# BOS Work Session Presentation

# Introduction

a. Over the last two years, we've engaged the stakeholders within the Fire Rescue System to take a comprehensive look at our current services and capabilities, look at anticipated growth in the community and identify needs for the next 10 years
    i. Preliminary Consensus was the following:
        1. Need to develop with policy makers (BOS) a service expectation for the community.
        2. In support of that service expectation have a unified and comprehensive plan to assure the capabilities to meet the service delivery needs. Specifically:
            a. Staffing
            b. Apparatus
            c. Facilities
            d. Funding
        3. Develop annual Operational and Capital Improvement budget requests that support the Service expectation and service delivery needs.

# Current Overview

a. Service requests
    i. Definitions
        1. An “incident” is a specific event.
        2. An “incident” may call upon multiple units and stations due to size and complexity of the event and generate multiple “incident responses” or “runs”.

    ii. By Fiscal Year

        i. In FY 2020 10,802

        ii. In FY 2021 11,798

        iii. In FY 2022 13,219

        iv. In FY 2023 13,413

    iii. By Calendar Year

        i. In Calendar Year 2021 – there were 12,717 Fire and EMS incidents, a 17.4% increase from 2020.

        ii. In Calendar Year 2022 – there were 13,357 Fire and EMS incidents, a 5% increase from 2021.

        iii. In Calendar Year 2023 – there were 13,330 Fire and EMS incidents, essentially static with 2022.

**Frederick County Fire and Rescue Department**
**Incident Summary Statistics 2023**

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Incidents in Image Trend Reporting System | 1,093 | 1,012 | 1,202 | 1,177 | 1,150 | 1,101 | 1,116 | 1,155 | 1,098 | 1,125 | 1,159 | 1,230 | 13,618 |
| C.A.D. Generated Incidents Not Dispatched | 28 | 24 | 39 | 17 | 17 | 21 | 20 | 17 | 23 | 14 | 37 | 21 | 278 |
| Total Incidents Dispatched and Responded To | 1,065 | 988 | 1,163 | 1,160 | 1,123 | 1,080 | 1,096 | 1,138 | 1,075 | 1,111 | 1,122 | 1,209 | 13,330 |
| Average Incidents Per Day | 34.4 | 35.3 | 37.5 | 38.7 | 36.2 | 36.0 | 35.4 | 36.7 | 35.8 | 35.8 | 37.4 | 39.0 | 37 |
| Total E.M.S. Incidents | 873 | 758 | 903 | 904 | 883 | 846 | 880 | 892 | 822 | 903 | 875 | 1,006 | 10,545 |
| B.L.S. Transports | 344 | 319 | 375 | 375 | 362 | 307 | 360 | 357 | 374 | 367 | 355 | 432 | 4,327 |
| A.L.S. Transports | 273 | 230 | 271 | 289 | 235 | 298 | 290 | 300 | 239 | 304 | 282 | 322 | 3,333 |
| Patient Refusals | 124 | 79 | 108 | 109 | 115 | 110 | 121 | 127 | 103 | 93 | 95 | 112 | 1,296 |
| No Patients / Other | 132 | 130 | 149 | 131 | 171 | 131 | 109 | 108 | 106 | 139 | 143 | 140 | 1,589 |
| Total Motor Vehicle Crashes | 38 | 35 | 52 | 44 | 44 | 59 | 48 | 55 | 65 | 44 | 43 | 46 | 573 |
| Other Fire Related Type Incidents | 148 | 185 | 202 | 207 | 195 | 171 | 164 | 189 | 187 | 163 | 201 | 157 | 2,169 |
| Total Structure Fires (That Required Extinguishment) | 6 | 10 | 6 | 5 | 1 | 4 | 4 | 2 | 1 | 1 | 3 | 5 | 48 |
| Property Loss | 275,000 | 102,500 | 120,000 | 310,000 | 0 | 16,000 | 75,000 | 2,000 | 150,000 | 30,000 | 0 | 240,000 | 1,320,500 |
| *Not accurate as some reports did not include this information! | | | | | | | | | | | | | |
| Frederick County Fire and Rescue A.L.S. #10 | 22 | 20 | 22 | 16 | 16 | 13 | 17 | 13 | 13 | 24 | 32 | 33 | 241 |
| Stephens City Volunteer Fire and Rescue Co., Inc. | 241 | 222 | 289 | 284 | 294 | 296 | 296 | 269 | 266 | 259 | 253 | 288 | 3,257 |
| Middletown Volunteer Fire and Rescue Co., Inc. | 94 | 76 | 103 | 89 | 85 | 94 | 84 | 93 | 90 | 95 | 80 | 83 | 1,066 |
| Clear Brook Volunteer Fire and Rescue Co., Inc. | 145 | 133 | 174 | 157 | 157 | 143 | 141 | 162 | 147 | 161 | 143 | 173 | 1,836 |
| Gore Volunteer Fire and Rescue Co., Inc. | 48 | 44 | 43 | 46 | 41 | 48 | 23 | 51 | 43 | 39 | 34 | 54 | 514 |
| Round Hill Community Vol. Fire and Rescue Co., Inc. | 167 | 168 | 184 | 198 | 167 | 151 | 168 | 180 | 192 | 176 | 168 | 219 | 2,138 |
| Gainesboro Volunteer Fire and Rescue Co., Inc. | 86 | 83 | 77 | 101 | 83 | 77 | 75 | 83 | 79 | 77 | 76 | 85 | 982 |
| - Frederick County Fire and Rescue A.L.S. #1 | 56 | 39 | 45 | 71 | 36 | 44 | 39 | 44 | 34 | 46 | 66 | 52 | 572 |
| Star Tannery Volunteer Fire and Rescue Co., Inc. | 14 | 19 | 20 | 26 | 31 | 26 | 15 | 20 | 33 | 24 | 19 | 25 | 272 |
| Greenwood Volunteer Fire and Rescue Co., Inc. | 277 | 273 | 264 | 267 | 253 | 252 | 251 | 283 | 235 | 274 | 293 | 282 | 3,204 |
| North Mountain Volunteer Fire and Rescue Co., Inc. | 50 | 51 | 57 | 69 | 54 | 57 | 44 | 69 | 58 | 55 | 48 | 52 | 664 |
| Reynolds Store Volunteer Fire and Rescue Co., Inc. | 44 | 40 | 44 | 54 | 36 | 42 | 48 | 55 | 37 | 37 | 42 | 39 | 518 |
| Millwood Station Volunteer Fire and Rescue Co., Inc. | 158 | 159 | 204 | 193 | 177 | 180 | 191 | 169 | 170 | 164 | 184 | 196 | 2,145 |
| Incident Reports Less Than 85% Complete | 9 | 4 | 7 | 7 | 19 | 7 | 6 | 10 | 6 | 9 | 10 | 5 | 99 |

**Frederick County Fire and Rescue Department**
**Incident Summary Statistics 2022**

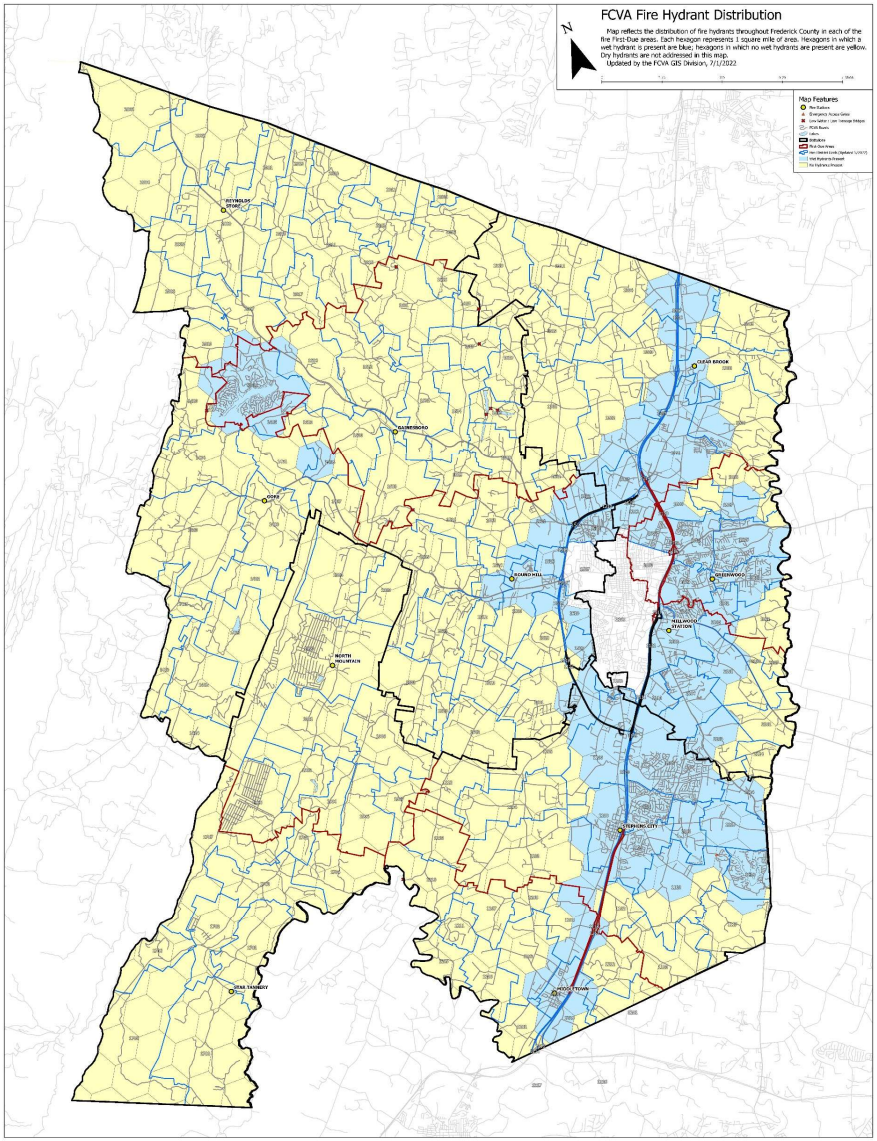
| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Incidents in Image Trend Reporting System | 1,186 | 912 | 1,114 | 1,081 | 1,155 | 1,202 | 1,179 | 1,109 | 1,177 | 1,088 | 1,049 | 1,402 | 13,654 |
| C.A.D. Generated Incidents Not Dispatched | 21 | 16 | 23 | 18 | 23 | 26 | 24 | 29 | 35 | 33 | 27 | 22 | 297 |
| Total Incidents Dispatched and Responded To | 1,165 | 896 | 1,091 | 1,063 | 1,132 | 1,176 | 1,155 | 1,080 | 1,142 | 1,055 | 1,022 | 1,380 | 13,357 |
| Average Incidents Per Day | 37.6 | 32.0 | 35.2 | 35.4 | 36.5 | 39.2 | 37.3 | 34.8 | 38.1 | 34.0 | 34.1 | 44.5 | 37 |
| Total E.M.S. Incidents | 915 | 696 | 836 | 828 | 896 | 895 | 886 | 849 | 917 | 826 | 810 | 991 | 10,345 |
| B.L.S. Transports | 383 | 295 | 351 | 327 | 327 | 355 | 373 | 337 | 391 | 340 | 336 | 410 | 4,225 |
| A.L.S. Transports | 270 | 190 | 254 | 230 | 277 | 263 | 256 | 260 | 249 | 238 | 255 | 295 | 3,037 |
| Patient Refusals | 120 | 98 | 104 | 110 | 105 | 108 | 109 | 114 | 117 | 117 | 78 | 107 | 1,287 |
| No Patients / Other | 142 | 113 | 127 | 161 | 187 | 169 | 148 | 138 | 160 | 131 | 141 | 179 | 1,796 |
| Total Motor Vehicle Crashes | 21 | 33 | 51 | 37 | 47 | 56 | 41 | 41 | 54 | 53 | 47 | 52 | 533 |
| Other Fire Related Type Incidents | 229 | 160 | 197 | 187 | 190 | 217 | 225 | 184 | 169 | 170 | 158 | 328 | 2,414 |
| Total Structure Fires (That Required Extinguishment) | 11 | 7 | 7 | 11 | 3 | 8 | 3 | 6 | 2 | 6 | 7 | 9 | 80 |
| Property Loss | 136,500 | 80,500 | 167,250 | 259,835 | 100,500 | 451,500 | 0 | 137,200 | 0 | 70,500 | 701,000 | 137,900 | 2,242,685 |
| *Not accurate as some reports did not include this information! | | | | | | | | | | | | | |
| Frederick County Fire and Rescue A.L.S. #10 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 26 | 31 | 17 | 20 | 32 | 155 |
| Stephens City Volunteer Fire and Rescue Co., Inc. | 301 | 217 | 293 | 225 | 281 | 291 | 256 | 269 | 293 | 248 | 235 | 325 | 3,234 |
| Middletown Volunteer Fire and Rescue Co., Inc. | 88 | 71 | 99 | 82 | 98 | 97 | 81 | 96 | 103 | 90 | 92 | 119 | 1,116 |
| Clear Brook Volunteer Fire and Rescue Co., Inc. | 174 | 142 | 169 | 168 | 129 | 160 | 179 | 173 | 126 | 140 | 155 | 187 | 1,902 |
| Gore Volunteer Fire and Rescue Co., Inc. | 33 | 51 | 46 | 53 | 34 | 53 | 52 | 30 | 44 | 48 | 51 | 64 | 559 |
| Round Hill Community Vol. Fire and Rescue Co., Inc. | 203 | 153 | 188 | 226 | 197 | 202 | 194 | 173 | 201 | 189 | 153 | 225 | 2,304 |
| Gainesboro Volunteer Fire and Rescue Co., Inc. | 80 | 73 | 70 | 74 | 72 | 111 | 84 | 64 | 63 | 69 | 94 | 111 | 965 |
| - Frederick County Fire and Rescue A.L.S. #1 | 57 | 43 | 60 | 67 | 51 | 54 | 57 | 36 | 43 | 44 | 57 | 61 | 630 |
| Star Tannery Volunteer Fire and Rescue Co., Inc. | 21 | 24 | 20 | 25 | 23 | 12 | 38 | 23 | 19 | 22 | 20 | 42 | 289 |
| Greenwood Volunteer Fire and Rescue Co., Inc. | 313 | 189 | 259 | 269 | 297 | 284 | 278 | 271 | 272 | 273 | 236 | 306 | 3,247 |
| North Mountain Volunteer Fire and Rescue Co., Inc. | 47 | 52 | 63 | 57 | 55 | 47 | 64 | 47 | 51 | 41 | 55 | 87 | 666 |
| Reynolds Store Volunteer Fire and Rescue Co., Inc. | 46 | 30 | 39 | 47 | 31 | 66 | 51 | 34 | 28 | 29 | 47 | 66 | 514 |
| Millwood Station Volunteer Fire and Rescue Co., Inc. | 200 | 154 | 195 | 177 | 208 | 199 | 177 | 213 | 203 | 180 | 161 | 244 | 2,311 |
| Incident Reports Less Than 85% Complete | 4 | 14 | 7 | 4 | 17 | 20 | 27 | 7 | 6 | 9 | 10 | 10 | 135 |

**Frederick County Fire and Rescue Department**
**Incident Summary Statistics 2021**

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Incidents in Image Trend Reporting System | 1,013 | 940 | 1,059 | 1,025 | 1,018 | 1,072 | 1,049 | 1,143 | 1,098 | 1,151 | 1,137 | 1,246 | 12,951 |
| C.A.D. Generated Incidents Not Dispatched | 10 | 16 | 22 | 26 | 19 | 17 | 19 | 15 | 24 | 17 | 25 | 24 | 234 |
| Total Incidents Dispatched and Responded To | 1,003 | 924 | 1,037 | 999 | 999 | 1,055 | 1,030 | 1,128 | 1,074 | 1,134 | 1,112 | 1,222 | 12,717 |
| Average Incidents Per Day | 32.4 | 33.0 | 33.4 | 33.3 | 32.2 | 34.0 | 33.2 | 36.4 | 35.8 | 36.6 | 37.1 | 39.4 | 35 |
| Total E.M.S. Incidents | 807 | 703 | 766 | 749 | 776 | 844 | 818 | 905 | 873 | 897 | 875 | 960 | 9,973 |
| B.L.S. Transports | 364 | 296 | 273 | 288 | 286 | 340 | 294 | 391 | 365 | 392 | 358 | 405 | 4,052 |
| A.L.S. Transports | 253 | 206 | 266 | 258 | 293 | 272 | 295 | 268 | 283 | 233 | 270 | 286 | 3,183 |
| Patient Refusals | 82 | 85 | 95 | 96 | 97 | 89 | 95 | 110 | 117 | 108 | 96 | 125 | 1,195 |
| No Patients / Other | 108 | 116 | 132 | 107 | 100 | 143 | 134 | 136 | 108 | 164 | 151 | 144 | 1,543 |
| Total Motor Vehicle Crashes | 38 | 37 | 36 | 28 | 45 | 51 | 48 | 41 | 50 | 50 | 51 | 58 | 533 |
| Other Fire Related Type Incidents | 151 | 176 | 224 | 215 | 174 | 151 | 158 | 177 | 148 | 178 | 179 | 193 | 2,124 |
| Total Structure Fires (That Required Extinguishment) | 7 | 8 | 11 | 7 | 4 | 9 | 6 | 5 | 3 | 9 | 7 | 11 | 87 |
| Property Loss | 25,500 | 265,600 | 370,000 | 1,500 | 100,000 | 155,000 | 205,000 | 153,000 | 250,000 | 179,000 | 120,000 | 289,950 | 2,114,550 |
| *Not accurate as some reports did not include this information! | | | | | | | | | | | | | |
| Stephens City Volunteer Fire and Rescue Co., Inc. | 229 | 257 | 243 | 244 | 227 | 268 | 238 | 276 | 281 | 290 | 289 | 294 | 3,136 |
| Middletown Volunteer Fire and Rescue Co., Inc. | 80 | 85 | 85 | 77 | 101 | 100 | 92 | 93 | 80 | 106 | 87 | 106 | 1,092 |
| Clear Brook Volunteer Fire and Rescue Co., Inc. | 134 | 124 | 137 | 146 | 131 | 145 | 162 | 163 | 141 | 151 | 160 | 198 | 1,792 |
| Gore Volunteer Fire and Rescue Co., Inc. | 32 | 31 | 47 | 45 | 28 | 37 | 34 | 54 | 47 | 35 | 66 | 63 | 519 |
| Round Hill Community Vol. Fire and Rescue Co., Inc. | 171 | 152 | 168 | 165 | 180 | 158 | 183 | 189 | 179 | 180 | 194 | 199 | 2,118 |
| Gainesboro Volunteer Fire and Rescue Co., Inc. | 68 | 60 | 89 | 72 | 66 | 57 | 69 | 74 | 79 | 63 | 78 | 87 | 862 |
| Star Tannery Volunteer Fire and Rescue Co., Inc. | 27 | 14 | 21 | 23 | 26 | 21 | 14 | 24 | 9 | 24 | 22 | 37 | 262 |
| Greenwood Volunteer Fire and Rescue Co., Inc. | 255 | 206 | 264 | 206 | 247 | 239 | 243 | 237 | 244 | 294 | 269 | 311 | 3,015 |
| North Mountain Volunteer Fire and Rescue Co., Inc. | 46 | 41 | 48 | 57 | 42 | 47 | 49 | 60 | 51 | 55 | 53 | 58 | 607 |
| Reynolds Store Volunteer Fire and Rescue Co., Inc. | 29 | 24 | 45 | 46 | 29 | 38 | 46 | 45 | 42 | 35 | 41 | 48 | 468 |
| Millwood Station Volunteer Fire and Rescue Co., Inc. | 173 | 166 | 161 | 198 | 188 | 171 | 183 | 193 | 182 | 210 | 199 | 235 | 2,259 |
| Incident Reports Less Than 85% Complete | 10 | 3 | 12 | 7 | 5 | 11 | 5 | 14 | 4 | 4 | 10 | 14 | 99 |

**Frederick County Fire and Rescue Department**
**Incident Summary Statistics 2020**

| | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Incidents in Image Trend Reporting System | 925 | 846 | 884 | 750 | 821 | 920 | 1,004 | 992 | 913 | 917 | 1,063 | 1,001 | 11,036 |
| C.A.D. Generated Incidents Not Dispatched | 19 | 15 | 21 | 9 | 18 | 17 | 16 | 13 | 14 | 16 | 23 | 22 | 203 |
| Total Incidents Dispatched and Responded To | 906 | 831 | 863 | 741 | 803 | 903 | 988 | 979 | 899 | 901 | 1,040 | 979 | 10,833 |
| Average Incidents Per Day | 29.2 | 28.6 | 27.8 | 24.7 | 25.9 | 30.1 | 31.9 | 31.6 | 29.9 | 29.1 | 34.7 | 31.6 | 29 |
| Total E.M.S. Incidents | 729 | 620 | 657 | 547 | 626 | 722 | 760 | 777 | 708 | 698 | 755 | 786 | 8,385 |
| B.L.S. Transports | 304 | 275 | 291 | 227 | 273 | 307 | 309 | 321 | 291 | 276 | 270 | 347 | 3,491 |
| A.L.S. Transports | 261 | 207 | 209 | 149 | 185 | 218 | 251 | 264 | 236 | 243 | 270 | 243 | 2,736 |
| Patient Refusals | 72 | 65 | 85 | 87 | 90 | 86 | 100 | 87 | 93 | 71 | 96 | 91 | 1,023 |
| No Patients / Other | 92 | 73 | 72 | 84 | 78 | 111 | 100 | 105 | 88 | 108 | 119 | 105 | 1,135 |
| Total Motor Vehicle Crashes | 34 | 24 | 31 | 26 | 30 | 43 | 43 | 38 | 32 | 46 | 46 | 40 | 433 |
| Other Fire Related Type Incidents | 136 | 178 | 168 | 162 | 141 | 133 | 181 | 160 | 154 | 156 | 229 | 148 | 1,946 |
| Total Structure Fires (That Required Extinguishment) | 7 | 9 | 7 | 6 | 6 | 5 | 4 | 4 | 5 | 1 | 10 | 5 | 69 |
| Property Loss | 1,000 | 141,000 | 221,050 | 40,000 | 2,000 | 9,000 | 95,000 | 20,000 | 0 | 5,000 | 70,250 | 10,000 | 614,300 |
| *Not accurate as some reports did not include this information! | | | | | | | | | | | | | |
| Stephens City Volunteer Fire and Rescue Co., Inc. | 214 | 224 | 225 | 178 | 204 | 229 | 229 | 237 | 216 | 232 | 248 | 273 | 2,709 |
| Middletown Volunteer Fire and Rescue Co., Inc. | 83 | 86 | 70 | 69 | 67 | 70 | 94 | 92 | 63 | 89 | 105 | 82 | 970 |
| Clear Brook Volunteer Fire and Rescue Co., Inc. | 104 | 116 | 105 | 104 | 122 | 137 | 160 | 123 | 111 | 114 | 168 | 141 | 1,505 |
| Gore Volunteer Fire and Rescue Co., Inc. | 38 | 32 | 34 | 26 | 28 | 26 | 32 | 41 | 33 | 34 | 49 | 34 | 407 |
| Round Hill Community Vol. Fire and Rescue Co., Inc. | 176 | 123 | 144 | 109 | 136 | 128 | 144 | 172 | 136 | 147 | 183 | 138 | 1,736 |
| Gainesboro Volunteer Fire and Rescue Co., Inc. | 59 | 52 | 55 | 58 | 58 | 49 | 80 | 49 | 61 | 49 | 96 | 52 | 718 |
| Star Tannery Volunteer Fire and Rescue Co., Inc. | 24 | 18 | 24 | 24 | 17 | 16 | 23 | 18 | 13 | 13 | 26 | 29 | 245 |
| Greenwood Volunteer Fire and Rescue Co., Inc. | 192 | 200 | 199 | 151 | 171 | 233 | 242 | 241 | 223 | 193 | 215 | 215 | 2,475 |
| North Mountain Volunteer Fire and Rescue Co., Inc. | 40 | 39 | 45 | 48 | 35 | 41 | 41 | 52 | 35 | 33 | 60 | 38 | 507 |
| Reynolds Store Volunteer Fire and Rescue Co., Inc. | 39 | 20 | 33 | 26 | 34 | 27 | 31 | 32 | 25 | 19 | 46 | 38 | 370 |
| Millwood Station Volunteer Fire and Rescue Co., Inc. | 137 | 138 | 124 | 104 | 132 | 160 | 182 | 143 | 162 | 160 | 171 | 165 | 1,778 |
| Incident Reports Less Than 85% Complete | 5 | 1 | 9 | 7 | 11 | 5 | 13 | 2 | 0 | 7 | 12 | 10 | 82 |




# FCVA Fire Hydrant Distribution

Map reflects the distribution of fire hydrants throughout Frederick County in each of the fire First-Due areas. Each hexagon represents 1 square mile of area. Hexagons in which a wet hydrant is present are blue; hexagons in which no wet hydrants are present are yellow. Dry hydrants are not addressed in this map.

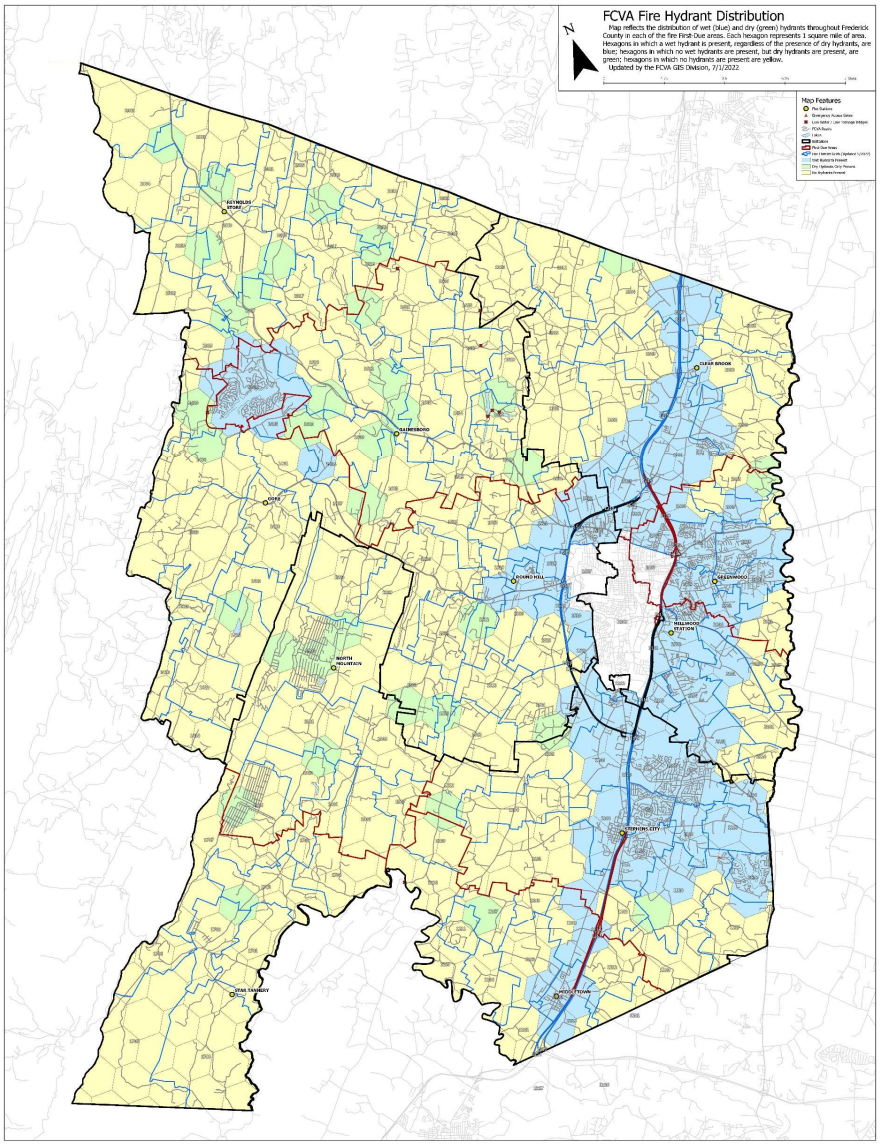
Updated by the FCVA GIS Division, 7/1/2022

N

0 1.75 3.5 5.25 7 Miles

Map Features

- Fire Stations
- Emergency Access Gates
- Low Water / Low Tonnage Bridges
- FCVA Roads
- Lakes
- Battalions
- First-Due Areas
- Fire District Grids (Updated 5/2022)
- Wet Hydrants Present
- No Hydrants Present





# FCVA Fire Hydrant Distribution

Map reflects the distribution of wet (blue) and dry (green) hydrants throughout Frederick County in each of the fire First-Due areas. Each hexagon represents 1 square mile of area. Hexagons in which a wet hydrant is present, regardless of the presence of dry hydrants, are blue; hexagons in which no wet hydrants are present, but dry hydrants are present, are green; hexagons in which no hydrants are present are yellow.

Updated by the FCVA GIS Division, 7/1/2022

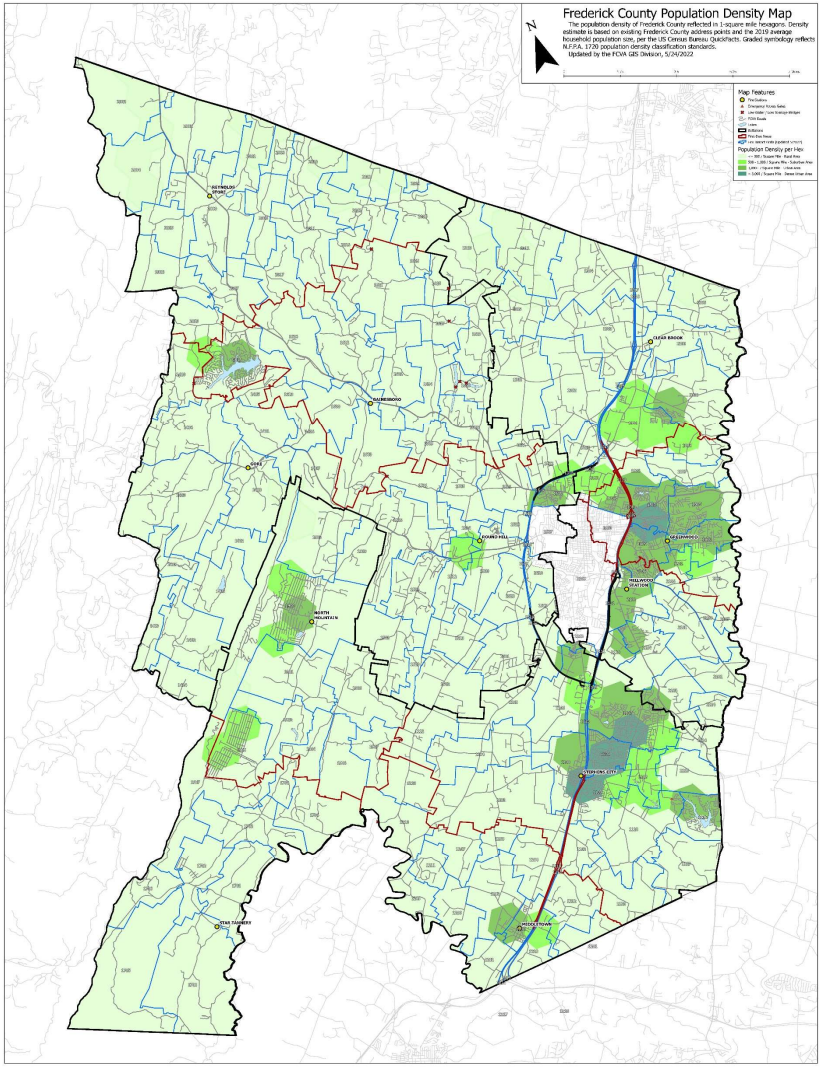
N

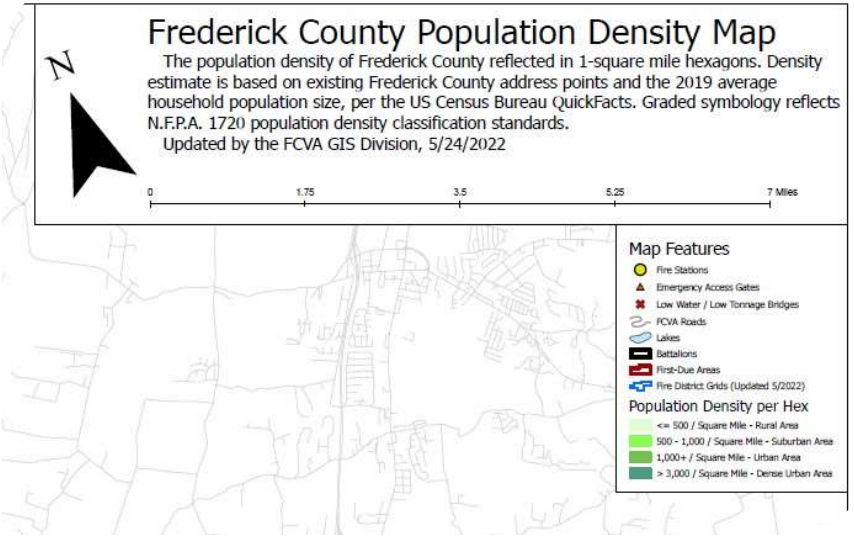
0 1.75 3.5 5.25 7 Miles

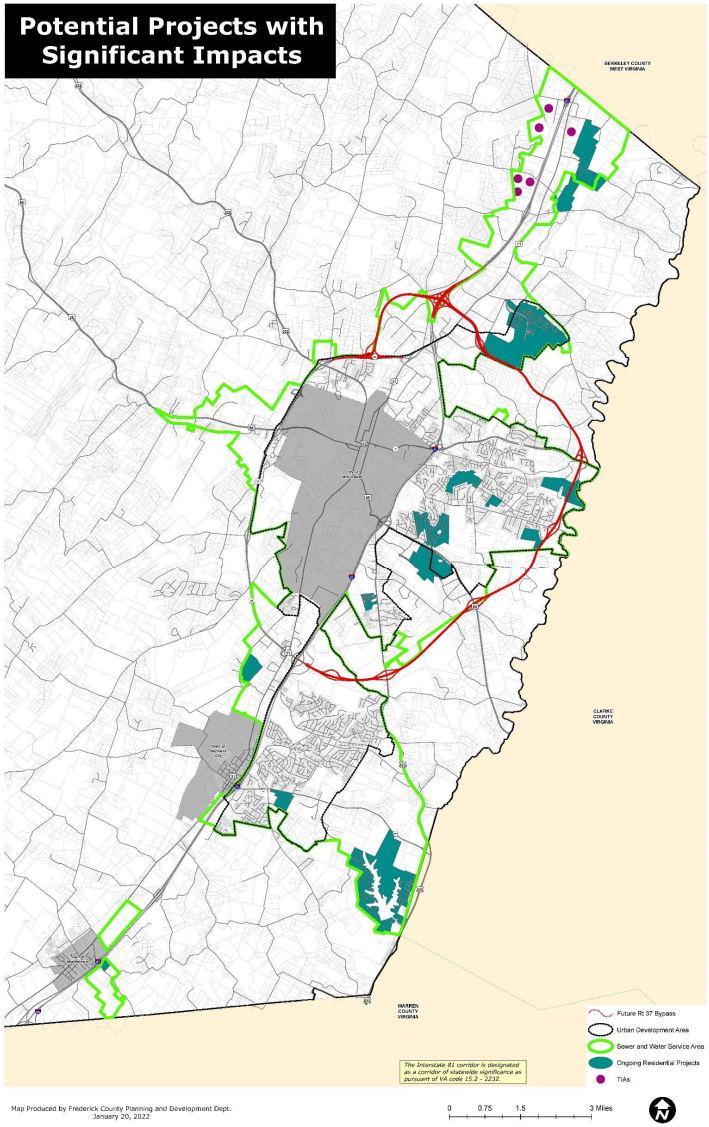
Map Features

- Fire Stations
- Emergency Access Gates
- Low Water / Low Tonnage Bridges
- FCVA Roads
- Lakes
- Battalions
- First-Due Areas
- Fire District Grids (Updated 5/2022)
- Wet Hydrants Present
- Dry Hydrants Only Present
- No Hydrants Present

# Current Population Density and Growth





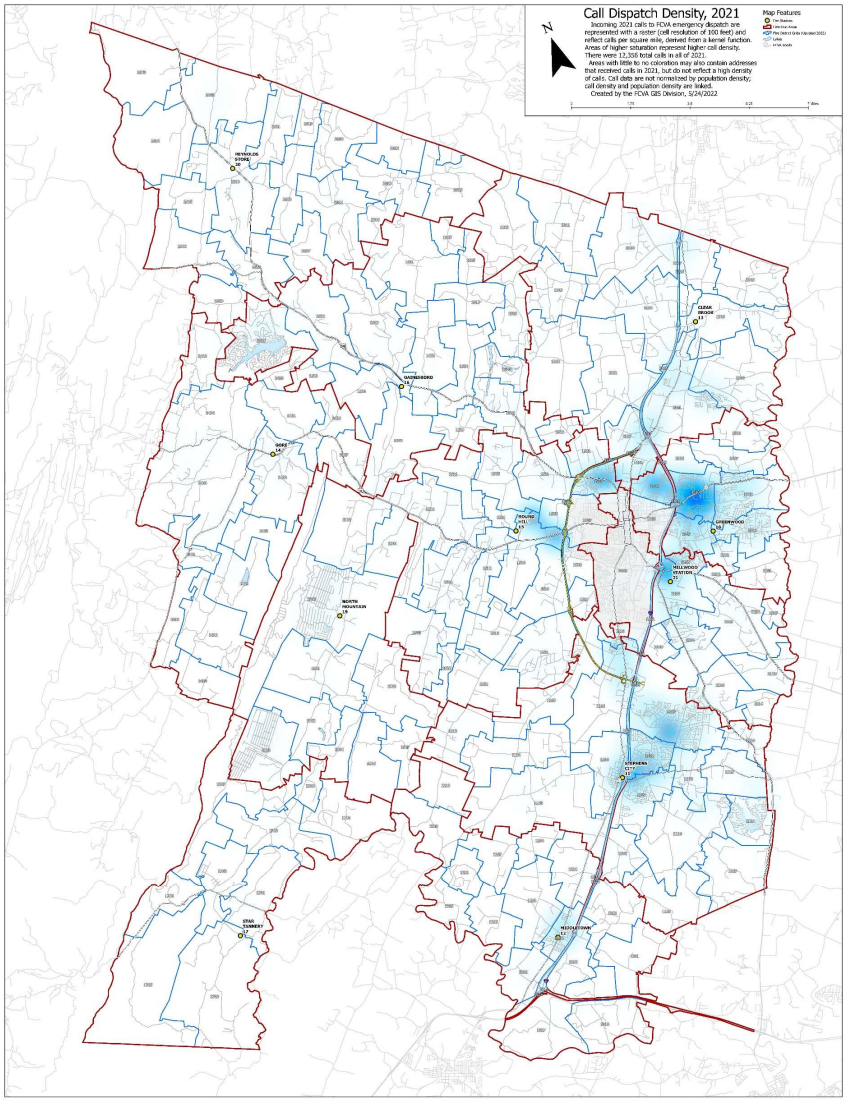

Future Rt 37 Bypass

Urban Development Area

Sewer and Water Service Area

Ongoing Residential Projects

TIAs





# Call Dispatch Density, 2021

Incoming 2021 calls to FCVA emergency dispatch are represented with a raster (cell resolution of 100 feet) and reflect calls per square mile, derived from a kernel function. Areas of higher saturation represent higher call density. There were 12,356 total calls in all of 2021.

Areas with little to no coloration may also contain addresses that received calls in 2021, but do not reflect a high density of calls. Call data are not normalized by population density; call density and population density are linked.

Created by the FCVA GIS Division, 5/24/2022

Map Features


- Fire Stations
- First-Due Areas
- Fire District Grids (Updated 2022)
- Lakes
- FCVA Roads

N

0 1.75 3.5 5.25 7 Miles

# What is the community Service Level expectation?

a. Factors to Consider
    i. Response time
        1. Distance (Road travel time)
        2. Availability of resources (call concurrency)
    ii. Effective Response Force
        1. Appropriate number of resources
        2. Appropriate type of resources
        3. Appropriately trained resources
        4. Appropriately equipped resources
        5. Example – Single Family Residential Home

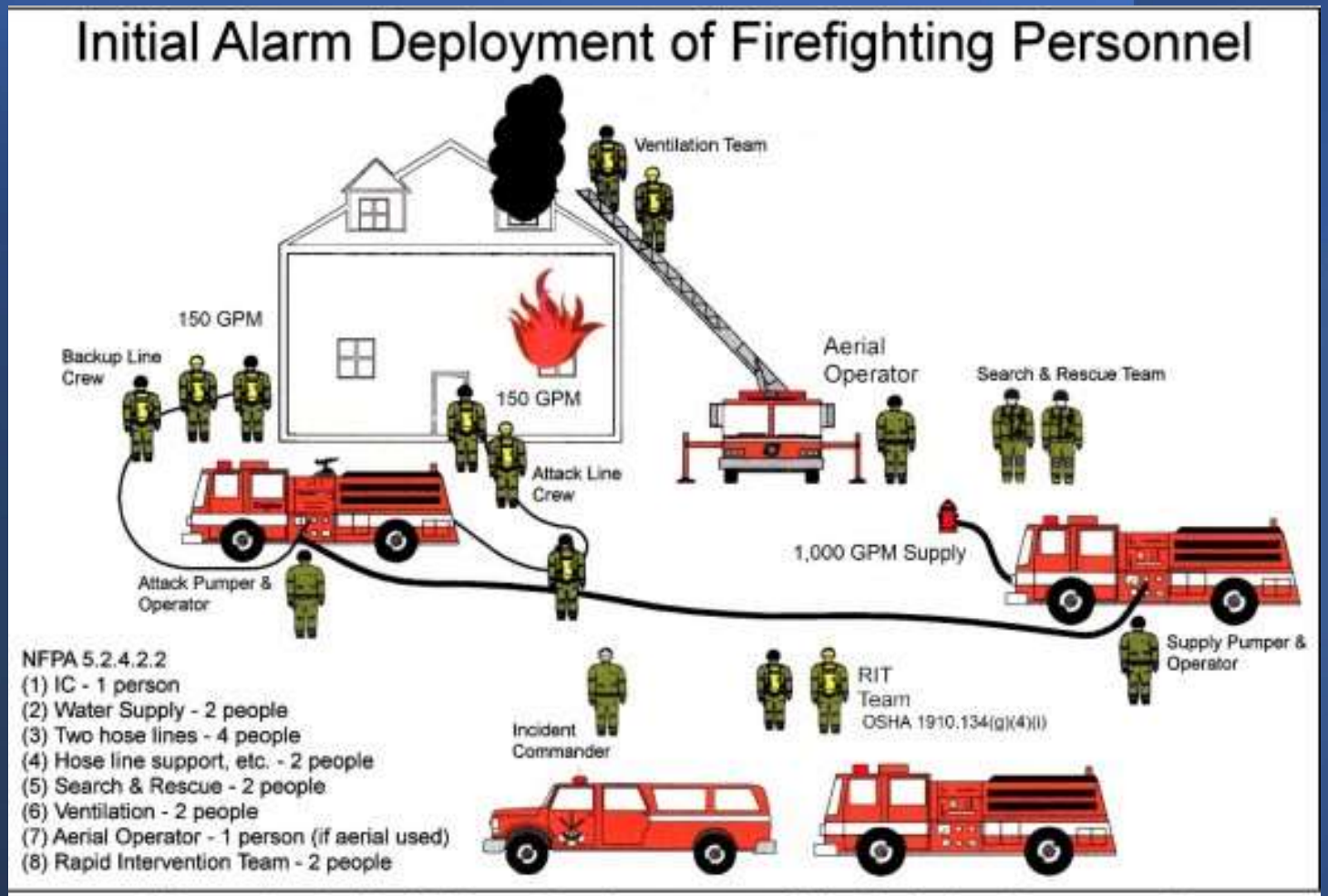



**Figure 3 – Initial Alarm Deployment of Firefighting Personnel**

# Standards

i. 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

FACT SHEET

# KEY REQUIREMENTS FOR EMERGENCY SERVICES IN NFPA 1710

The minimum requirements for provision of emergency services by career fire departments can be found in 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*.

NFPA 1710 addresses the structure and operation of organizations providing such services, which include fire suppression and other assigned emergency response responsibilities such as EMS and special operations.

The requirements intend to provide effective, efficient, and safe protective services to help prevent fires, reduce risk to lives and property, deal with incidents that occur, and help prepare for anticipated incidents.

The requirements are listed in NFPA 1710 for fire department service deployment based on the type of occupancy, along with the appropriate response staffing levels for each. The minimum staffing level for each occupancy is listed below. For the full breakdown of staffing requirements by position, refer to the subsections specific to each occupancy in 5.2.4.

## KEY REQUIREMENTS

**Occupancy Type:** Single-Family Dwelling
**Deployment:** Minimum of 16 members or 17 if aerial device is used

The initial full alarm assignment to a structure fire in a typical 2000 ft² (186 m²), two-story, single-family dwelling without a basement and with no exposures must provide for a minimum of 16 members (17 if an aerial device is used).

**Occupancy Type:** Open-Air Strip Mall
**Deployment:** Minimum of 27 members or 28 if aerial device is used

The initial full alarm assignment to a structure fire in a typical open-air strip shopping center ranging from 13,000 ft² to 196,000 ft² (1203 m² to 18,209 m²) in size must provide for a minimum of 27 members (28 if an aerial device is used).

**Occupancy Type:** Garden-Style Apartment
**Deployment:** Minimum of 27 members or 28 if aerial device is used

The initial full alarm assignment to a structure fire in a typical 1200 ft² (111 m²) apartment within a three-story, garden-style apartment building must provide for a minimum of 27 members (28 if an aerial device is used).

**Occupancy Type:** High-Rise
**Deployment:** Minimum of 42 members or 43 if building is equipped with fire pump

The initial full alarm assignment to a fire in a building with the highest floor greater than 75 ft (23 m) above the lowest level of fire department vehicle access must provide for a minimum of 42 members (43 if the building is equipped with a fire pump).

FACT SHEET

# KEY REQUIREMENTS FOR EMERGENCY SERVICES IN NFPA 1710 *CONTINUED*

## ADDITIONAL REQUIREMENTS

Fire departments that respond to fires in occupancies that present hazards greater than those found in 5.2.4 must deploy additional resources on the initial alarm as described in 5.2.4.6.

Even though fireground staffing levels have changed, NFPA 1710 continues to require that engine companies be staffed with a minimum of four on-duty members, as stated in 5.2.3. In addition, 5.2.2.2.1 requires that the fire department identify minimum company staffing levels as necessary to meet the deployment criteria required in 5.2.4 to ensure that a sufficient number of members are assigned, on duty, and available to safely and effectively respond with each company.

Additional changes to the 2020 edition of the standard include an update to the definition for *career fire department* and a clarification of how to determine if the department would fall under either NFPA 1710 or NFPA 1720, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments*.

Several new definitions relating to geographic areas based on population density have been added and the number of responders needed based on the type of incident and tasks to accomplish has been included. New requirements have been added for mobile water supply tankers/tenders and deployment and training of incident safety officers. Also, material on wildland fire suppression has been expanded.

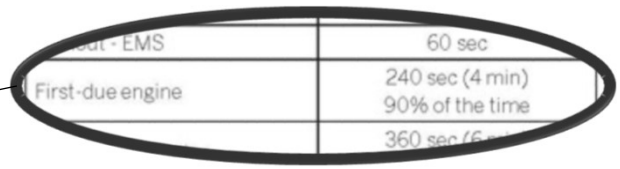
## RESPONSE OBJECTIVES

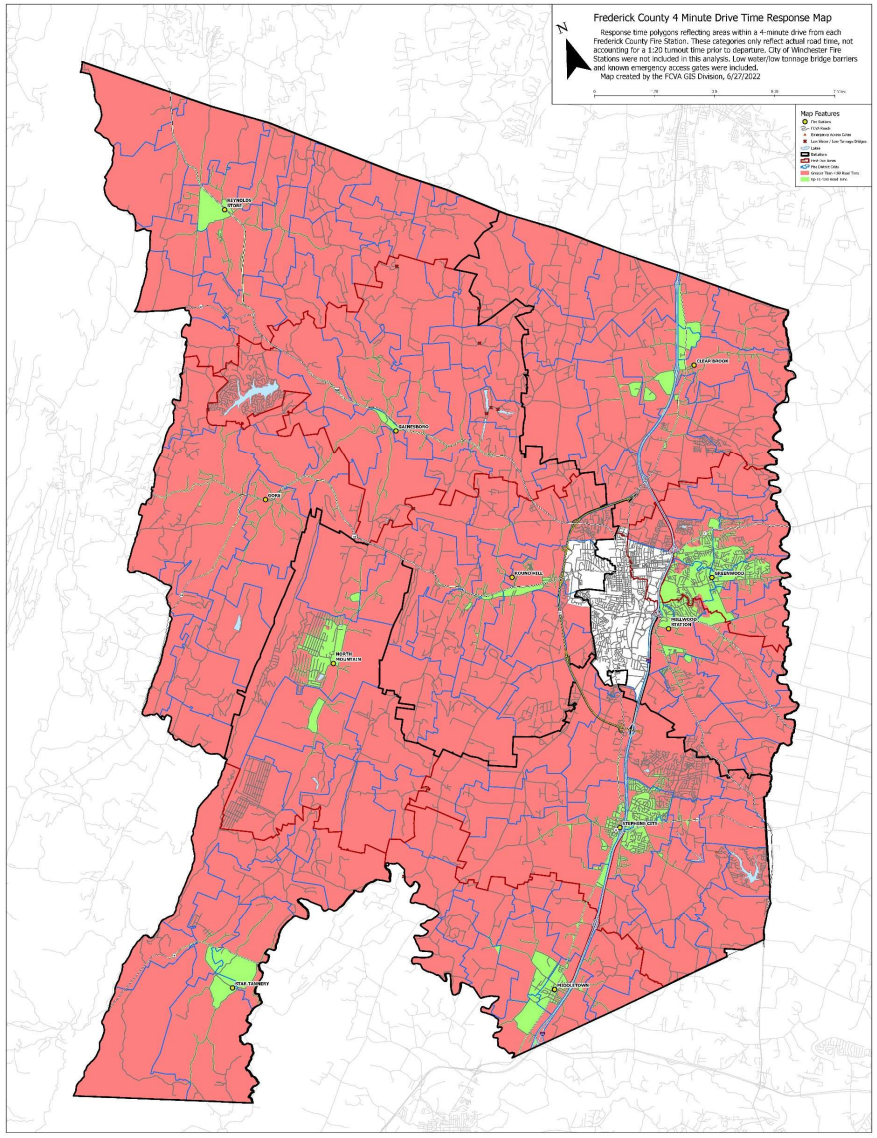
Documenting the benchmarks and response objectives that make up NFPA 1710 is crucial to capturing and tracking data that would be helpful in ensuring the necessary allocation of resources.

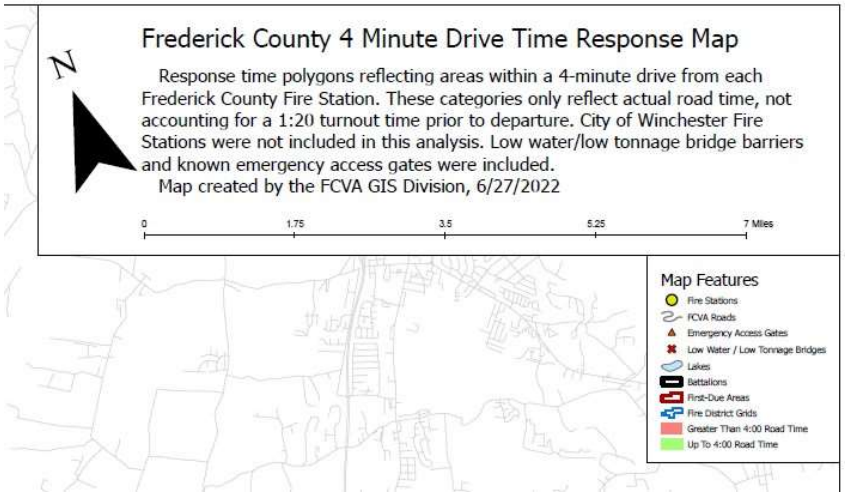
| Benchmarks | Response Objectives |
|---|---|
| Alarm answer | 15 sec 95% of the time or 40 sec 99% of the time |
| Alarm processing | 64 sec 95% of the time or 106 sec 99% of the time |
| Turnout - Fire | 80 sec |
| Turnout - EMS | 60 sec |
| First-due engine | 240 sec (4 min) 90% of the time |
| Second-due engine | 360 sec (6 min) 90% of the time |
| Initial full alarm - Low/ medium hazard | 480 sec (8 min) 90% of the time |
| Initial full alarm - High hazard | 610 sec (10 min 10 sec) 90% of the time |

### Learn More

- Visit nfpa.org/1710 for free digital access to the standard.
- Sign up on nfpa.org/NFPA-Membership to:
  - Get one-on-one help with your technical questions at nfpa.org/tqs
  - Access exclusive content
  - Search content and connect with your peers to share information and answer questions on NFPA's online community at nfpa.org/xchange




Frederick County 4 Minute Drive Time Response Map
Response time polygons reflecting areas within a 4-minute drive from each Frederick County Fire Station. These categories only reflect actual road time, not accounting for a 1:20 turnout time prior to departure. City of Winchester Fire Stations were not included in this analysis. Low water/low tonnage bridge barriers and known emergency access gates were included.
Map created by the FCVA GIS Division, 6/27/2022
N
Map Features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Map created by the FCVA GIS Division, 6/27/2022
N
0
1.75
3.5
5.25
7 Miles
Map Features
Fire Stations
FCVA Roads
Emergency Access Gates
Low Water / Low Tonnage Bridges
Lakes
Battalions
First-Due Areas
Fire District Grids
Greater Than 4:00 Road Time
Up To 4:00 Road Time

NFPA 1720 – Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments.

Pin Header

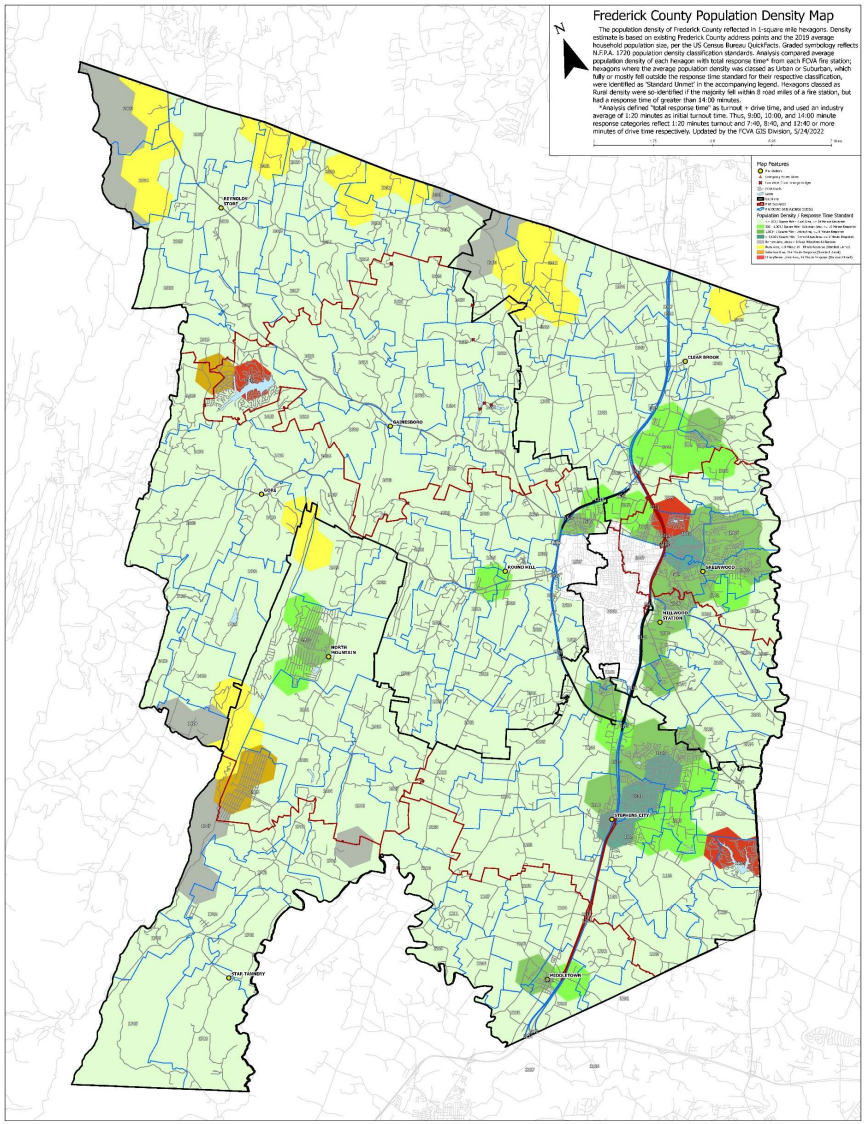
**Table 4.3.2 Staffing and Response Time**

| Demand Zone[a] | Demographics | Minimum Staff to Respond[b] | Response Time (minutes)[c] | Meets Objective (%) |
|---|---|---|---|---|
| Urban area | >1000 people/mi$^2$ (2.6 km$^2$) | 15 | 9 | 90 |
| Suburban area | 500–1000 people/mi$^2$ (2.6 km$^2$) | 10 | 10 | 80 |
| Rural area | <500 people/mi$^2$ (2.6 km$^2$) | 6 | 14 | 80 |
| Remote area | Travel distance ≥ 8 mi (12.87 km) | 4 | Directly dependent on travel distance | 90 |
| Special risks | Determined by AHJ | Determined by AHJ based on risk | Determined by AHJ | 90 |

[a]A jurisdiction can have more than one demand zone.

[b]Minimum staffing includes members responding from the AHJ's department and automatic aid

[c]Response time begins upon completion of the dispatch notification and ends at the time interval shown in the table.




# Frederick County Population Density Map

The population density of Frederick County reflected in 1-square mile hexagons. Density estimate is based on existing Frederick County address points and the 2019 average household population size, per the US Census Bureau QuickFacts. Graded symbology reflects N.F.P.A. 1720 population density classification standards. Analysis compared average population density of each hexagon with total response time* from each FCVA fire station; hexagons where the average population density was classed as Urban or Suburban, which fully or mostly fell outside the response time standard for their respective classification, were identified as 'Standard Unmet' in the accompanying legend. Hexagons classed as Rural density were so-identified if the majority fell within 8 road miles of a fire station, but had a response time of greater than 14:00 minutes.

*Analysis defined "total response time" as turnout + drive time, and used an industry average of 1:20 minutes as initial turnout time. Thus, 9:00, 10:00, and 14:00 minute response categories reflect 1:20 minutes turnout and 7:40, 8:40, and 12:40 or more minutes of drive time respectively. Updated by the FCVA GIS Division, 5/24/2022

N

0 1.75 3.5 5.25 7 Miles

Map Features

- Fire Stations
- Emergency Access Gates
- Low Water / Low Tonnage Bridges
- FCVA Roads
- Lakes
- Battalions
- First-Due Areas
- Fire District Grids (Updated 5/2022)

Population Density / Response Time Standard

- <= 500 / Square Mile - Rural Area, <= 14 Minute Response
- 500 - 1,000 / Square Mile - Suburban Area, <= 10 Minute Response
- 1,000+ / Square Mile - Urban Area, <= 9 Minute Response
- > 3,000 / Square Mile - Dense Urban Area, <= 9 Minute Response
- Remote Area, Areas > 8 Road Miles from All Stations
- Rural Area, < 8 Miles / 14+ Minute Response (Standard Unmet)
- Suburban Area, 10+ Minute Response (Standard Unmet)
- Urban/Dense Urban Area, 9+ Minute Response (Standard Unmet)

# Implications of adopting plan consistent with NFPA 1720

i. Can you reach population densities by time/distance?
    1. Station location and additional station need.
        a. Areas of concern
    2. Concurrency (availability of resources)
    3. Ability to assemble timely Effective Response Force in Western part of county and its impact on service delivery throughout the county.

# Pro-forma staffing for NFPA 1720 – 10 year

i. Locations needing review
    1. Highest
        a. 522/Lake Frederick – Stephens City
        b. 37 North/81 North/ Snowden Bridge
        c. 37 South/Kernstown/Middle Road
        d. Lake Holiday
        e. Mountain Falls
ii. Complete 1st Station in first 10-year window, plan for 2nd and set benchmarks for new station or other adjustments
iii. For a new station target initial minimum four (4) person staffing.

# Additional Staffing Considerations

a. Set minimum staffing of four (4) for all stations to reflect true cross-staffing of Fire and EMS.
    i. Provides rural and suburban areas with true initial response for fires, fire and EMS initial response to combined incidents such as MVC, hedge against concurrency and reduces need to pull from additional stations to meet Effective Response Force.
b. Increase minimum staffing at high-volume stations to have dedicated EMS unit of two (2) personnel and four (4) personnel to cross staff fire and 2nd EMS unit.
    i. Provides coverage against depleting EMS units in event of a fire event and provides resources to cover predictable concurrent calls.

# Constraints

- Practical ability to attract, hire, train and effectively integrate into staffing model.
  - Historically 12 -15 hires in a hiring cycle annually.
  - Typical attrition in a year running 4-8 positions.
  - Typically takes 18 months from the time the position is authorized, to recruitment, hiring, training and field experience for a new position to be counted as effective minimum staffing.
  - Set general target of eight (8) new hires a year with assumption that four (4) – eight (8) replacement positions will also be needed for annual attrition.

# Recommendation

- Approximately 80 additional staff over next 10 years (average eight per year).
- At current estimates each position costs with salary, benefits, uniforms, equipment, etc. approximately $100,000 per position for full first year funding.
- Assumes continued level of volunteer participation to continue supplemental staffing, particularly provide surge capacity for large scale incidents and long duration incidents.

# Existing Stations

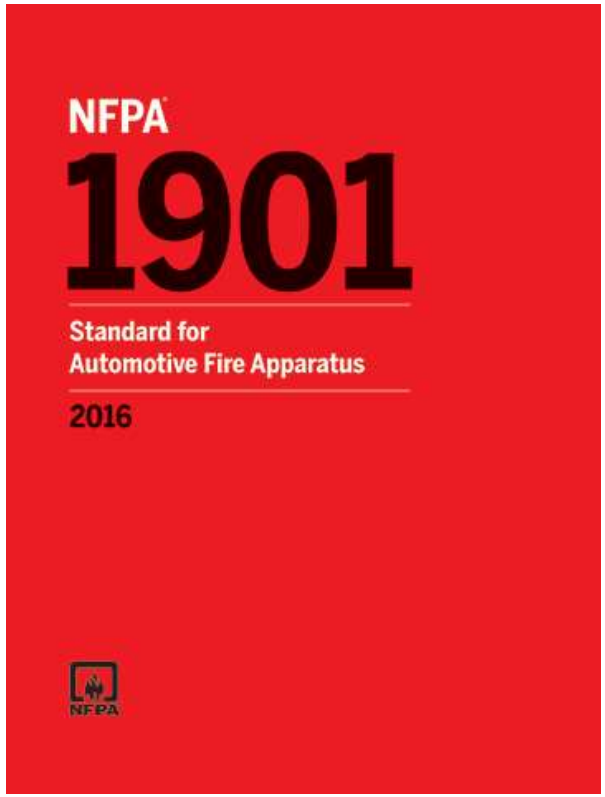
i. Nine (9) of eleven (11) existing stations are owned by volunteer companies and were not initially constructed for 24/7 crew assignment.
    1. Two (2) are county owned buildings and volunteer companies pay for second structure on each property used as 'event centers" for fund raising operations.
    2. Two (2) volunteer stations have undergone renovations to living areas over last 24 months for an approximately $1.7 million.
        a. Renovations where principally to living areas and not overall station or bays.
        b. Committee has been developing criteria to set minimum standards for each of the stations and reviewing needs. Objective is to incorporate into annual CIP planning process.
    3. Funding has been a significant issue in addressing existing facility needs. Clear Brook was able to leverage existing proffer dollars available to finance over $500,000 renovation and Greenwood has been utilizing a line of credit for financing approximately $1.2 million project.

# Apparatus

a. Historical Approach
    i. Each company has provided its own apparatus and accounted for their own reserve needs. Replacement schedule dictated by availability of self -funding. Reliance on assistance from state EMS grants for ambulance purchase and varied approaches to financing from all cash payments from saved reserves, partial cash and partial financed transactions, to full finance transactions. Companies sometimes carry payment on operating account, liquidate savings account to make payment or combination.

# New approach

i. Two years ago the County approved funding for the first dedicated County-wide reserve apparatus. Currently:
    1. One (1) reserve Engine and one (1) additional reserve engine available from training division.
    2. One (1) Reserve rescue engine.
    3. One bariatric equipped unit/reserve ambulance.
ii. Committee inventory existing fleet, creating new minimum standards for each apparatus type, reviewing deployment model and preparing recommendations for replacement schedule for annual Capital Improvements Plan (CIP).
    1. Committee adopting NFPA 1901 model.
        a. Chart 17- 19 – NFPA 1901 Standard for Automotive Fire Apparatus
        b. Chart 20 - 26 – Fleet Inventory


NFPA
1901
Standard for
Automotive Fire Apparatus
2016
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**Annex C Weights and Dimensions for Common Equipment**

*This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.*

**C.1** The Fire Apparatus Manufacturers Association (FAMA) provides a worksheet for use by purchasers to calculate the portable equipment load anticipated to be carried on an apparatus. To ensure that the apparatus chassis is capable of carrying the installed equipment (pump, tank, aerial device, etc.) plus the specified portable equipment load with an appropriate margin of safety, the purchaser should use this worksheet to provide apparatus vendors with the weight of the equipment they anticipate carrying when the apparatus is placed in service.

**C.1.1** The approximate measurements and weights of equipment that are commonly available and used during fire department operations are listed on the worksheet. The purchaser should fill in the number of units of each piece of anticipated equipment in the column titled "Quantity" and multiply that by the weight per unit to get the total weight. The dimensions of each piece of equipment are given to assist in planning compartment size or the location on the fire apparatus. Where the purchaser wants to carry specific equipment in a specific compartment, that compartment designation should be shown in the column titled "Compartment Location."

The worksheet can be downloaded as an Excel spread- the FAMA website, *www.fama.org*, and customized to equipment a department expects to carry. There columns on the spreadsheet to assist the fire aintaining records of the equipment it carries

**uidelines for First-Line and Reserve Fire Apparatus**

*a part of the requirements of this NFPA document informational purposes only.*

maximize fire fighter capabilities and mini- uries, it is important that fire apparatus be e latest safety features and operating capabili- to 15 years, much progress has been made in ional capabilities and improving the safety apparatus. Apparatus more than 15 years old ly a few of the safety upgrades required by the f the NFPA fire department apparatus stand- ivalent Underwriters Laboratories of Canada s. Because the changes, upgrades, and fine 1901 have been truly significant, especially in the area of safety, fire departments should seriously consider the value (or risk) to fire fighters of keeping fire apparatus more than 15 years old in first-line service.

It is recommended that apparatus more than 15 years old that have been properly maintained and that are still in serviceable condition be placed in reserve status;be upgraded in accordance with NFPA 1912; and incorporate as many features as possible of the current fire apparatus standard *(see Section D.3)*. This will ensure that, while the apparatus might not totally comply with the current editions of the automotive fire apparatus standards, many of the improvements and upgrades required by the current editions of the standards are available to the fire fighters who use the apparatus.

Apparatus that were not manufactured to the applicable NFPA fire apparatus standards or that are over 25 years old should be replaced.

**D.2 Evaluating Fire Apparatus.** It is a generally accepted fact that fire apparatus, like all types of mechanical devices, have a finite life. The length of that life depends on many factors, including vehicle mileage and engine hours, d preventative maintenance program, quality of th ing program, whether the fire apparatus was us design parameters, whether the apparatus was on a custom or commercial chassis, quality of wo the original manufacturer, quality of the compone availability of replacement parts, to name a few.

In the fire service, there are fire apparatus with of service that are simply worn out. There are als tus that were manufactured with quality componen had excellent maintenance, and that have responded mum number of incidents that are still in serviceable condition after 20 years. Most would agree that the care of fire apparatus while being used and the quality and timeliness of maintenance are perhaps the most significant factors in determining how well a fire apparatus ages.

Critical enhancements in design, safety, and technology should also play a key role in the evaluation of an apparatus' life cycle. Previous editions of the fire department apparatus standards featured many requirements advancing the level of automotive fire apparatus safety and user friendliness. Contained within the 2009 edition were requirements for rollover stability; tire pressure indicators; seat belt warning systems requiring all occupants be properly seated and belted; extended seat belt length requirements resulting from an in-depth anthropometric study evaluating the average size of today's fully dressed firefighter; roadability, including minimum accelerations and top speed limitations; enhanced step and work surface lighting; cab integrity testing; increased use of retroreflective striping in the rear of apparatus, providing a consistent identifiable set of markings for all automotive fire apparatus; and enhanced aerial control technologies, enabling short jacking and envelope controls.

**D.3 Upgrading Fire Apparatus.** Any apparatus, whether in first-line or reserve service, should be upgraded in accordance with NFPA 1912, as necessary, to ensure that the following features are included as a minimum:

(1) Seat belts with seat belt warning systems are available for every seat and are new or in serviceable condition.
(2) Warning lights meet or exceed the current standard.
(3) Reflective striping meets or exceeds the current standard.
(4) Slip resistance of walking surfaces and handrails meets the current standard.
(5) A low-voltage electrical system load manager is installed if the total connected load exceeds the alternator output.
(6) The alternator output is capable of meeting the total continuous load on the low voltage electrical system.
(7) Where the gross vehicle weight rating (GVWR) is 36,000 lb (16,000 kg) or more, an auxiliary braking system is installed and operating correctly.
(8) Ground and step lighting meets or exceeds the current standard.

(9) Noise levels in the driving and crew compartment(s) meet the current standard, or appropriate hearing protection is provided.
(10) All horns and sirens are relocated to a position as low and as far forward as possible.
(11) Signs are present stating that no riding is allowed on open areas.
(12) A pump shift indicator system is present and working properly for vehicles equipped with an automatic chassis transmission.
(13) For vehicles equipped with electronic or electric engine throttle controls, an interlock system is present and working properly to prevent engine speed advancement at the operator's panel, unless either the chassis transmission is in neutral with the parking brake engaged, or the parking brake is engaged, the fire pump is engaged, and the chassis transmission is in pumping gear.
(14) All loose equipment in the driving and crew areas is securely mounted in accordance with the current standard.

**D.4 Proper Maintenance of Fire Apparatus.** In addition to needed upgrades to older fire apparatus, it is imperative that all fire apparatus be checked and maintained regularly to ensure that they will be reliable and safe to use. The manufacturer's instructions should always be followed when maintaining the fire apparatus. Special attention should be paid to ensure that the following conditions, which are particularly critical to maintaining a reliable unit, exist:

(1) Engine belts, fuel lines, and filters have been replaced in accordance with the manufacturers' maintenance schedule(s).
(2) Brakes, brake lines, and wheel seals have been replaced or serviced in accordance with the manufacturers' maintenance schedule.
(3) Tires and suspension are in serviceable condition, and tires are not more than 7 years old.
(4) The radiator has been serviced in accordance with the manufacturer's maintenance schedule, and all cooling system hoses are new or in serviceable condition.
(5) The alternator output meets its rating.
(6) A complete weight analysis shows the fire apparatus is not over individual axle rating or total GVWR.
(7) The fire pump meets or exceeds its original pump rating.
(8) The water tank and baffles are not corroded or distorted.
(9) If the apparatus is equipped with an aerial device, a complete test to original specifications has been conducted and certified by a certified testing laboratory.
(10) If so equipped, the generator and line voltage accessories have been tested and meet the current standard.

**D.5 Refurbishing or Replacing Fire Apparatus.** Fire department administrators and fire chiefs should exercise special care when evaluating the cost of refurbishing or updating an apparatus versus the cost of a new fire apparatus. Apparatus that are refurbished should comply with the requirements of NFPA 1912. A thorough cost–benefit analysis of the value of upgrading or refurbishing a fire apparatus should be conducted. In many instances, it will be found that refurbishing costs will greatly exceed the current value of similar apparatus.

Some factors to consider and evaluate when determining whether to refurbish or replace a fire apparatus include the following:

(1) What is the true condition of the existing apparatus? Has it been in a major accident, or has something else happened to it that would make spending significant money on it ill advised?
(2) What advancements in design, safety, and technology have improved the efficiency and safety of personnel?
(3) Does the current apparatus meet the program needs of the area it is serving? Is it designed for the way the fire department operates today and is expected to operate in the foreseeable future, or is the apparatus functionally obsolete? Can it carry everything that is needed to do the job without being overloaded?
(4) If the apparatus is refurbished, will it provide the level of safety and operational capability of a new fire apparatus? It should be kept in mind that in many cases, refurbishing does not mean increasing the GVWR, so it is not possible to add a larger water tank or additional foam agent tanks or to carry massive amounts of additional equipment. Enclosing personnel riding areas might add enough weight to the chassis that existing equipment loads need to be reduced to avoid overloading the chassis.
(5) What is the anticipated cost per year to operate the apparatus if it were refurbished? What would the cost per year be for a new apparatus? Insurance costs, downtime costs, maintenance costs, depreciation, reliability, and the safety of the users and the public all have to be considered. At what rate are those costs rising each year? Are parts still readily available for all the components on the apparatus? A refurbished 15-year-old apparatus still has 15-year-old parts in it. How long could the fire department operate without the apparatus if it suddenly needed major repairs?
(6) Is there a current trade-in value that will be gone tomorrow? Most apparatus over 12 years old have little trade-in value. Are there creative financing plans or leasing options that can provide a new fire apparatus for little more than the cost of refurbishing or maintaining an older apparatus?

**D.6 Conclusion.** A fire apparatus is an emergency vehicle that must be relied on to transport fire fighters safely to and from an incident and to operate reliably and properly to support the mission of the fire department. A piece of fire apparatus that breaks down at any time during an emergency operation not only compromises the success of the operation but might jeopardize the safety of the fire fighters relying on that apparatus to support their role in the operation. An old, worn-out, or poorly maintained fire apparatus has no role in providing emergency services to a community.

## Annex E History of NFPA 1901

*This annex is not a part of the requirements of this NFPA document but is included for informational purposes only.*

**E.1 History of Specification.** A report of the NFPA Committee on Fire Engines adopted at the 1906 NFPA Annual Meeting included many of the provisions and test procedures since followed in standards for fire department pumping apparatus.

In 1911, at the convention of the International Association of Fire Engineers, the Committee of Exhibits conducted

# Mobile Computer Terminal (MCT)


**What is it?**

- Computer terminal in fire and rescue vehicles that is directly connected to our dispatch system

**What Does it Do?**

- Dispatch the closest unit by physical location
- Access critical dispatch information directly in the emergency vehicle
- Communicate with dispatch & other responding units
  - Some agencies report an 80% reduction in radio traffic

# MCT

**How will we use it?**

- Automatic Vehicle Location (AVL) will dispatch the closest unit to the incident scene
- Responding units will receive critical incident information on their MCT's
  - Location & detailed information about the emergency
  - List of all dispatched units & their status
- Units will transmit their status to dispatch
  - Enroute to an incident
  - On the scene of an incident
  - Available for another incident
- Incident commanders will monitor for safety
  - How many units are responding
  - Which units are on-scene
  - What other units might be needed