ignition to flashover. The instantaneous eruption into flames generates a tremendous amount of heat, smoke, and pressure, with enough force to push beyond the room of origin through doors and windows. The combustion process then speeds up because there is an even greater amount of heat to move to unburned objects.

The time from ignition until water is applied to a fire should be no longer than the six to nine minutes it takes for flashover to occur with a free-burning fire. Again, flashover is defined as the instant burning of an explosive mixture of heated air, smoke, and gases that flashes through openings around the fire area, such as doors and windows. This does not include a smoldering fire, which can burn for hours before breaking out into the free-burning stage.

Flashover is a critical stage of fire growth for two reasons. First, no living thing in the room of origin will survive, so the chances of saving lives drop dramatically. Second, flashover causes a quantum jump in the rate of combustion, and a significantly greater

amount of water is needed to cool the burning material below its ignition temperature. More firefighters are needed for fire attack and there exists the likelihood of reduced fire safety. Figure 4.19[3] is a summary of the significance of flashover in the process of fighting fire.

Figure 4.19
FLASHOVER COMPARISON

SIGNIFICANCE OF FLASHOVER	
Pre-Flashover	**Post-Flashover**
Limited to One Room	May Spread Beyond One Room
Requires Smaller Attack Lines	Requires Larger, More Attack Lines
Search & Rescue Is Easier	Compounds Search & Rescue
Initial Assignment Can Handle	Requires Additional Companies

For these reasons, it is critical that fire suppression forces reach a fire structure and initiate effective suppression efforts prior to flashover. **Travel time must be kept short enough to ensure that it does not exceed the six-to-nine-minute flashover requirement.**

EMS-Based Response Time Considerations

Time is one of the most important factors relating to patient outcomes in emergency medical situations. Rapid delivery of EMS is essential in the acute situation of cardio-respiratory arrest; a measurable factor is the time from heart stoppage and cessation of breathing (clinical death) to when irreversible brain damage begins (biological death). Although the time varies with patients and conditions, the generally recognized intervention time to prevent biological death is four to six minutes. Time is also critical in heart attacks, stroke, and major trauma where time interval recommendations for emergency crews have been established by the American Heart and Stroke Associations and by trauma surgeons.

[3] Source: Creating and Evaluating Standards of Response Coverage for Fire Departments, 3rd Edition - Summer 2001, CFAI

NFPA 1710 Standard

There are a number of applicable NFPA standards and practices that include response time considerations important to labor and fire officials nationwide. NFPA 1710 (Standard for the Organization and Deployment of Fire Operations) response time-related provisions are described in the following sections.

NFPA 1710 is an industry standard that serves as a benchmark for the fire department organization and deployment of services offered by firefighters. It is the standard for paid/career fire departments that describes the requirements for delivery of services, response capabilities, incident management, and strategy.

This Standard includes the following benchmarks related to call receipt and processing time, turnout time, and response (travel) time:

- Turnout time of eighty seconds on fire suppression calls and sixty seconds for EMS calls;
- The fire department's fire suppression resources deployed to provide for the arrival of an engine company within a four-minute travel time and/or the initial full alarm assignment within an eight-minute response time to 90 percent of the incidents;
- The fire department's EMS basic life support (BLS) resources with automatic defibrillator equipment deployed to provide for the arrival of a BLS unit (EMS first responder or transport unit) within a four-minute travel time; and,
- The fire department's EMS resources providing advanced life support (ALS) service deployed to provide for the arrival of an ALS company within an eight-minute travel time to 90 percent of the incidents.

It should be noted that the various standards and criteria discussed in previous sections placed a high priority on both the effective delivery of fire and EMS service in the protection of life and property. Moreover, the safety of the firefighters and officers delivering the services and safety for the customer and stakeholder were important considerations to the development of these standards and to their application. The City of Portland has adopted the NFPA 1710 response time parameters for its goal in responding to fire and medical incidents.

Figure 4.20 shows the travel time of apparatus from each of the current fire stations. The model utilizes the street network of the City and surrounding areas calculating the travel time extent via distance and speed capability of streets. Actual posted speed limits were utilized and time penalties were assessed for negotiating turns, intersections, and traversing railroad crossings. These at-grade crossings were identified by aerial photos, trestle or an overpass were not assessed a time penalty against the apparatus on the roadway. This model assumes departure from the fire stations which may not always be the case. It also does not take into account weather conditions, traffic congestion, construction, or detours. It does respect the one way restrictions as they are in place.

It can be seen in Figure 4.20 that there is significant overlap of the travel time between the peninsular stations. While this may seem wasteful, it has to be taken into consideration that fire calls usually do not require a single apparatus response like medical calls. Multiple apparatus from other stations are standard firefighting procedure. This will be discussed in more detail in a following subsection.

Each station and its apparatus are currently assigned a response district as depicted in Figure 4.21. While a unique methodology was utilized to draw the districts by the fire department, an overly of the closest station by travel time is placed upon the same map for comparison.

Given Figure 4.21, the Portland Fire Department should consider redistricting the apparatus responsible areas based upon fastest travel time rather than the current method. The separation between the Northgate Fire Station and the Riverton Fire Station is due to the railway. If an overpass were constructed, either station's apparatus could reach the other's area faster.

Figure 4.20
CITY FIRE TRAVEL TIME EXTENT

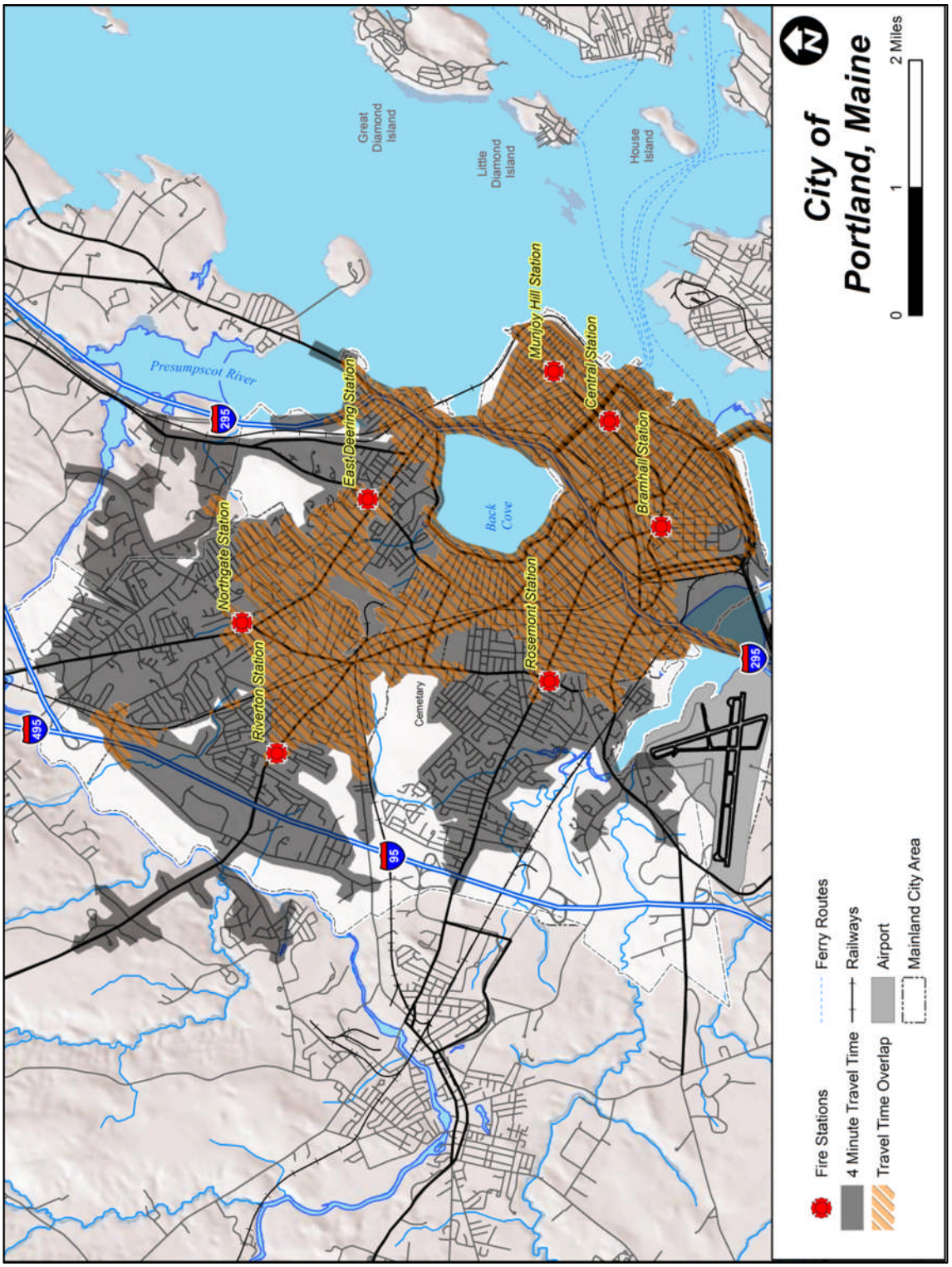
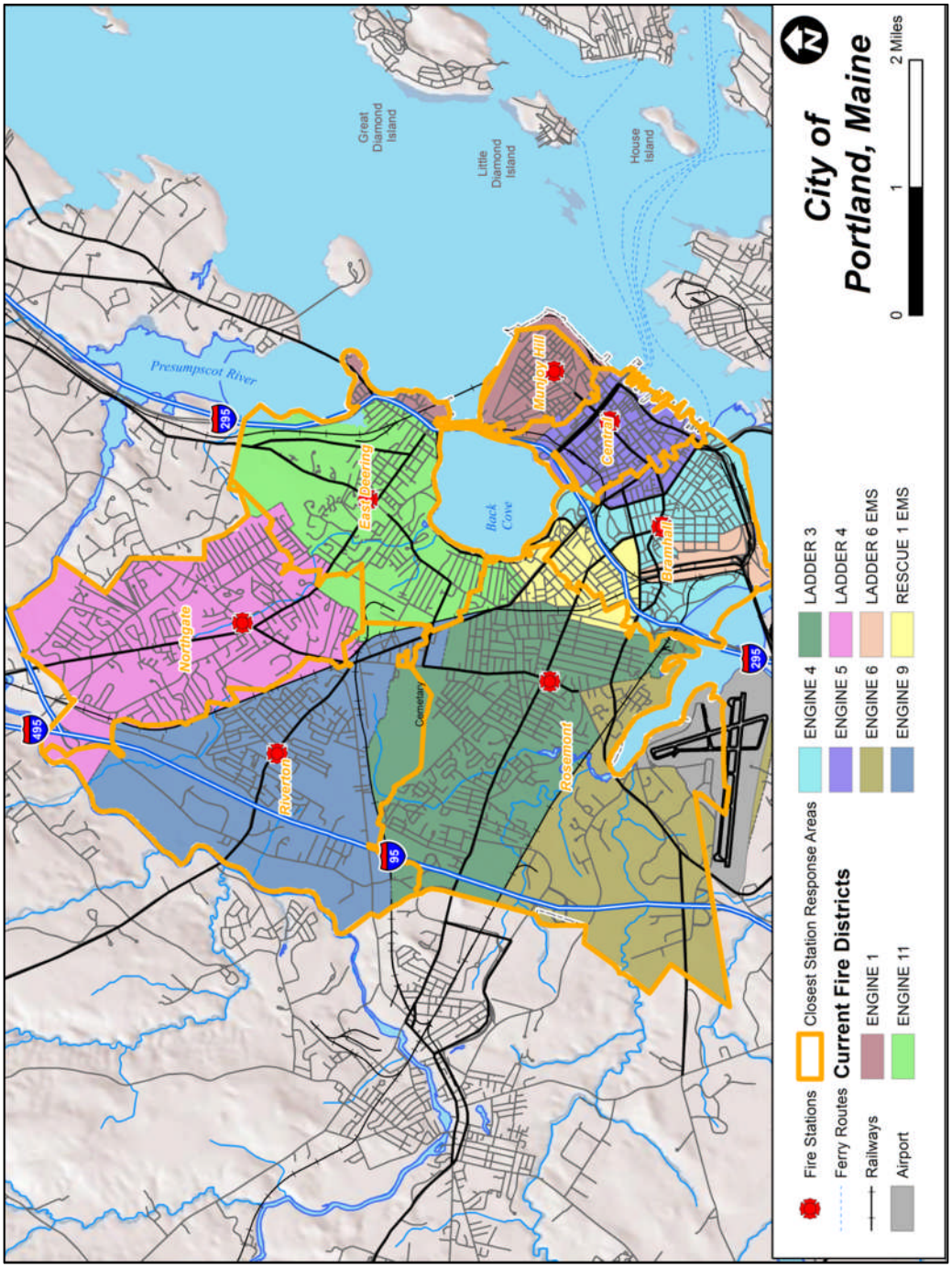


Figure 4.21
CLOSEST STATION RESPONSE AREA



The small area of the islands allows the volunteer companies to easily reach all areas within the recommended travel time. The delays involved are primarily turnout time from the volunteer responders as well as the delay of the Fire EMS Boat to reach them to provide additional fire and medical support. The similar holds true for the airport fire crews as they are limited to the airport property itself and the nature of the apparatus is not typically conducive to public roadway travel. The primary delay here is the extended travel time necessary for City fire apparatus and MEDCU to be able to reach the airport as can be seen in the previous figure. Figure 4.22 models the Fire EMS Boat's travel time capability to the islands utilizing the ferry routes and a constant speed of 10 knots. Similar time penalties were assessed for negotiating turns. Some additional routes to docks seen on aerial photos were added. The model does not take into account weather or alternate routes due to harbor traffic.

The MEDCU's are not allocated to every station and the NFPA 1710 recommends a longer response time for these advanced medical care units based upon the given shorten response from a basic medical care provider on a fire apparatus. Figure 4.23 shows the travel time extent of the MEDCU's from their assigned stations. This was run on the same model parameters as the fire station travel figure shown previously and the same cautions apply. Recall that two MEDCU's are assigned to Central Station.

Figure 4.22
FIRE EMS BOAT TRAVEL TIME EXTENT

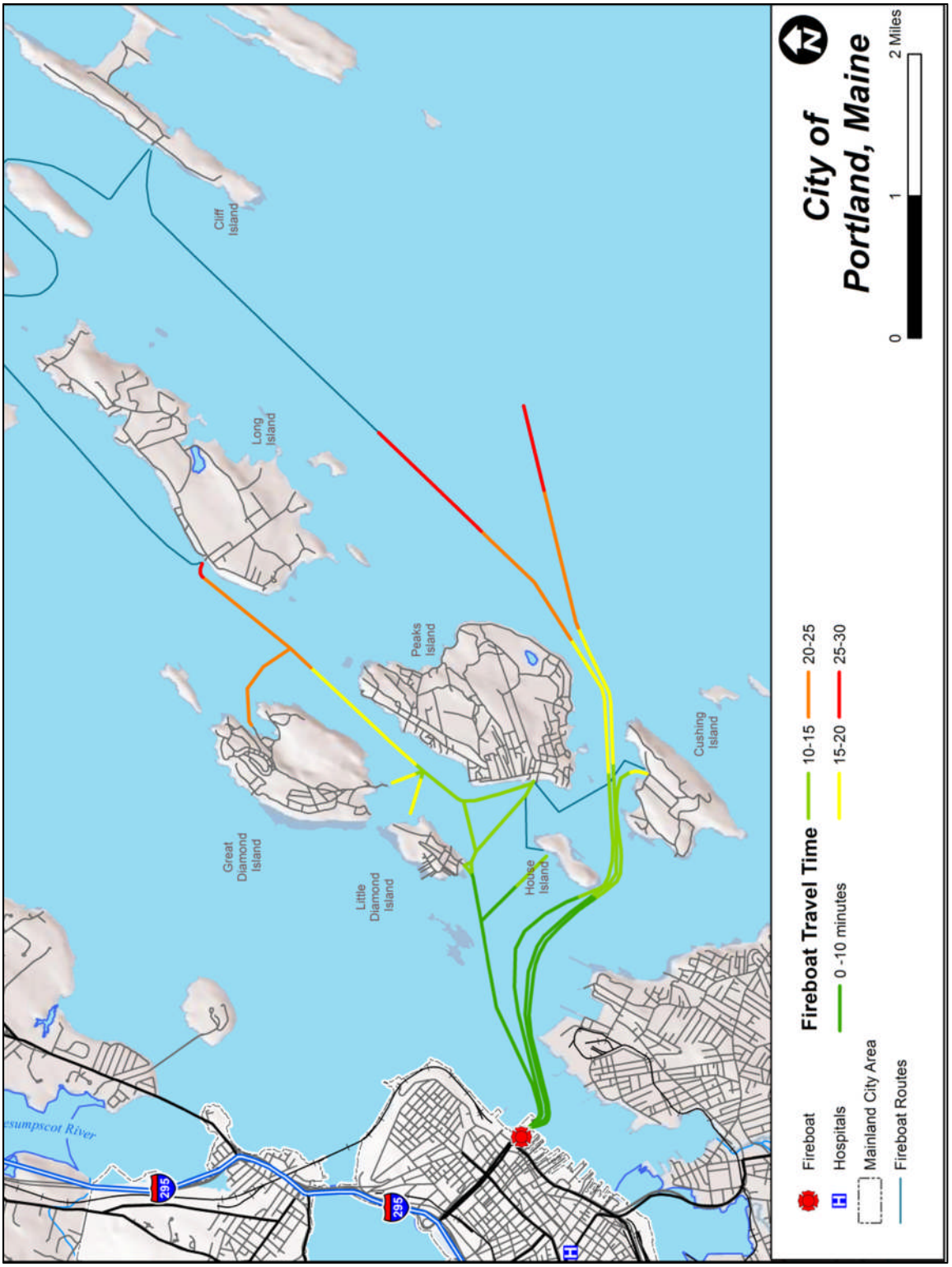
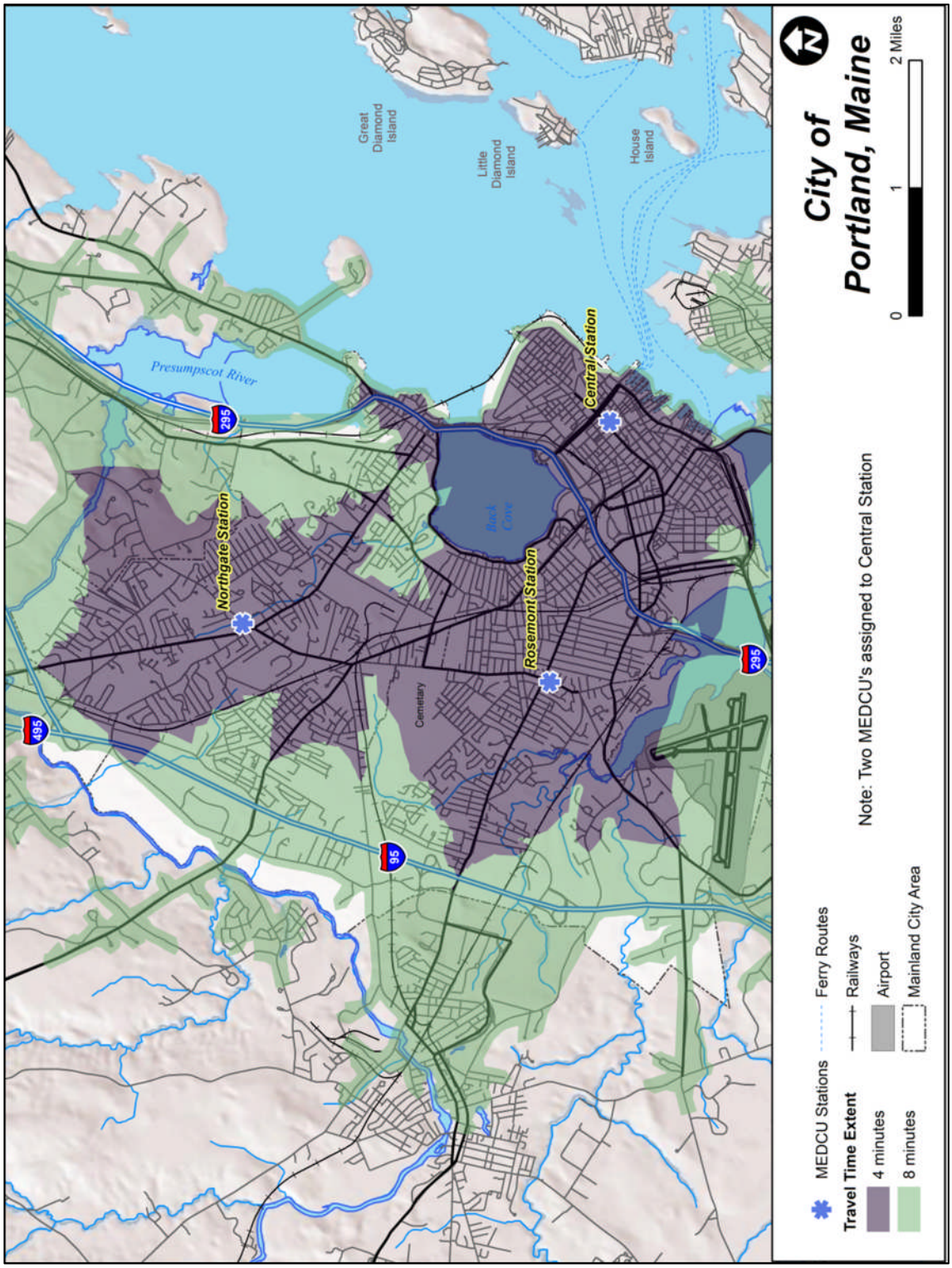


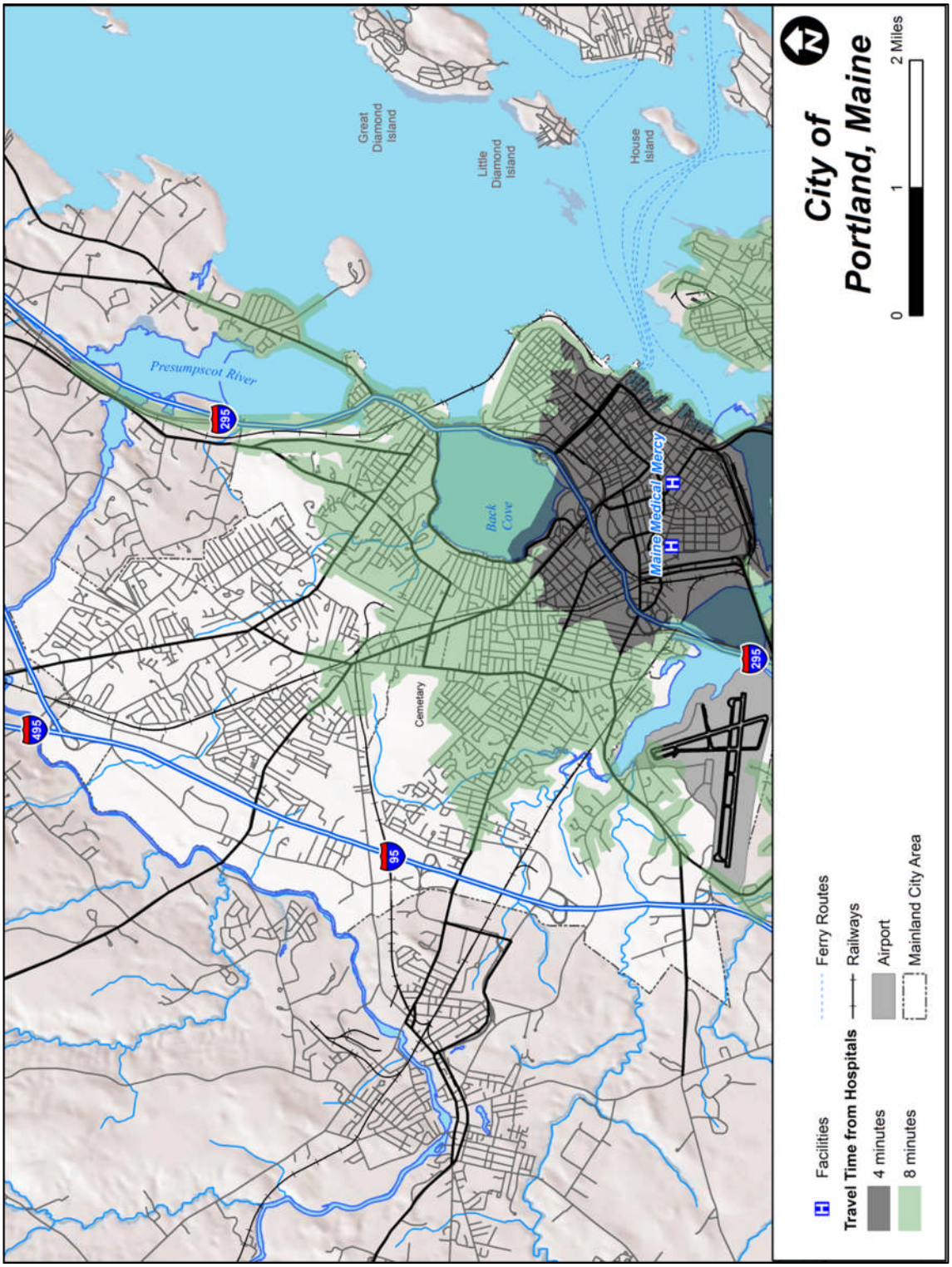
Figure 4.23
MEDCU TRAVEL TIME EXTENT



The eight minute travel time extent is the allowable time under NFPA 1710 standards and it can be seen that all of the City can be reached by a MEDCU responding from their assigned station (which may not always be the case). As can be imagined, significant overlap between the MEDCU units at this travel time occurs. The shorter travel time extent is shown in the event that either a first basic responder is not available, is responding from a distance, or policy restricts fire apparatus first response.

Fire incidents terminate typically at the dispatched address when the scene is declared 'cleared'. These are numerous locations over the course of time. For MEDCU's, most calls terminate at the hospital when they declare themselves 'available' for the next call. Therefore, the response time from the hospital can be modeled to reflect the travel time extent should a MEDCU receive a call immediately after the 'available' declaration or in the event all four MEDCU's are at the hospitals pending availability. The proximity of the hospitals within the City restricts the travel time capability of a MEDCU responding to the northwest part of City if no other MEDCU's are available west of the hospitals. See Figure 4.24.

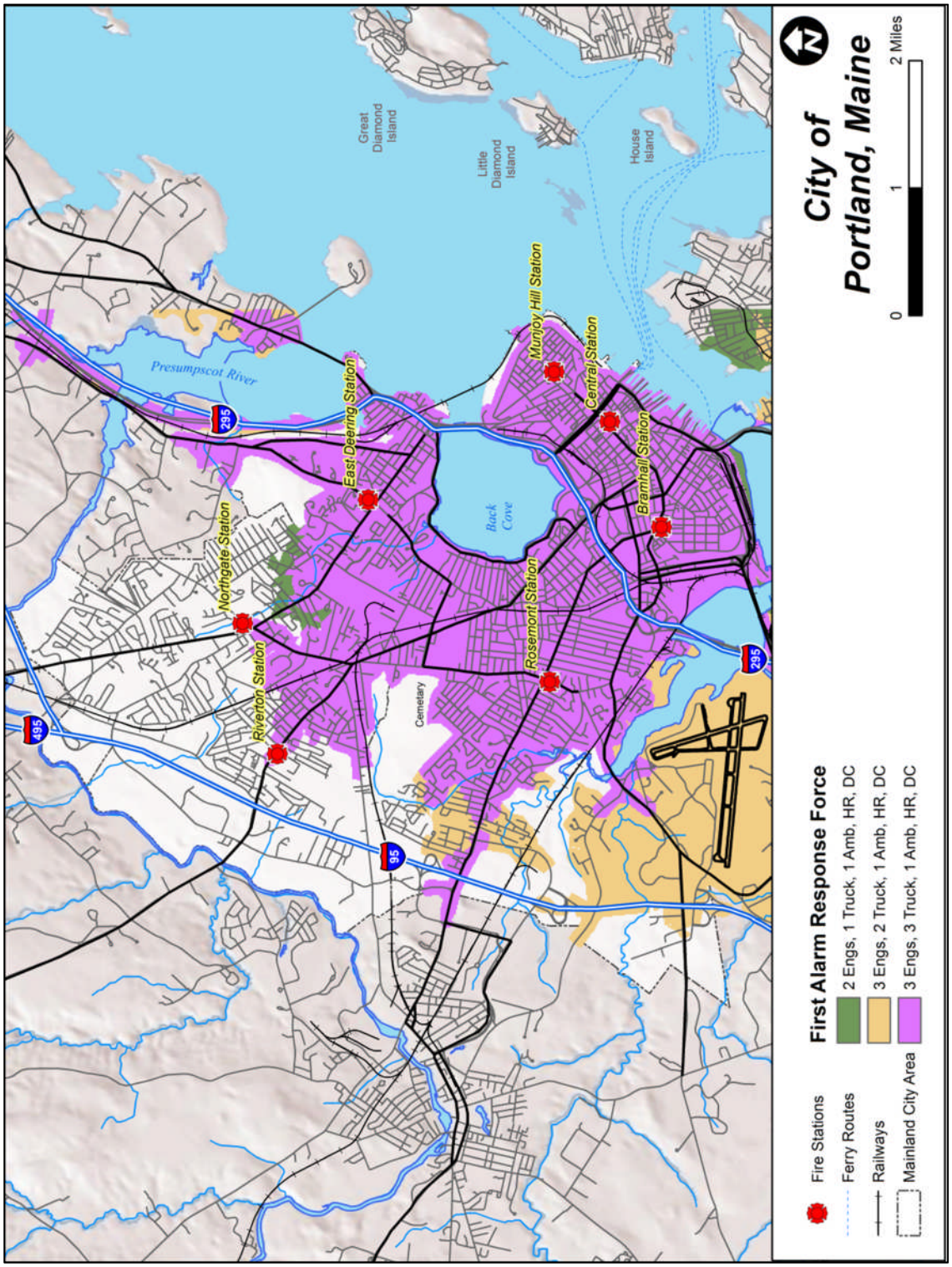
Figure 4.24
TRAVEL TIME EXTENT FROM HOSPITALS



Most medical calls require one MEDCU unit; some exceptions include multiple victim incidents, cardiac arrest, and major trauma. For fire alarms, a multitude of resources are dispatched in the event of an actual fire or other emergency where the collection of apparatus is needed.

Standard firefighting procedures call for the arrival of the entire initial assignment (sufficient apparatus and personnel to effectively combat a fire based on its level of risk) within a certain amount of time. Under NFPA 1710 for career departments this would equate to two engines and one truck within eight minutes of dispatch. This is to ensure that enough people and equipment arrive soon enough to be effective in controlling a fire before substantial damage occurs. The Portland Fire Department has established a first full alarm for structure fires as a collective response of the on-duty deputy chief, three engines, three ladder trucks, one MEDCU and one rescue unit (24 firefighters) for initial report of a structure fire. See Figure 4.25.

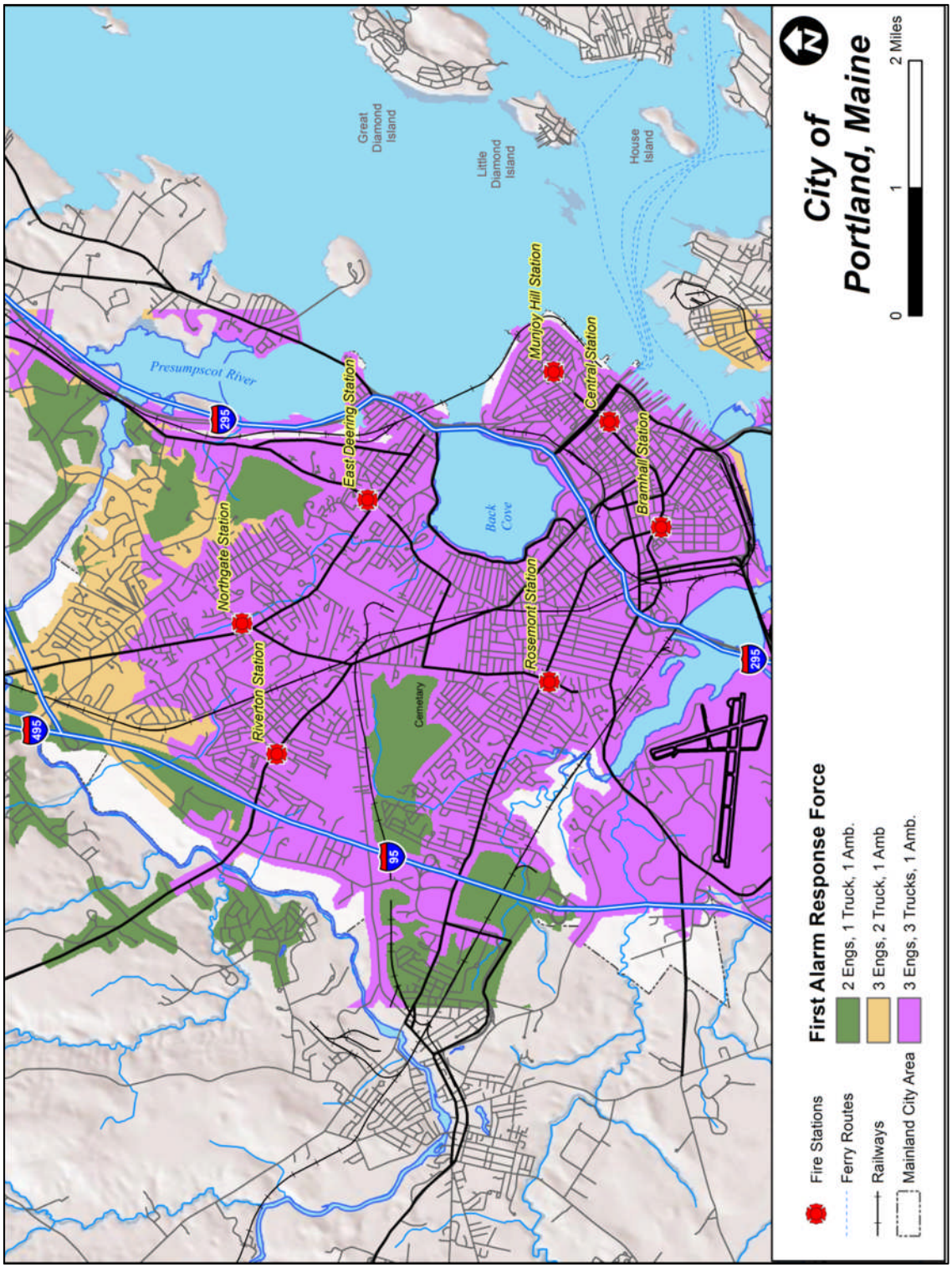
Figure 4.25
CURRENT FIRST ALARM FORCE



This is the reason that coverage overlap in Figure 4.25 for apparatus must be viewed in a cautious light rather than as purely wasteful, in addition the workload of units must also be taken into consideration and will be discussed in the next section. However, PFD's collective first alarm response, being greater than the NFPA 1710 standard and reliant on the heavy rescue component of which there is only one available, limits the potential geographic extent of the first alarm assembly force. For example, were the first alarm assembly force reduced to the on-duty deputy chief, two engines, one truck, one MEDCU (12 firefighters, 15 with four person fire crews) would change the geographic extent of the first alarm force as shown in Figure 4.26.

Since most calls are not fires, or fires that require the current level of response, PFD should consider reducing the initial response to lighten unit workload and keep units available for emergencies actually needed.

Figure 4.26
ALTERNATIVE FIRST ALARM ASSEMBLY



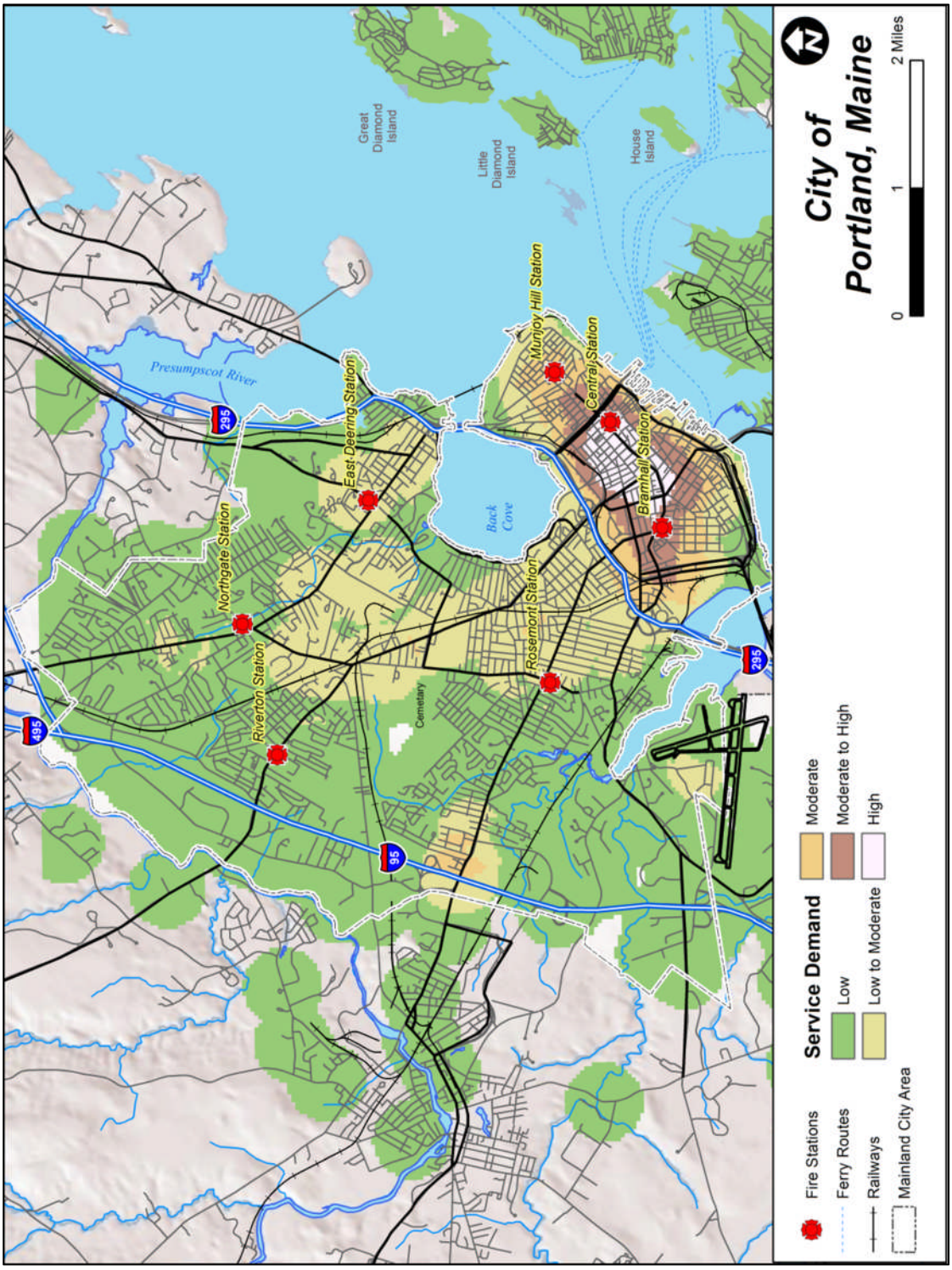
CURRENT SERVICE DEMAND ANALYSIS

Demand for service for the fire department is not distributed evenly within the City. There are areas where incident calls occur frequently and near each other as well as other places where demand is less intense and the occurrence is a further distance from each other. Service demand is typically higher in areas of higher population, not just residential but as offices and shopping centers fill with people as well. Figure 4.27 illustrates the level of demand for services over the last year[4] for the Portland Fire Department.

As expected the highest demand is on the peninsula area with downtown commercial and high density population. Demand is also clustered higher because of the mall near I-95 and the airport terminal. The pattern does not differ significantly by hour of day, nor by call type as further explained subsequently.

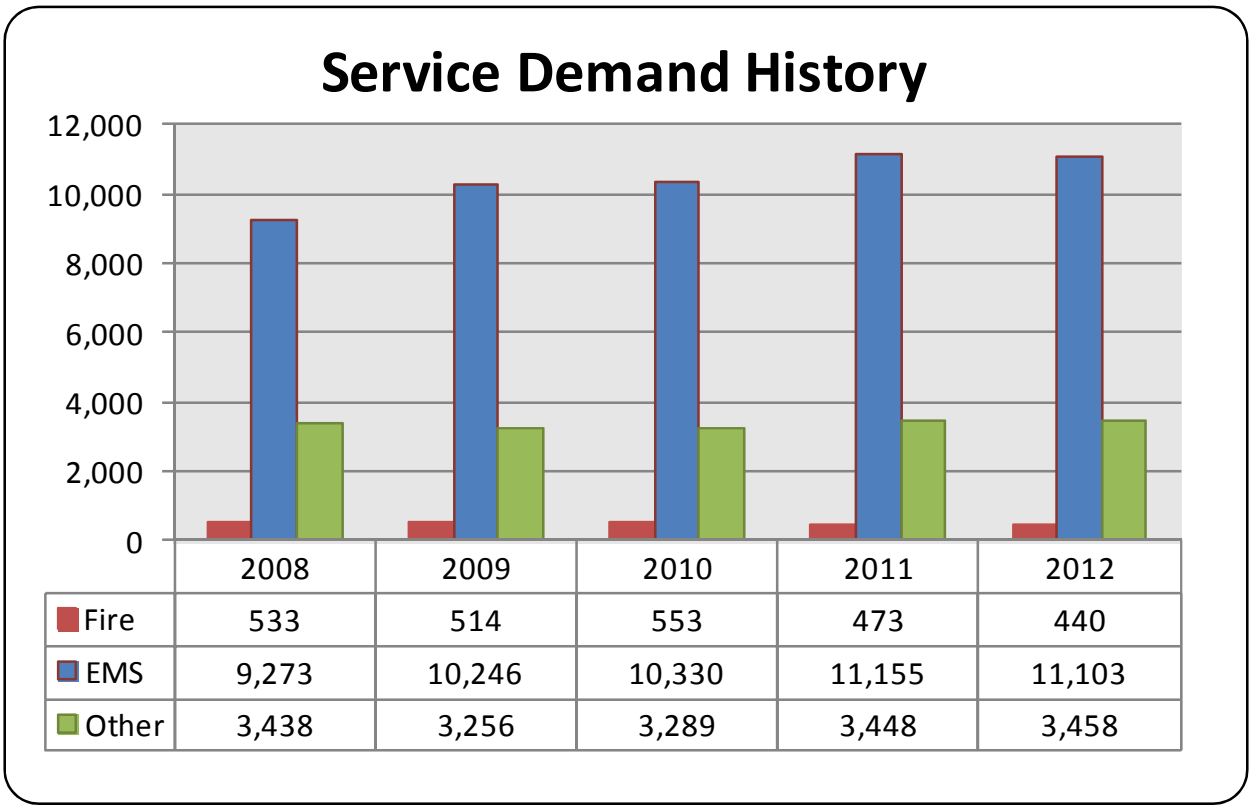
[4] NFIRS Incidents

Figure 4.27
SERVICE DEMAND



Records of incidents with the City of Portland were acquired by the fire department through the exported files from the National Fire Incident Reporting System (NFIRS), the Computer-Assisted Dispatch (CAD) records from the Emergency Communications Center, as well as the MEDCU's Patient Care Report database (PCR). Reportedly, these three databases are auto-populated with information[5] from the CAD. In addition, the Fire Department Summary reports were also utilized to determine historical workload. Figure 4.28 illustrates the change in volume for categories of reported fire, medical and all other categories of incidents (alarm, hazard, spill, etc.) over the past five years[6].

Figure 4.28
HISTORIC SERVICE DEMAND



	2008	2009	2010	2011	2012
Fire	533	514	553	473	440
EMS	9,273	10,246	10,330	11,155	11,103
Other	3,438	3,256	3,289	3,448	3,458

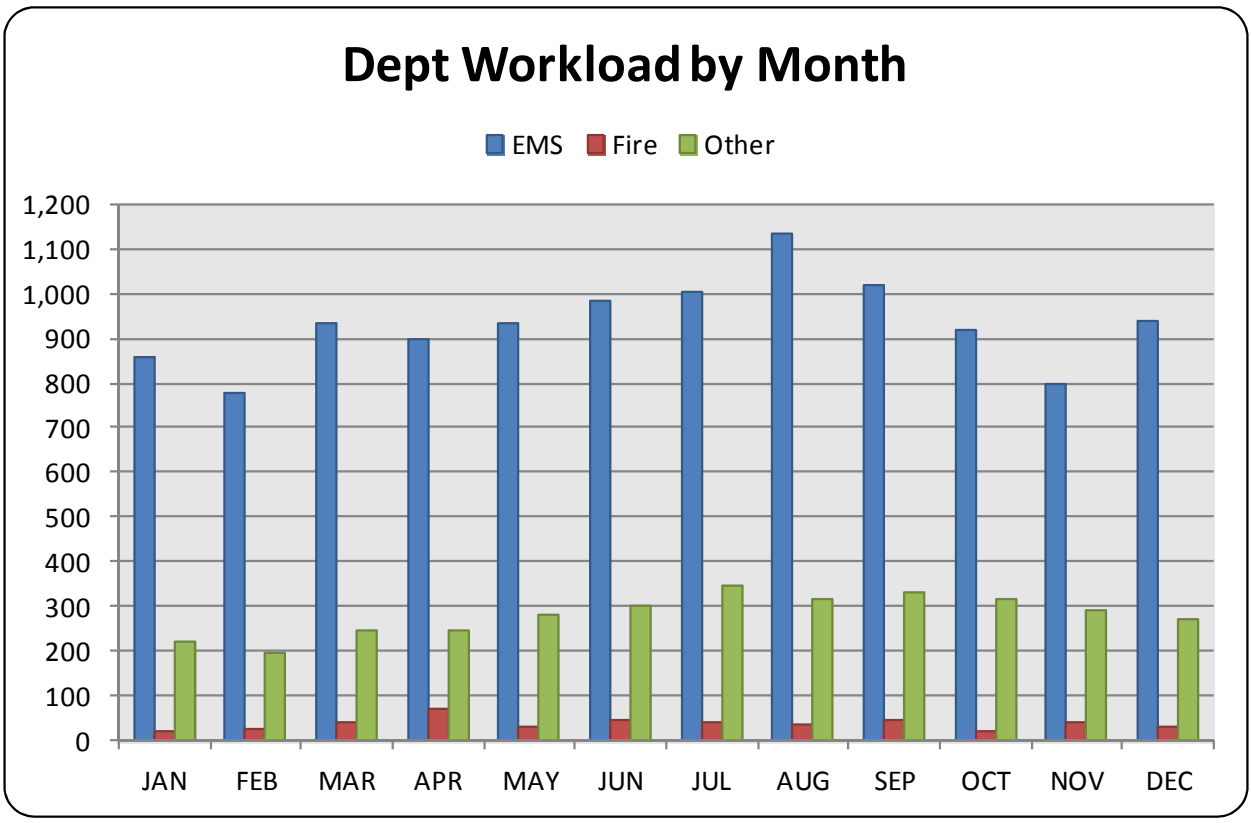
It can be seen that medical calls account for the majority of service demand within the City of Portland. Looking at the data as percentages, fire and other types of calls reduced from 4.32% and 26.16% to 2.93% and 23.05% respectively. During the same period, EMS calls increased from 69.53% to 74.02%. Most of the 'other' types of calls were for false alarms.

[5] Incident number, address, time stamps

[6] PFD annual Reports, 2012 NFIRS summary report

Examining the last year of data[7] more closely, changes in demand can be seen on a monthly basis. Figure 4.29 illustrates that service demand is higher in the summer months for all types of calls. Fire calls are especially higher in April, while EMS calls are higher in July, August, and September.

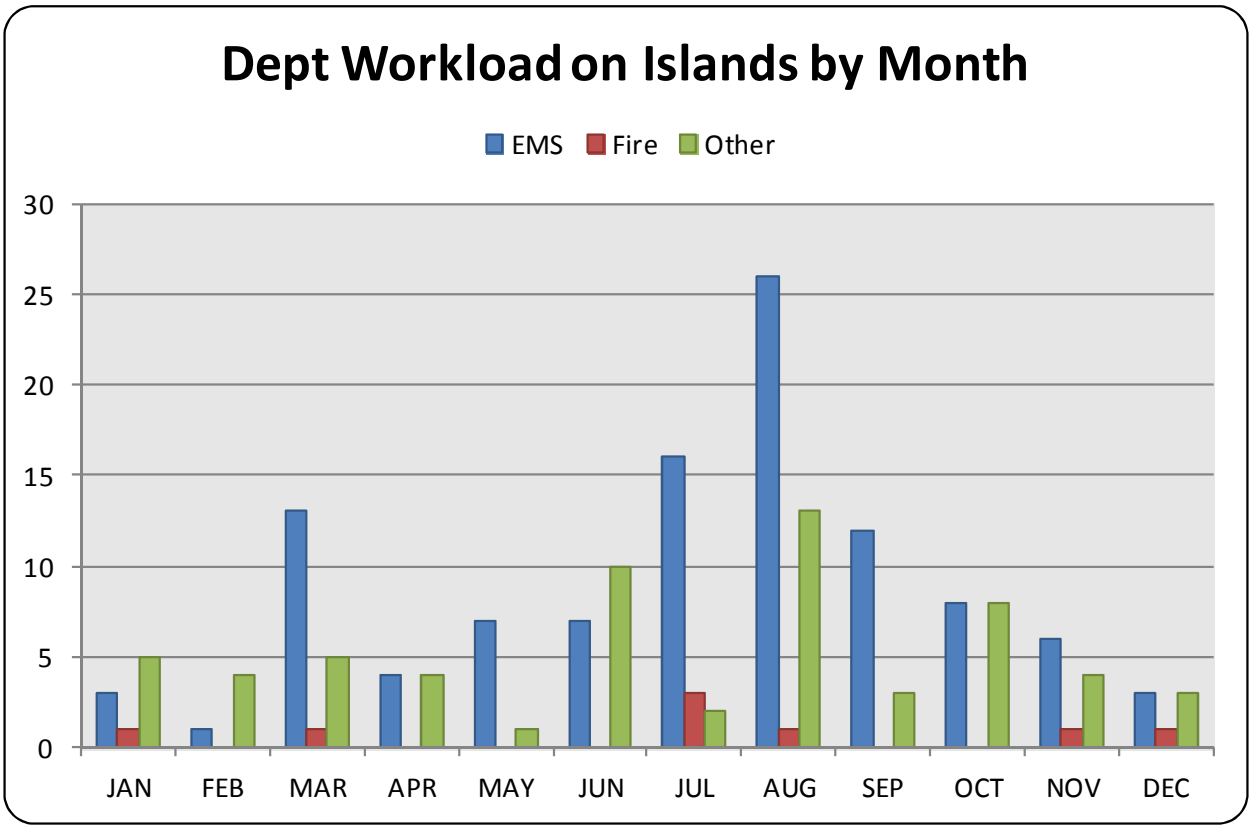
Figure 4.29
DEPARTMENT WORKLOAD BY MONTH OF YEAR



The higher workload during the summer may be attributed to the seasonal island population and correlated airport passenger traffic. There were only 176 island calls in 2012 and that is not enough to skew the overall data. However, as expected most calls occur in the summer months.

[7] CAD Records

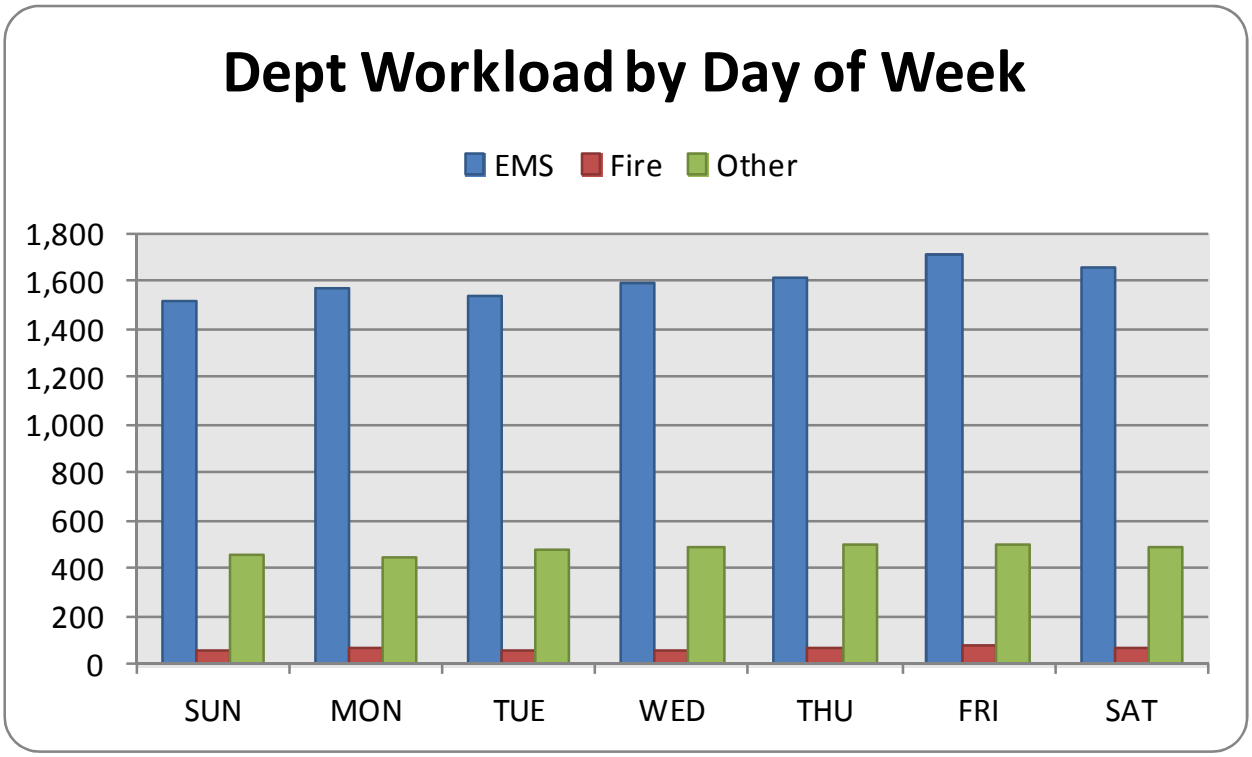
Figure 4.30
ISLAND WORKLOAD BY MONTH



The airport service demand volume is also too low to skew the overall service demand statistics, totaling approximately 200 calls per year. Although not shown graphically, the service demand at the airport is higher during the month of July and September.

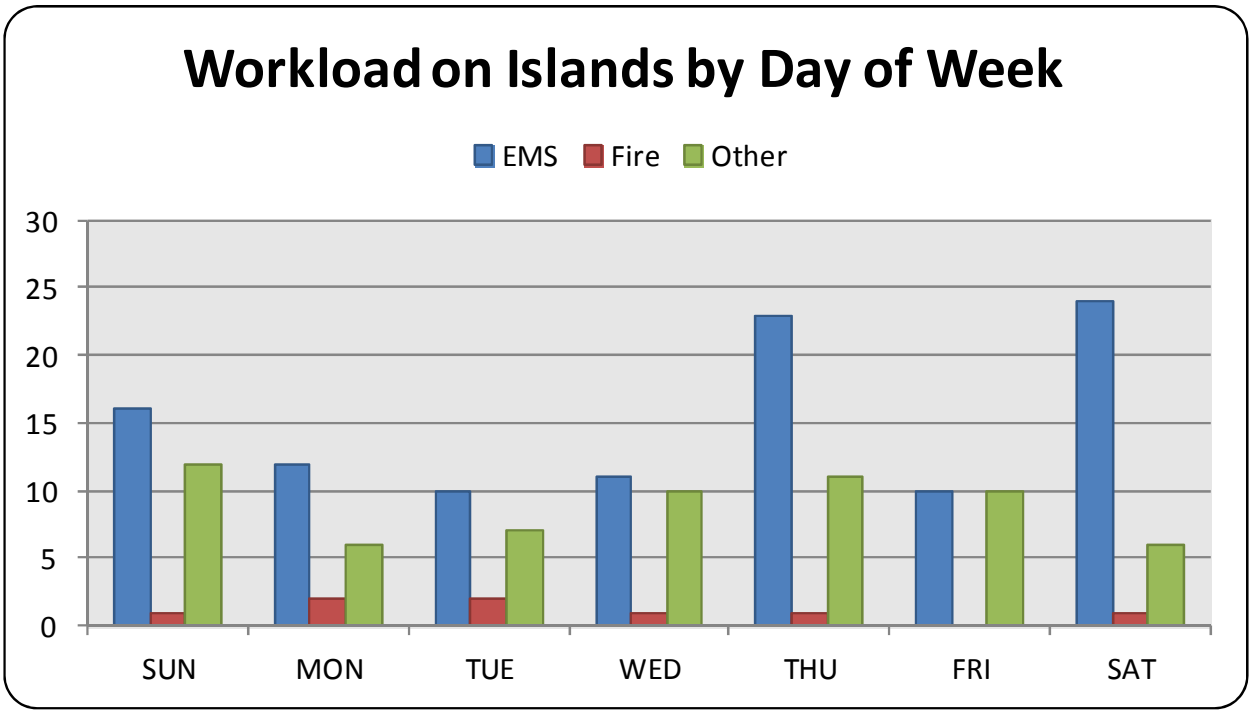
Examining the department service demand by the day of the week reveals that Friday is the busiest day of the week for all calls for the Portland Fire Department (see Figure 4.31).

Figure 4.31
DEPARTMENT WORKLOAD BY DAY OF WEEK.



Calls on the islands are more numerous on Thursdays and Saturdays with medical calls while non-fire 'other' type calls more frequent on Sundays. Fires are more prevalent on Tuesdays but fortunately none occurred on a Friday (see Figure 4.32).

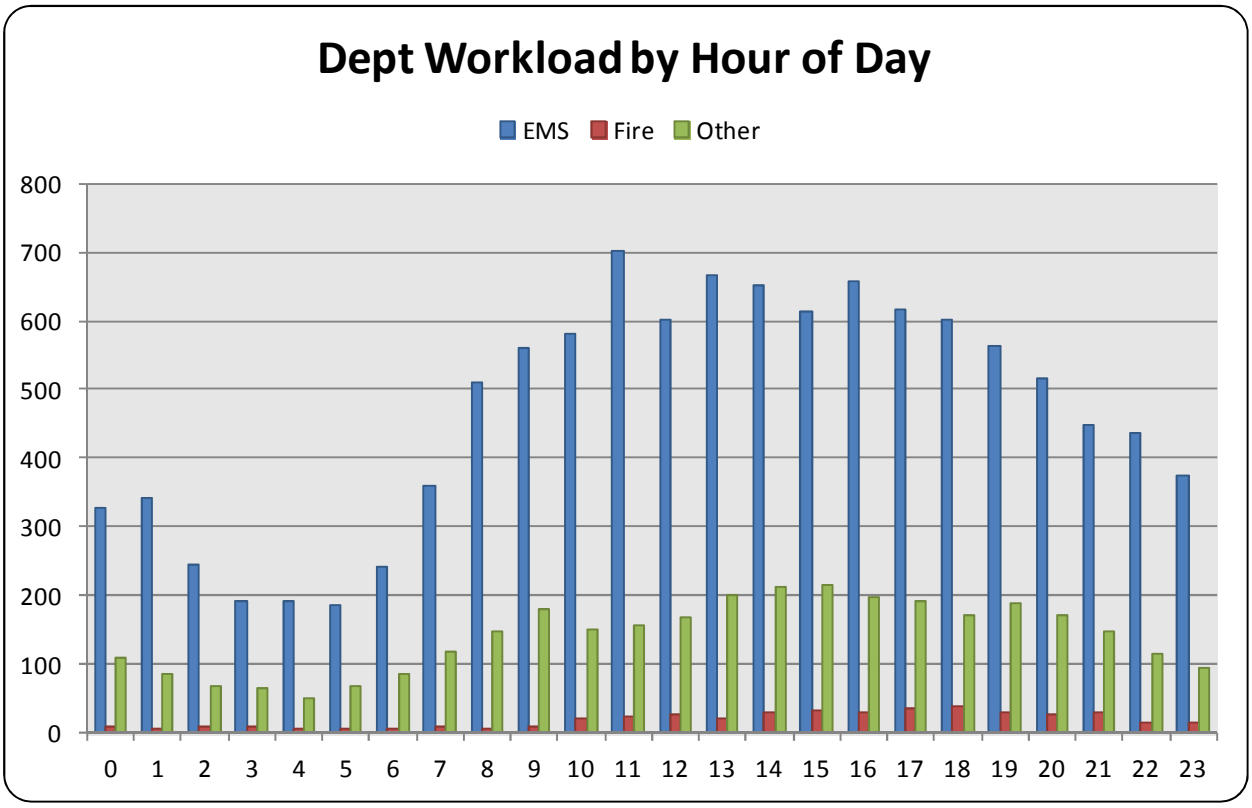
Figure 4.32
ISLAND WORKLOAD BY DAY OF WEEK



For the airport, the busiest day is Monday declining through Thursday and increasing into the weekend with a lower volume on Sundays.

Next, the workload is examined upon an hourly basis (see Figure 4.33). It can be seen in the following figure that service demand for the fire department increases with daytime human activity. The peak hours for demand is from 8 AM until 8 PM, with the busiest seen at the 11AM hourly time frame. The islands and the airport hourly demand mimic this same pattern.

Figure 4.33
WORKLOAD BY HOUR OF DAY



These peak hours are typically when simultaneous calls occur and this can reduce the available units for subsequent calls. For instance, once there are four simultaneously occurring calls that dispatch an ambulance (barring the instance when multiple MEDCUs are needed on the same call) there would be no MEDCU's left in the City for the fifth that may occur. To assess the likelihood of this occurring, Figure 4.34 illustrates the simultaneous call activity for the City of Portland Fire Department[8]. The 'level' column refers to the number of calls occurring simultaneously, as the 'count' column tallies each instance that that level occurs.

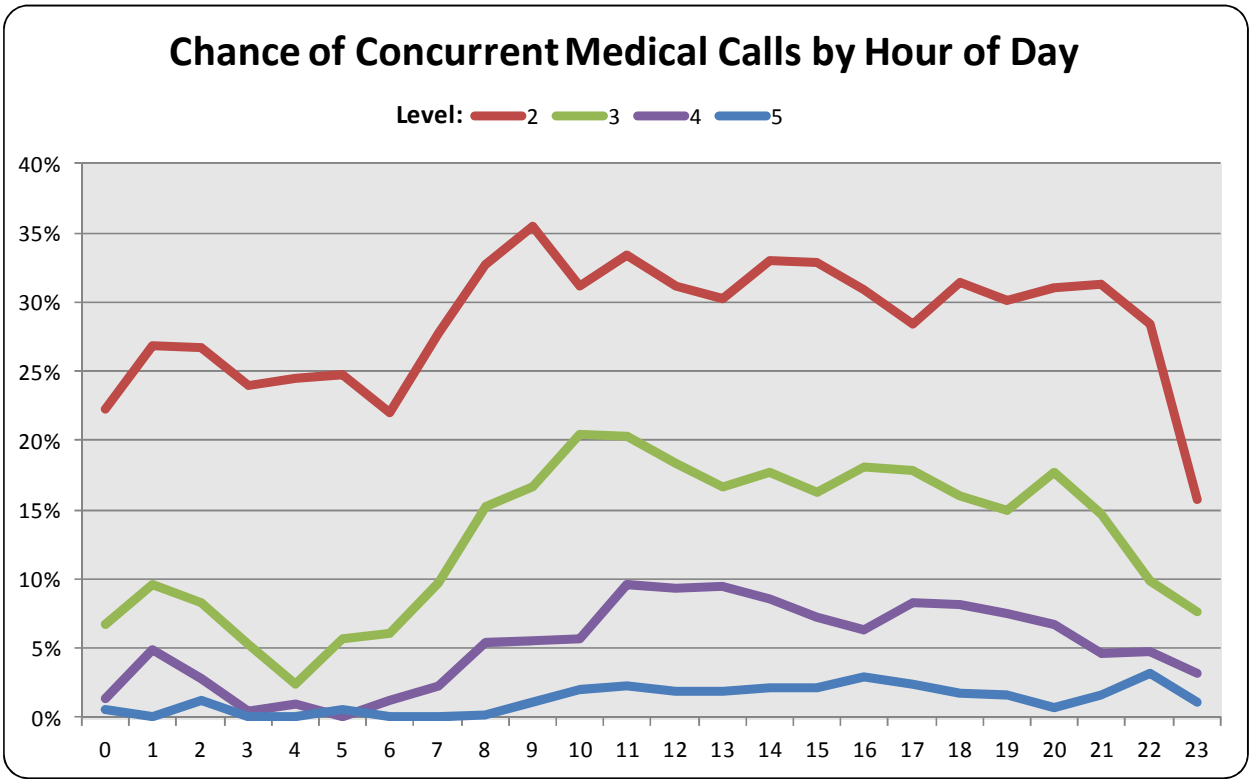
[8] NFIRS records

Figure 4.34
CONCURRENT CALLS

Level	Count	Pct.
1	5,065	34%
2	4,052	27%
3	2,529	17%
4	1,479	10%
5	872	6%
6	435	3%
7	190	1%
8	102	1%
9	39	0%
10	29	0%
11	22	0%
12	10	0%
13	10	0%
14	8	0%
15	5	0%
16	2	0%
17	6	0%
18	3	0%
19	2	0%
20	3	0%
21	1	0%
22	3	0%
23	2	0%
24	1	0%
25	2	0%
26	1	0%

This figure must be viewed with the fact it utilizes the last unit cleared time to calculate the amount of concurrent calls. Many units dispatched initially may have cleared and are available, while one unit or the deputy chief may remain on scene, keeping the call 'open'. Standby and coverage move assignments were removed to get a more accurate reading as these 'assignments' are open for hours even though the unit is available. In comparison to other cities of similar size, these figures represent a busier department. However, many of the fire departments respond to medical assignments and clear quickly; they do not have a transportation component. Many similar-sized third service ambulance services experience concurrency rates along the lines seen here.

Figure 4.35
CHANCE OF CONCURRENT MEDICAL CALLS



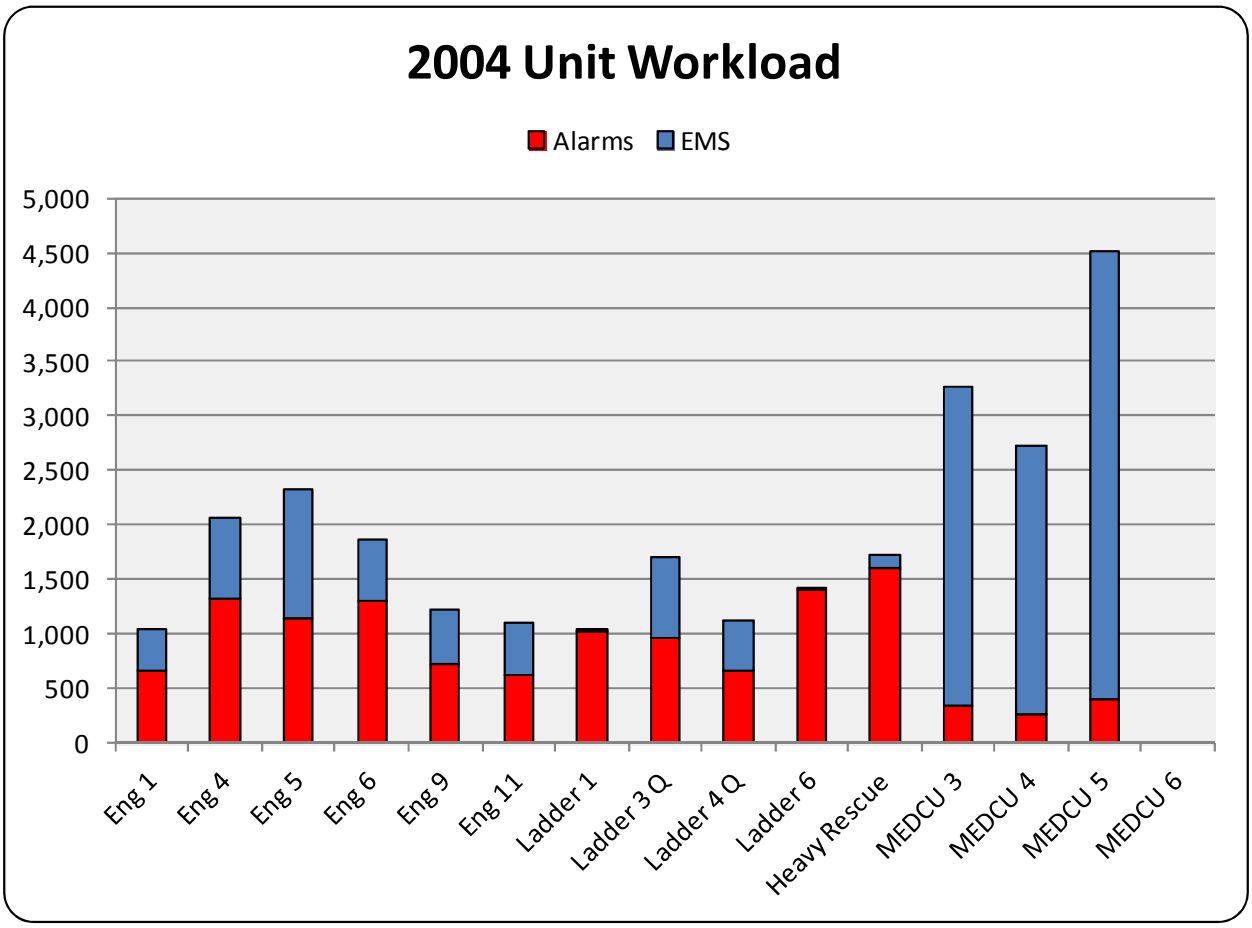
It can be seen in Figure 4.35 that approximately 12% of the time (adding level 4 and level 5 together) during the hours between 11AM and 8PM, there are multiple medical calls occurring where no ambulances would be available for a period of time. Translated into actual call volume this would mean that a fifth ambulance would have a yearly unit demand of fewer than 200 calls or less than one call per day.

More importantly then is how busy the individual units are and if the City runs out or dangerously low in resources. First, a cursory look at mutual aid received by the Portland Fire Department reveals that during 99 calls last year, other agencies assisted PFD. These were overwhelmingly for EMS (93) and the rest for other call types, no fires. This does not necessarily mean that PFD units did not respond. Conversely, PFD assisted other agencies 118 times, mostly EMS (87) and other call types (25). There were six out of town fires that PFD sent assisting apparatus. These amounts are statistically too small to draw much concern.

The next section details the workload by unit for the mainland City units, the island units, and the airport facility. We begin with a historical review working toward the last year's data[9] (see Figures 4.36-4.38).

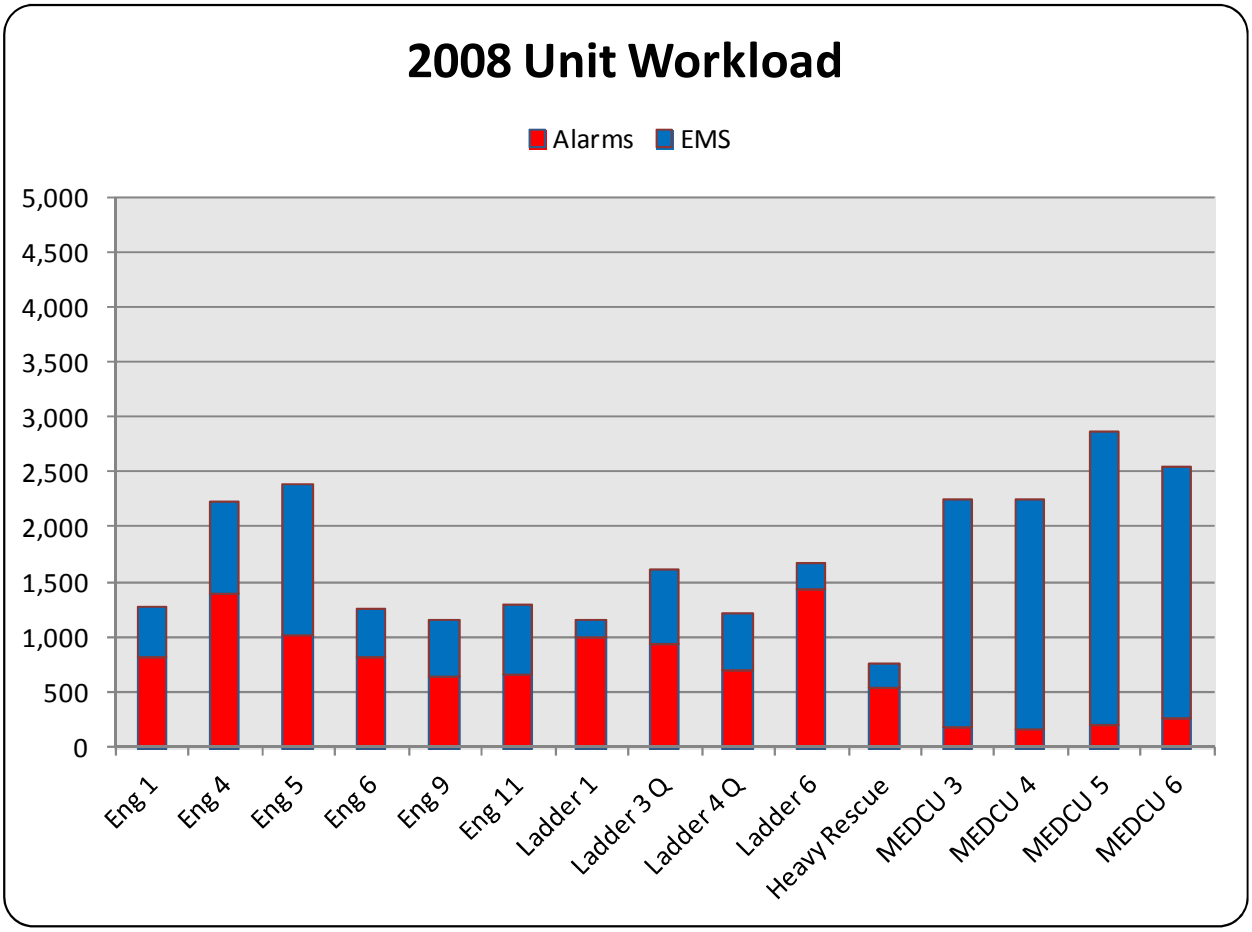
Figure 4.36 illustrates the disproportionate workload for the MEDCU's. The need for an additional unit seems evident from the comparative workloads. MEDCU 6 was not placed into service until July 4th, 2006.

Figure 4.36
2004 UNIT WORKLOAD



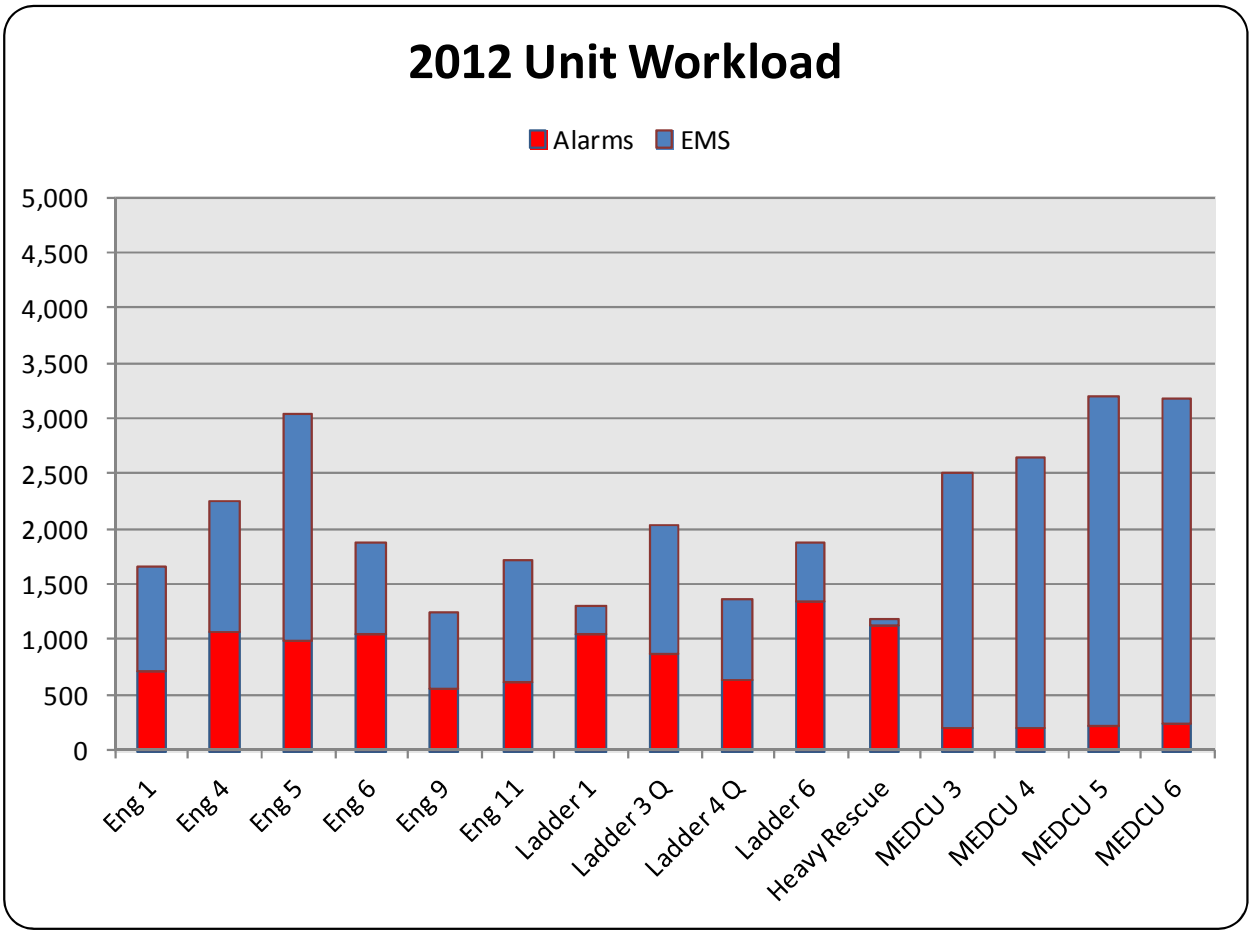
[9] CAD Records

Figure 4.37
2008 UNIT WORKLOAD



The additional MEDCU has evened out the workload for these unit types. The Heavy Rescue unit was placed out of service in June of 2008, hence its lower workload.

Figure 4.38
2012 UNIT WORKLOAD



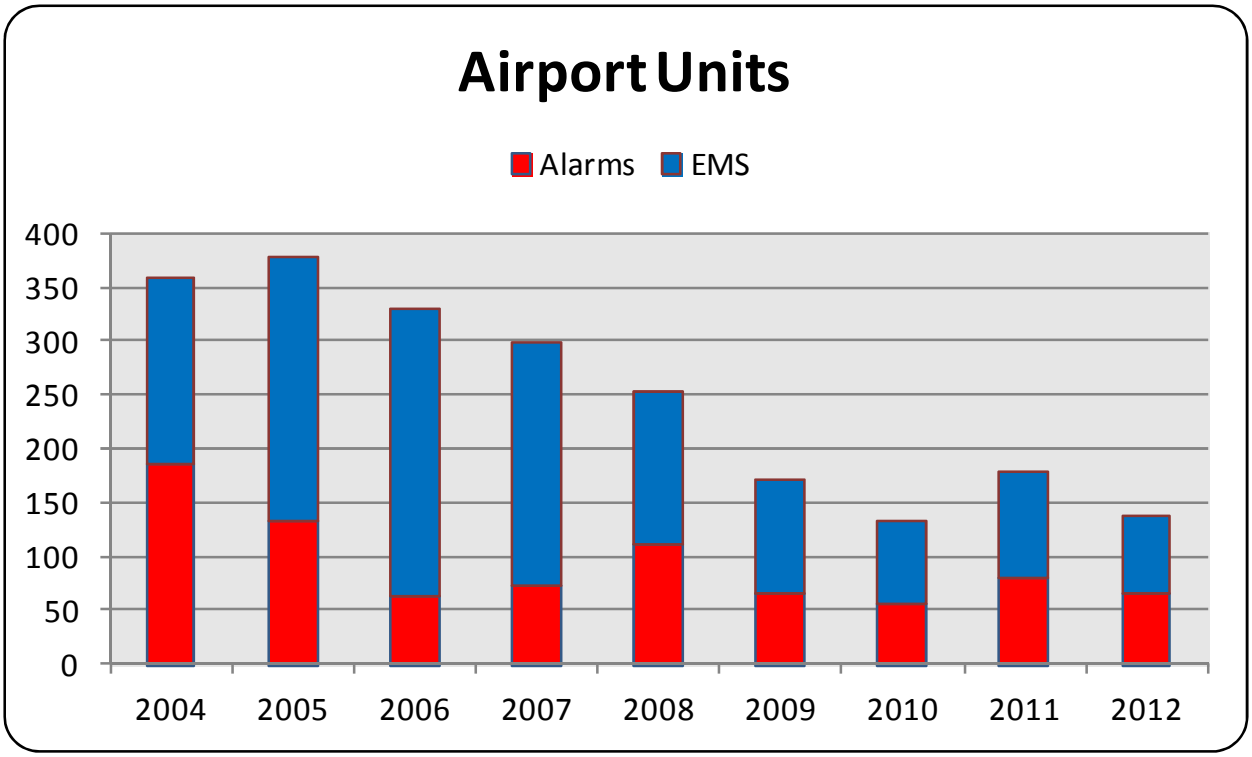
The busiest units are assigned to the Central Station in 2012, and the even workload of the MEDCU's has not been sustained as expected given the service demand in that area. From the unit workload data, it appears that a MEDCU is not dispatched on every fire call. This is acceptable since most fire calls will not require a medical response. In the case of a recognized need or potential such as a working structure fire, it is appropriate to send an ambulance initially.

Similarly, fire suppression apparatus should not respond to routine medical calls except in cases where additional manpower is beneficial such as cardiac arrest, severe trauma, multiple victim incidents, obese patient and the like. A fire suppression unit should be sent if the MEDCU is responding from out of district.

The airport units have a history of declining workload since 2004. Engine 6 had been relocated to the airport area in 2005 that may have redirected terminal fire and medical

calls to it instead. In 2008, Engine 6 has since been assigned to the Bramhall Station. Figure 4.39 illustrates the total workload of the crash trucks alone as the Air Rescue Supervisor would respond to every call plus some of its own detail.

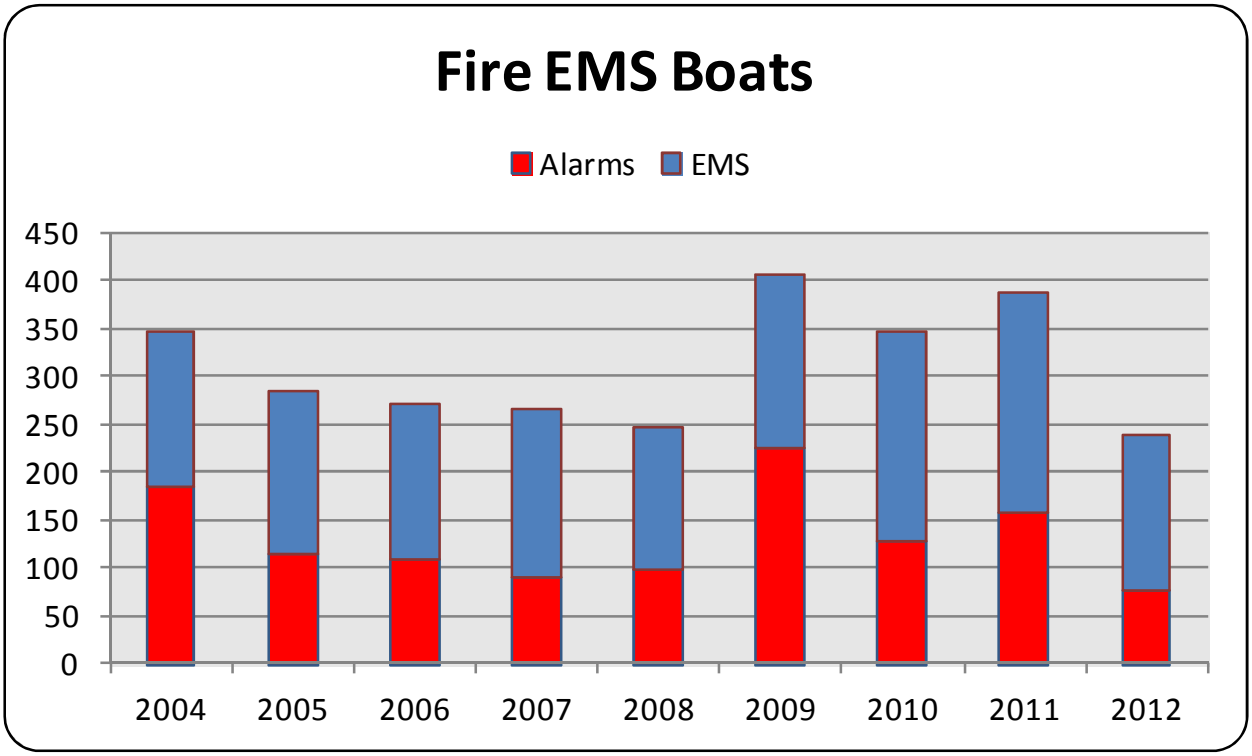
Figure 4.39
AIRPORT UNIT DEMAND



In 2003, the US Fire Administration released a special Technical Report[10] about Fire EMS Boat use across the country. A detailed table of use from 1999-2001 from major port cities such as New York, Philadelphia, Baltimore, Chicago, Houston, Jacksonville, and San Diego were included. Portland's nearest neighbor Boston was unable to provide data at the time. Nonetheless, the average number of Fire EMS Boats was 2.1 with NYC with 3 ranging downward to Chicago and New Orleans with 1. The average annual response was 241.5, with NYC highest at 807 and Philadelphia the lowest with 54. Comparatively during the same time period, Portland's Fire Department Marine Division averaged 256 calls, increasing each year.

[10] USFA TR-146

Figure 4.40
FIRE EMS BOAT UNIT DEMAND



Fire EMS Boat workload had also been declining since 2004. Several years of unusually high workload in 2009 through 2011 is not sustained in 2012 with demand resuming its decline in demand. The table does not include 'service calls' where the Fire EMS Boat is responsible for routine inspections on the island. This can be accomplished through a different methodology than using the Fire EMS Boat.

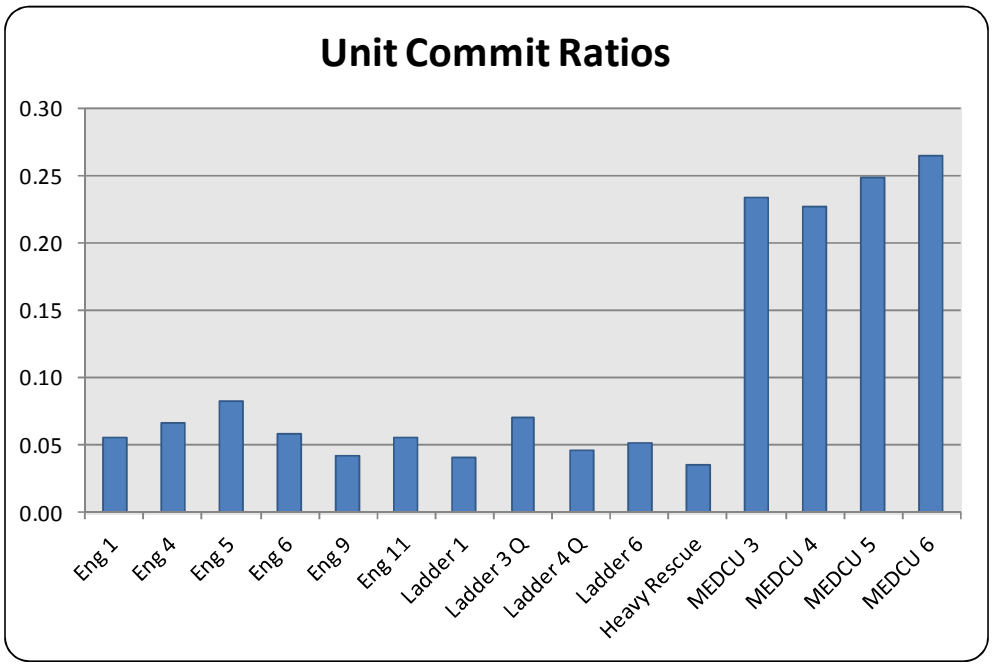
While the amount of calls for service may seem impressive, this belies the actual amount of time units spent on calls during their shift. Some calls, like fires, take hours while others are cancelled within minutes as units respond or are called off by the crew at the scene. Figures 4.41 details the percentage of time each unit spent actually on an emergency assignment[11].

[11] CAD Records. Airport units demand too low to register unit commit ratio above .01.

Figure 4.41
UNIT COMMIT RATIOS

Unit ID	Total Time On Incidents	Incident Commit Ratio	Scene Time Minimum (Hr:min)	Scene Time Maximum (Hr:min)
Eng 1	485:37:00	0.06	0:00	4:38
Eng 4	577:50:00	0.07	0:00	5:10
Eng 5	715:25:00	0.08	0:00	4:59
Eng 6	505:30:00	0.06	0:00	3:11
Eng 9	369:15:00	0.04	0:00	3:47
Eng 11	543:27:00	0.06	0:00	4:06
Ladder 1	349:25:00	0.04	0:00	5:12
Ladder 3 Q	617:02:00	0.07	0:00	3:28
Ladder 4 Q	401:17:00	0.05	0:00	3:05
Ladder 6	445:55:00	0.05	0:00	3:17
Heavy Rescue	311:07:00	0.04	0:00	3:50
Marine Units	188:48:00	0.02	0:01	6:34
MEDCU 3	2047:33:00	0.23	0:00	3:37
MEDCU 4	1987:53:00	0.23	0:00	3:38
MEDCU 5	2179:43:00	0.25	0:00	4:26
MEDCU 6	2314:42:00	0.26	0:00	3:35

Q=Quint



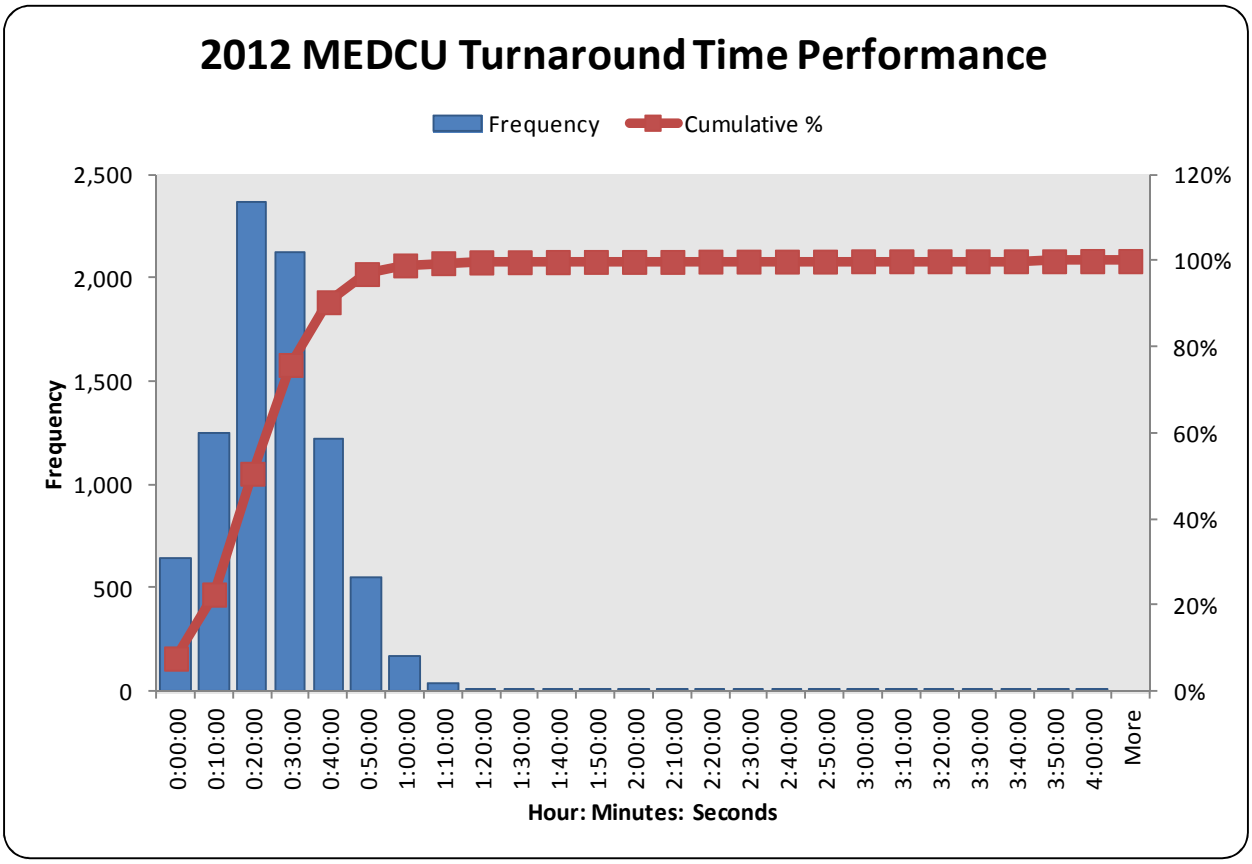
It can be seen in Figure 4.41 that the MEDCU's spend four to five times more time on calls than fire suppression units. This is due to the medical call demand volume and the amount of MEDCU's versus fire apparatus. Though fire type calls are fewer, they do take longer but not necessary for all the units dispatched; similar to medical calls.

Fire industry practices postulate that fire suppression units should be no more than a .20 ratio; lest firefighter fatigue and career burnout ensue. It further proposes that fire based EMS units should be no more than .30 ratio. Private EMS industry considers adding an additional unit when ratios reach .45 and routinely run units at ratios higher than .50. Considering these industry practices, the Portland Fire Department may consider a reduction in fire suppression units. Instead, PFD should consider peak load staffing patterns for the MEDCU's to handle the volume and concurrent calls that occur during the daytime hours.

Additionally, MEDCUs have an additional component of transportation to the hospital, and transferring the patient to the doctors and nurses. Turnaround time is the elapsed time between a MEDCU arriving at a hospital, transferring the patient, cleaning or restocking the unit, and giving report and documentation before becoming available. This can be the lengthiest time of an EMS call, but it is also the measure that can be abused by crews delaying availability to grab a bite to eat, socialize with hospital staff and each other. The Patient Care Report data of the MEDCU's, auto-populated with CAD timestamps, were analyzed to determine if MEDCU turnaround time is excessive. Bear in mind that some very minor medical calls require little, if any, turnaround time while critical emergencies usually require a longer than average time to turnaround from the hospital and become available.

Industry practice for this measure varies by agency. Some agencies do not allow for any turnaround time, which is foolish given the tasks at hand. Others allow for turnaround at the discretion of the crew. Still other agencies mark a goal and either query the crew when this mark is reached or automatically designate the unit available unless the crew provides reason for delay. These goals, when they are set, tend to be between 15 minutes to half an hour.

Figure 4.42
TURNAROUND TIME PERFORMANCE



Portland Fire's MEDCU units have an average turnaround time of 20 minutes and fifty-four seconds (0:20:54) which is quite good and should be commended. Ninety percent of the time, MEDCU clears within thirty-nine minutes and eleven seconds (0:39:11). Proportionally, the turnaround time is generally equal among the separate units. It is clear from this analysis that, for the majority of time, MEDCU units are not unnecessarily unavailable.

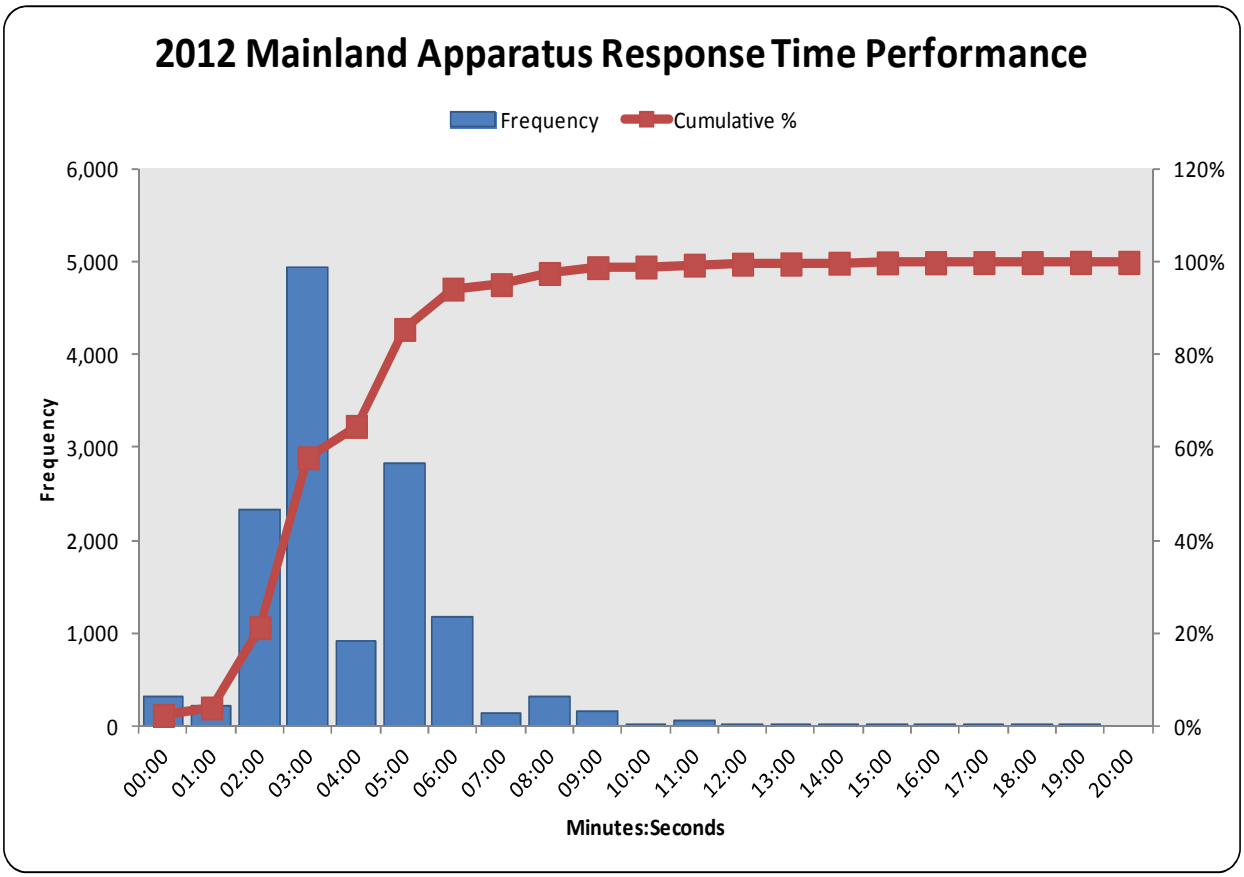
RESPONSE TIME ANALYSIS

The most important measure of performance of any emergency service provider especially to whom they serve, is how fast does help arrive. Discussions of the reasons for and the specific parameters of the establishment of national response time guidelines from the NFPA have been outlined in an earlier subsection in this chapter. As a reminder, it is recommended that the first arriving apparatus to a fire alarm or a medical emergency

arrive within five minutes of being dispatched, 90% of the time. Subsequent apparatus are allowed additional time as also discussed previously. Figure 4.43 illustrates the response time performance for City apparatus[12] on the mainland using the CAD dataset. Mutual aid to other areas was removed for public assists and standbys.

The average response time for first arriving units on the mainland is three minutes and twenty-six (0:03:26) minutes, while 90% of all calls is answered within six minutes (0:06:00).

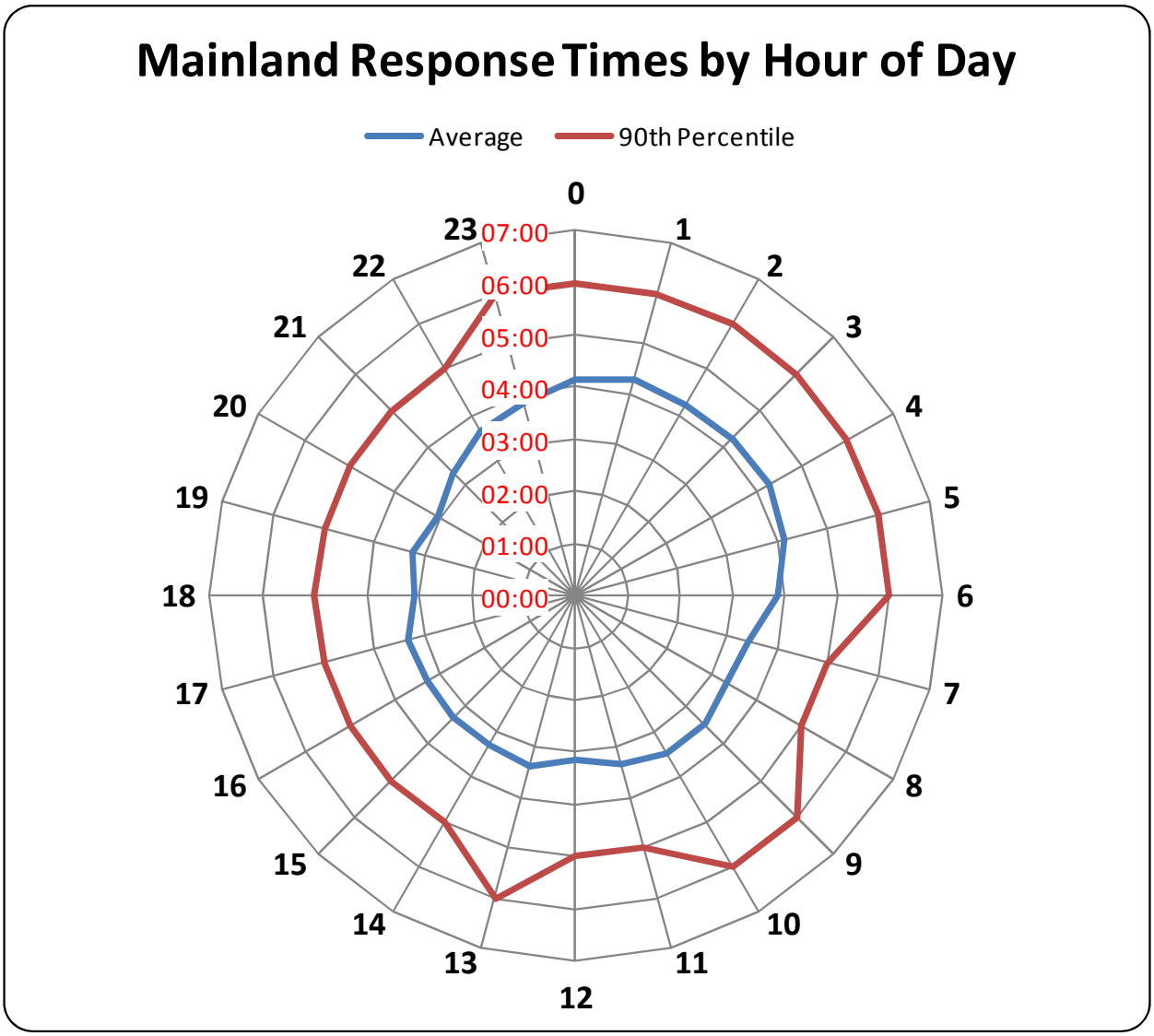
Figure 4.43
RESPONSE TIME PERFORMANCE



Hourly, response time is generally higher during the overnight hours as shown in the graphic Figure 4.44.

[12] Not including airport, island, or marine units.

Figure 4.44
MAINLAND HOURLY RESPONSE TIME



There are many factors that can contribute to delaying a response, such as weather and construction to name a few, but one that is ultimately controlled by firefighters and paramedics is turnout time. Turnout time is elapsed between the dispatch and the unit becoming enroute to the scene. For 24 hour shift workers, it is not unusual for this delay to extend during the overnight hours.

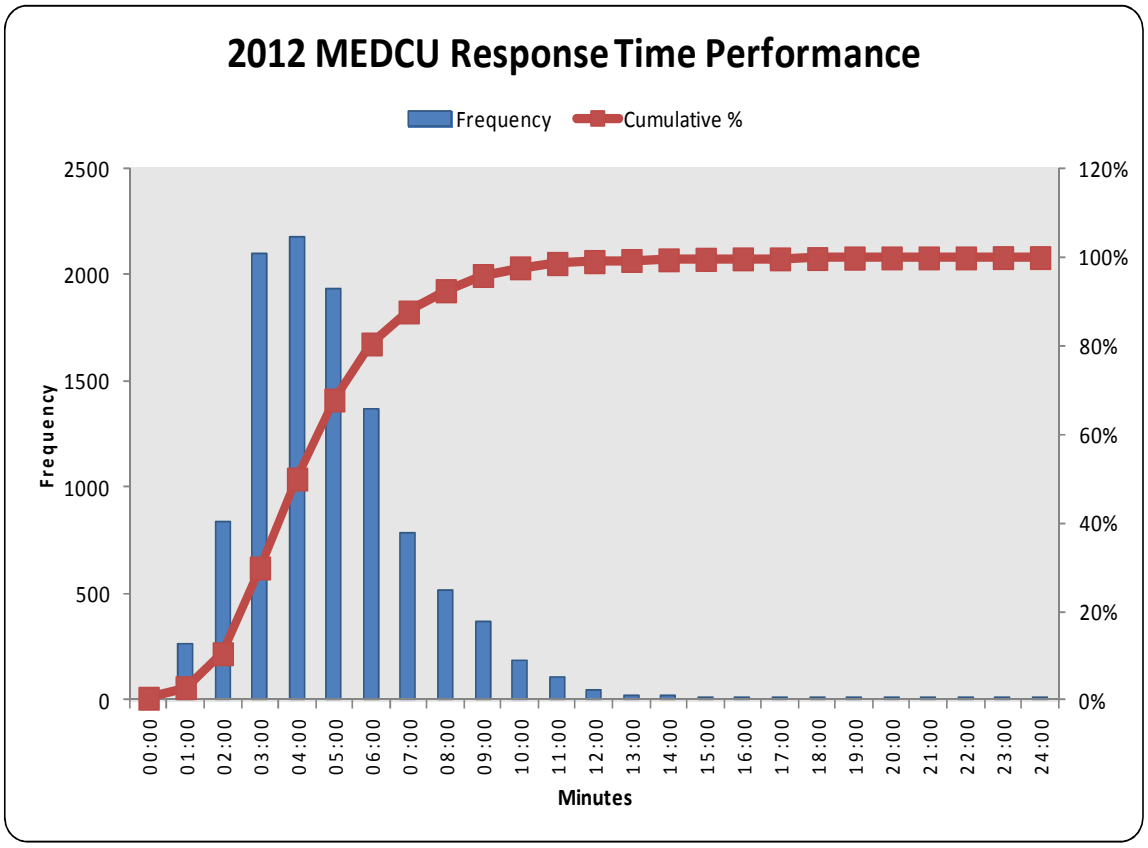
In other cases, station design plays a role in the difficulty of a crew to reach the gear and apparatus to exit the station. A crew may not be in the station, but within another building or business when the alarm comes in, causing a longer turnout time.

Not all calls for service are truly a critical emergency, yet nonetheless need to be answered. To improve response time performance and to reduce the risk to firefighters, the public, and to property, a thorough review of dispatch procedures that reduce the use of lights and sirens to calls that are deemed non-emergent should be considered. A level of criticality, similar to that being accomplished with EMS calls, should also be accomplished for fire calls, with an appropriate response dictated. A public relations campaign to reduce the amount of non-emergent calls to the fire department should also be initiated to reduce the demand for services.

For island calls, the average response time is also six minutes, while the 80th percentile response time is nine minutes. For volunteer agencies, this is acceptable under NFPA guidelines. For the airport crews, an average response time of six minutes was recorded as well. Fire EMS Boats, because of their longer response time were excluded from the mainland apparatus response time performance analysis. However, CAD records revealed that many calls did not record a "at the scene" time, but the ones that did (105 calls out of 238 total records) revealed an average response time of thirty-nine minutes (0:39:00), ninety percent of the calls were answered within an hour and seven minutes (1:07:00). This contributed to the higher unit commit ratio compared to the relatively low unit workload demand.

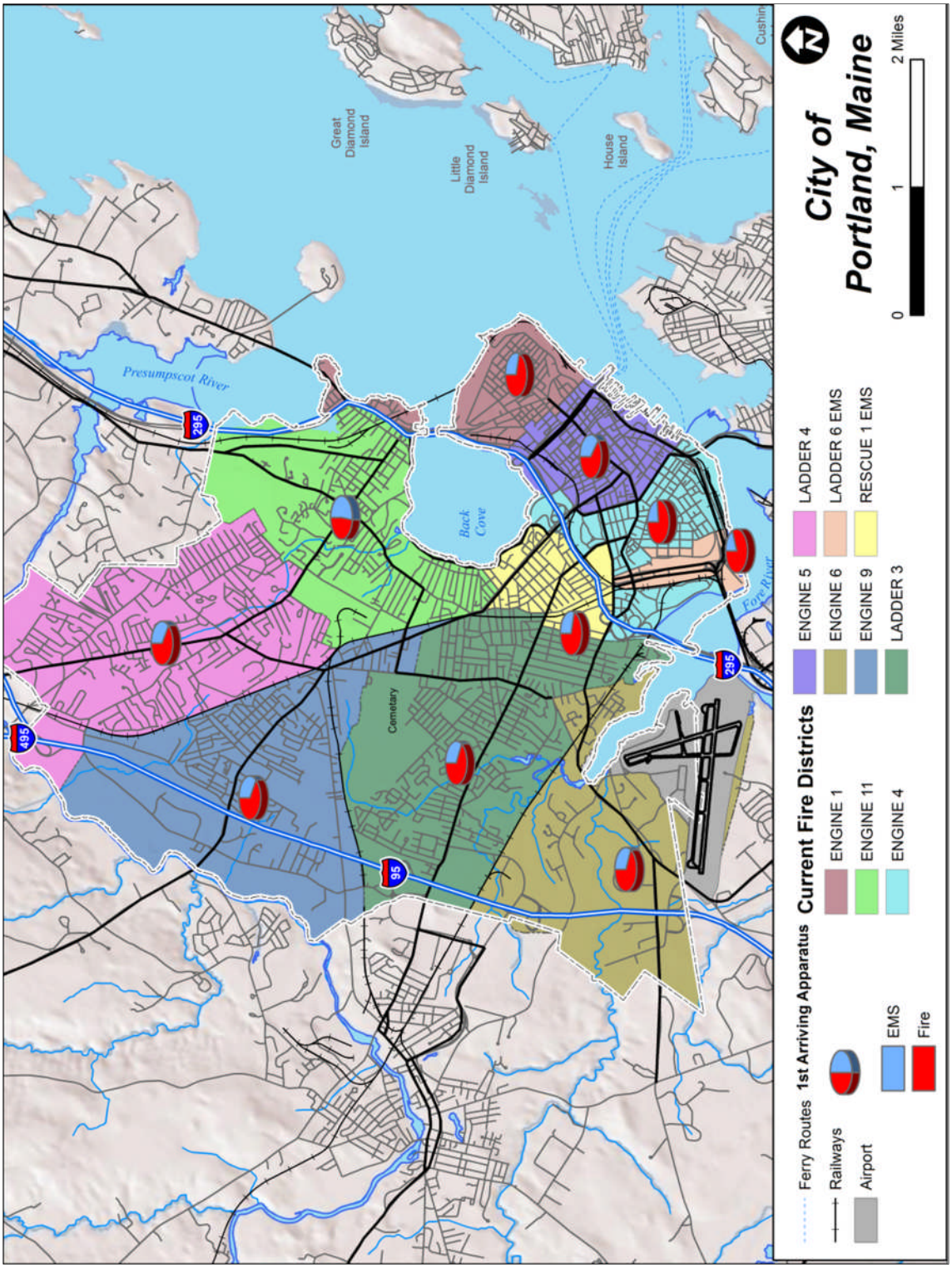
To isolate the mainland response times further, the MEDCU units were isolated for their response time performance. The graph that follows indicated the range, frequency, and cumulative percentage of total response time (Dispatch to 'at the scene'). On the average, a MEDCU arrives on scene within four minutes and twenty-six seconds (0:04:26) and to 90% of calls within seven minutes and twenty-six seconds (0:07:26).

Figure 4.45
MEDCU RESPONSE TIME PERFORMANCE



An analysis was conducted to determine which unit, fire or MEDCU, arrives at scenes first. In Figure 4.46, the pie charts in each of the current apparatus district generally depict the results of the analysis. Overall, fire apparatus arrive on the scene first two-thirds of the time. In Engine 11's district, the MEDCU's arrive first nearly half the time.

Figure 4.46
FIRST ARRIVING APPARATUS



FUTURE TRENDS

Part of the process to understand the future trends facing the City of Portland was to interview the officials in the City planning office to obtain information regarding future residential and commercial developments underway or proposed within the City.

New Residential & Commercial Development

The City has a goal to increase residential population to at least 25% of the county population and to maintain this level. Some of the new residential development within the City should help toward this goal. Currently, there is some redevelopment of commercial property especially on the peninsula area into efficiencies and multi-family dwellings. Nearly 1,300 new units of this type are expected. There are at least five new single family home subdivisions with approximately 500 new units slated for possible construction. 199 new assisted living/elderly units are also proposed. Nearly half of all units planned are rental units with 35% of all units set aside for affordable housing. On Peaks Island, a former military hospital is proposed to become an inn with 50 – 100 new units.

On the commercial side of development**,** several new hotels for the downtown and old port are proposed that includes over 800 units. A new multi-use area near Thompson's Point for offices, a hotel, and a new basketball arena is proposed. The redevelopment of the Portland Company facility on the waterfront has several proposals yet to be determined which one is to be approved. A light industrial facility off of Rand Road on the west side of town is being developed.

Transportation Improvements

There is expected transportation changes planned for the City as well. The Bayside Development area is expected to return some streets to a grid type network. This is advantageous to the fire department as it increases connectivity of streets within the area. High and State Streets, currently one way corridors to and from a bridge crossing are proposed to return to two way traffic to reduce traffic speed. While two lane one ways can be faster for apparatus as traffic can yield, they are directional restrictive. Once again, two way streets improve accessibility to other routes. Franklin Street, a major arterial from I-295 to the ferry service, is expected to increase in accessibility from surrounding streets and be trimmed to reduce time to cross. The same is slated for Spring Street as

well. Another transportation improvement aimed at reducing congestion at multiple point intersections is also planned. Roundabouts, also known as a rotary or a traffic circle are proposed for the intersections on Brighton Street. Reduced congestion will improve fire apparatus ability to negotiate traffic to reach scenes faster.

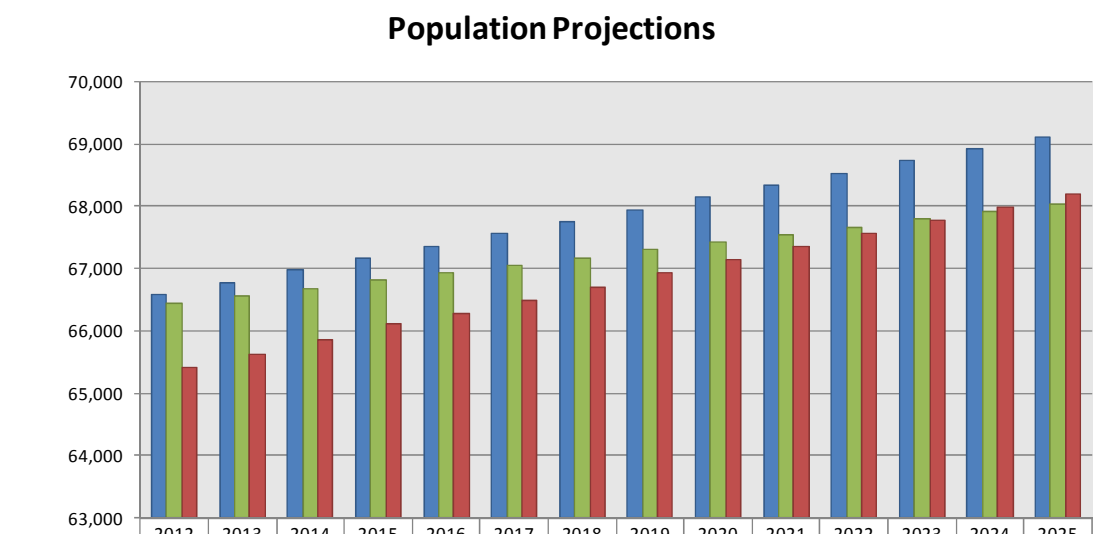
Population Projections

As indicated earlier in this chapter, the population of the City of Portland has increased modestly over the past several decades. It is anticipated that additional population growth will continue into the future. One method to project population growth is based on several decades of census experience. For the City of Portland, we used the decennial census figures from 1990 through 2010 to extrapolate figures through the year 2025.
This method, however, can fail to account for expected trends in the growth rate of an area. These changes often result from redevelopment, annexation, changes in employment capacity, or other socio-economic factors not taken into consideration in a linear projection from historic rates. Because of this, local population projections from agencies with differing methodology are also reviewed.
For Portland, information available from the State of Maine Planning Office and the Greater Portland Council of Governments was reviewed. The resulting population forecasts appear in Figure 4.47.

The locally produced population forecasts are more conservative than the census-based population forecast primarily due to local and regional issues that are expected to persist in restraining population growth for the City.

While these projections are not the definitive authority of future population within the City, they provide a way to base recommendations for future fire protection and emergency medical needs with expected service demand; since it is known that service demand for emergency agencies is based almost entirely on human activity.

Figure 4.47
POPULATION PROJECTIONS

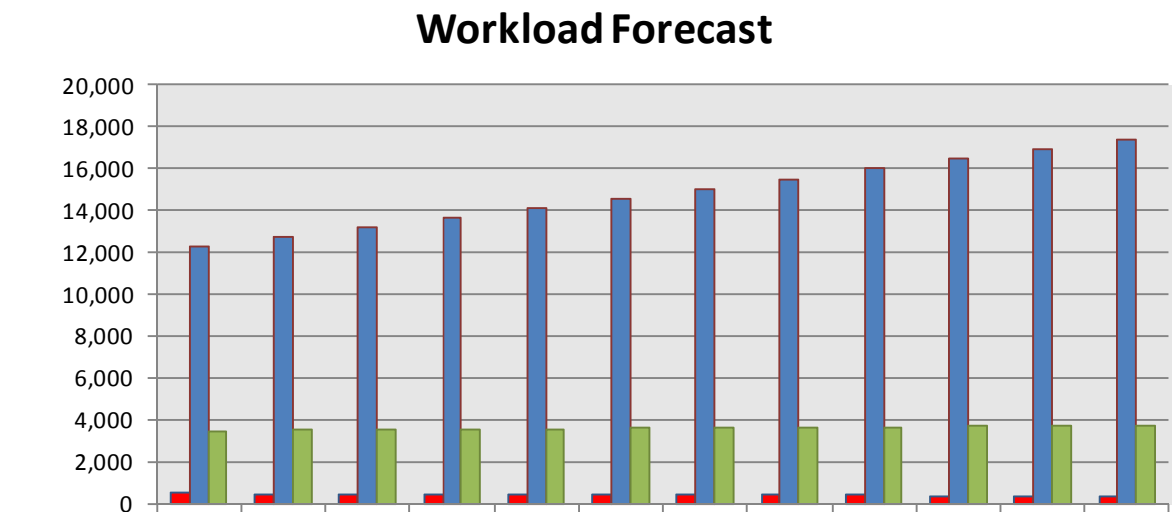


	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Census Based	66,583	66,778	66,972	67,167	67,361	67,556	67,750	67,945	68,139	68,334	68,528	68,723	68,917	69,112
GPCOG	66,439	66,561	66,684	66,806	66,928	67,051	67,173	67,296	67,418	67,540	67,663	67,785	67,908	68,030
MSPO	65,414	65,629	65,864	66,105	66,287	66,498	66,709	66,920	67,132	67,343	67,554	67,765	67,977	68,188

Workload Projections

In evaluating the deployment of facilities, resources, and staffing, it is imperative that consideration be given to potential changes in workload that could directly affect such deployment. Any changes in service demand can require changes and adjustments in the deployment of staff and resources in order to maintain acceptable levels of performance.
For purposes of this study, population projections extrapolated from the 2010 census to the projected 2025 level of population provided by the GPCOG was multiplied by a forecasted incident rate calculated from a five-year history of incidents per capita to estimate workload through the year 2025. The result of the analysis is shown in the Figure 4.48.

Figure 4.48
ESTIMATED FUTURE WORKLOAD



	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Fire Calls	459	447	436	425	413	402	391	379	368	356	344	333
EMS Calls	12,247	12,706	13,167	13,629	14,093	14,559	15,026	15,494	15,965	16,437	16,910	17,385
Other Calls	3,465	3,487	3,508	3,530	3,552	3,573	3,595	3,617	3,639	3,661	3,683	3,705

Actual fire incidents are expected to decline, but this is reflective of national trends due to improvements in building codes and public fire education. EMS and other types of fire calls are expected to continue to rise because of increased population. EMS calls are expected to increase more significantly as the 'aging' of the population continues.

CONDITION OF CURRENT PFD FACILITIES

This section outlines the Study Team's assessment of the condition of the current Portland fire stations. Each current Portland fire station was visited a number of times by Study Team members as part of the onsite information-gathering process of this Study. The following summarizes the resulting analysis of the condition of each fire station, and the need for appropriate action by the City for the continued serviceability of each fire station.

1. Munjoy Hill Station – 134 Congress Street / Engine 1 – Ladder 1

   The Munjoy Hill Fire Station, built in 1976, is a three bay with a total square footage of 4,755. Each of the three engine bays is 770 square feet in size.

   The Munjoy Hill Station includes an office area, a kitchen, watch office, men's bunkroom and toilet. And, the Station includes a workout-fitness area of 240 square feet, three storage areas and two officer's bunkrooms.

   This fire station houses public safety radio equipment, including a substantial radio system tower. It is considered to be in good condition.

2. Central Fire Station – 380 Congress Street / Engine 5, Medcu 5 and Medcu 6

   The Central Fire Station houses active fire and EMS apparatus and staff and the primary PFD administrative offices. The station includes five engine bays for apparatus and one short bay for deliveries and EMS supplies storage. Although old, having been built in 1926, it is considered to be in good condition given it was partially renovated in 2008.

   Central Fire Station includes a total square footage of 17,100 square feet and a basement of 1,500 square feet used for storage. Overall, the facility includes a kitchen, toilet areas, bunkrooms, 16 offices, supply areas and stairways, including one that is spiral in design.

   The Study Team was advised that a number of planned changes/upgrades are needed and planned, including the replacement of the spiral staircase that does not meet code, upgrading the fire alarm system, replacing the flooring in the bunkrooms. Further, the single zone heating system with the single thermostat in engine room is an issue causing improper heating in many parts of the building. Further, finding parking for vehicles of those working in the building is an issue due to limited parking spaces available.

3. Bramhall Station – 784 Congress Street / Engines 4 and 6, Ladder 6 & Rescue 1

   This fire station, which supports 18 firefighters and officers, including the platoon deputy chief, around the clock, has four engine room bays for apparatus and includes a total of 18,200 square feet of space. There are five offices, and kitchen, fitness, bunkroom, watch office, toilet, storage and dayroom/lounge areas.

Additionally, there are a number of work areas for the repair and maintenance of SCBA and nozzles as well as a classroom for training.

Although the Bramhall Fire Station is considered to be in good condition there are a number of changes/upgrades needed in the next five years, including repair of the roof on the hose tower, kitchen remodeling and repair of the leaking and crumbling roof over the generator room. Reportedly, the station seems to have shifted and settled with cracks and displaced concrete on the interior and exterior walls. Further, interior doors are out of alignment due to station movement. This facility is reported to be not very energy efficient; engine room bay doors are "drafty" and the oil-fired boiler is aging.

4. Rosemont Station – 212 Stevens Avenue / Ladder 3 and Medcu 3

This fire station was built in 1961, includes two engine room bays and is considered to be in fair condition for the following reasons:

- Most interior concrete floors have settled and continue to sink causing continuing plumbing and drainage problems;
- Multiple windows and exterior doors need replacement;
- Brick exterior needs repointing;
- Lack of space for general maintenance, laundry and storage; and,
- Most infrastructure systems need upgrading.

The facility includes 5,428 square feet that provides bunkroom, office, kitchen/lounge and toilet areas. There is storage in the basement that is utilized by the Alarm Division. The Study Team was advised that there has been discussion regarding possibly replacing this building with another more suitable up-to-date facility.

5. East Deering Station – 474 Ocean Avenue / Engine 11

This small two-bay fire station was built in 1957 and is considered to be in good condition with a total of 3,000 square feet of space, of which 1,728 is the two engine room bays.

Reportedly, there is a need for landscaping and paving of the parking lot with grading to the street level for increased parking area and improved drainage. A generator with automatic start capability is needed. Further, the apparent settling of the building in the northwest corner should be monitored and the cause needs to be determined.

6. Northgate Station – 386 Allen Avenue / Ladder 4 & Medcu 4

   The Northgate Fire Station was built in the 1970's, includes two engine room apparatus bays and is considered to be in good condition. It includes a total of 5,000 square feet of space with bunkroom, kitchen, office dayroom and front entry areas.

   The Study Team was advised that there is the potential need for the expansion of this facility to include an additional engine bay, living area and workout space to meet potential future growth needs.

7. Riverton Station – 1592 Forest Avenue / Engine 9

   This 4,140 square foot fire station, which was built in 1971, is considered to be in fair condition for the following reasons:

   - Ceiling in several areas needs repair or replacement due to water damage caused by roof leaking; and,
   - Air and water leakage through several windows and panels.

   The facility includes kitchen, bunkroom, office and toilet areas. Typically, two firefighters and an officer work out of this fire station.

8. Marine Division – 56 Commercial Street
   The quarters facility for the Fire EMS Boat staff is in the process of being fully renovated at this time.

9. Air Rescue Station – 1005 Westbrook Street / Apparatus is four airport FF units.
   The 5,825 square foot Air Rescue Station located at the Portland JetPort is owned and provided by the JetPort and is considered to be in fair condition.

All mainland PFD fire stations were equipped with Plymovent Exhaust Systems to keep the interior of the facilities as diesel smoke-free as possible in the interest of firefighter safety and health. The City and Fire Department should be commended for taking this progressive action.

The Study Team noted that there is a general lack of space and equipment in PFD fire station facilities for physical fitness activities. The City and Fire Department should continue to support the participation of firefighters and officers in physical fitness activities to encourage staff to remain in good physical condition and reduce work-related

injuries. This is essential to the safety and health of the personnel who provide the City's fire protection and EMS first responder services.

All Portland fire stations, except for the Fire EMS Boat quarters, are equipped with emergency power generators. Reportedly, the generators at the Munjoy and Bramhall fire stations are in need of replacement.

General Condition of Portland Fire Stations

Fire station buildings are staffed 24 hours a day, seven days a week. In addition, due to the rough nature of the work performed by firefighting personnel in and out of their fire stations, fire station buildings typically receive rougher treatment than average office, commercial or government buildings. The amount of maintenance and repair work necessary to keep fire stations in good condition is generally greater than that normally required in other municipal buildings. If this work is not performed as required, the buildings remain in a state of continual disrepair, present a very poor image to the public, inadequately support the work performed by the firefighting personnel, and may become a safety or health hazard to the firefighters and officers. The Study Team believes a high priority should be placed on the funding of the maintenance, repair and general upkeep of the Portland Fire Department fire stations.

Ultimate responsibility for the maintenance and upkeep of fire stations rests with the owner: the City of Portland. It has been the experience of the Study Team, however, that a strong partnership effort on the part of the municipality, the fire department leadership, and the firefighters working in the fire stations is the best approach to providing well maintained and livable fire station facilities. Although each of these three groups (City, Fire Department leadership, and firefighters) have provided maintenance effort in the past, including some painting being performed by the firefighters, a much stronger effort needs to be made to maintain the Portland Fire Department fire stations at an acceptable level.

Consideration should be given by the Fire Chief and City officials to the implementation of appropriate proposed projects that lead to safe, efficient and well maintained PFD facilities that the City, citizens and Fire Department consider a reflection of the quality service provided by the Portland Fire Department to its customers—the residents and businesses of the City of Portland.

Condition of Furnishings Generally

Fire stations serve multiple functions to fulfill the provision of fire and EMS services. Fire stations serve in some of the following manners:

- Garage for vehicular apparatus;
- Maintenance location for preventative maintenance for apparatus and equipment;
- Training area for firefighting and EMS personnel;
- Kitchen and eating area for personnel working 24 hour shifts;
- Living and sleeping area for on-duty personnel;
- General working and office location for personnel; and,
- Physical fitness facility to keep the personnel in shape.

To support these functions, fire stations must be equipped with a broad range of furniture and equipment. Many of these furnishings are not required for normal office or other business work due to the specialty nature of the work performed and the 24-hour use and performance of the work by firefighters and officers. Some examples of the furnishings that are unique to fire stations as work sites include: physical fitness equipment; maintenance tools; equipment and supplies; kitchen tables, appliances and supplies; relaxation area lounge chairs and televisions; and, bathing and sleeping area furnishings such as beds, pillows, and lockers. These, and many other similar furniture and equipment items, are essential.

The City of Portland should continue placing a high priority on providing, and replacing as necessary, the furniture and equipment required for the general operation of the Portland Fire Department fire stations. A sufficiently funded line item should remain in every annual budget for the replacement of fire station furniture and equipment. The Fire Chief should consider periodically performing a detailed furniture and equipment repair/replacement survey at each fire station, developing a list of the needs, and requesting funding for priority needs each fiscal year.

SUMMARY

The Portland Fire Department has a more than adequate number of fire stations to serve the City and the islands. They allow apparatus to provide coverage over most of the City within the four minute travel time model and the MEDCU units to reach the entire City within the NFPA 1710 guidelines. The airport units provide necessary coverage to the

facility as do the marine units to the islands, waterfront, and cruising vessels in Casco Bay. The workload of the units is not unmanageable and the response time performance reflects this and is acceptable. Higher EMS call volume is typical for fire departments that respond to such calls. In Portland, the MEDCU units are doing a good job of handling them within time recommendations and efficiently returning the unit back in service and available for the next call. Several fire stations have maintenance issues and space capacity needs that should be addressed.

RECOMMENDATIONS

4-1 The Fire Chief should consider adopting a closest station response area rather than the current apparatus based response districting.

4-2 The City should consider a railway crossing to assist apparatus response between the Northgate and Riverton Stations to provide greater coverage.

4-3 The Fire Chief should consider alternatives to the current first alarm assembly so that a greater geographic extent of the City can be reached with a safe level of firefighters and equipment.

4-4 The Fire Chief is encouraged to implement a policy to have no fire apparatus response to routine medical calls unless criteria, such as cardiac arrest, major trauma, etc., are determined by dispatch or lead medic on scene. See Chapter Six.

4-5 The Fire Chief should consider developing an initial response policy that dictates when lights and sirens are to be utilized for all unit types based upon criticality. Unnecessary and dangerous to run 'hot' to every dispatch or to the hospital.

4-6 The City should replace the power generators located at the Munjoy and Bramhall fire stations.

4-7 The City and Fire Chief should consider placing a higher priority on the provision and maintenance of all fire station facilities and equipment.

4-8 The City and Fire Chief are encouraged to upgrade the Central Fire Stations, including the one-zone heating system, in preparation for the proposed revision of the functions to be supported by the facility; full service Fire Prevention functions and continuing service as PFD headquarters.

CHAPTER FIVE
FIRE AND EMS APPARATUS

The selection and purchase of fire department apparatus and equipment are obviously an important part of any fire department's business…it is usually second to salaries and benefits.

Foremost, the selection and purchase process must be based on community needs. Careful research and planning are crucial to meeting these needs. Fire vehicles and equipment are very specialized and technical in their nature.

Fire departments must be knowledgeable about all applicable standards and laws that impact the design, performance, use, and maintenance of the equipment. The selection and purchase of apparatus and equipment must take into account several factors. The foremost factor is the safety of the fire fighters and the public. One of the 16 Firefighter Life Safety initiatives of the National Fallen Firefighters Foundation states: "Safety must be a primary consideration in the design of apparatus and equipment." Another factor is how the vehicle or equipment fits in with the previous purchases.

In addition, the fire department must provide training on the proper use of all the vehicles and equipment and must provide maintenance for the item purchased as described by the manufacturer."[1]

COMMISSION ON FIRE ACCREDITATION INTERNATIONAL (CFAI)

The Commission on Fire Accreditation International (CFAI) emphasizes the role fire, EMS and support apparatus and vehicle acquisition and maintenance plays in an efficient, safe, and effective fire department. Progressive fire departments use this criterion, and others, as a benchmark for determining the best and safest service possible. The CFAI *Apparatus and Vehicles* and the *Apparatus Maintenance* Criterion Performance Indicators, as referenced by the Study Team, are provided below:

[1] Tutterow, Robert, *Fire Protection Handbook, Fire Department Apparatus and Equipment*, 2008, National Fire Protection Association.

Criterion 6B: Apparatus and Vehicles

Apparatus resources and designed and purchased to be adequate to meet the agency's goals and objectives.

Performance Indicators

1. Apparatus is located to accomplish the stated standards of response coverage and service level objectives.
2. Apparatus types are appropriate for the functions served, i.e. operations, staffs support services, specialized services and administration.
3. There is a replacement schedule for apparatus and other tools and equipment.
4. There is a program in place for writing apparatus replacement specifications.

Criterion 6C: Apparatus Maintenance

The inspection, testing, preventive maintenance, replacement schedule and emergency repair of all apparatus are well established and meet the needs for service and reliability of emergency apparatus.

Performance Indicators

1. The apparatus maintenance program has been established. Apparatus is maintained in accordance with manufacturer's recommendations, with activity conducted on a regular basis. Attention is given to the safety-health-security aspects of equipment operation and maintenance.
2. The maintenance and repair facility is provided with sufficient space and equipped with appropriate tools.
3. A system is in place to ensure the inspection testing fueling, preventive maintenance and emergency repair for all fire apparatus and equipment.
4. There are an adequate number of trained and certified maintenance personnel available to meet the objectives of the established program.
5. There is an adequate supervision to manage the program.
6. There is a management information system in place that supports the apparatus maintenance program and provides for analysis of the program.

These Criterion and Performance Indicators will be addressed in the body of the chapter and specifically in the chapter summary.

APPARATUS AND EQUIPMENT ADMINISTRATION

Portland Fire Department

The Fire Chief assigns fire and EMS apparatus and equipment acquisition and maintenance to one of the six Deputy Chiefs of the Department as an ancillary duty. This ancillary assignment is in addition to the Deputy Chief's administrative and operational responsibility, while serving on a rotating shift of the Department.

Overseeing the fire and EMS apparatus and equipment acquisition and maintenance program of the Fire Department, while managing a complete rotating shift and routinely responding to emergency incidents, requires the Deputy Chief to commit many of his off-shift hours to the apparatus and equipment responsibility. The oversight could be more efficiently accomplished by a senior officer that is not assigned to a shift responsibility to the benefit of both the rotating shift and the Apparatus and Maintenance program.

The Deputy Chief provides direction and oversight to the Fire Department program while the crux of Fire Department fleet maintenance is accomplished by or through the Fleet Services Division of the Public Services Department.

The Marine and Air Rescue Division Deputy Chief provides oversight to the boats, vehicles, tools and equipment associated with the Marine Division.

Fleet Services Division

The Fleet Services Division purchases, repairs and rebuilds City-owned vehicles and runs a preventative maintenance schedule to assure optimum equipment availability. Fleet Services provides for the cost of all parts, outside repairs and fuel for all City vehicles and equipment. Fleet Services maintains the City's vehicle replacement program with the Fire Department providing the necessary specialized expertise and knowledge associated with emergency service vehicles and equipment.

Jetport International Airport

The Jetport's Fringe and Indirect Cost Division reimburses the City's General Fund for expenses incurred for Portland Fire Department's cost of employee benefits, general liability insurance, firefighting and EMS services and other City provided services.

Crash Fire Rescue apparatus are acquired and maintained through the Jetport, independent of the City of Portland's capital budget and fleet maintenance shop. The Jetport's maintenance shop is under the Jetport Manager and completely autonomous from the City of Portland.

Typically, crash rescue apparatus are funded through a formula of Federal Aviation Administration (FAA) 90 percent, the State of Maine DOT five percent and the City of Portland five percent. The replacement schedule and all maintenance are mandated by the FAA. The Portland Fire Department's role in vehicle maintenance at the Jetport is limited to the on-going daily and routine checks and light maintenance by the assigned Department personnel working the same shift rotation as the rest of the Fire Department.

CURRENT APPARATUS AND VEHICLE INVENTORY

Figure 5.1 lists the current fire and EMS apparatus and vehicle inventory for the Portland Fire Department, along with their functions, capacities and assignments.

Additionally, the crash/rescue fleet ("Red" Units), which is supported by the FAA, the State of Maine and, on an enterprise basis, the City of Portland, are included.

The Portland Fire Department vehicle inventory is comprised of 12 pumpers, one heavy rescue truck, two ladder trucks, four quints, four tankers, ten MEDCUs, one wheelchair van, three fire/transport boats, ten staff/support cars, four fire alarm vehicles, three service trucks, one fire investigation vehicle, one confined space unit, two hazard material units, four utility vehicles, and one golf cart/trailer. Four crash/rescue vehicles are the responsibility of the airport.

Figure 5.1
PORTLAND FIRE DEPARTMENT FIRE AND EMS APPARATUS AND VEHICLE FLEET

UNIT	YEAR	MAKE/MODEL	FUNCTION	HGT/PUMP/TANK	ASSIGNMENT
Engine 1	2001	Pierce Enforcer	Pumper	1200/750	Munjoy
Engine 2	1992	Pierce Arrow	Reserve	1500/750	Forest Ave
Engine 4	2011	Seagrave	Pumper	1500/750	Bramhall
Engine 5	2011	Seagrave	Reserve/Quint	1500/500	Central
Engine 6	2000	Pierce Dash	Pumper	1500/650	Bramhall
Engine 9	1998	Pierce Dash	Pumper	1500/750	Forest Ave
Engine 10	1999	Pierce Saber	Reserve	1250/750	Bramhall
Engine 11	2000	Pierce Dash	Pumper	1500/1000	Ocean Ave
Engine 12	2004	Pierce Kenworth	Pumper	1250/1000	Peaks Island
Engine 13	1996	E-One Cyclone	Pumper	1250/750	GrtDiamond Isl
Engine 14	1998	Ford 350	Mini-Pumper	250/285	Cushing Island
Engine 15	2004	Pierce Kenworth	Pumper	1250/1000	Cliff Island
Rescue 1	1999	Freightliner	Heavy Rescue	-	Bramhall
Ladder 1	1993	Pierce Arrow	Ladder Truck	85'Platform	Munjoy
Ladder 3	2012	Seagrave	Quint	100'/1500/400	Stevens Ave
Ladder 4	2000	Pierce Dash	Quint	105'/1500/500	Allen Ave
Ladder 5	1994	Pierce Lance	Quint	105'/2000/300	Munjoy
Ladder 6	2001	Pierce Dash	Ladder Truck	105'	Bramhall
Ladder 12	1998	Pierce Dash	Quint	75'/1500/500	Peaks Island
Tank 12	1979	Chevrolet	Tanker	1000/500	Peaks Island
Tank 13	1972	Ford/Bean	Tanker	750/750	GrtDiamond Isl
Tank 14	1973	International	Tanker	500/750	Cushing Island
Tank 15	1990	Mack	Tanker	1000/750	Cliff Island
MEDCU 3	2012	Chev Braun	Ambulance	-	Stevens Ave
MEDCU 4	2010	Ford Braun	Ambulance	-	Allen Ave
MEDCU 5	2010	Ford Braun	Ambulance	-	Central
MEDCU 6	2008	Ford Custom	Ambulance	-	Central
MEDCU 7	2007	Ford Custom	Ambulance	-	Ocean Ave
MEDCU 8	2004	Ford Custom	Reserve Amb	-	Central
MEDCU 9	2008	Ford Custom	Reserve Amb	-	Central
MEDCU 12	1987	Ford Type II	Ambulance	-	Peaks Island
MEDCU13	1999	Ford	Ambulance	-	GrtDiamondIsl
MEDCU 15	1999	Ford	Ambulance	-	Cliff Island
WC 1	2008	Ford Type II	Wheel Chair Van	-	Central

Marine 1	2009	AJ Theriault	65' Fire Boat	3000	Marine Div
Marine 2	1993	Duffy	42'TransportBoat	-	Marine Div
Marine 3	2005	Pacific Skiff	20' Emer Boat	-	Marine Div
Car 1	2006	Chev Suburban	Fire Chief Car	-	Take Home
Car 2	2006	Chev Suburban	Deputy Chief	-	Bramhall
Car 3	2006	Chev Suburban	EMS Dep Chief	-	Take Home
Car 4	2003	Ford Crown Vict	FP Captain	-	Take Home
Car 41	1995	Ford Explorer	FP Lieutenant	-	Take Home
Car 5	1999	Chev Tahoe	Call Back DC	-	Bramhall
Car 6	1995	Chev Tahoe	Electrical Super	-	Take Home
Car 7	2006	Chev Suburban	Fire Train Capt	-	Take Home
Car 8	2000	Chev Tahoe	Reserve Staff Car	-	Central
Car 9	2000	Chev Tahoe	EMS Train Capt	-	Take Home
FireAlarm62	1995	Ford F700	Bucket Truck	35' Bucket	Persumpscot
FireAlarm63	2006	GMC 3500	Service Truck	-	Presumpscot
FireAlarm64	1999	Ford Ranger	Service Truck	-	Take Home
FireAlarm65	2005	Chev 2500 Van	Service Can	-	Presumpscot
ServiceTrk 2	1993	GMC Sierra	Service Truck	-	Bramhall
ServiceTrk 4	1993	Ford F350 4WD	Mechanic Truck	-	Take Home
ServiceTrk 7	1998	Chev Ext Cab	Marine Division	-	Marine Qtrs
FIV	2003	Ford Custom	Fire Invest Vehicle	-	Central
CS 1	1995	Ford Custom	ConfinedSpaceUnit	-	Bramhall
PM 1	2007	GMC 3500	HazMat Svc Trk	-	Presumpscot
HM 1	2005	Chev 2500	HazMat Response	-	Presumpscot
Bus	1985	GMC Bus	Drill School Trans	-	Metro Garage
Forestry 13	2004	Kawasaki ATV	Service Vehicle	-	GrtDiamondIsl
Utility 15	1994	Kawasaki ATV	Service Vehicle	-	Cliff Island
Truck 15	1987	Chevrolet PU	Utility Vehicle	-	Cliff Island
		Yamaha	Golf Cart/Trailer	500 Portable Pump	LtDiamondIsl
JetPort					
Red 2	2011	Ford E-One	Rapid Intervention	450lbs PurpK,100gal Foam	Jetport
Red 3	1989	Oshkosh	Crash Rescue	1250/3000/450foam	Jetport
Red 4	2000	Oshkosh	Crash Rescue	1250/1500/150foam	Jetport
Red 5	1977	Walters CT4	Crash Rescue	1000/1500/150foam	Jetport
Source: Portland Fire Department					

APPARATUS REPLACEMENT SCHEDULE

To maximize firefighter capabilities and minimize risk of injuries, it is important that fire apparatus be equipped with the latest safety features and operating capabilities.

Significant progress has been made in upgrading functional capabilities and improving the safety features of fire apparatus in recent years. Although limited in number in the PFD fleet, apparatus manufactured prior to 1991 usually included only a few of the safety upgrades required by the recent editions of the NFPA 1901, *Standard for Automotive Fire Apparatus.*

Based on these safety upgrade improvements, fire departments should seriously consider the risk to firefighters of keeping fire apparatus older than 15 years in first-line service

There are a number of national fire apparatus organizations that have promulgated sample replacement schedules for fire and EMS apparatus, including the National Association of Emergency Vehicle Technicians (NAEVT), Fire Department Safety Officers Association (FDSOA), the National Fire Protection Association (NFPA), and the Fire Apparatus Manufacturer's Association (FAMA).

FAMA developed the "Fire Apparatus Duty Cycle White Paper" in 2004. The paper is an in-depth analysis of many aspects of apparatus replacement, including the key factors to be considered in a typical apparatus replacement schedule including:

- Type of department;
- Fire department workload;
- Population served;
- Demographics served; and,
- Topography of region served

Sample FAMA Apparatus/Vehicle Replacement Consideration Guidelines are as follows:

Excellent Condition (E)

- Less than five years old
- Fewer than 800 engine hours
- Fewer than 25,000 miles
- No know mechanical defects
- Very short downtime and very few operating expenses
- Excellent parts availability
- Very good resale value
- Meets all present NFPA 1901 and 1911 edition safety standards

Very Good Condition (VG)

- More than five but less than ten years old
- More than 800 but fewer than 1600 engine hours
- More than 25,000 but fewer than 50,000 miles
- No known mechanical or suspension defects present
- Low downtime and above average operating costs
- Good parts availability
- Good resale value
- Meets NFPA 1901 and 1911 safety standards

Good Condition (G)

- More than ten but less than 15 years old
- Some rust or damage to the body or cab
- More than 1,600 but less than 2,400 engine hours
- Some existing mechanical or suspension repairs necessary
- Downtime and operational costs are beginning to increase
- Parts are still available but getting difficult to find
- Resale value decreasing
- Meets all NFPA 1901 and 1911 safety standards

Fair Condition (F)

- More than 15 but less than 20 years old
- Rust, corrosion, or body damage apparent on body or cab
- More than 2,400 engine hours
- More than 75,000 but fewer than 100,000 miles
- Existing mechanical or suspension repairs necessary
- Downtime is increasing and operational costs are above historical average
- Parts become harder to find and/or obsolete
- Very little resale value
- Does not meet all NFPA 1901 and 1911 safety standards

Poor Condition (P)

- More than 20 years old
- Rust, corrosion, or damage to the body of cab impacting use of the apparatus
- More than 2,400 engine hours or 100,000 miles
- Existing mechanical or suspension problems affecting operation of the apparatus

- Downtime is exceeding in-service availability
- Operational cost are exceeding the resale value
- Parts are obsolete
- Does not meet all NFPA 1901 and 1911 safety standards

Average Apparatus Service Life

There are numerous resources available for reference to the average active and reserve life of emergency vehicles. The FAMA, "Fire Apparatus Duty Cycle White Paper" (2004) reflects the following:

Average Expected Years of Apparatus in Active Service

	Urban	Suburban	Rural
Pumper	15	16	18
Aerial	18	19	21

Average Expected Years of Apparatus in Reserve Service

	Urban	Suburban	Rural
Pumper	10	11	14
Aerial	9	10	13

Average Expected Years of Service Life (Active Reserve)

	Urban	Suburban	Rural
Pumper	25	27	32
Aerial	27	29	34

The Fire Apparatus Manufacturers Association suggests that the active service life of an urban pumper is 15 years. Active pumpers in serviceable condition could move to reserve status, as needed, when reaching their urban (15 years) life span. For purposes of this Study the Portland Fire Department first response district is considered an urban area.

Applying the Fire Apparatus Manufacturers Association's formula to Portland Fire Department's urban aerial ladder trucks suggests the average expected years of active service to be 18. Heavy rescue trucks typically align with the aerial ladder truck replacement schedule.

The Henrico (VA) Fire Department recently implemented a different rationale for the determination of the replacement of fire department vehicles.[2] The rationale involves the comparison of the life-to-date maintenance costs to the original vehicle acquisition costs. Their philosophy is one of not asking taxpayers to invest more money in the maintenance of a fire department vehicle than what they originally paid for it. They call it the ratio of maintenance to acquisition or M:A. They remove their front-line units from service when the M:A reaches 60 percent. This effectively means the vehicle has a 40 percent M:A equity remaining to serve as a reserve unit.

The Fleet Services Division has the data retention capability to initiate the retention of all maintenance cost for the life of fire department vehicles to determine M:A ratios based on the excellent fleet management reports provided to the Study Team. Policymakers could determine the M:A percentage benchmarks for movement to reserve status or replacement.

These sample replacement schedules are illustrations of the apparatus capital planning considerations required of every fire department. It should be noted that planning and decision making leading to the replacement of apparatus should begin at least two years prior to the planned replacement year and based on either years of service or the condition of the unit. The intent is that the unit should, in fact, be physically replaced in the service life year. Experience has shown that it may take nearly two years to plan, obtain approval/funding, and take delivery of the new unit from the manufacturer.

While the Portland Fire Department has not promulgated a formal fire and EMS apparatus and vehicle replacement plan, the City Manager's *Recommended General Fund Capital Projects* process delineates City-wide capital recommendations that include the fire department fleet. Figure 5.2 identifies the City Manager's fleet recommendations for FY2013 through FY2017:

[2] McDowell, Tony, *No More Guess Work*, Fire Chief Magazine, October 2012.

Figure 5.2
CITY MANAGER'S RECOMMENDED GENERAL FUND CAPITAL
FIRE DEPARTMENT VEHICLE PROJECTS
2013-2017

Fiscal Year Replacement	Vehicle	Year Acquired	Projected Years of Svc	$ Budgeted
2013	MEDCU 6	2008	5	$225,000
	Engine 9	1998	15	675,000
	Car 41	1995	18	15,000
	Service Truck 7	1998	15	35,000
				$950,000
2014	MEDCU 5	2010	4	225,000
	Car 2	2006	8	50,000
	Car 1	2006	8	50,000
	Rescue 1	1999	15	1,000,000
				$1,325,000
2015	Car 3	2006	9	50,000
	MEDCU 4	2010	5	225,000
	Ladder 1	1993	22	1,500,000
	Car 7	2006	9	50,000
	Car 62	1995	20	30,000
				$1,855,000
2016	MEDCU 3	2012	4	225,000
	Engine 11	2000	16	700,000
				$925,000
2017	Car 64	1999	18	30,000
	MEDCU 4	2008	9	225,000
	Ladder 4	2000	17	1,500,000
				$1,755,000

Source: Portland City Manager

The City Manager's recommendations include a subtle fire department vehicle replacement schedule as follows:

Pumpers @ $700.000 each	15-16 years
Ladder Trucks @ $1,500,000 each	17-22 years
MEDCUs @ $225,000 each	4-9 years
Staff Automobiles @ $50,000 each	8-9 years

This replacement schedule is commensurate with industry-wide practices, especially when considering response vehicle workload assignments and the practice of moving certain "first line" units "back" to provide a "reserve" fleet.

Portland Fire Department Apparatus Replacement Process

The Apparatus and Equipment Deputy Chief provides the oversight to the Department's apparatus and equipment replacement process. While there is no formal apparatus replacement schedule, the Apparatus and Equipment Deputy Chief envisions a five to ten year process. Generally, the Study Team understands and agrees with the approach that, as an annual item, a MEDCU is replaced every other year.

Commensurate with the budget schedule and the informal process, the Deputy Chief establishes an apparatus committee usually comprised of the Deputy, two Fleet Service Division members, a Finance representative, and the Captain and crew members of the unit being replaced. The captain and crew members are invited but generally not to participate as compensation is not available. MEDCU unit members are invited when a MEDUC unit is being replaced.

The apparatus or MEDCU needs are determined and specification drawn for internal review by the Fire Chief and other appropriate fire department representatives.

PFD has entered into a five-year arrangement with the Seagrave Fire Apparatus Company after an extensive specification effort was completed by the department. All fire apparatus acquired for the next five to ten years will be purchased from Seagrave in an effort to standardize body and hose bed layouts, parts inventories, maintenance procedures and the use of Waterous pumps.

PFD should review and evaluate current purchase specifications development and selection practices and identify any opportunities for improvement. This evaluation should examine how the operation requirements of PFD, especially practices and conditions unique to Portland, and the maintenance and repair experience of the Department with specific makes and models of vehicles in the development of vehicle specifications. The findings of this evaluation should be used as the basis for developing and implementing formal vehicle specification and acquisition policies and procedures.

The replacement data identified in the City Manager's *Recommended General Fund Capital Vehicle Project* was melded with the Fire Apparatus Manufacturer's Association data to produce the following illustrative chart addressing a sample replacement schedule for the Department's primary response units (Engines, Ladders, Rescue and MEDCUs). Other factors, such as unit assignment, age, engine hours, mileage, and maintenance costs, etc. would have to be introduced for a more definitive, formal replacement schedule. The main purpose of the illustration is to identify the planning and funding considerations and requirements of the Department fleet.

Figure 5.3
ILLUSTRATIVE ENGINE, LADDER, RESCUE, MEDCU LIFE EXPECTANCY AND REPLACEMENT COST CHART

Unit	Year	Mileage	Engine Hours	*Life Expect Years	Current Age Years	**Condition	Replace Year	***Replace Cost	Annual Contrib	Current Cash Req
Engine 1	2001	66000	7454	15	12	G	2016	700,000	46,667	560,004
Engine 2	1992	133882	16580	15	21	P	Overdue	700,000	0	700,000
Engine 4	2011	10683	1142	15	2	E	2026	700,000	46,667	93,334
Engine 5	2011	17035	2123	15	2	E	2026	700,000	46,667	93,334
Engine 6	2000	102861	10277	15	13	G	2015	700,000	46,667	606,671
Engine 9	1998	95780	11017	15	15	F	2013	700,000	0	700,000
Engine 10	1999	14268	1663	15	14	G	2014	700,000	46,667	653,338
Engine 11	2000	105047	8465	15	13	G	2015	700,000	46,667	606,671
Engine 12	2004	6636	6335	15	9	VG	2019	700,000	46,667	420,003
Engine 13	1996	62801	6920	15	17	F	Overdue	700,000	0	700,000
Engine 14	1988	25419	25419	15	25	P	Overdue	700,000	0	700,000
Engine 15	2004	4278	4278	15	9	VG	2019	700,000	46,667	420,003

Ladder 1	1993	85154	13583	18	20	F	Overdue	1,500,000	0	1,500,000
Ladder 3	2013	0	0	18	0	E	2031	1,500,000	83,333	0
Ladder 4	2000	26321	9793	18	13	G	2018	1,500,000	83,333	1,083,329
Ladder 5	1994	30416	3714	18	19	F	Overdue	1,500,000	0	1,500,000
Ladder 6	2001	54031	8738	18	12	G	2019	1,500,000	83,333	999,996
Ladder 12	1998	58383	13754	18	15	F	2016	1,500,000	83,333	1,249,995
Rescue 1	1999	15134	9333	18	14	G	2017	1,000,000	55,556	777,784
MEDCU 3	2012	6034	457	5	1	E	2017	225,000	45,000	45,000
MEDCU 4	2010	43432	3684	5	3	E	2015	225,000	45,000	135,000
MEDCU 5	2010	23708	3123	5	3	E	2015	225,000	45,000	135,000
MEDCU 6	2008	44907	16557	5	5	E	Overdue	225,000	0	225,000
MEDCU 7	2007	88945	8496	5	6	VG	Overdue	225,000	0	225,000
MEDCU 8	2004	88107	12959	5	9	VG	Overdue	225,000	0	225,000
MEDCU 9	2008	128343	18373	5	5	E	2013	225,000	45,000	225,000
MEDCU 12	1987	76387	-	5	26	P	Overdue	225,000	0	225,000
MEDCU 13	1999	104928	-	5	14	P	Overdue	225,000	0	225,000
MEDCU 15	1999	117176	-	5	14	P	Overdue	225,000	0	225,000
TOTAL									$942,224	$15,254,462
Source: Portland Fire Department										
*Portland City Manager's Recommended General Fund Capital Vehicle Projects										
**Fire Apparatus Duty Cycle White Paper, 2004, FAMA, E=Excellent, VG=Very Good, G=Good, F=Fair, P=Poor										
*** Portland City Manager's Recommended General Fund Capital Vehicle Projects										

APPARATUS AND EQUIPMENT MAINTENANCE

"A properly maintained and tested emergency response vehicle will provide the agency with a safe, ready-to-use vehicle with a minimum of unscheduled down time." Compliance with the N.F.PA., 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus,* will provide the department with a comprehensive emergency response vehicle maintenance, inspection, testing and replacement program.

The need to have fully inspected tested and maintained emergency response vehicles (and equipment) is unprecedented. Recent emergency response vehicle accidents and lawsuits

have brought to the forefront the need for a professionally maintained fleet. A poor preventative maintenance (PM) program, no PM program at all, and/or unqualified technicians is a recipe for disaster. Any of these issues may lead to unsafe vehicles, increased maintenance costs and reduced apparatus life.

Along with these negatives, come the risk of accidents, lawsuits, lower morale and public distrust. Firefighter safety is of the utmost concern, and poorly maintained emergency response vehicles put everyone at risk. An accident caused by loss of brakes or broken components would be devastating.

The heartache of a Line of Duty Death (LODD) is followed by board of inquiries, legal investigations and NIOSH investigation into the cause of the accidents. Every aspect of the vehicle and agency will be looked at including, but not limited to, records, documentation, and qualifications of technicians, fleet department operations, testing, operator training and department policies.

The publicity following an accident is negative for the department and personnel. No one wants to see a picture of a ladder truck driven into a building or have to answer in court why NFPA 1911 (a national accepted ANSI standard) was not used to ensure the apparatus was maintained properly, tested and safe to operate.[3]

In-Station Maintenance

On-duty firefighter/paramedic crews provide the daily and routine checks and inspections of the Department's vehicles, tools, appliances and equipment under their respective company officers. Those minor maintenance matters that cannot be addressed at the station level are administratively forwarded to the Fleet Services Division for disposition. A Fire Department and Fleet Services Division consensus determination is made whether or not the matter will require taking the vehicle or equipment to fleet maintenance, out of service or whether it is of a minor nature where the vehicle or equipment may remain safely in-service.

Central Facility Maintenance

The Fleet Services Division is staffed with 24 positions including a dedicated Fire Equipment Specialist supplemented by 13 mechanics, an auto-body repair worker,

[3] *IAFC, White Paper, Apparatus Maintenance*

welder, parts manager, machine shop foreman and a vehicle maintenance supervisor among others.

Routine scheduled maintenance of the fire department fleet is accomplished as prescribed by the manufacturer's requirements. This may be at the Fleet Maintenance Shop, at the assigned station and/or an outside vendor.

Marine Division Maintenance

The routine boat and associated equipment maintenance program for the Marine Division boats is the responsibility of the assigned boat Captains (Lieutenants) under the Deputy Chief responsible for the Marine and Aviation Divisions. Apparently this arrangement, however, has resulted in the level of the boat maintenance being inconsistent from shift to shift depending upon the training and experience of the Marine Captain (Lieutenant) on duty. This has been especially true when there is a Captain or Lieutenant vacancy or extended absence. Maintenance that cannot be handled at the Captain/Lieutenant level is contracted to an outside vendor.

The routine checks and inspections of the apparatus, tools and appliances assigned to the island fire/EMS stations are accomplished by the firefighter/paramedic assigned to Peaks Island and/or the Fire Boat crew for the other islands.

The Marine Division boat and equipment maintenance budget is shown in Figure 5.4.

Figure 5.4
PORTLAND FIRE DEPARTMENT, MARINE DIVISION MAINTENANCE AND REPAIR BUDGET, FY11-FY13

Budget	FY11	FY12	FY13
Maintenance/Repair	$18,200	$34,400	$54,750
Small Tools/Equip	4,000	4,000	4,000
Supplies	4,000	4,000	4,000
Fuel	25,935	29,925	31,025
Propeller Replace			10,000
TOTAL	**$52,135**	**$72,325**	**$103,775**

Source: Portland Annual Budgets

The PFD should consider conducting an activity-based cost analysis of the Department's fleet and equipment maintenance and develop a process for distributing the costs of the vehicles and services consumed to each company and division that consumes them.

The objective of this process is to increase awareness of and accountability for the costs of the resources fire companies consume. Increasing fire department fleet and equipment users' understanding of cost and resources necessary to maintain the fleet and equipment can only increase the safety and reliability of the fleet.

Figure 5.5 shows the Fleet Services Division Shop's labor and parts costs; hours; and outside vendor costs for the Fire Department for the five-year period of January 1, 2008, through December 31, 2012.

Figure 5.5
PORTLAND FIRE DEPARTMENT FLEET MAINTENANCE
COSTS & LABOR HOURS
JANUARY 01, 2008 - DECEMBER 31, 2012

	Costs	Annual Average Costs	Hours	Annual Average Hours
MEDCU				
Labor	$82,430.82		3,342.69	668.54
Parts	132,817.92			
Vendor	44,760.01			
Sub-Total	$260,008.75	$52,001.75		
FIREFIGHTING				
Labor	192,665.67		7,831.55	1,566.31
Parts	543,918.76			
Vendor	171,060.22			
Sub-Total	$908,169.65	$181,633.93		
ADMIN				
Labor	5287.84		214.43	42.87
Parts	9,735,16			
Vendor	1,539.00			
Sub-Total	$16,562.00	$3,312.40		

ISLANDS				
Labor	10,819.09		438.73	87.75
Parts	15,945.43			
Vendor	1,539.00			
Sub-Total	$27,184.52	$5,436.90		
SPECIAL SVCS				
Labor	13,427.65		545.22	109.04
Parts	16,208.90			
Vendor	5,414.56			
Sub-Total	$35,051.11	$7,010.22		
Grand Total	**$1,246,976.03**	**$249,395.21**	**12,372.62**	**2,474.52**
Source: Portland Fleet Services Division				

Figure 5.6 shows the Fleet Maintenance Shop's documentation of fuel consumption and cost for the Fire Department for the five-year period of January 1, 2008, through December 31, 2012.

Figure 5.6
PORTLAND FIRE DEPARTMENT FUEL CONSUMPTION AND COST
JANUARY 01, 2008 - DECEMBER 31, 2012

	Gallon Consumption	Average Annual Consumption	Cost	Average Annual Cost
MEDCU				
Diesel	59,293.12		$175,767.41	
Unleaded	22,162.80		56,070.16	
Sub-Total	81,455.92	16,291.18	$231,837.57	$46,367.51
FIREFIGHTING				
Diesel	125,054.42		370,537.19	
Unleaded	9,679.30		23,320.48	
Sub-Total	134,733.50	26,946.70	393,857.67	$78,771.53
SPECIAL SVCS				
Diesel	351.10		1,017.19	
Unleaded	11,323.80		28,754.22	
Sub-Total	11,674.90	2,334.98	$29,771.41	$5,954.28
ADMIN				
Unleaded	15,397.00		39,527.76	
Sub-Total	15,397.00	3,079.40	$39,527.76	$7,905.55
GRAND TOTAL	**243,261.32**	**48,652.26**	**$694,994.41**	**$138,998.88**
Source: Portland Fleet Services Division				

Fire Department fuel costs continue to increase. This is especially true with the increased service demands upon the MEDCU vehicle and the large apparatus associated with firefighting. There are a number of options available to PFD that may be implemented by policy to conserve fuel consumption.

Examples of these options are as follows:

- Do not allow vehicles to sit at idle when practical and appropriate.
- Do an analysis to confirm the PFD "standard of cover" is commensurate with the Department's mission and the City's risk.
- Do an analysis to confirm the PFD BLS/ALS resource response is commensurate with service needs.
- Reduce the number of needless and false fire protection system actuations.
- Review the need for "take home" vehicles.
- The use of hybrid and/or alternative fuel staff vehicles
- The use of smaller staff vehicles
- Make every effort to take the least number of staff vehicles possible to training, meetings and other official gatherings.

TOOLS, APPLIANCES AND EQUIPMENT ACQUISTION & MAINTENANCE

"Best practices" as well as the Insurance Services Office (ISO) require that all automotive fire apparatus be equipped commensurate with N.F.P.A. *Standard 1901, Standard for Automotive Fire Apparatus.* This requirement pertains to reserve apparatus as well.

PFD should confirm that all automotive fire apparatus meets the N.F.P.A 1901 equipment inventory requirement.

The acquisition and replacement of tools, appliances and small equipment is overseen by the Apparatus and Equipment Deputy Chief. This process is "driven" by the City's budget cycle when the Deputy Chief seeks the input of Company Captains and EMS members to formulate the Department's needs for the next budget year.

The Marine Division tools, appliances and small equipment needs are submitted to the budget process through their Deputy Chief.

Maintenance of the Department's tools, appliances and small equipment is initially accomplished by the on-duty firefighters and paramedics as supervised by their company

officers. Routine maintenance needs are usually determine during daily apparatus and equipment checks or when returning from incidents. Station Captains and Lieutenants facilitate regularly schedule maintenance for these items as required by the manufacturers or "fair wear and tear."

Maintenance of tools, appliances and small equipment that is beyond the company level is referred to the Fleet Services Division.

Figure 5.7 illustrates how required tests for apparatus, tools and hose are accomplished by PFD.

Figure 5.7
REQUIRED APPARATUS, TOOLS AND HOSE TESTS

Test	Frequency	Assignment
Pumper Test	Annual	Company Captain and the Fire Equip Specialist
Aerial Test	Every Other Year	Underwriter's Lab Representatives
Ground Ladders	Annual	Call Back Lts and FFs
SCBA Flow Test	Annual	One Tech per Shift
SCBA Facepiece Fit Test	Annual	Assigned Captain
Hose Testing	Annual	Company Personnel
Island Hose Testing	Annual	Fire Boat Crew
Source: Portland Fire Department		

Apparently PFD performs its aerial test on an every-other-year basis. This test should be performed annually commensurate with N.F.P.A. Standard 1911.

APPARATUS AND EQUIPMENT POLICIES AND PROCEDURES

The Study Team was provided with the *Portland Fire Department Standard Operating Guidelines* pertaining to apparatus and equipment. Figure 5.8 lists the guideline numbers and titles.

Figure 5.8
STANDARD OPERATING GUIDELINES FOR APPARATUS AND EQUIPMENT

Guideline Number	Guideline Title
4.1.5.1	Use of Spare Fire Apparatus
4.1.4.5	Hose Loads for Engine Companies
5.1	Gear Inspections
5.1.1	Gear Inspection Criteria
6.1.5	Anti-Idle Policy
6.1.9	Unsafe Vehicles
7.5.2	Procedure for Repairing Hose
Source: Portland Fire Department	

A number of important apparatus and equipment standard operating guidelines are missing from the PFD manual. The Study Team suggests that the PFD, as soon as practical, conduct an analysis of their current standard operating guidelines as they relate to apparatus and equipment acquisition and maintenance and associated safety considerations. As a result of this analysis the Department should assign the appropriate staff to identify those standard operating guidelines that have been omitted or are missing and initiate the process, in priority, to promulgate a complete and updated library of guidelines.

An example of subjects for apparatus and equipment guidelines to be considered for inclusion in the PFD Policies and Procedures manual are as follows:

- Self-Contained Breathing Apparatus
- P.A.S.S. Devices
- Protective Equipment and Safety Equipment
- Service Requests and Work Orders
- Supplies Request
- Equipment Safety Inspections
- Lost/Destroyed/Damaged/Stolen Equipment
- Private Use of Fire Department Property

- Fueling of Apparatus
- Use and Operation of Washer/Extractor
- Apparatus Inventory
- Defibrillators
- Testing of Air and Oxygen Cylinders
- Hose Test Procedures
- Life Rope Inspections
- Labeling Contaminated EMS Equipment
- Check sheets and Worksheets
- Apparatus Standards
- Tools and Equipment
- Ladder Tests
- Fit Tests
- Pump Tests
- Aerial Tests

SUMMARY

Fire apparatus is an emergency vehicle that must be relied on to transport firefighters safely to and from an incident and to operate reliably and properly to support the mission of the fire department. Tools, appliances and equipment must be ready to use when needed.

Apparatus and equipment that break down at any time during an emergency operation not only compromises the success of the operation, but jeopardizes the safety of the firefighters relying on that resource to support their role in the operation. Old, worn-out, or poorly maintained fire apparatus and equipment should have no role in providing emergency services to a community.

The Commission on Fire Accreditation International (CFAI) provides criteria and a number of performance measures relating to apparatus and equipment and their maintenance. With minor exceptions, as addressed in the Chapter recommendations below, the Portland Fire Department meets or exceeds the apparatus and equipment criteria and performance indicators promulgated by the CFAI.

RECOMMENDATIONS

5-1 The City and Fire Chief should conduct an analysis of its current standard operating guidelines as they relate to apparatus and equipment acquisition and maintenance and associated safety considerations, as soon as practical.

5-2 The City and Fire Chief should develop and implement a formal, optimal replacement cycle policies for each of the key types of apparatus in the fleet using a recognized life cycle cost analysis technique.

5-3 The City and Fire Chief should develop and implement formal, optimal replacement cycle policies for required tools, appliances and equipment using a recognized life cycle cost analysis technique.

5-4 The City and Fire Chief should conduct an activity based cost analysis of PFD fleet maintenance and services as a basis to develop a process for distributing the cost of the vehicles and services consumed to each company and division that consumes them.

5-5 The City and Fire Chief should conduct an activity based cost analysis of PFD tools, appliances and equipment maintenance and services as a basis to develop a process for distributing the cost of the tools, appliances and equipment consumed to each company and division that consumes them.

5-6 The Fire Chief should develop and implement a Department-wide policy for the conservation of vehicle fuel.

5-7 Develop and implement a formal Marine Division boats, tools and equipment maintenance policy, including appropriate training for Marine Division personnel.

5-8 The Fire Chief is encouraged to conduct aerial ladder tests in compliance with N.F.PA., 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus*

5-9 The Fire Chief should confirm that all automotive fire apparatus equipment inventory is in compliance with N.F.P.A. 1901, *Standard for Automotive Fire Apparatus*.

5-10 The Fire Chief should consider assigning the PFD fire apparatus and equipment acquisition and maintenance oversight responsibility to a senior officer that is not required to manage a fire department rotating shift.

CHAPTER SIX
EMERGENCY MEDICAL SERVICES

This chapter includes sections on the history of Emergency Medical Services (EMS) in the United States, the delivery of EMS in the State of Maine, and the delivery of EMS in the City of Portland.

OVERVIEW

The delivery of quality emergency medical care is one of the most basic services that a local government must ensure is available to its citizens. The actual delivery of such service is just one component of an EMS system. An EMS system consists of those organizations, resources, and individuals from whom some action is required in order to ensure a timely and medically appropriate response to medical emergencies. The basic goal of an EMS system is to get the patient to a definitive care facility in a timely manner so that no further harm occurs to the patient. Although an EMS system does not stop when the patient arrives at the hospital door, the delivery of pre-hospital care and patient transport are the most complex components of a community's EMS system. Traditionally, there are 13 recognized essential elements of the pre-hospital component of an EMS system.

1. Prevention and early recognition;
2. Bystander action and system access;
3. Call taking and dispatching function;
4. Telephone protocols and pre-arrival instructions;
5. First responder dispatch;
6. Ambulance dispatch;
7. First responder services;
8. Ambulance services—basic and advanced life support;
9. Direct on-line medical control;
10. Transport;
11. Receiving facility interface;
12. Off-line medical control; and,
13. Record keeping and evaluation.

Emergency medical care can be delivered through a variety of methods, which include: contracting the service through a private ambulance company; delegating the service to a

volunteer agency in the community; providing direct service through government employees; or any combination of the above.

As EMS in the United States has evolved, so have the different models or profiles of organizational structures for the delivery of the service. In the early 1980s, the United States Fire Administration published Fire *Service/EMS, A Program Management Guide*. This publication identified 28 different profiles for the delivery of EMS. Twenty-six of the profiles included participation of the fire department in some aspect of the pre-hospital EMS system. Each profile has its own particular strengths and weaknesses. The profiles, identified thirty years ago, still accurately portray fire service based EMS today. The original profiles identified in the *Management Guide* are built around five primary variables:

1. Dual-role vs. cross-trained vs. "civilian" providers;
2. Career only vs. career & volunteer vs. volunteer only organizations;
3. First responder vs. EMT vs. paramedic certifications;
4. Transporting units vs. non-transporting units; and,
5. Engine or truck company first response vs. no engine or truck company first response.

These variables can be combined into 52 different ways of EMS delivery; it is most likely that every variable has been tried and is probably in service today somewhere in the United States. The variables also can be pieced together as necessary to meet the needs and resources of a particular community. Many jurisdictions have started out with one profile and changed to another as their EMS systems have grown and resources shifted.

The combination of these variables can be classified into one of four main categories of pre-hospital emergency medical service delivery:

1. *Third-Party Service.* EMS services are delivered by a separate public safety agency that usually holds equal status with other agencies in the community, such as the fire department and police department. Career, volunteer, or a combination of career and volunteer personnel may provide these third-party services. (The City of Portland's MEDCU service was a third-party service prior to 1997. Approximately 19% of Maine's transport providers deliver service as a third-party municipal service.)

2. *Hospital-based Service*. EMS services are delivered from a medical facility, normally a local or regional hospital. Personnel delivering the services are usually hospital or health care system employees and hospital funding commonly supports the services. (Approximately 8% of Maine's transport providers deliver service through a hospital-based service.)

3. *Private Service.* EMS services are delivered by a privately owned company for a fee, on a for-profit basis. A local government would most likely enter into a written agreement with the private ambulance company identifying the level of services provided and cost of said services. (Private ambulance companies account for less than 7% of the service providers in Maine.)

4. *Fire Department-based Service.* EMS services are delivered by fire department personnel (career, volunteer, or combination). Fire department personnel are trained as EMS care providers and are equipped to provide care and transport for sick and injured patients. (By far, fire department-based EMS is the most popular [40%] delivery model in Maine.)

COMMISSION ON FIRE ACCREDITATION INTERNATIONAL (CFAI)

The Commission on Fire Accreditation International (CFAI) emphasizes the importance of emergency medical services delivery in today's fire department operations. Progressive fire departments use this criterion, and others, as a benchmark for determining the best practices for EMS delivery. The CFAI *Emergency Medical Service* Criterion Performance Indicators are provided below:

Criterion 5G: Emergency Medical Service (EMS)
There is an Emergency Medical Services program providing the community with a designated level of out-of-hospital emergency medical care.

Performance Indicators

1. Given the agency's "standard of response coverage" and emergency deployment objectives as described in Criterion 3A.2, the agency meets their response time, apparatus and equipment objectives for each type and magnitude of emergency medical deployment objective.
2. There is adequate staffing to meet agency objectives.

3. There is adequate apparatus and equipment to meet state and national standards.
4. There are adequate supplies and materials to meet the stated level of response.
5. There are standard operating procedures, standing orders, protocols and methods in place to meet the stated level of response.
6. There is an information system in place to record and analyze the effectiveness of the EMS program.
7. There is a patient care record maintained for each patient contacted by the EMS System. This report should contain patient history, incident history, data by which treatment was determined, rendered and the patient disposition recorded. The report should be protected from public access and maintained as per local and state records retention requirements.
8. There is an independent review of patient care records. On-line and off-line medical control is available to the agency. The agency has a quality assurance program in place.
9. On-line and off-line medical control is available to the agency.
10. The agency has a quality assurance program in place.

The Study Team considered the CFAI criteria during their assessment of Portland FD's delivery of EMS.

HISTORY OF EMS IN THE FIRE SERVICE

There is a long history of fire department involvement in the delivery of EMS services in the United States. As early as 1928, a few fire departments began providing first aid services to citizens suffering from heart attack symptoms or having trouble breathing. These services were provided with equipment that the firefighters carried to treat other firefighters who would be overcome with smoke at fire incidents. Later in the 1930s, fire departments began developing special vehicles that they used to provide assistance to citizens in their communities who became ill or injured. These specialized units included vehicles used for heavy rescue and extrication operations.

During the 1940s and 1950s, many fire departments continued to provide ambulance service, consisting primarily of basic first aid and transport operations. As new techniques were developed for the care of the ill or injured outside of the hospital setting,

fire departments in major cities such as Baltimore, Seattle, Los Angeles, Milwaukee, and Columbus were the first to implement the techniques.

In 1966, the National Traffic and Motor Vehicle Safety Act was passed authorizing the U.S. Department of Transportation to set EMS guidelines and establish the National Highway Traffic Safety Administration, which was charged with improving emergency medical services. As pre-hospital care started to become more sophisticated with the introduction of national standards for training of Emergency Medical Technicians (EMT) and Paramedics, fire department involvement in EMS grew throughout the United States.

In 2004, it was estimated that more than 60 percent of all fire departments in the United States were involved in providing some level of emergency medical service. Those fire departments that provided EMS services to their community found that at least 50 percent (and up to as high as 80 percent) of their total emergency incidents handled each year were EMS related.

In 2012, the Portland Fire Department (PFD) responded to over 15,000 calls for service or which 74% were EMS-related.

For a fire department to deliver quality EMS service, local government officials, fire department leadership, and EMS care providers must all embrace the importance of the service and must all understand the demands that a quality EMS program places on departmental resources.

The International Association of Fire Fighters (IAFF), one of the largest unions of the AFL-CIO, has taken a pro-active position on fire-based EMS delivery. To quote Harold A. Schaitberger, General President of the IAFF, "Fire department based EMS systems are—and will continue to be—the frontline responders for medical emergencies in the pre-hospital environment and the safety net for all citizens without access to primary care". In fact, in some U.S. communities, the delivery of EMS services is being returned to the local fire department after struggling with various models of private sector involvement.

Many leaders in the fire service at the national level believe that the fire departments that have been involved in the direct delivery of EMS services have also been the fire departments that have remained the most stable through the difficult up-and-down economic times of the last 20 years. The fire service has truly taken on an "all-hazards"

approach to its response capabilities in recent years and those fire departments that only respond to the report of fire are the fire departments that will continue to have their future in jeopardy.

A well-staffed, well-trained, and well-equipped fire engine can mean so much more to a community than just a fire response vehicle. If that vehicle is staffed with trained and equipped medical providers, it becomes the neighborhood first-aid unit that helps people with cut hands, broken bones, asthma attacks, and life threatening emergencies. Going on an EMS run should not be an inconvenience to a fire department; it should be an opportunity to aid and interact with the citizens that the department serves.

Every fire truck in the City of Portland is much more than a fire response vehicle – it delivers trained EMS providers – quickly – to the doorsteps of the community.

THE MODERN EMS AGENCY

The progressive EMS delivery agency is really a complex agency that has many customers—one of which is the patient receiving the care. EMS customers also include the patient's family; the citizens of the community; local medical professionals; the local hospital emergency room staff; trauma and specialty referral centers; local nursing and long-term care facilities; health care insurance providers; health care educators; 911 call takers and dispatchers; and, of course, the EMS providers themselves.

Modern EMS delivery is actually an aggressive EMS delivery that begins before the 911 call is initiated. Public health care awareness and injury prevention education are often delivered by local or regional hospital resources, as well as the EMS provider agency in hopes that the 911 call can be prevented, or at least made early in the event. In communities where public health care education has been prioritized as an important part of the EMS system, the result is quite often improved patient survivability and outcome. As a community's population changes in age and cultural composition, the need for public health care education grows increasingly more important.

When the 911 call is made, the progressive EMS agency will answer with an Emergency Medical Dispatch (EMD) trained call taker who will also provide pre-arrival instructions to the calling party so that basic lifesaving interventions can be started prior to the arrival of trained EMS providers. That progressive agency will have in place a tiered-type of response system that brings both basic and advanced life support services to the patient

within nationally accepted response time criteria. Ultimately, the patient will be properly diagnosed, treated, and transported to a medical facility capable of providing definitive care.

THE IDEAL CHAIN OF SURVIVAL EVENTS

In the "ideal" EMS system, a patient with a life-threatening medical emergency, such as a heart attack, should first encounter a family member or bystander who is CPR trained and who also recognizes the signs and symptoms of the medical emergency. The bystander or family member would activate the local EMS system through a 911 call and would initiate basic first aid and CPR care.

If needed, the EMD trained 911 call taker would provide nationally recognized pre-arrival care instructions via telephone while emergency responders were being dispatched. These pre-arrival instructions would continue until the arrival of the trained emergency responders. If this emergency was occurring in a public venue, such as a shopping mall or health club, an Automatic External Defibrillator (AED) would be immediately available for use along with an AED-trained staff member or security person.

The first emergency response personnel to arrive on the scene would be trained at least to the EMT-B (Basic) level and equipped with a first-aid bag, oxygen delivery equipment, and an AED. Within a few minutes, a trained paramedic (or two) would arrive with advanced life support equipment capable of providing cardiac monitoring, intravenous medication therapy, and advanced airway management techniques. Using standing medical protocols, the patient would receive a 12-lead electrocardiogram, lifesaving medications, and other cardiac therapies in order to diagnose and treat the medical emergency.

The patient would be stabilized, loaded into a transport unit and begin a short trip to a definitive care facility capable of handling cardiac emergencies. While en route to the care facility, the paramedics would consult via radio or telephone with emergency care physicians to obtain orders for further pre-hospital interventions. The patient would arrive at the care facility having received appropriate advanced life support care (ALS) within the delivery time criteria established by the American Heart Association.

Patient care would be transferred to the emergency room staff and an accurate and clearly written transfer report would be provided. The transfer would be seamless and timely and the care providers would ready their equipment for the next response with minimal delay.

Back at their station, the care providers would finalize any reports and file them using a computer-based data collection system. The data would be used for billing, State reporting, departmental analysis of service delivery, and EMS system master planning—in addition to simply documenting the incident.

Finally, a Quality Assurance staff member would review the care provider's written report for accuracy and protocol compliance and then send a customer service survey to the patient within 30 days of the incident.

As stated previously, how all these system components arrive in the time required is really a complex process that varies from community to community throughout the United States. When multiple agencies are required to provide the system components listed above, inter-agency cooperation and coordination are paramount to successful patient outcome. Should one component fail, then the system fails to provide the best care.

EMS IN MAINE

Maine EMS is the statuary emergency medical services agency of Maine. Maine EMS is a bureau within the Maine Department of Public Safety established to be the central agency responsible for the coordination and integration of all state activities concerning emergency medical services and the overall planning, evaluation, coordination, facilitation and regulation of EMS systems. The Maine EMS system includes: the Board of EMS, the Maine EMS staff, six regional EMS offices, and the Medical Direction and Practice Board.

Currently, EMS systems in Maine are regulated by Maine Emergency Services Act of 1982, which is Title 32, Chapter 2-B of the Maine Statutes.

Chapter 2-B regulations affect several areas of EMS system operations: licensing of ambulance and emergency first responder services; establishing training and certification requirements for each level of emergency care provider; and inspecting vehicles and equipment to ensure that they meet inventory and operational requirements.

There are four basic levels of EMS providers recognized in Maine with each level facilitating a hierarchy of emergency care.

1. *First Responder (FR):* Providers who are Maine EMS licensed First Responders operate in the pre-hospital environment to perform basic lifesaving interventions under limited supervision usually before the ambulance arrives. (PFD does not use FRs) Licensed First responders in Maine may perform the following skills:
    a. Oxygen administration
    b. Use of basic airway devices
    c. CPR
    d. Use of an AED
    e. Assist in uncomplicated childbirth
    f. Spinal immobilization
    g. Application of simple extremity splints
    h. Simple, emergency patient moves
    i. Vital signs assessment
    j. Control bleeding

2. *EMT-Basic (EMT-B).* EMT-Basic is considered the entry-level point for the majority of EMS providers in the State of Maine. A person must be licensed (at least) as an EMT-B in order to provide unsupervised care in the patient compartment of an ambulance. The EMT-B curriculum includes medical emergencies, trauma emergencies, pediatrics, obstetrics, EMS operations, special patient populations, and others. The Maine Spinal Assessment Program is also included in the EMT-B curriculum. EMT-B students must also complete observational clinical time in the hospital emergency department and an EMS agency ride-along.

    Once licensed, EMT-Bs must maintain their certification through a combination of refresher training and continuing education requirements. At the scene of emergencies, EMT-Bs are versatile care providers who can perform basic lifesaving functions such as AED use, CPR, basic airway management, bleeding control and bandaging, and the administration of certain controlled substances on a limited, life threatening only basis. In addition, the EMT-B is trained in fracture management, childbirth procedures, poisoning and overdose management, and other basic medical care procedures. The EMT-B is probably the most recognized

level of EMS training throughout the United States. EMT-Bs are often considered the workhorse of most any EMS service—public or private.

3. *Emergency Medical Technician-Intermediate (EMT-I)*. The functions of an EMT-I include the functions of an EMT-B plus advanced airway management, cardiac monitoring, manual defibrillation, intravenous/intraosseous therapy, basic pharmacology, and ALS operations. Clinical rotations occur both in the hospital and field. Hospital clinical includes rotations in the emergency department, operating room, intensive care unit, IV team, and respiratory therapy. Hospital clinical time is designed to build on skills learned in the classroom and lab settings as students begin to apply newly learned therapies under the supervision of a preceptor. Quite often, the EMT-I is used to supplement the more advanced trained EMT-Paramedic by providing a caregiver who can initiate intravenous therapy and advanced airway management techniques as well as assist with other ALS skills.

4. *Emergency Medical Technician-Paramedic (EMT-P).* The functions of the EMT-P include the functions of the EMT-B and the provision of advanced life support techniques related to the treatment of cardiac and respiratory emergencies, major trauma, and other life threatening events. The EMT-P operates under the direct and indirect medical control of a licensed emergency care physician to provide such lifesaving interventions as controlled substance administration, endotracheal intubation, needle cricothyrotomy, CPAP, electrocardiogram, cardiac pace making, etc. Next to the quick deployment and actions of an AED-equipped EMT-B, the EMT-P is the EMS care provider most likely to make a significant difference in the outcome of a critical patient in the pre-hospital setting. In many locations across the United States, the generally accepted standard of care in the EMS industry is to deliver two, EMT-Ps to the scene of every life threatening medical or trauma-related emergency.

Any agency delivering EMS services in Maine must understand the organization of the Maine EMS system. It is impossible to provide services without knowing the roles and responsibilities of all the agencies and players involved, and it is equally important that provider agencies be active participants in local, regional and State councils and committees.

EMS IN PORTLAND

The history of EMS delivery by the Portland Fire Department (PFD) dates back to at least 1975 where EMS was using the "third service" model with units housed in PFD fire stations. Known as MEDCU (Medical Crisis Unit), the service began with two transport ambulances that provided basic life support care and transport. In the early 1980s, the level of care on the MEDCUs was raised to the EMT-Paramedic level, and in the early 1990s, a third MEDCU was added due to increased call volume.

In 1997, MEDCU was merged into the PFD with the intent of improving the level of service provided to the community as well as improving the pay and benefits of the EMS workers. The merger of MEDCU into the PFD was a critical point in the history of the fire department, and even though it occurred over 15 years ago, some issues still exist today regarding the integration of the paramedics into fire department operations. To quote a number of PFD personnel, "The merger was never completed". More discussion on this topic will be presented later in this chapter.

Today, the PFD operates four MEDCU units out of three fire stations. These units are staffed 24 hours a day with at least an EMT-I and an EMT-P. In 2012, the MEDCU units transported almost 9,000 people to the hospital and in FY2013 they are projected to produce over $3 million in ambulance billing revenue.

Most of the PFD personnel interviewed by the Study Team reported the importance of EMS in the PFD. There were very few negative comments received about the PFD being involved in full-service EMS delivery, other than some internal issues relating to paramedic use and staffing. In fact, in speaking with PFD personnel, the Study Team found a strong belief by many that the department should not abandon MEDCU. Instead, the department should expand the service by increasing the number of MEDCUs operated.

Public Education and Early Recognition

The first important link in the American Heart Association's (AHA) Chain of Survival is the early recognition of a medical emergency. Public health education efforts in recent years have tried to focus the public's attention to the warning signs and symptoms of heart attack, cardiac arrest, stroke, and foreign body airway obstruction. In some

communities, public health care education is a joint effort involving several health care agencies and often includes the EMS system.

The PFD is a Maine HeartSafe Community, which is a State and national level recognition program based on the Chain of Survival. The purpose of the program is to recognize the excellent work being done by EMS programs throughout Maine, and to provide further opportunities to enhance community partnerships, resources and services to improve cardiovascular health, and decrease deaths due to cardiovascular-related events, including sudden cardiac arrest, heart attack and stroke.

To be designated a Maine HeartSafe Community, applicants must meet criteria that help improve cardiovascular health and decrease death and disability associated with cardiovascular events. The criteria are as follows:

- The EMS program and/or community partners must offer CPR training to their community members.
- The EMS program and/or community partners must offer cardiovascular-related education and/or awareness activities in their community.
- At least one emergency response designated vehicle must be equipped with an AED.
- Placement of at least one permanent AED with AED-trained personnel in public or private areas where many people are likely to congregate or be at higher risk for cardiac arrest (such as shopping malls, large employers, airports, etc.).
- Advanced Cardiac Life Support is dispatched to all priority medical emergencies, either as primary responders or as ALS backup.
- The EMS program has an ongoing process to evaluate and improve the Chain of Survival in their community.

The Study Team commends the PFD and its work for achieving certification as a Maine HeartSafe Community. There are only sixty-four HeartSafe Communities in the State of Maine, so the PFD and the City should be very proud of their efforts.

In addition to the PFD's delivery of EMS, the Study Team believes that the PFD should increase its EMS public education efforts in the community by becoming more involved in the delivery of citizen CPR. The Team also recommends that the PFD become involved in the State's Child Passenger Safety program by becoming a Car Seat Inspection and Education Location for the City of Portland.

EMS System Access

The second critical link in the Chain of Survival is easy access to 911 and activation of the EMS system. All of Maine has 911 as the dedicated emergency telephone number for police, fire, and emergency medical assistance; therefore, 911 is accessible to Portland residents. There appear to be no major issues with 911 access in Portland other than some language barrier issues, which is common in cities with such an ethnically diverse population. City of Portland residents have access to 911 using either the traditional hard-wire or cellular telephone systems.

Bystander Action

The third critical link in the Chain of Survival is the delivery of bystander CPR. In order for bystander CPR to be effective, there has to be a bystander present who is trained to administer CPR. As already discussed, in many communities where the fire department delivers EMS, the fire department is also involved in providing citizen CPR training. This training is often done in partnership with local health care facilities or civic organizations. Historically, in communities where CPR has been marketed, delivered, and accepted by the public, the survival rate of cardiac arrests has improved.

The PFD does not participate in public CPR education. The PFD should consider partnering with Maine Medical Center or Mercy Hospital to implement a citizen CPR program by offering CPR instruction on a regularly scheduled basis throughout the community. The program should be multilingual and should be in partnership with other local health care organizations. The program might even be able to be funded entirely through a public/private partnership.

Another link in the Chain of Survival is the early access to cardiac defibrillation for the correction of lethal heart dysrythmias. Originally, defibrillation was thought best in the hands of trained paramedics. As technology improved over the last decade, we now find the use of public access automatic external defibrillators (AEDs). The new AEDs are very simple to use and are practically failsafe in terms of accidental misuse. The Study Team learned that public access AEDs are widespread throughout the City as part of the HeartSafe Community program. The Study Team commends the parties responsible for the implementation of those public access AEDs.

911 Call-Taking and Dispatch

The PFD operates a joint dispatch center with the South Portland and Cape Elizabeth Fire Departments. (See Chapter 12: Communications and Dispatch for more information and recommendations concerning dispatch operations.) The communications center is the Public Safety Answering Point (PSAP) for all 911 calls within the Cities of South Portland, Portland and Cape Elizabeth. The center is staffed 24 hours a day to answer 911 calls and radio dispatch the fire and police departments.

When an emergency incident occurs in Portland, the patient or bystander can obtain help by calling 911. The 911 call is answered by a call-taker at the joint communications center and the process is set in motion by which the most appropriate resource is dispatched to handle the emergency event. Dispatchers at the communications center are trained and State Certified Emergency Medial Dispatchers (EMD) and the communications center is compliant with Maine Title 32 Chapter 2-B SS 85-A, which is in reference to emergency medical dispatch personnel.

The Study Team found one area of concern related to the PFD and the EMS call taking and dispatch functions for the PFD. While the dispatchers are EMD certified and the communications center uses ProQA EMD software (which is based on the Medical Priority Dispatch System), the PFD has chosen not to fully implement the EMD program and dispatcher capability. The result of this decision is the excessive dispatch of resources to relatively minor events, which in turn taxes response capabilities of those resources during times of peak call volume.

EMD works by prioritizing 911 emergency medical calls into call types and categories. For example, a simple nosebleed would be categorized as a 21-A-02 call type – or in simple terms, an Alpha call. More serious types of medical emergencies might fall into Bravo, Charlie, Delta, and Echo call types – with the Echo call type being the most life threatening and most likely requiring the greater number of emergency medical response resources.

In most communities that deliver fire-based EMS and that have fully implemented EMD, a single ambulance staffed with two EMT-Bs would respond to that Alpha nosebleed event described above. In Portland, a fire truck (engine, ladder, or heavy rescue) is dispatched on almost every Alpha call, along with a MEDCU unit staffed with ALS providers. Given the call volume and the demand for EMS in the City, the Study Team

feels that sending a fire truck on every Alpha call is not a good business practice or use of resources.

The Study Team repeatedly heard from PFD EMS providers during the employee interview sessions about the need to "fully implement EMD" and the need to reduce the number of times a fire truck responds on medical runs with the MEDCUs. The Team vetted the issue during interviews with numerous PFD officials and concurs that the PFD should be able to implement EMD to its fullest and deliver a tiered response of EMS resources based upon the call type and recommended dispatch of resources.

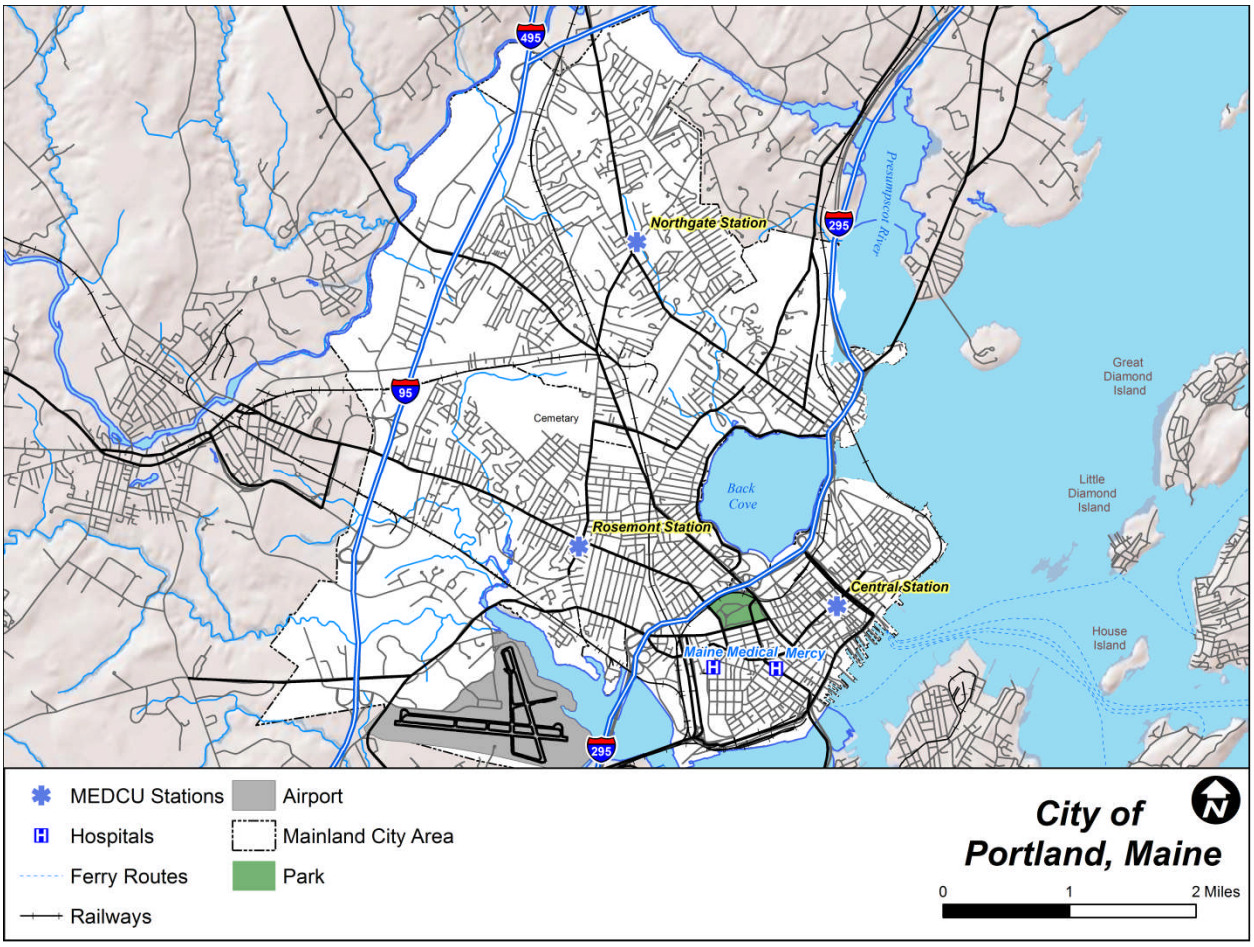
Therefore, the Study Team recommends that the PFD immediately begin work with the Medical Director and the communications center to fully implement EMD operations that will allow the dispatch of EMS resources using a tiered response format based upon call type. This recommendation includes the use of EMT-B staffed MEDCUs where appropriate.

EMS Provider Response and Patient Transport

All PFD EMS responders are cross-trained as firefighters. Currently, the department has 119 EMT-Bs, forty-eight EMT-Is, and fifty-nine EMT-Ps. The department operates four full-time EMS transport units (MEDCUs) out of three fire stations. MEDCU 3 operates out of the Rosemont Station located on Stevens Avenue, MEDCU 4 operates out of the North Deering Station on Allen Avenue, and MEDCU 5 and MEDCU 6 operate out of the Central Fire Station on Congress Street. (See Figure 6.1 for map of locations.)

The department operates a fifth MEDCU (MEDCU 7) on a limited basis, Monday through Friday each week from 0800 hrs to 1600 hrs for the purpose of non-emergency transports and as a backup to the four, full-time units. MEDCU 7 is staffed during those hours using off-duty PFD personnel who are compensated at a straight-time rate during the non-emergency transport hours. When MEDCU 7 is being used for a non-emergency transport, it is called the NET Team – or the Non-Emergency Transport Team. When the unit gets sent on an emergency run, its radio designation reverts to MEDCU 7 and staffers are compensated at an overtime rate. When not in use at all, MEDCU 7 is stored with Engine 11 at the East Deering Station.

Figure 6.1
FULL-TIME MEDCU LOCATIONS



There are five other MEDCUs staffed only on an as-needed basis. MEDCUs 8 and 9 are reserve units that are staffed using overtime and placed in service during special events such as the Old Port Festival and the Maine Marathon. There are three MEDCUs located on the islands and staffed primarily by volunteer personnel on an as needed basis. MEDCU 12 is located on Peaks Island and is staffed by the single, PFD career fire fighter from the Marine Division. This firefighter spends his or her entire 24-hour shift on Peaks Island unless needed for response on another island. The second provider on Peaks Island comes from the available volunteer staffing on the island.

MEDCU 13 is located on Great Diamond Island and MEDCU 15 is located on Cliff Island. Both units are staffed using volunteer personnel who live or work on the islands. In most cases, MEDCU 13 and MEDCU 15 will not have ALS capability until the arrival of an ALS provider from the PFD Fire/EMS Boat.

In 2012 the PFD MEDCUs ran over 11,000 calls and transported close to 9,000 patients.

Figure 6.2
ENGINE COMPANY AND MEDCU CREWS PROVIDE ALS CARE AT ONE OF THEIR MANY RUNS DURING A 24-HOUR SHIFT

In terms of the organization, the Emergency Medical Services Division of the PFD is headed by a Deputy Chief with a support staff of three officers and one firefighter/paramedic. The Deputy Chief works a traditional Monday to Friday administrative work schedule and has an office at Central Station.

Reporting to the Deputy Chief are a Captain, two Lieutenants, and a Firefighter/Paramedic. The Captain serves as the EMS Training Officer for the department and is responsible for tracking all licensure training and continuing education requirements for over 200 EMS providers. The EMS Training Officer is a licensed EMT-P and an Instructor Coordinator III. He has an office at Central Station and no administrative support staff.

A Lieutenant is in-charge of EMS Quality Assurance and Quality Improvement and another Lieutenant serves as the department's EMD Compliance Officer. Both

Lieutenants are licensed at the EMT-P level and each has an office at Central Station - also with no administrative support staff.

A Firefighter/Paramedic serves as the department's EMS Supply Officer with a collateral duty of managing electronic patient care reporting data. He too has an office at Central Station and no administrative support staff.

Prior to 2008, there was an EMS-Supervisor on-duty 24-hours a day – one per platoon. The position was known as Car 10 and it was staffed with a Lieutenant licensed at the EMT-P level. The responsibilities of Car 10 were many – the supervisor was basically the "go to person" for EMS related issues throughout the City and the PFD. A few of the responsibilities included:

- Coordinate MEDCU staffing with the on-duty Deputy Chief
- Oversee the NET Team and Wheelchair Van
- Schedule future NET transports with the Barron Center
- Respond to motor vehicle collisions with entrapment
- Respond to in district calls when units are responding from out of district
- Respond to all Priority 1 calls
- Respond to all Mutual aid calls
- Respond to all structure fires
- Respond to all mass casualty incidents
- Provide oversight of on-duty crews at Sea Dog events or Bike Team deployments
- Know MCI, Jetport and ICS and EMS sector roles
- Manage biohazard issues (needle stick injuries, exposures, etc.)
- Assist MEDCU crews as requested including driving and/or clean up at hospital
- Drive MEDCUs on priority calls to minimize stripping engine companies of personnel in outlying districts
- Restock engine companies with supplies as needed
- Fire Ground – contact Red Cross, Salvation Army and Metro as needed
- Fire Ground- setup rehab with second MEDCU
- Fire Ground- Callback incoming EMS Lieutenant for city coverage and facilitate third alarm overage utilization
- Fire Ground-assist Car 2 and 3 as needed
- Respond to customer complaints and document with official report
- Respond to extraordinary calls with extended scene time or multi agency involvement

- Know coverage policy for SRT call outs
- Keep informed and aware of needs of the Field Training Officer and trainee
- Assist Car 3 in any administrative task such as meeting attendance etc.
- Respond to Mercy Hospital and Maine Medical Center to serve as a liaison in the event of a mass casualty incident
- Participate in the Quality Improvement and Quality Assurance process as directed by the EMS Chief

In 2008, Car 10 was removed from service as part of a department-wide staffing reduction plan. Since that time, no on-duty supervisor has been dedicated to EMS activities. A number of the Car 10 responsibilities were defaulted to the on-duty platoon Deputy Chief and some of the responsibilities were shifted to the Deputy Chief in charge of the Emergency Medical Services Division. The company officers where MEDCUs were stationed assumed a few of the Car 10 responsibilities, and unfortunately, some of the Car 10 responsibilities went unmanaged. (Further discussion about Car 10 is presented later in this chapter.)

MEDCUs deliver ALS care by staffing each full-time unit with at least an EMT-I and an EMT-P. Prior to 2006, MEDCUs were routinely staffed with two EMT-Ps around the clock, but a cost savings measure was implemented to allow an EMT-I to replace one of the EMT-Ps in an effort to reduce personnel costs. Today, there may be times when two EMT-Ps are used to staff a MEDCU unit, but those instances would be limited.

Because MEDCU 7 is a part-time, emergency transport unit whose primary job is to perform routine transports, there is no requirement for staffing other than a licensed EMS provider. It is not uncommon for MEDCU 7 to be staffed with two EMT-B providers.

In Portland, when a high-priority 911 call is received (such as an unconscious person), the nearest fire truck (engine, ladder, or rescue) and MEDCU are dispatched. Upon arrival of the fire truck, BLS care (at a minimum) is initiated following standing medical protocols. The initial patient care crew will transfer care to the ALS-equipped MEDCU crew upon their arrival, and then both crews will provide a combined effort in patient care.

A fire truck in Portland quite often has a Firefighter/EMT-I or a Firefighter/EMT-P on it as part of its normal staffing complement (occasionally the officer is an ALS provider as well.) These positions are staffed as dedicated firefighter slots – they just happen to be

filled by a firefighter who also has an ALS certification. With 59 EMT-Ps and 48 EMT-Is, the probability of having an ALS licensed provider on that first arriving fire truck to an EMS call is pretty good. The presence of a second ALS provider often makes a huge difference when providing care for a critically ill or injured patient. (Further discussion of ALS providers on fire trucks occurs later in this chapter.)

EMS-Based Response Time Considerations

Time is one of the most important factors relating to patient outcomes in emergency medical situations. Rapid delivery of EMS is essential in the acute situation of cardio-respiratory arrest; a measurable factor is the time from heart stoppage and cessation of breathing (clinical death) to when irreversible brain damage begins (biological death). Although the time varies with patients and conditions, the generally recognized intervention time to prevent biological death is four to six minutes. Time is also critical in heart attacks, stroke, and major trauma where time interval recommendations for emergency crews have been established by the American Heart and Stroke Associations and by trauma surgeons.

NFPA 1710 Standard

There are a number of applicable NFPA standards and practices that include response time considerations important to labor and fire officials nationwide. NFPA 1710 (Standard for the Organization and Deployment of Fire Operations) response time-related provisions are described in the following sections.

NFPA 1710 is an industry standard that serves as a benchmark for the fire department organization and deployment of services offered by firefighters. It is the standard for paid/career fire departments that describes the requirements for delivery of services, response capabilities, incident management, and strategy.

This Standard includes the following benchmarks related to call receipt and processing time, turnout time, and response (travel) time:

- Turnout time of eighty seconds on fire suppression calls and sixty seconds for EMS calls;
- The fire department's fire suppression resources deployed to provide for the arrival of an engine company within a four-minute travel time and/or the initial

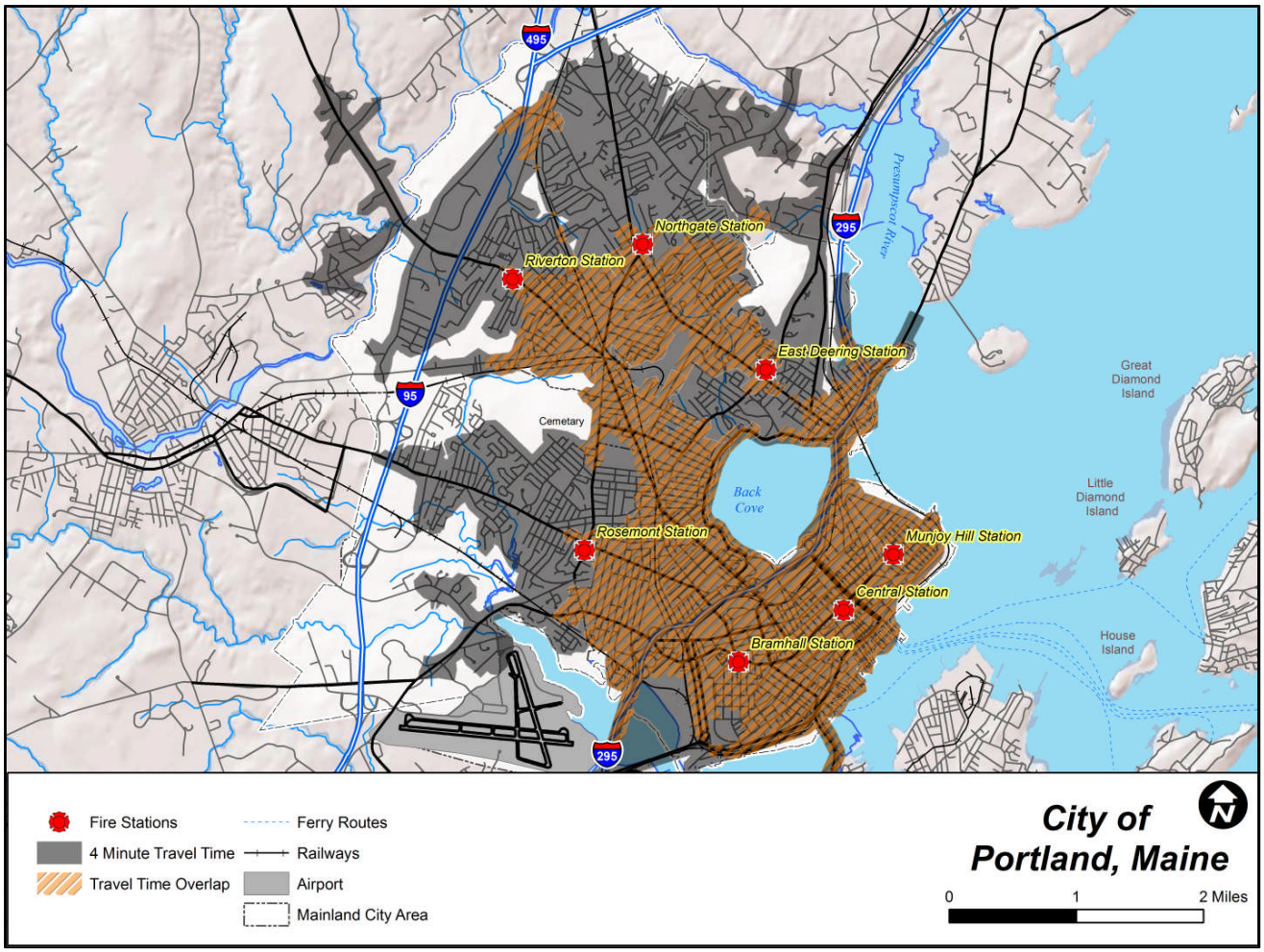
full alarm assignment within an eight-minute response time to 90 percent of the incidents;

- The fire department's EMS basic life support (BLS) resources with automatic defibrillator equipment deployed to provide for the arrival of a BLS unit (EMS first responder or transport unit) within a four-minute travel time; and,
- The fire department's EMS resources providing advanced life support (ALS) service deployed to provide for the arrival of an ALS company within an eight-minute travel time to 90 percent of the incidents.

It should be noted that the various standards and criteria discussed in previous sections placed a high priority on both the effective delivery of fire and EMS service in the protection of life and property. Moreover, the safety of the firefighters and officers delivering the services and safety for the customer and stakeholder were important considerations to the development of these standards and to their application. The City of Portland has adopted the NFPA 1710 response time parameters for its goal in responding to fire and medical incidents.

Figure 6.3 models the travel time of apparatus from each of the current fire stations. The model utilizes the street network of the City and surrounding areas calculating the travel time extent via distance and speed capability of streets. Actual posted speed limits were utilized and time penalties were assessed for negotiating turns, intersections, and traversing railroad crossings. These at-grade crossings were identified by aerial photos, trestle or an overpass were not assessed a time penalty against the apparatus on the roadway. This model assumes departure from the fire stations that may not always be the case. It also does not take into account weather conditions, traffic congestion, construction, or detours. It does respect the one-way restrictions as they are in place.

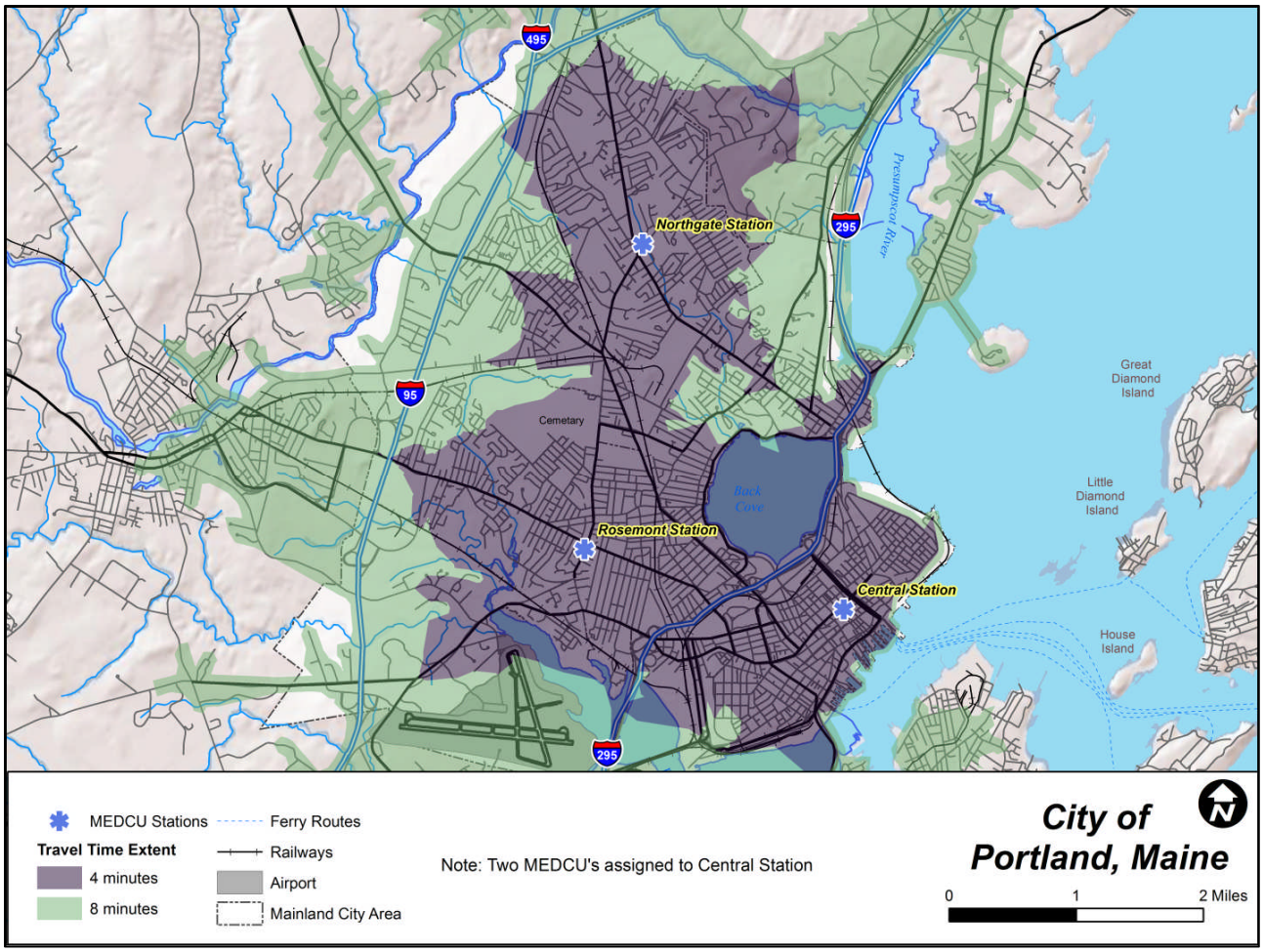
Figure 6.3
CITY FIRE TRAVEL TIME EXTENT



It can be seen in Figure 6.3 that there is significant overlap of the travel time between the peninsular stations. While this may seem wasteful, it has to be taken into consideration that fire calls usually do not require a single apparatus response like medical calls. Multiple apparatus from other stations are standard firefighting procedure.

The MEDCUs are not allocated to every station and the NFPA 1710 recommends a longer response time for these advanced medical care units based upon the given shorten response from a basic medical care provider on a fire truck. Figure 6.4 exhibits the travel time extent of the MEDCUs from their assigned stations. This was run on the same model parameters as the fire station travel figure shown previously and the same cautions apply. Remember that two MEDCUs are assigned to Central Station.

Figure 6.4
MEDCU TRAVEL TIME EXTENT

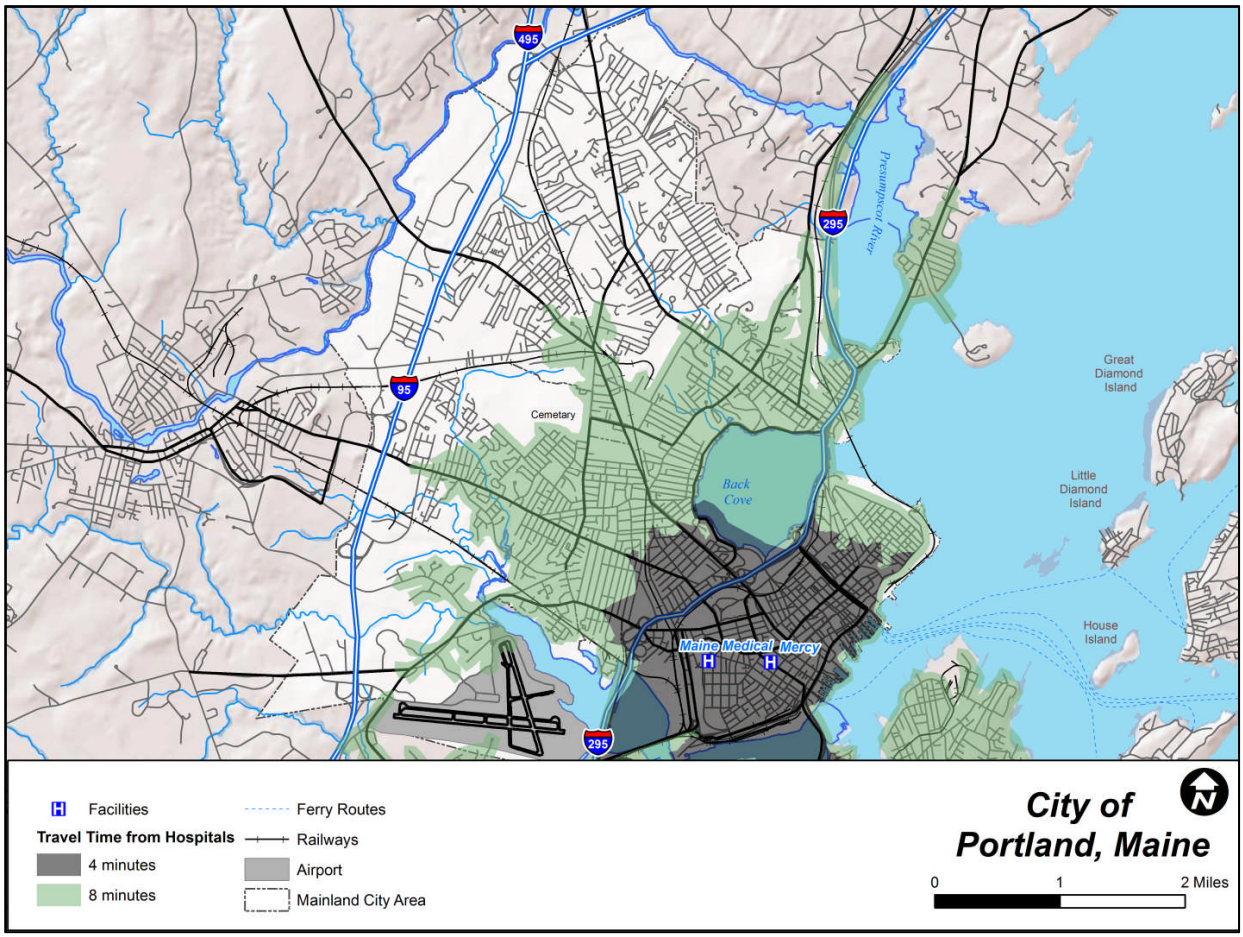


The eight-minute travel time extent is the allowable time under NFPA 1710 standards and it can be seen that all of the City can be reached by a MEDCU responding from their assigned station (which may not always be the case). As can be imagined, significant overlap between the MEDCU units at this travel time occurs. The shorter travel time extent is shown in the event that either a first basic responder is not available, is responding from a distance, or policy restricts fire apparatus first response.

Fire incidents terminate typically at the dispatched address when the scene is declared 'cleared'. These are numerous locations over the course of time. For MEDCUs, most calls terminate at the hospital when they declare themselves 'available' for the next call. Therefore, the response time from the hospital can be modeled to reflect the travel time extent should a MEDCU receive a call immediately after the 'available' declaration or in

the event all four MEDCUs are at the hospitals pending availability. The proximity of the hospitals within the City restricts the travel time capability of a MEDCU responding to the northwest part of City if no other MEDCUs are available west of the hospitals.

Figure 6.5
TRAVEL TIME EXTENT FROM HOSPITALS



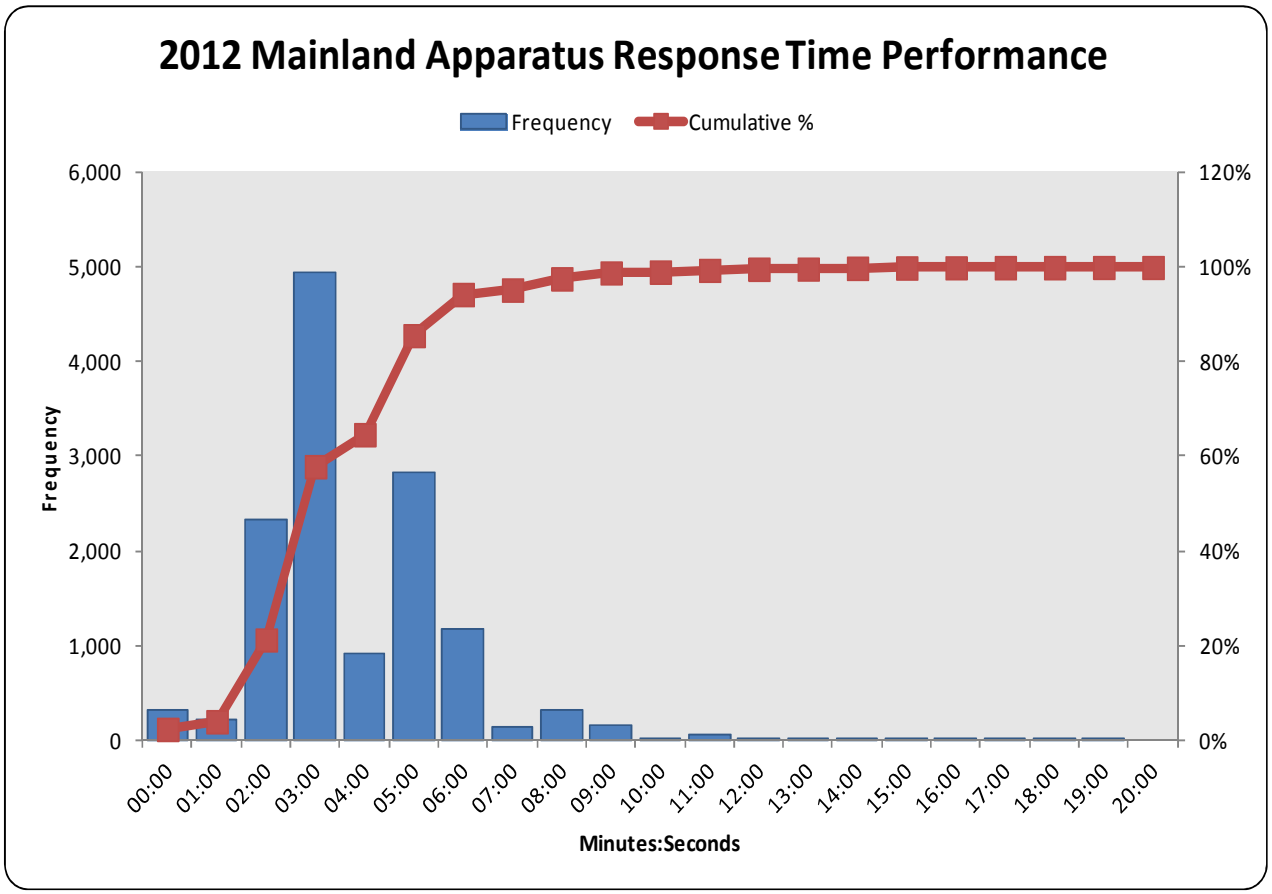
Many medical calls require simply one MEDCU; some exceptions include multiple victim incidents, cardiac arrest, and major trauma. For fire alarms, a multitude of resources are dispatched in the event of an actual fire or other emergency where the collection of apparatus is needed.

RESPONSE TIME ANALYSIS

The most important measure of performance of any emergency service provider especially to whom they serve, is how fast help arrives. Discussions of the reasons for and the specific parameters of the establishment of national response time guidelines

from the NFPA have been outlined earlier in this chapter. As a reminder, it is recommended that the first arriving apparatus to a fire alarm or a medical emergency arrive within five minutes of being dispatched, 90% of the time. Subsequent apparatus are allowed additional time as also discussed previously. Figure 6.6 illustrates the response time performance for PFD apparatus on the mainland using the CAD dataset. Mutual aid to other areas was removed as well were public assists and standby's. The average response time for first arriving units on the mainland is three minutes and twenty-six seconds (0:03:26), while 90% of all calls is answered within six minutes (0:06:00).

Figure 6.6
RESPONSE TIME PERFORMANCE

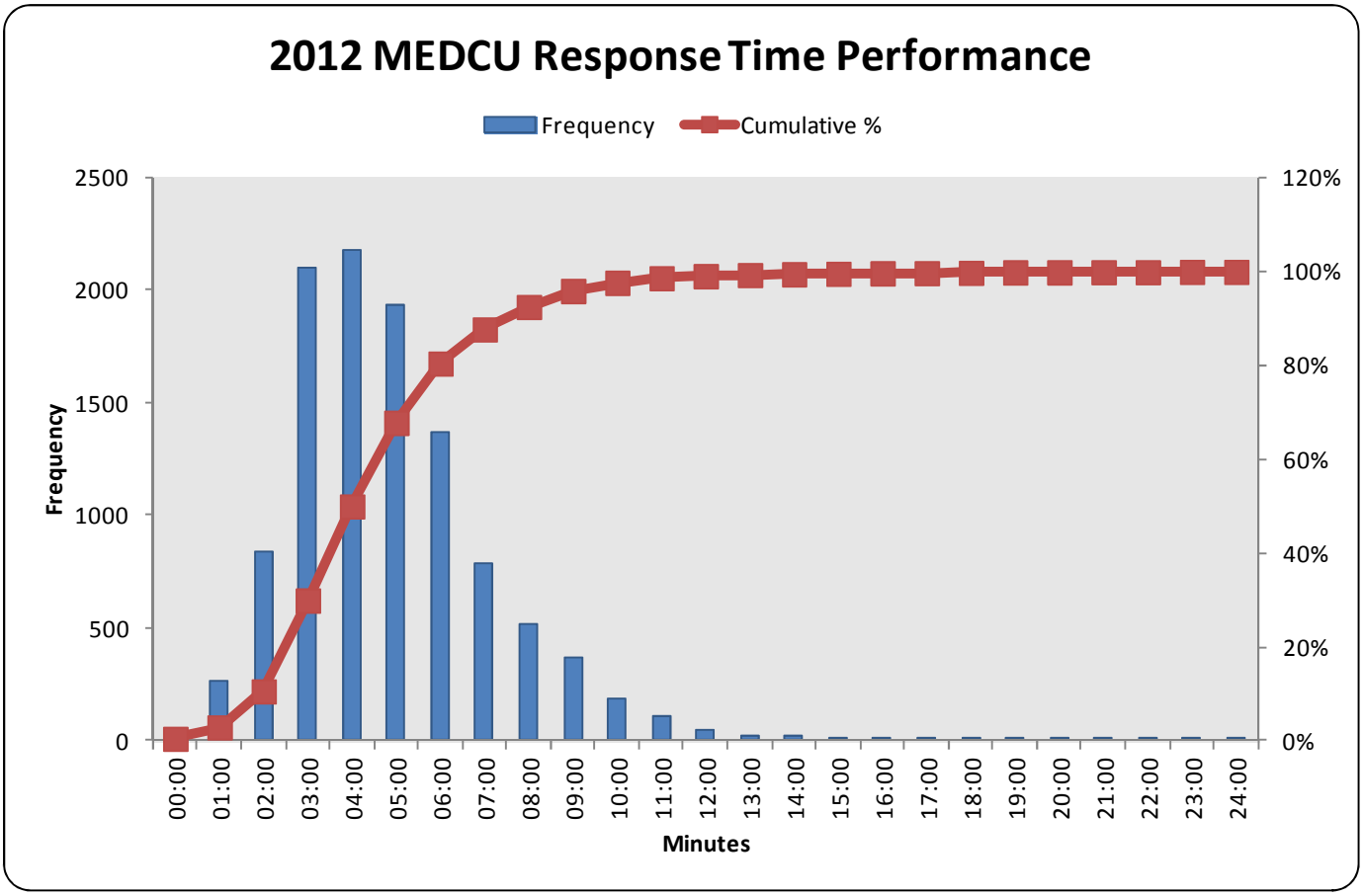


There are many factors that can contribute to delaying a response, such as weather and construction to name a few, but one that is ultimately controlled by firefighters and paramedics is turnout time. Turnout time is elapsed between the dispatch and the unit becoming enroute to the scene. For 24-hour shift workers, it is not unusual for this delay to extend during the overnight hours. In other cases, station design plays a role in the

difficulty of a crew to reach the gear and apparatus to exit the station. A crew may not in the station, but within another building or business when the alarm comes in, causing a longer turnout time.

To isolate the mainland response times further, the MEDCUs were isolated for their response time performance. Figure 6.7 illustrates the range, frequency, and cumulative percentage of total response time (Dispatch to 'at the scene'). On average, a MEDCU arrives on scene within four minutes and twenty-six seconds (0:04:26) and to 90% of all calls within seven minutes and twenty-six seconds (0:07:26).

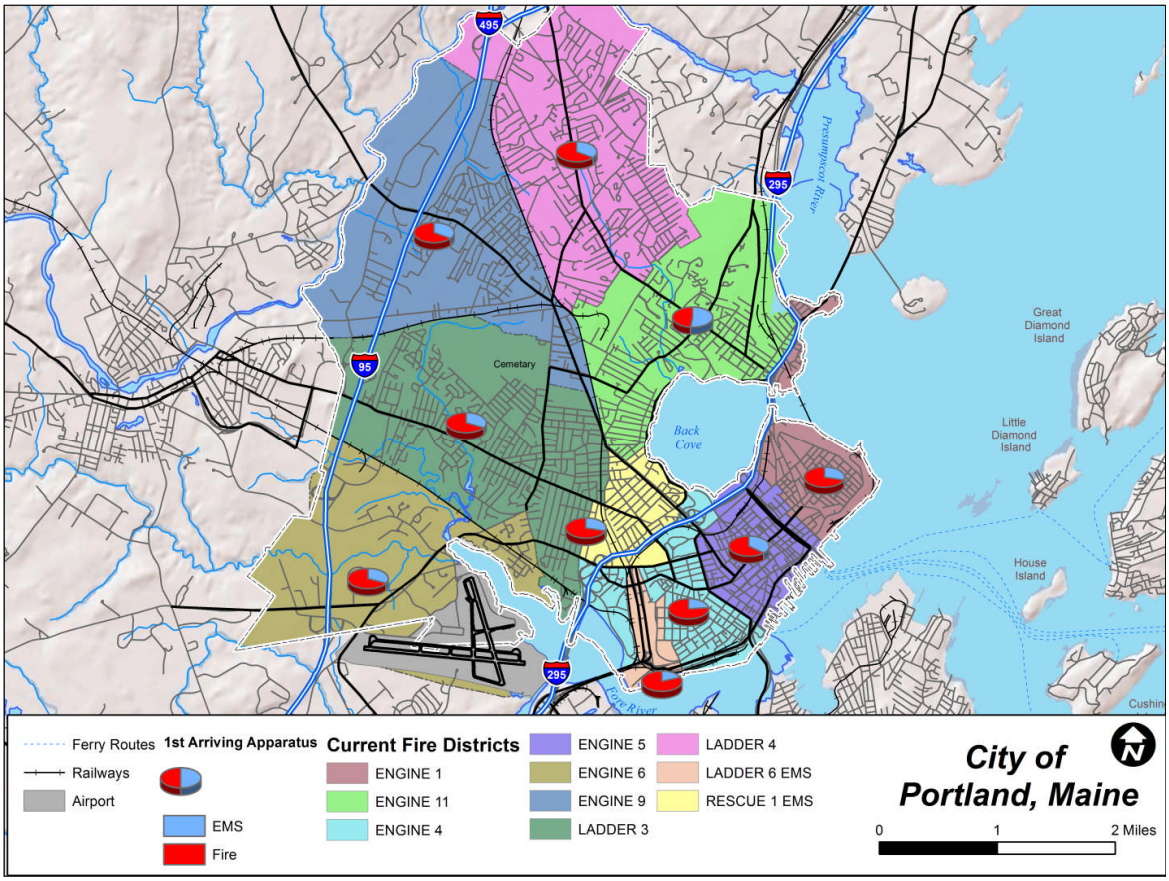
Figure 6.7
MEDCU RESPONSE TIME PERFORMANCE



An analysis was conducted to determine which unit, fire or MEDCU, arrives at scenes first. In the following Figure 6.8, the pie charts in each of the current apparatus districts

depict the results of the analysis. Overall, fire apparatus arrive on the scene first, two-thirds of the time. In Engine 11's district, MEDCUs arrive first nearly half the time.

Figure 6.8
FIRST ARRIVING APPARATUS

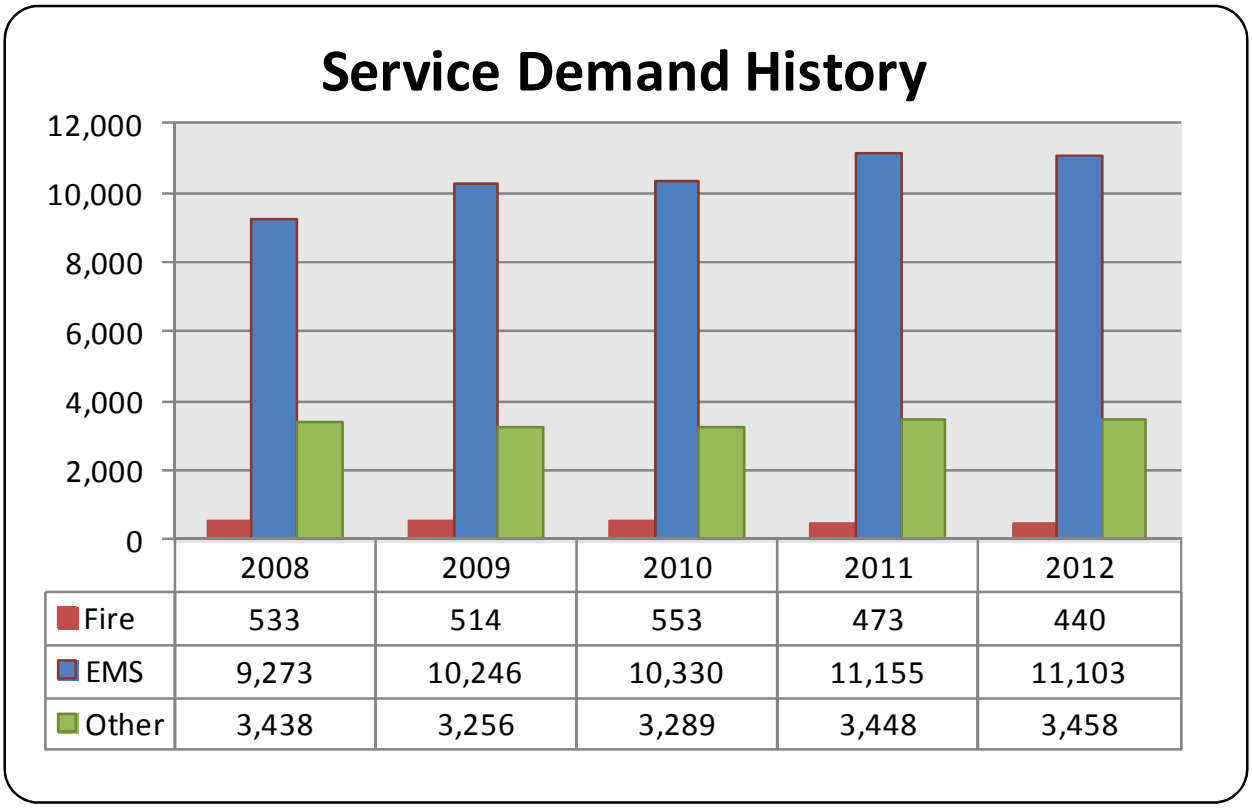


Service Demand

Records of incidents from the PFD were acquired through the exported files from the department's National Fire Incident Reporting System (NFIRS), the Computer-Assisted Dispatch (CAD) records from the Emergency Communications Center, as well as the MEDCU Patient Care Report database (PCR). Reportedly, these three databases are auto-populated with information from the CAD. In addition, the Fire Department Summary reports were also utilized to determine historical workload. Figure 6.9 illustrates the

change in volume for categories of reported fire, EMS and all other categories of incidents (alarm, hazard, spill, etc.) over the past five years.

Figure 6.9
HISTORIC SERVICE DEMAND

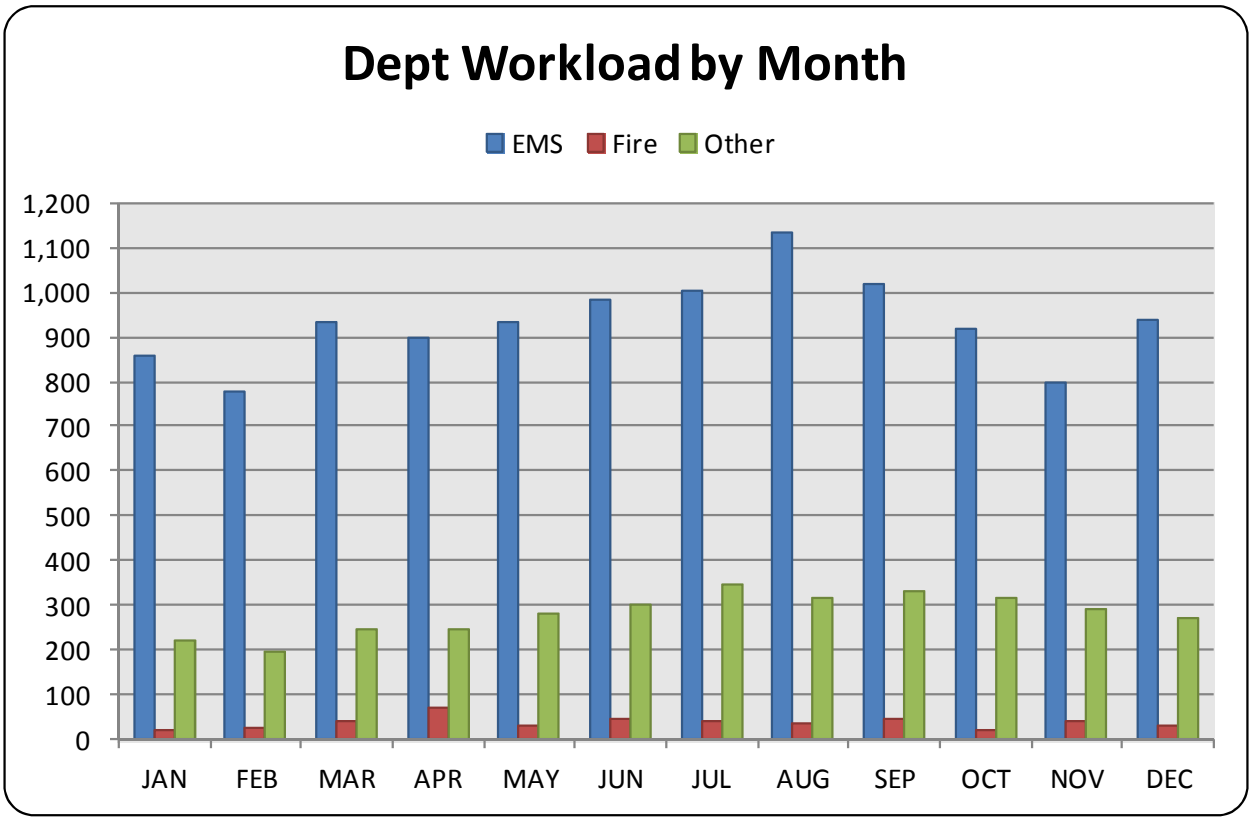


	2008	2009	2010	2011	2012
Fire	533	514	553	473	440
EMS	9,273	10,246	10,330	11,155	11,103
Other	3,438	3,256	3,289	3,448	3,458

It is clear that EMS calls account for the majority of service demand within the City of Portland. Looking at the data as percentages, fire and other types of calls reduced from 4.32% and 26.16% to 2.93% and 23.05% respectively during the period analyzed. During the same period, EMS calls increased from 69.53% to 74.02%.

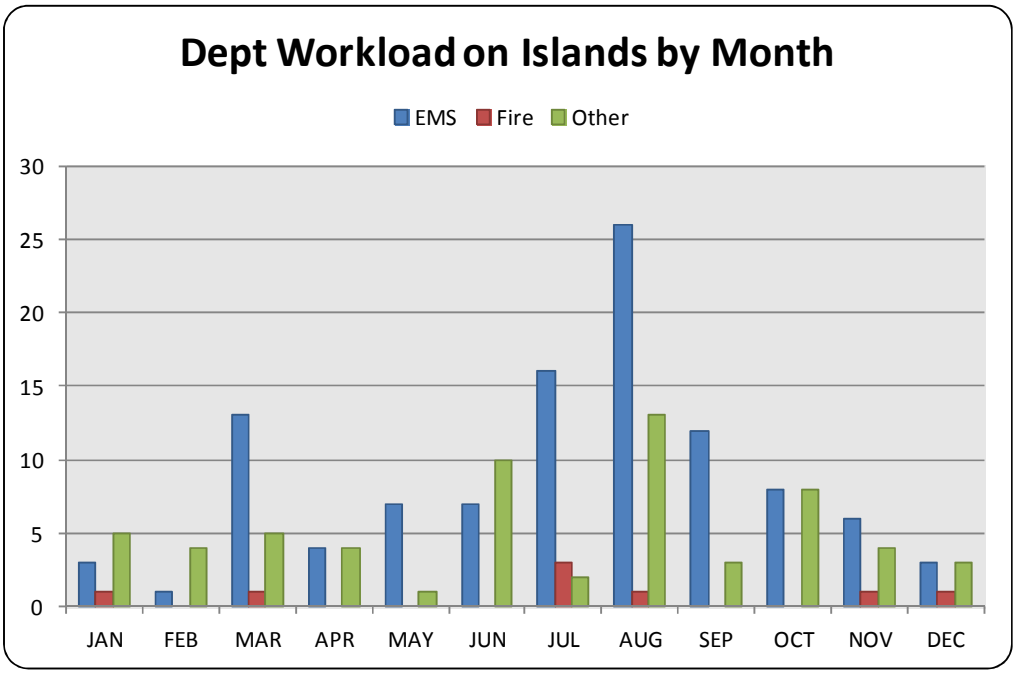
Examining the 2012 data more closely, changes in demand can be seen on a monthly basis. Figure 6.10 illustrates that service demand is higher in the summer months for all types of calls. Fire calls are especially higher in April, while EMS calls are also high in July, August, October and September.

Figure 6.10
DEPARTMENT WORKLOAD BY MONTH OF YEAR



The higher workload during the summer may be attributed to the seasonal tourist population. There were only 176 island calls in 2012 and that is not enough to skew the overall data. However, as expected most calls occur in the summer months. (See Figure 6.11.)

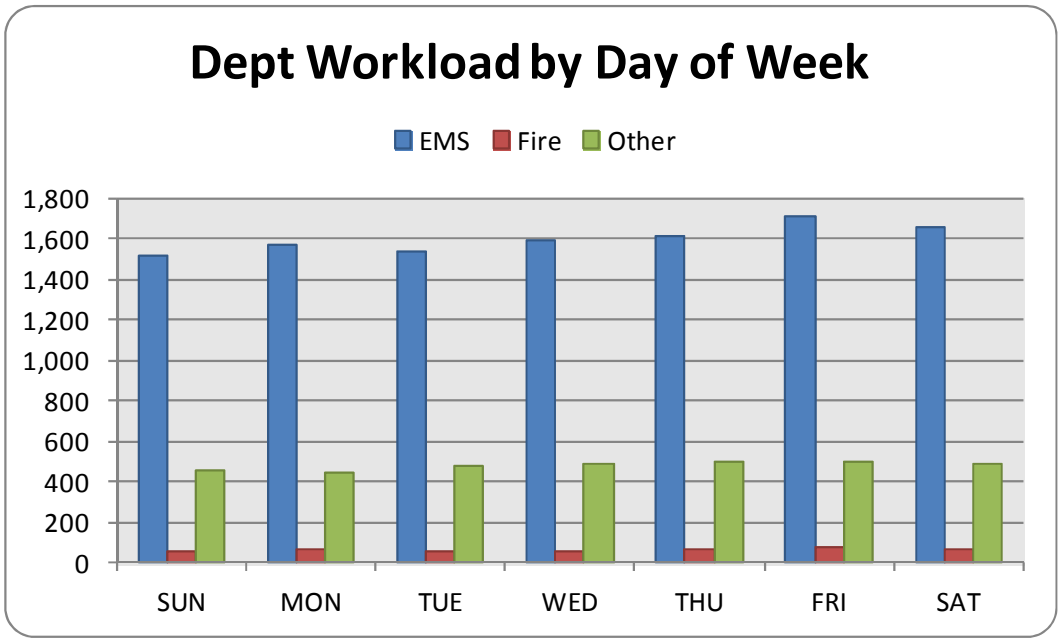
Figure 6.11
ISLAND WORKLOAD BY MONTH



Examining the department service demand by the day of the week reveals that Friday is the busiest day of the week for all calls in the PFD. (See Figure 6.12.)

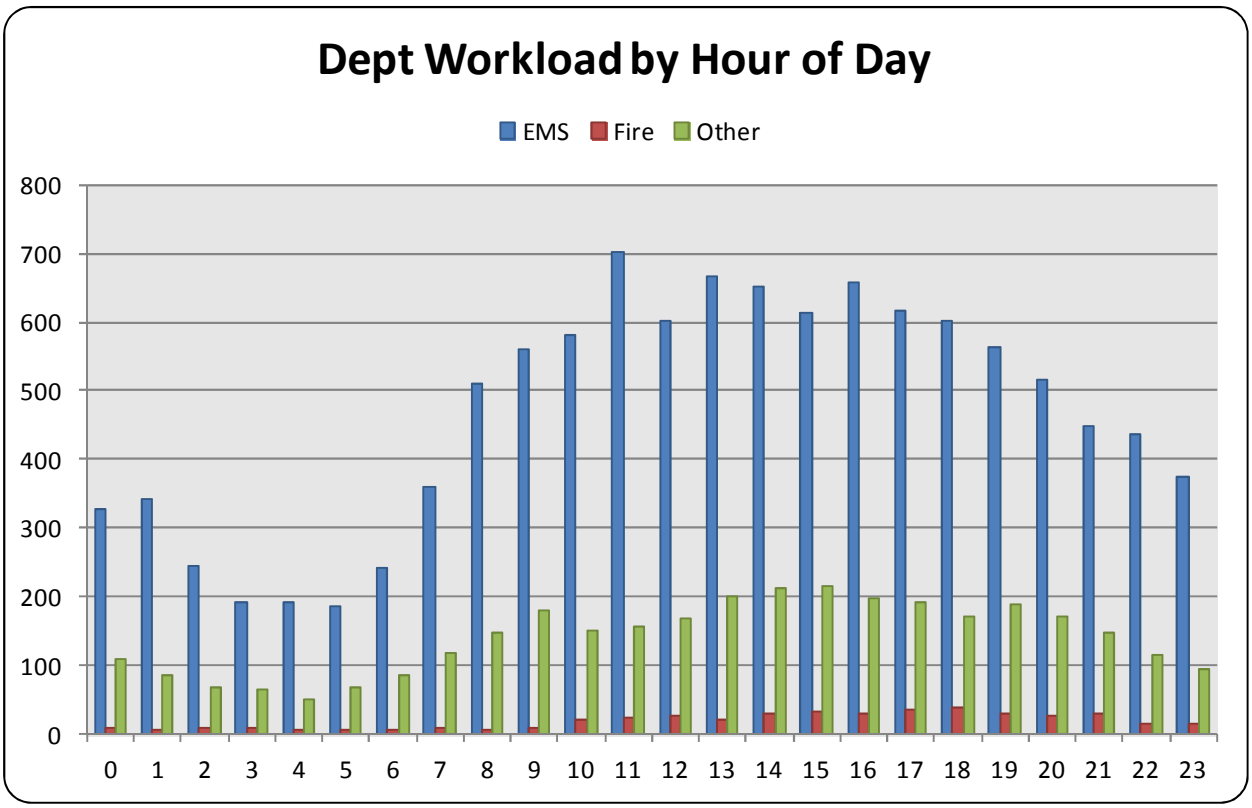
.

Figure 6.12
DEPARTMENT WORKLOAD BY DAY OF WEEK.



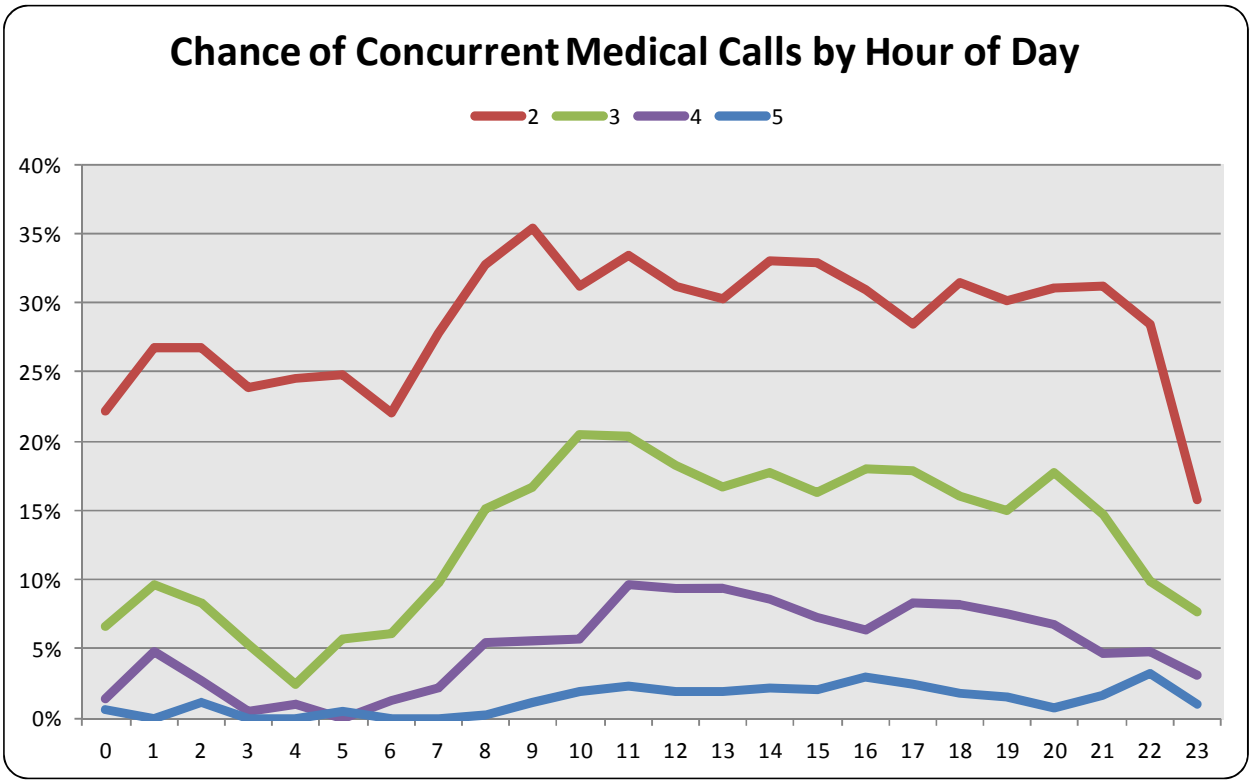
The Study Team also examined the workload on an hourly basis. It can be seen in Figure 6.13 that service demand for the fire department increases with daytime human activity. The peak hours for demand are from 8 AM until 8 PM, with the busiest seen at the 11AM hourly time frame. The islands and the airport hourly demand mimic this same pattern.

Figure 6.13
WORKLOAD BY HOUR OF DAY



These peak hours are typically when simultaneous calls occur which can reduce the available units for subsequent calls. On a weekend for instance, after four simultaneously occurring calls that require a MEDCU dispatch, there would be no MEDCUs left in the City for the fifth call and a mutual aid response would be needed.

Figure 6.14
CHANCE OF CONCURRENT MEDICAL CALLS



It can be seen in Figure 6.14 that approximately 12% of the time in the afternoon hours there are multiple EMS calls occurring where no ambulances would be available for a period of time.

The next section details the workload by unit for the mainland PFD units, the island units and the airport facility. We begin with a historical review working toward the last year's data. (See Figures 6.15-6.17.)

Figure 6.15
2004 UNIT WORKLOAD

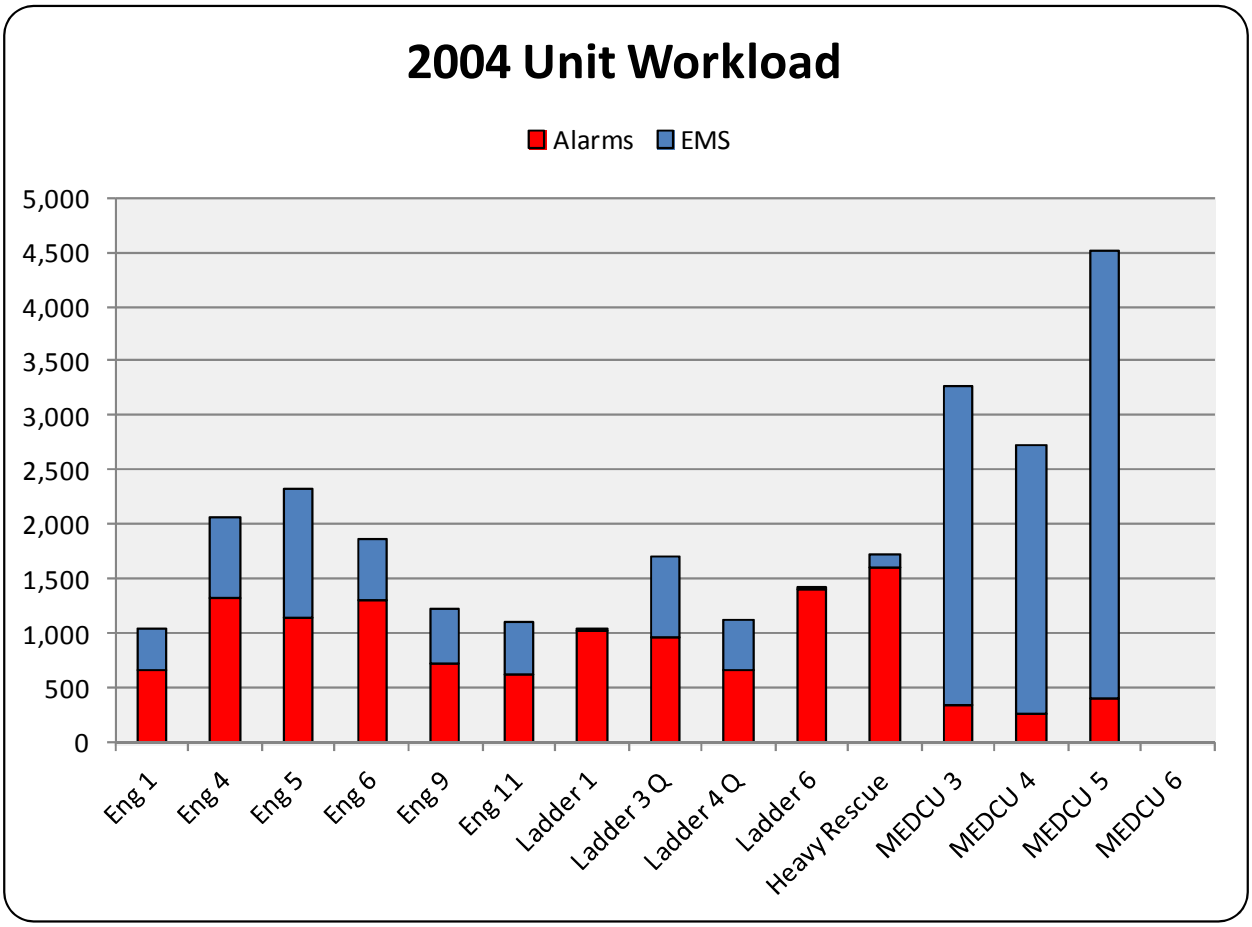
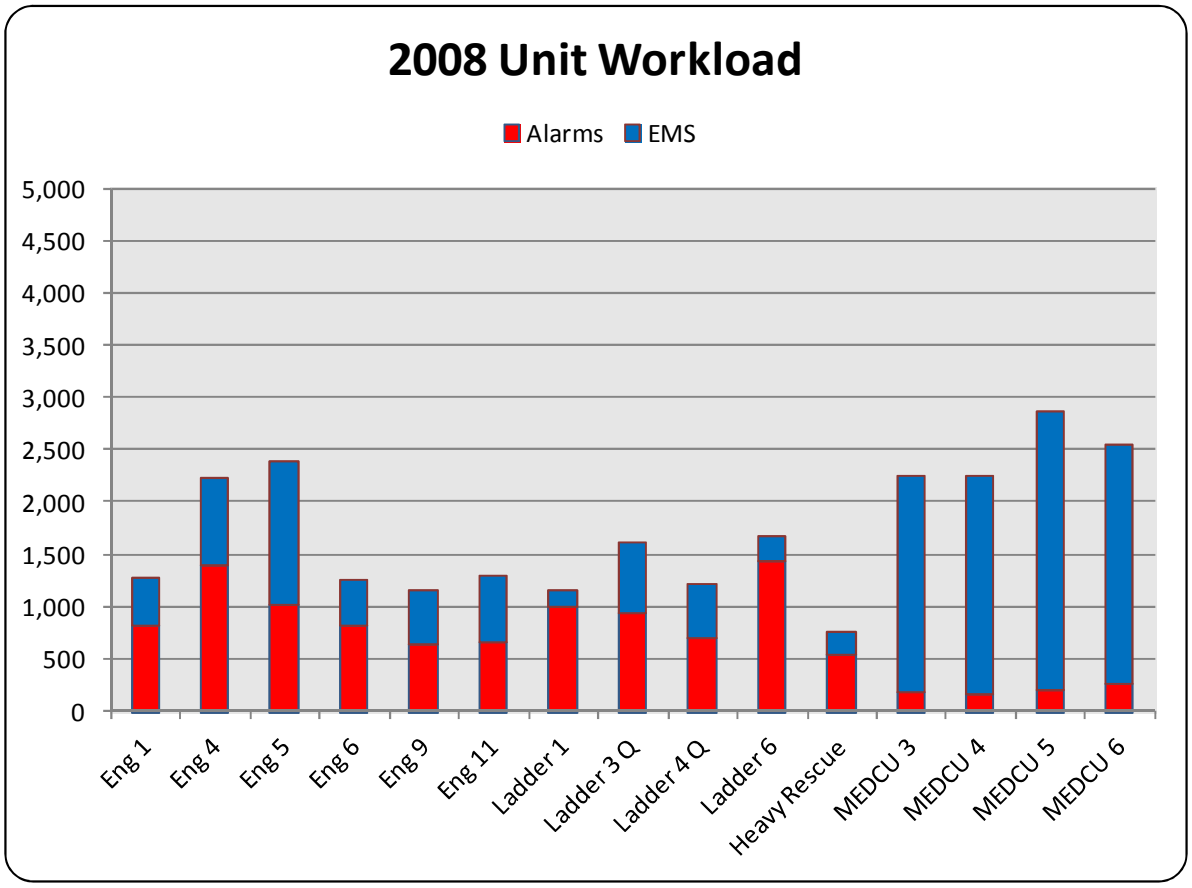


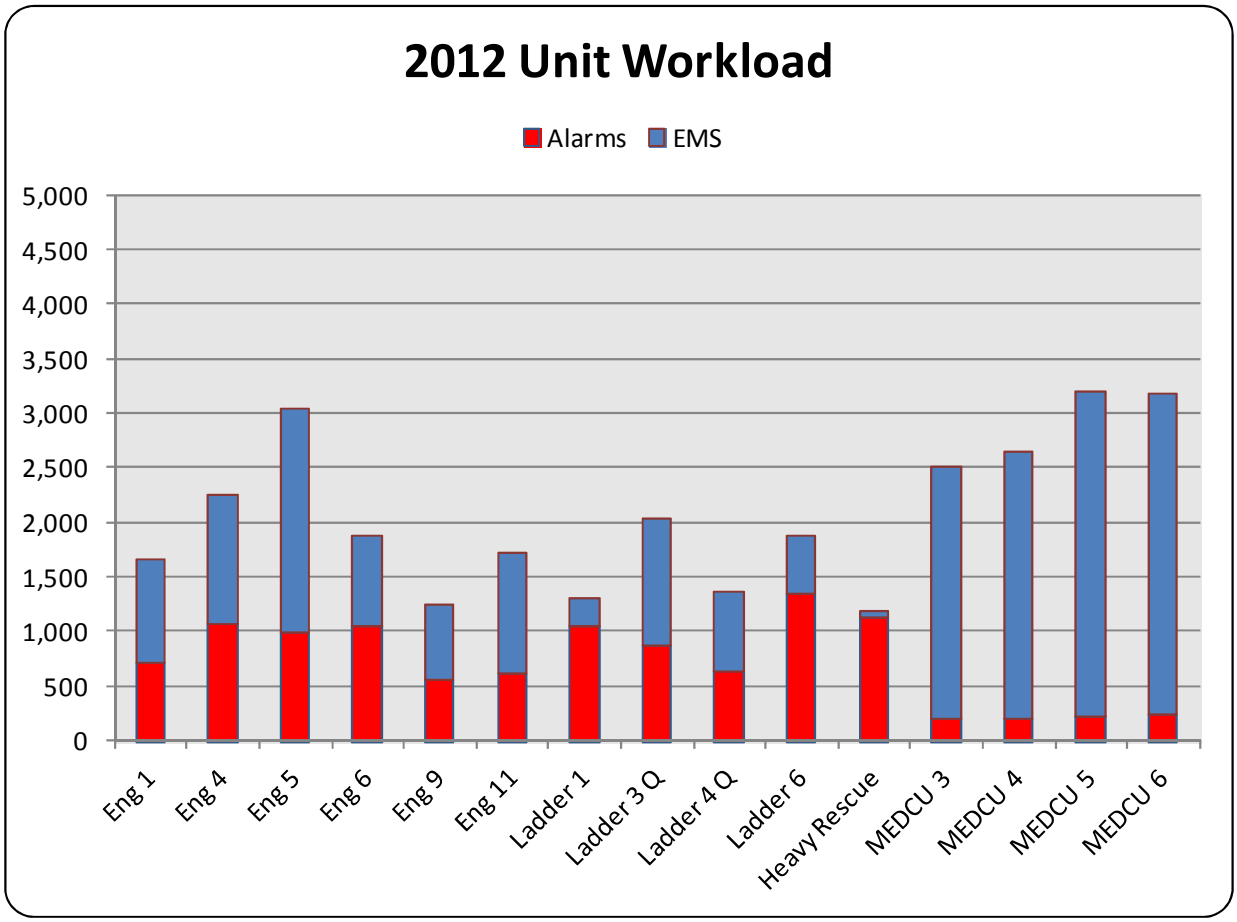
Figure 6.15 illustrates the disproportionate workload for the MEDCUs. The need for an additional unit seems evident from the comparative workloads. MEDCU 6 was not placed into service until July 4, 2006.

Figure 6. 16
2008 UNIT WORKLOAD



The additional MEDCU has evened out the workload for these unit types (Figure 6.16).

Figure 6.17
2012 UNIT WORKLOAD



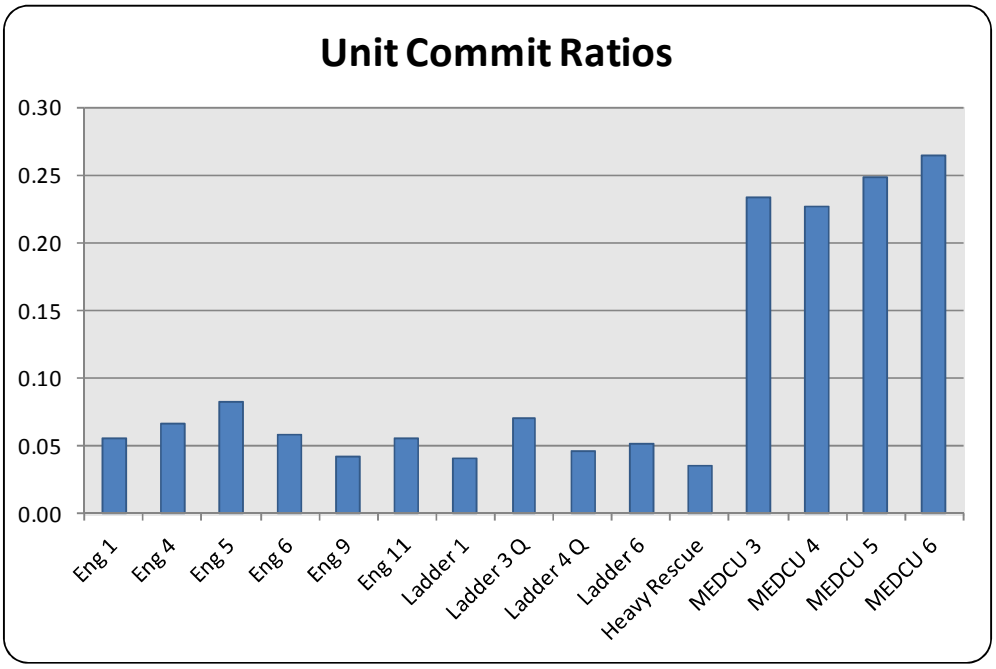
The busiest units are assigned to the Central Station (Engine 5, MEDCU 5, and MEDCU 6). The workload of MEDCU 5 and MEDCU 6 is similar with both units responding to more than 3,000 runs in 2012 (Figure 6.17). It is also apparent that a MEDCU is not dispatched on every fire call, which is acceptable since most fire call types generally do not require a medical response. MEDCU responses to fire incidents is generally reserved for working structure fires or when requested by the incident commander.

While the amount of calls for service may seem impressive, this belies the actual amount of time units spent on calls during their shift. Some calls, like structure fires, take hours while others are managed within minutes and some cancelled all together. Using PFD data provided to the Study Team, Figure 6.18 details the percentage of time each unit spent on an emergency incident in 2012.

Figure 6.18
UNIT COMMIT RATIOS

Unit ID	Total Time On Incidents	Incident Commit Ratio	Scene Time Minimum (Hr:min)	Scene Time Maximum (Hr:min)
Eng 1	485:37:00	0.06	0:00	4:38
Eng 4	577:50:00	0.07	0:00	5:10
Eng 5	715:25:00	0.08	0:00	4:59
Eng 6	505:30:00	0.06	0:00	3:11
Eng 9	369:15:00	0.04	0:00	3:47
Eng 11	543:27:00	0.06	0:00	4:06
Ladder 1	349:25:00	0.04	0:00	5:12
Ladder 3 Q	617:02:00	0.07	0:00	3:28
Ladder 4 Q	401:17:00	0.05	0:00	3:05
Ladder 6	445:55:00	0.05	0:00	3:17
Heavy Rescue	311:07:00	0.04	0:00	3:50
Marine Units	188:48:00	0.02	0:01	6:34
MEDCU 3	2047:33:00	0.23	0:00	3:37
MEDCU 4	1987:53:00	0.23	0:00	3:38
MEDCU 5	2179:43:00	0.25	0:00	4:26
MEDCU 6	2314:42:00	0.26	0:00	3:35

Q=Quint



It can be seen in Figure 6.18 that MEDCUs spend four to five times more time on calls than fire suppression units. This is primarily due to the EMS call demand volume, the

number of MEDCUs versus fire apparatus, and the amount of time each EMS call takes to complete. The vast majority of fire incidents are short-lived: burnt food, a defective electrical outlet, an accidental activation of a fire alarm. These incidents rarely last more than a few minutes and often times just involve one or two units while the remaining units return to service.

The vast majority of EMS incidents result in a patient being transported to a hospital where a patient report has to be generated and the unit restored to service ready for the next call. The result is that even a minor, non-life threatening EMS incident can outlast a minor fire incident by a significant margin.

When considering Unit Commit Ratios for transport units in a fire-based EMS system it becomes important to evaluate the ability for units to be ready to respond to the next call as well as having the units available for other department based activities such as training, apparatus and station maintenance, public education activities, fire prevention activities, etc.

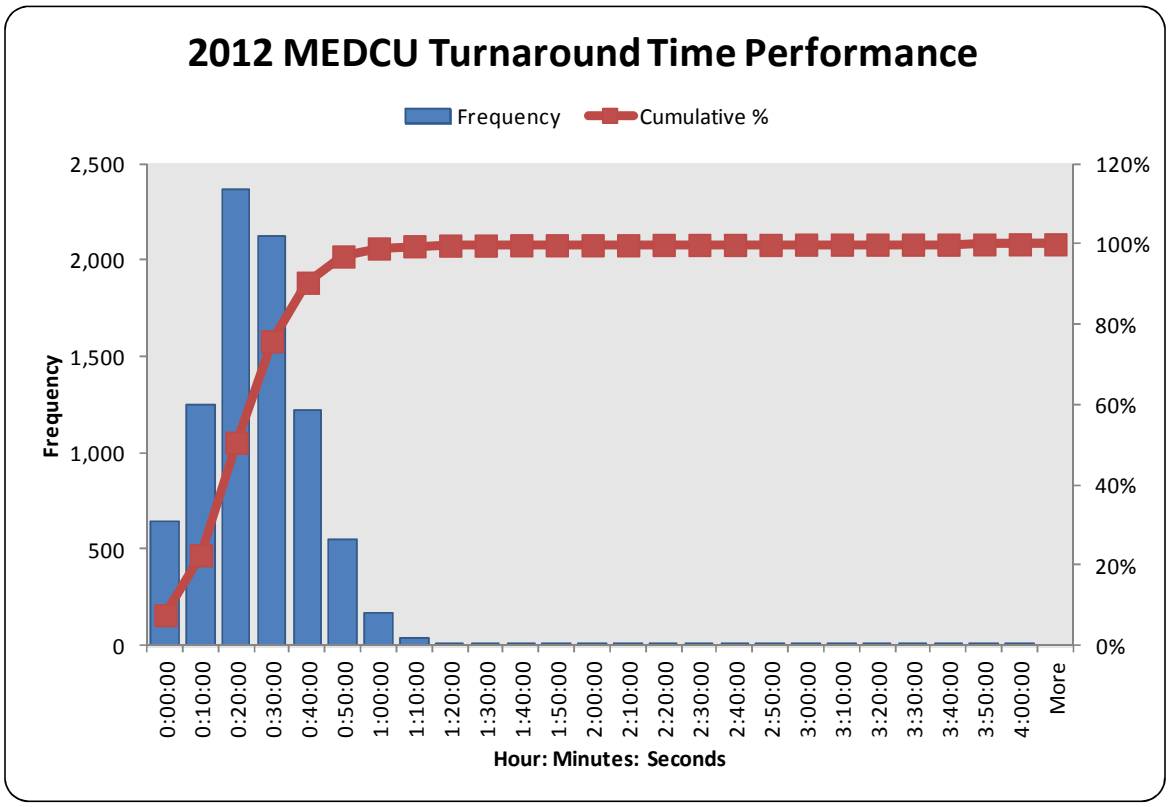
Private sector EMS providers are working for a profit and look to maximize the use of their transport units. If a private ambulance doesn't have a patient in the back of it being transported somewhere, then the company is not taking in revenue. Private providers quite often run at Unit Commit Ratios greater than 0.50 – however they are also normally a single function service with single service providers (no cross-training.)

In fire-based and public sector EMS, the Unit Commit Ratio threshold is normally much lower in the 0.25 to 0.30 range. Some fire-based EMS systems utilize call volume trigger points in addition to, or in lieu of, a set Unit Commit Ratio. A value of 2,500 calls per year is sometimes used as the trigger point for consideration of placing additional EMS units in service.

As noted previously, MEDCUs have an additional time component of transporting a patient to the hospital and then transferring the care of that patient to the hospital staff. "Turnaround time" is the elapsed time between a MEDCU arriving at the hospital's doorstep and becoming available to run the next call for service. During turnaround time, the MEDCU crew must transfer patient care, clean and resupply the unit, provide a patient report to the hospital staff, and then ready themselves for the next call. In an urban environment, turnaround time can be the lengthiest time segment of an EMS call.

The Study Team reviewed the MEDCU Patient Care Report data to evaluate the turnaround time of the MEDCUs in 2012. Industry practice for this measure varies by agency. Some agencies do not allow for any turnaround time, which is foolish given the tasks at hand. Others allow for turnaround at the discretion of the crew; and still others mark a goal and either query the crew when this mark is reached or automatically designate the unit available unless the crew provides reason for delay. When set, these goals tend to be between 15 minutes to 30 minutes in duration.

Figure 6.19
TURNAROUND TIME PERFORMANCE



In 2012, MEDCUs had an average turnaround time of 20 minutes and fifty-four seconds (0:20:54), which is quite good and should be celebrated. Proportionally, the turnaround time is generally equal among the individual MEDCUs. It is clear from this analysis that the MEDCU crews are doing a good job of readying their units for the next call after transporting patients to hospital facilities.

Hospital Interface & Medical Control

There are two hospitals serving the City of Portland, Maine Medical Center and Mercy Hospital. Both hospitals are located not far from each other in the southwestern section of the "peninsula." In 2012, about 75% of the patients transported by a MEDCU were transported to Maine Medical Center with the majority of the remaining transported to Mercy Hospital.

Maine Medical Center is the State's premier referral hospital, offering services not available elsewhere, and serves as a community hospital for Greater Portland. Maine Medical Center is a Level I trauma center, a burn center and home to The Barbara Bush Children's Hospital. Combined with the pre-hospital care provided by the PFD's MEDCUs, the visitors and citizens of Portland have access to some of the best emergent care in the United States.

The Study Team is aware of no issues or concerns involving PFD's interactions with any of the local hospitals.

In Maine, like most states, EMS systems are required to have a medical director. The work of the EMS providers at the emergency scene falls under the auspices of the system's Medical Director. The role of Medical Director is an important role in any Maine EMS system: it is a position of authority that should not be taken lightly. All EMS providers in a jurisdiction basically operate and perform their duties under the license of the Medical Director, thus the Medical Director must be carefully selected to ensure that the person chosen is engaged at all levels of EMS in the jurisdiction. Some jurisdictions have assistant or deputy medical directors to help provide oversight and direction to the EMS system.

The current Medical Director for PFD EMS is an emergency department physician at Maine Medical Center in Portland where he currently also serves as the Department of Emergency Medicine's EMS Director. In addition, he is also the State EMS Medical Director. The PFD's Medical Director performs his duties and responsibilities under contract with the City and that contract includes stipend and insurance provisions.

Having met with the Medical Director and also noted all the accolades of his work, it is clear to the Study Team the PFD is very fortunate to have such a passionate, progressive, and practical emergency department physician as their medical director. The Study Team

has often encountered other EMS agencies where their medical directors are absent or unseen or even disinterested; the State of Maine and the City of Portland are fortunate. As protectors of the largest city in the State of Maine, the Study Team recommends that the PFD utilize its Medical Director to the fullest extent possible including the continued evaluation of treatment protocols, the complete implementation of EMD, and the supportive desire to be on the "cutting edge" of pre-hospital care.

The Study Team has one recommendation concerning the PFD's medical director and that is to include the Medical Director position in the department's organization chart. All of the PFD's providers operate under the Medical Director's license, thus the Team believes it is important for said inclusion. The Study Team recommends that the Medical Director be included in the PFD organizational chart under the EMS Division.

Billing and Records

Much of the EMS service delivered in the State of Maine is delivered using a fee system that attempts to recover service delivery costs via the patient's health care insurance provider. When a patient is transported to the hospital by a PFD MEDCU, the patient's health care insurance provider is billed for ambulance service. Currently, PFD uses Intermedix, a national emergency healthcare services provider to handle all billing operations. Money collected from Intermedix is forwarded to the City of Portland and deposited in the City's general account. The contract with Intermedix expires in December 2014 with an option for two, one-year renewal periods.

The current billing process uses a fee schedule that covers a number of EMS service components related to patient care and transport to the hospital. Items included in the schedule include: BLS supplies, IV supplies, oxygen, ground mileage, ALS care, etc. At the end of each patient transport and transfer to emergency room staff, a list of services provided is compiled by the MEDCU using the patient care report.

Data presented to the Study Team concerning the percentage of successful fee collections was incomplete and inconclusive. Such information is important when reviewing the EMS billing process because it is part of the evaluation process for the third-party billing firm and for the EMS delivery agency. The success of EMS billing really starts with good documentation from the service providers and continues with strong administrative support work to collect the information for submittal to the billing firm. Weak

administrative support most often results in a lower percentage of successful fee collection.

According to data provided by the PFD, EMS billing derived $2,455,440 in FY2011 with a projected $2,939,940 in FY2012 and a recommended $3,039,900 in the FY213 budget process. Division revenues were projected to increase each year because of an increase in call volume and it appears those projections have remained true.

What is not known is what could be done better to improve the amount collected. The only item that is known for sure is that perhaps 300 patients or more were transported by mutual aid EMS units during each of those fiscal year periods resulting in a zero percent collection rate for the City of Portland on those transports.

Accurate recordkeeping is a very important part of any EMS delivery system. In Maine, the standard record keeping form for EMS incident reporting is the Maine EMS Run Sheet. The PFD uses an electronic version of this report in their Health EMS software program. These reports are commonly known and referred to as ePCR or electronic patient care report.

Presently, EMS providers use the Health EMS software on a Panasonic Toughbook laptop computer and provide a printed copy of the report at the hospital. Data from the ePCRs is eventually downloaded for storage and for billing purposes.

Regarding the patient care reporting process, there were two concerns noted during Study Team interviews. First is the lack of content consistency in report writing – especially the narrative section of the patient care report. The Team recommends that the PFD develop a policy and procedure that standardizes the content format of the patient care narrative and develops a content template.

The second item related to recordkeeping is the inability for station officers to query for missing reports at the station level. The Study Team believes that station officers should be able to query the reporting system so that they can monitor their subordinates' completion of vital reporting documents. Therefore, the Team recommends that PFD work with the software provider to enable the station officers (Captains and Lieutenants) to query the system for missing and incomplete reports so that those reports can be completed in a timely and correct manner.

Funding of EMS in Portland

As previously discussed, like many EMS service delivery programs in Maine, PFD's EMS service is a fee-based service. A third-party billing service is responsible for billing a patient's health care insurance provider and for disbursing those collections to the City of Portland—after the billing agency deducts its fee for service. Of course, none of the EMS fees collected are returned directly to the PFD. The assumption by some folks is that if $1 million is collected then that $1 million is used to fund $1 million of the PFD's budget; that simply is not the case.

For the FY2013 budget, the Division of Emergency Medical Services has a Final Allowance (approved budget) of $2,396,100 as shown in Figure 6.20.

Figure 6.20
FY13 DIVISION OF EMERGENCY MEDICAL SERVICES BUDGET

Classification	Final Allowance
Payroll	$2,027,270
Administrative Services	$48,475
Contractual Services	$156,460
Maintenance and Repairs	$17,550
Rentals	$2,800
Supplies	$137,500
Utilities	$6,045

The projected revenues for FY13 (from EMS billing) are $3,039,900. The Study Team finds no issue with the budget as proposed.

Quality Assurance

Another important part of an EMS delivery program is the presence of a quality assurance (QA) and quality improvement (QI) program. A QA/QI program helps ensure that proper documentation has been completed and that patient care was provided in accordance with medical protocols and procedures. The Study Team knows of no official written QA/QI policy for the PFD EMS; however, a draft policy has been developed and awaits implementation.

The Study Team learned that QA/QI issues are currently handled by the department's Quality Assurance and Quality Improvement Officer who is a Lieutenant in the EMS Division. From interviews and observations the Study Team has no doubt that QA/QI activities are occurring and that the PFD has a strong commitment to delivering a quality product to the citizens and visitors in the community. However, there is no written program required by Maine EMS. Therefore the Study Team recommends the PFD immediately develop and implement a written QI plan that is approved by the Maine EMS Board.

Along the lines of quality assurance, the Study Team found that the PFD passed the most recent ambulance inspection that is conducted by Maine EMS. The Study Team commends the PFD for meeting the State ambulance service licensing and inspection requirements.

STEMIs and Cardiac Arrests

While there are a number of recommendations in this chapter, the Study Team would be foolishly remiss if it did not note two very important successes of the PFD EMS delivery system – STEMI treatment and cardiac arrest survival.

A STEMI (ST segment elevation myocardial infarction) is a very serious type of heart attack where the patient has a narrow window of opportunity to be treated with heart saving medications and invasive cardiac procedures such as cardiac catheterization. In the treatment of heart attacks, the saying "time is muscle" is the motto for rapid diagnosis and treatment in the hopes of restoring full heart function.

To be successful at STEMI management, pre-hospital care providers must be adequately trained and equipped to recognize a STEMI and there must be a definitive care facility nearby capable of treating a STEMI immediately upon patient arrival at the facility. In the City of Portland, the pre-hospital EMS delivery system and Maine Medical Center are fully trained, equipped, and capable of managing STEMI patients with excellent success.

In data provided to the Study Team, STEMI patients are arriving at the hospital by MEDCU (instead of personal vehicle) transport more than 60% of the time and that percentage far exceeds national and State of Maine averages. In addition, a one-hour

"door to open artery" time is quite the norm at Maine Medical Center – again, excellent performance mark.

The Study Team commends the PFD, its Medical Director, and the Maine Medical Center for their outstanding work in this fairly new field of cardiac emergency management.

Regarding cardiac arrests, the Study Team finds the PFD once again on the leading edge of advanced care procedures. Since 2011, the PFD has piloted a treatment protocol whereby patients in cardiac arrest are aggressively treated on scene for up to 20 minutes before either being transported to the hospital or pronounced dead.

Traditionally, patients in cardiac arrest were a "load-and-go" scenario where CPR and advanced life support treatments were conducted during the movement process from scene to ambulance to hospital. Researchers questioned the quality of care during those times of movement and thus developed a pilot protocol whereby the patient is treated where her or she is found using high-quality CPR and advanced cardiac life support care procedures.

Since implementing the pilot protocol, the PFD's cardiac arrest save rate has gone from 6% to 17%; they tripled their resuscitation success rate. Clearly, this pilot program could not have been implemented without well-trained, equipped, and capable EMS providers and a Medical Director confident in the system. The Study Team commends the PFD and its Medical Director for their outstanding work and being a national leader in cardiac arrest resuscitation success.

In terms of cardiac care, both the STEMI program and the cardiac arrest program clearly add to the quality of life in the City of Portland.

PORTLAND EMS ISSUES

A number of issues were brought to the attention of the Study Team concerning the delivery of EMS services in Portland. The following sections review those matters and provide recommendations for improvement.

The Merger

Without a doubt, the most frequent comment received by the Study Team during its employee interview sessions centered on the "merger not being completed." This comment relates all the way back to 1997 when MEDCU was a municipal third-service and was merged into the PFD. The merger was completed for a number of reasons, but too many (EMS providers and firefighters alike) feel as though the two organizations never completed the process.

From the ALS providers' and MEDCU riders' side, they often spoke of being treated as though they are not really part of the fire department even though they are cross-trained as firefighters. They routinely spoke of fire crews not having an interest in EMS unless their officer shows an interest.

From the "fire side" of the issue, the Study Team heard from employees who are not interested in riding the ambulance and who got hired by the PFD to go to fires. The Team also heard from ALS providers who now ride the fire apparatus who noted that they "had done their time on the MEDCUs" and now it was someone else's turn.

The Study Team finds such commentary not unusual for a fire-based EMS system. However, it does not condone the behavior and finds that such indifferences can be counterproductive to delivering a quality product.

From the Study Team's perspective, the "merger" occurred over 15 years ago, and it is time to put the topic to rest. A large percentage of the personnel working for the PFD today were not employed by the PFD when the merger occurred. Without a doubt, all call volume and incident data for the entire department for the last 10 years show that the PFD is really an EMS service that goes to some fire-related calls. The vast majority of the work performed everyday by every fire station is EMS-related.

The Study Team completely understands that a strong, firefighting force is needed to combat structure fires in an old city like Portland, but it is foolish to believe that EMS should take a "backseat" in the operation of the department. The Team believes that the department's "bid" system helps to perpetuate the perceived and real disparity between the MEDCU staffing and the fire truck staffing and the notions of inferiority and superiority.

While the Study Team believes that much of inner-departmental conflict regarding EMS and fire providers will be eliminated through the natural attrition of personnel, the Team believes that action is needed now to help quell some of the concerns. Therefore, the Study Team recommends that the PFD and the Portland Professional Firefighters IAFF Local 740 (Local) work together reduce the perceived and real animosity that exists between EMS providers and personnel assigned for fire apparatus. This work may require a revision to the bid system whereby stations are bid, not individual units.

Rotation of Personnel

Another issue raised was the assignment of personnel to the MEDCUs. Although all but one PFD employee is cross-trained as a firefighter, personnel are assigned individual "units" through the labor contract mandated bid system. While the bid system works well if one is trying to get assigned to a fire truck, it does not work so well if one is trying to get a break from riding a MEDCU.

There is no process in the PFD to give personnel riding a MEDCU a respite, unless the company officer allows a rotation at the station level contrary to the labor contract-mandated requirement. The Study Team learned that such rotation occurs on a couple of shifts at a couple of stations, but for the most part no rotation occurs.

The Study Team agrees with the concern raised over the rotation of providers on the MEDCUs, especially when PFD personnel are specifically cross-trained in fire and EMS. Though assignment to a particular unit is not uncommon in large fire departments, in a full-service, fire-based EMS system with cross-trained providers, best practice is to provide relief to EMS transport personnel by rotating them with fire apparatus personnel. The Team believes this rotation is important to the health and longevity of EMS providers and to the quality of patient care provided.

The Study Team learned from several sources during its assessment and interview process about the idea of a "squad" concept in which ALS providers would be assigned to a station – not a unit – and the station officer on-duty would be responsible for crew rotation either on a mid-shift basis or an every other shift basis. The Team finds this concept in use in many fire-based systems throughout the United States and sees no reason why the concept would not work in the PFD.

Therefore, the Study Team recommends that the PFD and the Local work together to implement a program by which personnel are assigned to a fire station — not an individual unit. This program will require a revision to the current bid system so that personnel bid a station, not a unit.

Certification ALS Providers

There are three levels of licensed EMS providers in the PFD: EMT-B, EMT-I, and EMT-P. Personnel certified at those levels receive weekly stipends for maintaining their certification. According to Article 25 of the current collective bargaining agreement between the City and Local 740, an EMT-P receives a certification stipend of $60.00 weekly, an EMT-I receives a certification stipend of $35.00 weekly, and an EMT-B receives a certification stipend of $22.50 weekly. None of those stipends require the employee to actually provide EMS care – just maintain EMS certification.

In an effort to entice ALS providers to bid a MEDCU assignment, additional stipends are in place. An EMT-I receives a weekly stipend of $20.00 for being assigned to a MEDCU and an EMT-P receives a weekly stipend of $60.00 for being assigned to a MEDCU.

One of the concerns raised during the Study Teams data gathering and employee interview session was the "certified" ALS provider who never rides a MEDCU and may not really deliver any ALS care throughout a given time period, yet they receive the weekly certification stipend described above. The Study Team finds the practice of providing certification stipends without requiring delivery of that certified level of care a bit odd and not a best practice.

The Study Team fully supports the use of stipends or pay differentials for the various EMS licensing certification levels. However, the Team feels that certified providers should have to deliver some pre-determined level of service in order to receive those stipends. Therefore, the Study Team recommends that the PFD and the Local work together to develop an EMS stipend program for EMT-Is and EMT-Ps whereby certified providers have to deliver said service on a MEDCU for a minimum number of hours over a pre-determined time period (e.g. 24-hours a month on a MEDCU – overtime hours can count toward the 24-hr a month requirement).

The use of certification ALS providers in addition to assignment ALS providers on the MEDCUs will help with the personnel rotation issue noted earlier in this chapter and will

also help in the QA/QI process by having certified providers be more involved in total patient care and thus helping to maintain their ALS skills.

ALS Engine and Ladder Companies

All of PFD mainland engine companies, ladder companies, and the rescue are equipped with ALS equipment and supplies for an ALS provider (EMT-P or EMT-I) to initiate care on a critically ill or injured patient. The PFD is commended for providing these resources; the resources only enhance the quality and capability of the EMS provided throughout the City.

With the 100-plus ALS providers in the PFD and the equipment already in place on the apparatus, the Study Team believes that the opportunity exists for the implementation of dedicated paramedic engine and ladder companies. There are a couple approaches to implementing such a program: full-implementation with every engine company serving as a paramedic engine company, or select implementation where certain engine or ladder companies are chosen based on location and service demand needs.

Looking at the distribution of fire stations, the hospitals, and the EMS call demand areas, the Riverton Station and North Deering Station (Northgate) appear to be good candidate locations for implementing the paramedic engine company concept. Both stations are remote from the high-call volume peninsula area. The Riverton Station is without a MEDCU now so the paramedic engine program would improve the delivery of ALS capability in that response district. The North Deering Station has a MEDCU, but the probability of the MEDCU being on another run is high, thus the paramedic ladder company would be available to delivery first responder ALS capability during those time periods.

At the Riverton Station, Engine 9 would become a full-time ALS capable engine company with guaranteed staffing of at least one EMT-P 24 hours a day (rank does not matter). At the North Deering Station, Ladder 4 would become a full-time ALS ladder company with guaranteed staffing of at least one EMT-P 24 hours a day (rank does not matter). Guaranteed staffing means that if needed, overtime hiring would be used to ensure that an EMT-P is assigned to the paramedic engine or ladder around the clock.

Therefore, the Study Team recommends that the PFD consider the implementation of dedicated ALS delivery using fire apparatus: this program should be piloted first by using Engine 9 and Ladder 4. The pilot program should be no less than 12 months.

Car 10

It is quite apparent to the Study Team that the loss of Car 10 several years ago has had a significant impact on the department's ALS providers. The loss of Car 10 was one of the top weaknesses noted during the Team's employee interview sessions. To most ALS providers, Car 10 was "the checks and balances" in the system, the "on-duty go-to guy when they had an ALS issue." To quote one ALS provider, "Car 10 was your safety net."

The Study Team strongly believes that the Car 10 function needs to be restored. The delivery of EMS in the City of Portland is just too high a priority and has too high a call volume not to have some type of ALS supervisory role present around the clock to handle the often unusual matters that arise with ALS care and incidents.

With the recommended implementation of two, 24-hour-a-day District Chiefs as noted in Chapter 7: Operations of this report, the Study Team recommends that one of those District Chiefs assume the old supervisory responsibilities of Car 10. The District Chief should be licensed as an ALS provider. In addition to his or her incident response and platoon management responsibilities, the District Chief should also serve in an EMS Supervisory capacity when dealing with EMS-related service delivery issues that occur while on duty city-wide.

A Fifth Full-time MEDCU & MEDCU 6

Given the workload of the existing full-time MEDCUs, the Study Team believes that a fifth, full-time MEDCU is needed so that the workload on the other MEDCUs can be reduced thus allowing all on-duty MEDCU personnel the opportunity to participate more in station-related activities such as training and public education. Consideration should be given to implementing the fifth, full-time MEDCU as a BLS unit staffed with EMT-Bs and located either at the Riverton Station (Engine 9) or the East Deering Station (Engine 11). The unit would be ALS equipped but not staffed at the ALS level. Implementation of this fifth MEDCU may likely require the decommissioning of an engine company and the reallocation of that company's personnel.

The implementation of this new MEDCU should coincide with the full implementation of EMD thus allowing a BLS staffed unit to respond as a single unit to an Alpha call. If so desired, the implementation could coincide with the implementation of a paramedic engine company at the Riverton Station (Engine 9).

Another consideration is converting either MEDCU 5 or MEDCU 6 to a BLS unit equipped with ALS gear but staffed with EMT-Bs. While MEDCU 6 most likely is best served operating and responding out of the Bramhall Square Station, should the PFD decide to keep both MEDCUs at Central Station, then the Study Team recommends one of the units be converted to a BLS unit. This conversion could also coincide with making Engine 5 a dedicated paramedic engine.

Converting MEDCU 5 or 6 to a BLS unit and designating Engine 5 as a dedicated paramedic engine company would provide BLS response capability in the high-call volume Old Port/downtown area while also developing a tiered-response system using the paramedic engine company.

All of these recommendations concerning the creation of BLS transport units must be coordinated and approved through the Medical Director.

NET Team

The Non-Emergency Transport Team (NET Team) is PFD's program that staffs an additional MEDCU each weekday (0800 to 1600 hrs) for the purpose of handling routine transports from facility to facility. The Study Team's assessment of the NET Team current operation is that the money paid to staff the NET Team each day is a poor use of limited resources.

Each weekday, two off-duty PFD personnel are paid straight time to staff MEDCU 7 as the NET Team vehicle. The NET Team handles non-emergency transports that are scheduled ahead of time for such activities as patent dialysis or transfer from a hospital to a rehab facility.

When created, the NET Team was used quite often especially through the City's Barron Center, the community hospital-like facility operated by the City for indigent residents or

those who cannot pay for hospitalized care. At some point, most likely when Car 10 was decommissioned, the NET Team became unreliable because the scheduling of the unit through the PFD became unreliable.

In speaking with personnel responsible for patient transfers at the Barron Center, it is pretty clear that the PFD's NET Team became unreliable and the Barron Center was forced to acquire the services of private ambulance companies to handle its patient transfer needed. According to information provided to the Study Team, most patient transfers to and from the Barron Center are handled by private ambulance companies with the NET Team handling the overflow. PFD data shows that in 2012, the NET Team handled 282 non-emergency transports or about one a day.

The NET Team unit is also supposed to be the "back-up" MEDCU – or 5th MEDCU – for emergency 911 calls. When the NET Team unit responds to an emergency incident, the unit is known as MEDCU 7. In 2012, MEDCU 7 ran 435 emergency incidents and transported 397 patients.

When totaled, the NET Team/MEDCU 7 handled 717 calls for service in 2012 – or about 2.7 calls for service per day (260 days in service). The Study Team finds the current use of the NET Team not cost-effective and offers three recommendations. First, abolish the NET Team in its entirety – this is probably not the best choice. Second, dedicate the NET Team solely to non-emergency transports and actively pursue the Barron Center business that the team once held. This means working with the Barron Center to develop a MOU for service with performance standards and schedules. Third, and perhaps the most useful, implement MEDCU 7 as a BLS unit from 0800 hrs to 2000 hrs each day as a "peak demand" unit. Staff the unit with EMT-Bs and dispatch it as part of the PFD's full complement of MEDCUs. In other words, don't save MEDCU 7 for the fifth concurrent 911 call. Dispatch MEDCU 7 as a BLS unit using EMD and the "closest unit responds" dispatch model.

Implementation of MEDCU 7 as a peak demand period BLS unit will require the approval and coordination through the Medical Director.

EMS Staffing on Peaks Island

On July 4, 2011, the PFD began staffing one career firefighter on Peaks Island – 24-hours a day. Prior to that date, fire and EMS response staffing was supplied solely by volunteer

personnel living or working on the island and by two Portland Police Department law enforcement officers who had some EMS cross-training. The 2011 staffing change was the result of a reduction in force at the police department as well as the fire department. The result was the decision to provide one police officer and one firefighter on the island around the clock to provide first response to various emergencies occurring on the island.

Regarding EMS delivery on Peaks Island there are a couple of concerns. First, as noted in Chapter 9: Health and Safety, the firefighter sent to the island each day can be anybody and most often is someone chosen from the staffing "pool." As noted in Chapter 9, the day that the Study Team visited Peaks Island for the first time, it was also the first time the firefighter was assigned to the island and his first time seeing the station and the apparatus. This clearly is a problem from a safety perspective and from a "setting up an employee for failure" perspective.

Another issue related to EMS delivery on Peaks Island is the level of EMS certification of the firefighter assigned to the island for the shift. Presently, there is no requirement for the firefighter assigned to the island to be an ALS-certified provider. The Study Team feels that if the PFD is to continue assigning a single firefighter to Peaks Island that the firefighter should be an experienced firefighter and should be an EMT-P. Best practice in this scenario would have the PFD use the highest trained EMS provider – thus the recommendation for the EMT-P.

Therefore, the Study Team recommends that the PFD immediately begin using experienced firefighter/EMT-Ps as the minimum staffing requirement for the Peaks Island shift work firefighter. This also requires that the MEDCU on Peaks Island be stocked with a complete set of ALS equipment and supplies.

EMS Training

The EMS training needs of the PFD are huge. With over 200 EMS providers at three different certification levels, there is an ongoing need for continuing education training just to meet the State licensure requirements. As noted in Chapter 10: Fire and Rescue Training of this report, EMS training is handled by one person, the EMS Training Officer.

The Study Team's assessment of EMS training in the PFD is good in terms of giving the providers the training needed to maintain their current level of certification. There are

many dedicated providers who have a real interest in EMS and that makes delivering the training easy. Logistically, the delivery of required training is not easy whether it is attempted on-duty or off-duty. On-duty training requires companies to be placed unavailable for service while they complete the training program. Off-duty training usually requires the payment of overtime to the students because the training is a job requirement in order to maintain their certification.

Another issue regarding EMS training in the PFD is the ability for EMT-Is to complete training and coursework to become EMT-Ps. Currently that process does not work very well and with upcoming changes to the EMT-P curriculum, it will most likely become even more difficult.

The problem is that the PFD is licensed by the State as a paramedic service – meaning EMT-P. Yet, the PFD does not make EMT-P a job requirement, but does require newly hired firefighters to become EMT-Intermediates during their first year of employment. Of course, any of this required training requires funding, time to complete, and a means by which to complete the work.

Regarding EMS Training, the Study Team has several recommendations. First, the PFD needs to closely examine its current and future needs of EMT-Ps and develop a plan/program for meeting those needs. One option is to include the EMT-P certification as part of the hiring requirement; this means that applicants must possess a National Registry EMT-P card in order to be considered for employment. Doing so will remove the burden of training to the EMT-P level from City and place it on the applicant, which is a significant cost savings to the City.

One school of thought is that too many paramedics can result in a dilution of skill sets and abilities because of limited opportunity to see patients. The Study Team concurs somewhat with that premise and offers that the hiring process could be adjusted at times when needed to hire just EMT-Ps, while at all other times hiring EMT-Is. A number of fire-based EMS fire departments handle their hiring process that way. When they have a shortage or planned shortage of EMT-Ps, they hire a trainee class of already certified EMT-Ps. At other times, they may hire just EMT-Bs or persons with no EMS certification at all.

A second recommendation involves compensation for off-duty training. Presently it appears that there are too many rules for how and who gets paid for off-duty certification

training. The Study Team recommends that the PFD and the Local establish a clear process for off-duty EMS-related training that is the same for all levels of EMS certification.

The third recommendation involves the field training of ALS providers. An EMT-I and an EMT-P must complete many hours of classroom and clinical work. They learn critical life-saving techniques and skills that impact the patients for which they provide care. While current teaching practices and clinical experiences are much more advanced than a couple decades ago, nothing can replace the experience gained providing ALS care on an emergency service EMS unit.

A department's commitment to developing good providers is critical to the long-term success of those providers and to the long-term success of the department's EMS program. The PFD's current field training program for ALS providers has been reduced to a questionable level and field training officers and interns are often called upon to compromise their setting. The Study Team recommends that the PFD develop and implement an ALS internship program whereby new ALS providers are assigned to a field training officer for no less than a 6-week period during which time they must meet pre-established goals that are skill and confidence based. During the internship period, interns are not to count as minimum staffing.

Finally, there is a need for platoon support of EMS training. Car 10 provided some of that support during its time of operation. Currently, platoon-based EMS training varies from platoon to platoon and may only involve the training scheduled by the EMS Training Officer. The Study Team, therefore, recommends that the PFD implement a Field Training Educator on each platoon whose job would be to assist the EMS Training Officer as needed and to deliver additional EMS training on his or her designated platoon. The Field Training Educator should be an ALS provider, however, rank does not matter.

EMS Committee

In a busy fire department like the PFD, it is often difficult to evaluate operations and plan for the future because so much time is spent handling the current events. Because the Study Team has made so many recommendations regarding the delivery of EMS by the PFD, the Team recommends that the PFD create an EMS Committee to serve as a means to examine the recommendations and to provide advisory input into implementation. The

EMS Committee should be comprised of PFD management representatives, Local 740 representatives, the Medical Director (or designee), and a representative from the City's Health and Human Services Department. The committee should meet at least monthly in the beginning with scheduling adjustment made as time passes and progress is made.

OPTIONAL APPROACH TO EMS DELIVERY

As outlined in the initial description of pre-hospital EMS earlier in this chapter, an approach taken to the delivery of EMS in many municipalities involves the provision of such services by one or more qualified private ambulance companies. With the private ambulance service approach, EMS services are delivered by a privately owned company on a for-profit basis. Typically, a local government would enter into a written agreement with the private ambulance company identifying the level of services provided and the cost of said services.

The implementation of this optional approach to EMS delivery would require the development of a comprehensive request for proposals that would serve as the basis for receiving proposals from qualified firms and subsequently a City-service provider contract for service provision that would address the following items, at a minimum:

- Level of EMS to be provided, including performance standards to be met
- Provision of medical control
- Nature of accreditation to be maintained by the services provider
- Written policies and procedures to be maintained
- Professional appearance of services provider staffing
- Number of ambulance units to be maintained in service by hour of day
- Minimum level of qualifications of service provider staff
- Level of maintenance of provider's response vehicles
- Housing/location of response vehicles
- Patient billing methodology and collection efforts

Further, the successful EMS provider should be required to provide the following:

- Immediate stand-by coverage as requested by the PFD and response to structure fire incidents.
- Stand-by services at training and exercises
- Stand-by services at City sports events
- Participate in appropriate state-wide mutual aid responses

Private ambulance companies are relied upon to provide high quality pre-hospital EMS in many regions of the United States. Further, the Study Team has assessed a number of large municipalities served by private EMS providers, including Hartford, CT; Springfield, MA; Tacoma, WA; and the Phoenix, AZ, region. In general, with proper selection and contractual requirements in place, private for-profit ambulance companies have had successful partnerships with municipal fire services in the delivery of EMS, and this model could be considered by the City of Portland.

However, after a careful review of Portland's fire-based EMS delivery process, the Study Team does not recommend a move to a private sector provider in any form. PFD's MEDCU system has a longstanding history of being a premier EMS delivery service in New England and the Study Team finds that "premier" capability still exists today even with the various recommendations for improvement made by the Team.

When a municipality considers the transition from a fire-based EMS system to a private provider system there are a number of items that must be considered – most important is the quality of service provided to the citizens and visitors of the community. When EMS is based out of the fire department, the service providers are normally cross-trained in both fire and EMS skills and are more likely to make a career of being a fire department employee and EMS provider. A private EMS provider most likely does not cross-train its providers and a high employee turnover rate is quite common because job advancement in a private ambulance company is often limited.

Fire departments who respond with or use private ambulance service providers often find inexperienced providers (newly certified EMT-Bs and EMT-Ps) and at times, a delay in transport service arrival. The use of inexperienced providers is simply a result of high-employee turnover in some private ambulance companies. In many places, newly certified providers are simply looking for an entry-level job until they can be hired in a fire-based system. A lack of or failure to provide service by the private ambulance provider would likely become a liability for the City of Portland.

In terms of the "delay in transport arrival," that issue is a direct function of the for-profit nature of the private provider system. When a municipality provides EMS through a fire-based system, there is no intent on making a profit, even if patient billing is used. EMS is a core service provided by a municipality—a matter of public safety, similar to law enforcement. There is no expectation of making a profit on law enforcement and peace-

keeping—safety from crime is a public good. The delivery of quality pre-hospital emergency medical care is the same. While patient billing helps offset the cost of EMS delivery by a municipality, it rarely supports a cost-neutral result.

A private ambulance service often struggles to make a profit on 911 emergency service alone because the revenue generated through patient billing depends on the patients' abilities to pay. When servicing an urban area such as the City of Portland, the frequent users of 911 EMS may have limited ability to pay—either directly or through health care insurance. Therefore, a private ambulance provider may have to cut corners in personnel, or vehicles, or service in order to remain profitable in an urban environment with high call volume and system users unable to pay for service.

Often times, a private ambulance service also engages in inter-facility transports in the community to offset their losses in 911 emergency services. Inter-facility transports are a "known entity" and payment is guaranteed—often at a level above what would be charged for a 911 emergency transport. A common approach sometimes taken by the private company is to use one or more of their 911 emergency response units to perform inter-facility transports when not running 911 emergency calls. Most of the time, this procedure could work flawlessly. But at some point, there will be an instance where a 911 call has a delayed response of a private ambulance because that ambulance is tied up with an inter-facility transport and a different ambulance has to be sent—often from farther away.

The Study Team has found these delays in transport service arrival in several of its studies performed in other municipalities. The common thread has been the use of a private ambulance service for 911 emergency response and that private ambulance service also is involved in inter-facility transports.

Another issue regarding the changeover from a fire-based to a private ambulance service provider model is the housing of transport units. Where will the private ambulance providers stay and how will their vehicles be housed? Fire stations are logical places to house the providers and their vehicles because of station distribution in the community, but that would not be without controversy. With over 200 EMS licensed providers in the PFD, the Study Team believes that a management "nightmare" would occur should the fire-based MEDCUs be replaced with private providers and co-located in the fire stations.

Moving from a fire-based EMS model to a private ambulance service also raises the concern of the inability to go back. When a fire department that is involved in a full-service ALS delivery model transitions to a full-service private provider model, it is not easy to return to the fire-based model should the private provider encounter service delivery problems. The fire department would have disposed of its EMS assets and EMS infrastructure and significant expense would be incurred to restart the service.

When EMS is delivered by a private ambulance company there have been instances of these firms not being able to meet contractual performance standards or going out of business due to financial losses. When that happens, the municipality can suddenly find itself without an EMS provider and suddenly faced with significant expenditure to reinstitute the fire-based system or be forced to find another private provider.

The other danger of course is the contract for service. Careful management of the contract is important, especially when considering uninterrupted service as the contract nears its renewal date. With the fire-based EMS model, there is no concern over service contracts or if the provider company is going to go bankrupt.

While the City of Portland could certainly evaluate the use of a private provider for EMS delivery, the Study Team recommends against privatizing EMS delivery in the City because of the quality system already in place and because of the commitment, dedication and professionalism of everyone involved in providing said service. To quote one provider, "We would disappoint the citizens if we changed to a private service."

Further, it should be noted that, according to the FY 2013 approved budget, current Medcu billing for services is estimated to provide a revenue of $3,039,900. The approved FY 2013 EMS Division budget expenditures of $2,396,100 would provide a surplus of $643,800 that could be utilized to fund the Medcu annual replacement cost.

SUMMARY

To quote the PFD's Medical Director, "There are great people working at PFD. The department needs to capture, mentor, and grow the superstars!" After the Study Team completed its interview sessions it was quite apparent that the PFD has much talent and is quite capable of moving its service delivery to the next level—especially in the area of EMS. In essence, the PFD MEDCU program is net neutral in relation to revenue and cost of services provision.

With over 100 certified EMT-Intermediates and EMT-Paramedics, four full-time ALS equipped transport units, and ALS-equipped engine and ladder companies, PFD's full-service EMS system provides a much higher level of service than many traditional fire department first responder services. The PFD must be commended for its efforts to provide said service.

While there is much work ahead for the PFD in terms of the EMS recommendations, the Study Team is confident that the PFD can continue to deliver quality fire-based EMS while meeting the demands and challenges of the future.

RECOMMENDATIONS

6-1 The Fire Chief should increase PFD's public education efforts in the community by becoming more involved in the delivery of citizen CPR training. This training should be regularly scheduled throughout the community and be offered in a multilingual approach.

6-2 The Fire Chief should initiate the process for the PFD to become involved in the State's Child Passenger Safety program and become a Car Seat Inspection and Education Location for the City of Portland.

6-3 The Fire Chief should immediately begin work with the Medical Director and the communications center to fully implement EMD operations that will allow the dispatch of the closest EMS resources using a tiered response format based upon call type. This recommendation includes the use of EMT-B staffed MEDCUs where appropriate.

6-4 The Fire Chief should utilize the PFD's Medical Director to the fullest extent possible including the continued evaluation of treatment protocols, the complete implementation of EMD, and the supportive desire to be on the "cutting edge" of pre-hospital care.

6-5 The Fire Chief should include the Medical Director position in the department's organization chart under the EMS Division.

6-6 The Fire Chief should develop a policy and procedure that standardizes the content format of the patient care narrative and develops a content template for provider use.

6-7 The Fire Chief should work with the ePCR software provider to enable the station officers (Captains and Lieutenants) to query the system for missing and incomplete reports so that those reports can be completed in a timely and correct manner.

6-8 The Fire Chief should immediately develop and implement a written QI plan that is approved by the Maine EMS Board.

6-9 The Fire Chief and the Portland Professional Firefighters IAFF Local 740 should work together to reduce the perceived and real animosity that exists between EMS providers and personnel assigned for fire apparatus.

6-10 The Fire Chief and the Local should work together to implement a program by which personnel are assigned to a fire station — not an individual unit. This program will require a revision to the current bid system so that personnel bid a station, not a unit.

6-11 The Fire Chief and the Local should work together to develop an EMS stipend program for EMT-Is and EMT-Ps whereby certified providers have to deliver said service on a MEDCU for a minimum number of hours over a pre-determined time period (e.g., 24 hours a month on a MEDCU – overtime hours can count toward the 24-hr-a-month requirement).

6-12 The Fire Chief should consider implementing dedicated ALS delivery using fire apparatus: this program should be piloted first by using Engine 9 and Ladder 4. The pilot program should be no less than 12 months.

6-13 The Fire Chief should assign one of the newly created District Chief positions to assume the most critical functions of the previous Car 10 position.

6-14 The Fire Chief should require the District Chief (with Car 10 duties) to be licensed as an ALS provider.

6-15 The Fire Chief should implement a fifth, full-time MEDCU as a BLS unit staffed with EMT-Bs and located either at the Riverton Station (Engine 9) or the East Deering Station (Engine 11). The unit should be ALS equipped, but not staffed at the ALS level. (This implementation may likely require the decommissioning of an engine company and the reallocation of that company's personnel.)

6-16 The Fire Chief must ensure that implementation of a fifth MEDCU as a BLS transport unit coincides with the full implementation of EMD thus allowing a BLS staffed unit to respond as a single unit to an Alpha call. If so desired, the implementation should coincide with the implementation of a paramedic engine company at the Riverton Station (Engine 9).

6-17 The Fire Chief should consider converting either MEDCU 5 or MEDCU 6 to a BLS unit equipped with ALS gear but staffed with EMT-Bs. This conversion could coincide with making Engine 5 a dedicated paramedic engine.

6-18 The Fire Chief must ensure that the creation of BLS transport units is coordinated and approved through the Medical Director.

6-19 The Fire Chief, with Medical Director approval, should implement one of three options concerning the NET Team:

1. Abolish the NET Team in its entirety.
2. Dedicate the NET Team solely to non-emergency transports and actively pursue the Barron Center business that the team once held.
3. Implement MEDCU 7 as a BLS unit from 0800 hrs to 2000 hrs each day as a "peak demand" unit. Staff the unit with EMT-Bs and dispatch it as part of the PFD's full complement of MEDCUs.

6-20 The Fire Chief should immediately begin using experienced firefighter/EMT-Ps as the minimum staffing requirement for the Peaks Island shift work firefighter. This also requires that the MEDCU on Peaks Island be stocked with a complete set of ALS equipment and supplies.

6-21 The Fire Chief and the City need to closely examine the current and future needs of EMT-Ps in the PFD and develop a plan/program for meeting those needs.

6-22 The Fire Chief and the City should consider including EMT-P certification as part of the hiring requirement; meaning that applicants must possess a National Registry EMT-P card in order to be considered for employment.

6-23 The Fire Chief and the Local need to establish a clear process for off-duty EMS-related training that is the same for all levels of EMS certification.

6-24 The Fire Chief should develop and implement an ALS internship program whereby new ALS providers are assigned to a field training officer for no less than a 6-week period during which time they must meet pre-established goals that are skill and confidence based. During the internship period, interns are not to count as minimum staffing.

6-25 The Fire Chief should implement a Field Training Educator on each platoon whose job is to assist the EMS Training Officer as needed and to deliver additional EMS training on his or her designated platoon. The Field Training Educator should be an ALS provider.

6-26 The Fire Chief should create an EMS Committee to serve as a means to examine the recommendations and to provide advisory input into implementation. The EMS Committee should be comprised of PFD management representatives, Local 740 representatives, the Medical Director (or designee), and a representative from the City's Health and Human Services Department. The committee should meet at least monthly in the beginning, with scheduling adjustment made as time passes and progress is made.

6-27 The City should continue to fund and support the delivery of EMS using the fire-based EMS approach; there should be no privatization of EMS delivery in the City.

CHAPTER SEVEN
OPERATIONS AND COMMUNICATIONS

This chapter addresses the operational aspects of fire protection and rescue service delivery in the City of Portland. The chapter is divided into several sections that examine incident response workload analysis; specialty response services; marine and air rescue services and pre-incident planning. Emergency Medical Services (EMS) delivery was covered in Chapter 6.

INTRODUCTION

On the scene of a fire or rescue emergency there is no time to make decisions by committee. Although some quick consultation can take place, time for deliberation is limited. Decisions made at the emergency scene may be irreversible and the consequences of error can be disastrous. Such errors can lead to further property loss, as well as injury or death to civilians and firefighters. In many cases, the fire officers have to make decisions based on information that they gathered hastily. The fact is that all structure fire situations are different; these differences include:

- The type of fire and its location in the building;
- The building type and its construction;
- The interior contents and furnishings of the building;
- The presence of hazardous materials;
- The presence of built-in fire protection and life safety systems; and,
- The time of day and weather conditions.

All fire officers and firefighters must be well trained and prepared in order to be successful in handling emergency incidents. If training and preparation is left up to "on-the-job experience," the cost in property and life loss has the potential to be significant.

There are several key factors needed to ensure that emergency scene operations occur as efficiently, effectively, and safely as possible. First, fire and rescue stations must be sufficient in number and geographic distribution in order to allow for the timely arrival of emergency equipment. Second, emergency response apparatus must be adequately staffed to allow basic tasks to be completed in a timely and effective manner. Third, emergency responders must be properly trained and equipped to handle a wide variety of emergency

incident scenarios. Finally, standardized operating procedures are needed to help guide emergency scene decision-making in the deployment of basic levels of service.

THE FIRE PROBLEM

The term "working fire" is a common term used throughout the United States by fire service personnel to describe a structure fire where fire department resources are expected to engage in some type of fire attack operation in order to mitigate the incident. Unfortunately, there is no agreed upon standard definition of a "working fire;" the term varies from region to region and, therefore, fire incident data vary as well.

For the purpose of this report, the Study Team defines a "working fire" as any fire incident where fire department personnel must don their protective clothing and equipment and use at least one hose line to control and extinguish a structure fire.

In 2012, a fire department's incident response statistics probably include a wide variety of call types ranging from emergency medical runs, to public service calls, to automatic fire alarms, to trash fires. Of all the incidents to which fire departments respond, the working structure fire is generally one of the least frequent events, yet it carries with it perhaps the greatest threat to life and property.

The majority of incidents handled by today's fire departments are handled with one or two pieces of apparatus, and, with the exception of an emergency medical incident, these incidents are handled with a decreased level of urgency. A working structure fire on the other hand presents a series of urgent matters that must be quickly addressed by responding forces if lives and property are to be saved.

A structure fire requires the response of an adequate number of personnel and equipment; it requires quick and accurate decision-making; and it requires discipline. Without any of those three key elements, the structure fire may very well be extinguished without incident— but not without additional property loss and risk to emergency responders and civilians.

Therefore, the Study Team believes that a fire department must be sufficiently staffed, equipped, and prepared for the response to structure fires. Being ready for the structure fire response will also help ensure the department's response readiness for all other call types.

A Look At National Fire Data

Fire continues to be a serious problem throughout the United States and has been for many years. In general, persons and communities of lower socioeconomic status generally tend to suffer greater occurrences of fire and its related losses. Thus, the workloads of fire departments are generally greater in the lower economic neighborhoods of the United States.

A review of national data indicates the magnitude of the fire problem on a national basis. The following fire data and statistics* present a "snapshot" of fire's impact on the United States in 2011.

- 1,389,500 fires were responded to by public fire departments, an increase of 4.4% from 2010;
- 484,500 fires occurred in structures, a very slight increase of 0.5%;
- 370,000 fires or 76% of all structure fires occurred in home structures;
- 219,000 fires occurred in vehicles, a slight increase of 1.6% from the year before;
- 686,000 fires occurred in outside properties, an increase of 8.2%;
- 3,005 civilian fire deaths occurred in 2011, a decrease of 3.7%.
- 2,520 civilian fire deaths occurred in the home (84% of all fire deaths), a decrease of 4.5%;
- 300 civilians died in vehicle fires;
- Nationwide, there was a civilian fire death every 175 minutes;
- A civilian death in home fires occurred every 208 minutes;
- 17,500 civilian fire injuries occurred in 2011, a decrease of 1.2%;
- 13,910 of all civilian injuries occurred in home fires;
- 1,190 civilians were injured in vehicle fires;
- Nationwide, there was a civilian fire injury every 30 minutes;
- A civilian fire injury in home fires occurred every 38 minutes;
- An estimated $11.7 billion in property damage occurred as a result of fire, a very slight increase of 0.6% from last year;
- $9.7 billion of property damage occurred in structure fires;
- $6.9 billion of property loss occurred in home fires;
- $1.4 billion of property loss occurred in vehicle fires;
- An estimated 26,500 intentionally set (not including any allocation of fires with unknown cause), a decrease of 3.6%;
- Intentionally set fires in structures resulted in 190 civilian deaths, a 5.0% decrease;

- Intentionally set structure fires also resulted in $601,000,000 in property loss, an increase of 2.7%;
- 14,000 intentionally set vehicle fires occurred, no change from 2010, and caused $88,000,000 in property damage, a slight decrease of 1.1% from a year ago

*Data was obtained from the National Fire Protection Association.

MAINE FIRE PROBLEM

According to the State Fire Marshall's website, the following are relevant statistics that reflect the fire problem in the State of Maine, based on National Reporting System data reported by Maine Fire Departments. Reported data is as follows for 2011.

- 4,542 total fires;
- 502 fire incidents occurred on Fridays, the busiest day of the week;
- 248 fire incidents occurred between 5pm and 5:59 pm during the year;
- 1,227 total fires were unintentional causes;
- 435 total fires were cooking area, kitchen area of origin;
- 86,558 total incidents;
- 8,826 total incidents occurred in August, the busiest month;
- 22,605 total incidents involved 1 or 2 family dwellings;
- 14,914 total incidents involved multifamily dwellings;

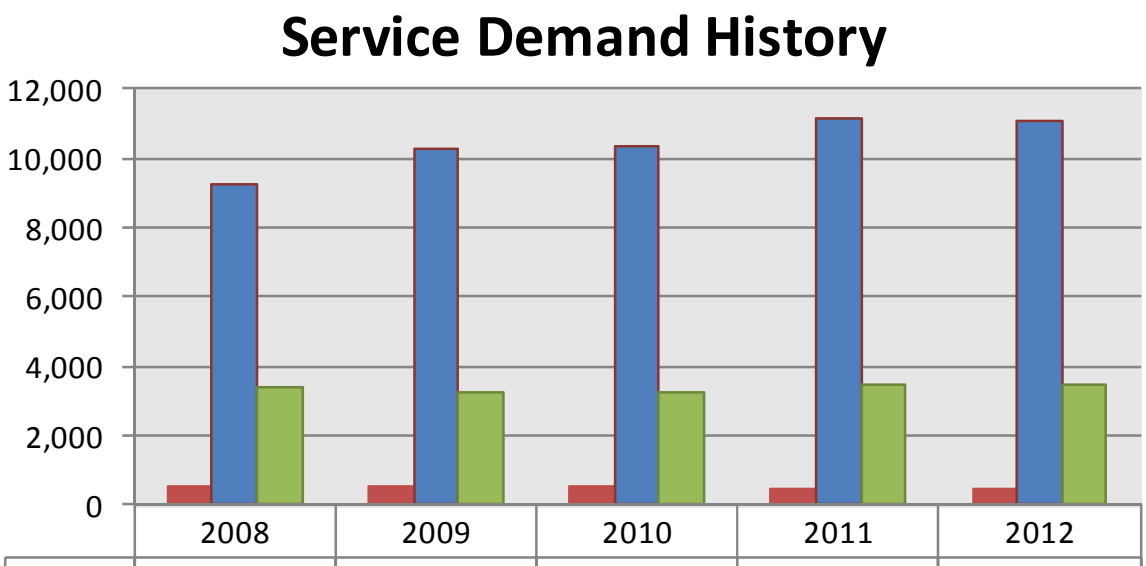
The number of fire deaths in the State of Maine for the years 2000-2012 were:

2000 - 17 deaths
2001 - 18 deaths
2002 - 16 deaths
2003 - 20 deaths
2004 - 18 deaths
2005 - 23 deaths
2006 - 15 deaths
2007 - 12 deaths
2008 - 15 deaths
2009 - 14 deaths
2010 - 9 deaths
2011 - 23 deaths

PORTLAND FIRE DEPARTMENT WORKLOAD ANALYSIS

Records of incidents within the City of Portland were acquired by the fire department through the exported files from the National Fire Incident Reporting System (NFIRS), the Computer-Assisted Dispatch (CAD) records from the Emergency Communications Center, as well as the MEDCU's Patient Care Report database (PCR). Reportedly, these three databases are auto-populated with information[1] from the CAD. In addition, the Fire Department Summary reports were also utilized to determine historical workload. Figure 7.1 illustrates the change in volume for categories of reported fire, medical and all other categories of incidents (alarm, hazard, spill, etc.) over the past five years[2].

Figure 7.1
HISTORIC SERVICE DEMAND



	2008	2009	2010	2011	2012
Fire	533	514	553	473	440
EMS	9,273	10,246	10,330	11,155	11,103
Other	3,438	3,256	3,289	3,448	3,458

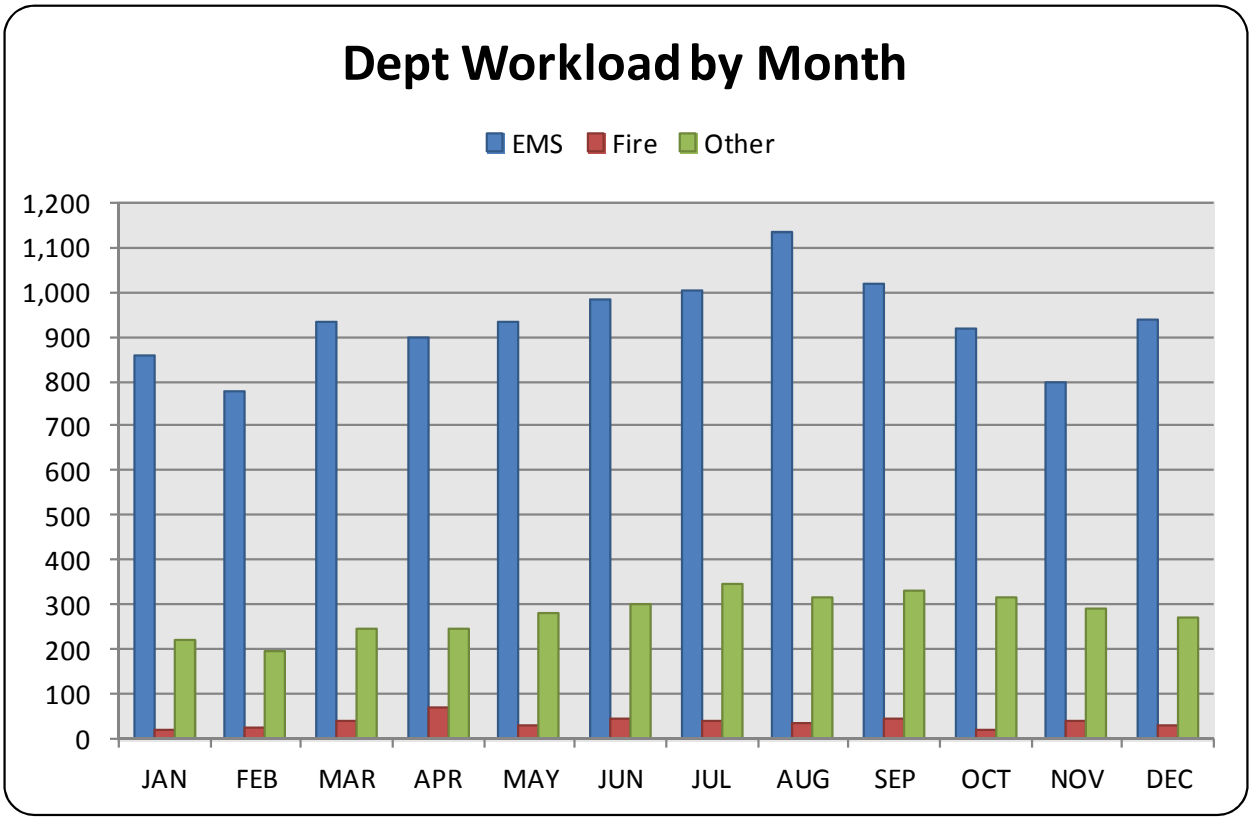
[1] Incident number, address, time stamps

[2] PFD annual Reports, 2012 NFIRS summary report

It can be seen that medical calls account for the majority of service demand within the City of Portland. Looking at the data as percentages, fire and other types of calls reduced from 4.32% and 26.16% to 2.93% and 23.05%, respectively. During the same period, EMS calls increased from 69.53% to 74.02%. Most of the 'other' types of calls were for false alarms.

Examining the last year of data[3] more closely, changes in demand can be seen on a monthly basis. Figure 7.2 illustrates that service demand is higher in the summer months for all types of calls. Fire calls are especially higher in April, while EMS calls are higher in July, August, and September.

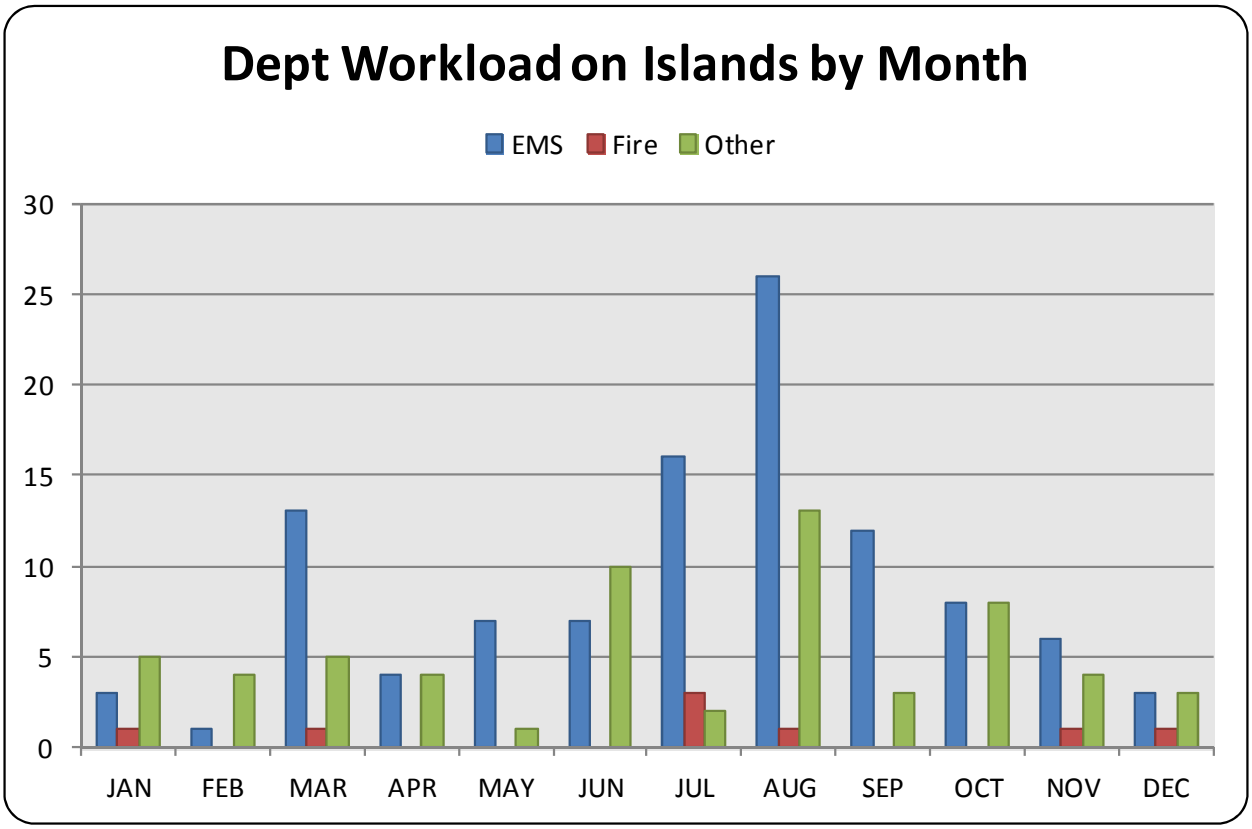
Figure 7.2
DEPARTMENT WORKLOAD BY MONTH OF YEAR



[3] CAD Records

The higher workload during the summer may be attributed to the seasonal island population and correlated airport passenger traffic. There were only 176 island calls in 2012 and that is not enough to skew the overall data. However, as expected most calls occur in the summer months. (See Figure 7.3.)

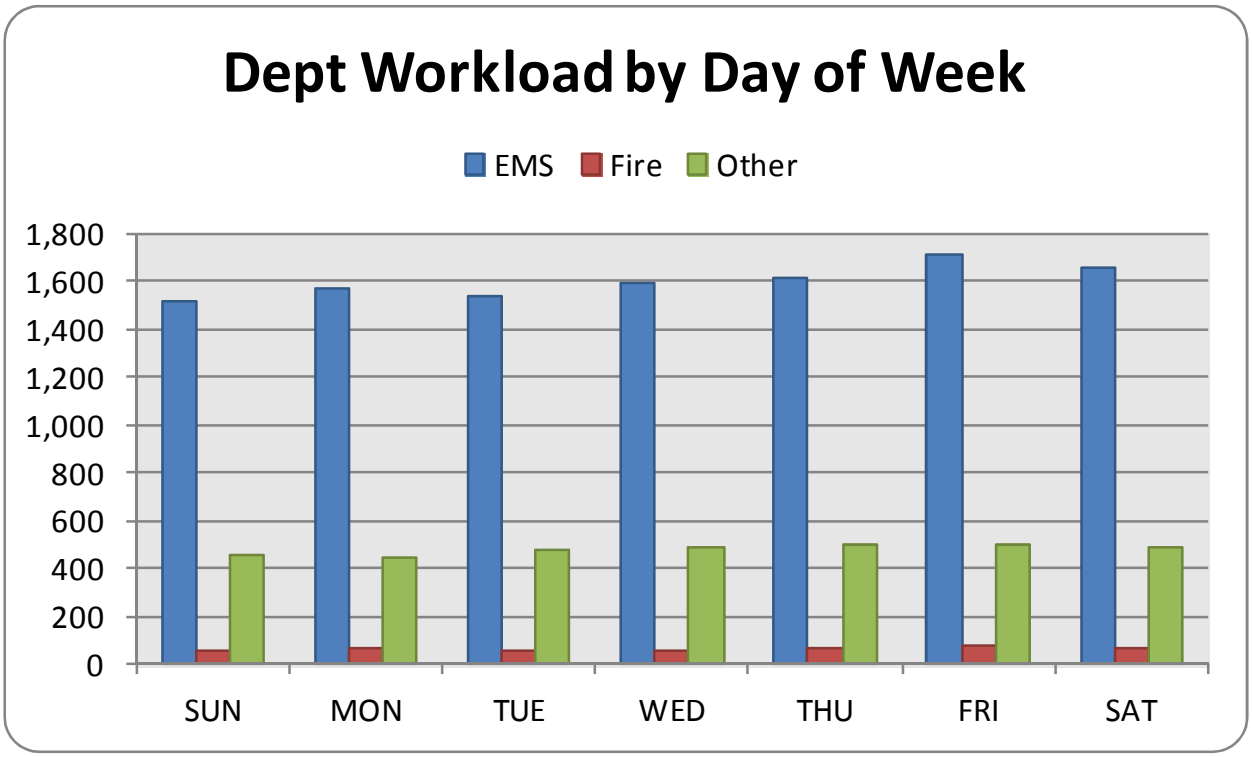
Figure 7.3
ISLAND WORKLOAD BY MONTH



The airport service demand volume is also too low to skew the overall service demand statistics, totaling approximately 200 calls per year. Although not shown graphically, the service demand at the airport is higher during the month of July and September.

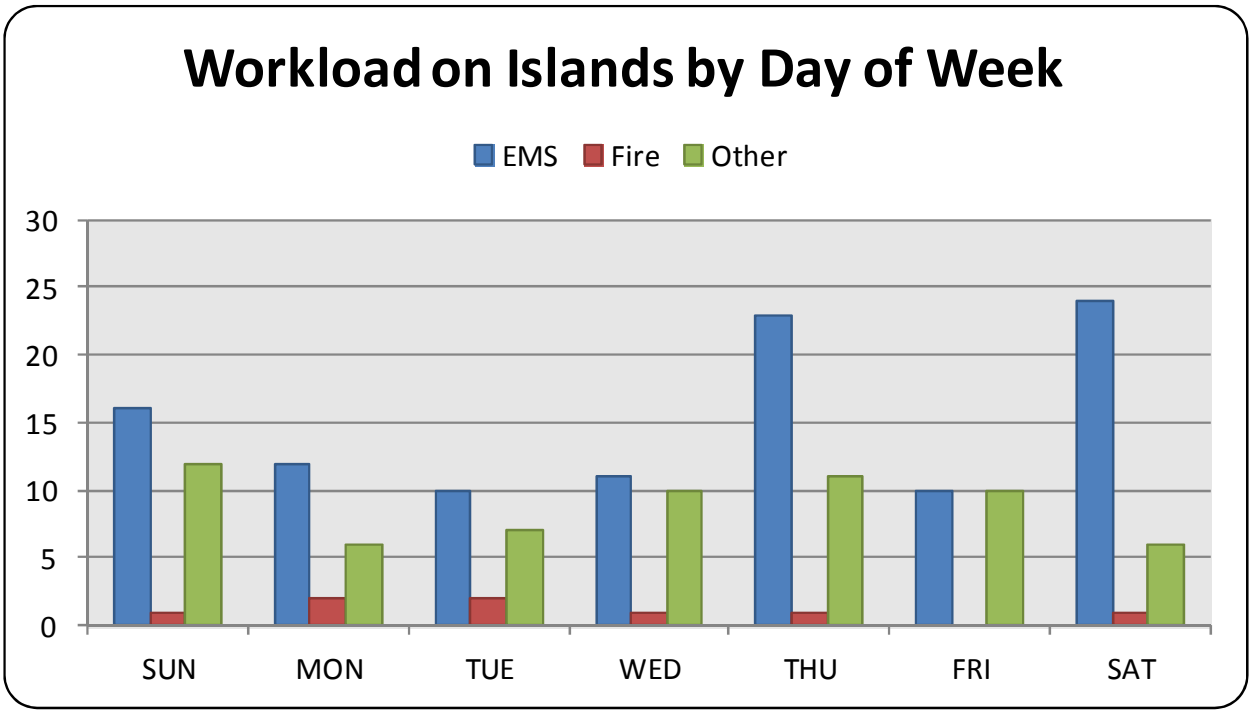
Examining the department service demand by the day of the week reveals that Friday is the busiest day of the week for all calls for the Portland Fire Department (see Figure 7.4).

FIGURE 7.4
DEPARTMENT WORKLOAD BY DAY OF WEEK



Calls on the islands are more numerous on Thursdays and Saturdays with medical calls while non-fire 'other' type calls more frequent on Sundays. Fires are more prevalent on Tuesdays but fortunately none occurred on a Friday (see Figure 7.5).

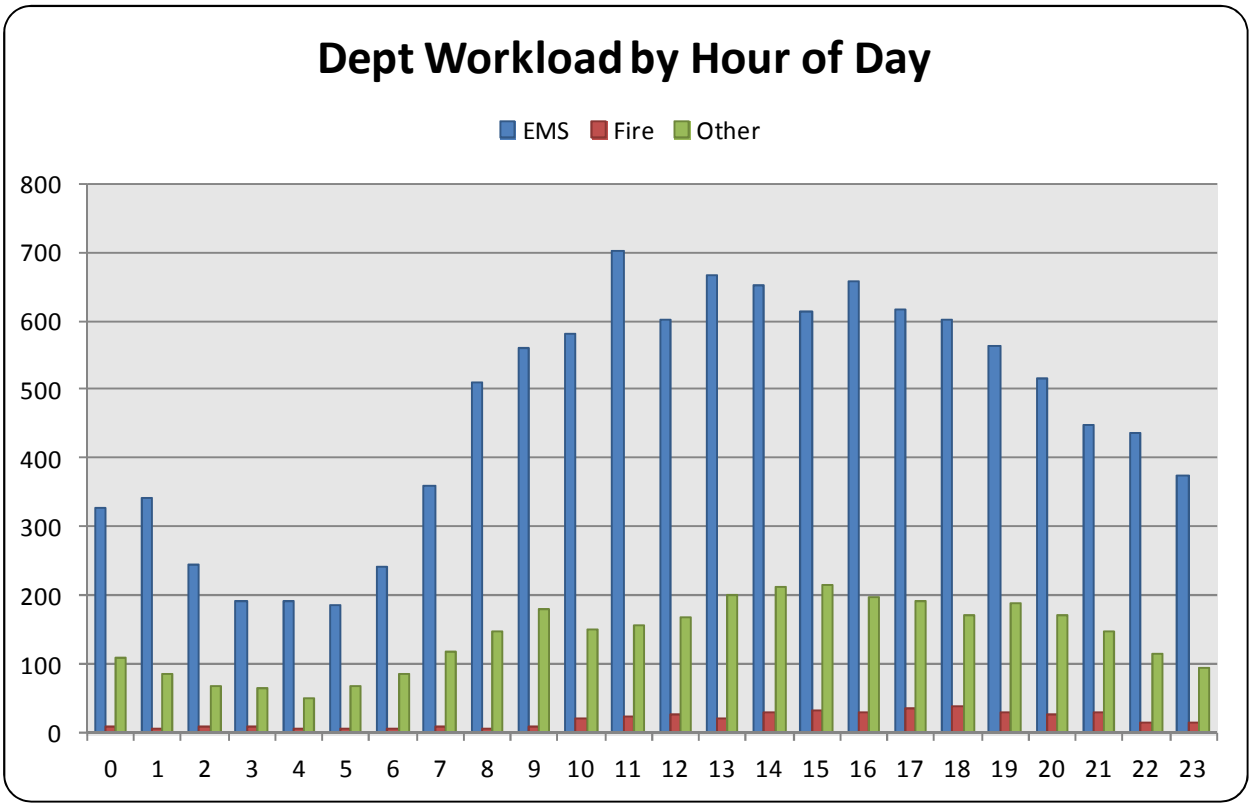
Figure 7.5
ISLAND WORKLOAD BY DAY OF WEEK



For the airport, the busiest day is Monday declining through Thursday and increasing into the weekend with a lower volume on Sundays.

Next, the workload is examined upon an hourly basis (see Figure 7.6). It can be seen in the following figure that service demand for the fire department increases with daytime human activity. The peak hours for demand is from 8 AM until 8 PM, with the busiest seen at the 11AM hourly time frame. The islands and the airport hourly demand mimic this same pattern.

FIGURE 7.6
WORKLOAD BY HOUR OF DAY



These peak hours are typically when simultaneous calls occur and this can reduce the available units for subsequent calls. For instance, once there are four simultaneously occurring calls that dispatch an ambulance (barring the instance when multiple MEDCUs are needed on the same call) there would be no MEDCUs left in the City for the fifth that may occur.

PRE-FIRE PLANNING

Traditionally, one major job responsibility for station personnel is to conduct pre-fire planning programs for "target hazards" within their first-due response area. Chief William Clark, in his textbook entitled *Firefighting Principles and Practice*, discusses pre-fire planning in the following manner:

> "When a fire department is acquainted with the potential of a fire before it occurs, that department has an advantage over the fire, provided that it makes preparation in keeping with the need shown by the advanced study. It is of little use to identify

> and isolate firefighting problems if nothing is done to offset them. The elements of a pre-fire plan should not only pinpoint needs but also provide for meeting them. Target hazards and their peculiar features should be identified. The requirements for combating a fire in any of them should be studied and plans should be prepared."

Although the PFD fire station assigned firefighters and officers may periodically complete a pre-fire plan or conduct a site "walk through" for new buildings in the response area, the Study Team finds that there is no comprehensive pre-fire planning program.

While the lack of adequate pre-fire plans is not uncommon in a fire department, the Study Team believes that this should not be the case in an all-career fire department—especially one that protects a city that possesses so many varied hazards. Pre-fire planning should be assigned a high priority in the workload of the officers and station personnel. The information included in those plans will assist in the decision-making process when the emergency incident occurs.

To remedy this situation, the Study Team urges the on-duty firefighting personnel to visit the target hazards in the city, tour each facility, prepare drawings and lists of hazards, and then, upon return to the station, develop the tactics and strategy for handling incidents at the particular facility. The drawings and information should then be shared with all personnel through training programs. This approach to pre-fire planning is progressive and improves the safety factor for firefighters and officers who may be required to fight fires in structures that have been previously pre-fire planned in this manner.

The pre-planning documents should be kept electronically readily available for officers to refer to while en route to the incident and for incident commanders to refer to during the course of appropriate incidents. In addition, officers should conduct regular station refresher drills utilizing this material.

The essential elements of a pre-fire plan suggested for the PFD should include the following:

1. Special Hazards:
   - Structural faults;
   - Cracked walls;
   - Overloading;
   - Hazardous materials; and,
   - Man-traps (locations, amounts, 704M class, etc.).
2. Entry and Access:
   - Types of doors and windows;
   - Recommended entry;
   - Force entry procedures if necessary;
   - Stair location; and,
   - Access to roof, basement, storage and utilities.
3. Special Apparatus Assignment:
   - Recommended revisions to the standard apparatus assignment based on one or more unique aspects of the structure and/or contents.
4. Life Safety:
   - Need for evacuation;
   - Number of people;
   - How to evacuate;
   - Where people are concentrated or potentially trapped;
   - Exit travel; and,
   - Operational restrictions.
5. Exposure:
   - Buildings and/or material in vicinity;
   - Distance from;
   - Type of occupancy;
   - Type of construction;
   - Means of fire spread; and,
   - Combustibility.
6. Confinement:
   - Possible fire and smoke travel (within or without);
   - Firefighting openings;
   - Fire walls;

- Compartmentation;
- Automatic dampers; and,
- Fire doors.

7. Protection Systems:
   - Sprinklers;
   - Automatic extinguishing systems;
   - Standpipe;
   - Internal alarm;
   - Emergency lighting; and,
   - Location of valves, controls, etc.
8. Ventilation:
   - Building features;
   - Building equipment;
   - Location of controls;
   - Roof;
   - Wall; and,
   - Basement openings.
9. Occupancy and Fuel Load:
   - Location;
   - Type or class; and,
   - Amount and concentration of combustibles.
10. Water Supply:
    - Location of fire department connections and valves;
    - Hydrant locations;
    - Main sizes; and,
    - Location and quantity of auxiliary sources.
11. Salvage:
    - High value areas;
    - Stock susceptible to spike/water damage;
    - Water removal methods; and,
    - Location of drains and sumps.
12. Utilities:
    - Location of air conditioning and heating controls and switches;
    - Location of Knox box;
    - Location of elevator keys;

- Location of trash room/s; and,
- Location of controls and valves for electricity, gas (inside and outside), and water (inside and outside).

13. Construction:
    - Building specifications;
    - Type of construction;
    - Class type; and,
    - Construction of roof, interior walls and floors, false ceilings and shafts.
14. Personnel Needs:
    - Personnel needs required to deliver the estimated water flow and their recommended locations around the facility; and,
    - Additional personnel requirements, such as additional alarms and mutual aid response.
15. Additional Agencies:
    - Any additional agencies from within the City or the Commonwealth for handling an incident at this facility.

MARINE FIRE/EMS SERVICES

This Section provides a review of fireboats generally, their history, and development through the years.

Fireboats Generally

A **fireboat** is a specialized watercraft with pumps and nozzles designed for fighting shoreline and shipboard fires. The first fireboats, dating to the late 18th century, were tugboats, retrofitted with firefighting equipment. Older designs derived from tugboats and modern fireboats more closely resembling seafaring ships can both be found in service today. Some departments would give their multi-purpose craft the title of "Fireboat" also. They are frequently used for fighting fires on docks and shore side warehouses as they can directly attack fires in the supporting underpinnings of these structures. They also have an unlimited supply of water available, pumping directly from below the hull and can be used to assist shore based firefighters when other water is in low supply or is unavailable, for example, due to earthquake breakage of water mains, as happened in San

Francisco due to the 1989 Loma Prieta earthquake. Modern fireboats are capable of pumping tens of thousands of gallons of water per minute.

Occasionally, as is the case in Portland, fireboats are used to carry firefighters and Emergency Medical Technicians with their equipment to islands and boats in the Bay.

Cities with fireboats are usually located on a large body of water with port facilities. Smaller fire departments lacking resources will use a rigid-hulled inflatable boat or borrow boats from local rescue agencies (EMS, coast guard, military).

History of Fireboats

The first recorded fire-float was built in 1765 for the Sun Fire Insurance Company in London. This was a manual pump in a small boat, rowed by its crew to the scene of the fire. A similar craft was built in Bristol by James Hillhouse for the Imperial Fire Insurance Office in the 1780s. All firefighting in Bristol was carried out either by private insurance companies or the Docks Company until the formation of the Bristol Fire Brigade as a branch of the police in 1876. In New York City a small boat with a pump was used to fight marine fires. By the middle of the nineteenth century, self-propelled steam-fire-floats were beginning to be introduced. The FDNY leased the salvage tug *John Fuller* as the city's first powered fireboat in 1866. Prior to the *John Fuller*, as early as the late 1700s, the FDNY used hand-pumpers mounted to barges and large rowboats. The first purpose built steam driven boats were introduced by Boston Fire Department (*William F. Flanders*) and FDNY (*William F. Havenmeyer*) in 1873 and 1875 respectively.

U. S. Cities With Fireboats

The following is a selected list of U.S. cities and other municipalities that provide fireboat services with one or more fireboats. The staffing of these fireboats varies:

- Baltimore City Fire Department - 4
- Boston Fire Department - 2
- Buffalo Fire Department - 1
- Charlotte Fire Department - 1
- Chicago Fire Department - 2
- Cleveland Fire Department - 1

- Detroit Fire Department - 1
- District of Columbia Fire Department - 3
- Fairfax County Fire and Rescue Department - 4
- Honolulu Fire Department - 1
- Jersey City Fire Department - 1
- Los Angeles Fire Department - 5
- Massachusetts Port Authority – 2
- Miami Fire Department- 1
- Miami-Dade Fire Rescue Department-2
- New York City Fire Department Fireboats - 4
- Newport News (VA) Fire Department - 1
- Portland (ME) Fire Department - 3
- Portland (OR) Fire & Rescue - 2
- Port of Houston Authority Marine Fire Department - 3
- San Francisco Fire Department - 2
- Sandusky Fire Department - 1
- Seattle Fire Department - 5
- Tacoma (WA) Fire Department - 3

Portland Fireboat History

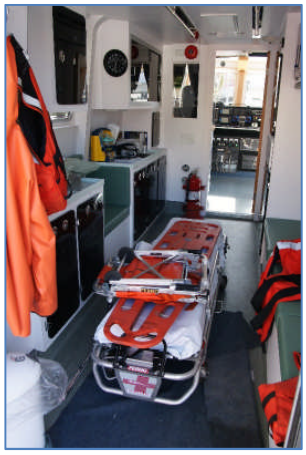
The following are a number of Fireboat changes that have occurred in the history of the Portland Fire Department:

- 1894 – Engine Seven Fireboat commissioned fitted with a steam engine capable of discharging 1,800 GPM and quartered at the Portland Pier;
- 1906 – New quarters opened for "Engine 7 Fireboat" at the State Pier, and was berthed on the east side of the pier;
- 1931 – Engine Seven Fireboat replaced with a new *City of Portland* with a pumping capacity of 6,000 GPM;
- 1959 – Portland purchased another replacement fireboat, the *City of Portland*. The 65-foot boat from General Ship Company had a pumping capacity of 7,000 GPM;
- 1993 – Known as Marine 2, the *Joseph C. Cavallaro. Jr.* is a 42-foot Duffy and Duffy, went into service as a rescue boat for the waterfront and Portland's Coastal Islands, with a 540 HP Caterpillar diesel engine and without any water pumping capacity;

- 2005 – Known as Marine 3, the Pacific Skiff 2025, 20-foot aluminum workboat with a 140 HP Suzuki outboard motor and no water pumping capacity; and,
- 2009 - Known as Marine 1, the *City of Portland* Ranger 2000 Class all-welded aluminum 65-foot diesel fire EMS boat built by A. F. Theriault & Son of Metaghan River, Nova Scotia, Canada, and designed by Robert Allen Ltd. of Vancouver, B.C., Canada. This *City of Portland* is equipped with a Hale SPM3000 DT fire pump rated at 3,000 gallons per minute. It is powered by an Iveco C-13 ENT M77 engine, rated at 545 BHP, with an on-board FoamPro dual foam system, supplied by 60-gallon Class-A foam tank and 100-gallon Class-B foam tank.

Figure 7.7
PAST PORTLAND FIREBOATS – 1894, 1906 AND 1959

Figure 7.8
CURRENT PORTLAND FIREBOAT – 2009
WITH EMS PATIENT TREATMENT AREA



The Fireboat Division provides firefighting capabilities for the Portland waterfront area, islands, and all marine craft associated with Portland Harbor and Casco Bay. The fireboat further provides emergency medical services treatment and transportation for island residents and visitors and training for the island volunteer firefighter EMT call forces. The Marine 1 crew conducts life and fire safety inspections of waterfront facilities and

harbor patrols as required. The Division is regularly involved in seamanship and pilot training and ongoing maintenance of the three boats.

Fireboat Budget and Staffing

The FY13 final approved fiscal allowance budget appropriation is provided in Figure 7.9.

Figure 7.9
SUMMARY FIREBOAT BUDGET - 2013

APPARATUS	NUMBER
Payroll	$,792,077
Benefits	$3,000
Maintenance	$62,750
Supplies	$39,025
Utilities	$6,740
TOTAL	$903,592

Source: PFD.

Fireboat Staffing

The following are the authorized staff of the Fireboat:

Fire Captain EMT-I	1
Fire Lieutenant EMT-B	3
Firefighter EMT-P	1
Firefighter EMT-B	7
Total	12

The following points relate to the staffing of the Fireboat functions:

- Three personnel per each of the four shifts; with two assigned to waterfront, one assigned to Peaks Island:
- The Peaks Island assignment is rotated between the two shift Firefighters every six months. Additionally, a Portland Police Officer is assigned to Peaks Island;

- The island-assigned Firefighter is the initial incident commander for Peaks Island incidents.
- A land-based MEDCU and/or Engine is dispatched to the Fireboat based on the nature of the incident. A firefighter from the responding engine serves as the Deck Hand for the Fireboat crew.

Fireboat Responses

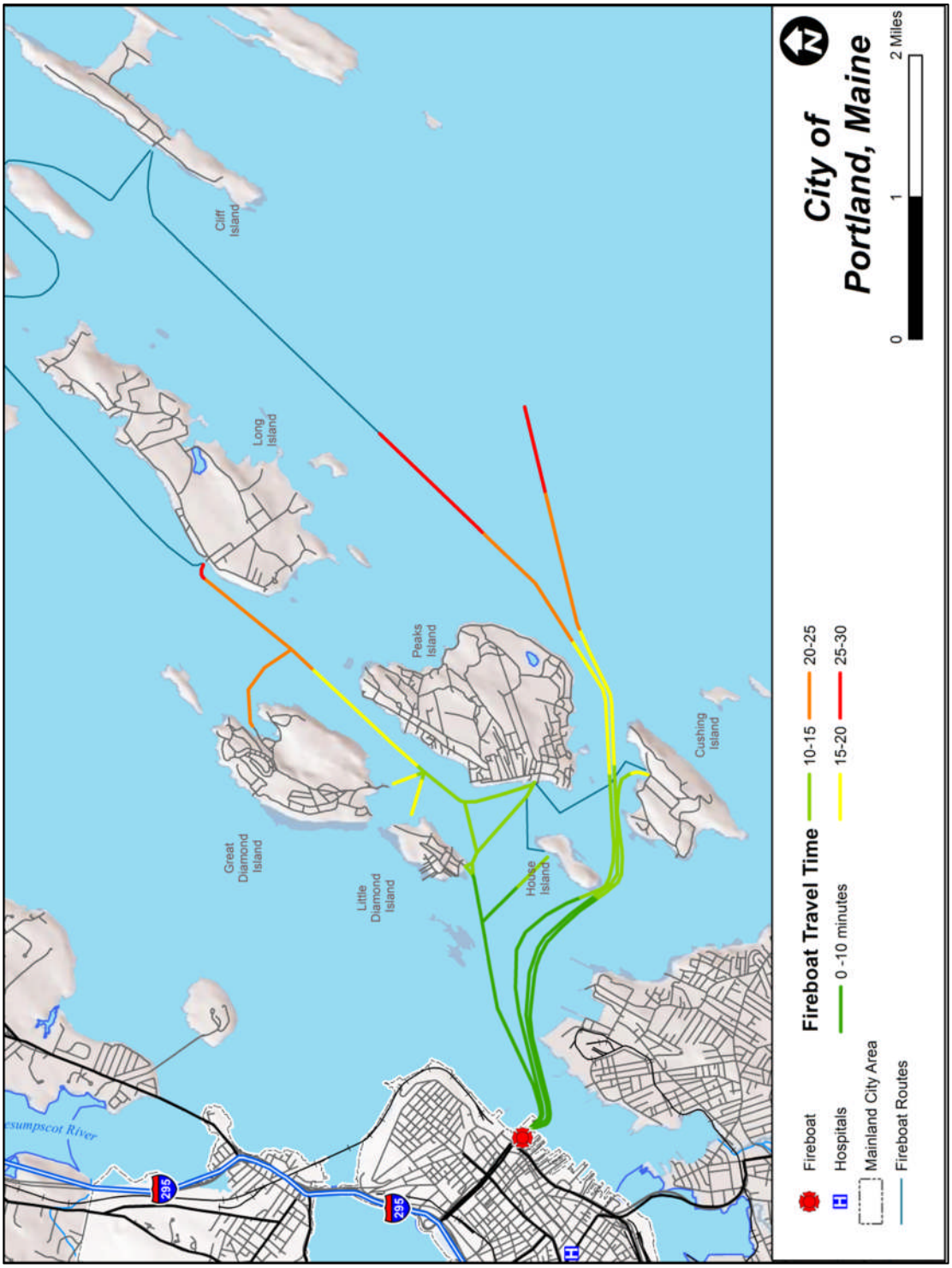
The following describes the various aspects of Fireboat responses on emergency incidents:

- Fireboat must wait for a land based engine and/or MEDCU to arrive at the dock before responding since the Fireboat may not respond with a crew of two;
- Usually takes 3 to 5 minutes to get underway if closest land-based engine and/or MEDCU is available;
- Travel time to Peaks Island by Fireboat is approximately 15 minutes;
- Current estimated (conservative) Peaks Island Emergency Medical Service incident resolution time for the Fireboat of +/- 56 minutes is comprised of;
    - Observation of incident occurrence and calling 911
    - Dispatch (includes assigned Island PFD Firefighter and PPD Police Officer)
    - Getting underway
    - Travel to Island
    - Arrival/deploy
    - Loading patient
    - Travel to Mainland
    - Transfer to MEDCU
    - Travel to hospital
    - Transfer to hospital
- The assigned Peaks Island PFD Firefighter and PPD Police Officer may have the patient "packaged" at the pier depending upon initial location and nature of the incident;
- "Life Flight" helicopter available, if needed; and,

- Current estimated (conservative) Peaks Island fire incident deployment time of +/- 31 minutes for the Fireboat is comprised of:
    - Observation of incident occurrence and calling 911
    - Dispatch (includes assigned Island PFD Firefighter and PPD Police Officer)
    - Getting underway
    - Travel to Island
    - Arrival/deploy
    - Island travel time to the incident
- Sleeping accommodations on the "new" Fireboat were deleted due to budget restraints. Accommodations were available on the previous boat.
- Current quarters at the State Pier are poor.
    - Single exit
    - Multi-use spaces (admin/sleeping/maintenance/etc.)
    - Isolated second sleeping area
    - No ventilation
    - Must utilize a single 220v electric outlet for both the stove and the clothes dryer
    - Clothes washer drains in the "kitchen" sink
    - Smoke alarms "marginally" installed
    - Lack of multi-gender accommodations
- Reportedly, the renovation project related to providing adequate quarters for the Fireboat has been authorized and is underway.

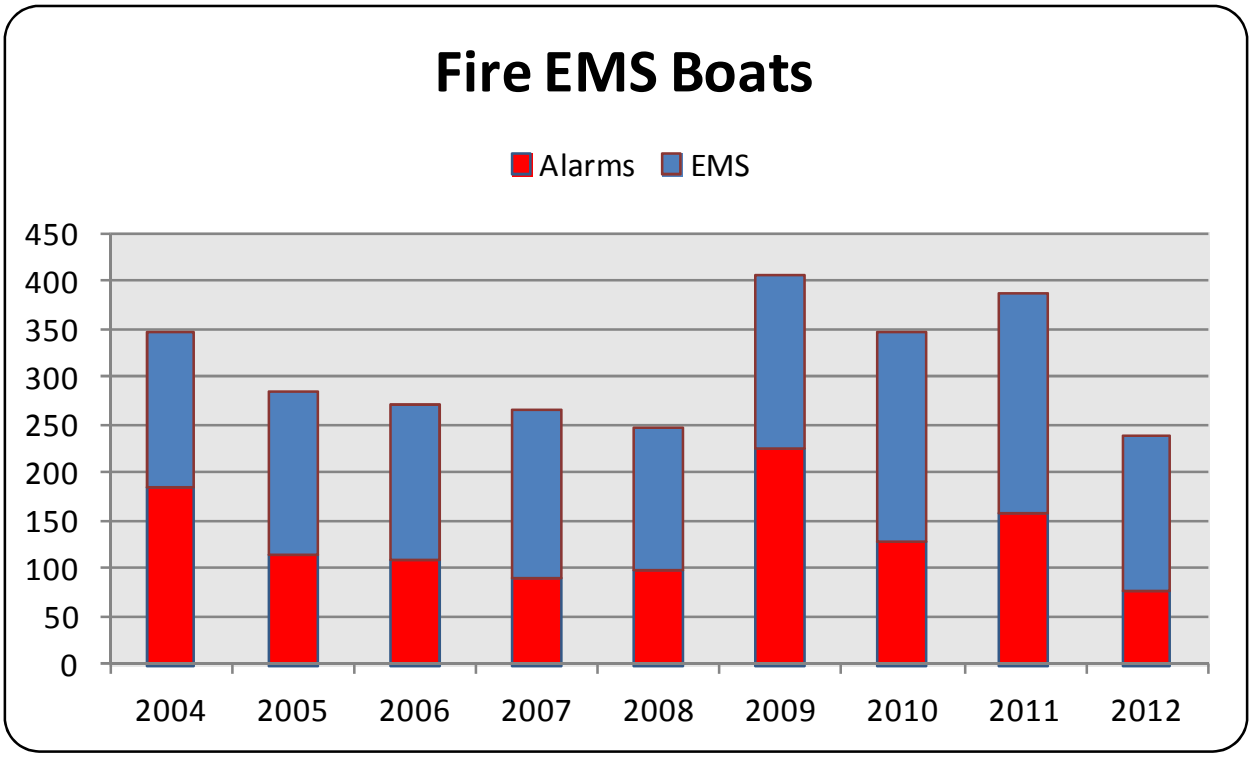
See Figure 7.10 for Fire EMS Boat travel time extent.

Figure 7.10
FIRE EMS BOAT TRAVEL TIME EXTENT



In 2003, the U.S. Fire Administration released a special Technical Report[4] about Fire EMS Boat use across the country. A detailed table of use from 1999-2001 from major port cities such as New York, Philadelphia, Baltimore, Chicago, Houston, Jacksonville, and San Diego was included. Portland's nearest neighbor Boston was unable to provide data at the time. Nonetheless, the average number of Fire EMS Boats was 2.1 with NYC with 3 ranging downward to Chicago and New Orleans with 1. The average annual response was 241.5, with NYC highest at 807 and Philadelphia the lowest with 54. Comparatively during the same time period, Portland's Fire Department Marine Division averaged 256 calls, increasing each year. See Figure 7.11.

Figure 7.11
FIRE EMS BOAT UNIT DEMAND



Fire EMS Boat workload had also been declining since 2004. Several years of unusually high workload in 2009 through 2011 is not sustained in 2012 with demand resuming its decline in demand. The table does not include 'service calls' where the Fire EMS Boat is responsible for routine inspections on the island. This can be accomplished through a different methodology than using the Fire EMS Boat.

[4] USFA TR-146

Workload (Illustrative)

The following are examples of the types of work activities that the Fireboats are involved in:

- Approximately 350+ responses per year, fire and EMS;
- On-going training (PFD, US Coast Guard, Island resources);
- On-going maintenance of marine fleet and associated equipment;
- Apparatus checks for Island resources;
- Hose testing for Island resources;
- Water front life and fire safety inspections; and,
- Waterfront special events.

Future Fireboat Decisions

There are a number of issues facing the PFD and City in the future relating to the Fireboat. The following sections review each issue, outline possible alternatives and provide related suggestions for considerations.

Is a Fireboat Needed?

The Study Team has come to understand that the actual need for the City of Portland to own and staff a Fireboat has been brought into question. As outlined in Figure 7.11, there are two primary services delivered by a Fireboat for the residents and business owners/operators of the City emergency medical services and fire protection.

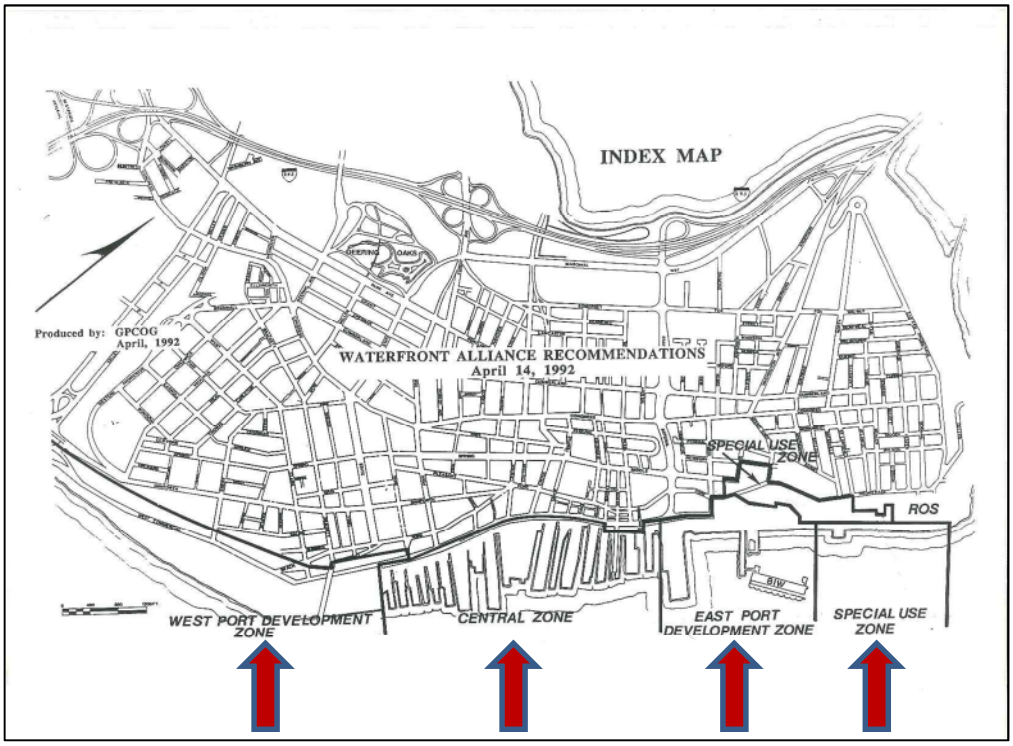
Regarding the provision of emergency medical service the PFD fireboats are responding to the various islands or boats in Cosco Bay or other waterways to provide medical patient care and transport back to the mainland for transport to the hospital for definitive care. Since there is no other means for someone with a medical emergency to obtain treatment and transport to the mainland there does not seem to be any serious question being raised regarding the need for the PFD to operate a boat for that purpose. Any of the three PFD boats are capable of providing this EMS service, although the 42′ *Joseph C. Cavallaro. Jr*. or the 65′ *City of Portland* are capable of providing EMS care and transport effectively.

Regarding the provision of fire protection, there is only one PFD boat that is capable of pumping water and carrying foam to extinguish fire; the Fireboat *City of Portland*. For nearly 130 years a Portland Fireboat has responded to extinguish fires in a number of primary areas, as follows:

1. On the mainland to support vehicular fire apparatus to suppress fires by providing needed water supply as backup to the fire hydrant system;
2. On the mainland waterfront areas to deliver water and foam on the sides of wharfs and other buildings and structures where other fire apparatus is unable to gain access;
3. To support fire protection to the various islands;
4. To extinguish fires on boats and other watercraft in the various bays and waterways; and,
5. To assist other adjacent and other area municipalities to extinguish fires in and along their waterfronts.

Although the use of *City of Portland* to extinguish fires in the above areas is very important, clearly, in the Study Team's view, the most important area for the City where a fully functional fireboat is needed to provide fire suppression services is to the City's waterfront areas. See Figure 7.12 for the four designated areas of concern.

Figure 7.12
PORTLAND WATERFRONT



There are two primary aspects of providing fire protection to the downtown and waterfront areas of Portland that are most important. These are supplementing the fire hydrant water supply if needed, but, most importantly providing access to the water side of all wharfs, marinas and buildings where the mainland-based fire apparatus is unable or has difficulty gaining access. Further, fireboats are able to reach fires in the piling areas under the wharfs. This, in many cases, means that the Fireboat has access to two or three sides of wharfs and under wharfs, marinas and buildings on the wharfs that PFD engines, ladders and rescues are unable to access for fire suppression purposes.

For fire suppression purposes it is extremely important for the fire department to gain as much 360 degree access on as many sides of buildings and structures involved in fire as possible. Fire forces that are able to access all sides of fire-involved risks are able to suppress the fire much quicker and completely to keep the extent of damage to as small an area as possible. Hence, fire departments are constantly working during the plans review process for new buildings to assure as much fire apparatus access around buildings as is possible.

The Portland waterfront areas of particular concern, as defined initially by the Waterfront Alliance Recommendations report of 1992, have been referred to as follows:

- West Port Development Zone;
- Central Zone;
- East Port Development Zone; and,
- Special Use Zone.

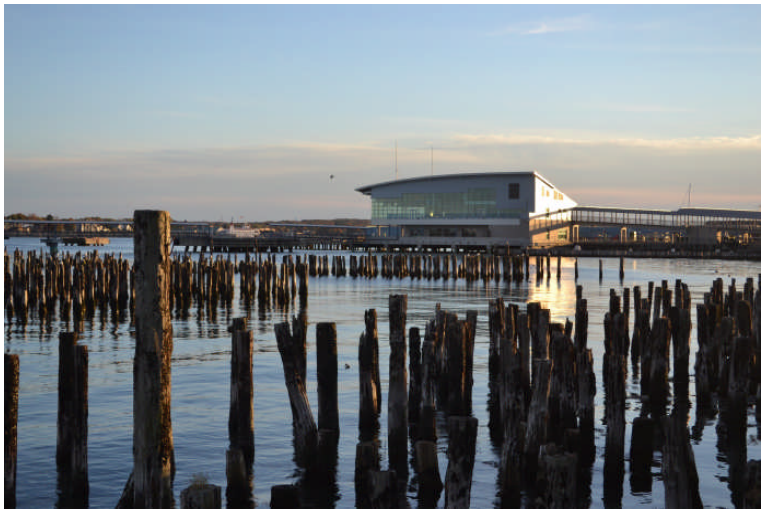
The Study Team was advised that it is City development policy to strongly encourage investment and to protect the working waterfront area. Apparently, this is the stated policy due to the fact that, as officials have advised, the very "identity" and the "cultural assets" of the City are and will for the future be located largely in the waterfront area. Reportedly, there are 2,000-2,500 jobs currently based in the waterfront area and the assess value of the City is substantial in the area. For the future, it is hoped that this area of the City will continue to develop as a working waterfront and with high end mixed use consisting of, among other things, hotel and retail development.

With this type of important area of the City it is important for the PFD to have all the tools essential to the continued protection of the Portland waterfront, including a substantial fireboat to work with the land-based fire forces to assure access to as many aspects of the structures and buildings on the waterfront that otherwise would not be

accessible for fire suppression purposes. It is very difficult to provide fire suppression services to major risks when fire apparatus is limited in terms of its access. The extent of damage can be kept to a minimum with increased access.

Through the years Portland has experienced a number of tragic major fires. The waterfront has not been immune to the damage resulting from fire. Evidence of the results of fire damage to the Portland waterfront is still in existence today. In the 1970s, a fire involving the piers serving the historic grain elevators at the terminus of the Grand Trunk Railroad burned and were not rebuilt. Figure 7.13 illustrates the remains of these piers that are visible today and are in the foreground of the photo with Ocean Gateway behind.

Figure 7.13
EXISTING GRAND TRUNK RR FIRE PIERS



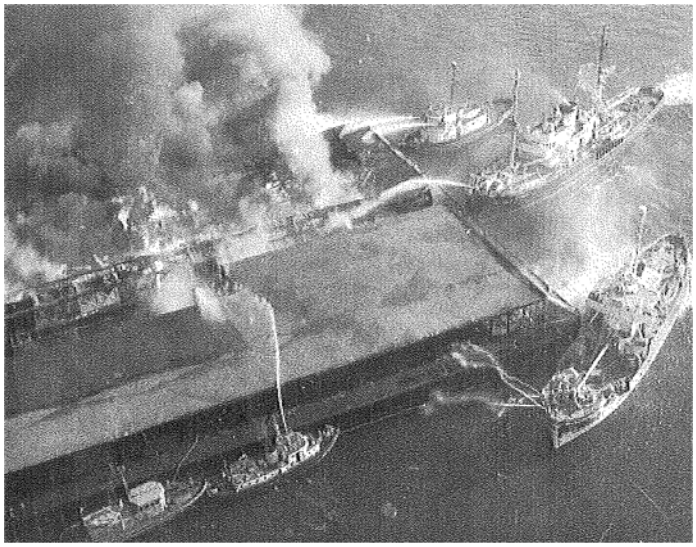
In conclusion, it seems clear to the Study Team that the City should retain a substantial fireboat capability. With the importance of the waterfront to the future development and economic and recreational viability of the City, the protection of the waterfront with a fireboat fire suppression capability is considered very important.

Other fires that have occurred in the waterfront in recent years include:

- June 22, 2007 – Clay Docks fire on West Commercial Street;
- February 6, 2002 – 128-year old *Fannie J* tugboat at the Commercial Street dry dock at Gowen Marine;
- August 6, 2001 – Fire under Custom House Wharf;

- November 19, 1999 – 500 tons of scap paper fueled a raging fire at Merrill's Marine Terminal;
- August 23 1997- The Celtic Pride II, an 82-foot fishing boat closed bridge;
- August 6, 1999 – Fire cause damage to Custom House Wharf and an old lobster boat;
- August 8, 1997 – Flames damage a Commercial Street building on Maine Wharf;
- July 28, 1970 – Grand Trunk Piers 7 & 8 (picture above); and,
- July 27, 1970 – Newspaper expose stating that "Waterfront has Long History of Spectacular Fires"

Figure 7.14 - MAINE STATE PIER FIRE 1947 W/ 5 FIREBOATS



Fireboat Fleet Configuration

Currently, the PFD boat fleet includes three boats that are reportedly largely utilized as follows:

- 65′ Ranger 2000 Class boat with 3000 gpm water pump utilized for fire and EMS/rescue services;
- 42′ Duffy and Duffy w/o pump utilized for EMS/rescue service; and,
- 20′ Pacific Skiff 2025 aluminum workboat with a 140 HP Suzuki outboard utilized to access shallow areas the other boats are unable navigate.

In the view of the Study Team the PFD does not need three boats for the long-term future. Two boats, one fully functional fire and EMS/rescue boat and one quick response shallow draft large semi-enclosed inflatable RIB type boat for EMS/rescue transport and shallow access would be sufficient.

Further, the current use of the term "Fireboat" is misleading and does not adequately reflect the actual services delivered. For the proper terminology the term "Fire EMS Boat" should be utilized for the future.

Fireboat Quarters

The Study Team reviewed various alternative locations for the PFD's Marine Division quarters, including relocation to Peaks Island for dockage and crew quarters at that fire station.

Relocation to Peaks Island was not deemed feasible given the inadequacy of and lack of protected dockage for the boats, the distance of the Peaks Island Fire Station from the dock area resulting in increased response time and the inadequate space in the Peaks Island Fire Station requiring interior renovation or addition to the facility.

Reportedly, the current location of the Marine Division quarters between two decks of the parking garage at the State Pier adjacent to the docking location of the marine division's three boats is being renovated to deal with significant configuration and safety issues.

For the Marine Division quarters for the long-term it is suggested that Engine 5 and MEDCU 5 currently located at the Central Fire Station be relocated and co-located with the Marine Division at a new fire station located along the waterfront in the Central Waterfront Zone. With this suggested co-location the PFD would have other Marine Division staffing alternatives that could be considered for implement action regarding the staffing of boats and any boat response could be immediate without awaiting other units responding from other locations/stations in order to provide proper boat staffing for response.

Subsequent to this co-location of Engine 5 and MEDCU 5 with the Marine Division the Central Fire Station would continue to function as PFD headquarters with the Fire Prevention Division and the addition of a City Emergency Operations Center for disaster management operations.

Staffing of The Fireboat And Islands

As previously described in this Section, the Fireboat must wait for a land-based engine and/or MEDCU to arrive at the dock before responding since the Fireboat may not respond with a crew of two. This is due to a budgeted staff member of the Marine Division being assigned to Peaks Island. For the near-term it is suggested that the Peaks Island staffing be made permanent and a replacement third staff member, a paramedic, be added to the Fireboat staffing in order to allow for immediate response of the Fireboat on calls.

JETPORT AIR RESCUE

The City of Portland's Airport has been an Index C airport. Recently, it was changed to an Index B airport. Fire protection, along with annual training required at all US Airports, is governed by the FAA's part 139. All FAA 139 information can be found: http://www.faa.gov/airports/airport_safety/aircraft_rescue_fire_fighting/

The training consists of 12 different categories, including:

1. Airport Familiarization;
2. Emergency Communications and Alarms;
3. Aircraft Familiarization, Application of Extinguishing Agents;
4. Hoses/Nozzles/Turrets;
5. Personal Safety;
6. Water Rescue/ Ballistic Parachutes/Low Visibility Conditions;
7. Adapting Structural Equipment;
8. Cargo Hazards;
9. Firefighting Operations;
10. Aircraft Evacuation Assistance; and,
11. Firefighter Duties under the AEP.

Employees do each subject twice a year/two subjects a month. They are mandated by the FAA to participate at a live pit burn yearly, but most ARFF Departments do it twice yearly so as not to be out of compliance, as the burn nullifies the employee from working if one goes beyond 1 year from the last burn date. The burns they go to charge each person who attends.

Further, the following apply:

1. The silver gear the firefighters wear is more expensive than regular firefighter turnout gear.
2. They are required to tour all commercial passenger aircraft every 6 months.
3. They have to be screened by the FBI to get a badge.
4. They are specially licensed to drive on the airfield and have to renew badges annually.
5. They inspect all the facilities with access to inside the fence of the airport.
6. They also have an FAA annual inspection where the FAA inspector checks all training documentation, and then moderates a hot drill, which is a simulated alarm at the designation of their choosing, and ARFF has to respond to that designation flowing agent within 3 minutes for the first truck, and 4 minutes for the second, (as per FAA 139 guidelines).

All vehicles are staffed with one person. During an actual emergency, as an officer, the employees have to rely on the experience and training of the persons operating those crash trucks. They have to know, without being told, where to stage on the field for an approaching problem, where on the field the accident happened, and if an accident does occur, which side of the aircraft and from what angle should they approach for optimum passenger life safety. The other operator has to see where the first operator goes, and adjust from that. Aircraft accident survivability is measured in seconds (unlike escaping a house fire, which is measured in minutes), because of the confined space passengers are in, the toxicity of the smoke, the skin of the aircraft, heat at which fuel burns, etc. There is a lot involved and one has to be on their "game."

Air Rescue History

The Air Rescue Station has always had 3 vehicles. An officer was always in charge of the shift and a driver was assigned for each big crash truck. Another big crash truck was/is on hand as a spare in case one of the two front-line crash trucks needs to be serviced. There are 2 radios in all the vehicles: one radio is for communications with the Air Traffic Control Tower and the other radio is the Portland Fire Department radio. Air Rescue had one specially trained firefighter assigned to cover any time a firefighter was out on vacation or sick.

The staffing changed a few years later when they increased the manpower to 3 permanently assigned firefighters plus the officer in charge of the shift. The extra

firefighter was assigned to drive the command vehicle, which is also the designated command post during a major aircraft incident. During an emergency, the driver would monitor and communicate with ATCT, while the officer would coordinate the incoming fire and rescue apparatus. Having 2 people on the command truck also afforded the possibility of physically helping passengers during a crisis. There was also only one qualified vacation/sick leave coverage person per shift.

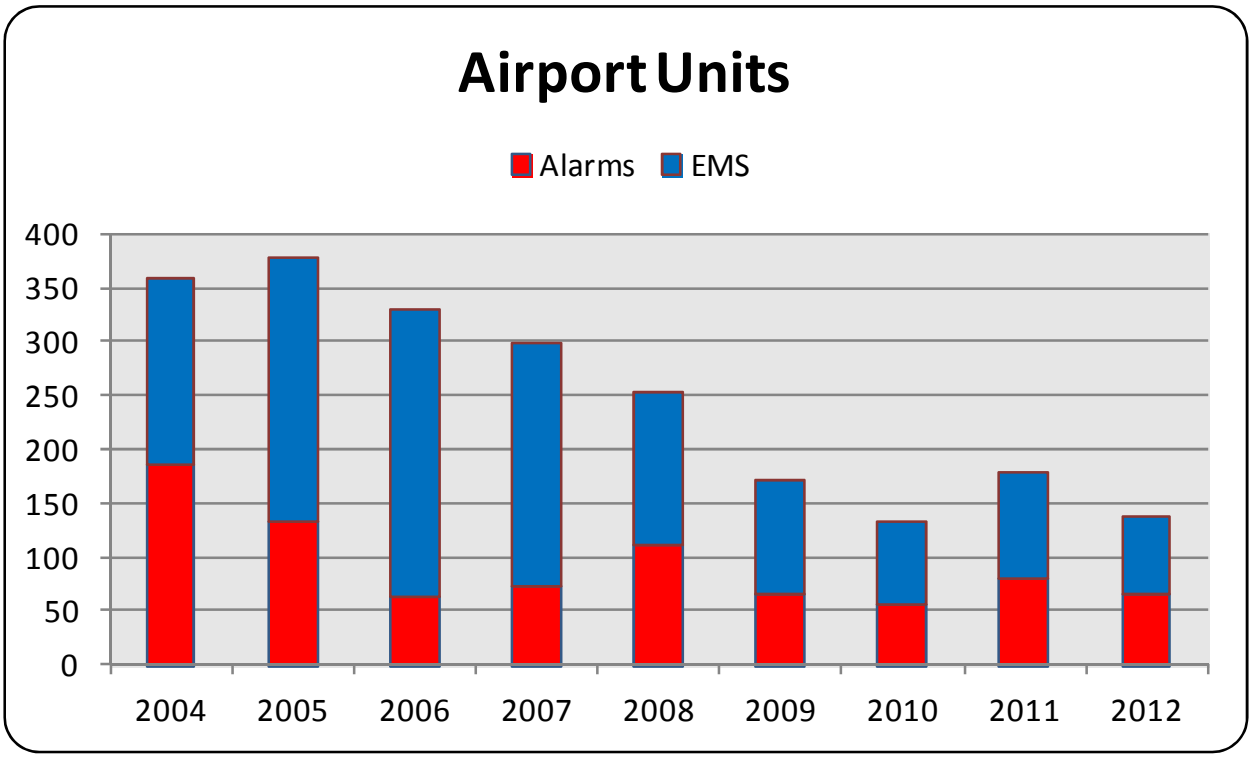
A few years later, the Portland Fire Department moved Engine 6 from Bramhall Station to Air Rescue. They then took the fourth person assigned to Air Rescue and moved him to Engine 6 because this would allow a person with in-depth knowledge to ride Engine 6 onto the airfield for aircraft emergencies.

Air Rescue Workload

The airport units have a history of declining workload since 2004. Engine 6 had been relocated to the airport area in 2005 that may have redirected terminal fire and medical calls to it instead. In 2008, Engine 6 has since been assigned to the Bramhall Station. Figure 7.15 illustrates one of the Jetport vehicles and Figure 7.16 summarizes the total workload of the crash trucks alone as the Air Rescue Supervisor would respond to every call plus some of its own detail.

Figure 7.15
JETPORT SUPPRESSION UNIT

Figure 7.16
AIRPORT UNIT DEMAND



Current Staffing

ARFF is a three-vehicle, three permanently assigned firefighters FAA response station. The staff includes a lieutenant and two firefighters assigned per shift. A captain is assigned as staff to run the station in addition to covering the lieutenant's vacations and sick leave. The firefighters' sick leaves and vacations are covered by qualified firefighters who are assigned at different stations in the department. Two shifts have 3 firefighters assigned from 2 different stations. One shift has 2 firefighters assigned from the same station. One shift currently has no firefighters assigned for coverage. The union contract calls for up to 4 coverage persons per shift. A major problem is trying to coordinate the required monthly training for all individuals assigned per shift, having to take into account vacations, sickness, the coverage person's training and inspections, etc. This can be a daunting task.

Jetport Fire Staffing Options

With the recent change in the Jetport index from Index C to Index B there is a need to determine means for providing PFD services to the Jetport with as limited cost of services provision as possible relating to staffing.

For the future, the following are potential options to consider:

1. Have 1 coverage person assigned per shift for safe and efficient firefighting operations, along with maximum benefit in keeping training current for all individuals assigned to work at Air Rescue;
2. For 20-hour per day coverage (7,300 hours per year), providing two firefighters on each platoon with a daywork Captain to manage the day-to-day operation and cover the busiest times of the day, thus saving the Jetport the cost of four lieutenants, an FY2013 salaries and wages savings to the Jetport of $245,552 with released personnel returning daily to selected fire stations for the remainder of the shift;
3. For 20-hours per day coverage (7,300 hours per year), providing one firefighter on each platoon with a daywork captain to manage the day-to-day operation and cover the busiest times of the day, thus saving the Jetport the cost of four lieutenants and four firefighters, an FY2013 savings to the Jetport of $455,828 with released personnel returning daily to selected fire stations for the remainder of the shift; or,
4. Provide the level of staffing and hours of daily coverage desired by the Jetport on an overtime basis with an estimated average estimate overtime rate of $35 per hour of coverage.

With these options, there would be other savings in other cost categories, depending on the optional staffing approach determined appropriate. Likewise, there would continue to be certain costs for training, for example, that would be associated with the selected optional staffing approach.

SPECIAL OPERATIONS SERVICES

This section includes an overview of fire department special operations services and the process by which these services are delivered in the City of Portland.

Overview of Special Operations Services

In fire service jargon, the term "special operations" generally refers to those services that a fire department provides other than fire and EMS response. The traditional special operations services include hazardous materials (Hazmat) response, vehicle extrication service, and technical rescue service. The delivery models for special operations services can vary greatly from community to community across the United States. With the exception of vehicle extrication service, the other special operations services are seldom needed in most communities. Because special operations services are highly technical in nature and require specialized training and equipment, many communities opt not to deliver the services, or they elect to partner with neighboring communities to share resources in either a mutual aid or a regional team format.

When considering the need for special operations services, it is important to remember that when these types of services are needed, there cannot be a delay in response. The common dilemma faced by many communities is "at what cost" does the community wish to support the delivery of fire department special operations services, because the delivery of these services is often expensive both in terms of training time and equipment.

The decision by a fire department or community to initiate any new service must be examined closely in terms of the expected demand for and the costs of delivering the service. The demand and costs must always be compared to the existing available resources in the department's response region. This comparison is important in order to gather adequate information so that an informed decision on special operations services can be made. For example, it might be more practical for a fire department to train all of its responders to the "awareness" level of trench collapse emergencies and use a neighboring community's trench rescue team as the primary response agency rather than fund the purchase of expensive trench rescue equipment and train its own trench collapse rescue team.

The regional team approach to the delivery of special operations services continues to be a common approach in suburban communities across the nation.

Hazardous Materials Response

Over the last few years, international disasters such as those in Yakima Nuclear Power Plant (Japan) and the *Deepwater Horizon* drilling rig (USA) have re-focused attention on the potential for catastrophic hazardous materials incidents throughout the world. In the 1980s, the concern for prevention of hazardous materials disasters served as impetus for federal legislation to prevent and control releases of hazardous materials and to protect workers involved in hazardous waste site clean-up and emergency response.

On October 17, 1986, President Ronald Reagan signed into law the Superfund Amendment and Re-authorization Act of 1986 (SARA). This legislation truly transformed the delivery of emergency response services and affected almost every jurisdiction throughout the nation. Although SARA is over 25 years old, its impact still affects how emergency responders handle present day hazardous materials incidents, both in terms of response operations and personnel training.

SARA provides for protection of the community under Title III and the protection of the worker under Title I. As a result of the legislation, the federal Environmental Protection Agency (EPA) and the federal Department of Labor, through the Occupational Safety and Health Administration (OSHA), both adopted regulations that had major impacts on communities' planning and response to hazardous materials incidents. The regulations impacted communities in a number of ways, but most significantly in the areas of planning, information gathering and retrieval, and emergency response capabilities.

In 29 CFR 1910.120 Hazardous Waste Operations and Emergency Response, OSHA provides the following definitions for the various levels of emergency response capabilities:

- *First Responder—Awareness (FRA).* Individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. Persons trained to the FRA level simply recognize the presence of an emergency involving hazardous materials and take action to notify emergency responders.
- *First Responder—Operations (FRO).* Individuals who respond to releases or potential releases of hazardous substances as part of the initial response for the purpose of protecting nearby persons, property, or the environment from the effects of the release. Persons trained to the FRO level meet the FRA requirements and are trained to take defensive actions to control or minimize the effects of a

hazardous materials release. FROs generally do not take any action that involves touching the hazardous material or its container and they are commonly trained in decontamination operations. The FRO is the "workhorse" of most every fire department in terms of basic response to hazardous materials incidents. More fire department personnel are trained to the FRO level than to any other hazardous materials training level.

- *Hazardous Materials—Technician (HMT).* Individuals who respond to releases or potential releases of hazardous substances for the purpose of stopping the release and mitigating the incident. Persons trained to the HMT level meet the FRO requirements and are trained to take offensive actions to control the release of a hazardous material from its container. HMTs are basically trained to manage leaks involving a wide variety of hazardous materials containers. The HMT is the workhorse of most every Hazmat response team. More Hazmat Team personnel are trained to the HMT level than to any other hazardous materials training level.
- *Hazardous Materials—Specialist (HMS).* Individuals who respond with and provide support to hazardous materials technicians at hazardous materials incidents. Typically, persons trained to the HMS level specialize in certain topic areas either through specialized knowledge or specialized skill. A local or regional Hazmat response team may have several "specialists" available to them through a callout or contact roster. For example, a local agricultural chemist might serve as a Hazmat team's pesticide specialist, but he would not respond or operate at an acid tanker incident.

In the post 9/11 era, most Hazmat response teams have been tasked with accepting the new role of weapons of mass destruction (WMD) response in addition to their regular Hazmat response duties. When looking to identify who would fit the need for WMD response, the local Hazmat Team was the natural choice given their training in chemical protective clothing and their management of chemical releases. These additional WMD responsibilities were further reinforced by the anthrax events that followed September 11, 2001, when Hazmat Teams across the nation found themselves responding to potential biological agent emergencies.

Today, a local Hazmat Team is faced with a myriad of complex issues. The Hazmat response field has grown tremendously over the last three decades, from responding to oil spills along the highways in the 1980s to being prepared for chemical, biological, and nuclear terrorist events in 2013.

Hazardous Materials Response in Maine

The Maine Department of Environmental Protection (DEP) provides a spill and site cleanup capability comprised of 34 individuals of which 25 are technician level oil and hazardous material responders; many of whom have additional specialized training in ground transportation and/or marine conveyances. Most responders are also trained to the technician level for weapons of mass destruction.

Additionally, the Maine DEP has coordinated regional efforts relating to Hazmat related response teams in various areas of the State. Within the six currently designated regions of the State, there are reportedly eight Decon Strike Teams (DST) and thirteen Hazmat Regional Response Teams (RRT). Figure 7.17 illustrates the regions and location of the various response teams in the State.

Hazardous Materials Response in the City of Portland

The hazardous materials response services provided by the PFD are extensive to the hazardous materials technician (HMT) level. The Study Team found the PFD Hazmat response effort to be somewhat disorganized, as there is no central geographic focus for Hazmat response for the department.

While there certainly are a number of hazardous materials use and storage sites of significance within the City of Portland, the demand for Hazmat response service beyond the capabilities of the PFD has been low.

The Study Team finds that the level of demand for Hazmat response services in the City of Portland representative of other communities similar in size and composition located throughout the northeast. The Study Team also finds that while there are several facilities/sites that use and store significant quantities of hazardous materials within the City, there is no current or immediate future need for an increase in the level of Hazmat response services already being provided.

The Study Team finds that the Hazmat response services provided by Portland and the mutual aid response teams meet the demands of the community.

Figure 7.17
RESPONSE TEAMS

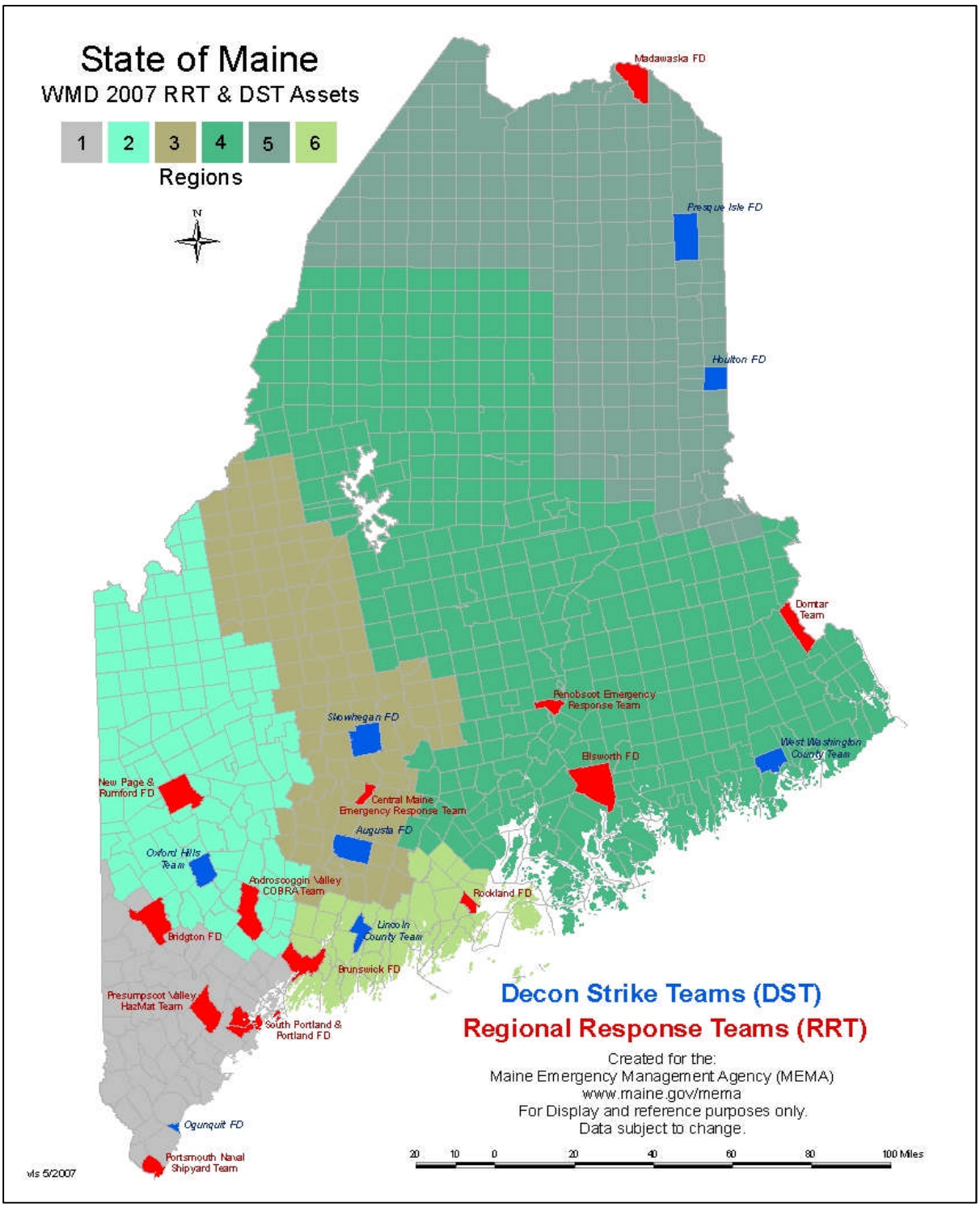


Figure 7.18 illustrates the PFD vehicles utilized by the Hazmat Team in response to hazardous materials related incidents. The equipment/supply carrying vehicles utilized by the Team are housed at two locations; the Rescue is located at the Bramhall Fire Station on Congress Street and the other primary Hazmat vehicles, including the box truck, large trailer and towing vehicle are kept at a warehouse building on Presumpscot Street.

Figure 7.18
PFD HAZMAT VEHICLES

There reportedly are 63 members of the Portland Hazardous Response Team including six members from the Portland Police Department. According to PFD officials the 57 members of the Hazmat Team are assigned to various platoons and fire stations or other work locations. There is no geographic focus for the Hazmat Team members and vehicles.

Subsequent to the dispatch of a reported Hazmat incident in or out of the City of Portland the response of the PFD Hazmat Team members, is rather disorganized, particularly if the incident is in the City. The following describes a Team deployment scenario subsequent to dispatch of a Hazmat incident in the City:

- Incident is dispatched;
- Dispatched apparatus responds staffed by a number of on-duty Team member;
- Off-duty Hazmat Team members respond from other locations;
- On-duty Platoon commander advises all Hazmat Team members of the location to meet;

- On-duty Hazmat Team members on responding fire apparatus become committed on incident in their assigned role;
- The response of the Rescue must be assured;
- Someone must decide and advise who will go to Presumpscot Street for the Hazmat vehicles;
- Other personnel need to be assigned to take the place of fire apparatus assigned Hazmat Team members in order for the Hazmat Team to join up;
- The on-duty Platoon commander must continue to command the emergency incident while at the same time determine the adequacy of the responding Hazmat Team members providing related assignments; and,
- The Team begins to coalesce and staff the Hazmat vehicles to deploy as needed to mitigate the incident.

As described to the Study Team, this process of Hazmat Team deployment is time-consuming and unorganized due to the fact that there apparently is no organized approach to the platoon, fire station and fire apparatus assignment of members of the Hazmat Team. Further, there are likely too many members on the Hazmat Team, which adds substantial cost to the organization, staffing and equipping of the Team. The following approach to providing an organized approach to the assignment and deployment of the Hazmat Team on emergency incidents is suggested:

1. Set the Hazmat Team membership to approximately forty (40);
2. Assign approximately ten (10) Team members to each of the four platoons;
3. Designate the Bramhall Fire Station as the Special Service Fire Station where the Rescue is currently located and focus related service provision, including hazmat at that fire station;
4. Designate the Platoon Commander housed at the Bramhall Fire Station as the Special Services chief;
5. Assign the Hazmat Team leader to the Bramhall Fire Station;
6. Consider designating an engine company adjacent to the Bramhall Fire Station as a Hazmat support unit; and,
7. House the majority of the hazmat vehicles at the Bramhall Fire Station.

With these suggested actions the Hazmat and other special services of the PFD should become better organized and cost effective.

Vehicle Extrication Service

Vehicle extrication is the most common type of rescue service provided by fire and EMS departments today. While the advancement in passenger vehicle safety features has certainly helped reduce the injury and death rates in motor vehicle collisions, there still remains the need for specialized emergency response equipment and specially trained response personnel capable of "cutting" patients out of mangled cars after a violent collision.

The manner in which vehicle extrication service is delivered generally varies by the locale and the demand for service. Three common service delivery models are the use of (1) a heavy rescue squad model (a specialized vehicle that carries large quantities of various rescue equipment); (2) a rescue engine model (an engine company equipped with some rescue equipment in addition to firefighting equipment); and (3) a ladder truck model (aerial device that carries extrication equipment). Each model has its own strengths and weaknesses, but the most important component is that trained rescue personnel (technicians) arrive with the tools needed to complete the extrication so that the traumatically injured patient can be taken to a definitive medical care facility for treatment in a timely manner.

Extrication services in the City of Portland are setup to use a combination of the heavy rescue and engine model. The PFD's Rescue 1, Engine 6 and Engine 11 are set for providing extrication services. The Rescue and Engine 6 both operate out of the Bramhall Fire Station on Congress Street. The engines are equipped with a variety of vehicle extrication tools and equipment—enough so that the unit and the personnel responding to a motor vehicle collision should be able to complete most vehicle extrication operations without the need for an additional heavy rescue squad or other extrication-capable unit.

The Study Team finds the number of motor vehicle collisions and the need for extrication services normal for an urban environment the size of the City of Portland. While the City has Interstate 95 and 295 passing through it, the remainder of the City has areas where the opportunity for severe collisions exists, thus there is a large demand for vehicle extrication operations.

The Study Team was not informed of any significant operational issues involving the delivery of vehicle extrication services, other than the co-location of Rescue 1 and Engine 6 and the training of personnel. There are two NFPA standards that address rescue

training and incident scene operations: NFPA 1006 Standard for Rescue Technician Professional Qualifications, 2008 Edition, and NFPA 1670 Standard on Operations and Training for Technical Search and Rescue Incidents, 2009 Edition.

Unlike the emergency medical services that have stringent training and certification requirements concerning patient care, fire and rescue services in many locales throughout the United States have few, if any, regulatory agencies that impose such requirements. The same is true in Maine. A fire department can operate a heavy rescue squad or vehicle extrication unit with basically no training. While that is probably not in the best interest of that department in terms of liability, it definitely can be done.

The Study Team recommends that all PFD personnel assigned to perform vehicle extrication rescue operations be trained and certified to the applicable NFPA and/or the Maine state training standards—at a minimum to the Basic Vehicle Rescue Technician Level.

Further, with Rescue 1 being located at the Bramhall Fire Station, another appropriately located engine company should be equipped as a second extrication engine in order for there to be three strategically located extrication equipped units in the City.

Technical Rescue Services

Technical rescue services normally include confined space rescue, trench collapse rescue, structural collapse rescue, high-angle rescue, and water rescue.

Confined-Space Rescue

In January 1993, OSHA issued a regulation entitled "Permit-Required Confined Spaces" (29 CFR 1910.146). Historically, confined-space work has proven deadly for many workers and "would be" rescuers. Confined spaces are notorious for their poor atmospheric conditions and their internal configurations and entanglement hazards. The OSHA regulation was enacted in an attempt to reduce the number of injuries and deaths that occur in confined spaces by requiring only trained entrants and rescuers be allowed to work in confined-space environments.

While the OSHA confined-space regulation is focused mostly on industry and those who work in and around confined spaces, there are important implications for fire department

and emergency service personnel. Facilities that have permit-required confined spaces must identify the rescue team before workers are allowed to enter a confined space. Large industrial facilities or utility companies often have their own confined-space entry and rescue teams. However, smaller companies will often use the local fire department as the default rescue team—often unbeknownst to the fire department.

The Study Team knows of no federal or state statutes that require a fire department to equip, train, and engage in confined-space rescue service delivery. However, should a fire department elect to provide such service, then it is only prudent for them to comply with the nationally accepted training and regulatory practices.

Several industries in the City of Portland present the potential for confined-space emergencies. Some of the industrial facilities most likely have confined spaces that would require the use of specially trained rescuers if an emergency occurred. The Study Team recommends the continued Rescue 1 initiative for rescue services for all confined-space rescue service needs in the City of Portland.

Trench Collapse Rescue

Some fire departments across the United States provide trench collapse rescue service as part of their comprehensive rescue service plan. Many of these departments have experienced tremendous growth in their communities and have seen the need for the service. In other areas of the country, trench collapse rescue is provided by a regional response team, possibly one that is search and rescue based. Regardless of the delivery model, the cost of trench collapse rescue service is very expensive and often cost prohibitive to many departments.

The Study Team finds the frequency of trench rescue incidents over the last five years normal for an older, urban environment such as the City of Portland. The Study Team recommends the continued Rescue 1 initiative for rescue services for all trench rescue service needs in the City of Portland.

Summary of Special Operations

In addition to the traditional fire and EMS services delivery, fire departments also provide a wide variety of other specialized services that are seldom needed, but really make a difference when used. The decision by a fire department to be in the special

operations services business must be a decision that is well thought out and based upon a real need, not a perceived need presented by a few personnel who want to start a new program to satisfy their interests. When faced with limited resources and expanding calls for service from the community, a fire department should carefully select the services it provides. Often times a joint effort approach by several neighboring departments is a more efficient use of resources to accomplish the same task.

The Portland Fire Department needs to continue to closely examine all of its special operations services to see what the demands for service are and how to best prepare to respond to those demands. Establishing program goals and mutual aid partnerships will be important for each type of special operation service provided. In most cases, perhaps the best way to meet the established goals will be to utilize regional resources in addition to being the sole provider of the service.

COMMUNICATIONS AND DISPATCH

This Chapter addresses a number of basic concepts and processes related to 9-1-1, public safety communications and dispatch functions; and specific descriptions of the method of operations for the dispatch of the PFD and other regional fire departments. Relevant aspects, conclusions and recommendations relating to the use of automation and technology, emergency communications center characteristics, state-of-the-art alarm process and dispatch procedures, training, staffing and scheduling of emergency communications center personnel are also discussed.

Information relating to a number of relevant dispatch subjects such as objectives, performance measurements, 9-1-1 operations and automated dispatch systems, are included in this Chapter to familiarize the reader with the technology and processes. For the reader not interested in general information on 9-1-1 operations, the description of, conclusions, and recommendations for City of Portland operations begin on page 306.

Overview Of Public Safety Answering Point Operations

A Public Safety Answering Point (PSAP), also commonly referred to as the 9-1-1 center, is a call center responsible for answering calls to an emergency telephone number for police, fire and emergency medical services. In October 1999, the Federal Wireless Communications and Public Safety Act of 1999 (9-1-1 Act) took effect with the purpose of improving public safety by encouraging and facilitating the prompt deployment of a

nationwide, seamless communications infrastructure for emergency services. One provision of the 9-1-1 Act directed the Federal Communications Commission (FCC) to make 9-1-1 the universal emergency number for all telephone services.

Trained telephone operators/dispatchers, known as telecommunicators, are responsible for obtaining pertinent information from callers and dispatching the appropriate emergency services to calls for help. Modern PSAPs and 9-1-1 systems automatically report the telephone number and location of 9-1-1 calls made from wireline or landline phones, a capability called Enhanced 9-1-1 or E9-1-1. The FCC also requires wireless telephone carriers to provide 9-1-1 and E9-1-1 capability, where a PSAP requests it. Once it is implemented fully, wireless E9-1-1 will provide an accurate location for 9-1-1 calls from wireless phones.

A commonly held belief of the public is that public safety providers are as close as a telephone. While this is generally true of public safety service provision, members of the general public have a significant misunderstanding and lack of knowledge of the myriad functions which cause public safety officers to arrive where needed in a timely manner. Given the vast array of technological and human functions which must be carefully, accurately, and quickly executed to ensure a proper response to a demand for service, it is amazing to many, upon learning the sequence of actions, that existing dispatching systems work as well as they do. Without the ability to receive calls, gather necessary preliminary information, transmit that information, and dispatch appropriate resources in such a manner to ensure a timely response, any system is doomed to failure. While there are a variety of methods in use across the country today, each must be considered individually for applicability to the needs, capabilities, and technologies of the jurisdiction being served.

Communication Center Objectives

An emergency public safety communications center is the nerve center of primary emergency public safety services. It is the critical link–the lifeline–between the public and its protectors–the police officers, firefighters and rescue personnel. The general purpose and intent of the emergency communications center is best described by the following statement of objectives:

1. Establish and maintain a call center that the public client can contact for emergency assistance with the expectation that some corrective action or emergency service will result from that call.

2. Establish and maintain a system to which emergency calls for service result in prompt dispatch of proper agencies, personnel and equipment to effectively address the emergency.
3. Establish and maintain a system wherein properly trained and dedicated personnel closely monitor the progress of the agencies, personnel and equipment en route to the scene of the emergency and assist in prompt arrival of the services.
4. Establish and maintain a system wherein the resources remaining available to an emergency service agency are redistributed throughout the service area to minimize extended service response times because of "holes" in the coverage.
5. Provide, in a timely manner, and upon request from the field incident commander, additional resources that match the incident commander's request as closely as possible.
6. Generate and maintain accurate and precise records as required by the emergency response system. The emergency response system includes the communications center.
7. Monitor the emergency to its conclusion, exchanging with field units any record-related or administrative information required by standing orders. Upon stabilizing or abating the emergency, properly close the records on the event or incident, file the record, and move on to the next incident.
8. Establish and maintain a properly designed radio communications system able to provide reliable dispatch of emergency units in stations or the field, and provide reliable information flow between the communications center and the field units, and the field units one with another at any time, including non-emergency periods.
9. Establish and maintain a properly designed radio, information and tele-communications system capable of providing reliable information flow between the agency that addresses an incident and other agencies or jurisdictions that may be called to assist.
10. Develop and maintain a database and records system that allows the communications center to identify the location of the call for service so the proper operational agency can respond.

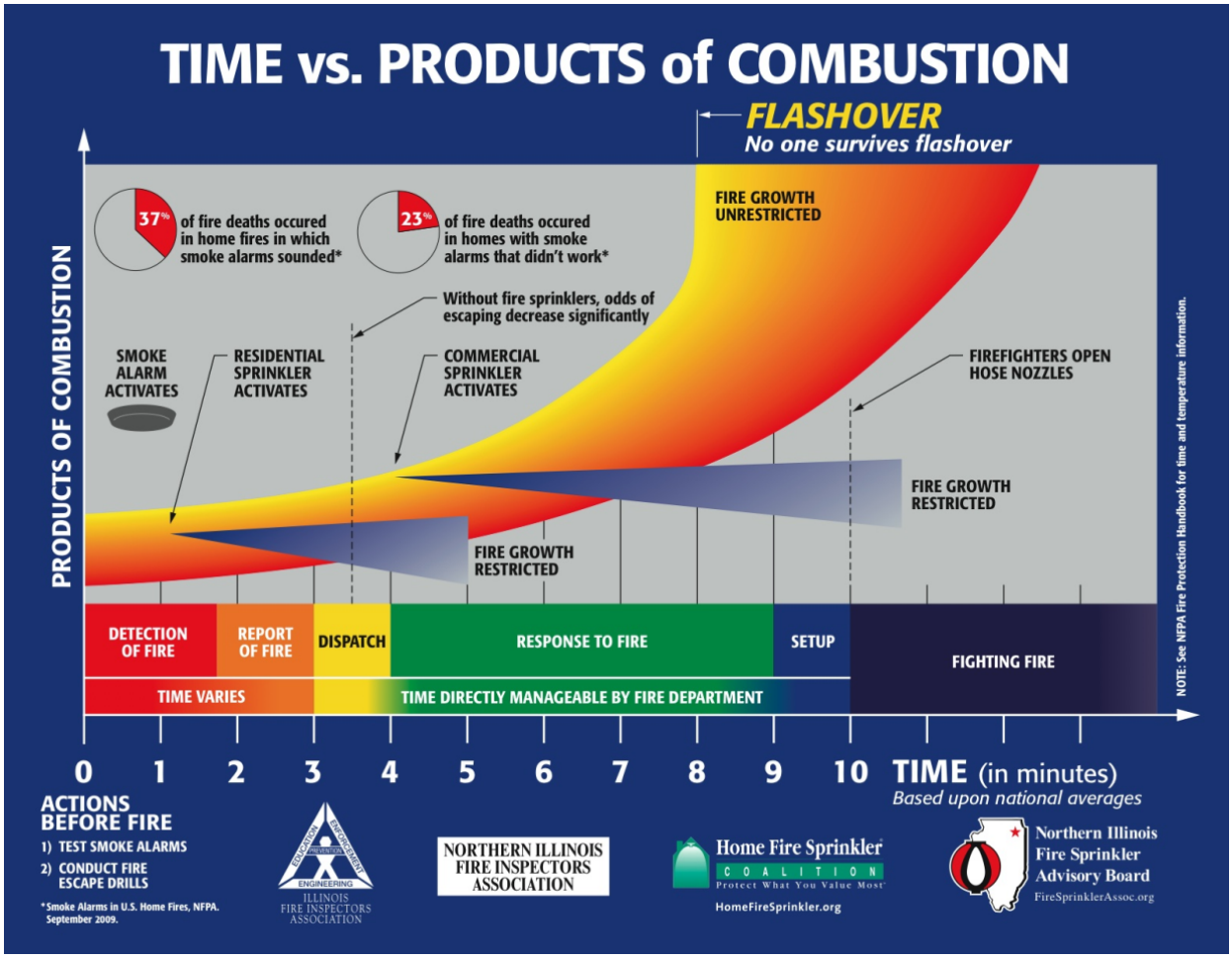
These stated objectives of a public safety communications and dispatch center are general in nature; but these objectives provide the framework within which to understand the

overall goals, and purposes of a modern model emergency communications center. The objectives also provide an overview of how the support systems involved in a model public safety communications system assist in realizing the mission of the typical communications center.

CASCADE OF EVENTS AND PERFORMANCE MEASURES

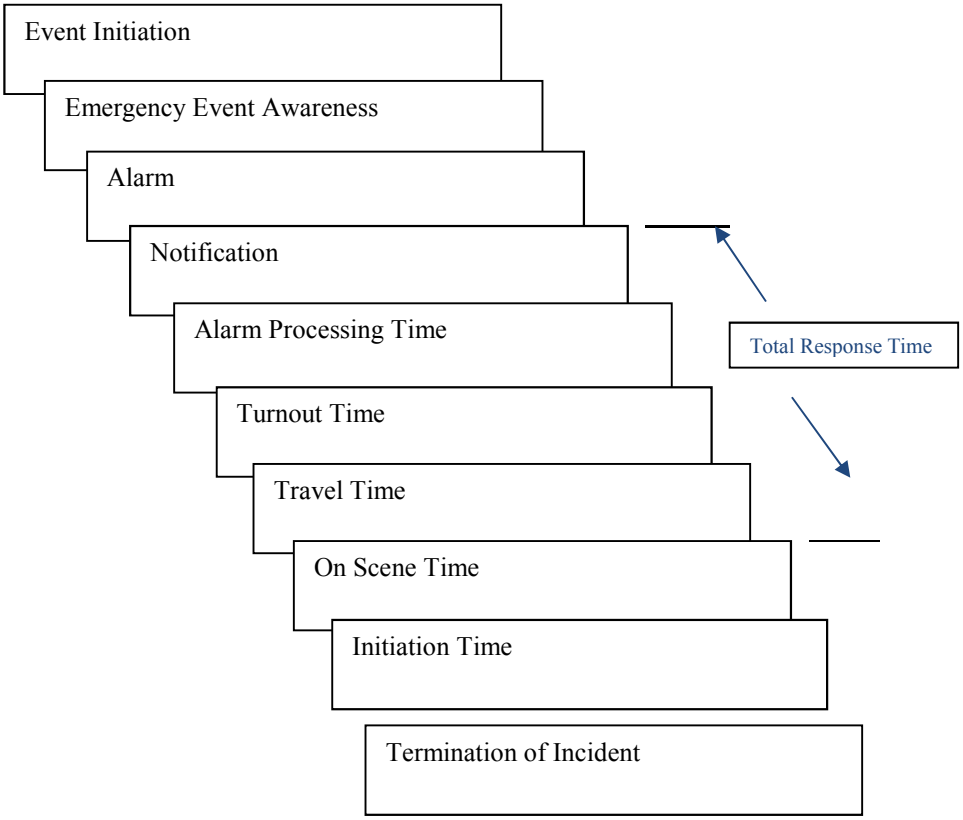
An essential element in the assessment of any emergency service delivery system is the ability to provide timely and adequate resources for anticipated emergency situations such as fires, rescue situations, medical emergencies, and other foreseen occurrences. Each emergency situation requires a variable amount of staffing, apparatus, equipment, and other resources to be effective. Appropriately trained and equipped fire companies must arrive, deploy, and control the emergency within specific timeframes for successful emergency event strategies and tactical objectives to be met. For example, most fire departments and emergency medical providers strive to extinguish small structure fires quickly before they reach flashover potential to minimize risk and damage; and to intervene in medical emergencies quickly to reduce clinical and biological death from cardiac arrest or severe blood loss. In both of these instances response times, appropriate staffing and adequate resources are critical factors that affect the outcome of the event. The capability of a fire department to respond to these events within four minutes of the initiation of the event improves the chances of saving lives and property. The entire premise of a fire department's successful response to a structure fire is based on its ability to effectively deploy properly trained personnel and adequate resources before the fire reaches flashover. The chart below (Figure 7.19) from the Fire Sprinkler Association demonstrates fire growth to flashover and the critical timeline for fire department intervention.

Figure 7.19
TIME VS. PRODUCTS OF COMBUSTION



The Commission on Fire Accreditation International (CFAI) has defined response time elements as a cascade of events. This cascade concerning the passage of time is the interval from when a fire or emergency medical event occurs and the fire service arrives on scene, and is a reflection of the time elements that make up the total response time in handling an event. Figure 7.20 illustrates that there are many components of time that must be kept as short as possible if a fire is to be controlled or a patient is to survive.

FIGURE 7.20
CASCADE OF EVENTS WHEN RESPONDING TO A FIRE OR MEDICAL EMERGENCY



Event Initiation Point—The point at which factors occur that may ultimately result in activation of the emergency response system. Precipitating factors can occur seconds, minutes, hours, or even days before the point of awareness is reached. An example is the patient who ignores chest discomfort for days until it reaches a critical point at which time he/she makes the decision to seek assistance.

Emergency Event Awareness—The point at which a human being or technologic sentinel (i.e., smoke alarm, infrared heat detector, etc.) becomes aware that conditions exist requiring activation of the emergency response system.

Alarm—The point at which awareness triggers notification of the emergency response system. An example of this time point is the transmittal of a local or central alarm to a public safety answering point (PSAP). Again, it is difficult to determine the time interval during which this process occurs with any degree of reliability. The alarm transmission interval lies between the awareness point and the alarm point. This interval can be

significant, as when the alarm is transmitted to a distant commercial alarm monitoring organization, which then retransmits the alarm to the local 9-1-1 dispatch center. When there is an automatic transmission of the signal, the fire department gains valuable time in controlling the event. Another example of this situation occurs in many jurisdictions when 9-1-1 is called from a cell phone, which often goes to a central answering point and is then rerouted to the appropriate dispatch center.

Notification—The point at which an alarm is received by the PSAP. This transmittal may take the form of electronic or mechanical notification received and answered by the PSAP.

Alarm Processing Time—The time between the first ring of the 9-1-1 telephone at the dispatch center and the time the computer-aided dispatch (CAD) operator activates the station and/or company alerting devices.

Turnout Time—The interval between the activation of station and/or company alerting devices and the time when the responding crew is aboard the apparatus and the apparatus is beginning to roll toward the call as noted by the mobile computer terminal or notifies dispatch by voice that the company is responding.

Travel Time—The point at which the responding apparatus signals the dispatch center that they are responding to the alarm and ends when the responding unit notifies the dispatcher of its arrival on scene (via voice or mobile computer terminal notification).

On-Scene Time—The point at which the responding unit arrives on the scene of the emergency.

Initiation of Action—The point at which operations to mitigate the event begin. This may include size-up, resource deployment, and patient intervention.

Termination of Incident—The point at which units have completed the assignment and are available to respond to another request for service.

Figure 7.20 contains at least three major critical components: alarm processing time, turnout time, and travel time. Collectively, they make up the total time from when a person activates the emergency response system and the system delivers a vehicle on site. It is imperative to keep in mind that certain intervals described, such as turnout and travel time, can be directly influenced by the fire service via station locations and design, staffing levels, as well as local rules and procedures for response. Others factors, such as notification and alarm processing, can be influenced indirectly through public education

and engineering initiatives. The fire service can also influence the call-processing interval through its ability to define standards and compel performance by its dispatch centers.

National consensus standards developed by the National Fire Protection Association (NFPA) describe acceptable performance standards for alarm receipt, alarm processing, turnout, and response time. NFPA 1221, *The Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, defines acceptable alarm receipt performance as 95 percent of alarms received on emergency lines to answered within 15 seconds and 99 percent to answered with 40 seconds; acceptable alarm processing performance as processing 95 percent of alarms processed with 60 seconds and 99 percent of alarms processed within 90 seconds; and where alarms are transferred from the primary PSAP to a secondary PSAP the transfer proceed should not exceed 30 seconds for 95 percent of the alarms processed.

ORGANIZATION AND MANAGEMENT

This section discusses model management and coordination approaches for communications centers used by other municipalities. The Study Team has evaluated each of these models in the delivery of emergency communications services.

Approaches to Model Dispatch Center Organization

The Study Team has observed a number of approaches to manage and direct combined public safety communications centers. These include management by:

- Police departments;
- Separate municipal agencies;
- Fire departments; and,
- Regional facilities (e.g., multiple municipalities or county).

The management of communications centers by law enforcement departments is the most predominant approach in the United States. This practice seems related to the law enforcement workload, which typically has a higher call load than fire/rescue/EMS agencies. Third party agencies include separate telecommunications agencies or emergency management agencies. There are very few combination public safety communications centers managed by fire departments.

When either the police or fire department manages the combination communications center, there is a potential for a perceived or actual "favoritism" to develop where the dispatchers indirectly or openly favor the field personnel, policies and procedures of the agency for which they work. Regardless of whether the problem is perceived or real, public safety officials need to be proactive to avoid claims of "favoritism" in emergency communications service delivery.

The management of a number of combination public safety communications centers have dealt with this potential issue in three primary ways. Larger municipalities often budget for a police or fire liaison/supervisor position from the agency not responsible for the communications center. This position may be onsite either around the clock (in very large communications centers) or on the day shift to monitor, provide liaison and/or actually provide a certain level of dispatch operations supervision.

Another method has been the establishment of a "board of advisors" or "users board" to provide a means for input and communications on issues of mutual concern to the management of the communications center.

COMPUTER AIDED DISPATCHING

One of the most significant improvements in public safety dispatch in the last 40 years has been the introduction of computer aided dispatch (CAD) systems. These systems represent a well-proven technology that offers noteworthy benefits for the safety of law enforcement personnel; decreases in dispatch processing time; and improved accuracy of the dispatch process. The result is quicker and more accurate emergency public safety responses. CAD systems have become an essential component of quality communications and dispatch centers in public safety throughout the United States.

In order to effect reductions in the response time components, elicit incident information, verify the location of the incident, identify potential hazards to public safety personnel, and determine the available unit(s) most appropriate to respond. Automation of at least some of these processes should be implemented for public safety agencies.

The primary objectives of CAD systems are to:

- Increase the speed of the dispatch process, thus reducing response time;
- Increase the accuracy of the dispatch process;
- Increase safety by improving the information that is available to field personnel;

- Improve the utilization and management of resources by providing more information regarding incident locations, and by improved status keeping and display; and,Collect data concerning calls for service and subsequent responses in support of management information and resource allocation in departmental activity.

CAD systems vary widely in their functions and capabilities. The reasons for variances are the individual characteristics and requirements of different public safety agencies. The size of the service area involved, the population being served, and the funding available are all key factors in the function and capabilities acquired as part of a CAD system.

Typical Features of CAD

CAD provides a number of specific beneficial features for public safety, such as:

1. Geographic Base Files. Generally, computer aided dispatch systems have five geographic files which are utilized in the operational CAD environment. These include:
   a. The block face file;
   b. The intersection file;
   c. The common place name file;
   d. The alias/misspelled street name file; and,
   e. The hazards/premise file.

   These files are utilized to define to the CAD the street segments, address range, intersections and so forth that comprise the geographic aspects of the service area.
2. Location Data. CAD systems can quickly and accurately retrieve specific location data from a large data base.
3. Unit Dispatch Recommendation. Based on criteria developed by public safety officials, a CAD system has the capability to recommend specific fire unit(s) or other emergency service provider for a response assignment for any given address entered into the system as part of the call taking and dispatch process. As calls for service are received, the system can reorder response assignments.
4. Incident Records/Premise History. The CAD system storage of recent incident records allows for rapid access to various kinds of incident data for later analysis and study. For field public safety personnel, premise history can be very

important. For example, if department resources are dispatched to an address of a known felon or hazmat storage location, the dispatch personnel and the responding public safety units dispatched may not know the volatility of this incident, and may become involved in a situation without essential information. Address-based "hazard information" that can be entered into the CAD system, based on prior calls to this same address, information provided by the property owner/occupant and/or fire investigations in progress, may well prevent injury or worse to the personnel responding, and allow for improved incident handling.

5. Message Capability. CAD can have a message-sending capability that, for many fire departments, has become critical to their internal operations. In addition, both dispatch messages, as well as administrative messages, may be transmitted and logged.

CAD / 9-1-1 Systems Interface

The more recent, up-to-date versions of CAD systems include an interface with the 9-1-1 system. The 9-1-1 telephone number and address data can be entered into a CAD system to reduce the number of keystrokes necessary to carry out the dispatch function. This feature improves accuracy and speed of emergency dispatch.

CAD provides for the accurate logging of all operational activity associated with calls for service, incidents, nature of incidents, location of calls, time of calls, duration of calls and units assigned. When coupled with a computerized records management system, this capability provides management with an accurate data base upon which to base rapid operations analysis and feedback for determining an efficient deployment and distribution model for basic service delivery.

When CAD is interfaced with the 9-1-1 system, citizens calling for fire or EMS services automatically have their address and telephone number displayed on the screen for the call-takers. In emergency situations the citizen caller is not required to explain in great detail the circumstances and the address. The exact address can be a very difficult issue as it relates to response in emergency situations because of the anxiety, possible language barrier, and/or physical impairment of the individual calling for emergency services.

Documentation of Incidents

CAD systems generally document all dispatch and CAD systems activities on a computer. The specific data that CAD systems normally document include the following:

- Nature of incident;
- Incident number;
- Location (address) of incident;
- Fire and/or EMS agency response district where incident occurred;
- How call received: 9-1-1, business line, radio, etc.;
- Name of calling party;
- Telephone number of calling party;
- Time call received;
- Time call dispatched;
- Time units on-scene;
- Time units in-service;
- Time incident cleared;
- Unit(s) assigned;
- Name or ID number of call-taker receiving call;
- Name or ID number of dispatcher handling call; and,
- Other relevant incident data.

Most CAD systems are designed utilizing mini or PC-type computers. Incident data for a certain period of time is maintained in the data base of the CAD computer. Management reports can be produced and analysis can be performed with the incident data. Based on the storage capacity of the CAD computer(s), incident data are normally transferred to other larger computers for long-term record keeping and analysis.

MOBILE DATA COMPUTERS

As part of state-of-the-art CAD systems, fire and EMS agencies have been acquiring and implementing portable/mobile computing devices. This technology has been emerging in public safety communications systems since the late 1970s and is another well-proven technology. In the private sector, mobile digital terminals have been used since the early 1980s to speed transmission of assignments.

Initially, as the technology evolved, the units were mobile and therefore generally referred to as "mobile digital terminals" (MDTs). However, as the technology has continued to progress portable computing devices have come into use in this capacity and therefore a number of differing types of portable/mobile computing devices are in use, many currently referred to as "mobile digital computers" (MDCs).

In addition to being an integral part of the computer-aided dispatch process, these units may be a part of the records management system (RMS) and/or they can be standalone reporting mechanisms.

TIME SYNCHRONIZATION

Maintenance of accurate dispatch times is important to many aspects of public safety dispatching. Some of the following require the maintenance and documentation of accurate times for various components of the dispatch process:

- Response to inquiries from the public;
- Management studies and analysis; and,
- Response to requests for documented information for legal and court cases.

Individually, many components of the communications center include time keeping capability. Many of the following components of the typical communications center include internal time keeping capability:

- Voice recorders;
- Dispatch consoles;
- CAD systems;
- ANI/ALI controllers and other 9-1-1 equipment;
- Wall time displays;
- Time-lapse video units; and,
- Alarm receivers.

The accuracy of dispatch-related times maintained by the various dispatch center communications components is essential to the availability of reliable and consistent time information. Likewise, it is essential that the times maintained by the various communications system components be synchronized and consistent.

TRAINING OF DISPATCHERS

Training is one of the most important factors when considering the requirements of a public safety communications center. Training is key to the effective operations of the center and the center's ability to provide the appropriate emergency response to the public, as well as providing the necessary support to fire and EMS personnel.

The required amount and content of training will depend greatly on the background and experience of the individuals staffing the communications center. When individuals staffing the center have the institutional background and field experience, such as in the case of using uniformed personnel, then the training only has to focus on the equipment, skills, and procedures common to the communications center operations. When civilian personnel are used, the training may need to be more extensive so that the individuals are familiar with the service and field operations that impact or could be impacted by communication center operations.

Even with the automation of communication centers, there still must be provisions for human intervention and application of discretion. Because of human and situational variables, especially in emergency situations, decision making cannot be deleted from the dispatchers' responsibilities.

Dispatcher Training Model

This Section reviews a model public safety dispatcher training program.

Basic Dispatcher Training

A model fire/rescue/EMS dispatcher training program should include basic dispatcher training that would include some of the following basic topics:

1. Mission of communications center
2. Dispatcher duties and responsibilities
3. Professionalism
4. Telephone systems
5. Telephone answering and other related procedures
6. Radio communications systems
7. Radio procedures and codes

8. Telecommunications concepts and technology
9. Dispatch related automation concepts
10. 9-1-1 and CAD systems generally
11. Stress management and critical incident stress debriefing
12. Fire and rescue operations and terminology
13. Emergency medical dispatching and pre-arrival instructions
14. Records management systems

This basic training is generally concentrated classroom lectures and established lesson plans.

The content of the basic training programs offered by or following the instructional programs of APCO meet the intent of the basic training envisioned in this model.

Internship

Following completion of the basic dispatcher training program, each dispatcher candidate should complete an "internship" consisting of an appropriate number of shifts working with an experienced dispatcher. The candidate is evaluated on a daily basis.

Probationary Performance Standards

As an adjunct support to the basic training requirements outlined above, the implementation of a dispatch personnel training program should include comprehensive probationary training with appropriate performance standards and a dispatcher training manual or handbook.

Continuing In-Service Training

Following the completion of the basic dispatcher training, the internship, and successfully meeting the performance-based probationary standards and program, the dispatcher would be considered to be fully proficient. Subsequently, dispatchers should be required to maintain their dispatch knowledge through attending continuing in-service training programs.

Continuing in-service training programs vary with each communications center and are customized according to the needs and the personnel requirements. The majority of programs have regularly scheduled review and updating of basic subject areas and the addition of new topics and procedures. The amount of time varies since some are formal off-site classes while others are updates at line-up and shift change.

Supervisory Training

Supervisory training and continuing education is individualized in each communications center. In most of the centers, the focus of the training is supervisory and management subjects. The nature and level of formality of supervisory dispatcher training would be dependent upon the size of the communications center and the number of dispatchers to be supervised.

Quality Assurance

Quality assurance for call taking and dispatching should be an important part of ongoing dispatcher training. Senior dispatchers or a supervisor reviews dispatch records and recording of significant or unique events or incidents. Any problem observed or heard is noted and placed into line-up information and/or a follow-up drill or retraining program. Over the long-term, problem trends are identified and dispatch personnel are advised of methods for improvement.

RADIO SYSTEMS - GENERALLY

A number of radio frequency bands have been made available for public safety agencies by the Federal Communications Commission (FCC). These bands are as follows:

- VHF low band
- VHF high band
- UHF 450 MHZ
- UHF 490 MHZ
- UHF 700 MHZ
- UHF 800 MHZ

Each frequency band has associated advantages and disadvantages. The selection of a particular frequency band by public safety agencies is dependant upon a number of factors, including frequency availability, area to be covered, type of geography, size of radio system designed, and frequency bands used by adjacent public safety agencies.

Typical Radio System Configurations

There are a number of radio system configurations available for public safety use. These system configurations vary primarily in the number and usage of radio frequencies that comprise each of the systems. The different system configurations are as follows:

- Simplex - Utilizes a single radio frequency for both transmitting and receiving all radios for each channel. Only one radio can transmit at any time while all other radios receive.
- Two-frequency half duplex - Utilizes separate frequencies for transmitting and receiving. Only one radio can transmit at any one time; all others receive.
- Two-frequency full duplex - Utilizes separate transmit and receive frequencies and permits simultaneous conversations in two directions.
- Two-frequency repeater - Utilizes a centrally located high-powered base station "repeater." The repeater receives a transmission from any radio in the system on one radio frequency and instantly retransmits or "repeats" the message on a second frequency that is received by the other radios on the system. Repeater systems are two-frequency half duplex systems.
- Trunking systems - Utilizes a group of radio frequencies that are controlled by a computer at the base station or communications center. When a transmitter is keyed, it transmits a unique identity code to the computer. The computer instantly selects an available radio frequency and automatically directs the transmitting radio to use that frequency for transmission.

A radio system is generally comprised of the following primary components:

- Base station transmitter and receiver equipment;
- Antennae tower and equipment;
- Mobile radio equipment;
- Portable radio equipment;
- Applicable automation hardware and software; and,
- Communications center control equipment and consoles.

800MHz Trunking System

It is common knowledge that two-way radio communication is an essential tool for effective delivery of a wide range of public services. Fire, rescue, emergency medical services, law enforcement, public works, and transportation agencies cannot function well without access to reliable radio communications. Public safety radio communications is expected to grow by 55 percent over the next 10 years as a result of population and commercial growth. While the need is growing rapidly, the ability of users to upgrade their existing radio systems is limited, because most UHF/VHF frequencies have been licensed to users and are not available to jurisdictions or regions needing to upgrade or expand radio systems.

In recognition of this frequency availability problem, the Federal Communications Commission (FCC) has taken action to allocate large blocks of 800MHz spectrum radio frequencies to help satisfy this growing communications requirement of government, business, industry, and land transportation. While releasing these frequency blocks, the FCC stipulated that certain communications systems operating in the 800MHz band must employ trunking techniques (computer controlled) to achieve increased channel utilization and loading.

On the conventional single-channel, two-way radio system, several users have access to only one channel. When that channel is in use, other users in the shared system should not access the channel. Therefore, like telephone users on a "party-line," they must wait until the channel is free. Another channel may be clear in the area, but conventional system users have no means to access it.

On a trunking radio system, each user has access to a number of radio channels. When a user places a call (pushes the transmit button), the user is automatically assigned a clear channel for the duration of the message. While that channel is in use, other users can access other channels. At the conclusion of each message, the vacated channel is returned to the common pool where it becomes available to other users in the system.

Several key advantages of utilizing computer controlled trunking 700/800MHz radio systems are as follows:

1. Measurable improvement in frequency utilization;
2. Transmission of messages on identical frequencies at every site in the trunking system simultaneously;
3. Dynamic frequency allocation by tracking users and keying only sites and channels required to reach a particular user group;
4. Enhanced records capability regarding frequency use by units and groups in the system;
5. Improved frequency security;
6. Total ability to exclude unauthorized units from transmitting on the system;
7. Ability to allocate frequency groups "on-the-fly" in response to emergency requirements, such as disaster situations; and,
8. Ability to handle the increasing communications requirements with improved frequency allocation.

For a number of years, the FCC has been encouraging and facilitating communications users, such as fire, EMS and other local government agencies, to initiate regional planning efforts leading to the implementation of well coordinated and planned 800MHz trunking radio systems. As a result, many such systems have been or are being planned and implemented across the United States.

DISPATCH CONSOLE FURNITURE

For efficiency and effectiveness of operations, all dispatch components should be integrated into the consoles, including:

1. CAD screens, keyboards, and related support equipment;
2. Crime information access systems;
3. Map display system;
4. Telephone lines and controls;
5. Radio controls;
6. Quick recall short-term recording devices; and,
7. Time synchronization clock.

Clearly, both the computer and other equipment support requirements, as well as call taker, dispatcher and supervisor staff needs, should be carefully considered as part of the

design and implementation of consoles. Some of the more progressive ergonomic aspects of consoles include:

1. Adjustable height work surface;
2. Task lighting that may be dimmed;
3. Adjustable keyboard platform mechanism;
4. Radiant heat panel;
5. Footrest with provision for a foot switch;
6. Integrated trash bin;
7. Enclosed storage compartment;
8. Open design for equipment mounting flexibility; and,
9. Acoustic environment.

RECORDING RADIO AND TELEPHONE TRAFFIC

The recording of radio and telephone traffic on all radio frequencies is an essential function that should be performed at all times. Instant and long-term access to these recordings is important for many reasons, including:

1. Assist with dispatcher training;
2. Support dispatcher personnel evaluation efforts;
3. Legally document incident-related occurrences;
4. Provide documentation for purpose of a specific incident critique;
5. Provide recording of dispatcher activities for immediate playback to clarify unclear verbal information for dispatch accuracy purposes.

As is the case with many PSAP products, 9-1-1 center managers have a wide range of vendors and options from which to choose when considering recording systems. Important consideration when selecting recording systems include: the size of center's operation, the volume of calls handled, number of telecommunicator positions to be recorded, duplicate recording in a backup center, the desire for instant replay, time synchronization of the recorders, and duration of records storage.

Short-Term Recording Systems

Short-term (five to 30 minutes in duration) recording devices in communications centers can be of significant benefit to dispatch personnel. The availability of a short-term recording with immediate playback capability provides the call taker or dispatcher with the ability to play back a radio or telephone message in an effort to clarify what was said or occurred. This playback capability can be an invaluable tool to assist in situations where the dispatcher or call taker is unclear as to what the calling party or officer said or requested.

In many high-stress situations, people do not communicate as clearly and messages can be "garbled" or barely audible. For the dispatcher, immediately playing back the message may clear up the misunderstanding.

The technology involved with radio frequency recording has advanced significantly in the past few years. Today, many of the recording devices are computer controlled, utilize digital technology, and are very compact in size. A number of the more specific features of such equipment include:

1. Software based for ease of future upgrade ability;
2. Extended recording hours on digital data storage cartridges (e.g., 640 hours);
3. Simultaneous playback of multiple channels;
4. Extensive search capability;
5. Re-record capability;
6. Internal battery backup; and,
7. Voice compression to save media storage space.

Long-Term Recording Systems

Initially, when radio dispatch frequencies were recorded for purposes of long-term documentation, the recording medium was magnetic reel-to-reel tape. These recorders were of various sizes. Subsequently, the reel-to-reel magnetic recording machines utilized 24-hour tape reels with one magnetic tape reel recording each 24-hour period. Generally, a communications center would retain each 24-hour magnetic tape for a specified period of time (90 to 120 days, for example). Unless the tape was placed on hold for specific reasons, the magnetic tape would be reused.

Most recently, a number of computer disk and digital recording devices have been developed that allow for the continuous recording of much greater periods of time (days and weeks) with high quality, permanent storage, and various levels of search and replay capabilities. Further Next Generation 9-1-1 (NG9-1-1) initiatives lead by the National Emergency Numbers Association and the US Department of Transportation will require that new types of emergency communications (text, pictures, and video) be recorded along with the voice communications that have traditionally been recorded. Most existing communications recorders are not capable of recording anything other than audio, and major changes may be required to bring these devices into NG9-1-1 compliance.

PORTLAND REGIONAL FIRE & EMS DISPATCH

The following sections review and make recommendations relating to fire and EMS communications and dispatch.

Organization

The Portland Regional Communications Center (PRCC) was established in July, 2007, by interlocal agreement between the City of Portland and the City of South Portland. The PRCC is responsible for receiving telephone requests for all emergency services and dispatching appropriate resources as well as providing field service providers with automated information 24 hours per day.

The PRCC is governed by the Portland/South Portland Public Safety Dispatch Board that consists of:

- Police Chief of each city, or his/her authorized designee;
- Fire Chief of each city, or his/her authorized designee; and,
- City Manager of each city, or his/her authorized designee.

According to the interlocal agreement the Board is an administrative board with the following duties:

- Establish policies and procedures for the operation of police and fire dispatching, including the hiring, promotion and discipline of dispatch employees;
- Recommend a budget to each City Manager;
- Produce an annual budget;

- Make recommendations to the City Managers as to the terms and conditions of employment; and,
- Make recommendations to the City Councils as to the terms for additional interlocal agreements needed related to additional municipalities.

In accordance with the interlocal agreement, the Town of Cape Elizabeth is not dispatched by the PRCC as a member. Reportedly, this regionalization initiative has allowed all three communities to maximize their resources while maintaining the commitment to excellence. The PRCC dispatches the following police, fire and emergency medical services delivery agencies within Cumberland County:

- City of Portland
- City of South Portland
- Town of Cape Elizabeth

9-1-1 in PRCC

The E911 System, implemented by the PRCC, provides citizens with a three (3) digit telephone number to dial (9-1-1) for the service of law enforcement, fire, or emergency medical personnel. The PRCC 9-1-1 uses Fairpoint. The 9-1-1 lines in the PRCC are provided by and maintained by the State.

PRCC Radio System

The radio system in use is a Motorola SmartNet II 800MHz trunked radio system. The radio system is significantly out-of-date with early SmartNet systems having been installed in the 1980s. Likewise the Motorola Centracom Elite radio consoles in the PRCC are out of date as are the Futurecom vehicle repeaters used to enhance fire ground operations in the majority of the fire vehicles. Planning for the replacement of the PRCC radio system should continue leading to the installation of a state-of-the-art radio system to support the PRCC and its police, fire and emergency medical services providers.

Radio Interoperability

Radio system interoperability is the ability of any public safety government or military radio user to initiate and receive calls at any time without the assistance of an operator. Radio interoperability allows calls to be made to any other radio, packet-switched IP network, or circuit-switched telephone network connected user, or a combination of these, when the connection is properly authorized by system rules. Simply stated, it is when firefighters and emergency medical responders can go anywhere in the region or state and have immediate radio communications with each other using their own equipment on designated channels.

Planning for a new PRCC radio system should assure that the system provides full interoperability with other public safety service providers and their radio systems.

City of Portland Computer Aided Dispatch (CAD) System

The CAD system utilized by the PRCC is SunGard Public Sector – NaviLine CAD/AS400. Although this CAD system does not have all of the state-of-the-art functionality of some later CAD releases it is reportedly very stable. There has been discussion that this CAD system may be "sunsetted" in the not so distant future. With the current CAD having been installed in 1998 planning should continue in monitoring the status of this aging system with consideration as to a future replacement when determined necessary.

Mobile Data Computers

The PRCC CAD system was purchased and designed to provide mobile data computers (MDCs) support for emergency vehicles. This initiative should continue with the goal being to fully utilize MDCs, including implementation of MDC status maintenance, messaging and dispatching.

PSAP Audit

The Study Team understands that the State of Maine, Public Utilities Commission, Emergency Services Communication Bureau completed a State of Maine PSAP Audit for the period of January through October, 2012. The Bureau reportedly conducted an audit of the operations criteria as established for the State of Maine. As part of that audit it

apparently was determined that the PRCC average 9-1-1 call answering time was five (5) seconds and the average call processing time during the reporting period was two (2) minutes and eleven (11) seconds, or 2:11 minutes. These times seem very respectable, although, as always, every effort should be pursued to reduce these times as much as possible.

Overall, to the Study Team, who have managed county-wide public safety dispatch centers and assessed more than 80 police, fire and EMS emergency communications centers, the PRCC seems to be state-of-the-art in most ways. There seems to be a knowledge of those areas needing to be upgraded (e.g., aging radio system and CAD system) with planning for future action in that regard. **The City of Portland and City of South Portland should be congratulated for their progressive efforts, especially as related to PSAP consolidation.**

SUMMARY

Decisions made at the emergency scene may be irreversible and the consequences of error can be disastrous. Errors can lead to further property loss, as well as injury or death to civilians and firefighters. Successful fire operations require thorough pre-incident planning; knowledge of the nature and location of buildings; interior contents; and built-in systems.

In addition to the traditional fire and EMS services delivery, fire departments also provide a wide variety of other specialized services that are seldom needed, but make a difference when utilized. The decision by a fire department to be in the special operations service business must be one that is well thought out and made based upon a real need, not a perceived need presented by a few personnel who just want to start a new program to satisfy their interests. When faced with limited resources and expanding calls for service from the community, a fire department should carefully select the services it provides. Often times a joint effort approach by several neighboring regional departments is a more efficient use of resources while still accomplishing the task.

In the case of the PFD, the department needs to look closely at all of its special operations services to see what the demands for service are and how to best prepare the department to respond to those demands. Establishing program goals will be important for each type of special operation service provided. In some cases, perhaps the best way to meet the

established goals will be to utilize outside mutual aid or regional resources instead of trying to be the sole-source provider of the service.

Every fire department should have a set of rules and regulations that outline performance expectations for its members, the standard operating procedures for the department, and disciplinary actions that can be taken against personnel not following the regulations. The Study Team found a serious need for an up-to-date, comprehensive policies and procedure manual within the PFD.

Pre-fire planning and building fire inspections performed by firefighters and officers can improve firefighting service. The increased knowledge by firefighting personnel of the buildings and other occupancies in their service area can be very beneficial. Additionally, these activities can result in more productive uses of staff time and improve public relations.

An emergency communications center is the nerve center of police, fire, and EMS service delivery agencies. It is the critical link, the lifeline, between the public and its protectors. Typically, emergency dispatch centers in a municipality are managed by a number of agencies, including fire, separate municipal agencies, regional agencies, or a police department. Predominantly, the public safety dispatch function is the responsibility of the police department. In City of Portland the emergency dispatch function is provided by the Division of Emergency Operations' 9-1-1 Communications and Dispatch Center.

The radio system is the backbone of the emergency dispatch system as it is the means for communications between the dispatchers and the service delivery personnel, and among the service delivery personnel—police, firefighters, fire officers, EMTs, and paramedics. Radio systems have progressed technologically through the years to the point where today, many radio systems are computer controlled, digital signal-based radio systems. The Portland Regional Communications Center serviced public safety agencies should be supported for the future in order to utilize a new state-of-the-art 800 MHZ digital trunking radio system.

A number of options for improving emergency fire dispatch services in Portland are outlined for consideration.

RECOMMENDATIONS

7-1 The Fire Chief should assign one of the platoon commanders to oversee Special Operations program as a collateral duty.

7-2 The Fire Chief should require all personnel assigned to perform vehicle extrication rescue operations be trained and certified to the applicable NFPA and/or the Maine State training standards.

7-3 The Fire Chief should consolidate all of rules, regulations, and procedures into a policy and procedure manual that addresses all aspects of the department's administrative and operational functions.

7-4 The City and Fire Chief should continue to maintain a substantial fire protection capability to the Portland waterfront, including the provision of fireboat services.

7-5 The Fire Chief should implement the revised term of Fire EMS Boat for the services provided by the Marine Division, consistent with the actual services provided and to avoid any related misunderstanding.

7-6 The City and Fire Chief should implement a two-boat approach to marine services delivery, as suggested in this Study report; a boat that provides fire and EMS services and a quick-response enclosed RIB type rescue boat for EMS transport services and shallow access to the various waterways.

7-7 The City is encouraged to continue the implementation of the renovation relating to the current Marine Division quarters in order to provide minimal needed safe quarters.

7-8 The City and Fire Chief are encouraged to staff the current daily Fire EMS Boat functions with three (3) uniformed personnel.

7-9 The City and Fire Chief are encouraged to provide paramedic staffing on Peaks Island to provide ALS level of care and firefighting support to the islands.

7-10 For the future, the City and Fire Chief are encouraged to pursue the co-location of the Marine Division and Engine 5 and MEDCU 5 from Central Fire Station in order to provide more rapid response of the Fire EMS Boats and the potential for cross-staffing of units co-located at a future fire EMS facility in the central waterfront area.

7-11 The City and Fire Chief should assist the Jetport in determining the appropriate level and schedule for the provision of staffing to the Air Rescue Division, with the reallocation of any staff not needed by the Jetport to other priority needs.

7-12 The Fire Chief should consider establishing a policies and procedures committee to provide consistency and coordination of the policy and procedure development process.

7-13 The Fire Chief should implement a comprehensive pre-fire planning program that address all of the moderate to severe target hazards in the City.

7-14 The Fire Chief should designate the Bramhall Fire Station as the special services fire station, as recommended in this Study report.

7-15 The Fire Chief should consider revising the staffing and deployment approach utilized by the Hazmat Team in order to provide a more cost effective, organized and rapid response of the Team.

7-16 The Fire Chief should implement the completion of pre fire plans on database accessibly via the mobile data terminals in apparatus.

7-17 The Fire Chief should identify another strategically located engine to provide extrication services in concert with extrication services units being located on Rescue 1 and Engine 11.

7-18 The City's and PRCC should continue the planning and upgrade the current 800MHz radio system to current state-of-the-art digital trunking system standards and full interoperability with surrounding counties.

7-19 The City's and PRCC should continue to monitor the viability of the current SunGard computer aided dispatch system in order to properly plan for and implement are replacement when needed.

CHAPTER EIGHT
ISLAND VOLUNTEER FIRE/EMS SERVICES

This Chapter provides information relative to fire, EMS and rescue volunteer recruitment and retention. Additionally, associated options and recommendations are outlined for consideration by the volunteer fire companies and the City.

This Chapter includes information about volunteerism generally; recruitment of volunteers; retention of volunteers; current efforts in recruitment and retention; length of service awards program; and other related topics associated with possible volunteer involvement in the PFD.

OVERVIEW OF VOLUNTEERISM

The Study Team's experiences in volunteer fire and EMS service reflect various approaches and reasons for volunteer participation. This experience is useful in explaining some opinions of volunteer service constraints and benefits.

Nationally, some volunteer fire departments seem to have a continual supply of individuals who want to and can volunteer their services. Others, however, have problems trying to recruit enough volunteers to maintain minimal staffing of units and subsequently may have difficulty retaining those members and developing qualified volunteer leaders. The key seems to be meeting the needs or expectations of the volunteers, which are different in many respects from paid personnel.

When individuals become career firefighters/EMTs, their initial concerns may be material needs, such as salaries, benefits and financial security, in addition to their desire to serve the public. The question of why people volunteer their services has been raised to the Study Team. Therefore, a review of accepted principles of motivation may be helpful. As Maslow's "Hierarchy of Needs" states, individuals are motivated by five levels of needs. These are in order of highest to lowest:

1. Physiological needs, such as food, water and shelter.
2. Safety needs, such as security, order and stability.
3. A sense of belonging, involving friendship, identification and love.
4. Esteem involving prestige, success and self-respect.
5. Self-actualization needs, which involve psychological needs from within.

According to Maslow people must meet their first need before being able to proceed to the second need. The first need is usually met through regular employment and, in some cases, through a second job. In order to meet this first need, sometimes both spouses must work.

As employment and salary also provide for the safety and security needs, individuals move to the third level, which involves the need for a sense of belonging. One way to satisfy this need is by volunteering to provide some level of community services. It is from this pool of people that volunteers are available for firefighting and emergency medical services.

ISLANDS FIRE VOLUNTEER FIREFIGHTERS

Through the years, the Portland islands have been provided fire and EMS by PFD firefighters and officers augmented by services of volunteer members at the following four volunteer fire associations:

1. Peaks Island Volunteer Fire upgraded 1938 to engine with 500 GPM pump;
2. Cushing Island Volunteer;
3. Cliff Island Volunteer Company, established in 1952;
4. Great Diamond Island Fire Company, established in 1949; anad,
5. Little Diamond Island Fire Company.

Each of these fire companies was organized under the laws of the State of Maine and the City of Portland; operates under a set of fire department rules and guidelines; and elects and/or appoints a set of officers pursuant to their rules and traditions.

It is the Study Team's goal to present suggestions as part of this Study that could provide the opportunity for maintaining and increasing substantial fire rescue service delivery by volunteer fire service delivery members.

RECRUITMENT OF VOLUNTEERS

Each volunteer for the fire and rescue services serves as an ambassador who can encourage others to apply for membership. While incentives, as listed in this section, are very important, personal recruitment by the current members is vital to the continued success of the volunteer program.

Many volunteer fire departments in towns, counties and cities use the following methods to recruit new volunteers for their volunteer fire departments:

1. Development and distribution of brochure material;
2. Word of mouth;
3. Family tradition;
4. Interest after having been a customer of the fire/EMS service;
5. Area-wide poster placement in businesses, etc.;
6. Door-to-door neighborhood recruitment;
7. CPR and EMT-A classes open to the public;
8. Televised public service announcements;
9. Radio public service announcements; and,
10. Speakers sent to community group meetings and high schools.

Current Recruitment Efforts

On the islands, the Study Team was advised that a number of volunteer recruitment tools have been used in an effort to attract new volunteers for the island fire companies. Reportedly, the volunteer fire companies have recruited new volunteers in the following ways:

1. Word of mouth;
2. Recruiting family members; and,
3. Public gatherings and school public education opportunities.

RETENTION OF VOLUNTEERS

Clearly, the management of public safety personnel resources is a critical task, because human resources generally determine the quality of services delivered to the public.

Volunteers may not be available to respond to fire and rescue calls for a variety of reasons. These include days off and away from the area, vacation, sickness, injury, other priorities and time commitments and time away for training.

A critical time period for efforts to retain volunteers is the first four years of membership. It has been said that if a new member completes the first four years he/she will most likely remain for many years. Programs aimed at retaining volunteers during their first four years of membership should be identified as a priority.

Based upon interviews with volunteer personnel participating in this Study, it seems there has been a reduction in some volunteer memberships.

The overall philosophy of the leadership of the fire companies is, however, consistent with a very important volunteer retention approach. Pride in the organization and treating the volunteer personnel "right" are important to the leadership.

Typically, when volunteer firefighters are asked about their reasons for remaining volunteers, they give a number of reasons, including:

1. Pride in the organization;
2. Once you get a taste of it, you want to continue;
3. Continuing need to help the public;
4. Keep up the friendships;
5. The great personal satisfaction received;
6. Physical activity; and,
7. Continuing involvement is an enjoyable activity for those who are career fire-fighters in other jurisdictions.

The efforts to retain volunteer personnel seem to vary. There is no official program focused on the retention of volunteer fire and rescue members. The retention programs for volunteer fire and rescue personnel should be broad-based and area-wide.

Many very successful volunteer fire and rescue services exist throughout the United States. The basis for their success varies significantly. However, the Study Team has noted that the more successful systems expend considerable effort to retain their volunteer personnel, including significant efforts to recognize their volunteers and their efforts.

Organizations with successful volunteer programs commit much time and effort to providing training and experience to volunteer personnel. Retaining trained and experienced personnel is more cost-effective than having to constantly train new volunteers. The trained and experienced personnel also provide better service.

Although a number of incentives in other communities may not apply to the Portland Islands area, the various benefits reflect a community's commitment to recruiting and maintaining volunteers. Several of the programs that have been successful in assisting to retain volunteers in other locales include:

1. Comprehensive awards program;
2. Social events, such as banquets and dinners;
3. Education tuition assistance programs;
4. Workers Compensation coverage;
5. Length of service awards programs;
6. Free training and experience for career preparation in fire, rescue, emergency medical and other related areas;
7. Free passes or tickets to community activities;
8. Physical fitness facilities and equipment;
9. Insurance coverage, including medical, dental and life insurance;
10. Various compensation programs, such as out-of-pocket expenses for fuel, clothing, education and training materials, and meals; hourly pay rate ("paid on call" volunteers); and, compensation based on an activity-related point system;
11. Reduced sewer and water rates;
12. Property tax percentage reduction; and,
13. Uniforms, clothing with the department's logo and individual tools, such as flashlights and stethoscopes.

Recruitment and retention of volunteers are of prime importance to the continuation of the volunteer fire and rescue service. Therefore, it is important that the PFD, City, and each of the volunteer fire department organizations work together to develop and implement programs that are intended to attain and maintain a high degree of volunteerism in the system.

Length of Service Benefit Program

Many jurisdictions in the United States with either a fully volunteer system or a combination of a career and volunteer system have established a length-of-service awards program (LOSAP) for the volunteer fire and rescue service personnel. This program has a proven track record of improving volunteer recruitment and retention. The program provides certain benefits to volunteers who have met minimum calendar-year service requirements for a set number of years. In other words, it is a volunteer retirement benefit program.

A number of programs established in other jurisdictions involve differing levels of program requirements. One type of LOSAP program is to maintain a defined level of service activity per month.

PUBLIC AWARENESS

The Study Team interviewed volunteer leaders and members who expressed concern that the general public is not fully aware of the volunteer involvement in the fire rescue service. Residents of the service area have moved from other counties and municipalities to the Study area and may believe that they are being served by a paid fire department. Most citizens may know they have a local fire station, but some may believe it is fully staffed with paid firefighters and officers. The Study Team has noted that this lack of understanding increases when the community is a bedroom community.

Many times there appears to be a need to educate township citizens and business people on the programs and composition of the fire service delivery agency.

RECRUITMENT AND RETENTION PLAN

The volunteer fire companies in the islands are encouraged to develop recommendations for a comprehensive volunteer recruitment and retention program for consideration by the PFD. In developing such a program, the PFD should consider the program ideas presented in this Chapter. This consideration will help ensure that the program recommendations are both comprehensive and focused on the needs related to improving volunteerism in the islands regional area served by the PFD and its participating volunteer fire companies.

Any region-wide volunteer recruitment and retention program recommendations should include a delineation of appropriate funding requirements. The Portland Fire Department and its participating volunteer organizations are encouraged to approve the funding necessary to plan, develop, and implement a comprehensive volunteer recruitment and retention program.

SUMMARY

The staffing approach involving volunteer members of the islands provides a cost-effective service. The viability of this volunteer staffing approach in the future will, to a large extent, be based on the level of effort placed on volunteer recruitment and retention by the fire companies and the Portland Fire Department.

Recruitment of volunteers for the fire and rescue services has been accomplished primarily by "word of mouth." In addition, the volunteer fire companies have been implementing a limited number of ad hoc retention efforts, including training.

Nationally, there are a number of very successful volunteer recruitment and retention programs in local government's volunteer fire companies that continue to assist in providing the essential volunteer personnel for the provision of their fire and rescue service. This Chapter outlined a number of recruitment and retention options for consideration by the fire companies and the suggested Portland Fire Department.

RECOMMENDATIONS

8-1 Officials are encouraged to place periodic articles in local newspapers regarding activities of the volunteer component of the fire and rescue service.

8-2 A comprehensive volunteer recruitment and retention program should be developed. The program should be appropriately funded and include:

1. Length of service awards program or other pension program, as approved;
2. Recommendations for volunteer retention programs based on input received from the exit interview or forms;
3. Budget recommendation for the recruitment and retention programs;
4. Recommendations for volunteer recruitment programs, such as possible medical and dental care;
5. Volunteer handbook that can be given to prospective members of the fire departments, explaining the benefits and requirements of becoming a volunteer;
6. Programs focusing on retention of members during their first four years of membership; and,
7. Programs focusing on the recruitment and retention of volunteer members to participate in the provision of fire and rescue services.

8-3 The City and Fire Chief are encouraged to financially support the volunteer recruitment and retention efforts through annual budgetary funding.

8-4 The City and Fire Chief are encouraged to assign a firefighter paramedic to Peaks Island in order to provide ALS EMS services and firefighting support.

CHAPTER NINE
HEALTH AND SAFETY

This chapter includes sections on national safety and wellness standards for emergency responders and describes how the Portland Fire Department (PFD) measures up to those standards.

OVERVIEW

Over the last decade, there has been increased focus on the safety and health of emergency responders, especially those who are engaged in the delivery of fire and EMS. Several factors have contributed to this increased safety focus, including:

- An increase in the personal concerns of firefighters and medical responders for their own health and well-being;
- An increase in the costs associated with occupational illnesses and injuries;
- A better understanding of the impact that poor physical fitness has on a firefighter's ability to perform his or her job; and,
- An increase in the regulation of occupational health.

Much of the emphasis on firefighter safety and health seems to have come from career fire departments or fire departments with paid staffing; primarily from those states where Occupational Safety and Health Administration (OSHA) standards apply to municipal workers.

Research has repeatedly shown that the physical and mental demands associated with firefighting and emergency medical care operations, coupled with the environmental dangers of extreme heat, humidity, and cold, create conditions that can have an adverse impact on the safety and health of the individual firefighter or medical responder.

Throughout the course of their work, emergency responders come in contact with many health hazards (e.g., blood borne pathogens and hazardous materials). In addition, firefighting has been recognized for many years as one of the most hazardous occupations in the nation due to its number of occupational-related deaths and injuries.

Several years ago, a United States Fire Administration (USFA) report stated, "Firefighting is extremely strenuous physical work and is likely one of the most physically demanding activities that the human body performs." It is important for all

communities that provide fire protection services to remember that the best way to help their citizens in time of crisis is to have an emergency response force physically ready and capable of assisting those in need. This, of course, must be accomplished without the emergency responders themselves falling victim.

Over the last ten years, there have been more than 300,000 fire scene related injuries and more than 1,000 firefighters have lost their lives in the line of duty in the United States. According to a recent USFA report, 83 firefighters died in the line of duty in 2011; one of those deaths occurred in Shapleigh, Maine. A 58-year-old volunteer firefighter was killed in a motor vehicle collision while responding on a call.

Commission on Fire Accreditation International (CFAI)

The Commission on Fire Accreditation International (CFAI) emphasizes the importance of risk management and personnel safety in modern day fire department operations. Progressive fire departments use this criterion, and others, as a benchmark for determining the best and safest service possible. The CFAI *Risk Management and Personnel Safety* Criterion Performance Indicators, as referenced by the Study Team, are provided below:

Criterion 7F: Risk Management and Personnel Safety

There is a risk management program designed to protect the organization and personnel from unnecessary injuries or losses from accidents or liability.

Performance Indicators:

1. There is a specific person or persons responsible for implementing the Risk Management program.
2. There is a system for identifying and evaluating workplace hazards.
3. There are methods and procedures for correcting unsafe or unhealthy conditions and work practices once they have been identified, and a record system kept of steps taken to implement risk reduction through corrections.
4. There is an occupational health and safety training program designed to instruct the work force in general safe work practices, from point of initial employment to each job assignment and/or whenever there are: new substances, new processes, procedures or equipment. It should provide specific instructions with respect for operations and hazards relative to the agency.
5. There is a system for communicating with employees on occupational health and safety matters, including provisions designed to encourage employees to inform

the agency of hazards, and to minimize occupational exposure to communicable diseases or chemicals.

6. There is a management information system in place to investigate and document accidents, loss time injures, legal actions, etc.

The Study Team considered the CFAI criteria as the health and safety functions of the PFD were assessed.

NATIONAL FALLEN FIREFIGHTER SAFETY INITIATIVES

In 2005, the National Fallen Firefighters Foundation (NFFF), in conjunction with other United States fire service organizations, released a program known as the "16 Firefighter Life Safety Initiatives." The goal of the program is to develop a "blueprint for change" for the fire service. This national program is often referred to as the "Everyone Goes Home Program" and it aims to reduce the number of firefighter line-of-duty fatalities. With the number of firefighter line-of-duty deaths still a major concern, fire service leaders and organizations are convinced that dedicated, aggressive measures are needed if departments are to be serious about increasing firefighter safety.

The NFFF's "16 Firefighter Life Safety Initiatives" are as follows:

1. Define and advocate the need for a cultural change within the fire service relating to safety, incorporating leadership, management, supervision, accountability and personal responsibility.
2. Enhance the personal and organizational accountability for health and safety throughout the fire service.
3. Focus greater attention on the integration of risk management with incident management at all levels, including strategic, tactical, and planning responsibilities.
4. All firefighters must be empowered to stop unsafe practices.
5. Develop and implement national standards for training, qualifications, and certification (including regular recertification) that are equally applicable to all firefighters, based on the duties they are expected to perform.
6. Develop and implement national medical and physical fitness standards that are equally applicable to all firefighters, based on the duties they are expected to perform.
7. Create a national research agenda and data collection system that relates to the initiatives.

8. Utilize available technology wherever it can produce higher levels of health and safety.
9. Thoroughly investigate all firefighter fatalities, injuries, and near misses.
10. Grant programs should support the implementation of safe practices and/or mandate safe practices as an eligibility requirement.
11. National standards for emergency response policies and procedures should be developed and championed.
12. National protocols for response to violent incidents should be developed and championed.
13. Firefighters and their families must have access to counseling and psychological support.
14. Public education must receive more resources and be championed as a critical fire and life safety program.
15. Advocacy must be strengthened for the enforcement of codes and the installation of home fire sprinklers.
16. Safety must be a primary consideration in the design of apparatus and equipment.

The initiatives are seen by national fire service organizations such as the International Association of Fire Chiefs (IAFC) and the International Association of Fire Fighters (IAFF) as key elements in a plan to reduce firefighter injuries and deaths. All fire departments, and the municipalities that support those fire departments, are urged to discuss the NFFF initiatives and develop a plan by which they can address how their organization can improve the safety of all personnel.

According to the National Fire Protection Association's (NFPA) report, *Firefighter Fatalities in the United States—2011*, half of the firefighter deaths occurring in 2011 resulted from overexertion, stress, and related medical issues. "Of the 32 deaths in this category, 31 were classified as sudden cardiac deaths (usually heart attacks) and one was due to a stroke."

With the leading cause of firefighter deaths consistently being related to health and fitness, it is clear to see why organizations such as the IAFF and the IAFC have taken a strong stance on the importance of health and wellness programs for all firefighters. Today, fire service leaders are seeing the importance of a healthy and fit workforce and are striving to implement health and wellness programs in their departments.

NATIONAL STANDARDS AND REGULATIONS

OSHA Regulations

Traditionally, safety and health regulations, whether federal, state, or local, are most often enacted due to an event or series of events that have caused death or harm to employees. For example, perhaps several workers unfortunately die while working in an underground storage tank (confined space). An investigation reveals that the workers had little training, poor safety equipment, and no plan for rescue. From that event and a series of other similar events nationwide, a federal regulation might be enacted that addresses working in and around confined spaces. In fact, 29 CFR 1910.146 *Permit-Required Confined Spaces* is an OSHA regulation (standard) that was enacted using that type of scenario.

There are numerous OSHA standards that affect private industry across the nation. Industry often protests that these standards cost millions of dollars in training and equipment just to be in compliance; however, the safety professionals realize that compliance with the standards improves worker health and safety, and a healthy and safe workforce is a more productive workforce.

One problem with OSHA standards is that they do not apply to state or local government employees unless a particular state has enacted its own plan that incorporates the federal standards. Fortunately, in Maine the State Department of Labor enforces occupational safety and health regulations in public sector workplaces, including: state, county, and municipal workplaces; public schools, colleges, and universities; and quasi-government agencies such as water districts. Public safety and health rules are developed by the Maine Board of Occupational Safety and Health and the rules generally follow the federal OSHA regulations. However, the rules are not necessarily identical.

In relation to fire department operations, several OSHA regulations have implications: 29 CFR 1910.95 *Occupational Noise Exposure*, 29 CFR 1910.120 *Hazardous Waste Operations and Emergency Response*, 29 CFR 1910.134 *Respiratory Protection*, 29 CFR 1910.146 *Permit-Required Confined Spaces*, and 29 CFR 1910.1200 *Hazard Communication*.

In terms of fire department safety and health, many of the OSHA regulations have been adopted into the National Fire Protection Association (NFPA) standards—especially NFPA 1500 *Standard on Fire Department Occupational Safety and Health Program,*

2013 Edition. For those municipal fire departments in the non-OSHA states, NFPA 1500 has proven to be a very effective tool when it comes to worker health and safety.

National Standards

A "standard" is often thought of as an "accepted practice" that has been developed and recognized by a board of peers in a certain type of industry (industry standards). For example, the Society of Automotive Engineers (SAE) has a standard that addresses Automotive Lubricating Greases (J310). While certainly not a regulation, the SAE standard is recognized as an industry standard or "best practice" and should be followed by all parties interested in compliance with industry standards. From a customer service perspective, a reputable automotive service facility would only use SAE-approved lubricants when servicing the customer's vehicle because that is what the customer would expect.

For the fire service, the industry standards are the NFPA standards, which are known as consensus standards and are recognized by fire service professionals worldwide as the "best practices" for fire service related issues. Although none of the NFPA standards are regulatory in nature, they carry much of the same weight as a regulation when civil litigation is involved. Because the NFPA standards are recognized by fire service peers as industry practices, non-compliance with NFPA standards is often considered a "bad" business practice that can expose a fire department to liability issues. When fiscally possible, it is important for all fire departments to either comply with the NFPA standards or be in the compliance planning and development process.

PORTLAND FD —COMPLIANCE WITH STANDARDS AND REGULATIONS

The last line-of-duty death in the Portland Fire Department (PFD) occurred on September 14, 1993. Firefighter Frank E. Cowan suffered a heart attack while engaged in fire-fighting operations at a multi-alarm structure fire on January 5, 1993, in the 600 block of Congress Street and passed away later in September of that year. A line-of-duty death for any public safety agency is often a sentinel event that impacts operational procedures and department policy. Given the City's complexity in terms of hazards and densities, the Study Team finds it important for the PFD to focus on the safety and health of its emergency response force.

On August 23, 2011, an extremely "close-call" occurred during a firefighter trainee physical fitness training session. Two firefighter trainees suffered life-threatening, heat related emergencies while participating in a group fitness program: the Study Team would be remiss if it did not make mention of that event.

The two trainees were participating in an organized physical fitness training session as part of their fire academy program for becoming firefighters with the PFD. The two trainees fell ill during a running and exercise session and had to be taken by ambulance to a local hospital for definitive care of heat stroke and heat exhaustion. The injuries occurred during the trainees' first week of the PFD's fire academy program.

An investigation into the facts surrounding the event was launched at the request of the City Manager. A team of City and PFD officials completed the investigation and produced a written report of the findings and recommendations related to the event. The Study Team believes that the event should serve as the impetus for a complete, internal review of all operational procedures pertaining to the safety and well-being of all PFD emergency responders. The Study Team applauds the City and the PFD for completing an internal investigation into the event and implementing practices to minimize the re-occurrence of the event.

NFPA 1500

Perhaps the most well-known fire service safety standard is NFPA 1500 *Standard on Fire Department Occupational Safety and Health Program, 2013 Edition*. First issued in 1987, NFPA 1500 was the first national fire service standard to ever address a comprehensive approach to fire department safety and health programs. The 2013 edition is the most current edition of the standard, which has been revised six times since 1987 and is due to be revised again in 2018.

Even though NFPA 1500 is a voluntary consensus standard, it is the accepted industry practice for the fire service and has, in many instances, been used as an enforcing document when applying safety practices to traditional fire department operations. Senior fire officials throughout the United States have used NFPA 1500 to improve the safe operation of their fire departments and to justify to state and local authorities the improvements needed in order to meet the standard.

The Study Team finds the PFD in limited compliance with NFPA 1500 and work is needed to improve all safety programs within the PFD. The following is a review of each chapter of NFPA 1500 in relation to the PFD's operations.

Fire Department Administration

The NFPA 1500 standard requires various written documents in the forms of policies, procedures, and programs. The purpose of the written documents is to clearly define and communicate all of the department's safety programs to its personnel. By having established procedures and following those procedures, a fire department is more likely to take a safer approach in all of its operational areas. This chapter of the standard identifies items such as:

1. Having written policies and standard operating procedures that document the requirements and operations of the department for both the emergency and non-emergency settings.
2. Having a written risk management plan that addresses all facets of the fire department's operations from scene safety to injury reporting to facility inspections.
3. Having a written occupational safety and health program that identifies specific goals and objectives for the prevention and elimination of accidents and occupational injuries, exposure to communicable disease, illnesses, and fatalities.
4. Ensuring that the department establishes and enforces rules, regulations, and standard operating procedures throughout the department.
5. Developing and implementing an accident investigation program that investigates all accidents, injuries, fatalities, illnesses and exposures as well as the investigation of all accidents involving fire department vehicles, equipment, and facilities.
6. Forming an Occupational Health and Safety Committee for the purpose of conducting research, developing recommendations, and reviewing matters related to occupational safety and health within the department.
7. Having a recordkeeping system that requires the fire department to maintain a database on all accidents, injuries, illnesses, exposures, and deaths that are job-related; this recordkeeping requirement also includes comprehensive health records (confidential), training records, and vehicle and equipment maintenance records.
8. Appointing a health and safety officer to the fire department in compliance with NFPA 1521 *Standard for Fire Department Safety Officer*. The responsibilities of

the health and safety officer are many and they all relate to the communication and management of the department's risk management plan.

9. Having the health and safety officer ensures that all members of the department receive safety-related training for all aspects of their assigned duties and responsibilities; ensure that all accident and injury investigations are completed; ensure that safety supervision is provided at all training exercises and that all live fire training events are done in compliance with NFPA 1403 *Standard on Live Fire Training Evolutions*; and ensure that health and safety training programs and information are provided to the members of the department.
10. Having the department's health and safety officer be responsible for managing an accident and injury prevention program, which includes items such as the evaluation of safe work practices in both the emergent and non-emergent settings; the training and certification of all fire department apparatus drivers and operators (NFPA 1002 Standard *for Fire Apparatus Driver/Operator Professional Qualifications*); the implementation of an accident and injury reporting system that accurately reflects causes and corrective actions; and the conducting of periodic facility inspections to ensure that workplaces are hazard-free for the employees.
11. Having the department's health and safety officer be responsible for ensuring that injury and accident data is gathered in a correct and useful manner, and responsible for issuing an annual report to fire department senior staff on the accidents, injuries, and exposures that occurred in the department.

While there are a number of PFD policies and procedures relating to safety, the documents are generally limited in scope and breadth and, in some cases, dated. In addition, the Study Team learned through its interviews that written policies and procedures are not enforced consistently throughout the department, especially on a shift-to-shift basis. This can be problematic when addressing safety and health matters.

The PFD does not have a risk management plan as required by NFPA 1500. Such a plan is important in establishing the overall safety and health goals for the department and the processes by which the department will achieve those goals. The PFD should consider using the results of the Study Team's work as a basis for development of a risk management plan.

The PFD does not have a written occupational safety and health policy or an occupational safety and health program. As noted previously, the PFD does have a number of policies

and procedures that address certain health and safety issues (e.g., Passport System, mayday, gear inspection, unsafe vehicles.) However, these policies or procedures fall somewhat short of taking a strong, comprehensive safety and health approach to the issue. The Study Team recommends that the PFD develop a written safety and health policy and implement an organized and effective safety and health program.

The PFD is not in compliance with the accident and injury investigation requirements of NFPA 1500. While the PFD has a written policy on vehicle accident reporting (SOG 6.1.3 *FD Vehicle Accidents*), the policy is limited in scope and in need of revision. There is no formal policy on the investigation of apparatus accidents. It is also unclear how collision investigation is handled other than reporting the collision to the police department and to the Deputy Chief. There is also no policy concerning disciplinary or remedial training action for at-fault or preventable collisions involving PFD apparatus.

In 2012, PFD apparatus was involved in 19 collisions, 14 of which were found to be preventable. However, it is unclear to the Study Team who determined the collisions to be preventable or what criteria was used in that decision making process.

Figure 9.1
PFD APPARATUS COLLISIONS (2011 AND 2012)

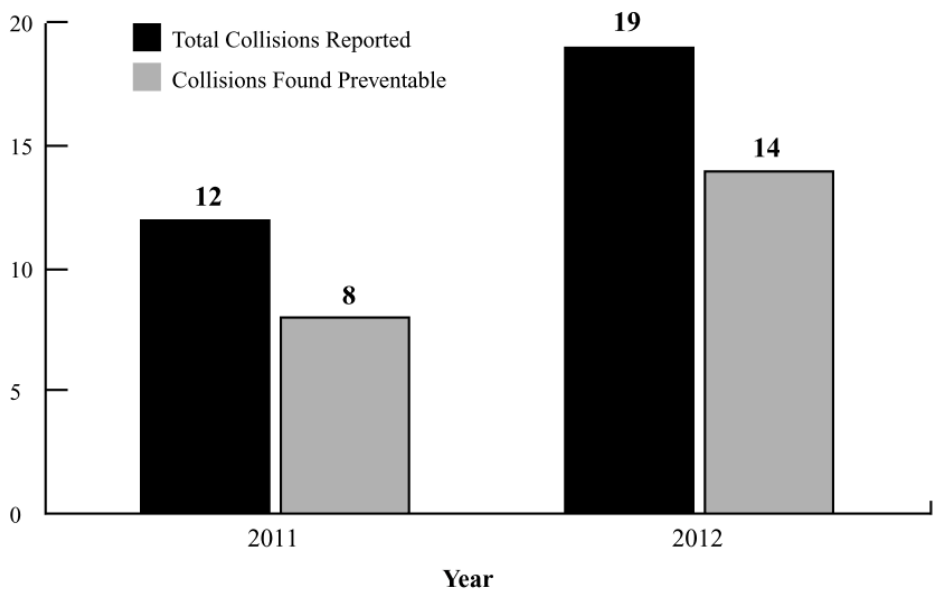
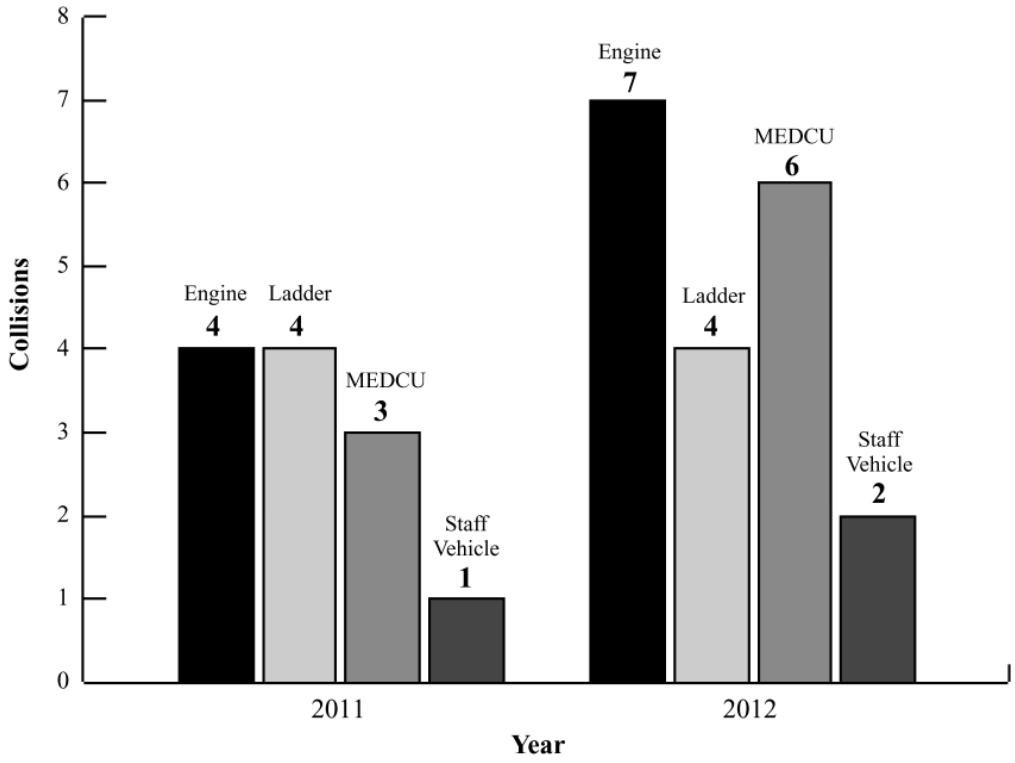
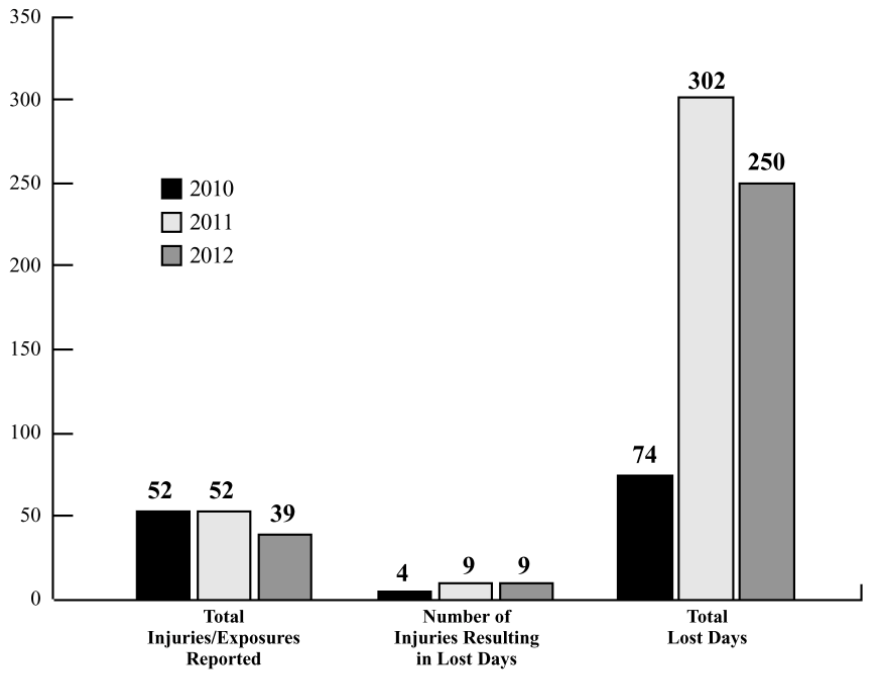


Figure 9.2
PFD APPARATUS COLLISION BY UNIT TYPE (2011 AND 2012)



Another example of the need for an injury and collision investigation program is the PFD's current tracking of employee injuries and lost work time. Based upon data provided to the Study Team, there were 39 reports of injury in 2012 resulting in 250 days (shifts) of loss time or job restricted work (light duty). In 2011, there were 52 reports of injury resulting in 302 days of lost time or job restricted work.

Figure 9.3
FIRST REPORT OF INJURY REPORTING



Note: A Lost Day for this table means any day (shift) where employee could not be counted as minimum manning on a fire or EMS unit.

Figure 9.4
LOST TIME INJURIES: ACTIVITY AT TIME OF INJURY

	2010	2011	2012
Fire Incident	2	2	2
EMS Incident	1	1	3
Training Activity	0	2	1
Physical Fitness Activity	0	1	1
Station Activity	1	3	2

The PFD uses Keller Online reporting for the entry and recording of job-related exposures and injuries. The Study Team finds the use of the online reporting tool adequate for the reporting of injuries; however, the Team finds the online process insufficient for causal investigation (at least in the manner by which the PFD uses it). The current injury data system is merely a reporting mechanism.

While no injury is an acceptable injury, the Study Team finds the PFD's injury rate and severity over the reporting period within normal limits for fire departments the size of Portland's or with the Portland workload. Over the last decade, the Study Team has found similar size fire departments with a far higher frequency of loss time injuries, therefore, the PFD is commended for their low injury rate.

The Study Team recommends that the PFD develop and implement an injury reporting and investigation program that meets the requirements of NFPA 1500 and that assists in identifying corrective measures needed to reduce the number and severity of firefighter injuries.

The Study Team also recommends that the PFD develop and implement a comprehensive written vehicle collision reporting policy that addresses all aspects of emergency vehicle collisions: driver training and certification; collision investigation and report writing; post-collision drug and alcohol screening; and driver remedial training.

The PFD does not have a designated health and safety officer as outlined in NFPA 1500. Currently, the Captain in charge of fire training and a Captain from the Fire Prevention Bureau share the Safety Officer duties of the department and most of those duties involve responding to emergency incidents as the incident scene safety officer.

The Study Team believes that the role of the fire department health and safety officer is as important as the role of the fire department training officer and as the role of a fire prevention manager: both serve critical functions of being the point of contact and manager for their areas of responsibility.

The Study Team finds that when no one is assigned to the health and safety officer position, the responsibility for managing safety programs and addressing safety matters often goes unassigned. The Study Team recommends that the PFD appoint one of the department's chief officers as the department's Health and Safety Officer in accordance with NFPA 1500 and NFPA 1521 *Standard for Fire Department Safety Officer, 2013 Edition*.

The PFD and Portland Professional Fire Fighters Local 740 (Local) are part of a "Safety Committee" as required by the collective bargaining agreement between the City of Portland and the Local. Such a committee is an important component in a fire department's comprehensive management of all safety related matters. The Study Team

recommends the continuation of the Safety Committee in all future agreements, with emphasis placed on regular (monthly or bi-monthly) meetings and clear lines of decision-making authority.

Currently, there is limited formal health and safety training in the PFD as defined in NFPA 1500. Most of the health and safety training completed by the PFD is the result of annual refresher training on topics such as hazardous materials response and infectious disease control. With the appointment of a Health and Safety Officer, the Study Team believes the department should experience a significant improvement in safety-related training.

Training and Education

In terms of training and education, NFPA 1500 requires that the "fire department establish and maintain a training and education program with a goal of preventing occupational deaths, injuries, and illnesses." The standard requires that all personnel be trained in the duties and responsibilities they are expected to perform, and the training is in compliance with recognized standards. Other requirements identified in this chapter include:

1. Having all members who engage in firefighting activities trained to meet the requirements of NFPA 1001 *Standard for Fire Fighter Professional Qualifications*.
2. Having all apparatus drivers/operators meet the requirements of NFPA 1002 *Standard for Fire Apparatus Driver/Operator Professional Qualifications.*
3. Having all personnel required to perform technical rescue operations meet the requirements of NFPA 1006 *Standard for Rescue Technician Professional Qualifications.*
4. Having all officers (company and chief) meet the requirements of NFPA 1021 *Standard for Fire Officer Professional Qualifications.*
5. Having all personnel who respond to hazardous materials incidents meet the operational requirements of NFPA 472 *Standard for Professional Competence of Responders to Hazardous Materials Incidents*.
6. Having all personnel trained in accordance with the guidelines established in NFPA 1581 *Standard on Fire Department Infection Control Program.*
7. Ensuring that all training exercises are conducted under the supervision of a qualified instructor.

8. Ensuring that all personnel are trained in the use and care of their personal protective clothing and equipment.
9. Implementing a recurring training program that is based on a proficiency cycle with the goal of preventing the degradation of skills.
10. Providing training and education activities that are needed to support the certifications of the department's personnel.
11. Ensuring that all personnel practice assigned skill sets on a regularly scheduled basis.
12. Ensuring that all respiratory protection training is conducted in accordance with NFPA 1404 *Standard for Fire Service Respiratory Protection.*

Basically, NFPA 1500 requires that a fire department has a response force that is (1) trained in accordance with national standards, (2) given ample opportunity to practice the skills in training exercises, and (3) expected to maintain the level of proficiency needed to perform their jobs safely and effectively.

As described in Chapter 10 (Fire and Rescue Training) of this report, the PFD is working to comply with a number of the nationally recognized standards and practices for training and certification of its personnel. Currently, the department's focus is on the training and certification of entry-level employees to the Fire Fighter I and II standards as well as providing the opportunity for incumbent employees to certify to those standards. There is also a limited effort underway to assist officers in obtaining certification at the Fire Officer I and II levels.

The PFD should continue to revise its fire and EMS training programs with an emphasis placed on certification-based training. The current in-service training program should continue to expand to meet the needs of the officers, firefighters, and EMS providers of the department, all in compliance with NFPA 1500.

The PFD's training program should establish minimum training requirements for all officer ranks and should minimize the practice of "grandfathering" personnel who do not met the established training requirements.

The Maine Fire Service Institute (MFSI) currently offers Fire Officer I and Fire Officer II certification (NFPA 1021) and the Study Team suggests that at a minimum, all the PFD captains and lieutenants be certified to the Fire Officer I level. In addition, all chief

officers should be certified to the Fire Officer II level and complete the NFA Incident Scene Safety Officer Course. To meet these certification requirements, the PFD will need to work in cooperation with MFSI and the Local to develop a reasonably plan (in terms of logistics and timeframe) by which to implement the officer certification requirements.

Fire Apparatus, Equipment and Driver/Operators

NFPA 1500 addresses many areas related to the design, selection, and use of fire department apparatus and equipment. The standard also addresses the training requirements of drivers/operators. This section of the standard "considers health and safety as the primary concern in the design, construction, acquisition, operation, maintenance, inspection, and repair of all fire department apparatus and equipment." Items addressed in this section of the standard include:

1. Ensuring that all new, fire department apparatus meet the requirements set forth in NFPA 1901 *Standard for Automotive Fire Apparatus*.
2. Ensuring that all fire department apparatus that is refurbished meet the requirements of NFPA 1912 *Standard for Fire Apparatus Refurbishing*.
3. Ensuring that all apparatus is operated by personnel who have successfully completed an approved driver training program. (NFPA 1451 *Standard for a Fire Service Vehicle Operator Training Program.*)
4. Having established response guidelines in the form of written and enforceable operating procedures.
5. Ensuring that all personnel use seat belts and other passenger restraint devices.
6. Having an established procedure for vehicle inspection, at least on a weekly basis, but within 24 hours of last use.
7. Having an established inspection and preventive maintenance program that meets the requirements of NFPA 1915 *Standard for Fire Apparatus Preventive Maintenance Program*.
8. Ensuring that all pumps, aerial devices, fire hoses, and ground ladders are tested annually in accordance with their corresponding NFPA standards.

The list above illustrates that almost every aspect of fire apparatus and equipment design, use, and maintenance is addressed by at least one NFPA standard.

The Study Team found no serious safety concerns with the apparatus fleet, the maintenance of that fleet, and the equipment carried on the apparatus. The Team was pleased with the condition of the fleet, as well as the personnel's care of the apparatus.

In terms of the PFD's compliance with this section of NFPA 1500, the only significant deficiency noted is the absence of an official, driver/operator training program.

The driver training program deficiencies are noted and discussed in detail in Chapter 10 (Fire and Rescue Training) of this report. Other than completing an Emergency Vehicle Operations Course, apparatus drivers in the PFD receive little formal training in the driving and operation of their vehicles. The Study Team recommends that the PFD develop and implement a comprehensive driver training program that meets the requirements of NFPA 1500 and Section 12-179, of Maine Department of Labor, Bureau of Labor Standards, Chapter 7: Minimum Driver Training Requirements for Fire Apparatus.

Protective Clothing and Equipment

One of the most comprehensive portions of the NFPA 1500 standard is the chapter on personal protective clothing and equipment. The primary focus of the protective equipment chapter is to ensure that each firefighter is provided with safe protective clothing and equipment, and that the clothing and equipment is cleaned and maintained on a regular basis in accordance with recommended practices. Items identified in this chapter include:

1. Ensuring that each firefighter is provided the protective clothing and equipment needed for the hazards to which he/she is expected to be exposed.
2. Ensuring that a written protective clothing and equipment use policy and program are in place and enforced by the department.
3. Ensuring that all structural firefighting protective clothing is cleaned at least once every six months in accordance with NFPA 1851 *Standard on the Selection, Care, and Maintenance of Structural Fire Fighting Protective Ensembles*.
4. Having all station/work uniforms comply with NFPA 1975 *Standard on Station/ Work Uniforms for Fire and Emergency Services*.
5. Having all structural firefighting clothing design and manufacturing comply with NFPA 1971 *Standard on Protective Ensemble for Structural Fire Fighting.*

6. Having a written protective clothing and equipment inspection and maintenance program.
7. Ensuring that all EMS providers are provided with adequate protective clothing and equipment to reduce the likelihood of exposure to blood-borne and air-borne diseases.
8. Ensure that all hazardous materials incident responders are provided adequate protective clothing and equipment to protect them from the known chemical hazards.
9. Having a written, hazardous materials protective clothing and equipment inspection and maintenance program.
10. Having a written, respiratory protection program that addresses the selection, safe use, care, maintenance, and air quality of respiratory protection devices.
11. Having a written standard operating procedure for the use of respiratory protection equipment.
12. Ensuring that all personnel receive annual training and recertification on the use of respiratory protection equipment.
13. Ensuring that adequate breathing air (quality and quantity) exists for the recharging of respiratory protection equipment. (NFPA 1989 *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection.*)
14. Ensuring that all Self-Contained Breathing Apparatus (SCBA) meet the requirements of NFPA 1981 *Standard on Open-Circuit Self-Contained Breathing Apparatus for the Fire Service*.
15. Ensuring that all personnel receive an annual face-piece fit test.
16. Ensuring that all SCBA are equipped with a functional Personal Alert Safety System (PASS) device.
17. Ensuring that all life safety rescue ropes are selected, used, maintained, and stored in accordance with NFPA 1983 *Standard on Fire Service Life Safety Rope ad System Components*.
18. Ensuring that all personnel are provided eye protection and hearing protection devices that meet applicable design standards.

When reviewing compliance with this part of the NFPA 1500 standard, the Study Team found a few areas of deficiency. The first deficiency was related to the regularly

scheduled cleaning of the structural firefighting protective clothing ensemble. The Study Team found limited NFPA-compliant policies or procedures concerning the cleaning of protective clothing. It should be noted, however, that the Team did not learn of any protective clothing concerns during any of the employee interview sessions that were conducted. In fact, having good protective clothing and gear was a common strength listed by many of the employees during those interview sessions.

The Team learned during a station visit, that a local hotel recently donated a used, commercial washer and dryer to the PFD and the units are being installed at the Bramhall station by the personnel assigned to that station. While the intent of the used machines is good, the Team is concerned about the ability of the machines to launder structural fire fighting clothing in accordance with the manufacturer recommendations.

The Study Team recommends that the PFD implement a protective clothing cleaning and maintenance program that complies with NFPA 1851 *Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protection Ensembles, 2008 Edition*.

Regarding the condition of the PFD's Self-Contained Breathing Apparatus (SCBA), the Team found no deficiencies. The department is in the process of acquiring new SCBA units that will replace all of the existing front-line units. The Study Team also found no issue with the maintenance and repair of the department's SCBA units or the department's face piece fit-testing program.

Emergency Operations

NFPA 1500 provides much direction in the area of incident scene management. The goal of the standard is to provide a safe, organized approach to mitigating all emergencies with the intent of utilizing resources in an effective and efficient manner. Items identified in this part of the standard include:

1. Using an incident management system that meets the requirements of NFPA 1561 *Standard on Emergency Services Incident Management System*.
2. Creating and using an incident action plan during the mitigation of all emergencies.
3. Dividing the management of an incident into tactical level management components that maintain an effective span of control.

4. Implementing an accountability system that keeps track of all personnel working on the incident scene.
5. Ensuring that dispatch and radio communications are effective and uncomplicated, and that emergency procedures are clearly identified.
6. Ensuring that risk management occurs at each emergency scene so that the risks taken are appropriate for the benefits acquired.
7. Ensuring that a written accountability procedure is in place and that all personnel follow the procedure on a regular basis.
8. Ensuring that adequate staffing is present on-scene to initiate a safe and effective fire attack. (NFPA 1710 *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, 2010 Edition.)
9. Ensuring that all personnel assigned to a hazardous environment work in teams of two and that no one ever works alone.
10. Ensuring that before entry is made into a hazardous atmosphere, a "standby" or initial rapid intervention company made up of two personnel is available and in position to affect the rescue of firefighters entering the atmosphere. (2-in/2-out policy)
11. Ensuring that, as the incident grows and additional resources arrive, a designated rapid intervention company be established for the rescue of fire department personnel.
12. Having a written procedure for the rehabilitation of all personnel at incident scenes.
13. Having a written post-incident analysis procedure that requires the written review of all major incidents including major property losses, civilian deaths, significant firefighter injuries, and firefighter deaths. All post-incident analyses must be made available to all fire department personnel.

In terms of emergency operations, the Study Team found numerous, incident management policies and procedures covering a variety of operational issues. Most of the policies and procedures are in need of revision in order to make them current with the procedures and terminology used in today's operations. Once revised, the policies and procedures need to be enforced on a regular and consistent basis across the four work platoons. The Study Team learned that the current enforcement of procedures varies from

platoon to platoon; this was perhaps the most common "weakness" listed during the Team's interview sessions with PFD employees, and it is a matter that is important for the department to address.

Another area of significant concern is the delayed response and implementation of an Incident Scene Safety Officer (ISSO) on the scene of emergency incidents—especially working fire incidents—or "All Hands" events as termed by the PFD. Presently, when an All Hands event occurs, the Training Captain and/or Fire Prevention Bureau Captain respond to the scene and assume the role of the ISSO. Both captains are trained to serve as an ISSO, so their training is not the issue.

The concern involving ISSO response is the timeliness of the response during the night and weekend time periods. During a weekday event (normal city business hours) the two captains are usually available from fire department headquarters or by fire department vehicle on duty somewhere in the city. At all other times, the two captains must be called in from home and a delay in response occurs.

To further complicate the matter, there is only one chief officer on-duty (Deputy Chief) for each platoon and that chief is expected to serve as the incident commander for any significant event occurring in the city. This incident commander serves as the incident commander and ISSO until another trained individual arrives who can serve in the ISSO capacity.

The presence of an ISSO early in an incident is critical. An ISSO is a second set of eyes and ears for the incident commander. The Study Team believes that having to depend on someone to come from home to serve as the ISSO—in a primarily all-career fire department—is a bad business practice. This delay in implementing an ISSO on All Hands incidents was another common weakness identified during employee interview sessions. Many employees felt that too much time passed at incidents before an ISSO was implemented.

The Study Team recommends that the PFD develop a comprehensive structure fire response procedure that meets the requirements set forth in NFPA 1500. This procedure should address the use of an initial 2-out team, the transition to a RIT operation, and a process by which a MAYDAY situation is managed.

The Study Team also recommends that the new structure fire response procedure require the dispatch of both on-duty District Chiefs (See Chapter 2: Organization and Administration) and assign the second arriving District Chief as the ISSO.

The final issue concerning this part of the NFPA 1500 standard is the lack of written post incident analyses (PIA). A PIA is an important tool in evaluating the operation of emergency response services. A PIA is not a disciplinary tool or a tool to find fault; it is a process by which a significant event is dissected and analyzed so that operational procedures can be validated and possibly improved.

A PIA plays an important role in a department's self-evaluation and growth. Without a formal PIA process, rumors can abound, false accusations can be generated, and a general distrust of other agencies can grow. The PFD should develop and implement a post-incident analysis policy and procedure that is used for all significant fire/rescue/EMS incidents that occur within the City of Portland. The definition of "significant" may be determined by the Fire Chief, but it should at least include multiple alarm fires, fires involving deaths and/or serious injuries, mass casualty incidents, etc. The Incident Commander should be the person charged with completing the PIA using the input of all personnel involved in the incident management process.

Facility Safety

This part of the standard addresses the safe operation of fire department facilities. The goal is to ensure that all fire department personnel have a clean and safe environment in which to perform their non-emergency duties and responsibilities. Items included in this chapter are:

1. Ensuring that all fire department facilities comply with all legal, health, safety, building, and fire code requirements.
2. Ensuring that all fire stations have adequate facilities for disinfecting, cleaning, and storing various items in accordance with NFPA 1581 *Standard on Fire Department Infection Control Program*.
3. Ensuring that work sites have adequate fire and life safety protection systems in place such as smoke detectors, fire alarm systems, carbon monoxide detectors, and automatic sprinkler system.
4. Having a written procedure and program for the annual inspection of all work sites.

The Study Team found many aspects of the PFD fire station facilities to be in poor condition and in need of attention, likely through a multi-year fire facility capital project. One example of an item needing attention is the repair of interior ceiling damage that is the result of a long-standing roof leak for which repair was delayed.

If the PFD Fire Prevention Bureau (FPB) was to conduct life safety and fire code inspections at the department's fire stations, there would be violations found at all of the work sites. Fire alarm systems are either absent entirely or are very limited in coverage. Fire exits and egress are limited at some of the stations. If held to the same fire prevention and life safety codes as the City of Portland's business community, the PFD would likely find some of its worksites without approved occupancy permits.

Two good examples of failing to comply with the life safety code are the Central Station and the existing quarters for the fireboat crew. The Central Station lacks adequate means of egress (there is no approved second exit from the second floor). There is also an open, spiral staircase leading to the second floor from the apparatus area. The egress issues at the Central Station are very critical because a fire starting in the apparatus bay area could easily result in numerous people trapped on the second floor of the station with no means of escape.

The Central Station also does not have a working fire alarm system, which only increases the threat level to personnel working on the second floor. They have no opportunity for early warning of a fire starting on the level below them. Central Station is also not ADA compliant in terms of providing access for the public. The Study Team views ADA access important at Central Station because that station serves as the department's headquarters—the one station in the department where public access should be at its best.

The fireboat crew quarters also has life safety code violations that would prohibit occupancy if the FPB were to conduct a code enforcement inspection. The quarters currently being used fails to meet several life safety code requirements for use as a housing/sleeping facility.

The Study Team recommends that the PFD and the City begin immediate work to resolve the life safety code issues at the Central Station and at the fireboat crew quarters so that both facilities are brought into compliance with current City codes.

The Study Team also learned that most of the PFD fire stations have limited presence of smoke detectors and carbon monoxide detectors. Carbon monoxide is a lethal byproduct of internal combustion engines—such as a diesel motor—and is often known as the "silent killer" because of its chemical and physical properties. The Study Team recommends the PFD immediately ensure that carbon monoxide detectors are installed in all fire stations with at least one detector being installed in each sleeping quarters area.

The Study Team also recommends that the PFD immediately ensure that every fire station dormitory is equipped with working smoke detectors in compliance with all state and local codes.

The Study Team recommends that the PFD ensure that each work site has a commercial-grade washer and dryer dedicated to the laundering of station uniforms and personnel clothing. *There should be no washing and drying of protective clothing or apparatus towels or similar items in washers and dryers that are used for laundering uniforms and clothing.* In addition, firefighters should not be expected to launder their dirty uniforms at their homes.

Finally, the Study Team recommends that the PFD in conjunction with the Safety Committee develop and implement a Facility Safety Inspection Program that complies with NFPA 1500 and ensures that a comprehensive safety inspection is completed at each PFD facility on at least a quarterly basis.

Medical and Physical Requirements

An important feature of any firefighting force is the health and well-being of the firefighters. NFPA 1500 clearly identifies several key areas of health and wellness that directly impact the ability of firefighting forces to perform their duties. This chapter addresses health areas such as:

1. Ensuring that all candidates and active personnel meet the medical requirements of NFPA 1582 *Standard on Comprehensive Occupational Medical Program for Fire Departments*.
2. Ensuring that all personnel receive annual medical certification for the use of SCBA.

3. Ensuring that all personnel receive a physical performance evaluation in accordance with NFPA 1583 *Standard on Health-Related Fitness Program for Fire Fighters*
4. Having an established health and fitness program for all personnel in accordance with NFPA 1583 *Standard on Health-Related Fitness Program for Fire Fighters*.
5. Having a confidential and permanent personal health file maintained on each firefighter, which includes the results of all physical and medical evaluations; a history of all occupational injury and illnesses; and an accounting of all hazardous materials and communicable disease exposures.
6. Ensuring that the department has a written infection control program in accordance with NFPA 1581 *Standard on Fire Department Infection Control Program*.

The PFD is deficient in the area of medical and fitness requirements. This finding is not uncommon in career fire departments such as Portland's; however, that does not make it acceptable. In fact, in an effort to help improve the overall health and wellness of the career fire services in the United States, the International Association of Fire Fighters along with the International Association of Fire Chiefs and 10 pairs of local union representatives and their municipalities joined together several years ago to form the Fire Service Joint Labor Management Wellness-Fitness Initiative Task Force (Initiative). The Initiative has become a model for many fire department wellness and fitness programs and the results have generally been positive on both the labor and management sides—employees remain healthy and fit and the employer sees longevity in a healthy and fit response force.

The Initiative identifies basic components of a health and wellness program for incumbent firefighters and includes areas such as physical fitness, medical assessments, injury rehabilitation, and behavioral health.

The PFD has limited, occupational medical program and fitness plans in place. The department requires prospective employees to complete the Candidate Physical Ability Test (CPAT), which is administered by the PFD as part of the hiring process. After completing CPAT, a candidate must then complete a medical examination with the PFD physician (Bayside Employee Health) before being offered a position of employment as a firefighter.

The Study Team applauds the PFD's use of CPAT in the hiring process. The CPAT program is a proven instrument in the process of candidate selection; however, it is not foolproof and that is why medical screening is also an important component of the hiring process.

Regarding the PFD's medical examination requirement, the Study Team learned that the examination does not comply with NFPA 1582 *Standard on Comprehensive Occupational Medical Program for Fire Departments* Chapter 6: Evaluation of Candidates. The job of a firefighter—career or volunteer—is physically demanding enough that a national standard has been developed regarding the medical evaluation procedures for the position.

The PFD does not offer any periodic medical evaluations to its personnel other than to those who are members of the hazardous materials response team (an OSHA requirement). The Study Team is a strong proponent of firefighter wellness and fitness and is a proponent of periodic medical evaluations of all personnel in the firefighter occupational series. Therefore, the Team recommends that the City of Portland and the PFD implement an occupational medical plan in accordance with NFPA 1582 *Standard on Comprehensive Occupational Medical Program for Fire Departments*.

A second important component of firefighter wellness is physical fitness. The Study Team found quite a bit of interest in physical fitness during its site visits at the PFD. Crews were observed participating in fitness activities and personnel appeared to be interested in physical conditioning. The Team also learned of the PFD's success at such fitness related events as the Stair Climb in Boston and the Firefighter Combat Challenge. The Team applauds the PFD's efforts in those activities and encourages future participation in such events.

The Study Team also learned of a PFD-sponsored annual fitness assessment that is administered to every member in the firefighter occupational series. The annual assessment is conducted by a third-party vendor and measures aerobic capacity, muscular endurance, and flexibility. The Study Team rarely encounters this type of annual/on-going fitness assessment, and the Team commends the PFD for operating the program.

Regarding the annual fitness assessment, the Team learned during its employee interview sessions that most of the employees felt the annual assessments were poorly done because the process was "more about going through the motions than measuring actual

physical ability." The Team recommends that the PFD and Local 740 examine the annual fitness assessment program in terms of fitness requirements and measurement methods so that the program returns to a valid, useful program as part of a comprehensive approach to firefighter wellness.

The Study Team also recommends that the PFD review its current physical fitness program and begin implementing the changes needed to allow the program to meet NFPA 1583 *Standard on Health-Related Fitness Program for Fire Fighters.*

Member Assistance and Wellness Program

Another important part of a fire department health and wellness program is access to help for substance abuse and/or work-related stress. Professionals in the emergency response field understand that the stresses associated with emergency response operations often lead to both physical and mental problems in responders. This chapter of NFPA 1500 addresses the need for personnel assistance and wellness programs; it includes items such as:

1. Providing personnel with a professional assistance program for help with substance abuse, stress, and personal problems that affect fire department work performance.
2. Having a written policy statement on alcohol and substance abuse.
3. Providing a wellness program for all personnel.

It was unclear to the Study Team if PFD employees have easy access to an employee assistance program, although it was indicated during a couple of the Team's interview sessions that such assistance is available through the City. This access was confirmed when the Study Team learned of the City's Employee Assistance Program through a meeting with the City Human Resources Department.

Such assistance is often mentioned in a fire department's labor contract; no mention of said assistance was found in IAFF Local 740's contract. In addition, the Study Team did not find a current substance abuse policy that addresses the aspects of alcohol and substance abuse as related to fire department operations.

The most important component of any emergency response organization is its people; therefore, an organization should strive to take care of its members, both physically and mentally. The Study Team recommends that the PFD work in conjunction with the Safety

Committee to review the current practices regarding an employee assistance program, alcohol and substance abuse policy, and critical incident stress management.

A related wellness concern is the availability and use of critical incident stress management (CISM) programs. Full-service fire departments such as the PFD are exposed to a myriad of stressful events—often in a day's work. Events involving fatalities and serious injury can take a toll on emergency service providers—and continued, unrelieved exposure to such events can destroy a career.

PFD responders (fire and EMS alike) frequently experience the results of violent crimes, horrific accidents, sexual and physical abuses, and tragic fires. The ability to provide CISM for emergency responders can be vital to responder mental health and wellness. The Study Team found limited evidence of CISM used (or available) in the PFD. During employee interviews, the topic of CISM was listed as a weakness on several occasions.

The Study Team was informed that if needed, the PFD could use the police department's CISM personnel or that another agency could provide such service. Given the population of the city and the volume of calls for emergency service generated, the Study Team believes that the PFD could train and operate its own CISM Team, especially with the number of paramedics and advanced life support providers in the department. These providers and their levels of training often lend themselves well to becoming CISM defusers. Therefore, the Study Team recommends that the PFD and Local 740 work to develop a CISM response group comprised of PFD personnel (of all ranks) for the purpose of delivering CISM services to the members of the PFD.

Other Concerns

The Study Time identified two other "safety" concerns unrelated to NFPA 1500: (1) staffing on Peaks Island and (2) paramedic "burnout." Both concerns warrant closer examination by the PFD, the Local, and the City.

The PFD staffing of Peaks Island (Island) presents a safety issue because there is only one PFD employee on duty at any given time on the Island, and often times that person is the least-senior employee available from PFD's personnel. The Study Team believes that assigning an inexperienced employee to the Island for a 24-hour tour of duty not only sets that lone employee up to fail, but it also compromises that employee's safety.

During the Study Team's visit to the Island, the Team met with the PFD employee assigned to the Island for that day. Like the Team, the PFD employee was also seeing the Island fire station and equipment for the first time. While there is a police officer stationed on the Island at the same time with the PFD employee, the firefighter is expected to be able to drive and operate all of the apparatus and will most likely be in charge of an incident—alone—until help arrives from either the Island volunteer force or the mainland force. None of these findings bear the mark of "safety."

The Study Team recommends that the PFD immediately review its staffing practices on Peaks Island with the intent of eliminating the assignment of inexperienced personnel to that staffing assignment. The Study Team also recommends that the PFD immediately develop clear, operational guidelines that provide direction to and expectations of the PFD employee assigned to Peaks Island. These guidelines need to include direction for the safe operation of equipment and apparatus, as well as providing direction for personal safety when working with the Island police officer at non-fire/EMS incidents.

The final safety concern involves employee "burnout;" more specifically, the burnout of EMS providers assigned to the ambulance transport (MEDCU) units. One of the most common weaknesses listed during the employee interview sessions was the inability for EMS providers to "get a break" from the MEDCUs.

The Study Team finds the PFD's practice of assigning the same EMS providers to the MEDCU units every shift not to be in the best interest of the providers, and probably not in the best interest of the patients to which they provide care. In a full-service, fire-based EMS delivery system such as PFD's, the industry best practice is to provide rotation of providers between fire apparatus and EMS transport units.

The more progressive fire-based EMS service assigns personnel to a fire station—not to a specific piece of fire apparatus and allows the station officer to make the riding assignments. In stations with busy EMS transport units, riding assignments might be changed midway through a 24-hour tour of duty or rotated every other shift. Regardless of the rotation process, the rotation of personnel between units gives the providers an opportunity to maintain their skill sets in both fire and EMS delivery while at the same time improving the quality of EMS care delivered because providers are not suffering the effects of burnout. (This matter is further discussed in Chapter 6 of this report.)

The Study Team sees the current MEDCU staffing plan as detrimental to the future of providing quality EMS in the City and to the development of current EMS providers into the future leaders of the department. Therefore, the Study Team recommends that the PFD work with the Local to develop and implement a process whereby personnel below the rank of Lieutenant are assigned to a station—not a unit, and those personnel are permitted rotation between the MEDCU riding assignments and fire apparatus riding assignments on a regular basis.

SUMMARY

The health and safety of firefighters and EMS personnel should be a major concern of those delivering the services, those receiving the services, and those helping to pay for the services.

Individuals working in public safety, particularly firefighting and EMS personnel, perform one of the most physically demanding and mentally stressful occupations in the nation. Quite often, fire and emergency medical personnel are subjected to environments that require rapid physical and mental response with a minimum of preparation.

Traditionally, at the national level, there has been limited attention paid to the wellness and fitness of firefighters. However, over the past decade, the safety and health of all emergency services providers has come to the forefront of discussion. Fire department's nationwide are implementing programs that help improve and support the health and wellness of their workforce. A recent initiative between the International Association of Fire Chiefs and International Association of Fire Fighters has resulted in the development and distribution of a Wellness-Fitness Program for firefighters and EMS personnel. This program serves as an outstanding model of how labor and management can work together to reduce firefighter injuries and fatalities while improving the overall health of fire department personnel.

The Portland Fire Department needs to revisit all of its health and safety policies and work with the Local and the City to develop a comprehensive approach to improving the health and safety of all PFD personnel. Many professionals in the fire service say that safety is an attitude that must be believed in, must be communicated, and, most importantly, must be enacted. Some work is needed in order for the PFD to attain that position.

RECOMMENDATIONS

9-1 The Fire Chief should consider using the results of the Study Team's work as a basis for development of a risk management plan.

9-2 The Fire Chief should develop a written safety and health policy and implement an organized and effective safety and health program.

9-3 The Fire Chief should develop and implement an injury reporting and investigation program that meets the requirements of NFPA 1500 and assists in identifying corrective measures needed to reduce the number and severity of firefighter injuries.

9-4 The Fire Chief should develop and implement a comprehensive written vehicle collision reporting policy that addresses all aspects of emergency vehicle collisions: driver training and certification; collision investigation and report writing; post-collision drug and alcohol screening; and driver remedial training.

9-5 The Fire Chief should appoint one of the department's chief officers as the department's Health and Safety Officer in accordance with NFPA 1500 and NFPA 1521 *Standard for Fire Department Safety Officer, 2013 Edition*.

9-6 The Safety Committee should be continued in all future agreements, with emphasis placed on regular (monthly or bi-monthly) meetings and clear lines of decision-making authority.

9-7 The Fire Chief should continue to revise the department's fire and EMS training programs with an emphasis placed on certification-based training. The current in-service training program should continue to expand to meet the needs of the officers, firefighters, and EMS providers of the department, all in compliance with NFPA 1500.

9-8 The Fire Chief should establish minimum training requirements for all officer ranks and should minimize the practice of "grandfathering" personnel who do not met the established training requirements.

9-9 The Fire Chief will need to work in cooperation with MFSI and the Local to develop a reasonable plan (in terms of logistics and timeframe) by which to implement the officer certification requirements.

9-10 The Fire Chief should develop and implement a comprehensive driver training program that meets the requirements of NFPA 1500 and Section 12-179, of Maine Department of Labor, Bureau of Labor Standards, Chapter 7: Minimum Driver Training Requirements for Fire Apparatus.

9-11 The Fire Chief should implement a protective clothing cleaning and maintenance program that complies with NFPA 1851 *Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protection Ensembles, 2008 Edition*.

9-12 The Fire Chief must ensure that the department's policies and procedures are enforced on a regular and consistent basis across the four work platoons.

9-13 The Fire Chief should develop a comprehensive structure fire response procedure that meets the requirements set forth in NFPA 1500. This procedure should address the use of an initial 2-out team, the transition to a RIT operation, and a process by which a MAYDAY situation is managed.

9-14 The Fire Chief should ensure that the new structure fire response procedure requires the dispatch of both on-duty District Chiefs with the second arriving District Chief serving as the ISSO.

9-15 The Fire Chief should develop and implement a post incident analysis policy and procedure that is used for all significant fire/rescue/EMS incidents that occur within the City of Portland.

9-16 The Fire Chief and the City should begin immediate work to resolve the life safety code issues at the Central Station and at the fireboat crew quarters so that both facilities are brought into compliance with current City codes.

9-17 The Fire Chief should immediately ensure that carbon monoxide detectors are installed in all fire stations with at least one detector being installed in each sleeping quarters area.

9-18 The Fire Chief should immediately ensure that every fire station dormitory is equipped with working smoke detectors in compliance with all state and local codes.

9-19 The Fire Chief should ensure that each work site has a commercial grade washer and dryer dedicated to the laundering of station uniforms and personnel clothing.

9-20 The Fire Chief, in conjunction with the Safety Committee, should develop and implement a Facility Safety Inspection Program that complies with NFPA 1500 and ensures that a comprehensive safety inspection is completed at each PFD facility on at least a quarterly basis.

9-21 The City of Portland and the Fire Chief should implement an occupational medical plan in accordance with NFPA 1582 *Standard on Comprehensive Occupational Medical Program for Fire Departments*.

9-22 The Fire Chief should continue to encourage and support fitness activities such as the Stair Climb and the Firefighter Combat Challenge.

9-23 The Fire Chief and the Local should examine the annual fitness assessment program in terms of fitness requirements and measurement methods so that the program returns to a valid, useful program as part of a comprehensive approach to firefighter wellness.

9-24 The Fire Chief should review the current physical fitness program and begin implementing the changes needed to allow the program to meet NFPA 1583 *Standard on Health-Related Fitness Program for Fire Fighters.*

9-25 The Fire Chief should work in conjunction with the Safety Committee to review the current practices regarding an employee assistance program, alcohol and substance abuse policy, and critical incident stress management.

9-26 The Fire Chief and the Local should work to develop a CISM response group comprised of PFD personnel (of all ranks) for the purpose of delivering CISM services to the members of the PFD.

9-27 The Fire Chief should immediately review PFD staffing practices on Peaks Island with the intent of eliminating the assignment of inexperienced personnel to that staffing assignment.

9-28 The Fire Chief should immediately develop clear, operational guidelines that provide direction to and expectations of the PFD employee assigned to Peaks Island. These guidelines need to include direction for the safe operation of equipment and apparatus, as well as providing direction for personal safety when working with the Island police officer at non-fire/EMS incidents.

9-29 The Fire Chief should work with the Local to develop and implement a process whereby personnel below the rank of Lieutenant are assigned to a station—not a unit—and those personnel are permitted rotation between the MEDCU riding assignments and fire apparatus riding assignments on a regular basis.

CHAPTER TEN
FIRE AND RESCUE TRAINING

This chapter includes sections on training standards, regulations, programs, and certifications at the national, state, county, and local level—including the process by which training is conducted in the Portland Fire Department (PFD). [Note: EMS Training was discussed in Chapter 6: Emergency Medical Services]

OVERVIEW OF FIRE SERVICES TRAINING

The main objectives of the fire service are to prevent injury and the loss of life and to protect property and the environment. All emergency response personnel providing these services must be fully qualified to safely and effectively perform a wide range of practical skills. These responders must have a broad knowledge base that allows them to adapt quickly to the many different scenarios faced by modern-day emergency responders. Today's fire department no longer just responds to fire calls; they are an all-hazard response force and must be trained as such.

While on-the-job experiences are important for gaining knowledge, most knowledge and skills must first be obtained through some type of training program. In today's fire department, effective training is the key to successful emergency operations and service delivery effectiveness.

Training in the fire service over the past decade has undergone significant change primarily because of the changing environment in which it exists. There have been numerous changes in technology that have resulted in significant improvements in equipment for emergency responder use. The fire, rescue, and emergency medical situations that emergency responders encounter are often more complex in the post-9/11 era; emergency responders in all public safety agencies must now prepare for large-scale, catastrophic events, in addition to the traditional fire and rescue incidents.

In the past decade, society has placed more emphasis on environmental concerns, which also poses a challenge to emergency services and their approaches to fire and hazardous situations. Personnel safety has become a primary concern, and technology has evolved to provide firefighters and EMS staff with more effective protective clothing and equipment. Fire services line-of-duty deaths are more closely analyzed than ever before

and have resulted in new, safety-directed training standards and emergency scene operating guidelines.

Nationally, the rate of firefighter injuries and fatalities remains a concern even with all the advances in technology, thus the emphasis on firefighter safety and survival. Fire departments across the United States have worked on refocusing some of their training efforts to "saving their own" from life-threatening situations and on returning to the core principles of firefighting. Fire service professionals realize that a fire department's commitment to training is an indicator of that department's commitment to excellence—because the two commitments go hand-in-hand with each other.

Fire service personnel receive their training and education in many different ways and from many different sources. Traditionally, fire service training falls into one of three categories: (1) training courses, (2) company drills (in-service training), and (3) formal education classes. Training courses normally address three areas of concern: (1) new or entry-level employee training; (2) skills maintenance training (refreshers and recertification); and (3) career development training (promotion requirements).

Training courses are generally structured classes conducted by an individual who is skilled and certified in the adult educational process. Training courses usually cover a specific subject area either in its entirety or in a sequential format (e.g., Firefighter I and Firefighter II). Examples of subjects that are covered in training courses for fire personnel include recruit firefighting; advanced firefighting courses; first responder and emergency medical technician courses; pump operations; aerial ladder operations; rescue techniques; hazardous materials; emergency vehicle driver training; company officer training; and incident command courses.

The reinforcement and maintenance of critical job skills and the updating of new information or practices usually occurs through in-service training or company drills. These company drills are planned practice sessions, which are usually conducted by a company officer covering a single, specific topic or practice of a manipulative skill. Examples of in-service drills include the practice of hose layouts, ladder raises, and knot tying.

An aggressive, well-planned company drill training program is very important to department readiness. Because so much of a firefighter's job requires the use of manipulative skills, it is necessary to regularly reinforce those skills, ensuring that they

are performed effectively, efficiently, and safely each and every time that they are needed.

Formal education courses are generally the responsibility of community colleges and other institutions of higher learning. Formal education is traditionally focused at the collegiate level and involves academic subject areas. These academic courses are designed to assist fire service personnel in performing their jobs as well as providing career development in preparation for promotion. Fire science and emergency medical services degree programs are now available from the Associate to the Masters Degree levels; there are even a few universities in the United States that have bestowed Doctorate degrees in related areas of study. The current trend in many career fire departments is to require the successful completion of college-level course work as prerequisite training for promotion.

Commission on Fire Accreditation International (CFAI)

The Commission on Fire Accreditation International (CFAI) emphasizes the role training and education have in the operation of an efficient, safe, effective fire department. Progressive fire departments use this criterion, and others, as a benchmark for determining the best approach to meeting training and education goals. The CFAI *Training and Education* Performance Indicators, as referenced by the Study Team, are provided below:

Criterion 8A: Training and Education Program Requirements

Training and education program activities are identified to support the agency's needs.

Performance Indicators

8A.1 The organization has a process in place to identify training needs. The process identifies tasks, activities, knowledge, skills and abilities required to deal with anticipated emergency conditions.

8A.2 The training program is consistent with the agency's mission statement and meets its organizational needs.

8A.3 The training program is consistent with legal requirements for performing mandatory training.

8A.4 The department has identified minimum levels of training required for all positions in the organization.

8A.5 A command and staff development program is in place.

Criterion 8B: Training and Education Program Performance

Training and education programs are provided to support the agency's needs.

Performance Indicators

8B.1 There is a process to ensure that personnel are appropriately trained.

8B.2 The organization provides both short and long range training schedules.

8B.3 The agency has identified the process for developing performance based measurements.

8B.4 The organization provides for evaluation of individual, company or crew and multi-company or crew performance through the use of performance based measurements.

8B.5 There is a training record system that provides for analysis of training needs.

8B.6 The agency maintains individual/member training records.

Criterion 8C: Training and Education Resources

Training and education resources, printed and non-printed library materials, media equipment, facilities and staff are available in sufficient quantity, relevancy, diversity and currentness to support the agency's needs.

Performance Indicators

8C.1 Available training facilities and apparatus are provided to support the training needs of the agency.

8C.2 Instructional personnel are available to meet the needs of the agency.

8C.3 Instructional materials are current, support the training program and are accessible.

8C.4 Apparatus and equipment utilized for training is properly maintained in accordance with the agency's operational procedures and is readily accessible to trainers and employees.

8C.5 There is current inventory of all training equipment and resources.

Criterion 8D: Selection of Training Materials
Materials selected for the training program are based on agency needs.
Performance Indicators

8D.1 There is a process in place for the selection of training and educational resource materials.
8D.2 Training materials are evaluated on a continuing basis, and reflect current practices.

The Study Team considered the CFAI criteria during the Team's review of PFD's training functions.

NATIONAL TRAINING STANDARDS AND PROGRAMS

Over the course of the last three decades, more demands have been placed on emergency responders to increase their level of service, which means that the level of training has had to increase as well. Movements began back in the early 1970s to provide structure and organization to the fire services training process. Those efforts resulted in the development of nationally recognized standards to serve as the basis for fire service training programs.

National Professional Qualifications System

In 1972, the Joint Council of National Fire Service Organizations founded the National Professional Qualifications System in an effort to help guide fire services toward training professionalism through training accreditation and certification. Certification arose over a concern that fire service training was becoming very unbalanced between various jurisdictions, almost to the point of becoming inadequate in some instances. As a result, a nine-member National Professional Qualifications Board (Pro Board) was established by the Joint Council to direct the new accreditation and registry system.

In order to develop a system of nationalized training for firefighters, the Pro Board requested that the National Fire Protection Association (NFPA) delegate to their technical committees, the development of clear standards for use in the certification process. As these standards were developed, they were reviewed, edited, and updated by fire services professionals throughout the United States.

The new NFPA standards were adopted as the basis for the Pro Board certification program. Today, NFPA professional qualifications training standards are the foundation of most fire service training programs found in North America and are recognized as the standards of practice in the fire/rescue training arena.

As this push to develop professionalism in the fire service continued, a National Board on Fire Service Professional Qualifications was established in 1990 to accredit training organizations and to certify individuals meeting the NFPA training standards. Today, the National Board on Fire Service Professional Qualifications accredits 32 states (*including Maine*) using 72 levels of 16 different NFPA training standards.

Fire departments with a commitment to the national certification process gain the respect, reputation, and prestige associated with an organization dedicated to professionalism. It is generally recognized in the fire service that departments that teach and certify their personnel to the professional standards will become stronger entities both in their communities and among fellow departments.

National Fire Academy

In 1975, the National Fire Academy (NFA) was established in Emmitsburg, Maryland, as part of the United States Fire Administration (USFA) for the purpose of developing and delivering fire service training programs on a national basis. Much of the work done by the NFA has been in the areas of executive officer development, fire department operations planning, and organizational management. Through its courses and programs, the NFA works to enhance the abilities of fire and emergency services and allied professionals to deal more effectively with fire and related emergencies—both natural and man-made.

The NFA's delivery systems are diverse. Courses are delivered at its resident facility in Emmitsburg and throughout the nation in cooperation with state and local fire training organizations, colleges, and universities. In an effort to make training affordable, a travel expense and lodging stipend is made available to students attending resident NFA courses in Emmitsburg.

Currently, the NFA has a four-year program for the development of senior fire officers. The Executive Fire Officer (EFO) program consists of four, two-week resident programs: Executive Development, Leading Community Risk Reduction, Executive Analysis of

Fire Service Operations in Emergency Management, and Executive Leadership. Following each course, the EFO candidate must submit an original research paper before being allowed to take the next course. Upon completion of the four-year program, the EFO student is awarded a certificate and is invited to attend an annual conference that focuses on the latest trends in the fire services. Many career fire departments are moving to require their top-level chief officer ranks hold or obtain an EFO certificate.

The NFA also offers courses at the college and university levels for staff and command officers, technical specialists, and executive fire officers. To reach the fire services population, the NFA has developed a train-the-trainer program to "hand off" its training courses to state and local agencies.

STATE TRAINING PROGRAMS

Fire/rescue training programs in Maine are available through the Maine Fire Service Institute (MFSI). MFSI is a division of Southern Maine Community College and is involved in the development and delivery of training programs for firefighters and fire officers on a statewide basis. MSFI also delivers state certification programs for instructors based on NFPA standards.

Most of the MFSI's programs are delivered on a regional basis at the request of local fire departments. The following is a listing of some of MFSI's available programs:

- Fire Fighter (NFPA 1001)—Levels I and II
- Fire Officer (NFPA 1021)—Levels I and II
- Fire Instructor (NFPA 1041) —Levels I and II
- Basic Pump Operator
- Coaching the Emergency Vehicle Operation
- Emergency Vehicle Operator Course
- Incident Safety Officer (NFA)
- Strategy and Tactics for Initial Company Operations (NFA)

Pro Board Certification

In addition to delivering the training courses noted above, the MFSI is also accredited to provide Pro Board certification in the following areas:

- Fire Fighter I
- Fire Fighter II
- Fire Officer I
- Fire Officer II
- Fire Instructor I
- Fire Instructor II

Instructor Training

One of the most important components of any training program is instructor training and certification. In Maine, MFSI provides instructor training and certification. The state offers training and certification at the Fire Service Instructor I and II levels following the NFPA 1041, *Fire Service Instructor Professional Qualifications* standard. MFSI requires that all of its instructors be certified in order to instruct in MFSI programs. MFSI is not involved in the selection or certification of municipal fire department instructors.

The Study Team feels that the State of Maine is making good strides in improving the delivery of fire and rescue training throughout such a large and diverse state. The state level certification program is well organized and operates with professionalism. The state is commended for its efforts in developing, implementing, and operating such a quality program.

EMS Training

In terms of emergency medical services (EMS) training programs at the state level, courses are available through Maine EMS—a bureau within the Maine Department of Public Safety. These programs are delivered utilizing various facilities across the state, based upon the demand for training. It is the opinion of the Study Team that Maine EMS does a very good job of coordinating and delivering EMS training and provider certification services on a statewide basis. [For more information on EMS training see Chapter 6 of this report]

PORTLAND FIRE DEPARTMENT TRAINING

Based on interviews and documentation there appears to be a strong push to improve training throughout the Portland Fire Department (PFD). Training impacts nearly every aspect of emergency response operations. Without well-planned and executed training programs, an emergency response organization will most likely struggle to be successful in its endeavors, which may in return impact the safety of its customers and service providers. The items presented in this chapter reflect recommended areas of improvement. The Study Team encourages PFD leadership to ensure that action is taken on each item.

The Study Team found the topic of training to be one of the key strengths of the department. Training was repeatedly mentioned as a strength during the employee interview sessions that the Team conducted. The employees noted that they thought the current fire academy (firefighter trainee program) was the strongest yet and that the current training officer is working hard to deliver a solid, core base of training for the department. The employees also noted—just as frequently—that the PFD has no training facility at which they can practice any of their job-required skills, and that the lack of a training facility impacts their ability to "get better at what they do".

PFD Training Officer

Currently, a captain serves as the Fire Training Officer for the PFD's Training Division. The Fire Training Officer is assigned an office at the Central Station and works a traditional "day work" schedule. The Fire Training Officer has no support or administrative staff assigned to him. There is also an EMS Training officer that carries out similar duties for EMS-related certification and licensure activities. The EMS Training Officer is housed at the Central Station as well, and has no support or administrative staff.

According to an August 1994 job description provided to the Study Team, the Fire Training Officer "is under the direct supervision of the Chief of Operations. Direct working contact with the Fire Chief may also be required on a routine basis".

In terms of the Fire Training Officer's nature of work, the 1994 job description states:
"This supervisory command position is responsible for the coordination, direction, and control of the training division of the Portland Fire Department. The general state of readiness of the department to deal with emergency situations is the responsibility of the

Training Officer. The Training Officer coordinates department training program goals and objectives to the company leve.l.

The current Fire Training Officer has the following responsibilities:

- Design, deliver, schedule, provide logistics for, and keep records for all departmental training (non-EMS)
- Operate as an incident safety officer
- Handle health and wellness officer issues
- Run all Fire Academies (firefighter trainee schools)
- Administer Candidate Physical Ability Testing (CPAT)
- Support the hiring process for new firefighters
- Assist on the Quality Assurance committee
- Assist with accident and injury investigation
- Participate with WMD and hazmat operations

The Study Team believes that the manner in which fire and EMS training is organized in the PFD needs some adjustment. First, the 1994 job description is out of date and needs to be redone to reflect current practices and service demands. The current Fire Training Officer reports to one of the platoon Deputy Chiefs whose collateral duty is the coordination of training. The EMS Training Officer does not report to the same Deputy Chief and neither training officer seems to have scheduling or coordinating control over Special Operations training (hazmat, marine, jetport, etc). Therefore, the Study Team recommends that the Training Officer role be assigned to one of the Deputy Fire Chiefs with both the fire training and EMS training captains being assigned under that chief officer. The two captains could be re-titled Fire Training Coordinator and EMS Training Coordinator and continue with their present training responsibilities.

The new Training Officer (Deputy Chief) would also be responsible for coordinating the delivery of all certification-based training programs, company drill programs, and special operations training. The Training Officer should be the custodian of all PFD training records through the use of modern recordkeeping processes.

The Study Team also recommends that the Fire Training Coordinator (new title) remains a captain's position with an added training requirement of Fire Instructor II. The Team recommends that the EMS Training Coordinator (new title) remains a captain's position with an added training requirement of EMT-Paramedic Instructor Coordinator III.

Training Records

The Study Team found the PFD's training records to be acceptable in content, just not on par with what should be in place for a fire department of its size in terms of official recordkeeping. Recordkeeping was good for the training programs delivered or coordinated by the Training Division in 2012. The weakness lies in the documentation of training that occurred at the company level in the fire stations. The Study Team learned that the documentation of company level training is inconsistent across the four platoons and nine fire stations. Company-level training would include drills given at a fire station by the on-duty officer or crew that would not involve a scheduled activity by the Training Division.

Company-level training documentation is important on many levels, including a fire department's ISO rating. In ISO's 2012 Public Protection Summary Report for Portland, the PFD received only 0.16% of the total possible points for company-level training. Many of those missing points were most likely related to the absence of company-level training documentation.

The Study Team recommends that the Training Officer review the process by which all company-level training data is recorded, stored, and retrieved and implement the changes needed to bring the recordkeeping more in line with ISO requirements. Ideally, this data entry should be accomplished at the station level using the company officer entering the information directly into the database. The data should be able to be reviewed on a daily basis by station and platoon supervisors.

Training Certifications

In terms of training or certification for officers, there is no requirement for an officer in the PFD to have completed any type of officer training course or certification. The promotional requirements for the ranks of Lieutenant through Deputy Chief are minimal. The promotional requirements are based on time in service and include no additional training or certification.

The Study Team finds the absence of officer training and certifications requirements in PFD very concerning. Officers in a fire department represent the leadership of the organization and to have leaders who must function using only on-the-job experience sets those leaders up for possible failure.

The lack of officer training and preparatory requirements was another one of the most frequent weaknesses noted during the Team's employee interview sessions. Officers at all ranks felt that much of their officer training had to come from on-the-job experience and that they were often inadequately prepared for the position to which they were promoted.

Figure 10.1
PERCENT OF PFD OFFICERS WITH FIREFIGHTER I & II AND FIRE OFFICER I & II CERTIFICATIONS

Certification	Captains	Lieutenants
Firefighter I & II	80%	52%
Fire Officer I & II	40%	30%
Note: Currently there are 15 Captains and 46 Lieutenants in the PFD.		

The NFPA Fire Officer I and Fire Officer II standards have been in existence since 1976 and are the recognized training standards for fire officers throughout both the public and private sector fire services. The Study Team believes that a fire department that ignores the fire officer training standards also fails its officers. In Maine, both the Fire Officer I and Fire Officer II programs are available and the Team believes that those programs should be incorporated into the PFD promotional requirements.

The Study Team also believes that college-level coursework should be included as a requirement for all officer positions. College-level coursework is an important component to developing professionalism in today's fire/rescue/EMS delivery organizations. With existing partnership between MFSI and the Southern Maine Community College, the ability to obtain the required credit hours for promotion should not be difficult.

The Study Team recommends the following minimum training and certification requirements for PFD officers (career and volunteer):

1. **Fire Chief**
   - Fire Officer II
   - Hazmat First Responder Operations Level
   - Fire Instructor I
   - Emergency Vehicle Operator Course
   - EMT – Basic
   - Incident Management
   - ICS 200, 300, 400, and 800

- 60 college credit hours in an accredited degree program or consider National Fire Academy – Executive Fire Officer (EFO) [completed or in progress]

2. **Deputy Chief**
   - Fire Officer II
   - Hazmat First Responder Operations Level
   - Fire Instructor I
   - Emergency Vehicle Operator Course
   - Incident Management
   - EMT-Basic (EMT-Paramedic for Deputy Chief of EMS)
   - ICS 200, 300, 400, and 800
   - 45 college credit hours in an accredited degree program or consider National Fire Academy – Executive Fire Officer (EFO) [completed or in progress]
3. **District Chief**
   - Fire Officer II
   - Hazmat First Responder Operations Level
   - Fire Instructor I
   - Emergency Vehicle Operator Course
   - Incident Management
   - EMT-Basic (EMT-Paramedic preferred)
   - ICS 200, 300, 400, and 800
   - 30 college credit hours in an accredited degree program
4. **Captains & Lieutenants**
   - Fire Officer I
   - Hazmat First Responder Operations Level
   - Fire Instructor I
   - Emergency Vehicle Operator Course
   - EMT-Basic (EMT-Paramedic preferred)
   - ICS 200 and 300
   - 15 college credit hours in an accredited degree program

As recommended, the above training/certification requirements would need to be met in order to be eligible to take the applicable aptitude test called for in the City Code division relating to the **Civil Service Commission**. The Study Team also recommends that the PFD work with MFSI and the Portland Professional Fire Fighters Local 740 to develop a delivery plan for the training courses needed for the existing officers so that the officers have an opportunity to comply with the revised training and certification requirements.

The Study Team also recommends that the PFD establish a continuing education program for the officers of the department so that they can keep pace with the changes in service delivery, technology, and leadership practices.

Related to training certifications, the Study Team feels it important that all formal (certificate-based) training be delivered by a certified instructor—preferably a certified Fire Instructor II. This certification provides validation to the curriculum and adds professionalism to the training program. Therefore, the Team recommends that the PFD require all certificate-based training (Firefighter I and II, Fire Officer I and II, etc.) have a Fire Instructor II certified instructor serve as the lead instructor for the program. If support instructors are needed, then the Team recommends the all support instructors be certified to at least the Fire Instructor I level.

Firefighter Training

In the traditional fire department setting, firefighter training begins with the introduction of new personnel to the basics of fire and rescue operations through the recruit training process. Recruit training differs from state to state and from jurisdiction to jurisdiction depending upon local standards and requirements. In most career fire/rescue systems, the recruit training process depends on the size of the department and the proximity to a formal training center.

In the PFD, career firefighters receive their entry-level training through the Portland Fire Academy as the final step of their hiring process. In 2012, sixteen firefighter trainees completed the 12-week Fire Academy, which upon completion they were awarded Firefighter I and II certification. The trainees also completed the Emergency Vehicle Operator Course (EVOC) during their time in the Fire Academy and received orientation to PFD EMS delivery. The sixteen trainees in the 2012 Fire Academy were either EMT-Intermediates or EMT-Paramedics prior to starting the academy training, which enabled them to complete the training process faster and be assigned to the staffing pool sooner than the 2011 trainees.

Further, regarding the 2012 firefighter trainees, the Study Team was advised that, although some of the trainees were EMT-I's and EMT-P's some of those hired where only EMT-B's and still are. They are in the process of getting their Intermediate licenses. The reason for the shorter drill school was an identified need to get them on the trucks

sooner by allowing those needing to attain that level doing it off and on duty, this allowed for a shorter academy, thus saving on overtime pay.

In 2011, twenty firefighter trainees completed a 21-week fire academy program that included EMT-Intermediate training in addition to Firefighter I and Firefighter II certification. The trainees also completed EVOC training during their time in the academy.

Figure 10.2
TRAINEES FROM THE 2012 FIRE ACADEMY PRACTICE THEIR POWER SAW SKILLS AT A VACANT PROPERTY IN THE CITY

The Study Team's review of the PFD Fire Academy found the program excellent in content and delivery—even with the limited resources and facilities available to the training staff. The strength of the Fire Academy was another one of the most frequently listed "positives" of the PFD during the Study Team's employee interview sessions. At every session, numerous attendees (officers and firefighters alike) provided nothing but strong, positive comments regarding the Fire Academy process. The Study Team commends the PFD and its Training Division for its work in this area.

In terms of entry-level training for volunteer personnel on the islands, the Study Team finds that training to be less structured and completed more on an "as needed basis"—which is not uncommon for a volunteer force. One of the difficulties with the volunteer forces on the islands is their limited number, their limited availability, and in some cases, their age (meaning older volunteers whose physical ability for the demands of interior firefighting are limited).

The Study Team recommends a complete review of the minimum training requirements needed to function on the islands as a volunteer responder and how such training is provided. One option to consider is the creation of an "Interior" and "Exterior" firefighter certification for volunteer personnel on the islands. An Interior-certified volunteer firefighter would meet all of the training requirements of a PFD career firefighter (short of EMT-I) and be able to function as part of a fire attack crew on the interior of a structure fire. An Exterior-certified volunteer firefighter would not be permitted to wear or use self-contained breathing apparatus and could only function as part of an outside crew at a structure fire—similar to industrial fire brigades that perform advanced exterior firefighting only (NFPA 600 Standard on Industrial Fire Brigades).

The Study Team also recommends the development and implementation of a Probationary Firefighter Training Manual/Program that provides (and evaluates) the knowledge, skills, and abilities needed for the job of PFD firefighter—both career and volunteer. The probationary program would be developed by the Training Division, but would be managed at the company level with district chief oversight. The content of the program should include all of the basic aspects of PFD services (engine company operations, ladder company operations, MEDCU operations, special operations supports, etc.) beyond what was covered in the fire academy.

Currently, a newly hired firefighter serves a probationary period of one year, which includes his or her time in the fire academy. During that probationary year, there is little, formal evaluation of skill ability. The only assessment completed for probationary employees is the PFD Probationary Performance Form, which is completed by the probationary employee's immediate supervisor.

The Study Team's review of the Probationary Performance Form reveals that the form is adequate for the general assessment of the employee, but it does not assess specific job-related skills. The goal of a probationary training program is to further develop the newly hired employee (or volunteer member) so that at the end of his or her 12-month period they can function in their job classification with minimal supervision.

Incident Management Training

The Study Team is not aware of any state or local regulation requiring that fire service chief officers be trained in the practice of incident management (command). However, Presidential Directive 5, issued in February 2003, requires all emergency response agencies across the nation be trained in and implement the National Incident Management System (NIMS) in order to be eligible to receive federal funding for Homeland Security initiatives.

Incident command training is critical to the success of incident management. If emergency responders expect to have positive outcomes at the incidents to which they respond, then those responders must be well-trained and well-versed in incident command. Fire department incident command has grown well past the days of the fire chief standing in the front yard of a burning home with nothing but his helmet on and his portable radio in his hand. Today's incidents can challenge even the most seasoned incident commander; all incident commanders must be able to command and operate in an era of mutual interoperability where many fire departments may be required to work together on incidents.

Without training and certification in incident command, fire departments are exposing their organizations to a high level of liability and the potential for disastrous outcomes. In almost every firefighter line-of-duty death that has occurred on the fire ground over the last 10 years in the United States, investigative findings have listed ineffective (or absent) incident command and poor crew accountability as common contributing factors to those deaths.

Data provided to the Study Team by the PFD Training Division shows that the PFD is in compliance with the NIMS training requirements. The Team also learned that no other incident management training is required of PFD chief officers and if some of the chief officers have such training, it would be training that was accomplished on their own time with minimal department support.

The Study Team believes that command officer development and skills maintenance is another critical element of maintaining a professional, well trained, all-hazards command staff. To support those efforts in the PFD, the Study Team recommends that the PFD develop and implement a command officer professional development program that includes initial training on incident command and incident scene safety for chief officer candidates and continuing education requirements for existing chief officers.

Skill Maintenance Training

Another important area of a fire department's training program is the continued maintenance of knowledge and skills. In-service training, as it is commonly referred to, generally covers a wide area of topics including basic firefighting skills, emergency vehicle driving, and federal government mandated hazardous materials refresher training.

When developing a company drill training program, the Fire Suppression Rating Schedule used by the Insurance Services Office (ISO) should be considered. The Schedule is actually a manual that is used by ISO to review the firefighting capabilities of individual fire departments. One section of the Schedule reviews a fire department's training functions and assigns points (credits) based upon certain training items. The following list from ISO provides examples of the training required for all fire department personnel for which credit points are allotted:

1. Half-day drills (three hours), eight per year
2. Half-day multiple company drills (three hours), four per year
3. Night drills (three hours), two per year
4. Company training at the fire station, 20 hours per member, per month
5. Leadership/command training for all officers, two days per year
6. Half-day sessions for driver and operator training, four per year

While the Study Team could not determine precise numbers from training records data, it was clear from the station level interviews of officers and firefighters that skill maintenance training (outside of the programs set in place by the Training Division) is inconsistent. In the 2012 ISO report, company level training received a very low mark—most likely from inconsistent documentation and company level recordkeeping.

Interoperability Training

In terms of multiple-company operations and mutual aid interoperability training, it was again unclear to the Study Team the frequency of this hands-on, drill-type training. The Study Team found little evidence of any type of regional or mutual-aid training and the Team knows of no immediate plans to implement such training.

The Study Team believes that multi-company training events are important to the development of teamwork and to reinforce the concept of fire ground discipline at the company level. The Study Team suggests that PFD revise its company level drill programs so that the program:

1. Ensures that meaningful, multi-company drills are held at least six times a year and that these drills focus on the various emergency response activities that require multiple units to work together in order to mitigate an incident.
2. Ensures that these drills also include the use of mutual aid agencies from the surrounding Portland area.
3. Addresses the training goals and objectives of the PFD and its individual companies.

Driver Operator Training

Of all the services provided by a fire/rescue department, two of the positions that provide a great exposure to liability are a provider of emergency medical care and the driver of an emergency vehicle. In both cases, training needs to be extensive, well documented, and recertified on a regular schedule.

The Maine Department of Labor's Bureau of Labor Standards issued Standard 12-179 Chapter 7: Minimum Driver Training Requirements for Fire Apparatus on March 2, 2011. While the standard is short in length, its content is clear and concise and

"indentifies the job performance requirements for career and volunteer firefighters who drive fire apparatus in order to reduce accidents, injuries and loss of fire equipment."

The Study Team found a number of PFD policies and procedures and notices that involve driving and operating PFD apparatus (fire and EMS), however, all of the documents are in need of revision and update. Most of the documents do not meet the requirements set forth in NFPA 1002, *Standard for Fire Apparatus Driver/Operator Professional Qualifications, 2009 Edition*.

Because most PFD firefighters have to be able to at least drive an ambulance (MEDCU) or an engine (pumper), the presence of a comprehensive, written driver training program/policy is important. This program/policy is not only for the department and its employees, but also for the City in terms of minimizing its liability exposure. Therefore, the Study Team urges PFD to develop and implement an emergency vehicle driver training program and policy that is NFPA 1002 compliant.

This driver training program should be comprehensive and should include separate training and certification packages for each type of apparatus (MEDCU, pumper, ladder, heavy rescue squad, etc.).

Training Facilities

The City of Portland does not own or operate a fire training facility. The absence of such a facility resulted in a score of zero points under the training facility category in the 2012 ISO survey. The PFD leases a classroom and office at the Stevens Avenue Armory located at 772 Stevens Avenue. The Army National Guard owns the armory and the space is leased to the PFD for a nominal cost on an annual basis.

While the armory classroom space is acceptable for didactic instruction, the facility lacks the space and ability to conduct any practical skill evolutions. In addition, the Study Team learned of a rumor concerning the possible sale of the armory to the University of New England, which owns much of the property already surrounding the armory complex.

The Study Team noted that the PFD had obtained a driving simulator and sprinkler trailer purchased through regional grant opportunities. This type of regional grant approach is a positive indicator of the potential for broader regional approaches to services delivery.

Figure 10.3
PFD'S EMS PROVIDERS ATTEND A LECTURE AT THE DEPARTMENT'S LEASED CLASSROOM IN THE STEVENS AVENUE ARMORY

Figure 10.4
THE TRAINING DIVISION'S LEASED OFFICE SPACE AT THE STEVENS AVENUE ARMORY

There is also a classroom/meeting room area at the Bramhall Station. While it is acceptable for company-level activities and small groups, the room is not conducive to larger, more formal training programs. The Bramhall classroom is a room in the back of the apparatus bays with tables and chairs and place to write and project images. It does

not provide the amenities of a modern learning environment—ventilation, comfortable seating, natural light, etc.

In terms of a facility for conducting practical skills work, such as hose line or ground ladder deployment, there is none. The Training Division has to locate vacant or abandoned structures throughout the city in order for personnel to have a place to practice their firefighting and rescue skills. Without a training facility, company officers must also find locations within their local response districts to conduct practical skill drills.

The more challenging problem is providing live fire training. Without a training facility, live fire training is most likely non-existent, which is the case with PFD. There simply is no place in the City for personnel to conduct live fire training activities.

The PFD is without any type of elevated drill tower, which impacts the department's ability to train with its aerial and ground ladders other than using buildings in the community. As noted already, the PFD lost a significant number of points in the Training Category of their 2010 ISO rating because of the lack of a drill tower or practical skill structure.

The Study Team learned of some prior discussions regarding the possible development of a regional training center in the Portland area. While it appears that the discussion has been occurring for quite some time, it also is apparent that minimal action has been taken —most likely due to fiscal constraint and the down-turned economy.

The Team learned that 3 to 4 acres of land has been "set aside" at the Ecomaine trash-to-energy facility on Blueberry Road for a possible fire or public safety training site. A water line has already been run to the property as part of the original site development for the area. The Study Team feels that the Ecomaine site is a reasonable location for a fire/rescue training facility because of the land use development of the area and because of the existing land buffer already in place for the trash-to-energy plant.

The Study Team also believes that there is an opportunity to work with MFSI and the regional fire departments to enter into a partnership whereby the Ecomaine site could be developed into a regional fire/rescue training facility with cost-sharing between local fire departments and the State.

Proposed Regional Training Center

The Study Team recommends that the PFD work with the City to start the planning process for the design and construction of a fire/rescue training facility, possibly as a regional training center. At a minimum, the training facility should include classroom and practical skill evolution space capable of supporting two, simultaneous training events regardless of whether they are classroom or practical skill sessions. The facility should also include adequate office space for instructors, storage space for training materials and props, locker room and shower facilities for students and instructors, and a dining area for meal breaks. If possible, the facility should also include the ability to conduct live fire training exercises.

Regarding the design and construction of a regional fire and EMS training center, the following information offers insight into the needs and possible uses.

The items listed below are meant to accommodate not only Portland Fire Department but its surrounding mutual aid partners.

- The location and property acquisition would require more extensive review and planning.
- The items noted here were created through a review of current literature and discussion with the PFD Training Division and senior leadership.
- USFA publication (FA168/May 1997):"*Safety and Health Considerations for the Design of Fire and Emergency Medical Services Stations*" was also used to develop the items presented in this listing.
- The design and construction of any buildings would comply with state, federal and NFPA codes.

Location

The training center should be accessible and convenient to regional stakeholders, but should allow for on-duty training with a minimum of travel time to emergency responses within the City.

Suggested Shared Uses of a New Training Facility

- EOC Center or backup
- Community center for public education
- Police tactical training site for SRT, class rooms etc.
- EMS testing center for State and National Registry
- Regional testing center for State and National Fire Certification
- CPAT testing center
- Fitness testing center
- Regional/department fire recruit school
- Citizens fire academy
- State approved EMS training center
- AHA training center
- Conference center

In no particular order these are features of an efficient and safe training center that would meet most if not all anticipated needs.

Training Center Grounds and Apparatus Bays

1. Adequate driveway and parking with drive-thru access bays
2. Driving Simulator (DEVS)
3. Auto extrication pad
4. Vehicle bays for a minimum of a ladder truck, pumper, ambulance and staff vehicle, all with exhaust evacuation
5. 4-story burn and rappel tower
6. Flashover simulator
7. Pump and ladder testing station
8. Concrete pad with an extinguisher prop
9. Aircraft mock-up and pit
10. Hose tower
11. Fuel depot
12. Back-up generator supply
13. Climbing wall for low and high angle operations
14. Trench and confined space mock-ups
15. Compressed gas storage area
16. Outbuilding(s) for low light operations, confined space mock-ups and Haz Mat
17. Residential 2 ½ story home for live fire training

18. Outdoor exercise area (track, volleyball and basketball courts)
19. Adequate space for expansion and parking and buffer space for dissipation of smoke during operations
20. Fencing around perimeter with surveillance

Interior

1. Public reception area with public restrooms (secure check in)
2. 3 staff offices with minimum space for administration and storage
3. Minimum of 1 large classroom with full AV capabilities and seating for 60
4. Computer testing center with a minimum of 10 terminals
5. Back-up regional communication center
6. Minimum of 3 breakout rooms to serve as meeting areas for 15 students each
7. EMS simulation lab and control room with latest in wireless simulation technology with a minimum of 4 Sim Man and Pediatric capability
8. Audio visual and media control room
9. Kitchen with adequate appliances and space to prepare food for 30 personnel for extended emergency operation (72 hours)
10. Gender specific toilets, showers and locker rooms
11. Laundry, decontamination area
12. Structural gear racks
13. SCBA refilling and maintenance station
14. Exercise and gym area to accommodate class size of 25 with cardiovascular, strength, and resistance training
15. Support areas (storage lockers, mechanical- electrical spaces, repair shop)
16. Secure storage for biomedical supplies and medical refrigeration

SUMMARY

The main objective of the fire service is to prevent injury and loss of life and to protect property and the environment. Training is a key element to successful emergency scene operations and organizational effectiveness. Training in the fire, rescue, and EMS disciplines is also a career-long venture, starting with recruit and basic training programs and progressing to more sophisticated advanced training and participation in higher educational opportunities. Between formal training programs and educational courses there must be ongoing reinforcement of knowledge and hands-on skills provided to all ranks.

It is very apparent from speaking with PFD officers and firefighters that they are committed to providing good service to their customers. It is also important for PFD to remember that its members and employees are its customers as well. Like many other fire departments across the United States, there are some serious shortfalls in training within PFD primarily involving company-level training, the duties and responsibilities of the Division of Training, and the lack of training certification requirements at the officer ranks.

The Study Team realizes that the findings presented in this chapter present serious challenges to the leadership of PFD and the Team urges all personnel to work together to overcome the challenges.

RECOMMENDATIONS

10-1 The Fire Chief and the City should update the job description for the Training Officer and the position should be re-titled to "Fire Training Coordinator."

10-2 The Fire Chief and the City should update the job description for the EMS Training Officer and the position should be re-titled to "EMS Training Coordinator."

10-3 The Fire Chief should assign the role of PFD Training Officer to one of the Deputy Fire Chiefs with both the fire training and EMS training captains being assigned under that chief officer.

10-4 The Fire Chief should retain the Fire Training Coordinator (new title) as a captain's position with an added training requirement of Fire Instructor II.

10-5 The Fire Chief should retain the EMS Training Coordinator (new title) as a captain's position with an added training requirement of EMT-Paramedic Instructor Coordinator III.

10-6 The Training Officer should review the process by which all company-level training data are recorded, stored, and retrieved and implement the changes needed to bring recordkeeping more in line with ISO requirements.

10-7 The Fire Chief and the City should implement the following minimum training and certification requirements for PFD officers (career and volunteer):

1. Fire Chief

- Fire Officer II
- Hazmat First Responder Operations Level
- Fire Instructor I
- Emergency Vehicle Operator Course
- EMT – Basic
- Incident Management
- ICS 200, 300, 400, and 800
- 60 college credit hours in an accredited degree program or consider National Fire Academy – Executive Fire Officer (EFO) [completed or in progress]

2. Deputy Chief

- Fire Officer II
- Hazmat First Responder Operations Level
- Fire Instructor I
- Emergency Vehicle Operator Course
- Incident Management
- EMT-Basic (EMT-Paramedic for Deputy Chief of EMS)
- ICS 200, 300, 400, and 800
- 45 college credit hours in an accredited degree program or consider National Fire Academy – Executive Fire Officer (EFO) [completed or in progress]

3. District Chief

- Fire Officer II
- Hazmat First Responder Operations Level
- Fire Instructor I
- Emergency Vehicle Operator Course
- Incident Management
- EMT-Basic (EMT-Paramedic preferred)
- ICS 200, 300, 400, and 800
- 30 college credit hours in an accredited degree program

4. Captains & Lieutenants

- Fire Officer I
- Hazmat First Responder Operations Level
- Fire Instructor I
- Emergency Vehicle Operator Course
- EMT-Basic (EMT-Paramedic preferred)
- ICS 200 and 300
- 15 college credit hours in an accredited degree program

10-8 The Fire Chief should work with MFSI and the Portland Professional Fire Fighters Local 740 to develop a delivery plan for the training courses needed for the existing officers so that the officers have an opportunity to comply with the revised training and certification requirements.

10-9 The Fire Chief should establish a continuing education program for the officers of the department to keep pace with the changes in service delivery, technology, and leadership practices in the industry.

10-10 The Fire Chief should require all certificate-based training (Firefighter I and II, Fire Officer I and II, etc.) have a Fire Instructor II certified instructor serve as the lead instructor for the program. If support instructors are needed, then those support instructors are to be certified to at least the Fire Instructor I level.

10-11 The Fire Chief should complete a thorough review of the minimum training requirements needed to function on the islands as a volunteer responder and how such training is provided.

10-12 The Fire Chief should consider the creation of an "Interior" and "Exterior" firefighter certification for volunteer personnel on the islands.

10-13 The Fire Chief should develop and implement a Probationary Firefighter Training Manual/Program that provides (and evaluates) the knowledge, skills, and abilities needed for the job of PFD firefighter—career and volunteer.

10-14 The Fire Chief should develop and implement a command officer professional development program that includes initial training on incident command and

incident scene safety for chief officer candidates and continuing education requirements for existing chief officers.

10-15 The Fire Chief should revise the department's company level drill program so that the program:

- Ensures that meaningful, multi-company drills are held at least six times a year and that these drills focus on the various emergency response activities that require multiple units to work together in order to mitigate an incident.
- Ensures that these drills also include the use of mutual aid agencies from the surrounding Portland area.
- Addresses the training goals and objectives of the PFD and its individual companies.

10-16 The Fire Chief should develop and implement an emergency vehicle driver training program and policy that is NFPA 1002 compliant and includes separate training and certification packages for each type of apparatus (MEDCU, pumper, ladder, heavy rescue squad, etc.)

10-17 The Fire Chief should work with the City to start the planning process for the design and construction of a fire/rescue training facility, possibly as a regional training center. At a minimum, the training facility should include classroom and practical skill evolution space capable of supporting two, simultaneous training events regardless of whether they are classroom or practical skill sessions.

CHAPTER ELEVEN
FIRE PREVENTION PROGRAMS

This chapter addresses all aspects of current life and fire safety inspections and code enforcement, public education, and fire investigation functions accomplished by the Portland Fire Department (PFD). The programs were compared to national program standards with recommendations for improvement.

BACKGROUND

The "National Fire Protection Association recommends a multifaceted, coordinated risk reduction process at the community level to address local risks. This requires engaging all segments of the community, identifying the highest priority risks, and then developing and implementing strategies designed to mitigate the risks.

Fire departments can serve a vital role in the concerted community risk reduction effort. The public safety needs of communities increasingly place fire department personnel in the role of emergency responders—first on the scene not only in a fire emergency, but in medical emergencies, natural disasters, and acts of terrorism as well.

With a proven record in prevention and responding effectively to fire emergencies, fire safety advocates often have the credibility and expertise to organize their communities around broader safety and risk issues. Most fire department leaders are encouraging their members to get more involved in their communities to strengthen organizational credibility and influence. There are a variety of ways this can be accomplished, and community risk reduction is the program that provides perhaps the greatest opportunity."[1]

Multifaceted coordinated risk reduction in a community may be addressed by a "cycle" of resources provided by the fire department in coordination with other community entities. These resources include **public education** so citizens are aware of hazards and medical challenges, how to prevent them, and what to do should they occur; **engineering/code enforcement** so fire and life safety is an inherent part of the community infrastructure and where violation compliance is achieved; **emergency response** so that when there is a failure in the education, engineering/code enforcement part of the

[1] Kirtley, Edward, N.F.P.A. *Community Risk Reduction, Fire Protection Handbook*

cycle the emergency can be resolved; and **fire investigation or EMS analysis** where the incident is documented, the cause determined and steps taken so it will not happen again.

With regard to fire protection:

> *"One of the true measures of a fire department's effectiveness is the amount of loss experience in the community or jurisdiction. If hazards and unsafe acts can be reduced there will be a resultant reduction in the area's fire experience…in order to reduce the losses due to fires, effective, focused fire prevention effort must take place."*[2]

The *NFPA Fire Protection Handbook*, Seventeenth Edition, Section 10, Chapter 4, describes the elements of a fire prevention program as follows:

"1. Activities that relate to construction, such as building codes, the approval of building and facility plans, and occupancy certification and re-certification for new occupants. Also included may be a sign-off for the presence of smoke detectors when new or old properties are sold.

2. Activities that relate to the enforcement of codes and regulations, such as inspections of certain occupancies, the licensor of certain hazardous facilities, the design of new regulations and codes, and legislation to adopt model codes.

3. Activities that relate to the reduction of arson, such as fire investigation and the collection of information and data related to setting fires. Included may be arson investigation and related court proceedings, and programs such as counseling for juvenile firesetters.

4. Activities that relate to the collection of data helpful in improving fire protection, such as standardized fire reporting, case histories and fire research.

5. Activities that relate to public education and training, including fire prevention safeguards, evacuation and personal safety steps, plant protection training for industrial and other work groups, hazardous materials and device safeguards, and encouragement to install early warning and other built-in signaling and extinguishing devices. Very popular are programs for school children, such as NFPA's Learn Not to Burn curriculum, and self-help classes such as water safety and similar "Stay Alive Till We Arrive" projects."

[2] Klinoff, Robert, 2007. Introduction to Fire Protection, 3rd Edition, Thomson Delmar, Clifton Park, NY.

CFAI FIRE PREVENTION/LIFE SAFETY CRITERIA

The CFAI accreditation criteria related to Fire Prevention/Life Safety that is relevant to this Performance and Management Study is as follows:

There is an adequate effective and efficient program directed toward fire prevention, life safety, risk, and reduction of hazards, the detection, reporting and control of fires and other emergencies, the provision of occupant safety and exiting and the provisions for first aid firefighting equipment.

Performance Indicators:

1. The authority having jurisdiction has an adopted fire prevention code.
2. The code enforcement program is designed to ensure compliance with applicable fire protection law and agency objectives.
3. There is adequate staffing to meet agency objectives.
4. There is a plan check system in place to insure buildings are built in accordance with adopted codes and ordinances.
5. There are adequate equipment and supplies allocated to the fire prevention function.
6. There are standard operating procedures/general operating guidelines for the fire prevention/life safety program.
7. There is an information system in place to record activities and trans-actions and to determine the effectiveness of the fire prevention program and its efforts in risk reduction.
8. There is a periodic appraisal made to determine if there is a balancing of the fire hazard risk against the fire suppression capabilities of the agency and/or system, and if not, what actions need to be taken to balance the relationship.

LEGAL AUTHORITY FOR FIRE PREVENTION

State of Maine

The State of Maine established the authority of the fire chief relating to municipal fire protection as outlined in the following section of State Statute.

Chapter 153: MUNICIPAL FIRE PROTECTION HEADING: PL 1987

§3153. Fire chiefs
3. Powers. The fire chief may:
B. With the approval of the municipal officers, adopt administrative regulations relating to municipal fire protection, consistent with this chapter and municipal ordinances;

City of Portland – Fire Chief

The City of Portland established in the Code of Ordinances the authority of the Chief of the Department relating to fire prevention as outlined below:

DIVISION 1. GENERALLY
Sec. 2-17. Additional duties assigned.
(b) Chief of Fire Department:

1. The Chief of the Fire Department shall be the administrative head of the fire department responsible for the supervision of all matters relating to fires in the city and shall promulgate, and from time to time amend, rules and regulations for the guidance, government, and conduct of the officers and members of the fire department.

Portland Life Safety Code

In Chapter 10, Fire Prevention and Protection, the City of Portland has adopted the N.F.P.A. Standard 1. *Fire Code,* and the N.F.P.A. 101. *Life Safety Code* by reference. These are model codes that are part of the N.F.P.A. adoption and update process.

ARTICLE I. LIFE SAFETY CODE
Sec. 10-1. Adoption of National Fire Protection Association 101:

Life Safety Code.

There is hereby adopted for the purpose of prescribing regulations governing conditions hazardous to life and property from fire or explosion, a code known as the National Fire Protection Association (NFPA) 101: Life Safety Code (hereinafter referred to as the "Life Safety Code") recommended by the National

Fire Protection Association, being particularly the 2009 edition thereof and the whole thereof, except for such portions as are deleted, modified or amended by section 10-3, of which code not less than one (1) copy has been and now is filed in the office of the city clerk and the same is hereby adopted and incorporated as fully as if set out at length herein, and shall be controlling within the limits of the city.
(Ord. No. 188-00, § 6, 4-24-00; Ord. No. 214-01/02, § 1; Ord. No. 25-10/11, 8-16-

Sec. 10-3 Amendments
(m) Inspections. *The authority having jurisdiction, whenever any governmental agency having jurisdiction over a particular premises should request it to do so, upon proper identification, shall have the right to enter at any and all reasonable times into or upon any premises subject to this Code for the purpose of inspecting the premises in order to determine compliance with the provision of this Code. It shall be a violation of this article for any person either to interfere with or to prevent such inspection.*

ARTICLE II. FIRE CODE
Sec. 10-16. Adoption of National Fire Protection Association 1: Fire Code.
There is hereby adopted for the purpose of prescribing regulations governing conditions hazardous to life and property from fire or explosion, that a certain code known as the National Fire Protection Association (NFPA) 1: Fire Code (hereinafter referred to as the Fire Code) recommended by the National Fire Protection Association, being particularly the 2009 edition thereof and the whole thereof, and except for such portions as are deleted, modified or amended by section 10-18, of which code not less than one (1) copy has been and now is filed in the office of the city clerk and the same is hereby adopted and incorporated as fully as if set out at length herein, and shall be controlling within the limits of the city. (Code 1968, § 321.1; Ord. No. 389-72, 9-6-72; Ord. No. 188-00, § 6, 4-24-00; Ord. No. 25-10/11, 8-16-10)
State law reference(s)--Authority to adopt codes by reference, 30-A M.R.S.A. § 3003.

ARTICLE III. ENFORCEMENT AND APPEALS.
Sec. 10-22. Rules and regulations.
The authority having jurisdiction may promulgate all reasonable rules and regulations to carry out the purposes and provisions of the Life Safety and/or Fire

Codes. Such rules and regulations shall be in writing and shall take effect no less than thirty (30) days following the date of issuance. (Ord. No. 25-10/11, 8-16-10)

PFD FIRE CODE ENFORCEMENT

The Fire Prevention Bureau within the Division of Special Services is comprised of one Fire Captain and one Fire Lieutenant. Currently a "light duty" firefighter is assigned to the office to assist with inspection correspondence and other assigned tasks.

The Fire Prevention Captain reports to the Fire Chief responsible for the Air Rescue and Marine Divisions and is the PFD Safety Officer. The Fire Lieutenant is the PFD plans reviewer. The Fire Prevention Bureau does not have dedicated clerical support.

The PFD is part of the City's development authorization review process and is required to approve or "sign off" before building and occupancy permits are issued by the Inspection Division of the Portland City Department of Planning and Development.

Permit Fees Required

Based on applicable ordinances, laws, and codes, the City collects fees for inspections performed, permits and licenses issued by the PFD's Bureau of Fire Prevention, as well as the collection of associated fees.

Figure 11.1 identifies the permit fees required by Section 1.12.7 0f the Portland Fire Prevention Code.

Figure 11.1
PERMIT FEES REQUIRED BY THE PORTLAND FIRE PREVENTION CODE

Permit	Fee($)
Application for Flammable Finishes	160.00
Bulk Waste Storage	160.00
Certificate of Fitness for Fire Alarm Service and Installation	250.00
Cutting and Welding	60.00
Dry Cleaning Plants	60.00
Fire Alarm Inspections Sticker	20.00
Fireworks Display	141.00
Flammable or Combustible Liquids Other Than Motor Fuel Dispensing	160.00
Hazardous Materials	60.00
Hot Work	25.00
Motor Fuel Dispensing and Refueling	160.00
Special Type Dispensing Systems Other Than Flammable or Combustible Liquids	160.00
Repair Garages and Service Stations	160.00
Source: Portland Fire Prevention Code	

The fees imposed by the Portland Fire Prevention Code are typical municipal, model code assessments and are generally assessed as part of the building permit process. The City of Portland collected $1,100,600 in building permits which includes the sum of the permits fee required of the Fire Code.

PFD BUILDING PLANS REVIEW

As adopted by the City of Portland; N.F.P.A. Standard 1, Fire Code:

> *The AHJ* (City of Portland) *shall have the authority to require plans and specifications to ensure compliance with applicable codes and standards.*

The review of plans and specifications is a code enforcement process intended to ensure compliance with the fire protection and life safety provisions of the applicable codes and standards. The fire plans examiner reviews site plans, building and fire protection system plans, means of egress, and other fire and life safety plans and specifications.

Cooperation among City officials is a key component to the success of any program. The PFD enjoys this cooperation. With good cooperation and coordination from plan review up to and including final approval, both the PFD and the community benefit by ensuring compliance with all applicable codes and standards.

Construction plans are delivered to and picked up from the Fire Department by the City's Inspection Division staff on a daily business-day basis. The Planning and Development Department uses *Urban Insight* software to document and track plans and permits. Fire protection system plans are submitted directly to the PFD Inspection Staff intake.

The PFD does not document the number of plans reviewed by the Department's plans reviewer. It is assumed that a fairly accurate estimate could be determined by accounting for the number of building permits issued by the City's Inspection Division.

With the PFD providing a single dedicated plans reviewer, a significant "bottleneck" has developed in the City's development authorization review process. The City must comply with Maine State law that requires a 30 day or less "turnaround" time for plans reviews. The City currently generally operates at the 30-day requirement with the majority of the review time being used by the Fire Department.

In an effort to "Spur Economic Growth" the City has undertaken an effort to "Streamline the City's Permitting Process." Two of a number of suggestions to accomplish this streamlining are to (1) reduce the Fire Department's plans review "turnaround time," which relates to additional staff and technology and (2) facilitate the capability for citizens to easily determine the current status of their submitted plans.

Discussion continues regarding whether or not the PFD plans reviewer(s) should have his/her workstation at the Department of Planning and Development's Inspection Division or at Fire Department headquarters. Having the PFD plans reviewer working from the Inspection Division would enhance a "one-stop shop" concept for customers.

BUILDING FIRE CODE INSPECTIONS

Portland Fire Code – Inspections

As adopted by the City of Portland; N.F.P.A. Standard 1, Fire Code:

> *The AHJ* (City of Portland) *shall be authorized to inspect, at all reasonable times, any building or premises for dangerous or hazardous conditions or materials as set forth in this Code.*

PFD Property Inspections

Property inspections (used to find and eliminate potential fire hazards) are an important part of an overall fire protection system. The fire code stipulates inspection requirements for those occupancies and processes subject to the code and that certain, more hazardous, properties must have a permit to operate and, in order to receive a permit, must have a fire safety inspection. An inspection by the Authority Having Jurisdiction (AHJ) should indicate, after insuring compliance, that a minimum degree of safety exists. Without an inspection this cannot be assured.

Required tests and inspections for a development authorization review process are generally conducted by the Bureau of Fire Prevention Fire Captain and Fire Lieutenant. The Fire Lieutenant generally does inspections for half the business day and completes plans reviews for the second half of the business day. Maintenance inspections of existing properties are generally accomplished by "in-service" fire companies from the fire stations.

The Bureau of Fire Prevention is unable to accurately define its inspection workload and identify the number of inspectable properties in the City subject to the Portland Fire Prevention Code. The Portland Department of Planning and Development estimates there are 4,897 inspectable properties in the City based on its property classifications. The Department of Planning and Development's property classifications appear different from the property classifications reported by the Fire Department.

Using the total number of inspections completed by PFD for CY2012 of 2,949, and the estimated number of inspectable properties reported by the Portland Department of Planning and Development of 4,897, the Fire Department completed an inspection of 60.22 percent of the City of Portland's inspectable properties.

In addition to the obvious life safety risk implications for citizens, tourists and firefighters due to not completing a city-wide fire safety code inspection program on a regular basis, this omission could present a significant liability should a questionable fire scenario present itself in a property that has not been inspected or has not been inspected for a long period of time.

There are limited resources available as a guideline for the number of inspectors required to accomplish a given workload for a jurisdiction. As an example, the State of Texas has added an addendum to their Insurance Services Office (ISO) grading schedule to give credit for accomplishing fire safety inspections. The *Texas Addendum to the Fire Suppression Rating Schedule* provides a significant guideline regarding staffing resources needed to complete an effective fire safety inspection program. According to the *Texas Addendum*, one full-time inspector can be expected to complete approximately 480 inspections per year. Their computation is based on two-inspections per day, times 20 work days/month times 12 months.

Portland Fire Department, based on the Department of Planning and Development's data, has an estimated 4,897 inspectable properties. This sum, divided by 480 commensurate with the *Texas Addendum*, represents the need for 10.2 full-time fire prevention code inspectors. Ten full-time fire prevention code inspectors would provide for an annual inspection of every fire prevention code inspectable property once per year.

It is understood that the PFD Fire Prevention Bureau has workload responsibilities in addition to annual maintenance inspections. Permits, new construction tests, inspections and plans review, to name a few. This Bureau workload is partially offset by utilizing "in-service" fire company personnel to complete a portion of the required maintenance inspections.

The PFD needs to accurately define the number of inspectable properties in the City subject to the Fire Prevention Code to facilitate planning for and resources to accomplish their inspection workload.

Inspections by "In-Service" Fire Companies

The Bureau of Fire Prevention reports that the PFD is embarking on an effort to increase the number of fire code inspections and public contacts assigned to fire companies to 60

(50 inspections/10 public contacts) per company, per shift, per year. Fire companies would be required to complete/update pre-incident plans during the inspection process.

The Fire Prevention Captain transmits a directive to station Captains during their monthly meeting on the first Thursday of each month. Currently, the Fire Prevention Bureau Captain "assigns" inspections to the fire companies via "territory lists." The assignments are inconsistent among the fire companies primarily based on the fact that "downtown" companies are responsible for a higher number of inspectable properties then outlying companies.

The "in-service" inspection process is as follows:

- The fire companies have access to the PFD *Naviline* software that documents incident reports and inspections properties. Prior to embarking on an inspection, the station officer reviews the *Naviline* file to determine the compliance history of the property. Most "open" or previous violations at a given property are not resolved.
- Station officers complete an inspection without discussing it with the tenant or occupant; tenants or occupants are not asked to sign the notice of violation and a "hard" copy is not left at the property.
- Upon return to the station the company officer enters the inspection results data into the *Naviline* database and destroys the "hard" copy. A violation letter is formulated by the company officer, placed in an unsealed envelope and sent to the Bureau of Fire Prevention by interoffice mail for review and mailing.
- The PFD interoffice mail is described as "hit or miss." This phenomenon, coupled with the review and mail turnaround time in the Bureau, results in the property owner not receiving the notice of violation for a week or two. This one or two week period is part of the 32 days "given" to property owners to comply with the violation notice.
- While company officers are expected to obtain updated information and owner addresses, many violation notification letters are returned to the Bureau with incorrect information and/or addresses for property owners.
- The Bureau of Fire Prevention usually gets a telephone call from property owners once a violation letter is received explaining that they have not had the opportunity to make the compliance corrections. The Bureau then transmits a certified, second letter to the owner requesting a "plan of action" and "threatening" a $75.00

reinspection fee. This fee is generally not collected. Follow-up and re-inspections are completed by the Bureau.

Many company officers completing "in-service" fire code inspections have not received formal training and orientation to make these inspections. PFD company officers making fire code inspections should attain a N.F.P.A 1031, *Standard for Professional Qualifications for Fire Inspector and Plan Examiners* certification.

Utilization of in-service personnel is a proven, positive method of accomplishing the inspection responsibility, facilitating a major public relations achievement, providing for initial pre-emergency plans and their update and maintaining a familiarization of buildings by response personnel.

Utilizing in-service personnel to complete fire safety inspections significantly offsets the full-time inspection personnel resources required to achieve a successful, county-wide inspection program, while simultaneously realizing the numerous other benefits outlined above.

Considering six engine companies, two ladder companies, two quint companies and one rescue company staffed by four shifts each, that amounts to 44 shifts times 60 inspections or 2,640 inspections per year. Assuming for this example that there are 4,897 inspectable properties as defined by the Department of Planning and Development, each fire company would have to complete approximately 112 inspections per year (less than ten per month) to complete an inspection of all inspectable properties each year.

Variations of this inspection rate could be incorporated based on property risk, complexity of the property and geographic logistics to maintain appropriate response times, etc. This is especially true with the consideration of incorporating the update of the PFD pre incident plans during "in-service" inspections.

The fire code inspections identified in Figure 11.2 include the initial and re-inspections completed by the PFD Fire Prevention Bureau and the in-service fire companies.

Figure 11.2
FIRE CODE INSPECTIONS COMPLETED BY THE PORTLAND FIRE DEPARTMENT (2008-2012)

Property	2012	2011	2010	2009	2008
Airport Ramps	152	176	208	220	-
Assembly	205	231	187	368	396
Business	726	875	698	927	916
Day Care	6	4	3	6	8
Detention/Correction	8	-	7	1	1
Educational	256	271	204	195	200
Health Care	49	66	40	55	58
Hotel/Dorms	12	24	21	39	42
Industrial	94	115	116	160	124
Lodging/Rooming	18	25	17	25	21
Mercantile	205	305	245	302	351
Mobile Fuelers	36	43	42	80	140
Multi-Family	1079	1074	666	703	923
Residential BdCare	11	22	17	23	37
High Rise	14	40	8	18	56
Storage	70	111	85	105	100
Tank Farms	8	12	11	19	26
TOTAL	2,949	3,394	2,575	3,245	3,399

Source: Portland Fire Department

New construction inspections, plans reviews and the witnessing of tests are conducted by Bureau of Fire Prevention personnel.

Please refer to the Fire Prevention/ Risk Reduction Organization section at the end of this Chapter for Study Team organization and staffing discussion and considerations.

PFD FIRE PREVENTION DATA COLLECTION AND ANALYSIS

Reportedly, the *Naviline* software currently utilized for inspection and incident reporting is less than intuitive for facilitating the inspection process at the fire company level and providing regular management reports. It is unclear whether it is a personnel training and orientation challenge or the fact that the inspection program has "outgrown" the system.

Many inspection automation/software innovations have been developed since the implementation of Portland's *Naviline* system. The Study Team suggests that the appropriate City entity complete an assessment of the current *Naviline* system as it relates to the fire code inspection process. This is especially timely in concert with the City's current effort to streamline the permitting process.

Many public safety organizations have introduced a tablet computer approach to their inspection process. The *Cloud* concept, for example, facilitates many options in streamlining the process at a relatively affordable cost. The tablet computer approach affords simultaneous data management opportunities to many other aspects of the Department as well.

The Fire Prevention Bureau should regularly provide management reports outlining Bureau workload requirements and accomplishments to analyze trends and planning needs for the plans review, inspection, fire investigation and life and fire safety aspects of the Department and the community.

FIRE INVESTIGATION

CFAI Fire Investigation Criteria

The CFAI accreditation criteria related to Fire Investigation that is relevant to this Study is as follows:
There is an adequate effective and efficient program directed toward identification of the causes and origins of fires, explosions and other emergency situations that endanger life or property.

Performance Indicators

1. There are methods and procedures in place to investigate the cause and origin of all reported fires.
2. The agency has adequate staffing to accomplish its stated objectives.
3. There are adequate equipment and supplies allocated to the fire cause and investigation program.
4. There is agreement and support from other agencies to aid the agency in accomplishing its goals and objectives.

5. There is an information system in place to document fire investigation activities and to provide data for analyzing program results.
6. There are standard operating procedures, general operating guidelines for the fire cause and investigation program.
7. There is a periodic appraisal made on the effectiveness of the fire investigation program.

Portland Fire Code - Investigations

As adopted by the City of Portland; N.F.P.A. Standard 1, Fire Code:

> *The AHJ* (City of Portland) *shall have the authority to investigate the cause, origin, and circumstances of any fire, explosion, release of hazardous materials, or other hazardous condition*

In the municipal cycle of providing life and fire safety, the investigation of fires and other emergencies is imperative to developing and maintaining an effective hazard and risk prevention program. Whether fire or medical oriented the analysis of the results of these investigations, inquires and documentation become an integral element in the fire department's determination of the appropriate prevention and intervention activities.

The data collected and analyzed provides a resource for the Department to develop an effective fire prevention program, improve fire safety legislation, identify life and fire safety education programs, describe the City fire problems and evaluate fire protection capabilities.

Fire Investigation Team

From approximately 1995 through 1997 the fire investigation effort for PFD was accomplished by the Fire Chief supplemented by a City Police Sergeant with a trained arson dog. Upon departure of that Fire Chief, the City Police assumed the entire origin and cause program until approximately 2009.

In the spring of 2010, the Fire Chief, in concert with five fire officers (Three Lieutenants and Two Captains), established the current fire investigation team as an ancillary duty to their assigned shift responsibilities. Each of the Fire Investigation Team members are assigned to one of the four rotating PFD shifts and are usually available for pager call

out, while off duty, on an overtime basis. Team members receive a weekly $25.00 stipend for their standby responsibility. The City Police provide three police officers to the team.

Typically a PFD incident commander (Deputy Chief) will call out a team member when there is a fire fatality, injury, significant damage and/or the cause appears suspicious or cannot be determined. A Fire Investigation Team member automatically responds to second and third alarms.

The Team members informally rotate their initial callout responses to control the workload and overtime distribution. The other off duty members are called out should the nature or complexity of the incident dictate. This call out procedure is not addressed by PFD guideline or policy. The team is supervised by the Captain of Ladder Co. #1.

The initial on-call Fire Investigation Team member sizes up the call out incident to determine whether or not to utilize the Team's Fire Investigation vehicle. The vehicle is a converted E450 ambulance fully equipped to facilitate an on-going origin and cause investigation and may be used to conduct interviews as needed.

PFD now has the primary origin and cause responsibility for the City and calls out the City Police when a crime is determined during their investigation process. The City Police provide the arrest authority, if needed, and the introduction of the case to the judicial system as required. PFD does not have a formal guideline or policy regarding this arrangement.

The City Police maintains a polygraph capability that is available to the fire origin and cause effort. The bomb technician team resource is provided by the City Police and the Fire Department assists as required or if an explosive is detonated. Bomb "scares" are addressed by PFD standard operating guidelines. Access to an evidence laboratory is provided by the City Police.

Juvenile Firesetter intervention is provided by the State Fire Marshal with certified personnel available in the County.

All of the Fire Investigation Team officers are members of the International Association of Arson Investigators (IAAI) and three members have voluntarily completed the National Fire Academy's two week Arson Origin and Cause Course. Team members voluntarily participate in local, monthly training classes.

Full-time fire investigators are expected to possess an N.F.P.A. 1033, *Standard for Professional Qualification for Fire Investigators* certification and be knowledgeable with N.F.P.A 921, *Guide for Fire and Explosion Investigations.*

These references support the fire investigator's need to be familiar with the following subjects:

- Fire science
- Fire chemistry
- Thermodynamics
- Thermometry
- Fire dynamics
- Explosion dynamics
- Computer fire modeling
- Fire investigation
- Fire analysis
- Fire investigation methodology
- Fire investigation technology
- Hazardous materials
- Failure analysis and analytical tools

The Fire Investigation Team's voluntary achievement of the National Fire Academy's two week fire investigation course, coupled with aggressive monthly training is certainly admirable; especially with a relatively new team. The Study Team believes the PFD should initiate a plan to accomplish N.F.P.A. 1033 certification for all Fire Investigation Team members. In addition to credibility in the judicial, law enforcement and insurance disciplines, the certification would confirm the individual knowledge of pertinent investigative subjects.

Figure 11.3 illustrates the number of incidents by type and the fire loss by year for the years 2009 through 2011.

Figure 11.3
NUMBER OF INCIDENTS BY TYPE
FIRE LOSS BY YEAR (2009-2011)

Incident Type	2011	2010	2009
Fire	473	553	514
Explosion	68	50	50
Rescue/EMS	11,155	10,330	10,246
Hazard Condition	533	525	631
Service	663	679	729
Good Intent	683	541	490
False Alarm/Call	1,474	1,451	1,321
Severe Weather	3	9	-
Special	24	34	35
TOTAL	15,077	14,173	14,016
Fire Loss	$1,180,530	$2,545,263	$1,314,507

Source: Portland Fire Department Annual Reports

The number of false alarms/calls per year appears to be excessive:

- 1,474 in 2011 or 9.8 percent of all responses; 4.04 per day,
- 1,451 in 2010 or 10.2 percent of all responses; 3.98 per day and
- 1,321 in 2009 or 9.4 percent of all responses; 3.62 per day.

To provide an illustrative perspective of the cost of responding to these false, good intent alarms the Study Team simply took the total annual Fire Department budget, determined the per incident response cost by dividing the budget by the number of annual incidents and then multiplying the per incident cost by the number of false, good intent calls. Using this formula the false, good intent incident response cost by year was as follows:

- 2011, $1011 per incident response or $1,490,854 for the year
- 2010, $1047 per incident response or $1,519,698 for the year
- 2009, $1060 per incident response or $1,400,562 for the year

These incidents can be reduced resulting in increased safety to firefighters and a significant savings to the PFD. Initially, implement a process to cause an analysis of the incidents to determine the details of the system actuations, good intent call or malicious false call.

The Fire Department has the code authority to pursue malfunctioning systems, the resources to educate the community to reduce good intent calls and the judicial support to assertively adjudicate malicious false alarm perpetrators. Firefighters would require a renewed orientation, as stakeholders, to change the current response culture of the Fire Department to facilitate preplanned remedies.

Figure 11.4 illustrates the origin and cause determinations completed by the PFD Fire Investigation Team for a three year period.

Figure 11.4
FIRE INVESTIGATION TEAM ORIGIN AND CAUSE DETERMINATIONS
2010-2012

Year	Structure	Vehicle	Outside	Incendiary	Accidental	Undetermined	Injury/Death	Arrests
2010	24	0	1	5	10	10	0/0	3
2011	20	2	6	4	14	10	5/1	-
2012	19	2	1	2	14	6	4/1	3
Total	**63**	**4**	**8**	**11**	**38**	**26**	**9/2**	**6**
Source: Portland Fire Department								

The Study Team believes that the development and implementation of a formal fire investigation and call out standard operating guideline would significantly enhance the program. Having the guideline in place would increase the consistency of call out determinations among incident commanders; cause a more accurate city-wide documentation of intentional fires, fire fatalities and injuries; greatly increase management analysis of the City's fire problem; and provide for an ongoing determination of the Department's investigation effectiveness.

Fire Investigation Organization and Staffing

The Fire Investigation Team operates on an overtime compensation basis and does not appear in the Department's budget document or on the PFD organization chart. Senior staff believes that the Team reports directly to the Fire Chief with little or no interface to the Bureau of Fire Prevention.

Please refer to the Fire Prevention/ Risk Reduction Organization section at the end of this chapter for Study Team organization and staffing discussion and considerations.

LIFE AND FIRE SAFETY PUBLIC EDUCATION

CFAI Public Education Criteria

The CFAI accreditation criteria related to Public Education that is relevant to this Study is as follows:

There is a public education program directed toward the agency's mission.

Performance Indicators

1. There is a public education program that includes individual, business and community participation.
2. The agency has staffing to accomplish the program's mission, goals and objectives.
3. There are adequate equipment and supplies allocated to the public education program.
4. The public education programs are targeted toward specific audiences based on program analysis.
5. The agency's information system allows for documentation and analysis of its public education program.
6. There is a periodic appraisal made to determine the effectiveness of the public education program and its effect on eliminating unacceptable risks.

Portland Fire Code – Public Education

As adopted by the City of Portland; N.F.P.A. Standard 1, Fire Code:

The AHJ (City of Portland) *shall have the authority to develop and implement a public fire safety education program as deemed necessary for the general welfare with respect to the potential fire hazards within the jurisdiction.*

The AHJ (City of Portland) *shall have the authority to ensure duly authorized public fire safety education programs or public fire safety messages are disseminated to the general public.*

Public Education - Generally

Public fire and life safety education programs should be a major part of any fire prevention program. Community outreach, education, and awareness programs should start as early as possible in preschool and/or elementary school and continue through high school.

Adult programs should also be available to increase fire and life safety awareness in the community. A review of the community's fire records can help to identify high-risk problems or areas in the community that require extra fire and life safety efforts.

Fire education programs in schools should be a year-round endeavor and not merely a special program conducted during an annual Fire Prevention Week. School systems can incorporate fire safety programs into their existing curricula. The fire prevention authority can help by advising schools on the proper training of presenters and by identifying appropriate materials to reinforce the fire safety message presented. NFPA's Risk Watch® and Learn Not to Burn® programs, for example, provide the training and materials needed for such a fire safety effort.

The media can be a useful partner in fire safety awareness initiatives for adults and children. Television and radio stations might run public safety messages free of charge as part of their licensing requirements. In addition, many cable companies offer public access as part of their contract to provide service to the community. These programs are excellent opportunities to provide fire safety education messages on a regular basis. The fire department, police department, and other public service agencies can pool their resources to use these public access avenues more effectively. Collaboration relieves a single agency from the burden of providing a complete program every week and gives the audience a broader spectrum of programming to keep their interest high.

PFD Life and Fire Safety Education Program

The PFD life and fire safety education program is generally limited to fire station tours and visits, in-service personnel making presentations at schools when requested, and a media push during Fire Prevention Week in October of each year.

There is no public education program directed toward the Department's mission. CFAI Performance Indicators have not been addressed. The culture of the Department, as it

relates to life and fire safety education, has evolved to an operational workload focus with the Fire Prevention Bureau being overwhelmed with the development authorization review process and the associated inspection and test workload. Life and fire safety is not mentioned in the Department's annual report.

Public Fire and Life Safety Education

The Study Team suggests that the goal of the PFD public fire and life safety program should be to provide fire hazard education to the public in order to reduce injuries and the loss of life and property due to fire.

The focus of PFD fire and life safety education programs should include:

1. How to prevent fires;
2. What to do if there is a fire; and,
3. How to extinguish a fire, if trained and equipped to do so.

School Fire Safety Classes

The fire safety classes in schools should cover various aspects of fire safety depending on the grade of the students that the presentation is being given. The topics generally covered could include:

1. Stop-drop-roll;
2. Get out and stay out;
3. Family meeting place;
4. Matches and lighters;
5. 911 telephone system;
6. Crawl low under smoke;
7. Hazards of smoking;
8. Exit drills in school and home;
9. Smoke alarms;
10. The fire triangle;
11. Fire extinguishers; and,
12. Careers in the fire service.

Out-of-School Programs

The fire safety classes for out-of-school and adult fire safety programs could cover the basic fire safety lessons that are used in the school programs and extend to fire safety in the home. The added topics addressed should include:

1. Cooking safety;
2. Candles;
3. Electrical fires;
4. Extension cords;
5. Good housekeeping;
6. Family meeting places; and,
7. Carbon monoxide detectors.

Business Fire Safety Education Program

The business fire safety program should include topics from the school and out-of-school programs and a detailed in-depth class on the use of fire extinguishers. The fire extinguisher class should include hands-on use. Other topics included in business classes are good housekeeping in the office, keeping aisles and exits clear, and use of portable electrical heaters.

COMMUNITY RISK REDUCTION COMPONENTS & FUNDAMENTALS

PFD policy makers should review the numerous resources available to initiate the components and fundamentals of a community risk reduction (life and fire safety education) program.

The two major components of a community risk reduction program involve the use of the five "E"s and engaging the community.

The five "E"s represent mitigation strategies as follows:

- **E**ngineering – Building safeguards into products and materials that, by their design, eliminate or reduce the risk.
- **E**ducation – The object of an education strategy is to raise public awareness and understanding about fire.
- **E**nforcement – Reducing risk through the use of codes and standards.

- **E**conomic Incentives – Influencing personal or corporate behavior through financial incentives or disincentives (providing smoke alarms at no cost).
- **E**mergency Response – Communities have realized that there are many risks that simply cannot be mitigated effectively through the other strategies.

For community engagement to have a positive impact on a community risk reduction initiative, Fire Department representatives must view community engagement as an everyday approach to doing business in the community.

ORGANIZATION OF FIRE PREVENTION/RISK REDUCTION

A review of the PFD Fire Prevention Bureau and related fire prevention and risk reduction entities of the Department, coupled with their relationship with the CFAI Criteria and Performance Measures, lead the Study Team to suggest that the Portland Fire Department "redesign" their Fire Prevention/Risk Reduction program.

The Study Team's general analysis of the PFD's compliance with the CFAI Criteria and Performance Indicators are documented below as supported by the narrative provided in this Chapter.

Figure 11.5
SUMMARY OF PFD COMPLIANCE WITH THE CFAI ACCREDITATION CRITERIA

Fire Prevention/Life Safety Criteria **There is an adequate effective and efficient program directed toward fire prevention, life safety, risk, and reduction of hazards the detection, reporting and control of fires and other emergencies, the provision of occupant safety and exiting and the provisions for first aid firefighting equipment.**	
Performance Indicators	*** PFD Interface**
Adopted fire prevention code.	Yes
Compliance with applicable fire protection law	Inadequate
Adequate staffing	No
Plan check system in place	Yes
Equipment and supplies allocated	Yes
Standard operating	Inadequate

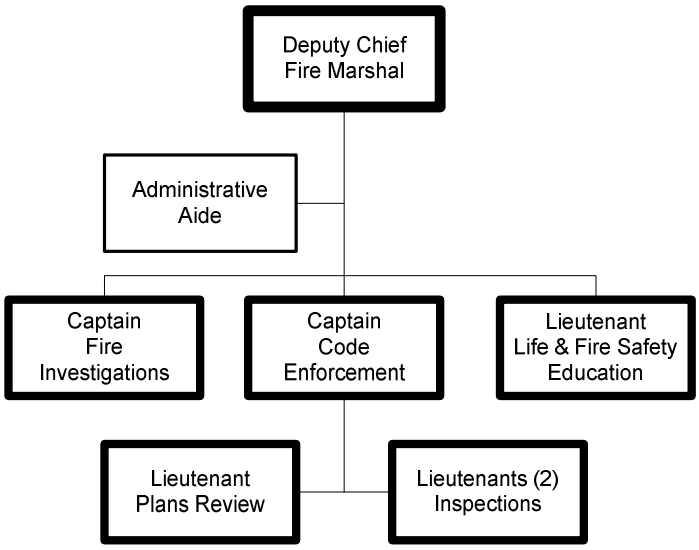
procedures/general operating guidelines.	
Information system in place	Inadequate
Periodic appraisal made to determine if there is a balancing of the fire hazard risk against the fire suppression capabilities	Inadequate
Fire Investigation Criteria **There is an adequate effective and efficient program directed toward identification of the causes and origins of fires, explosions and other emergency situations that endanger life or property**.	
Performance Indicators	*** PFD Interface**
Methods and procedures in place to investigate the cause and origin of all reported fires.	Yes
Adequate staffing	Yes
Equipment and supplies allocated to the fire cause and investigation program.	Yes
Agreement and support from other agencies	Yes
Information system in place	Inadequate
Standard operating procedures general operating guidelines for the fire cause and investigation program	Inadequate
Public Education Criteria **There is a public education program directed toward the agency's mission.**	
Performance Indicators	*** PFD Interface**
Public education program that includes individual, business and community participation.	No
Staffing to accomplish the program's mission, goals and objectives.	No
Adequate equipment and supplies	No

Programs are targeted toward specific audiences based on program analysis.	No
Information system allows for documentation and analysis	No
Periodic appraisal made to determine the effectiveness of the public education program and its effect on eliminating unacceptable risks	No
Source: Study *Corresponding data is found in chapter narrative	

A "redesign" of the Department's fire prevention/risk reduction effort necessarily requires an organizational baseline to address and coordinate the duties and responsibilities associated with an effective, efficient, Department-wide life and fire safety program.

This baseline is represented in the suggested fire prevention/risk reduction organization found in Figure 11.6.

Figure 11.6
SUGGESTED FIRE PREVENTION/RISK REDUCTION ORGANIZATION BASELINE



The following sections discuss the Study Team's description and suggested approach to organizational elements for the PFD Fire Prevention/Risk Reduction function.

Deputy Chief-Fire Marshal

The Fire Prevention/Risk Reduction program should be elevated from the current entity being supervised and overseen at the Captain level to a major Division of the Department under a Deputy Chief-Fire Marshal. Currently the program is a Bureau under the Special Services Division.

Plans Review, Inspections, Fire Investigations and Life & Fire Safety Education would become organizational entities under the dedicated, day work Deputy Chief-Fire Marshal. This would serve to "centralize" the fire prevention program and remove "stove pipe" tendencies between the current unassociated or non-existent entities.

Administrative Aide

Currently the Fire Prevention Bureau does not have dedicated clerical or administrative support. The Captain, Lieutenant and overtime based Fire Investigators must provide their own clerical and administrative support with occasional support from others. This takes valuable time from their primary responsibilities and contributes to extended plans review times, delayed inspection violation notice transmittals and administration, and additional overtime for Fire Investigators completing administrative tasks.

The proposed Administrative Aide would support the Fire Prevention/Risk Reduction Division

The Bureau of Fire Prevention is currently using a "light duty" employee to assist with some of these clerical assignments.

Plans Review

The current plans review effort is understaffed and represents the majority of the plans review turnaround time for the City. The Lieutenant-Plans Reviewer must complete inspections and test as well as complete plans reviews. This "balancing act" is inefficient and never-ending.

Inspections

While it is unclear what the actual number of inspectable properties is requiring Fire Prevention Code inspections, estimates based on available data indicate that only 60 percent of these inspections are being completed annually. The Fire Prevention Captain and Lieutenant are primarily dedicated to new construction/systems tests and inspection with the majority of maintenance inspections of existing properties being completed by "in-service" fire company personnel.

By one standard, based on available data, ten full-time inspectors would be required to complete the inspection of all fire code inspectable properties on an annual basis. This staffing requirement is being successfully offset by the utilization of "in-service" fire company personnel simultaneously gaining familiarity with community structures and engaging in a positive public relation opportunity. It is anticipated that pre-incident planning may be accomplished as well.

While it is not anticipated that ten full-time fire prevention code inspectors would be required in concert with the "in-service" inspectors, a number of full-time inspectors should be available to support the "in-service" inspectors as they approach more complex structures, need assistance with certain inspections, and/or support when the "in-service" members must respond to emergencies.

Two additional, full-time fire prevention code inspectors, complemented with the Fire Prevention Bureau Captain's oversight, would be appropriate for this responsibility. These two full-time inspectors would allow the Fire Prevention Bureau Captain to dedicate more of his time to daily oversight and assist him with new construction tests and inspections and allow the Fire Prevention Lieutenant, plans reviewer, to devote full time attention to plans review contributing to a reduced plans review turnaround time City-wide.

Fire Investigations

The fire investigation program, as currently operating, appears to be working well. Fortunately, its workload is not extreme. The program does not appear on the PFD organization chart or in budget documents. Assigning the Fire Investigation program to the oversight of the Deputy Chief-Fire Marshal in a re-design of a Division of Fire Prevention would serve to facilitate a more efficient PFD approach to fire prevention and

risk reduction and open improved communications with the other Departmental entities sharing the same mission.

The Fire Investigation program would continue to be overseen by the current "on-call" fire investigation Captain but report to the proposed Deputy Chief Fire Marshal.

Public Education

Clearly, as identified in the narrative of this chapter, Life and Fire Safety Education is currently a low priority in the PFD. The establishment of a Division of Fire Prevention, with the appropriate life and fire safety education activity Department-wide, would bring about a Department culture change where the fire prevention effort would have parity with emergency medical service as the two greatest workloads of the PFD.

There is now an opportunity to "build" a life and fire safety education program that could effectively address the five "Es," outlined previously, and appropriately "engage" the community.

The organization and staffing of this section will certainly need a contact/oversight point, but can be comprised of many aspects of the Department and community. The Study Team proposes a Lieutenant be assigned as oversight for the PFD Life and Fire Safety Education program.

The suppression, training, EMS and senior staff resources of the PFD, coupled with Local 740 members and community volunteers and coalitions provide a rich base for support of an effective program.

SUMMARY

The funding and organizational culture of the Portland Fire Department, with regard to fire prevention and community risk reduction, is focused operationally on mandated new construction plans review, inspections and tests with an ancillary approach to fire investigation and maintenance inspections of existing properties.

The current resources made available to the new construction plans review, inspection and test responsibilities of the Fire Prevention Bureau continue to foster backlogs and prioritizations in attempts to "catch up" with their workload. The Bureau consumes the

majority of the State mandated, 32-day turnaround time limit in the City's development authorization review process.

"In-service" fire companies complete the bulk of the fire prevention code inspections of existing properties. This process and the fire company's interaction with the current *Naviline* software program needs review so that all existing inspectable properties may be inspected annually with Bureau personnel completing a more frequent inspection of target hazards.

The Fire Investigation Team organization, in cooperation with the Portland Police Department, is doing an admirable job in their origin and cause determinations of fires, explosions and other related incidents.

The priority of Life and Fire Safety Education in the Department wanes. While enabled in the adopted City Code, this effort is not mentioned in the Department's budget, annual reports or organizational makeup.

The plans review, inspection, fire protection system test , fire investigation and life & fire safety education entities of the Portland Fire Department need to be organized in a manner, complemented by fire suppression forces and community coalitions, to address the City's fire problem in a coordinated effort.

This coordinated effort must include, among a number of things, the collection and analysis of all pertinent data resulting in regular management reports for the use of PFD policy makers in determining activities, trends and planning for all aspects of the Department.

The Department needs to "redesign" its fire prevention and risk reduction culture and organization to engage the Portland community as partners in life and fire safety.

RECOMMENDATIONS

11-1 The City and Fire Chief are encouraged to elevate and centralize the Fire Prevention Bureau to the Fire Prevention/Risk Reduction Division under the oversight of a dedicated Deputy Chief-Fire Marshal on Day Shift to include, at a minimum, Plans Review, Inspections, Fire Investigation and Life & Fire Safety Education.

11-2 The Fire Chief should redesign the Fire Prevention/Risk Reduction program to reflect the mission of the Department.

11-3 The Fire Chief should identify the number of fire prevention code inspectable properties.

11-4 The Fire Chief should establish an inspection frequency goal for all fire prevention code inspectable properties.

11-5 The City and Fire Chief should provide a dedicated Administrative Aide (Clerical and Administrative Support) to the Fire Prevention/Risk Reduction Bureau/Division.

11-6 The City and Fire Chief are encouraged to dedicate the current Plans Review Lieutenant to the PFD plans review activity without on-going inspection and test responsibilities.

11-7 The City and Fire Chief are encouraged to increase the full-time inspection staff by two inspectors to support "in-service" fire company inspectors and support of the new construction tests and inspections currently being accomplished by the Fire Prevention Captain.

11-8 The Fire Chief should assign the Fire Investigation program and on-call Fire Investigators to the proposed Deputy Chief-Fire Marshal.

11-9 The City and Fire Chief are encouraged to establish a Life and Fire Safety Education entity supervised by a Lieutenant under the oversight of the proposed Deputy Chief-Fire Marshal.

11-10 The Fire Chief should develop and cause to be implemented a program where "in-service" fire companies effectively and efficiently complete maintenance inspections of **all** Fire Prevention Code inspectable properties annually.

11-11 The City and Fire Chief are encouraged to complete an assessment of the current *Naviline* system as it relates to the fire code inspection process and compatibility with the Planning and Development Department's data base. This is especially

timely in concert with the City's current effort to streamline the permitting process.

11-12 The City and Fire Chief are encouraged to review the merits of assigning Fire Prevention Code Plans Reviewers to the Planning and Development, Inspection Division office to facilitate a more streamlined development authorization process.

11-13 The Fire Chief should document the number of plans review completed by the PFD.

11-14 The Fire Chief should initiate data collection and analysis to provide a resource for the Department to develop an effective fire prevention program, improve fire safety legislation, identify life and fire safety education programs, describe the City fire problems and evaluate fire protection capabilities.

11-15 The Fire Chief should initiate a policy where all fire company suppression and fire prevention officers successfully complete N.F.P.A 1031, *Standard for Professional Qualifications for Fire Inspector and Plans Examiner* certification.

11-16 The Fire Chief should initiate a policy where all Fire Investigators successfully complete N.F.P.A. 1033, *Standard for Professional Qualifications for Fire Investigator* certification.

11-17 The Fire Chief should develop and implement a formal fire investigation call out and standard operating guideline.

11-18 The Fire Chief should complete an analysis of the details of the fire protection system actuations, good intent calls and malicious false calls, that currently represent ten percent of all PFD emergency responses, to determine how they may be reduced.

CHAPTER TWELVE
COOPERATIVE SERVICES PROVISION

This Chapter explores and provides information on the various concepts of regionalization and applies those concepts to possible consolidation or regionalization opportunities for the City of Portland in Cumberland County.

This Chapter includes discussion regarding typical opportunities for fire and emergency services regionalization, including functional consolidation. It also explores the full consolidation alternative; associated fiscal impact; efficiency and effectiveness opportunities; and the impact of consolidation on personnel. The questions of what consolidation holds for personnel within the participating fire and EMS agencies and the municipality are also addressed.

In addition, this Chapter addresses the impact of regionalization on those served: the taxpayers, residents, and business people within the planning area. These consolidation options are presented irrespective of the various potential fire services delivery models that may be utilized or considered. Due to differing terminology, this Chapter utilizes "fire services delivery agency" to describe the name of various models.

POTENTIAL REGIONALIZATION BENEFITS

The focus of this review is to evaluate and assess opportunities for fire cooperation and consolidation in an effort to determine the potential for the following types of benefits:

1. Increased efficiency;
2. Improved effectiveness;
3. Seamless delivery of services;
4. Elimination of overlaps in positions;
5. Elimination of duplicate equipment;
6. Reduced response time for units dispatched;
7. Increased opportunity for staff specialization;
8. Upgrading recruit training programs;
9. Opportunity for increased promotional selectivity;
10. Increased promotional opportunity for personnel;
11. Potential revised perspective/outlook of personnel;

12. Enhanced or expanded services;
13. Improved safety of customers and services providers;
14. Reduced costs;
15. Improved incident command coverage;
16. Improved allocation and utilization of staffing;
17. Cost avoidance;
18. Coordination of planning;
19. Standardization of services and programs;
20. Improved and more effective training;
21. Potential improve ISO rating; and,
22. Impact on future state and federal grant funding.

Broadly speaking, the primary focus of this planning effort will be to assist in identifying **what is in the best interest of the customers being served by the fire services—the taxpayers, residents, property owners, and business owners/operators of the City of Portland**.

FUNCTIONAL CONSOLIDATION

Functional consolidation involves two or more fire and/or emergency medical services delivery agencies working together to either jointly or separately perform one or more functions in a fashion that shares resources and benefits. In other words, each fire services delivery agency still remains "whole" as a separate and independent entity, while allowing for the interchangeable use of equipment, facilities, and/or personnel throughout the organizations involved in the functional consolidation.

Functional consolidation can occur by one entity paying the other entity for services. Another approach in functional consolidation occurs when one fire services delivery agency agrees to perform a specific function if the other agency performs a function in exchange.

The purpose of functional consolidation is very similar to that of full consolidation:

1. Reduce duplication and redundancy;
2. Reduce the cost of providing services; and,
3. Improve levels of service without associated increased expenditures of tax funds.

Another reason why fire services delivery agencies and/or municipalities pursue functional consolidation is to take advantage of another fire services delivery agency's strengths, especially when one agency can provide certain services or perform certain functions that another may not be able to perform for fiscal or other reasons.

The remainder of this section reviews the various types of functional consolidation that have been implemented in one form or another in a number of other fire services delivery agencies throughout the United States.

Common Dispatching

The communications and dispatch function offers obvious opportunities for regionalization on the part of two or more fire services delivery agencies and/or police departments.

There is much work to be performed in creating consolidated communications and dispatch functions, as well as barriers to be eliminated. However, a large number of multiple fire services delivery agencies and/or police departments function at a significantly reduced cost through consolidated dispatching.

For a number of years, public safety agencies (police, fire, and emergency medical) have been served by a consolidated communications and dispatch center and, thereby, gained significant benefits and lead the way in this type of consolidation in Maine. The Study Team has assessed a number of municipal emergency dispatch centers with separate police and fire dispatch operations that incur increased cost of operations due to the separate approach. Consolidated or regional emergency dispatch centers have proven to be more cost effective when properly staffed and equipped.

Hazardous Materials Service Provision

The functional consolidation of specialty services can provide mutual benefits for fire services delivery agencies working together. Several of the special services are:

1. Hazmat team coverage;
2. Underwater rescue team coverage;
3. Building collapse/underground rescue team coverage;
4. Personnel/manpower squads; and,
5. Technical/heavy duty rescue.

The Portland Fire Department and/or South Portland Fire Department Hazmat Units provide these services in the region under the State-wide program. This is an excellent example of the type of functional consolidation that is mutually beneficial.

Many such services can be performed by various fire services delivery agencies and coalitions on a region-wide basis for the mutual benefit of all of the regional fire services delivery agencies involved. It would be cost-prohibitive and impractical for every fire services delivery agency to be self-sufficient in all these types of specialty services areas.

Fire Prevention Functions

For all jurisdictions, the building inspection and code enforcement responsibilities consume a great deal of time and are very technical functional areas. Although operating under the same State of Maine and codes, the various fire services delivery agencies perform these functions in different ways. In addition, where code interpretation is necessary, codes can easily be interpreted differently from one area of the municipality to the other.

Regionalizing certain or all aspects the fire prevention function resource commitments improves the level of service through consistent levels of service. Similar approaches are taken to the inspection of buildings as interpretation of State codes is applied.

Provision of Incident Command

It is essential that command-level coverage provided for the fire services delivery agencies be on a 24-hour-per-day basis. A major function that is essential to the success of every emergency incident is command supervision. This presence assures that all apparatus and personnel perform their functions and carry out the necessary tactics and strategy. Without command supervision to assure coordination and communication, potential safety issues develop. Command coverage does not stop at jurisdictional boundaries.

The concepts of command should be similar from one agency to another; therefore, functional consolidation in terms of development of shared, scheduled command duty is mutually beneficial to fire services delivery agencies. It can reduce the number of command officers necessary to perform the function. It can reduce the stress on current

command officers and the number of hours that they are required to work because of an inadequate number of command officers in the fire services delivery agency. Moreover, gaps in command coverage (day, night, weekend) can be covered by command officer/s from an on-duty or on-call adjacent agency.

Standard Incident Operating Procedures

A large number of emergency incident operating procedures are essential to the efficiency and effectiveness of fire and EMS crews, particularly during emergencies. It is important to maintain a standard approach adopted for the various types of procedures to assure cohesive performance. These same types of procedures exist in many fire services delivery agencies. If firefighters from different fire services delivery agencies are expected to work together successfully, they need to be following the same operating procedures in order to assure optimum success.

Mutually adopting the same incident operating procedures is as simple as working together toward their development and implementation. Subsequent to adoption, the procedures should be included in the departments' in-service training programs to assure that all personnel are fully aware of and follow the adopted procedures.

Apparatus Dispatch Assignments

Apparatus assignments refer to the number and type of apparatus dispatched on various types of incidents. Adopting the same apparatus assignments among multiple fire services delivery agencies goes hand-in-hand with the adoption of incident operating procedures.

Incident operating procedures are often based on a certain expectation regarding the number and type of apparatus to respond on specific types of incidents. With the consolidation of incident operating procedures, the apparatus assignments should also be consistent.

Availability of Reserve Apparatus

Every fire services delivery agency needs available apparatus to back up its primary units. However, the tendency is for fire services delivery agencies to view their reserve apparatus within the confines of their jurisdictional boundaries. The end result is, when viewed collectively, more apparatus is being maintained in reserve than would otherwise

be necessary if the fire services delivery agencies planned and used reserve apparatus in a joint manner.

Fire apparatus is very expensive in terms of maintenance, upkeep, and replacement. The deletion of one unit can present significant short- and long-term savings. In addition, there is less apparatus to clean and maintain in workable condition by on-duty firefighters.

Apparatus Type

The primary types of apparatus suggested for functional consolidation in this section are pumpers, ladder trucks, rescues and other specialty equipment. The Study Team noted during its review of the available apparatus (both in the departments involved in the Study, as well as surrounding fire services delivery agencies) that each department attempts to have a full complement of apparatus types. This results in fire services delivery agencies having both one or more pumpers and one or more trucks and rescues in their effort to provide a total cross-section of services within their own geographic boundaries.

Each of these units provides a specific type of service. That service can be provided equally well from a neighboring agency. Therefore, functional consolidation of types of apparatus would require fire services delivery agencies to review the types of apparatus needed and determine which units are required at every station and which ones can be provided from selected stations based on the agreed joint planning effort.

Major savings can be attained, both in terms of apparatus maintenance, upkeep and replacement as well as staffing with this type of joint planning effort. It should be noted that functional consolidation in the type of apparatus operated from different stations is supported by implementing dual response-type mutual aid, adopting standard apparatus assignment, and incident operating procedures.

Cooperative Provision of Training

Many fire services delivery agencies have one or more personnel assigned to the training function, either on a collateral duty basis or a full-time basis. Training activities are generally not dissimilar; however, if not coordinated in terms of the performance of joint

training activities on a regular basis, the implementation of inconsistent training programs is more likely to occur.

The development and delivery of a training program is very expensive. A significant amount of time, effort and funding are required to deliver quality training. Developing and delivering training to a large number of personnel provides opportunities for cost efficiency.

With collective consolidation training functions the same or better level of service can be provided to each jurisdiction on a more cooperative basis. It is through concentration of training staff resources that a higher level of training of officers becomes possible.

Pre-Fire Plan Development and Use

Progressive fire services delivery agencies develop detailed information regarding the design, construction and contents of target fire hazards within their area of responsibility. These pre-fire plans become the basis for resource allocation and fire attack decisions on major incidents. The consolidation of this function amongst several fire services delivery agencies insures that this information is readily available to all responding fire unit. The end result is improved operations and safety.

Fire Safety Education

As with the training function, fire safety education is more effective when it is performed consistently on a larger geographic basis. Multiple fire services delivery agencies would not be competing for the same media coverage or for public attention. Fire safety education programs are more successful if they are conducted in a planned large geographic area with the same message delivered in a concentrated manner over a defined period of time.

Consolidation of this function among adjoining fire services delivery agencies, with a focus on what messages will be delivered during specific times of the year, would have a stronger impact on the public. In addition, funds expended on public education media (such as slide/tape programs, movies, etc.) could have wider use, alleviating the need for two or more of the fire services delivery agencies to purchase the same fire safety education materials. Duplication and repetition are expensive practices in local governments.

Joint Purchasing in Quantity

It is a proven fact that items purchased in quantity offer potential savings. All fire services delivery agencies purchase similar items such as station maintenance materials, clothing and uniforms, protective clothing, office supplies, and other essential items. Fire services delivery agencies may attain significant savings through cooperative quantity purchasing.

FULL FIRE SERVICES DELIVERY AGENCY CONSOLIDATION

The difference between functional consolidation and full consolidation is that full consolidation results in the formation of a single fire services delivery agency organization. Creating one fully consolidated fire services delivery agency would bring about the following:

- One fire services delivery agency;
- One employer;
- One set of rules and regulations and/or standard operating procedures;
- One personnel management system;
- One union contract;
- One integrated chain-of-command; and,
- One work schedule.

Fiscal Impact — Savings

The potential for fiscal savings from consolidation is very high. The primary areas for savings involve the allocation of stations, personnel, and apparatus. A summary of areas for potential savings are:

- Reduction in annual operation and maintenance costs of duplicate fire stations;
- Increase in revenue from sale of buildings and land when fire stations are closed;
- Reduction in duplicate apparatus replacement costs;
- Reduction in annual apparatus operating and maintenance expense;
- Increase in revenue from sale of excess apparatus; and,
- Reduction in annual salaries and wages for duplicate personnel.

Another aspect of fiscal impact is the ability to utilize personnel on a broader basis. The cross-use of personnel by having the ability to detail firefighters and officers from one

station to another on a day-to-day basis provides for more consistent apparatus staffing levels and potential for reduced overtime costs.

At the present time, the potential participating fire services delivery agencies must negotiate a number of labor contracts on a periodic basis. Negotiating labor contracts is expensive, particularly if any aspects of those negotiations become litigated. The Study Team is not in a position at this time to estimate the cost savings by reducing the number of contracts to be negotiated. However, based on informal discussions, measurable cost savings are likely to be attained in this area.

FIRE SERVICES IMPROVEMENT BENEFITS

The national experience regarding regional fire services delivery indicates that major improvements in service to the public, or internal efficiencies that indirectly have a positive impact on the public, may be attained. Several key improvements typically include:

1. Improved fireground command and control communication;
2. Improved fireground operations by following the same standard operating procedures and working together as a team;
3. Reduced apparatus maintenance and upkeep required on the part of on-duty firefighters;
4. Reduced response times of apparatus, thus providing improved emergency service to incident scenes by dispatching the closest unit via mutual aid;
5. Improved customer and firefighter safety; and,
6. Improved dispatch function through improved incident command and control.

SUMMARY

In reviewing the concept of fire, rescue, and/or emergency dispatch consolidation or regionalization, as applied to the City of Portland and its fire and/or emergency dispatch services, it is clear that many important steps need to be taken by the City and the other participating services delivery agencies. The most important decision/s relate to the determination to consider and potentially implement an appropriate form/s of consolidation or regionalization.

Nationally, the study and implementation of various forms of fire, rescue, and dispatch consolidation or regionalization has clearly been the trend, particularly in the current difficult municipal fiscal climate. Likewise, discussion, study, and implementation of consolidation of these and other important municipal services in Maine is being viewed by many as a potential means for appropriate municipalities, such as the City of Portland, to provide improved services while at the same time gaining cost savings and efficiencies and savings.

Based on the National experience and that of the PSSi Study Team, it is clear that there are significant service improvement benefits, cost reduction, and avoidance opportunities that would benefit the taxpayers of the City of Portland resulting from implementation of fire, rescue, and/or emergency dispatch consolidation. Further, it is also clear that there are important benefits to be provided to the involved municipal services providers resulting from implementation of appropriate forms of consolidation, not the least of which is improved safety and delivery of services.

RECOMMENDATIONS

12-1 The City should consider implementing an appropriate form of fire protection services delivery regionalization with participating surrounding municipalities, potentially including South Portland, Scarborough, Westbrook and Falmouth.

12-2 The City should consider implementing an appropriate form of emergency medical services delivery regionalization with participating surrounding municipalities, potentially including South Portland, Scarborough, Westbrook and Falmouth.

12-3 The City should consider implementing an appropriate form of expanded emergency dispatch services delivery regionalization with participating surrounding municipalities, potentially including, Scarborough, Westbrook, Falmouth and others, as appropriate.

12-4 The City should consider expanding the regional planning effort with adjacent municipalities that could lead to substantial services delivery improvement and cost savings and/or avoidance.

CHAPTER THIRTEEN
VISION FOR THE FUTURE

This Chapter provides a suggested implementation plan and vision for the future for the City of Portland to consider. Clearly, the City and Fire Department need to make the final decisions on whether to implement changes and the timing of those changes. The City Manager should make the final decision on recommendations and timelines after gaining input from fire administration.

In developing this Fire Department Strategic Plan, the Study Team has drawn on its experiences as practitioners in fire departments, trained assessors with the Commission on Fire Accreditation International, chairpersons of International Association of Fire Chiefs (IAFC) committees, lecturers at John J. College, lecturers at Georgetown University School of Medicine, and consultants in fire departments of similar size to Portland, smaller agencies, and larger agencies to frame the findings and advisory recommendations for the City and the Portland Fire Department to consider.

There are nearly 170 recommendations in this Report. The firm typically suggests no more than 100 recommendations in public safety studies. The primary reason is for the detailed recommendations to be as specific as possible in terms of suggestions for the future.

TIMING

This plan should be viewed as a **strategic planning tool** during the next three to five years (2013-2018). The findings, observations and suggestions represent the professional judgment of the Study Team members at this time and are only **advisory in nature**. In the future, additional issues may need consideration; therefore, the plan should be used as a flexible guide for decisions relative to the management and provision of fire and emergency medical services.

For example, there may be changes in Port of Portland participation in fire/EMS funding, new demands on the PFD, increased risks in some areas, and changes in City policies on various public safety issues. Accordingly, this vision for the future should be utilized as a flexible document to be updated annually.

Moreover, in considering changes in the delivery of public safety services, incremental steps in some cases are necessary.

REVIEW OF REPORT

In public safety studies, the Study Team suggests a three-month period for a review of the findings and recommendations. One cannot expect to review several hundred pages of complex material and immediately decide on which suggestions, if any, to implement and the timing for change. Accordingly, the City Manager is encouraged to conduct a review of this report for up to three months.

As part of the review by the City Manager, the Fire Chief should be given an opportunity to provide input relative to any observations, findings and recommendations. Local #740 should also be provided the opportunity to comment on relevant issues.

As noted in all reports by the Study Team, it is important to view this report in its entirety, rather than identifying one or two issues, such as apparatus relocations, reductions in staff officer positions, or changes in the 24-hour shift schedule. The report should be seen as a seamless approach to expand qualitative and quantitative fire protection and emergency medical services for Portland stakeholders.

PORTLAND FIRE DEPARTMENT AT A CROSSROADS

The Portland Fire Department has a long history of providing quality fire, rescue, emergency medical and marine services in Portland. The Fire Department has been a regional and national leader in a number of fire and EMS service delivery areas, including the implementation of basic and advanced EMS transport service, implementation of mobile data terminals, and, more recently, consolidation of dispatch services.

The Fire Department appears to be at another crossroads in its history. The increasing cost of public safety services has been a major constraint on City of Portland administration and the City Council. Notwithstanding the fact that most cities are experiencing similar fiscal problems, there is substantial interest in keeping the best of the best and exploring new initiatives and alternatives to the delivery of qualitative services.

In the judgment of the Study Team, the Portland Fire Department has the opportunity to **act boldly**: continue its innovative philosophy and programs; refocus the resources and personnel to meet the needs of stakeholders in 2013 and beyond; seek additional funding streams; and actively pursue further partnerships with surrounding municipalities, State of Maine, and Federal officials to fund and protect Portland Harbor and surrounding waterways.

Fiscal constraints preclude public safety departments in many cases from continuing with "business as usual". The tax issues are requiring a reassessment of the often repeated seven-word phrase: "We have always done it that way".

IMPLEMENTATION OBSTACLES

It is not unusual for anyone to resist change. In public safety, personnel become accustomed to specific shifts, staffing models, days off, and assignments. As with other public safety studies, a number of the recommendations in this report were expressed by members of the PFD at all ranks and from stakeholders. Clearly, there will be resistance to someone losing a specific rank or being reassigned.

Although labor issues may surface, open communication and input should assist in "getting beyond" these types of implementation issues. In this regard, the Study Team believes that no employee should lose a job over the recommendations in this Performance Study. Rather, changes within the Fire Department should occur through reassignment and attrition.

ORGANIZATIONAL CHANGE

Organizational structures in fire and EMS agencies should be flexible meeting the unique management style of a fire chief and particular staff strengths. Some fire chiefs, for example, need strong senior subordinates so that the fire chief may work with stakeholders, officials and labor leaders, while other fire chiefs assign the community and labor relations duties to their senior staffs.

The current PFD organizational structure appears to be traditional and similar to other paid urban fire departments. A number of revisions are suggested. The primary changes relate to implementing an organizational structure that supports the provision of EMS services by the PFD and changes to operations with the implementation of deputy fire

chiefs on daywork and the initiation of two geographic services provision districts with field responsibility for EMS and special services, e.g., hazardous materials and marine services.

Programs to be Added or Deleted

There are a number of programs that are suggested for addition, deletion or significant modification. Those include:

1. Initiation of patient transport services with a fifth MEDCU;
2. Close one engine company;
3. Reduce Fire EMS Boat fleet
4. Staff Fire EMS Boat;
5. Reduce deputy chief to four;
6. Upgrade Fire Prevention Bureau;
7. Initiate platoon district chiefs;
8. Possible expansion of Portland Regional Communications Center; and,
9. Implement a City Emergency Operations Center.

Responsiveness to the Community

Based on stakeholder input and Study Team observations during the on-site work on this project, the Fire Department appears to need to enhance its relationship with the community and its various neighborhood organizations. A number of its programs, notably the public education programs, are a progressive partnership with members and organizations in the community. Participation of PFD staff in various city-wide and community organizations would serve the Fire Department well in its relation with the public.

POTENTIAL BENEFITS

In upgrading the personnel, operations, management and administration of a fire department, it is not possible to delineate all the positive outcomes. Improving the quality of life in a community and saving lives do not necessarily involve quantitative analysis.

A number of the anticipated returns on investment for the operations and management recommendations in this Study include:

1. Improved management of the Portland Fire Department by upgrading the senior uniformed staffing through programmatic oversight;
2. Improve platoon management through implementation of two district chiefs;
3. Increased pride in the organization;
4. Improved services to the island via dedicated staff assignment and upgraded boat services;
5. Upgraded utilization of special services capabilities through focused use of resources at the Bramhall Fire Station;
6. Decreased apparatus response time through sending closest units;
7. Reduced loss of time on the job through comprehensive firefighter safety programs;
8. Improved cost effectiveness through program revisions and reductions;
9. Improved EMS provision through increased number of MEDCUs;
10. Enhanced fire protection of buildings through fire prevention program improvements;
11. Improved responsiveness of PFD senior management via schedule changes;
12. Enhanced management of human resources;
13. Upgraded teamwork within the PFD via completion of EMS merger;
14. Improved cost effective service through automatic mutual aid;
15. Improved firefighter effectiveness through upgraded training;
16. Increased awareness, planning for major fire incidents, safety and improved effective use of firefighters through implementation of pre-fire planning by firefighters and officers in the fire stations;
17. Improved morale within the PFD;
18. Improved image of the PFD through program upgrades and accreditation;
19. Improved incident scene accountability;
20. More effective use of key senior staff members; and,
21. Enhanced status of the City being served by an accredited fire agency.

FISCAL IMPACTS

The non-personnel related fiscal impacts will depend on which, if any, recommendations are implemented by the City of Portland. The primary areas related to costs and savings (cost avoidance) include:

1. Upgrading the PFD fire station facilities;
2. Reducing the fire apparatus fleet;
3. Enhancing the fire and EMS services to the waterfront;
4. Implementing a two-boat fleet;
5. Reducing the number of emergency communications centers utilized and maintained;
6. Upgrading the officer development programs;
7. Implementing a two-district chief model;
8. Implementing an appropriate form of regionalization of EMS services;
9. Implementing an appropriate form of fire protection regionalization of services;
10. Implementing fire training program upgrades;
11. Implementing EMS training and certification program upgrades; and,
12. Implementing fire training program upgrades to National/State certification requirements.

Once the City decides on a specific course, internal finance personnel should be consulted to assess the fiscal impacts of any changes.

While a suggested time line is provided in Figure 13.1 as a guide for consideration of changes, the City Manager should make the final decisions relative to timing and customer orientation.

CUSTOMER ORIENTATION

In the judgment of the Study Team, the City of Portland is encouraged to embark on a course that will enhance the delivery of fire protection and EMS services. All decisions should be based on what is best for the customer in the City of Portland.

FIRE DEPARTMENT ACCREDITATION

Over a ten-year period, a committee of the IAFC, in cooperation with the International City Management Association, developed an analysis model for self-assessment fire departments and services. That fire department self-assessment process is now under the auspices of the Commission on Fire Accreditation International. The Study Team utilized portions of this model as a framework for this City of Portland Study to provide established criteria for review and the reader with information on the latest trends in the fire service.

In years past, standards available to the fire service have been the product of collaborative efforts involving organizations such as the National Fire Protection Association (NFPA). There have been other systems of standards and measurements for the fire and emergency services available; however, they were created to serve interests relating to the fire service, but not *specific* to the fire service. A good example of this type of process is the Insurance Services Office (ISO) grading schedule.

In 1988, the International City/County Management Association (ICMA) and the International Association of Fire Chiefs (IAFC) executive boards signed a memorandum of understanding that committed both organizations to the development of a voluntary national fire service accreditation system. Over a period of the intervening years, the framework for a fire department accreditation model was developed, beta test fire department accreditations were conducted, and an accreditation model was finalized and implemented under the management of the Commission on Fire Accreditation International.

The accreditation analysis categories included in the model are as follows:

1. Governance and Administration;
2. Assessment and Planning;

3. Goals and Objectives;
4. Financial Resources;
5. Programs;
6. Physical Resources;
7. Human Resources;
8. Training and Competency;
9. Essential Resources; and,
10. External Systems Relations.

The Study Team considered appropriate aspects of this CFAI accreditation model for this Study, and a member of the Team has been a peer fire department assessor. Additionally, the preparation made by the Portland Fire Department for this Study and the data and information collected is very similar to that necessary for the Fire Department to pursue accreditation.

As stated in the CFAI accreditation manual, the City and the Fire Department could benefit from becoming an accredited fire agency. Benefits include:

1. Further promotion of excellence in the Fire Department;
2. Quality improvement through self-assessment;
3. Provision of assurance to peers and the public that the Fire Department has defined missions and objectives and strives to go beyond them;
4. Identification of strengths and weaknesses within the PFD;
5. Provision of detailed evaluation of the PFD and its services;
6. Establishes a method or system for addressing deficiencies and building on the strong points;
7. Growth for the Fire Department and its personnel;
8. Establishment of a forum for the communication of management and leadership philosophies;
9. National recognition for the PFD by peers and the public;
10. Creation of a mechanism for developing concurrent documents, such as strategic and business plans and a "desktop manual" inclusive of all areas the PFD is involved in; and,
11. Further development of pride in the organization, from PFD members, community leaders and citizens.

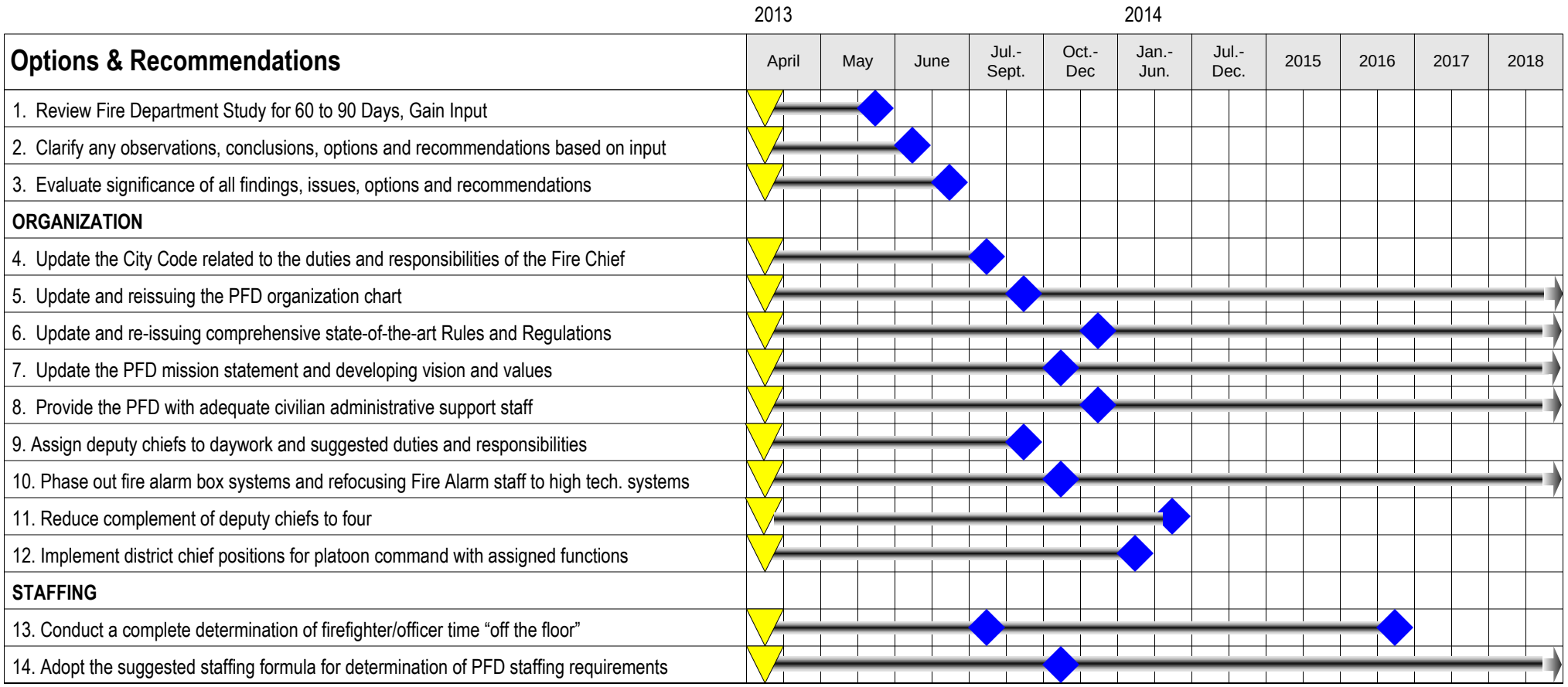
The Study Team recognizes that the Portland Fire Department exhibits a number of the characteristics of an excellent fire department. It appears that the City, the Fire Department, and stakeholders could benefit in many ways from the Portland Fire Department becoming an internationally accredited fire agency with the CFAI.

UPDATING THE PLAN

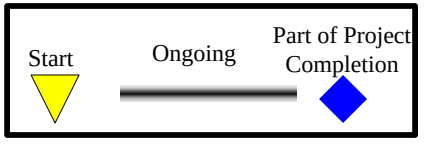
The City of Portland and the Portland Fire Department are encouraged to update this Plan each year. The update should include progress, obstacles, fiscal impacts, and anticipated outcomes.

City of Portland - Fire Department
Performance & Management Study
Suggested Timeline
Page One of Five

Figure 13.1



Legend

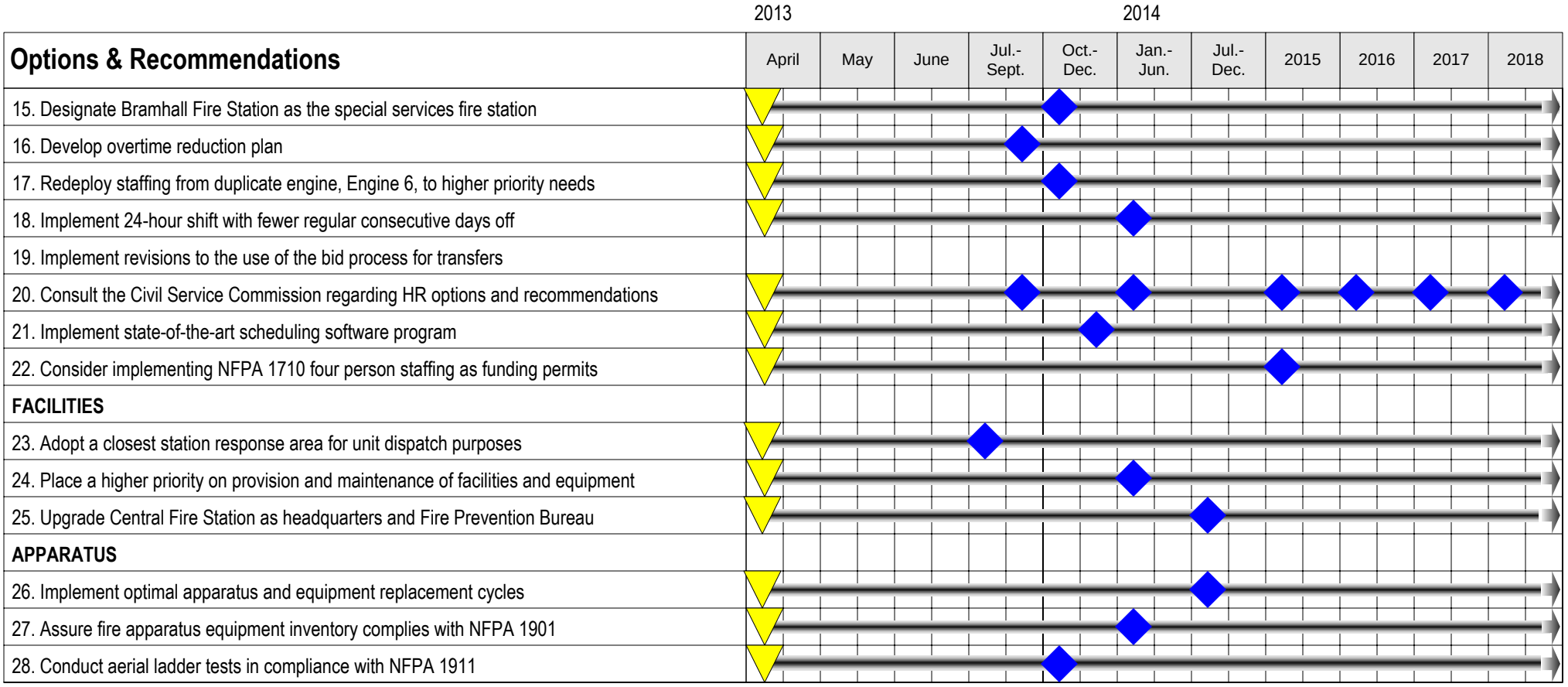


PSSi
PUBLIC SAFETY SOLUTIONS, INC.

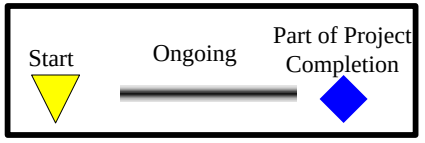
City of Portland - Fire Department
Performance & Management Study

Figure 13.1

Suggested Timeline
Page Two of Five



Legend



PSSi
PUBLIC SAFETY SOLUTIONS, INC.

City of Portland - Fire Department
Performance & Management Study
Suggested Timeline
Page Three of Five

Figure 13.1

Recommendations	April	May	June	Jul.-Sept.	Oct.-Dec.	Jan.-Jun.	Jul.-Dec.	2015	2016	2017	2018
	2013				2014						
EMERGENCY MEDICAL SERVICES											
29. Fully implement EMD operations to allow dispatch of the closest EMS units											
30. Implement a fifth MEDCU as a BLS transport unit to coincide with full EMD implementation											
31. Implement dedicated ALS delivery using fire apparatus											
32. Assign field platoon-level EMS oversight to district chief with ALS qualifications											
33. Staff MEDCUs 5 and 6 with EMT-Bs coinciding with dedicated ALS engine											
34. Increasing public education efforts with delivery of CPR training											
35. Initiating involvement in the State's Child Passenger Safety program											
36. Implement one of three NET Team options, abolishment, dedicated or peak demand BLS											
37. Implement Peaks Island minimum staffing as EMT-P											
OPERATIONS – FIRE BOAT & AIR RESCUE - COMMUNICATIONS											
38. Implement comprehensive computerized fire pre planning											
39. Revise the staffing and deployment approach to the Hazmat team											
40. Implement vehicle extrication with Rescue 1 and two engines											
41. Implement two-boat configuration with a fire EMS boat and a fast response rescue EMS boat											
42. Renovate the current Marine Division quarters for minimal safety needs											

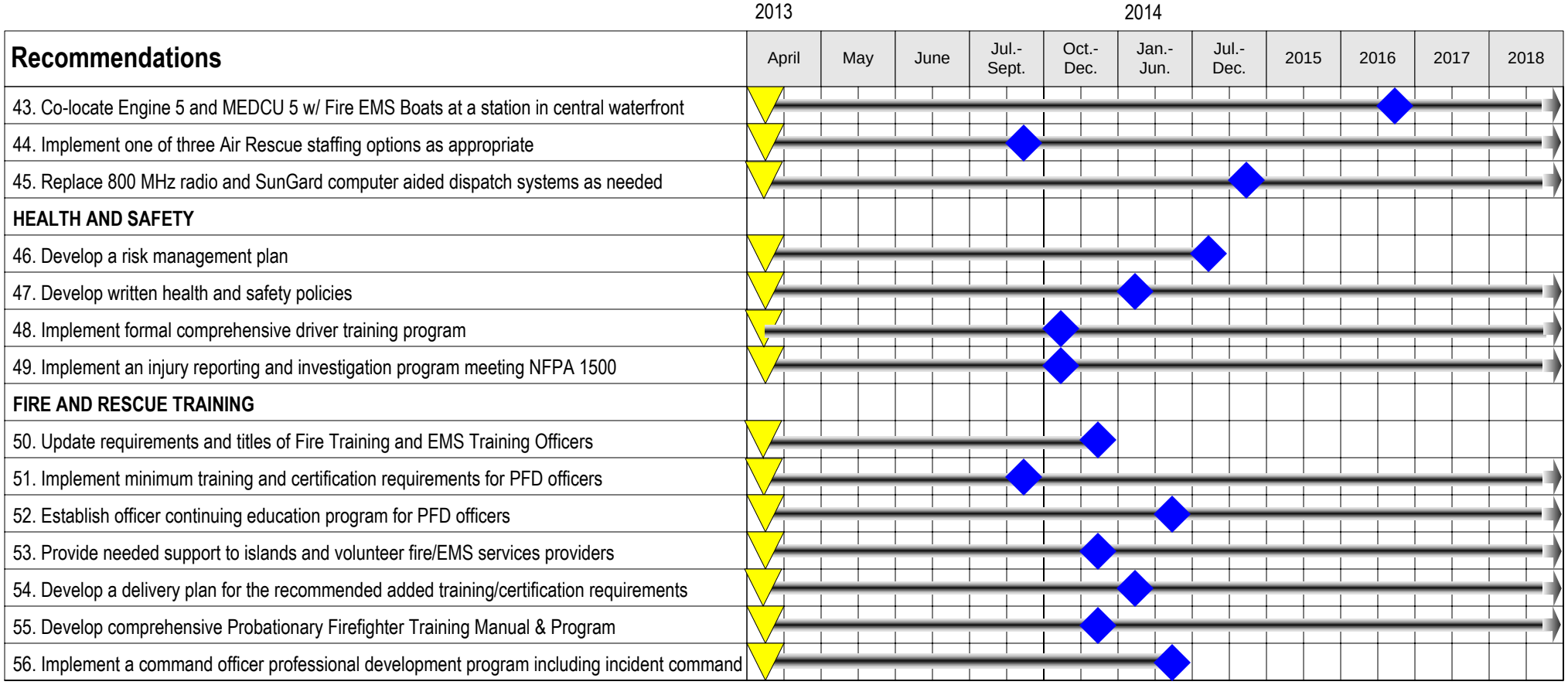
Legend

Start | Ongoing | Part of Project Completion

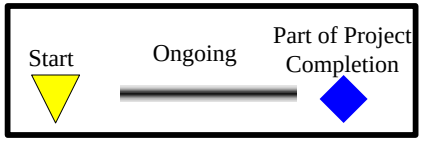
PSSi
PUBLIC SAFETY SOLUTIONS, INC.

City of Portland - Fire Department
Performance & Management Study
Suggested Timeline
Page Four of Five

Figure 13.1



Legend



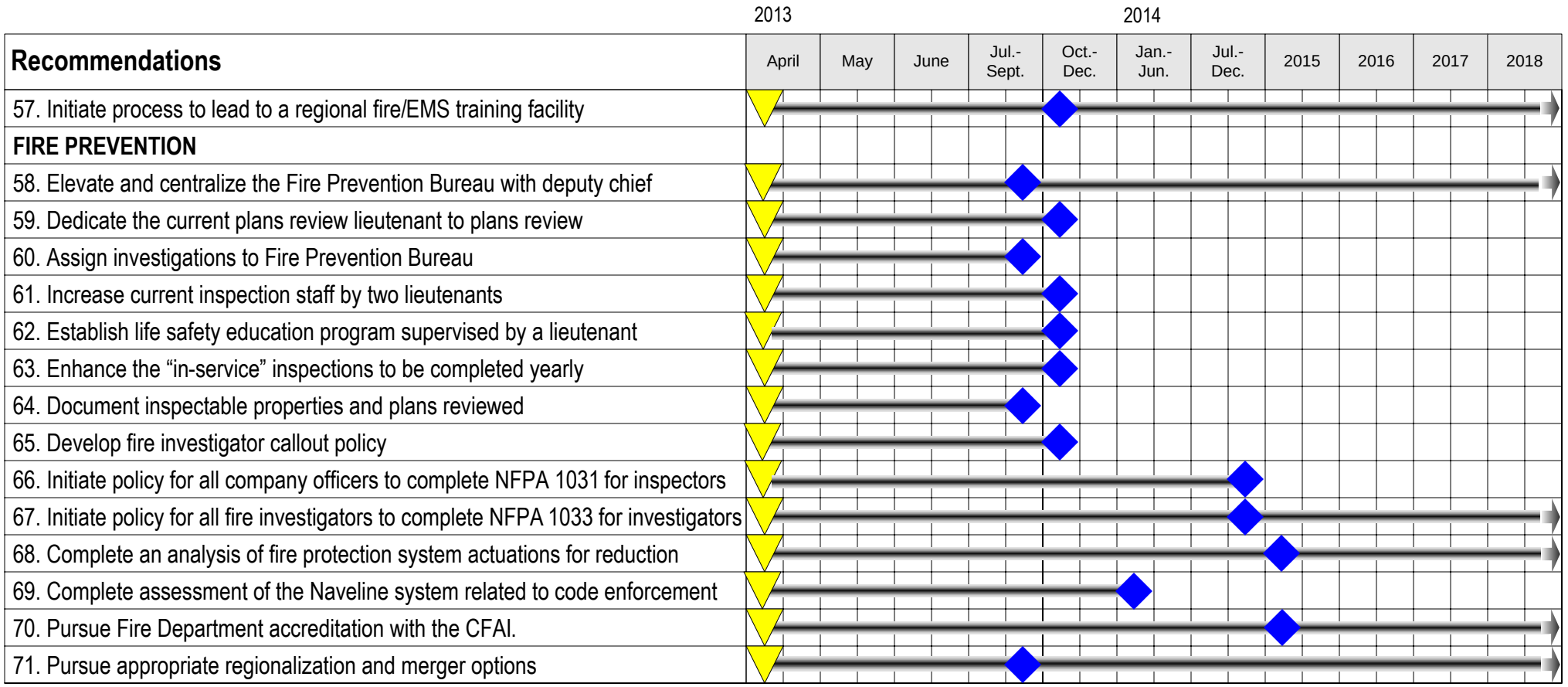
PSSi
PUBLIC SAFETY SOLUTIONS, INC.

City of Portland - Fire Department Performance & Management Study

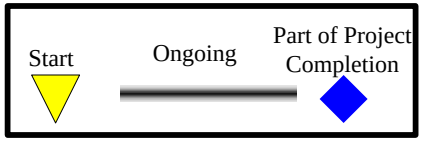
Figure 13.1

Suggested Timeline

Page Five of Five



Legend



PSSi
PUBLIC SAFETY SOLUTIONS, INC.

STUDY RECOMMENDATIONS

RECOMMENDATIONS — ORGANIZATION AND ADMINISTRATION

2-1 The City is encouraged to update City Code related to the duties and responsibilities of the Fire Chief.

2-2 The Fire Chief should develop an updated organization chart, including revisions made as a result of the implementation of appropriate options and recommendations set forth in this Study report.

2-3 The Fire Chief is encouraged to pursue the implementation of the upgrades in the organization structure of the PFD as outlined in this Study report.

2-4 The Fire Chief should consider the development of a revised mission statement and vision and values for the Portland Fire Department.

2-5 The City should consider providing an appropriate number of civilian administrative support staff to the PFD (at least an additional one for each major functional area, including operations, fire prevention and support services), as requested by the Fire Chief.

2-6 The Fire Chief should pursue refocusing the workload of the Fire Alarm Division to current and future high tech systems of the PFD and phasing out the antiquated fire box alarm systems throughout the City.

2-7 The Fire Chief should pursue assigning four of the PFD deputy chiefs to daywork assignments as recommended by this Study report; Operations, Fire Prevention, Support Services, and Emergency Management/Islands/Volunteer programs.

2-8 The City is encouraged to reduce the complement of PFD deputy fire chiefs by one position.

2-9 The City and Fire Chief should implement the recommended non-union district chief position to provide platoon command in two geographic/functional areas of the City: EMS and Special Services.

2-10 The Fire Chief is encouraged to designate the Bramhall Fire Station as the special services fire station.

2-11 The Fire Chief should pursue the provision of field EMS supervision as outlined in this Study report.

2-12 The City and the Fire Chief are encouraged to refocus the philosophy and resources of the PFD to the provision of life-saving as the primary service to be delivered, while maintaining a high priority on property protection through other related services, such as fire suppression, EMS, hazmat and code enforcement.

2-13 The Fire Chief is encouraged to establish and enhance the progressive approach to the assignment of important daily tasks to the chiefs and staff members of the fire stations.

2-14 The Fire Chief is encouraged to make full use of committees and cross-functional teams in the planning and implementation of appropriate PFD programs and tasks.

2-15 The Fire Chief should continue and strengthen the effort to development and implement a state-of-the-art policies and procedures for the PFD.

2-16 The City and Fire Chief should consider renaming the Portland Fire Department to the Portland Fire and Emergency Medical Services Department to more fully reflect the service provided today by the Department.

2-17 The City, Fire Chief and the Fire Department are encouraged to pursue accrediting the Portland Fire Department through the Commission on Fire Accreditation International model.

RECOMMENDATIONS — FIRE AND EMS SERVICES STAFFING

3-1 The City should consider adopting the suggested staffing formula for the determination of current and future staffing requirements for budget preparation purposes.

3-2 The City and Fire Chief should conduct a cost benefit analysis of staffing platoon assigned firefighter and officer positions with fulltime positions vs. overtime.

3-3 The City and Fire Chief should develop and implement an overtime reduction plan based on options and recommendations contained in this Study report.

3-4 The City and Fire Chief should consider conducting a complete determination of time "off the floor," including vacation, sick, training, on the job injuries, and details, for example, and use this data to accurately determine what its budgetary firefighter and officer position requirements are from year to year.

3-5 The City and Fire Chief should consider using the proposed staffing calculations formula for implementing reduced overtime expenditures.

3-6 The City and Fire Chief should consider apparatus staffing options at NFPA 1710 levels, four person engines and ladders, as PFD organizational changes are made and/or fiscal opportunities are available.

3-7 The City and Fire Chief should consider redeploying the staffing and associated capital and other costs from the duplicate engine (Engine 6) housed at the Bramhall Fire Station to higher priority staffing and financial needs of the PFD.

3-8 The Fire Chief is encouraged to evaluate the past personnel evaluation process, its successes and failures, and pursue appropriate revision of the process in order for a state-of-the-art process to be implemented with the resultant benefits for the employees and management.

3-9 The City and IAFF Local 740 are encouraged to implement a revised 24-hour work shift for platoon assigned uniformed personnel in order to attain improved cost effectiveness and reduce the number of regular consecutive days off, as suggested in this Study report.

3-10 The City and IAFF Local 740 are encouraged to make appropriate changes to the Transfers section related to the bid system, as soon as possible, or at the latest with the renegotiation of the Agreement at the end of 2013.

3-11 The City and Fire Chief should assure that there is a restriction (e.g., 36 or 48 consecutive hours) that an employee may be scheduled to work.

3-12 In pursuing implementation of these recommendations the Fire Chief should coordinate with the Civil Service Commission to assure consistency and proper involvement of the Commission with matters under consideration.

3-13 The City and Fire Chief should implement a state-of-the-art firefighter/officer scheduling program that automates the full process.

3-14 The City should integrate the PFD employee scheduling program with its payroll system for an improved, cost effective time-saving process.

3-15 As funding and priorities allow, the City should consider staffing engine and ladder companies to four, as provided in the NFPA 1710.

3-16 The City and IAFF Local 740 should work together to pursue methods to simplify the compensation approach called for in the Labor Agreement.

RECOMMENDATIONS — RISK ANALYSIS AND FACILITIES

4-1 The Fire Chief should consider adopting a closest station response area rather than the current apparatus based response districting.

4-2 The City should consider a railway crossing to assist apparatus response between the Northgate and Riverton Stations to provide greater coverage.

4-3 The Fire Chief should consider alternatives to the current first alarm assembly so that a greater geographic extent of the City can be reached with a safe level of firefighters and equipment.

4-4 The Fire Chief is encouraged to implement a policy to have no fire apparatus response to routine medical calls unless criteria, such as cardiac arrest, major trauma, etc., are determined by dispatch or lead medic on scene. See Chapter Six.

4-5 The Fire Chief should consider developing an initial response policy that dictates when lights and sirens are to be utilized for all unit types based upon criticality. It is unnecessary and dangerous to run 'hot' to every dispatch or to the hospital.

4-6 The City should replace the power generators located at the Munjoy and Bramhall fire stations.

4-7 The City and Fire Chief should consider placing a higher priority on the provision and maintenance of all fire station facilities and equipment.

4-8 The City and Fire Chief are encouraged to upgrade the Central Fire Stations, including the one-zone heating system, in preparation for the proposed revision of the functions to be supported by the facility; full service Fire Prevention functions and continuing service as PFD headquarters.

RECOMMENDATIONS — FIRE AND EMS APPARATUS

5-1 The City and Fire Chief should conduct an analysis of its current standard operating guidelines as they relate to apparatus and equipment acquisition and maintenance and associated safety considerations, as soon as practical.

5-2 The City and Fire Chief should develop and implement a formal, optimal replacement cycle policies for each of the key types of apparatus in the fleet using a recognized life cycle cost analysis technique.

5-3 The City and Fire Chief should develop and implement formal, optimal replacement cycle policies for required tools, appliances and equipment using a recognized life cycle cost analysis technique.

5-4 The City and Fire Chief should conduct an activity based cost analysis of PFD fleet maintenance and services as a basis to develop a process for distributing the cost of the vehicles and services consumed by each company and division.

5-5 The City and Fire Chief should conduct an activity based cost analysis of PFD tools, appliances and equipment maintenance and services as a basis to develop a process for distributing the cost of the tools, appliances and equipment consumed by each company and division.

5-6 The Fire Chief should develop and implement a Department-wide policy for the conservation of vehicle fuel.

5-7 Develop and implement a formal Marine Division boats, tools and equipment maintenance policy, including appropriate training for Marine Division personnel.

5-8 The Fire Chief is encouraged to conduct aerial ladder tests in compliance with N.F.PA., 1911, *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus*

5-9 The Fire Chief should confirm that all automotive fire apparatus equipment inventory is in compliance with N.F.P.A. 1901, *Standard for Automotive Fire Apparatus*.

5-10 The Fire Chief should consider assigning the PFD fire apparatus and equipment acquisition and maintenance oversight responsibility to a senior officer that is not required to manage a fire department rotating shift.

RECOMMENDATIONS — EMERGENCY MEDICAL SERVICES

6-1 The Fire Chief should increase PFD's public education efforts in the community by becoming more involved in the delivery of citizen CPR training. This training should be regularly scheduled throughout the community and be offered in a multilingual approach.

6-2 The Fire Chief should initiate the process for the PFD to become involved in the State's Child Passenger Safety program and become a Car Seat Inspection and Education Location for the City of Portland.

6-3 The Fire Chief should immediately begin work with the Medical Director and the communications center to fully implement EMD operations that will allow the dispatch of the closest EMS resources using a tiered response format based upon

call type. This recommendation includes the use of EMT-B staffed MEDCUs where appropriate.

6-4 The Fire Chief should utilize the PFD's Medical Director to the fullest extent possible including the continued evaluation of treatment protocols, the complete implementation of EMD, and the supportive desire to be on the "cutting edge" of pre-hospital care.

6-5 The Fire Chief should include the Medical Director position in the department's organization chart under the EMS Division.

6-6 The Fire Chief should develop a policy and procedure that standardizes the content format of the patient care narrative and develops a content template for provider use.

6-7 The Fire Chief should work with the ePCR software provider to enable the station officers (Captains and Lieutenants) to query the system for missing and incomplete reports so that those reports can be completed in a timely and correct manner.

6-8 The Fire Chief should immediately develop and implement a written QI plan that is approved by the Maine EMS Board.

6-9 The Fire Chief and the Portland Professional Firefighters IAFF Local 740 should work together to reduce the perceived and real animosity that exists between EMS providers and personnel assigned for fire apparatus.

6-10 The Fire Chief and the Local should work together to implement a program by which personnel are assigned to a fire station — not an individual unit. This program will require a revision to the current bid system so that personnel bid a station, not a unit.

6-11 The Fire Chief and the Local should work together to develop an EMS stipend program for EMT-Is and EMT-Ps whereby certified providers have to deliver said service on a MEDCU for a minimum number of hours over a pre-determined time period (e.g., 24 hours a month on a MEDCU – overtime hours can count toward the 24-hr-a-month requirement).

6-12 The Fire Chief should consider implementing dedicated ALS delivery using fire apparatus: this program should be piloted first by using Engine 9 and Ladder 4. The pilot program should be no less than 12 months.

6-13 The Fire Chief should assign one of the newly created District Chief positions to assume the most critical functions of the previous Car 10 position.

6-14 The Fire Chief should require the District Chief (with Car 10 duties) to be licensed as an ALS provider.

6-15 The Fire Chief should implement a fifth, full-time MEDCU as a BLS unit staffed with EMT-Bs and located either at the Riverton Station (Engine 9) or the East Deering Station (Engine 11). The unit should be ALS equipped, but not staffed at the ALS level. (This implementation may likely require the decommissioning of an engine company and the reallocation of that company's personnel.)

6-16 The Fire Chief must ensure that implementation of a fifth MEDCU as a BLS transport unit coincides with the full implementation of EMD thus allowing a BLS staffed unit to respond as a single unit to an Alpha call. If so desired, the implementation should coincide with the implementation of a paramedic engine company at the Riverton Station (Engine 9).

6-17 The Fire Chief should consider converting either MEDCU 5 or MEDCU 6 to a BLS unit equipped with ALS gear but staffed with EMT-Bs. This conversion could coincide with making Engine 5 a dedicated paramedic engine.

6-18 The Fire Chief must ensure that the creation of BLS transport units is coordinated and approved through the Medical Director.

6-19 The Fire Chief, with Medical Director approval, should implement one of three options concerning the NET Team:

1. Abolish the NET Team in its entirety.
2. Dedicate the NET Team solely to non-emergency transports and actively pursue the Barron Center business that the team once held.

3. Implement MEDCU 7 as a BLS unit from 0800 hrs to 2000 hrs each day as a "peak demand" unit. Staff the unit with EMT-Bs and dispatch it as part of the PFD's full complement of MEDCUs.

6-20 The Fire Chief should immediately begin using experienced firefighter/EMT-Ps as the minimum staffing requirement for the Peaks Island shift work firefighter. This also requires that the MEDCU on Peaks Island be stocked with a complete set of ALS equipment and supplies.

6-21 The Fire Chief and the City need to closely examine the current and future needs of EMT-Ps in the PFD and develop a plan/program for meeting those needs.

6-22 The Fire Chief and the City should consider including EMT-P certification as part of the hiring requirement; meaning that applicants must possess a National Registry EMT-P card in order to be considered for employment.

6-23 The Fire Chief and the Local need to establish a clear process for off-duty EMS-related training that is the same for all levels of EMS certification.

6-24 The Fire Chief should develop and implement an ALS internship program whereby new ALS providers are assigned to a field training officer for no less than a 6-week period during which time they must meet pre-established goals that are skill and confidence based. During the internship period, interns are not to count as minimum staffing.

6-25 The Fire Chief should implement a Field Training Educator on each platoon whose job is to assist the EMS Training Officer as needed and to deliver additional EMS training on his or her designated platoon. The Field Training Educator should be an ALS provider.

6-26 The Fire Chief should create an EMS Committee to serve as a means to examine the recommendations and to provide advisory input into implementation. The EMS Committee should be comprised of PFD management representatives, Local 740 representatives, the Medical Director (or designee), and a representative from the City's Health and Human Services Department. The committee should meet at least monthly in the beginning, with scheduling adjustment made as time passes and progress is made.

6-27 The City should continue to fund and support the delivery of EMS using the fire-based EMS approach; there should be no privatization of EMS delivery in the City.

RECOMMENDATIONS — OPERATIONS AND COMMUNICATIONS

7-1 The Fire Chief should assign one of the platoon commanders to oversee Special Operations program as a collateral duty.

7-2 The Fire Chief should require all personnel assigned to perform vehicle extrication rescue operations to be trained and certified to the applicable NFPA and/or the Maine State training standards.

7-3 The Fire Chief should consolidate all of rules, regulations, and procedures into a policy and procedure manual that addresses all aspects of the department's administrative and operational functions.

7-4 The City and Fire Chief should continue to maintain a substantial fire protection capability to the Portland waterfront, including the provision of fireboat services.

7-5 The Fire Chief should implement the revised term of Fire EMS Boat for the services provided by the Marine Division, consistent with the actual services provided and to avoid any related misunderstanding.

7-6 The City and Fire Chief should implement a two-boat approach to marine services delivery, as suggested in this Study report; a boat that provides fire and EMS services and a quick-response enclosed inflatable RIB type rescue boat for EMS transport services and shallow access to the various waterways.

7-7 The City is encouraged to continue the implementation of the renovation relating to the current Marine Division quarters in order to provide minimal needed safe quarters.

7-8 The City and Fire Chief are encouraged to staff the current daily Fire EMS Boat functions with three (3) uniformed personnel.

7-9 The City and Fire Chief are encouraged to provide paramedic staffing on Peaks Island to provide ALS level of care and firefighting support to the islands.

7-10 For the future, the City and Fire Chief are encouraged to pursue the co-location of the Marine Division and Engine 5 and MEDCU 5 from Central Fire Station in order to provide more rapid response of the Fire EMS Boats and the potential for cross-staffing of units co-located at a future fire EMS facility in the central waterfront area.

7-11 The City and Fire Chief should assist the Jetport in determining the appropriate level and schedule for the provision of staffing to the Air Rescue Division, with the reallocation of any staff not needed by the Jetport to other priority needs.

7-12 The Fire Chief should consider establishing a policies and procedures committee to provide consistency and coordination of the policy and procedure development process.

7-13 The Fire Chief should implement a comprehensive pre-fire planning program that address all of the moderate to severe target hazards in the City.

7-14 The Fire Chief should designate the Bramhall Fire Station as the special services fire station, as recommended in this Study report.

7-15 The Fire Chief should consider revising the staffing and deployment approach utilized by the Hazmat Team in order to provide a more cost effective, organized and rapid response of the Team.

7-16 The Fire Chief should implement the completion of pre fire plans on database accessibly via the mobile data terminals in apparatus.

7-17 The Fire Chief should identify another strategically located engine to provide extrication services in concert with extrication services units being located on Rescue 1 and Engine 11.

7-18 The City's and PRCC should continue the planning and replacing the current 800MHz radio system to current state-of-the-art digital trunking system standards and full interoperability with surrounding counties.

7-19 The City's and PRCC should continue to monitor the viability of the current SunGard computer aided dispatch system in order to properly plan for and implement and replacement when needed.

RECOMMENDATIONS — ISLAND VOLUNTEER FIRE/EMS SERVICES

8-1 Officials are encouraged to place periodic articles in local newspapers regarding activities of the volunteer component of the fire and rescue service.

8-2 A comprehensive volunteer recruitment and retention program should be developed. The program should be appropriately funded and include:

1. Length of service awards program or other pension program, as approved;
2. Recommendations for volunteer retention programs based on input received from the exit interview or forms;
3. Budget recommendation for the recruitment and retention programs;
4. Recommendations for volunteer recruitment programs, such as possible medical and dental care;
5. Volunteer handbook that can be given to prospective members of the fire departments, explaining the benefits and requirements of becoming a volunteer;
6. Programs focusing on retention of members during their first four years of membership; and,
7. Programs focusing on the recruitment and retention of volunteer members to participate in the provision of fire and rescue services.

8-3 The City and Fire Chief are encouraged to financially support the volunteer recruitment and retention efforts through annual budgetary funding.

8-4 The City and Fire Chief are encouraged to assign a firefighter paramedic to Peaks Island in order to provide ALS EMS services and firefighting support.

RECOMMENDATIONS — HEALTH AND SAFETY

9-1 The Fire Chief should consider using the results of the Study Team's work as a basis for development of a risk management plan.

9-2 The Fire Chief should develop a written safety and health policy and implement an organized and effective safety and health program.

9-3 The Fire Chief should develop and implement an injury reporting and investigation program that meets the requirements of NFPA 1500 and assists in identifying corrective measures needed to reduce the number and severity of firefighter injuries.

9-4 The Fire Chief should develop and implement a comprehensive written vehicle collision reporting policy that addresses all aspects of emergency vehicle collisions: driver training and certification; collision investigation and report writing; post-collision drug and alcohol screening; and driver remedial training.

9-5 The Fire Chief should appoint one of the department's chief officers as the department's Health and Safety Officer in accordance with NFPA 1500 and NFPA 1521 *Standard for Fire Department Safety Officer, 2013 Edition*.

9-6 The Safety Committee should be continued in all future agreements, with emphasis placed on regular (monthly or bi-monthly) meetings and clear lines of decision-making authority.

9-7 The Fire Chief should continue to revise the department's fire and EMS training programs with an emphasis placed on certification-based training. The current in-service training program should continue to expand to meet the needs of the officers, firefighters, and EMS providers of the department, all in compliance with NFPA 1500.

9-8 The Fire Chief should establish minimum training requirements for all officer ranks and should minimize the practice of "grandfathering" personnel who do not met the established training requirements.

9-9 The Fire Chief will need to work in cooperation with MFSI and the Local to develop a reasonable plan (in terms of logistics and timeframe) by which to implement the officer certification requirements.

9-10 The Fire Chief should develop and implement a comprehensive driver training program that meets the requirements of NFPA 1500 and Section 12-179, of Maine Department of Labor, Bureau of Labor Standards, Chapter 7: Minimum Driver Training Requirements for Fire Apparatus.

9-11 The Fire Chief should implement a protective clothing cleaning and maintenance program that complies with NFPA 1851 *Standard on Selection, Care, and Maintenance of Structural Fire Fighting Protection Ensembles, 2008 Edition*.

9-12 The Fire Chief must ensure that the department's policies and procedures are enforced on a regular and consistent basis across the four work platoons.

9-13 The Fire Chief should develop a comprehensive structure fire response procedure that meets the requirements set forth in NFPA 1500. This procedure should address the use of an initial 2-out team, the transition to a RIT operation, and a process by which a MAYDAY situation is managed.

9-14 The Fire Chief should ensure that the new structure fire response procedure requires the dispatch of both on-duty District Chiefs with the second arriving District Chief serving as the ISSO.

9-15 The Fire Chief should develop and implement a post incident analysis policy and procedure that is used for all significant fire/rescue/EMS incidents that occur within the City of Portland.

9-16 The Fire Chief and the City should begin immediate work to resolve the life safety code issues at the Central Station and at the fireboat crew quarters so that both facilities are brought into compliance with current City codes.

9-17 The Fire Chief should immediately ensure that carbon monoxide detectors are installed in all fire stations with at least one detector being installed in each sleeping quarters area.

9-18 The Fire Chief should immediately ensure that every fire station dormitory is equipped with working smoke detectors in compliance with all state and local codes.

9-19 The Fire Chief should ensure that each work site has a commercial grade washer and dryer dedicated to the laundering of station uniforms and personnel clothing.

9-20 The Fire Chief, in conjunction with the Safety Committee, should develop and implement a Facility Safety Inspection Program that complies with NFPA 1500 and ensures that a comprehensive safety inspection is completed at each PFD facility on at least a quarterly basis.

9-21 The City of Portland and the Fire Chief should implement an occupational medical plan in accordance with NFPA 1582 *Standard on Comprehensive Occupational Medical Program for Fire Departments*.

9-22 The Fire Chief should continue to encourage and support fitness activities such as the Stair Climb and the Firefighter Combat Challenge.

9-23 The Fire Chief and the Local should examine the annual fitness assessment program in terms of fitness requirements and measurement methods so that the program returns to a valid, useful program as part of a comprehensive approach to firefighter wellness.

9-24 The Fire Chief should review the current physical fitness program and begin implementing the changes needed to provide for the program to meet NFPA 1583 *Standard on Health-Related Fitness Program for Fire Fighters.*

9-25 The Fire Chief should work in conjunction with the Safety Committee to review the current practices regarding an employee assistance program, alcohol and substance abuse policy, and critical incident stress management.

9-26 The Fire Chief and the Local should work to develop a CISM response group comprised of PFD personnel (of all ranks) for the purpose of delivering CISM services to the members of the PFD.

9-27 The Fire Chief should immediately review PFD staffing practices on Peaks Island with the intent of eliminating the assignment of inexperienced personnel to that staffing assignment.

9-28 The Fire Chief should immediately develop clear, operational guidelines that provide direction to and expectations of the PFD employee assigned to Peaks Island. These guidelines need to include direction for the safe operation of equipment and apparatus, as well as providing direction for personal safety when working with the Island police officer at non-fire/EMS incidents.

9-29 The Fire Chief should work with the Local to develop and implement a process whereby personnel below the rank of Lieutenant are assigned to a station—not a unit—and those personnel are permitted rotation between the MEDCU riding assignments and fire apparatus riding assignments on a regular basis.

RECOMMENDATIONS — FIRE AND RESCUE TRAINING

10-1 The Fire Chief and the City should update the job description for the Training Officer and the position should be re-titled to "Fire Training Coordinator."

10-2 The Fire Chief and the City should update the job description for the EMS Training Officer and the position should be re-titled to "EMS Training Coordinator."

10-3 The Fire Chief should assign the role of PFD Training Officer to one of the Deputy Fire Chiefs with both the fire training and EMS training captains being assigned under that chief officer.

10-4 The Fire Chief should retain the Fire Training Coordinator (new title) as a captain's position with an added training requirement of Fire Instructor II.

10-5 The Fire Chief should retain the EMS Training Coordinator (new title) as a captain's position with an added training requirement of EMT-Paramedic Instructor Coordinator III.

10-6 The Training Officer should review the process by which all company-level training data are recorded, stored, and retrieved and implement the changes needed to bring recordkeeping more in line with ISO requirements.

10-7 The Fire Chief and the City should implement the following minimum training and certification requirements for PFD officers (career and volunteer):

1. Fire Chief

- Fire Officer II
- Hazmat First Responder Operations Level
- Fire Instructor I
- Emergency Vehicle Operator Course
- EMT – Basic
- Incident Management
- ICS 200, 300, 400, and 800
- 60 college credit hours in an accredited degree program or consider National Fire Academy – Executive Fire Officer (EFO) [completed or in progress]

2. Deputy Chief

- Fire Officer II
- Hazmat First Responder Operations Level
- Fire Instructor I
- Emergency Vehicle Operator Course
- Incident Management
- EMT-Basic (EMT-Paramedic for Deputy Chief of EMS)
- ICS 200, 300, 400, and 800
- 45 college credit hours in an accredited degree program or consider National Fire Academy – Executive Fire Officer (EFO) [completed or in progress]

3. District Chief

- Fire Officer II
- Hazmat First Responder Operations Level
- Fire Instructor I
- Emergency Vehicle Operator Course
- Incident Management

- EMT-Basic (EMT-Paramedic preferred)
- ICS 200, 300, 400, and 800
- 30 college credit hours in an accredited degree program

4. Captains & Lieutenants

- Fire Officer I
- Hazmat First Responder Operations Level
- Fire Instructor I
- Emergency Vehicle Operator Course
- EMT-Basic (EMT-Paramedic preferred)
- ICS 200 and 300
- 15 college credit hours in an accredited degree program

10-8 The Fire Chief should work with MFSI and the Portland Professional Fire Fighters Local 740 to develop a delivery plan for the training courses needed for the existing officers so that the officers have an opportunity to comply with the revised training and certification requirements.

10-9 The Fire Chief should establish a continuing education program for the officers of the department to keep pace with the changes in service delivery, technology, and leadership practices in the industry.

10-10 The Fire Chief should require all certificate-based training (Firefighter I and II, Fire Officer I and II, etc.) have a Fire Instructor II certified instructor serve as the lead instructor for the program. If support instructors are needed, then those support instructors are to be certified to at least the Fire Instructor I level.

10-11 The Fire Chief should complete a thorough review of the minimum training requirements needed to function on the islands as a volunteer responder and how such training is provided.

10-12 The Fire Chief should consider the creation of an "Interior" and "Exterior" firefighter certification for volunteer personnel on the islands.

10-13 The Fire Chief should develop and implement a Probationary Firefighter Training Manual/Program that provides (and evaluates) the knowledge, skills, and abilities needed for the job of PFD firefighter—career and volunteer.

10-14 The Fire Chief should develop and implement a command officer professional development program that includes initial training on incident command and incident scene safety for chief officer candidates and continuing education requirements for existing chief officers.

10-15 The Fire Chief should revise the department's company level drill program so that the program:

- Ensures that meaningful, multi-company drills are held at least six times a year and that these drills focus on the various emergency response activities that require multiple units to work together in order to mitigate an incident.
- Ensures that these drills also include the use of mutual aid agencies from the surrounding Portland area.
- Addresses the training goals and objectives of the PFD and its individual companies.

10-16 The Fire Chief should develop and implement an emergency vehicle driver training program and policy that is NFPA 1002 compliant and includes separate training and certification packages for each type of apparatus (MEDCU, pumper, ladder, heavy rescue squad, etc.)

10-17 The Fire Chief should work with the City to start the planning process for the design and construction of a fire/rescue training facility, possibly as a regional training center. At a minimum, the training facility should include classroom and practical skill evolution space capable of supporting two, simultaneous training events regardless of whether they are classroom or practical skill sessions.

RECOMMENDATIONS — FIRE PREVENTION PROGRAMS

11-1 The City and Fire Chief are encouraged to elevate and centralize the Fire Prevention Bureau to the Fire Prevention/Risk Reduction Division under the oversight of a dedicated Deputy Chief-Fire Marshal on Day Shift to include, at a minimum, Plans Review, Inspections, Fire Investigation and Life & Fire Safety Education.

11-2 The Fire Chief should redesign the Fire Prevention/Risk Reduction program to reflect the mission of the Department.

11-3 The Fire Chief should identify the number of fire prevention code inspectable properties.

11-4 The Fire Chief should establish an inspection frequency goal for all fire prevention code inspectable properties.

11-5 The City and Fire Chief should provide a dedicated Administrative Aide (Clerical and Administrative Support) to the Fire Prevention/Risk Reduction Bureau/ Division.

11-6 The City and Fire Chief are encouraged to dedicate the current Plans Review Lieutenant to the PFD plans review activity without on-going inspection and test responsibilities.

11-7 The City and Fire Chief are encouraged to increase the full-time inspection staff by two inspectors to support "in-service" fire company inspectors and support of the new construction tests and inspections currently being accomplished by the Fire Prevention Captain.

11-8 The Fire Chief should assign the Fire Investigation program and on-call Fire Investigators to the proposed Deputy Chief-Fire Marshal.

11-9 The City and Fire Chief are encouraged to establish a Life and Fire Safety Education entity supervised by a Lieutenant under the oversight of the proposed Deputy Chief-Fire Marshal.

11-10 The Fire Chief should develop and cause to be implemented a program where "in-service" fire companies effectively and efficiently complete maintenance inspections of **all** Fire Prevention Code inspectable properties annually.

11-11 The City and Fire Chief are encouraged to complete an assessment of the current *Naviline* system as it relates to the fire code inspection process and compatibility with the Planning and Development Department's data base. This is especially timely in concert with the City's current effort to streamline the permitting process.

11-12 The City and Fire Chief are encouraged to review the merits of assigning Fire Prevention Code Plans Reviewers to the Planning and Development, Inspection Division office to facilitate a more streamlined development authorization process.

11-13 The Fire Chief should document the number of plans review completed by the PFD.

11-14 The Fire Chief should initiate data collection and analysis to provide a resource for the Department to develop an effective fire prevention program, improve fire safety legislation, identify life and fire safety education programs, describe the City fire problems and evaluate fire protection capabilities.

11-15 The Fire Chief should initiate a policy where all fire company suppression and fire prevention officers successfully complete N.F.P.A 1031, *Standard for Professional Qualifications for Fire Inspector and Plans Examiner* certification.

11-16 The Fire Chief should initiate a policy where all Fire Investigators successfully complete N.F.P.A. 1033, *Standard for Professional Qualifications for Fire Investigator* certification.

11-17 The Fire Chief should develop and implement a formal fire investigation call out and standard operating guideline.

11-18 The Fire Chief should complete an analysis of the details of the fire protection system actuations, good intent calls and malicious false calls, that currently represent ten percent of all PFD emergency responses, to determine how they may be reduced.

RECOMMENDATIONS — COOPERATIVE SERVICES PROVISION

12-1 The City should consider implementing an appropriate form of fire protection services delivery regionalization with participating surrounding municipalities, potentially including South Portland, Scarborough, Westbrook and Falmouth.

12-2 The City should consider implementing an appropriate form of emergency medical services delivery regionalization with participating surrounding municipalities, potentially including South Portland, Scarborough, Westbrook and Falmouth.

12-3 The City should consider implementing an appropriate form of expanded emergency dispatch services delivery regionalization with participating surrounding municipalities, potentially including, Scarborough, Westbrook, Falmouth and others, as appropriate.

12-4 The City should consider expanding the regional planning effort with adjacent municipalities that could lead to substantial services delivery improvement and cost savings and/or avoidance.

APPENDIX A
POLICIES AND PROCEDURES TEMPLATE

	PORTLAND FIRE DEPARTMENT ***POLICIES AND PROCEDURES***	NO. 1 Page __ of __ DATE PFD Chief Approval

Appendix B

POLICIES AND PROCEDURES POLICY

PURPOSE

1.0 To require a manual for maintaining policies, procedures, organizational charts and other important information at all work sites, and prescribe the method for formatting, issuing and modifying these documents.

APPLICABILITY

2.0 All personnel and volunteers in the Portland Fire Department (PFD).

2.1 This policy was developed in cooperation with the International Association of Fire Fighters Local 740.

DEFINITIONS

3.0 PFD Chief: The head of PFD responsible for day-to-day command of the Department and supervision of the assigned career personnel and volunteers.

3.1 PFD: The acronym used to identify the Portland Fire Department that comprises career employees and volunteers.

3.2 Directive: A statement of policy or procedure issued by the PFD Chief.

3.3 Document Control Officer: The PFD employee assigned by the PFD Chief, responsible for policy and procedure review and development.

3.4 Form: A standardized document, usually electronically or pre-printed constructed to record or transmit specific information.

3.5 Information Bulletin: A statement issued by the head of any PFD organizational element to inform PFD employees of any matter of particular interest.

3.6 Manual: A term used in policies and procedures to refer to the PFD's Policies and Procedures Manual.

3.7 Personnel Actions: A PFD form used to announce PFD promotions, transfers, demotions, appointments, assignment of new hires, and separations.

3.8 Policies and Procedures Manual: A comprehensive collection of written PFD policies, procedures, and organizational information provided for the use of all PFD personnel. The Policies and Procedures Manual includes collections of ancillary controlling documents, such as a Directive Binder.

3.9 Safety Bulletin: A statement issued by the PFD Safety Officer to inform PFD employees of matters regarding worker health and safety.

3.10 Training Bulletin: A statement issued by the PFD Training Officer to inform PFD employees of training issues. A Training Bulletin may also be used internally by the Training Staff for training information relevant to instructors.

POLICY

4.0 The PFD Policies and Procedures Manual is the official method of documenting and collecting policies, procedures, organizational structure, functions, activities, and services of the PFD.

4.1 Documents in the PFD Policy and Procedures Manual do not supercede any part of any City of Portland policy and procedure.

4.2 Except for conflicts with the requirements of section 4.1 above, the Chief, PFD, in his or her sole discretion, may approve an exception to any PFD Policy and Procedure, Directive, or other controlling document or order issued within or by the Department.

4.3 All PFD Policies, Procedures, Directives, Forms, and Bulletins must be electronic using the "Arial 12 point" font.

4.4 Forms issued for use as part of the implementation of a policy or procedure must include:

1. A sequential number designator that includes: a two-letter designation indicating general organizational origin (e.g. AD = Administrative, EM = Emergency Medical Services, TR = Training, and OP = Operations, etc.), a four-digit abbreviation indicating the year issued, and three digits indicating the form number. If revised, the month and year of latest revision numerically follows the form number. For example, a form designated AD2009003 01/2013 indicates that it is an administrative form, issued in 2009, is form number 003, and was revised in January 2013;
2. A header, centered at the top of the first page of the form that includes the following information:
   - Portland Fire Department
   - Portland, Maine
   - Organizational Element (*Optional*)
   - Name of the Form

3. The PFD seal in the top left corner of the form. See Attachment 8.2 for a sample form.

4.5 Directives must be:

1. Formatted as the sample in Attachment 8.3;
2. Numbered sequentially by year and Directive number (e.g., 2013-3);
3. Issued on blue paper;
4. Posted on the station bulletin board for 30 days from the date of inception. After 30 days, Directives are to be placed in a Directives binder until rescinded. When rescinded, Directives are to be placed in an "Old Directives" station file for a period of twelve (12) months and then destroyed; and
5. Rescinded in writing by the Chief, PFD when no longer in effect, or include a cancellation date.

4.6 Information Bulletins must be:

1. Formatted as the sample in Attachment 8.4;
2. Numbered sequentially by year and Bulletin Number (e.g., 2013-6);
3. Issued on white paper;
4. Posted on the station bulletin board for 30 days, then maintained in a separate reading file for two (2) years.

4.7 Personnel Actions must be:

1. Formatted as the sample in Attachment 8.5;
2. Numbered sequentially by year and Personnel Action number (e.g., 2013-3);
3. Issued on golden rod paper; and
4. Posted on the station bulletin board for 30 days from the date of issuance, then maintained in a separate reading file for two (2) years.

4.8 Safety Bulletins must be:

1. Formatted as the sample in Attachment 8.6;
2. Numbered sequentially by year and Safety Bulletin number (e.g., 2013-3);
3. Issued on white paper; and
4. Posted on the station bulletin board for 30 days from the date of issuance, then placed in a permanent file for future reference.

4.9 Distribution of a new or revised document or page automatically cancels the existing issue of the same document or page and is identified by a new issue date and a cancellation section.

4.10 Development and revision of policies and procedures must be completed according to the flow chart in Attachment 8.0, unless otherwise noted in this policy.

RESPONSIBILTIES

5.0 All PFD personnel are responsible for:

1. Familiarizing themselves with and maintaining a constant awareness of the documents contained in the Policies and Procedures Manual;
2. Making suggestions for new or revised policies and procedures or other controlling documents which may be necessary or beneficial; and
3. Adhering to all PFD Policies and Procedures, Directives and other controlling documents.

5.1 Supervisory personnel are responsible for ensuring that subordinate personnel know and comply with all applicable Policies and Procedures, Directives and other controlling documents.

5.2 Station Captains are responsible for maintaining and updating the official station PFD Policy and Procedures Manual, and maintaining all Bulletins, Directives, Personnel Actions, and other forms and documents in the prescribed manner.

5.3 Deputy Chiefs and the heads of other PFD organizational elements are responsible for:

1. Assigning document numbers;
2. Maintaining master files of issued documents;
3. Forwarding all suggestions for new or revised policies and procedures to the Deputy Chief, via the chain of command; and
4. Reviewing and commenting on all other draft policies and procedures and directives in a timely fashion.

5.4 The Document Control Officer or designee is responsible for:

1. Coordinating all comments relating to the proposed documents or revisions to existing documents contained in the Policy and Procedure manual;
2. Maintaining files of all issued documents;
3. Coordinating support services; and
4. Annually reviewing the Policy and Procedure Manual.

PROCEDURE

6.0 Any PFD employee may forward a proposal to the Document Control Officer via the chain-of-command, to establish, revise, or modify a current policy or procedure.

6.1 The flow chart for preparation of documents is illustrated in Attachment 8.0 of this policy. The illustrated development process will be followed for all new or revised policies and procedures except those specifically reserved for negotiation under the Agreement between management and the employee bargaining unit.

6.2 Documents must be prepared in accordance with the format and standards contained in Attachment 8.1 of this policy. The originator must submit the word processed draft documents to his or her Deputy Chief via the chain-of command. Each level of the chain-of-command will provide appropriate comment and/or recommendation. The Deputy Chief will then forward the draft document to the Document Control Officer.

6.3 The Document Control Officer or designee will review the draft document for organization, conflict, and readability, making appropriate changes according to recommendations received from the chain-of-command.

6.4 The draft document will be circulated for comment according to the flow chart, Attachment 8.0. A revised draft document may be circulated one or more additional times if the comments received generate substantive changes to the original draft. Comments must be returned to the Document Control Officer within 30 days of distribution of the draft for each round of comments. The Deputy Chief, Bureau of Program Support Services may waive the 30-day comment deadline.

6.5 When sending draft documents out for comment, the Document Control Officer will distribute:

1. An electronic marked-up version containing the proposed changes with language to be deleted indicated by brackets and new language indicated by underline;
2. A clean copy incorporating the proposed changes with brackets and under-lines removed; and
3. Electronic copies of the marked up version and clean version as an email attachment.

6.6 After receiving input generated by the comment process, the Document Control Officer or designee will review the draft document comments, make final editorial changes, and prepare a final copy for the PFD Chief's signature.

6.7 Distribution of the approved document will then be made to all PFD work sites and Manual holders for inclusion in the Manual.

6.8 Once a new policy is distributed to the work sites, the officer-in-charge of the work site will have all PFD personnel and volunteers review the new policy.

6.9 Cancellation of documents will be done in writing and issued by the PFD Chief.

CANCELLATION

7.0 This policy cancels and replaces PFD Policy and Procedure No.__ entitled Policies and Procedures issued _____.

ATTACHMENTS

8.0 PFD Policy Development Flow Chart

8.1 Format and Standards Description

8.2 Sample Form

8.3 Safety Bulletin format (to be developed)

8.4 Training Bulletin format (to be developed)

8.5 Directive format (to be developed)

8.6 Information Bulletin format (to be developed)

8.7 Personnel Action format (to be developed)

8.8 Policies and Procedures format

Police, Fire and Dispatch Management Consultants
106 Schooner Way, Suite 110
Chester, Maryland 21619
(301) 580-1900