Grand Rapids Fire Department 2020 Standards of Coverage

The following document functions as the Grand Rapids Fire Department's All-Hazards Community Risk Assessment and Standards of Coverage statement. The Commission on Fire Accreditation International (CFAI) defines the process, known as "deployment analysis," as a written procedure which determines the distribution and concentration of fixed and mobile resources of an organization. The purpose for completing such a document is to assist the department in ensuring a safe and effective response force for fire suppression, emergency medical services, hazardous materials incidents, technical rescues, and facilitating activities for domestic preparedness, emergency planning, and disaster response.

Creating a Standards of Coverage requires the research, study, and evaluation of a considerable array of community features. The following report will begin with a descriptive overview of both the City of Grand Rapids and the Grand Rapids Fire Department. Following this overview, an all-hazards risk assessment provides an analysis of potential risks, and describes activities the department employs to mitigate those risks. Current deployment and performance was assessed to determine the capabilities and capacities that are available. Benchmark statements and baseline performance support the department's ability to meet distribution and concentration metrics. The report concludes with plans for maintaining and improving capabilities, as well as policy recommendations to address gaps in performance or desired outcomes.

The GRFD would like to thank all of members of the accreditation core team and the strategic planning team for their assistance with this process.

Core Team

Fire Chief John Lehman
Deputy Chief of Support Services Ron Tennant
Deputy Chief of Operations Todd VanderWall
Assistant Chief of Administration Brad Brown
Training Chief Bill Race
Fire Marshal Eric Dokter
Battalion Chief Jack Johnson
Planning Captain & Accreditation Manager Scott Gray
Captain - EMS Steve MacBride
Planning Lieutenant and Assistant Accreditation Manager Alex Hanes
RMS/GIS Specialist Alexandria Baszler
Local 366 Representative Matt Stevens
Local 366 Representative Dan Veneklase
Grand Rapids Emergency Communications Center Manager Reed Wakeman

Strategic Planning Team

BC Kathy Thompson
BC Dave Noorman
BC Mark Noorman
BC Eric Freeman
BC Colin Kelly
Capt. Mark Fankhauser
Capt. Ed Braman
Capt. Paul Mason
Capt. Steve Lohman
Capt. Don Gerkey
Capt. Dan VanderHyde
Capt. Craig VanderWall
Capt. Joel Boyer
Lt. Bill Smith
Lt. Casey Spielmaker
Lt. Justin Steeby
Lt. Robert Rood
E.O. Adam Lubbers
E.O. John VanLente
E.O. Dan Weatherwax
E.O. Vincent Lorelli
E.O. Joel MacDonald
FF Tom Felix
FF Nick Fedewa
Emergency Management Administrator Allison Farole
Information Services Coordinator Brian Block
Administrative Analyst Trudy Renney
All Core Team Members

Criterion Owners (not in the core group)

Captain Brian DeForest
Captain Scott Stevenson
Captain of Fleet Maintenance Fred White
Captain of Facilities Todd Wright
Captain Mike Witteveen
Lt. Hazmat Planner Jason Kelley
Human Resources Analyst Grace Boda
Water Department Director Wayne Jernberg

Standards of Coverage Process

The development of an SOC is a process involving a thorough analysis of the systems utilized by the GRFD to provide fire and rescue services to the community. It is a data driven process that describes current service levels, identifies strengths and weaknesses of the system, and establishes a clear road map for improvement. This was accomplished as a team effort between the fire department, IAFF local 366 and city leadership. Eight distinct sections were prepared, resulting in a comprehensive evaluation of baseline performance and the department's benchmark statements for service delivery. The process was facilitated by the GRFD Planning Division and received input and approval from multiple levels (fire department, Local 366 and city leadership). The outcome is a rigorous appraisal of the risks in our community and the department's deployment of resources to mitigate those risks. This has become an iterative process for the GRFD, with annual updates to the SOC representing an incremental approach to continuous improvement. Grand Rapids is a dynamic city, with redevelopment driving a constant reassessment of the environment and deliberate adjustments by the fire department to maintain its high standards and citizen desired outcomes.

Section A - Documentation of Area Characteristics

The GRFD protects Michigan's second largest city, encompassing 45.3 square miles and populated by 201,013 citizens. Daytime population swells by at least 17%, especially in the urban core where many businesses occupy the downtown district. Grand Rapids operates under a commission-manager form of municipal government, and the city is divided into three political wards. The city continues to diversify as local medical, technology and higher education sectors experience prolonged expansions. In fact, non-manufacturing employment in the Grand Rapids metropolitan statistical area accounts for 80.47% of the labor force. Grand Rapids continues to top many national lists. Smart Asset rated Grand Rapids number 1 in its list of best places for first-time home buyers. In 2020 Grand Rapids placed 21st in Livability.com's Top 100 Best Places to Live.

Section B - Description of Agency Programs and Services

The GRFD employs a staffing model that utilizes 203 personnel (31 in administration, 172 in fire suppression) spread throughout 11 fire stations; and staffs emergency response units based upon the anticipated risk in the community. On a daily basis, 15 emergency response units of various sizes and capabilities are in service. The department responds to fires, emergency medical, hazardous materials and technical rescue type incidents within the city and with surrounding jurisdictions when requested. The training division delivers initial and ongoing education for fire, rescue and EMS. The department's fire prevention division provides community risk reduction activities, which encompasses building inspections, public education and investigations. Wellness initiatives include physical and mental health services. The administrative staff is tasked with payroll, human resources, planning, emergency management, budgeting and purchasing oversight.

The fire department is highly engaged in planning at the city, departmental and program levels. The GRFD aligns with citizen expectations and performance goals that are outlined in the City of Grand Rapids Strategic Plan. Strategies at the city level include increasing critical metric compliance for fire, hazardous materials, tech rescue, water rescue, and EMS incidents, ensuring employees assigned an emergency operations center role are trained to an appropriate level, ensuring safe, healthy and well-maintained city facilities and improving cost effectiveness through asset management, continuous improvement and innovation.

Departmental goals are clearly identified in the department's FY19-FY22 Strategic Plan and accompanying Operational Plan. Specific strategies relating directly to the standards of coverage process include ensuring appropriate response to high-risk buildings and events, evaluating whether the training program ensures sustainability and growth at all ranks, performing a community risk assessment to identify areas of concern, and developing a structured wellness program.

Finally, it is expected that the GRFD will coordinate with the emergency communications center and the water department to maintain or improve the city's Insurance Services Office (ISO) class 1 rating, making it one of the top 1% of the departments in the country and the only class 1 agency in the state based upon ISO's public protection classification rating system.

Section C - All-Hazard Community Risk Assessment

When evaluating community risk, a probability and consequence matrix was utilized to rank natural and manmade hazards into low, moderate, high or maximum risk categories. In 2015, a comprehensive process took place to define the current geographical planning zones (GPZ's), aligning similar type risks within respective first due districts. 282 GPZ's allow for a more granular look at risk and incident data/outcomes.

13.47% of the city is made up of low risk GPZ's, 73.08% moderate risk GPZ's, 10.60% high risk GPZ's and 2.85% maximum risk GPZ's. These breakdowns are similar to other metropolitan cities, where the vast majority of risk is moderate. Fire crews performed risk assessments on 4,718 buildings across the city, focusing on the commercial occupancies. Data was migrated from an in house developed geographical information systems application to a newer cloud-based records management system in 2019. Hazards identified during this process are available for review using apparatus based tablets and are incorporated into the emergency communications center CAD system, so crews have access to this vital information while enroute to an emergency.

The department assesses risks for structure fires, emergency medical service calls, hazardous materials incidents and technical rescue responses on an annual basis. Dispatch procedures are aligned with GRFD standard operating guidelines, required critical tasking, and the comprehensive risk assessment of the community. The department strives to align the response of the GRFD to the risk in the community in the safest and most efficacious manner possible. This results in clearly defined and appropriate effective response forces dispatched proficiently to any risk in the community at the low, moderate, high or maximum response level.

Section D - Current Deployment and Performance

This section involved an extensive examination of data at the citywide, first due, and geographical planning zone levels, resulting in confirmation of some trends and identification of new ones. Descriptive statistics provide perspective into the population and property protected, size of districts, road miles covered, number of hydrants present, and other key data points. Travel time and concentration were closely evaluated, overlaying actual incident data to see how effective the current fire station locations are.

Incidents by type, apparatus responses, deployed hours and unit hour utilization were also examined, helping to clearly define why some response districts need two apparatus, and identifying the threshold point for other areas. Each of the 11 fire station districts received a comprehensive analysis. Eight pages of data and maps were compiled for each district, including a brief narrative overview, population and demographics evaluation, community risk assessment, drivetime analysis, a study of effective response force assembly, station response data and baseline performance.

Section E - Evaluation of Current Deployment and Performance

After the thorough review of community expectations and current performance of the GRFD, benchmark statements were reviewed and revised. These define the alarm processing, turnout time, travel time and total response time for the first unit (distribution) and effective response force (concentration) for the four main categories of calls (fires, emergency medical services, hazardous materials and technical rescues) at the four levels of risk (low, moderate, high and maximum). The effective response force (number of personnel required) and the critical tasks that will take place are assessed annually. These considerations are aligned with departmental standard operating guidelines

Benchmark goals (what we are trying to achieve) were defined as 7 minutes total response time for first unit response (distribution) for all call types other than EMS, with a goal of 7 minutes and 30 seconds. Concentration goals range from 9 minutes and 30 seconds for a moderate risk EMS incident, to 11 minutes for a moderate risk structure fire, 12 minutes for a hazardous materials or technical rescue incident, 13 minutes for a high risk structure fire and 15 minutes for a maximum risk structure fire. This section also includes baseline (actual) performance,

Section F - Plan for Maintaining and Improving Response Capabilities

The fire department is a leader in lean methodology deployment for the city and the fire service in general. As such, heavy emphasis is placed on the plan, do, check, act cycle that promotes a continuous improvement model. Reviewing critical data on a frequent basis, comparing to past performance and plans, and evaluating actual performance sets the stage for action. Communication has been identified as a weakness for decades in the organization, so it is being formally addressed through various methods including daily team huddles, department-wide daily video meetings, company officer meetings, and chief level visits at the stations to keep people informed in this rapidly changing environment. A key component of this process is the widespread use of MDI (managing for daily improvement) boards at the administrative, program and station level. The department also shares video documentation of the weekly management walk to report progress for all programs.

Automated reports, command staff meetings and company level input are encouraged to promote incremental adjustments, resulting in increased performance and citizen outcomes. Finally, implemented changes are closely monitored, achievements are celebrated, and tie-ins to long range strategic goals are clearly established. This level of transparency and accountability is key to the high performing environment within the Grand Rapids Fire Department.

Section G - Overall Evaluation

Synthesizing all of the previous information into a few succinct statements proved challenging, but some major trends were identified. Of particular focus is the redevelopment of the downtown area with newly emerging risk profiles. Restoration of the river and the downtown housing surge are but two examples where deployment models will need to change to maintain incident outcomes. Potential opportunities include continued deployment of a homelessness outreach team and maintaining the relationship with the communications center to improve alarm handling time and incorporate alarm answering times into the fire department's record management system.

Internal weaknesses include aging fire stations that don't support current operational needs, making the deployment of specialty units less than ideal. Station distribution has not kept up with the incident demand occurring on the outer edges of the city. Also noted was the lack of a dedicated safety officer on certain response levels as part of the incident command system. The safety officer is often a dual role position maintained by the initial battalion chief or other officer on scene. Overall strengths were the dedicated men and women of the GRFD, who consistently produce high quality emergency and non-emergency outcomes. A clearly defined risk assessment process and corresponding effective response forces, the utilization of data driven decision making, and finally, the newly updated apparatus fleet.

Seven formal recommendations were developed that link directly to data identified in the standards of coverage process and align with the GRFD FY19-FY22 Strategic Plan and the department's Self-Assessment Manual (SAM):

1- Monitor the Kalamazoo District

2 - Continue Dispatch Improvements

3 - Continue Risk Assessments and Community Risk Reduction Efforts

4 - Assess Safety Officer Deployments

5 - Continued Implementation of the Homelessness Outreach Team

6 - Update the Station Notification System

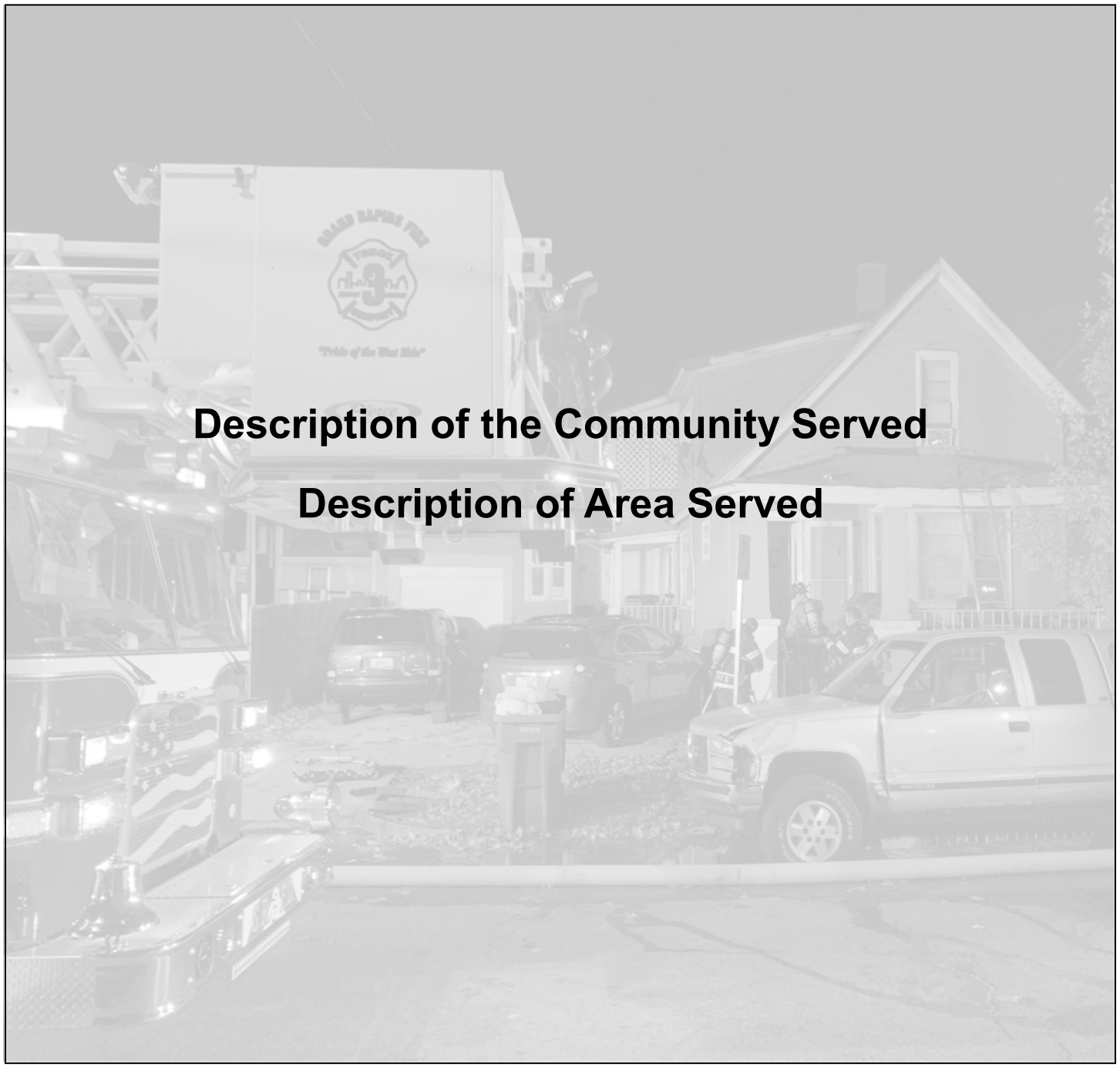
7 - Continued Work on Fire Station Construction

Section H - Appendices

The final section includes additional information pertaining to the GRFD, specifically focusing on the specialty apparatus, their locations and usage.

This report was designed and assembled by the Grand Rapids Fire Department Planning Division. For any questions or clarifications, please contact them at 616-456-3900.

Section A - Documentation of Area Characteristics



Description of the Community Served

Description of Area Served

Description of Community Served

Legal Basis for the Existence of the Agency

The Village of Grand Rapids was incorporated in 1838 and the city was officially created in 1850 with the adoption of the city charter. The city charter was recodified in 1991 and contains language in Part 1- Charter, Title 2 which legally established a department of public safety which is made up of both the fire and police departments.

A pictorial map of Grand Rapids from 1868

Historical Overview

Grand Rapids was founded on the banks of the Grand River, which was the major economic driver of the emerging city, providing transportation for goods and services. Gypsum (plaster) mining was the area's first major industry. Grand Rapids continued to grow during the late 1800's, developing as a major lumbering center and as the premier furniture manufacturing city in the United States, earning the nickname "Furniture City". Grand Rapids continues to be a leader in office furniture production. In 1945, Grand Rapids became the first city in the world to fluoridate its drinking water – a move hailed as one of the 20th century's greatest public health achievements. Grand Rapids is the childhood home of U.S. President Gerald Ford, who is buried with his wife Betty on the grounds of the Gerald R. Ford Presidential Museum in the city. The city's main airport and one of its freeways are also named after him. The city has recently been successful in attracting businesses focusing on the health sciences and as a hub for educational institutions. Grand Rapids is home to one of the 21st century's fastest-growing life-sciences clusters – the Medical Mile.


Station No. 4 in 1899 at the corner of Crescent and Bond

Major Departmental Milestones

The first organized fire companies began forming in 1844 and the first engine was purchased in 1846. On July 30, 1859, the city council passed an ordinance partly reorganizing the department, designating William Hyde as its first full time chief. The department gradually grew and by 1900 had become a full time/full pay organization. In 1933 IAFF Local 366 was organized and within five years nearly all members of the department were affiliated with the union. The 1970's and 1980's saw several original fire stations close with the construction of the Burton St., Franklin St., Leonard St., Monroe Ave. and Covell Ave. stations. Emergency Medical Services delivery expanded in 1990, resulting in a large increase in emergency incidents for the GRFD.

In 1945, the GRFD attained an ISO class 3 rating, which it would hold until 2012 when it moved to a class 2. In 1958, the department was trained in CPR and began responding on a limited basis to rescue calls within the city. Fire investigation was formally established in 1969, and in 1974 the work week shifted from 63 hours per week to 50.4 hours per week by granting members a leave day.

In 2005, fire dispatch was shifted from sworn fire personnel to civilians and medical squads were introduced to the GRFD. In 2008, the two remaining truck companies were replaced with quints.

In 2012 the department designed and placed into service a traffic attenuator (designated as Utility 2), a specialized piece of equipment that protects fire apparatus and personnel when working in a high-speed, high-volume traffic environment. The unit protects motorists in Grand Rapids and responds to neighboring jurisdictions to assist police agencies and the Michigan Department of Transportation when requested. Also in 2012, another new type of apparatus called a squad, a mini pumper with compressed air foam system (CAFS), was incorporated into the deployment model.

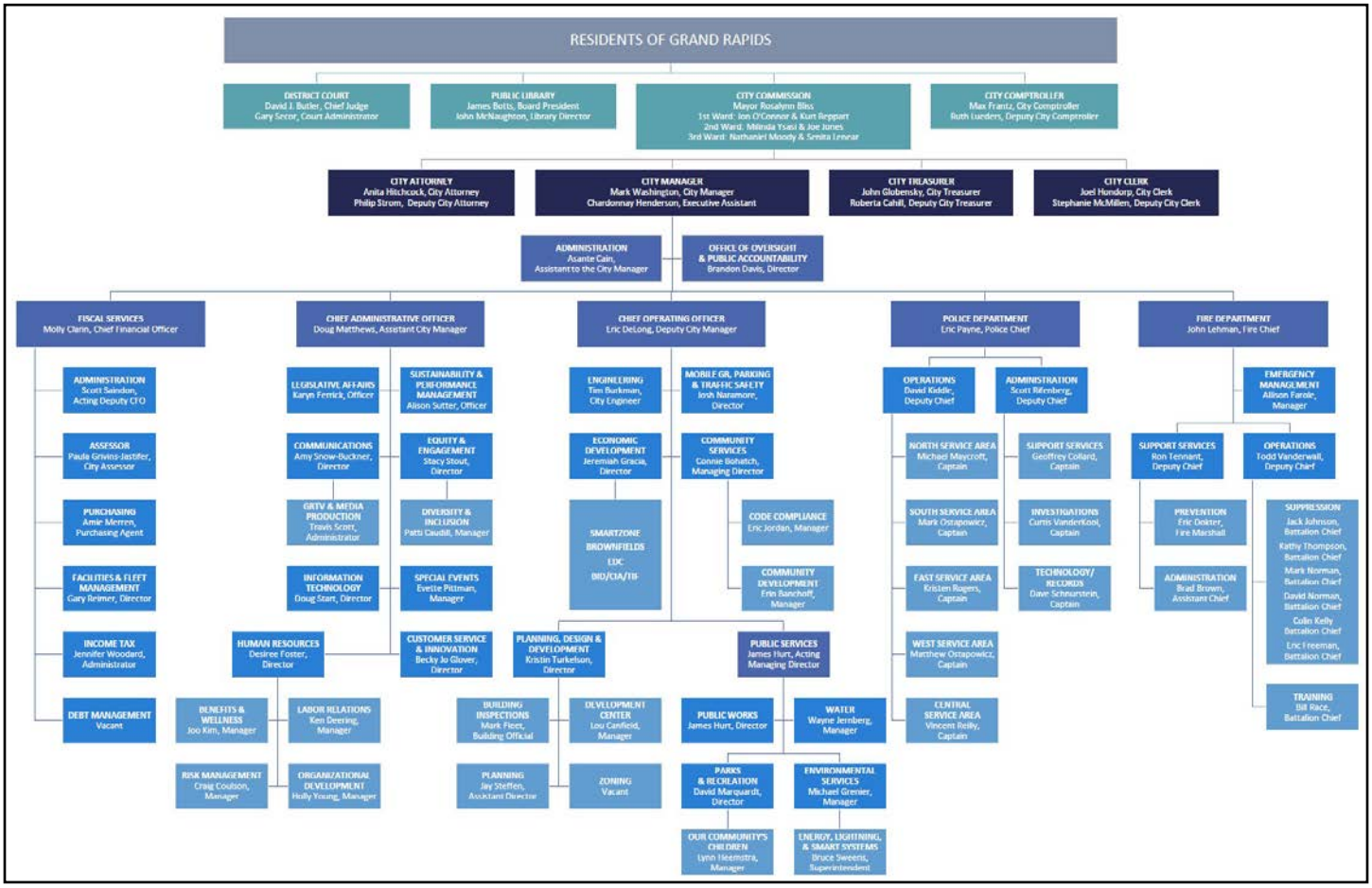
The biggest change in 2012 occurred with the creation of the residential safety program (RSP), which has received multiple federal grants over the last eight years to fund smoke alarm installations during residential safety assessments for owner occupied dwellings in the City of Grand Rapids. Since the spring of 2013, the GRFD has conducted over 10,452 assessments and installed over 62,830 alarms.

The department was accredited by the Commission on Fire Accreditation International in 2016. In 2017, the department phased out the use of squads in favor of full-size engines with CAFS capabilities. After many years of striving, the department attained an ISO class 1 rating in 2018.

Profile of Governing Authority

Description of Political System

Grand Rapids operates under a commission-manager form of municipal government. Under this system, the governance responsibilities are divided between an elected city commission (sets strategic policy) and an appointed full-time city manager (charged with implementation of policy). The city is comprised of three wards, with two commissioners from each ward and a mayoral position chosen by the entire electorate. Term limits were recently voted into place in the fall of 2014, limiting any citizen to no more than 2 four-year terms in the position of Mayor or City Commissioner. The fire department is part of the public safety services group and reports to the city manager for day to day operations, which is reflected in the organizational chart below.



The city commission is empowered to create policies and ordinances for all city departments. Department heads are charged with creation and approval of additional policies to complement city wide direction. The fire chief reports directly to the city manager and meets on a weekly basis to ensure alignment between the city's and the department's mission, vision and values. The public safety committee, comprised of three city commissioners and the city manager, provides a forum for the fire chief and GRFD command staff to communicate goals and objectives to the local government and its citizens. The department also interacts with city leadership on a frequent basis throughout the annual budget and fiscal approval process.

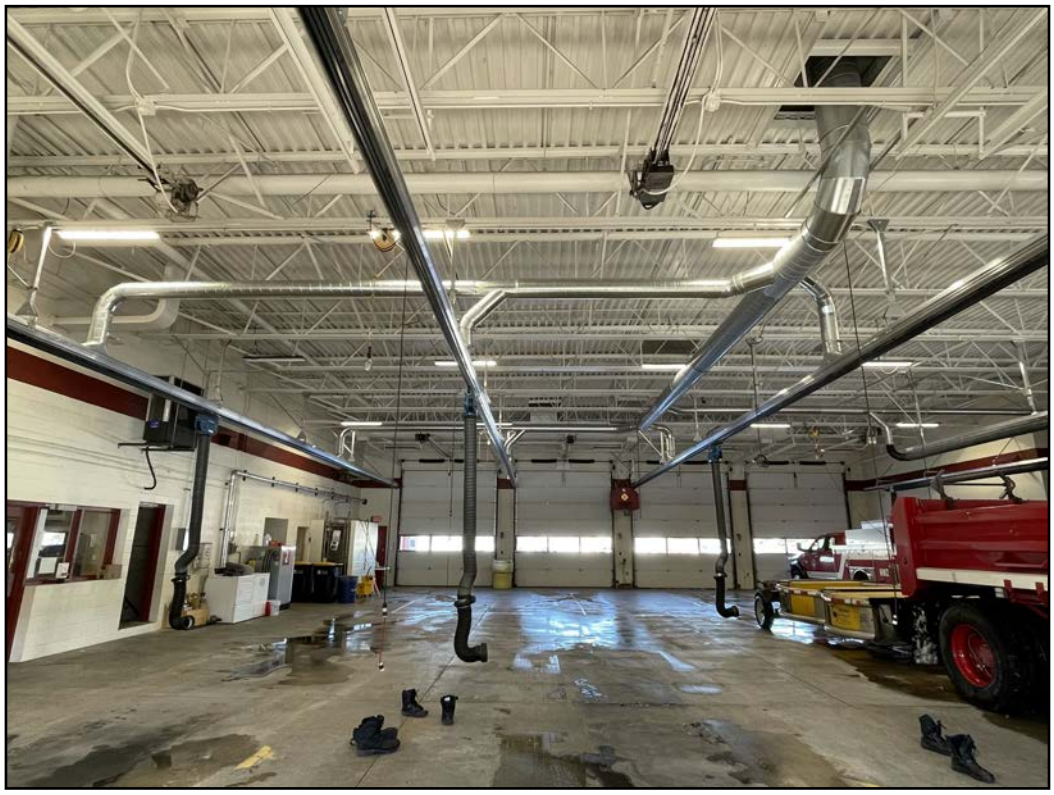
Funding Sources and Restrictions

The Fire Department operates as part of the General Operating Fund (GOF). The primary revenue source for the GOF is the City income tax, set at 1.5% for residents located in the City and 0.75% for employees earning income within the City, but residing outside of the City. Per state law, city property values for purposes of levying property taxes are based on 50% of the assessed value, with annual increases limited to the inflation rate until properties are sold or transferred. The 2020 total taxable value for industrial, commercial, and residential properties was $4.9 billion. Industrial property accounts for 3.69% of the total taxable value, while commercial property accounts for 31.27%. The remaining balance of 65.04% is attributed to residential properties.

The city administers an annual budget cycle, utilizing a fiscal year which runs from July 1-June 30. In November of each year, the city sends out budgetary instructions to the department heads who assemble their upcoming fiscal year budgets and submit them to the city manager for review. A budget presentation to the city manager and chief financial officer takes place and final adjustments are made before the final budget is endorsed by the city commission. Although the overall budget is approved, purchases over a certain amount must follow the city's requirements for competitive bidding, and receive final authorization by the fiscal committee. The fire department has a blend of revenues, with the majority coming from the city's general operating fund. The department also receives grants and was the beneficiary of a short term increase in the city income tax to fund personnel and transformation efforts over a five year period from FY 2011 - FY 2015.

Grant Funding

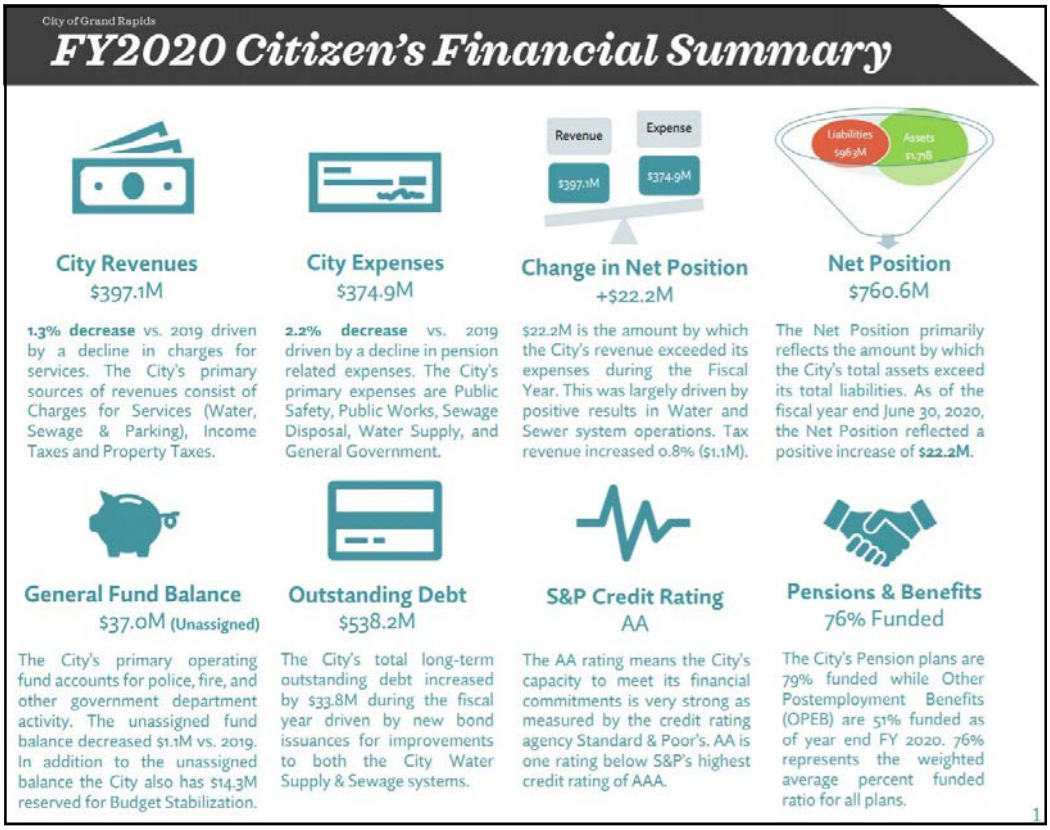
The GRFD understands that one time funding with grants is unsustainable, but also views these monies as a way to increase the safety and efficiency of the organization, while optimizing the use of the general operating fund. The success of the grant program has increased exponentially with the application of data analysis, accentuated by alignment with the accreditation process. Since 2002, the GRFD has been awarded over $14 million dollars via federal, state and private grants. These vital revenues from outside of the general fund have provided continued funding for the residential safety program, replacement of SCBA's and bottle filling equipment, and vehicle exhaust removal systems for the stations.



Overall City Budget

The FY 2020 city budget was $491,836,477. The general fund budget was $150,796,232 and the fire department's budget was $32,418,005. The FY 2021 fire department budget was targeted at $34,060,098.

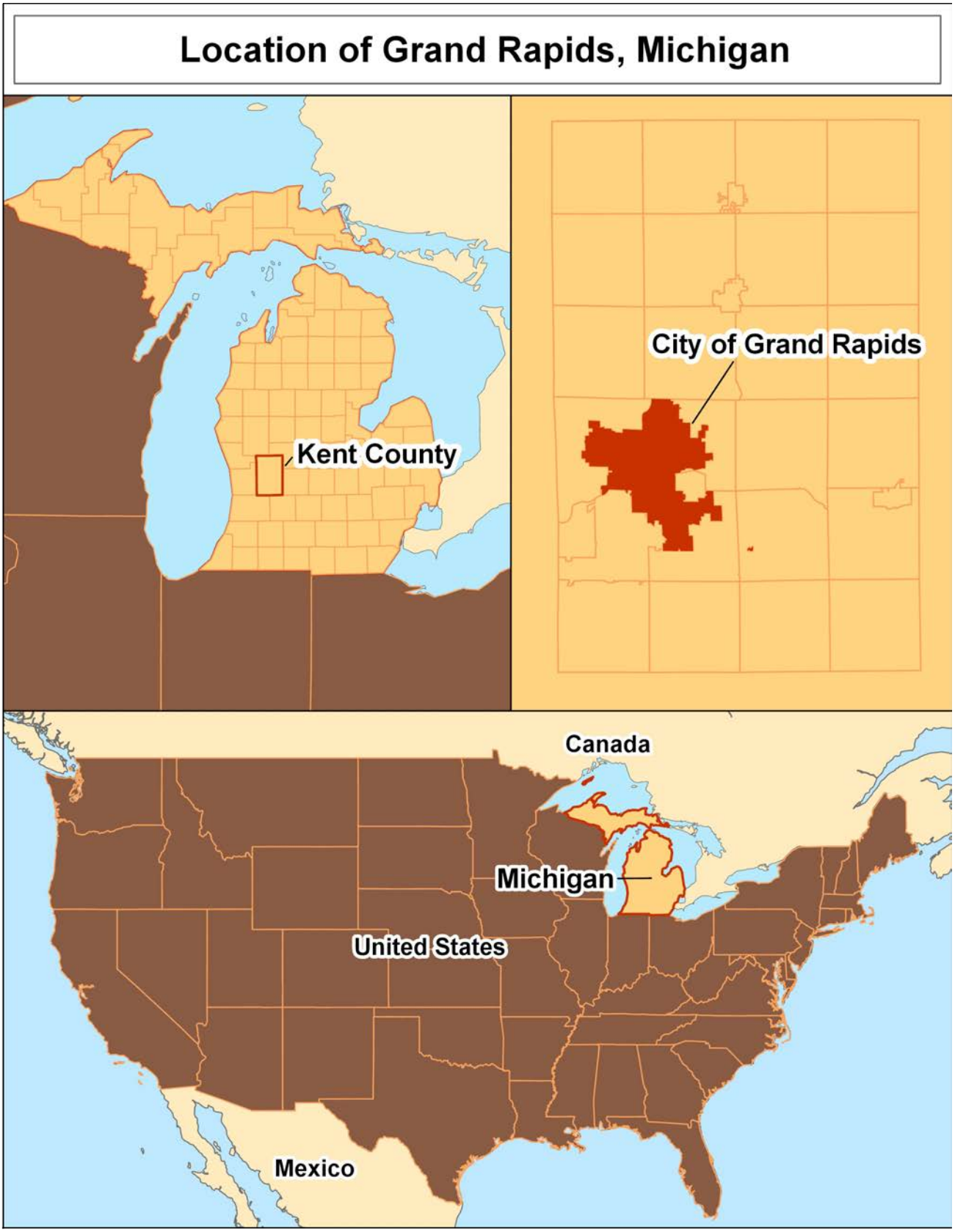
The fire department contributes to the general fund by generating revenue through the prevention division, via funding from the State of Michigan through a revenue sharing program, and through cost recovery for certain response types.



Description of Area Served

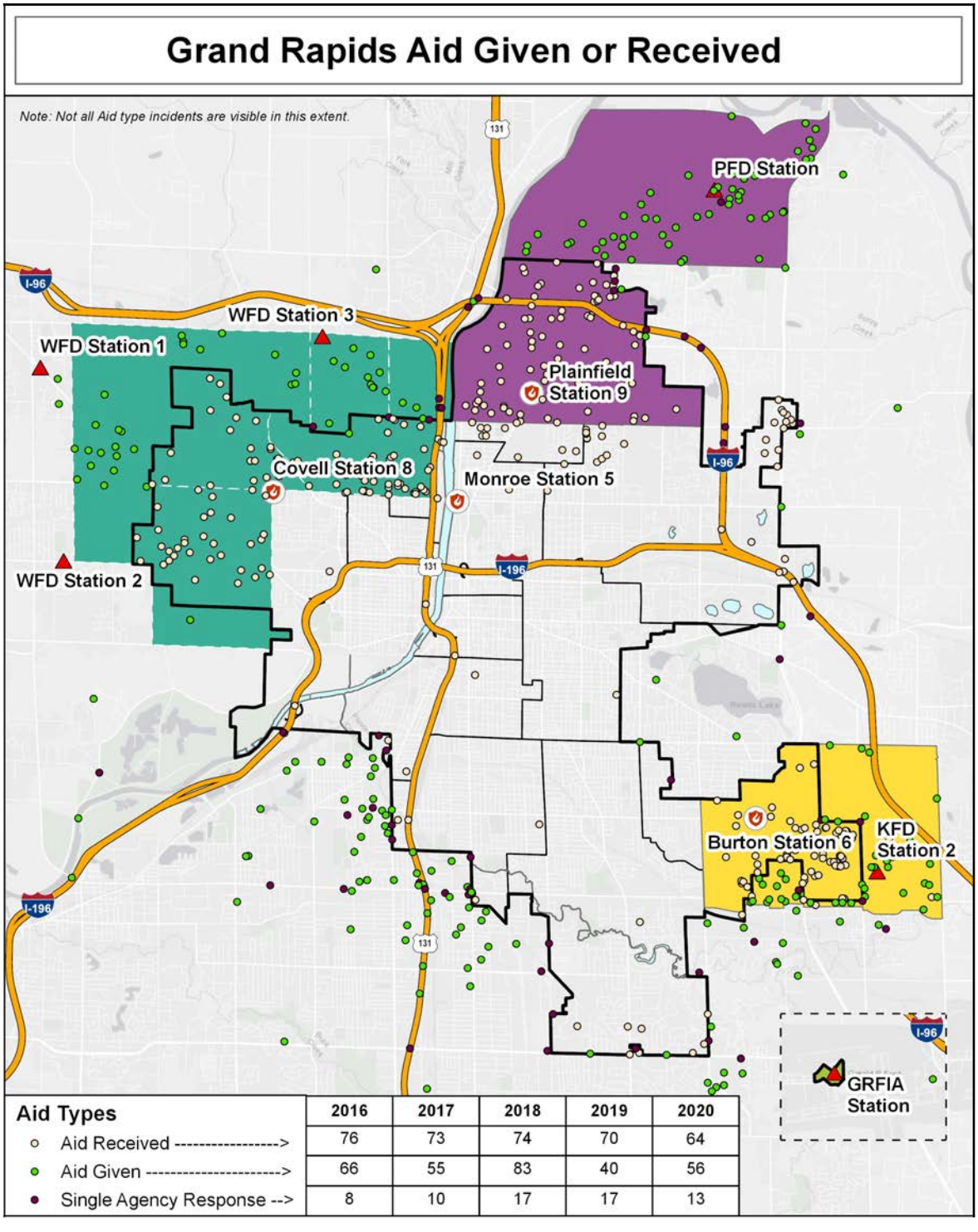
Map of Locality, Region, and Country Relationships

The map below shows the location of the State of Michigan, Kent County and the City of Grand Rapids to lend perspective to the city's surroundings.



Jurisdiction Served/Mutual Aid Responsibilities

The Grand Rapids Fire Department currently responds predominately within the city of Grand Rapids, providing a full spectrum of fire and rescue services, but does respond approximately 70 times per year into neighboring jurisdictions. The majority of aid given is with the three automatic aid partners which includes the cities of Kentwood and Walker, as well as Plainfield Township. The department meets annually with surrounding cities to assess and improve aid agreements.



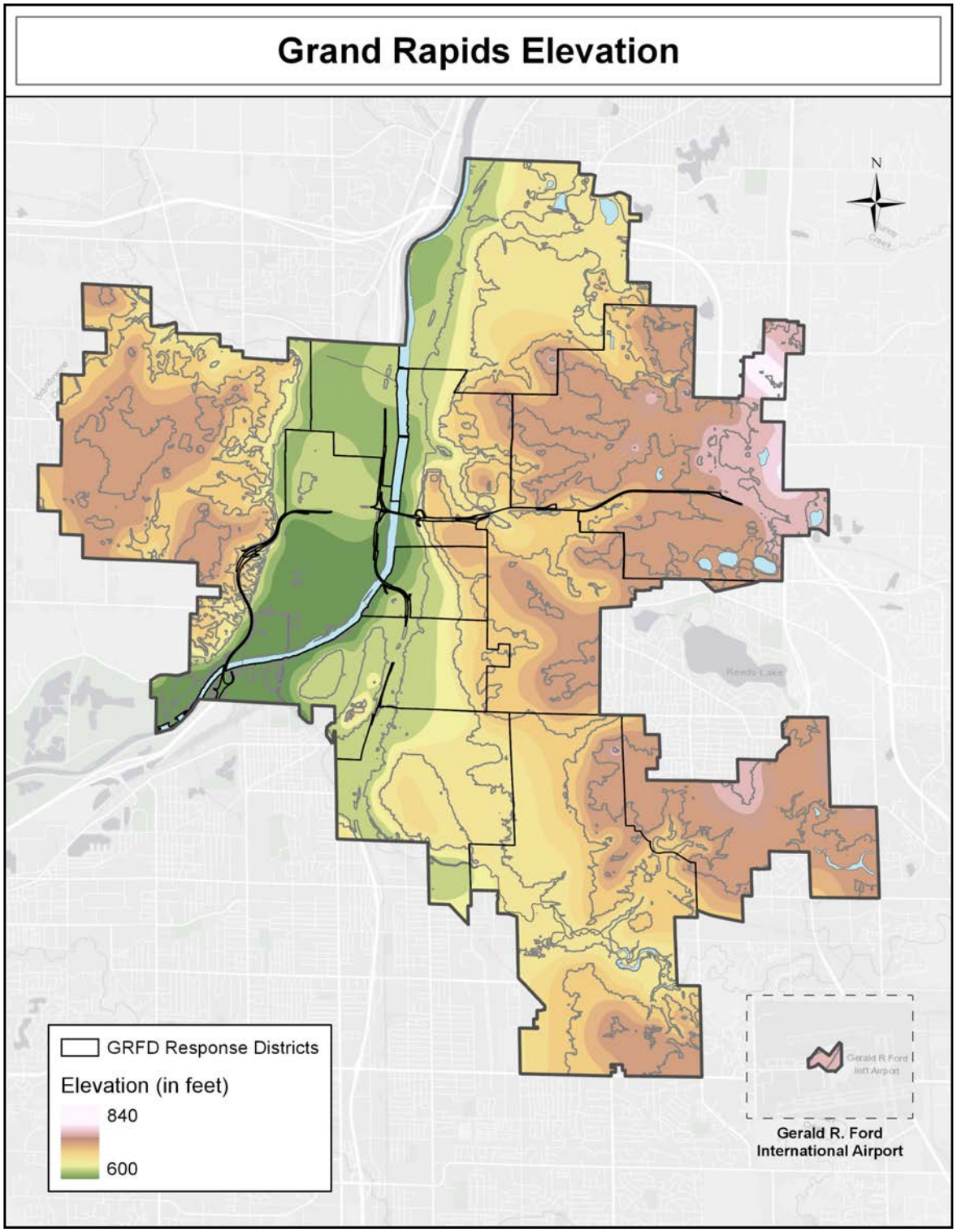
Aid Types	2016	2017	2018	2019	2020
Aid Received ---------->	76	73	74	70	64
Aid Given ---------->	66	55	83	40	56
Single Agency Response -->	8	10	17	17	13

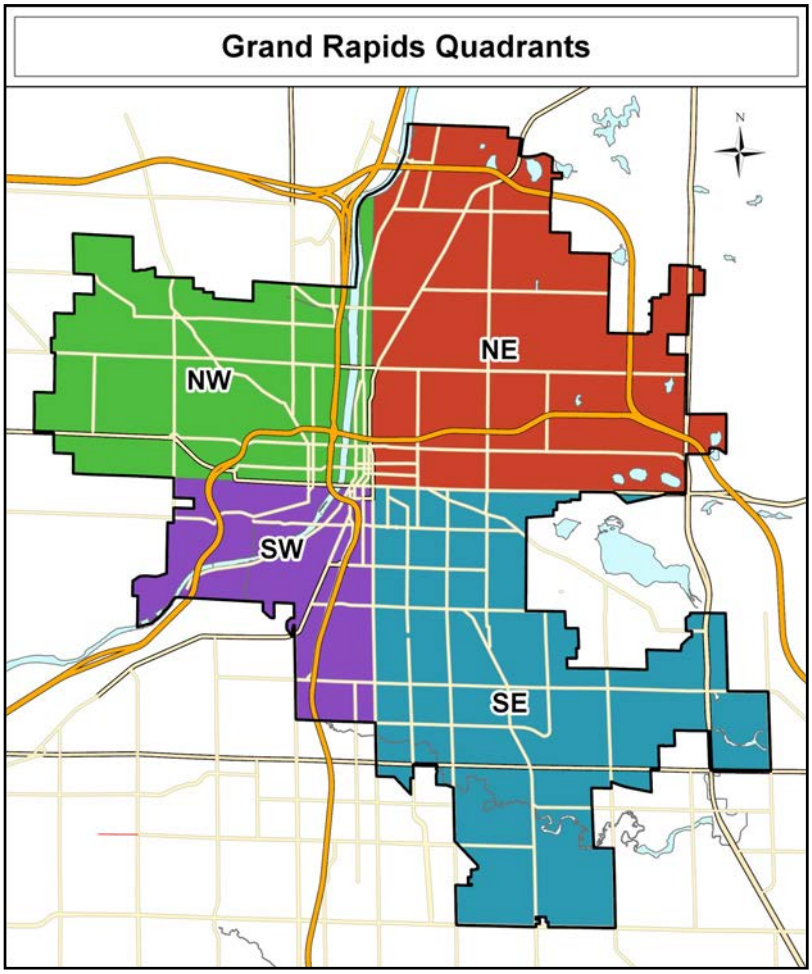
Maps are utilized as quick-reference templates to facilitate inter-operability as well as identify available resources within neighboring departments. These partners also respond into the City of Grand Rapids, assisting with meeting response time goals on critical calls such as structure fires or cardiac arrests. Station captains facilitate and schedule ongoing training with auto-aid partners. In addition, the GRFD is part of the Kent County Mutual Aid Agreement and will provide resources throughout the county when requested. The county is a participating member of MI-MABAS, the mutual aid box alarm system for the State of Michigan. Technical rescue and hazardous materials disciplines are also provided throughout the region when requested. Recent increases in auto-aid received reflect changes to how data is captured, with increased use of NFIRS code 571– cover assignment to better reflect aid given or received.

Topography

Grand Rapids is located in Southwest Michigan. The city is approximately 30 miles east of Lake Michigan and about 60 miles west of the capital city of Lansing. Grand Rapids is approximately 610 feet above sea level, encompassing 45.3 square miles with 44.43 consisting of land and .87 being water. The topography of the city can be seen below.

The Grand River, which is the longest river in Michigan, is 252 miles long and runs right through downtown Grand Rapids. Multiple projects are underway to bring the rapids back to the river, providing a whitewater sports venue and several development opportunities along the banks of the river.





Major Transportation Features

Street Network

The City's street network is based upon a grid system with the North/South dividing line of Fulton St. and the East/West dividing line of Division Ave. This results in the city being divided into four quadrants: NE, NW, SE, and SW.

The city is served by three Interstate highways, six state highways and two U.S. highways.

The metropolitan region has public bus transportation. The main transfer station for public and private bus systems, as well as Amtrak service, is in the downtown area.

Rail

With the country's 12th largest rail system and nearly 3,600 miles of track, Michigan is well served by regional hubs in Grand Rapids and Detroit, and supported by an infrastructure detailed in our State Rail Plan. A federally designated high speed rail corridor, served by Amtrak, connects Grand Rapids to Chicago.

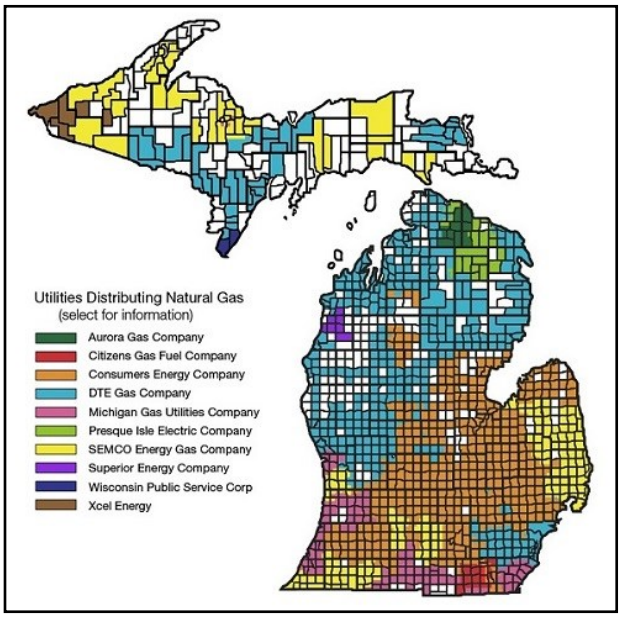
Airports

Gerald R. Ford International Airport is the region's largest commercial airport, which is located outside of the city borders. The terminal, parking structure, and adjacent buildings fall under the jurisdiction of City of Grand Rapids, with the runways and other structures lying in neighboring cities and townships. The airport operates their own independent fire department with primary responsibility for Airport Rescue and Fire Fighting duties, and there is an auto-aid agreement specific to the airport. On any large scale incident, the GRFD and other mutual aid partners play a critical role in hazard mitigation. The GRFD participates in mass casualty incident and airport disaster drills.

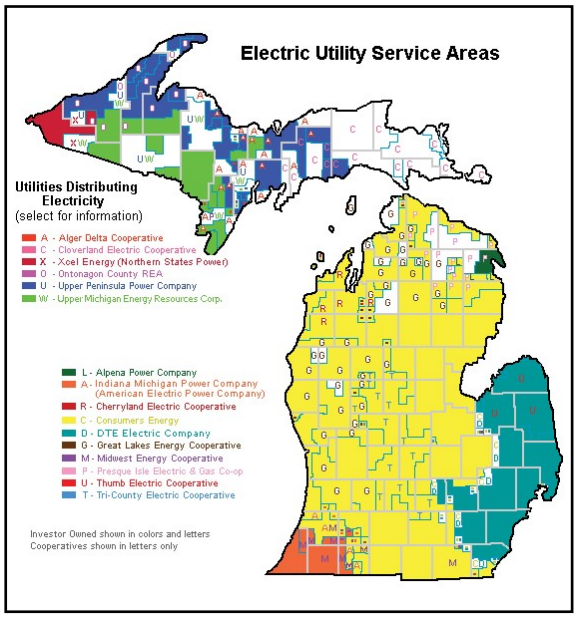
Utilities

The city maintains its own water supply and wastewater treatment plants, which provide services to city businesses and residents, and several surrounding cities and townships as well. The water and sewer systems provide service through 1,200 and 870 miles of lines, respectively.

Grand Rapids owns and operates a water filtration plant located on the coast of Lake Michigan, approximately 30 miles directly west of the city, that processes lake water and pumps it to Grand Rapids.

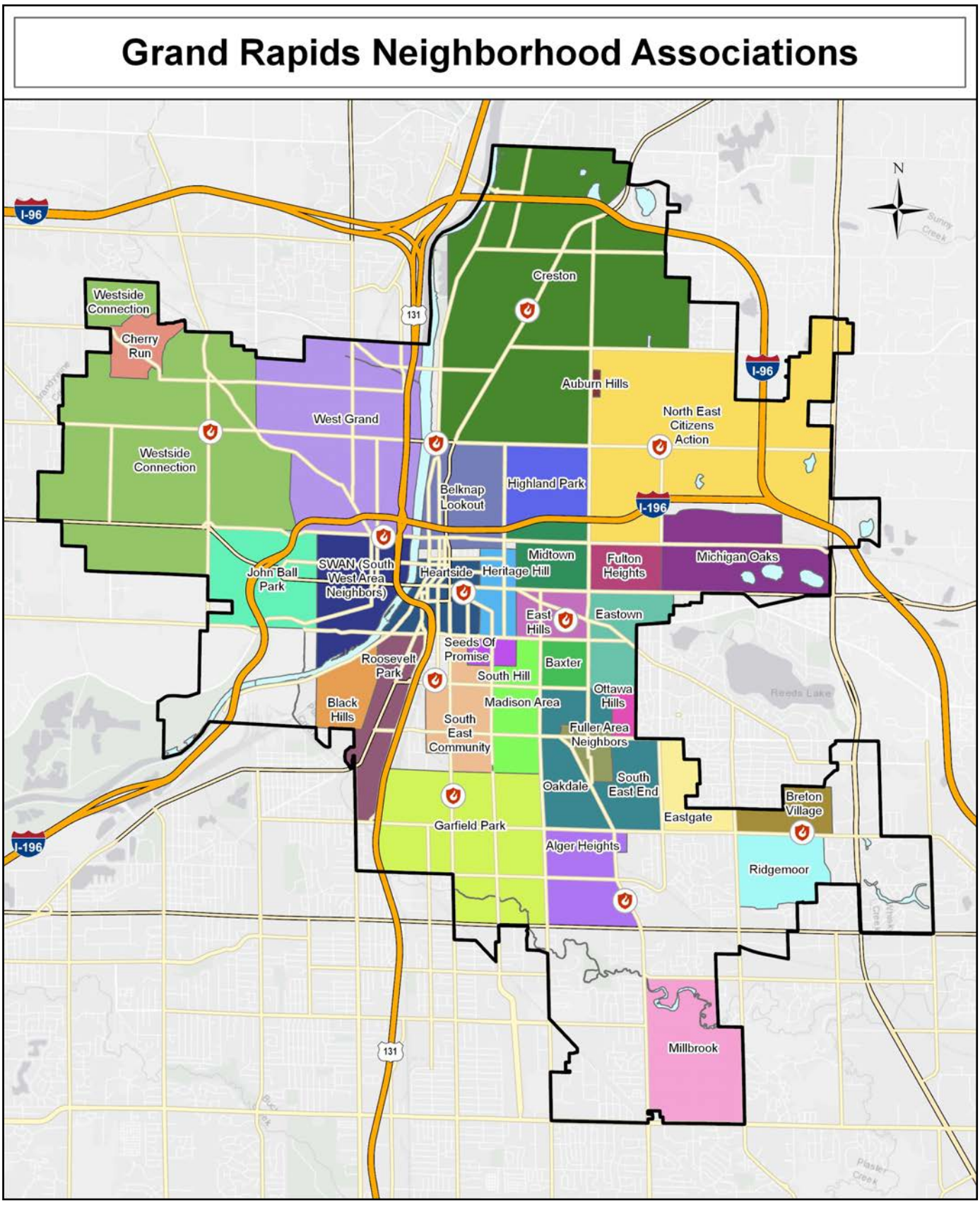


Businesses and residents of the city are supplied with natural gas from DTE Energy, electricity from Consumers Energy, and telephone service through multiple providers.



Neighborhoods

The GRFD interacts with both neighborhood associations and business associations on a frequent basis to disseminate critical information and listen to the needs of the community. Some of the more organized neighborhood organizations include Baxter, East Hills, Eastown, Heartside, Heritage Hill, and West Grand.



Climate

Grand Rapids has large seasonal temperature differences, with very warm and humid summers, cold and snowy winters, and short and mild springs and autumns. Owing to moisture patterns arising from the proximity to Lake Michigan, the city averages around 75.6 inches of snow a year. The area often receives abrupt lake effect snowstorms, producing significant amounts of snowfall which may serve as an impediment to emergency operations.

Summers are warm and severe storms are not uncommon during a typical summer, resulting in elevated incident volumes resulting from downed power lines. Detailed weather information can be seen in the table below.

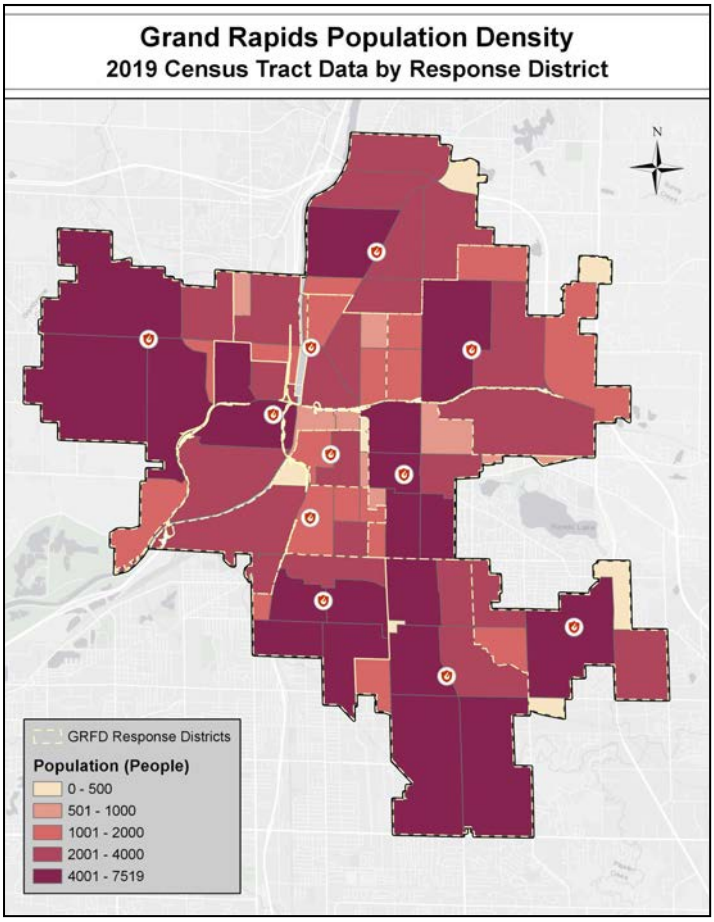
Grand Rapids Weather	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Avg. Temperature	24.5	27	35.5	48	58.5	68.5	72.5	71	63	51	40	29.5	49.08
Avg. Max Temperature	31	34	44	58	69	79	83	81	73	60	47	35	57.83
Avg. Min Temperature	18	20	27	38	48	58	62	61	53	42	33	24	40.33
Days with Max Temp of 90 F or Higher	0	0	0	0	0	2	4	2	0	0	0	0	8
Days with Min Temp Below Freezing	28	25	22	9	1	0	0	0	0	3	15	25	128
Precipitation (inches)	2.09	1.79	2.37	3.35	3.98	3.77	3.78	3.59	4.28	3.26	3.51	2.5	38.27
Monthly Snowfall (inches)	21	15	8	2	0	0	0	0	0	1	7	22	76
Average Wind Speed	12.5	12.2	12	11.9	10.2	9	8.2	8	9	11	11.75	12	10.65
Avg. Relative Humidity	76	71	63	54	53	54	50	52	55	56	69	75	60.67

Population

Grand Rapids is currently the second largest city in Michigan, with an estimated 2020 population of 201,013, placing it as the 113th most populous city in the United States. The metro area contains 1,077,370 people 51st the United States) and the Combined Statistical Area contains 1,412,470 people, placing it 42nd in the United States.

The city covers an area of 45.3 square miles, and with a population density of 4,437 people per square mile, Grand Rapids is denoted as urban according to CFAI guidelines. The 2010 census also indicated a household count of 72,785, with 41,926 families living in the city.

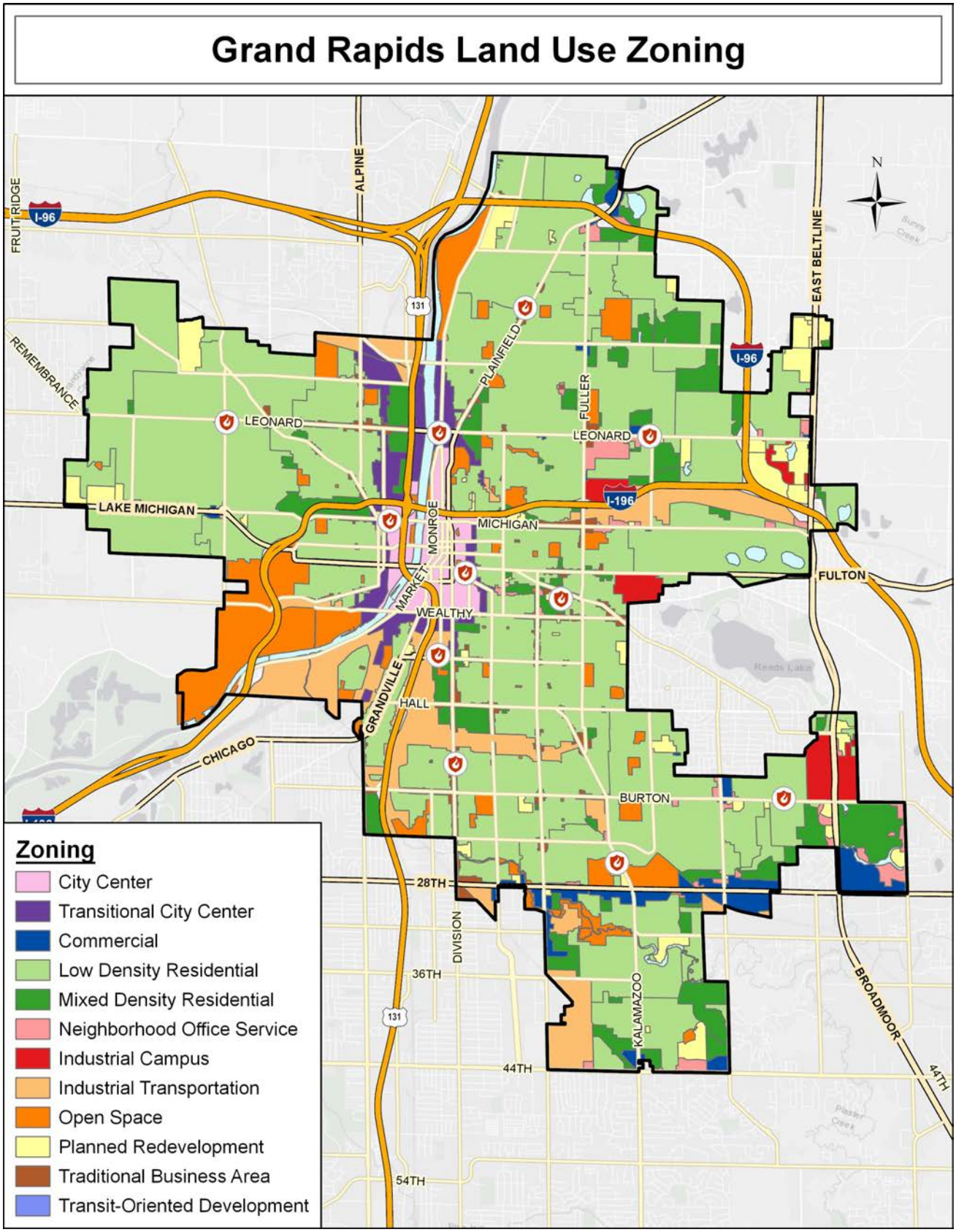
The city is ethnically diverse. According to the 2020 American Community Survey, the population is 67.23% White, 18.56% Black or African-American, 16.10% Hispanic, and 2.43% Asian. 5.64% of the population reported belonging to more than one ethnicity. Data shown in the map to the right are from the 2019 5-year US Census projections.



Development

Description of Master Plan

The City of Grand Rapids Master Plan has delineated the city into 12 types of land use which assists the fire department in understanding the makeup of the community.



Economic Development

The downtown area has been a focus for redevelopment and investment over the last ten years, resulting in a shift in population to the downtown core. The vibrancy of the city continues to grow with accolades such as:

2020

- #3 - Top Cities Where U.S. Manufacturing is Thriving - Grand Rapids, AdvisorSmith
- #7 - Top 10 Metros for Millennials - Grand Rapids, New York Times/CommercialCafe
- #1 - 7 Places to Go in 2020 -- Before the Crowds Hit - Grand Rapids, Jetsetter
- #2 - Top Housing Market for Millennials - Grand Rapids, ImproveNet
- #21 - 100 Best Places to Live in the U.S. - Grand Rapids, Livability
- #1 - Best Cities for First-Time Homebuyers - Grand Rapids, SmartAsset
- #1 - Cities with the Most Manufacturing Jobs - Grand Rapids/Kentwood, Smartest Dollar

2019

- Top 10 Cities to Buy Affordable Homes on a $60k Salary - Grand Rapids, CNBC
- #5 - Top U.S. Growth Cities for 2018 - Grand Rapids/Wyoming, U-Haul
- #51 - Best Metro for STEM Professionals - Grand Rapids, WalletHub
- #10 - Annual International Housing Affordability Survey - Grand Rapids, Demographia
- #45 - 2019 Top 100 Best Places to Live - Grand Rapids, Livability
- #6 - Best Places to Retire in the U.S. - Grand Rapids, U.S. News & World Report
- #6 - 25 Best *Affordable* Places to Live in the U.S. in 2019 - Grand Rapids, U.S. News & World Report
- #13 - 25 Best Places to Live in the U.S.in 2019 - Grand Rapids, U.S. News & World Report
- #2 - Top Hiring Metro Areas in the U.S. - Grand Rapids, ManpowerGroup
- #4 - Best Cities for First-Time Home Buyers - Grand Rapids, WalletHub
- #1 - Mid-Sized Metro for Economic Growth Potential - Grand Rapids, Business Facilities
- #1 - America's 10 Hottest Neighborhoods, Grand Rapids (49505 - Creston), Realtor.com
- #1 - Top Metro for Sustainable Development, Site Selection Magazine
- #15 - Best Places to Buy a House in 2019, Grand Rapids - WalletHub
- #9 - Best Midsize Cities to Buy a House in 2019, Grand Rapids - WalletHub
- #25 - Best Food Cities in America, Grand Rapids - WalletHub
- #12 - 2020 State Business Tax Climate Index - MEDC
- #2 & #6 - Hottest U.S. Housing Markets of 2019, Grand Rapids (Alger Heights & Creston) - Redfin

Rankings courtesy of The Right Place of West Michigan

Employment

Grand Rapids has long been a center for furniture manufacturing. Office furniture manufacturers such as American Seating, Steelcase (and its subsidiaries Coalesse and Turnstone), Haworth, and Herman Miller are based in and around the Grand Rapids area. In 1881, the Furniture Manufacturers Association was organized in Grand Rapids; making it the country's first furniture manufacturing advocacy group. The Kindel Furniture Company and the Hekman Furniture Company have been designing and manufacturing furniture in Grand Rapids since 1912 and 1922 respectively.

The Grand Rapids area is home to a number of well-known companies including Alticor/Amway (a multi-level marketing company), Bissell (a privately owned vacuum cleaner and floor care product manufacturer), Highlight Industries (an industry leader in stretch wrap equipment), SpartanNash (a food distributor and grocery store chain), Foremost Insurance Company (a specialty lines insurance company), Meijer (a regional supercenter chain), GE Aviation (formerly Smiths Industries, an aerospace products company), Wolverine World Wide (a designer and manufacturer of shoes, boots and clothing), Universal Forest Products (a building materials company), and Schuler Books & Music, one of the country's largest independent bookstores.

The region, and the city in particular, is diversifying as local medical, technology, and higher education sectors continue to expand. In fact, non-manufacturing employment in the Grand Rapids area accounts for 80.47% of the labor force, with 19.53% employed in the manufacturing sector. The top Grand Rapids area employers can be seen in the table below:

Top 20 West Michigan Employers			
Rank	COMPANY NAME	EMPLOYEE COUNT	DESCRIPTION
1	Spectrum Health (HQ)	25,000	General Medical & Surgical Hospitals
2	Meijer (HQ)	10,340	Supermarket Retail & Distribution
3	Mercy Health (Kent & Muskegon)	8,500	General Medical and Surgical Hospitals
4	Gentex Corporation (HQ)	5,800	Computer/Electronic Manufacturing
5	Gordon Food Service (HQ)	5,000	Grocery and Related Products Merchant Wholesalers
6	Amway Corporation (HQ)	3,791	Consumer Goods Manufacturing
7	Herman Miller Inc. (HQ)	3,621	Office Furniture Manufacturing
8	Perrigo Company	3,500	Pharmaceutical Manufacturing
9	Steelcase Inc.(HQ)	3,500	Office Furniture Manufacturing
10	Farmers Insurance Group	3,500	Direct Property and Casualty Insurance Carrier

Health Care Systems

The city is home to two major hospitals. Large-scale growth in the health care, medical education, and medical research sectors has had major impacts on the local economy. Headquartered in Grand Rapids, Spectrum Health is West Michigan's largest employer. Spectrum Health's Meijer Heart Center, Lemmen-Holton Cancer Pavilion, and Butterworth Hospital, a level I trauma center, are on the Grand Rapids Medical Mile, which has world-class facilities that focus on the health sciences. They include the Van Andel Research Institute, Grand Valley State University's Cook-DeVos Center for Health Sciences, and the Michigan State University College of Human Medicine medical school's Secchia Center, along with Ferris State University's College of Pharmacy. Nearly a billion dollars has been invested in the Spectrum Health Cancer Pavilion, the Spectrum Health Helen DeVos Children's Hospital, and the expansion to the Van Andel Institute. These facilities have attracted many health science businesses to the area.

Mercy Health Saint Mary's is an accredited teaching hospital that encompasses The Lacks Cancer Center, the area's only dedicated cancer hospital, the Hauenstein Neuroscience Center, housing the area's most comprehensive neuroscience program and state-of-the-art emergency and trauma services, an Orthopedic Center of Excellence, the and the Wege Center for Health and Learning.

Education Systems

K–12 public education is provided by the Grand Rapids Public Schools (GRPS) as well as a number of private schools. City High-Middle School, a magnet school for academically talented students in the metropolitan region operated by GRPS, is perennially ranked among the nation's top high schools. Grand Rapids is also home to the oldest co-educational Catholic high school in the United States, Catholic Central High School. National Heritage Academies, which operates charter schools across several states, has its headquarters in Grand Rapids.

Grand Rapids is a college town, home to at least 15 institutions of higher education in the metro area, serving tens of thousands of students. Grand Rapids offers a variety of college experiences to choose from: state universities, private colleges, Christian colleges, and one of the nation's best community colleges.

Grand Valley State University's Pew Campus

Recreation

There are multiple sports venues within the city and nearby region. Van Andel Arena is home to the Grand Rapids Griffins hockey team, in addition to hosting multiple entertainment events each year.

Grand Rapids has a number of popular concert venues where touring artists have performed, including 20 Monroe Live, the Division Avenue Arts Collective, the Intersection, DeVos Performance Hall, Van Andel Arena, Royce Auditorium in St. Cecilia Music Center, Wealthy Theater and The Pyramid Scheme.

Every June brings the Festival of the Arts, a three day event which spans across the entire downtown area. The city hosts numerous smaller festivals celebrating a variety of cultural interests. In the fall, Art Prize, the world's largest public art competition takes place, bringing over $22 Million in economic impact from 389,400 visitors to the city over a 3 week period in September/October. When the weather turns cold, the city operates an outdoor ice rink at Rosa Parks circle, drawing large crowds during the holiday season.

In addition to the sports and entertainment found within Grand Rapids, there are numerous museums including the Grand Rapids Public Museum, The Grand Rapids Art Museum, and the Gerald R. Ford Presidential Museum which opened in 1981 and is part of the Presidential libraries system of the National Archives and Records Administration. The city is also home to Frederik Meijer Gardens & Sculpture Park and the John Ball Zoological Garden.

Grand Rapids is a city of neighborhoods and parks, 90 city parks contain more than 2,000 acres of green space. There are over 288 miles of bicycle trails within the city limits. The Grand River is a popular destination for outdoor enthusiasts and recreational fishing. Salmon weighing up to 35 pounds are caught in downtown Grand Rapids during the spring and fall migration up the Grand River.

Section B - Description of Agency Programs and Services

Organizational Overview

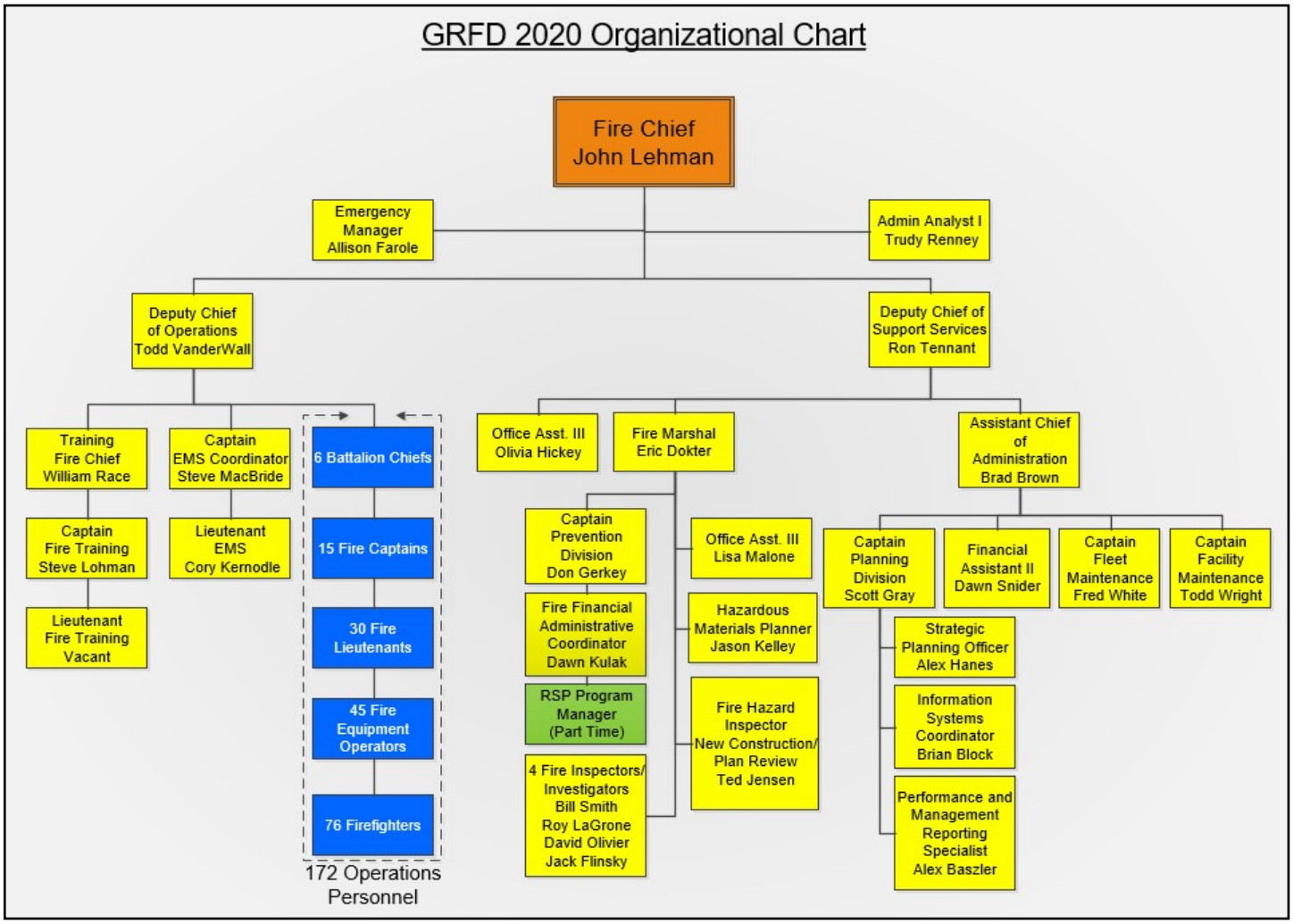
Community Expectations

Organizational Overview

The Grand Rapids Fire Department provides a full spectrum of emergency responses via four main areas: fire suppression, emergency medical services (EMS), hazardous materials, and technical rescue mitigation. A map of the department's current deployment model can be seen in Section D - Current Deployment and Performance. The department also administers many critical non-emergency risk based programs such as the residential safety program and commercial fire inspections.

The department operates under a "total authorized strength" model with 201 uniformed and civilian employees providing services to the citizens and businesses within Grand Rapids. In addition to a multitude of non-emergency functions, the organization has seen steady increases in emergency incident demand.

The Fire Chief, John Lehman, oversees a command staff of two deputy chiefs, an assistant chief, six battalion chiefs, a training chief and a fire marshal. The operations division is managed by one deputy chief and the support services division is managed by the other. The assistant chief oversees fleet, facilities, budgeting and planning. This model can be seen in the organizational chart below.



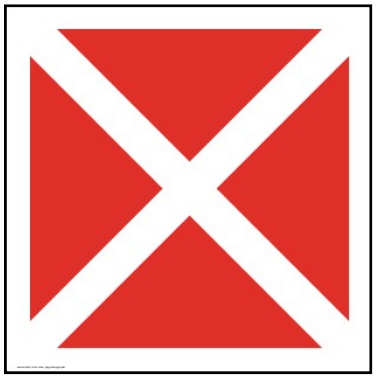
Specific program oversight is assigned to the members of the executive staff. Programs that are identified in the Self-Assessment Manual will be outlined in this section, and the remainder of the significant programs will be described in the order that they are assigned to the fire chief, deputy chief of operations, deputy chief of support services, and assistant chief of administration respectively.

Community Risk Reduction

The Fire Prevention Division (FPD) focuses inspection efforts to support the department's community risk assessment. The division's building inspectors continue to focus on the city's highest risk buildings and hazardous processes through the division's operational permit program. Existing building staff and office staff also work to administer the maintenance of installed fire protection systems throughout the city as a part of the GRFD's Fire & Life Safety Program.

Inspection activities are conducted in approximately 950 higher-hazard existing buildings every year. These activities include initial inspections, follow-up inspections, and other enforcement activities. Higher risk occupancies in the city continue to be monitored via the risk assessment program. Both high and maximum risk occupancies are identified and key fire protection and hazard information is gathered by fire suppression crews. This information is available to fire companies through the cloud based RMS system as they respond to alarms.

Fire safety inspections are performed in residential high rises, to enhance fire safety for occupancies which have a higher life safety risk. The Fire Prevention Division focuses its efforts to ensure that installed fire protection systems continue to function as designed. Well over 2,000 fire suppression and fire alarm system inspection reports are reviewed annually. Follow-up inspections to ensure repairs of defective systems and inspections of occupancies that had deficient systems are performed.



A vacant building identification and evaluation program was developed in 2018 to decrease the likelihood of firefighter injuries which are more common in this type of fire. At the end of 2019, As the program proceeds, vacant buildings identified by fire crews or inspectors are inspected, evaluated for hazards, and very hazardous buildings are referred to the Building Department and City Attorney's Office for repair or demolishment.

The Fire Prevention Division consults with ArtPrize artists and venues to ensure safety from fire and other hazards for visitors who enjoyed those installations. Planning continues to coordinate with ArtPrize for inspections of venues for future events.

Nightclub inspections are conducted to ensure adequate crowd management and guard against overcrowding in approximately 100 venues.

The Fire Prevention Division is responsible for following up on nuisance reports associated with the City's two-year Recreational Fire Permit program. Fire suppression crews responded to 140 active complaints of smoke due to recreational or nuisance fires between March and April of 2019, and FPD personnel evaluated the reports for possible additional education or enforcement action. FPD is authorized to issue civil infractions to repeat offenders.

GRFD Fire Prevention Division personnel worked alongside a multi-department team to plan and prepare for the development and commissioning of medical marijuana grow and provisioning centers in the city. This project will continue to require resources from GRFD as well as other city departments as the rules for recreational marijuana facilities are developed at the State level.

FPD inspectors, working alongside school maintenance and security personnel, inspect 103 elementary and secondary schools within the City of Grand Rapids annually. This includes every elementary and secondary school in the Grand Rapids Public School system.

FPD personnel conduct training events to educate operators of Mobile Food Preparation Vehicles (MFVs) in the safety regulations as part of the city's efforts to encourage the growth of the food truck scene in the city. FPD inspectors conduct inspections of all city-licensed Mobile Food Preparation Vehicles. Additionally, the Grand Rapids FPD has taken a lead role with area fire departments for safety inspection programs for MFVs, working alongside inspection personnel from Kalamazoo, Grand Haven, Muskegon Heights, Saugatuck, and Oshtemo Township to develop reciprocity and allow operators to move between jurisdictions without incurring inspection costs in each one. This work has evolved into a group within the Michigan Fire Inspection Society known as Mobile Food Service Unit Inspection Consortium.

Construction & Plan Review

Our fire prevention staff provides technical expertise in the area of fire protection system installation and acceptance for new building and remodeling projects. This application of fire protection technical expertise begins in pre-construction meetings with builders and developers, continues through system plan reviews and consultation with contractors, and culminates with the acceptance inspection and testing of the installed systems. During this whole process, GRFD fire inspectors work closely with city personnel from a variety of different departments in order to provide as seamless an integration of services as possible.

GRFD personnel are involved in preconstruction meetings with architects, engineers, and designers; on-site consultation with superintendents and installers; inter-departmental meetings to coordinate requirements and inspections, and Design Team meetings where developers consult with city decision-makers on potential issues and project considerations before plans are finalized.

In 2019, more than 700 fire alarm and suppression system plan reviews were performed, which shows continuing strong construction activity in the city.

Approximately 850 fire alarm and suppression system rough-in and final inspections were performed in 2019, which is another increase of more than 10% over 2018, and which again shows continuing strong growth in construction within the City of Grand Rapids. Approximately 50 of the final inspections were for larger projects which required the participation of two to five inspectors.

Pyrotechnics

GRFD issues permits and witnesses demonstrations of pyrotechnic and flaming displays for theatrical and musical performances to ensure the safety of the public and performers. Each year, approximately 20 pyrotechnic displays and 19 instances of the use of open flames are evaluated and approved by FPD personnel. There were no injuries reported from any of these potentially hazardous events.

Public Education

The Grand Rapids Fire Department public education program is administered by the Fire Prevention Division. Education with the goal of risk reduction is the objective for the program, and varying types of instruction and training are directed towards individual, business and community audiences.

The GRFD is dedicated to educating the public about fire safety. In addition to our home safety assessments, our firefighters attend block parties, appear at school events, and make the scene at festivals and trade shows to spread the word about smoke alarms and fire safety. Division staff design curricula and train suppression personnel to deliver safety presentations and conduct residential safety assessments. Division personnel are also responsible for procuring and distributing the supplies and materials necessary to accomplish these goals. Prevention personnel also deliver public education directly as part of their inspection activities.

During the Fire Safety Month of October, and to the end of November, our fire crews reach out to all of the second graders in schools near their fire stations to talk about fire safety. Each year, we are able to reach over 2,000 of our future fire-safe citizens.

The Fire Prevention Division assists fire suppression personnel in inviting the public to learn about fire safety topics and fire department operations during fire safety station open houses every October.

Lastly, more than 4,000 children received home fire safety education through the use of the Residential Safety Program's safety trailer, a mobile classroom that simulates a home. During the program, children learn to identify safety hazards in the home, and respond to a simulated fire with the use of theatrical smoke and actual smoke detectors by safely evacuating the "home." The children leave with educational materials to share with their parents so that the skills they learn can be used by the entire family.

Residential Safety Program

The Residential Safety Program continues to support the department's federally funded, home safety assessments. This program gives us the opportunity to deliver fire safety education directly to our citizens, and install smoke and carbon monoxide alarms utilizing our on-duty fire crews. GRFD's latest FEMA grant request included funds for the purchase and installation of carbon monoxide (CO) alarms as a part of the Residential Safety Program. CO alarms will augment our robust smoke alarm installation program to increase the ability of our citizens to respond safely to hazardous conditions in their homes.

The number of Home Safety Assessments conducted has increased over the last few years. Since the spring of 2013, the GRFD has conducted over 10,452 assessments and installed over 62,830 alarms.

The RSP team attends multiple public events every year. Many events include the safety trailer program to educate approximately 4,000 children about home fire hazards, evacuation planning, and what to do when a smoke alarm goes off in their homes.

Citizens that receive the free alarms and Home Safety Assessments have expressed a 99.68% satisfaction rate. Many praised both the program and GRFD personnel for their knowledge and professionalism.

The GRFD works with community stakeholders to identify eligible program participants. A few of the many organizations that helped promote the program are: American Red Cross, Bethany Christian Services, Disability Advocates of Kent County, DTE Energy, Grand Rapids African American Health Institute, Grand Rapids Children's' Museum, LINC Up, Operation Save-A-Life, Storytime in the Park, West Michigan Hispanic Chamber of Commerce, as well as many Neighborhood Associations.

Fire Match

The Fire Match Program interacts with multiple juvenile fire setters every year. Vital relationships with the Kent County Probation Department and various counseling agencies also play a major role with the referrals that help families in the Grand Rapids metro area. This program's overall broad reach and impact is a testament to stakeholder involvement.

The Fire Match Program utilizes a one day juvenile fire setter clinic. This clinic provides assistance to families with children exhibiting fire setting behavior. The hopes are to reach the "unreported" segment of juvenile fire setters in the Grand Rapids community and to give an intense and impactful informational clinic using fire staff, the Kent County Probation Office, professional counselors, and a local media personality.

Fire Investigation

Fire inspectors are cross-trained by the Michigan State Police or at the National Fire Academy to provide origin and cause determination, when on-scene personnel cannot determine the origin and cause of a fire or when another circumstance requires a formal fire investigation.

While the identification of intentionally set fires is a very important component of the reason fire investigations are conducted, identifying the cause of even accidental fires assists the fire department in formulating its approach to the development of its overall fire prevention message.

Support is provided to our fire investigation efforts by the Grand Rapids Police Department, Kent County Sherriff's Department, The Federal Bureau of Alcohol, Tobacco, Firearms, and Explosives, and the Michigan State Police.

All members of GRFD Fire Prevention Division who undergo fire investigation training are trained in the use of the objective analytical process, commonly known as the scientific method, to structure their investigation and for the drawing of conclusions. Members who have been trained in this methodology have successfully qualified to provide expert testimony in Circuit and District Courts.

Emergency Preparedness

The City of Grand Rapids has relied on Kent County for emergency management services for most of the past decade. With the establishment of the Emergency Management Administrator position in 2019, the City of Grand Rapids is currently rebuilding the emergency management program. The program is currently guided by an Emergency Action Guide (EAG) that is the driving force for all emergency management activities. Overall, emergency management activities occur throughout city departments; however, there is no coordination amongst these activities. The City of Grand Rapids is not recognized as a separate voting member on the Region 6 Homeland Security Planning Board and does not receive its own Emergency Management Performance Grant (EMPG) funding.

Upon evaluating the current status of the emergency management program for the City of Grand Rapids, the fire department recommended the establishment of the Office of Emergency Management (OEM). The Office of Emergency Management is housed within the City of Grand Rapids Fire Department and reports directly to the fire chief. OEM services are delivered to all internal and external customers within the city. To provide guidance for the OEM, an Emergency Operations Plan (EOP) is being drafted. Additionally, a Continuity of Operations Plan (COOP) and Emergency Action Plans (EAP's) are being developed to ensure city services are continuous and all personnel know what safety actions to take. To provide a guide for the Office of Emergency Management to meet accreditation and annual goals, the office is developing a strategic plan that includes a mission and vision statement. Several local and regional drills are conducted throughout the year including multi-agency hazardous materials drills. The all-hazards plan and domestic preparedness, planning, and response program are evaluated following any activation of the EOC or exercise via debriefing sessions with involved members.

September 11, 2019 storm damage—Fairview St. NE

Twenty-one initial actions have been drafted to establish the Office of Emergency Management for the City of Grand Rapids. Highlights include:

- Developing an Emergency Operations Plan (EOP)
- Developing a Continuity of Operations Plan (COOP)
- Developing a Disaster Recovery Framework
- Restructuring the Emergency Operations Center (EOC) and providing position-specific training

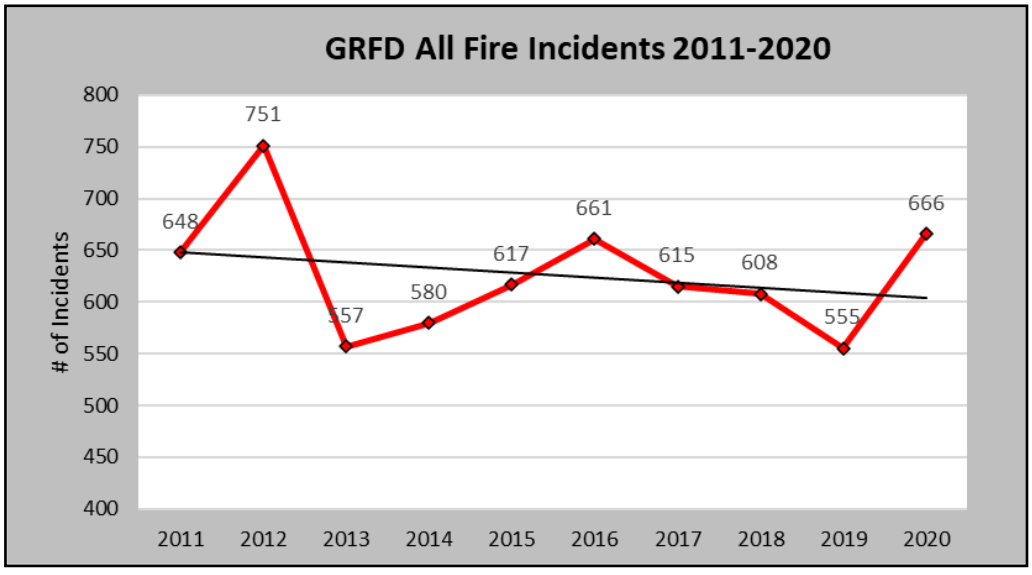
Fire Suppression

Grand Rapids averages approximately one structure fire per day in the city and one other type of fire (car, dumpster, brush). Many of the fires are contained to the object, room of origin, or floor of origin due to the quick response of the crews. Historic save rates show that the GRFD saves approximately 97% of the property to which it responds. 2016-2020 saw $26,971,125 in property loss with $884,074,1743 saved. The staffing levels in place allow the deployment system to handle one high risk fire in a commercial occupancy, or two moderate risk structure fires in residential dwellings before the system is depleted and call backs of off duty personnel or backfilling from automatic and mutual aid companies are required.

A typical moderate risk structure fire alarm will send at least 19 personnel arriving on the following apparatus: four engines, one rescue engine one ladder/platform, and one battalion chief. This complement provides specialized equipment such as rapid intervention equipment, forcible entry capabilities, an abundant water supply and basic firefighting hand tools. If it will be an extended incident, crews are rotated through rehabilitation and additional units are deployed to assist.

All frontline apparatus are staffed with three personnel. Battalion chief cars are staffed with one person. There are eleven fire stations housing two rescue engines, nine engines, four aerials (platforms or ladders), and two battalion chiefs. The city is broken into north and south battalions, each with a battalion chief to oversee daily operational functions and to act as incident command and safety officers. Additional cross staffed apparatus include: two hazardous materials response vehicles, an air delivery vehicle, three water rescue vehicles, five water craft, a heavy rescue truck, a transport/rehabilitation bus, a utility blocker for highway and high speed roadway operations, three brush trucks, and a mini pumper for responses to parking structures. The layout of the fire stations with first due districts and assigned frontline apparatus can be seen in Section D - Current Deployment and Performance.

The Grand Rapids Fire Department has answered an average of 22,621 alarms over the last ten years. Over the past decade total responses rose fairly steady, While overall calls for response continue to climb, the positive news from these totals is that fire calls continue to trend downward. The GRFD responded to 648 fire calls in 2010, and finished the decade with 666 fire calls in 2020.



The department assisted other communities outside of our city at 68 incidents in 2020. We also received assistance from other communities on 64 occasions. To better facilitate the giving and receiving of aid, the GRFD joined the Michigan Mutual Aid Box Alarm System (MI-MABAS). The mission of Michigan MABAS is to coordinate the effective and efficient intrastate and interstate mobilization and deployment of fire, emergency medical services, and special operations mutual aid resources during natural and man-made emergencies and disasters.

To simplify, MABAS is an organized network to call for additional resources when jurisdictions are overwhelmed due catastrophic events. Increased response capabilities for our community are available with this new partnership.

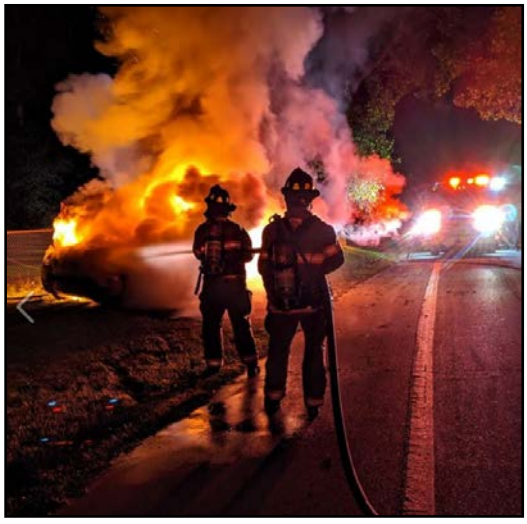
One strategy within the fire department response pillar is to increase community awareness of firefighting, EMS and special operations. We address this strategy by holding community Fire Expos at LaGrave Station. The department also conducts Fire Ops 101 events (which is a half day class for city officials and community leaders to gain a basic understanding of what goes into the job of firefighting), and community open houses at each fire station during fire safety week in October. Over the last two years, approximately 800 people attended both the open houses and the expo event, and nine community leaders participated in the Fire Ops 101 event. An after action review was conducted following each event, and the department plans on holding a Fire Expo every 3 years, annual open houses at each of our 11 stations in October, and a Fire Ops 101 event every two years.

Battalion Fire Chiefs

Battalion chiefs serve as the link between administration and suppression personnel. They supervise daily operations and provide direction consistent with the GRFD Mission of valuing people by saving lives, protecting property and responding to the needs of our community.

There are two Battalion Chiefs assigned to each of the three shifts, for a total of six. One battalion chief is assigned to the north portion of the city and operates out of the Monroe Avenue Fire Station. The other battalion chief covers the south end of the city and works out of the Division Avenue Station.

A primary responsibility of battalion chiefs is operating as the Incident Commander at any large-scale incident such as a structure fire, hazardous materials incident, or a vehicle extrication. These incidents typically include three or more suppression units. The battalion chief coordinates the operations on scene, ensures that there are sufficient resources to mitigate the incident and provides for the safety of personnel and civilians .



In addition to operational duties, the battalion chiefs also manage several administrative needs. These include tasks such as:

Staffing - Chiefs review each day's complement of personnel and ensure that the minimum number of personnel are on duty. They also adjust the daily placement of members to meet the needs of city coverage, training and other necessary functions.

Information - Battalion chiefs start the day with an online Live Meeting to share information that includes all fire stations, administrative personnel, and fire dispatch. The battalion chiefs also share information from the monthly Command Staff meeting. Finally, the battalion chiefs provide information about actions at incidents through various means including after action reviews, quality assurance/quality improvement documentation for various medical incidents, and information shared at quarterly meetings with officers in their respective battalions.

Training - Every other month, a battalion chief is assigned to create and share with other battalion chiefs a training exercise designed to meet the needs of suppression personnel. This training is then provided to all members. The chiefs also work closely with the training division to oversee crew reviews of monthly assigned training exercises.

Program Managers - Each battalion chief is assigned as a program manager and oversees the administrative functions of their respective programs. These include special operations, wellness, recruitment/outreach, support services, liaison with mutual aid departments and extrication.

Emergency Medical Services

The GRFD operates as a Medical First Responder (MFR) agency under the purview of the Kent County Emergency Medical System (KCEMS). Two private companies (American Medical Response and LIFE Ambulance) provide advanced life support services (paramedic) to the city, with the fire department arriving first the majority of the time to assess the situation and stabilize patients.

The GRFD responded to 15,539 requests for medical service in 2020, accounting for 67.21% of the total call volume.

Calls are broken down into four main categories based upon perceived severity of the caller. Med 0's are potentially life threatening calls and dispatched before final determination by the advanced life support agency is complete. Med 0's account for 21.72% of the EMS calls in the city based upon 2020 data, with examples including cardiac arrest, respiratory arrest, etc. Med 1's are potentially life threatening and account for 44.63% of the EMS call volume in the city. Med 2's are less severe, but still require MFR response and comprise 33.04% of the calls. Med 3's are typically low acuity, with GRFD providing assistance to ALS agencies .61% of the time. Response to EMS calls range from 3 personnel responding in a single unit for a Med 2 in their district, to sending 2 units plus a battalion chief (who serves as quality assurance and provides additional command assistance where needed) on a cardiac arrest, all the way to 19 personnel for a mass casualty type incident.

Ensuring continuous quality improvement (CQI) remains a high priority for the professional emergency medical care that the Grand Rapids Fire Department provides. In 2019 a new position was filled by a lieutenant shared with the training division, who has taken on the retrospective CQI review of reports, and providing continuing education for our members in EMS as well as fire training topics. The department maintains a team of Instructor Coordinators who take a critical look at our training, equipment, and supplies to ensure we maintain our skills for the population that we serve. The department also provides CPR classes to city employees and citizens on an annual basis.

The department has identified a move to EMT licensure as supporting its mission of responding to the needs of the community. Recent recruit classes have attained Basic EMT licensure as part of their training. The department also offers opportunities for existing MFR's to advance to EMT.

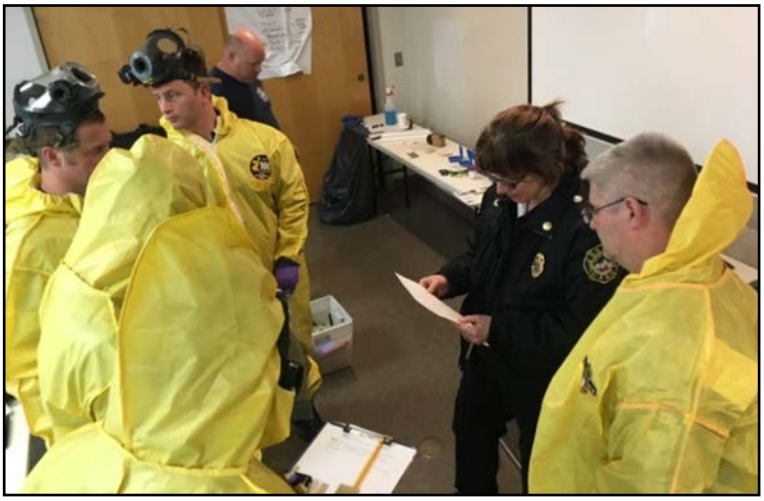
A large focus of recent continuing education was focused on active shooter and hostile event responses. Coordination with the Grand Rapids Police Department took place to ensure that our teams will work effectively during these dynamic events if needed. A Rescue Task Force deployment model was used at the basis for this initiative.

Special Operations - Hazardous Materials

The hazmat team responds to several chemical spills in the city each year, as well as assisting regional agencies with on-scene help. The department maintains a 36 member team. All members receive training to the technician level. Members also take classes in radiation detection and response, transportation emergencies, chemistry, and hazmat officer.

Hazmat team members also provide technical assistance and advice to fire and police units when a full team call out is not necessary. The department responds to fuel spills, chemical spills, unknown product identification, and suspected bio-terrorism incidents.

The department responds to hazardous materials incidents with a tiered response approach. Small spills of common hydrocarbon materials are addressed by single fire companies, equipped with basic spill control equipment, and hazmat operations level trained employees. Larger spills (32 - 200 gallons, calls for Class B Foam) are handled with a first due fire company, Hazmat 1 (the main hazardous materials response vehicle) and a crew from the Franklin Station Hazmat Team. A minimum of one technician responds with the crew from Franklin to oversee the operation. For a chemical emergency in the city, the entire on duty Hazmat Technician Team is sent from Franklin Station, along with HazMat 1, in addition to a variety of fire companies to support the operation. For weapons of mass destruction and CBRNE (chemical, biological, radiological, nuclear and explosive) events, GRFD members who are part of the State of Michigan Regional Response Team 61 will be dispatched whether the incident is inside the city, or in response to a local, regional or state request.



On the equipment side of things, the department has improved its monitoring capabilities, upgrading its Raman spectroscopy and fourier-transform infrared spectroscopy (FTIR) identification devices. The department has added new components to its decontamination capability by adding the Decon IQ course, Dahlgren Decon Solution, and Fibertech wipes. A large assortment of foam and containment supplies is cached at Franklin Station.

The department continues to streamline its approach to hazmat, while increasing its capabilities to become a certified MI-MABAS type 1 team.

Special Operations - Technical Rescue

To align with the varying risks in the city, the GRFD maintains several special operations teams. All GRFD members are trained to the awareness level for all special operations functions. Special operations team members are trained to the operations or technician level, with many trained to the IC (incident command) or specialist level.

The department has worked closely with the local bargaining unit to make significant changes in the deployment model for special response operations. Special responses include hazardous materials, technical rescue, and water rescue incidents. These events require a group of firefighters with specialized skills to mitigate a technical incident. Instead of specially trained responders scattered across the city at various stations, centralization of special response personnel at LaGrave Station for technical rescue, Bridge Station for water rescue, and Franklin Station for hazardous materials has provided efficiencies in training and response. The department will continue to monitor these adjustments for potential improvements in the response model. The department analyzes its metrics for distribution and concentration for technical rescues and makes operational adjustments to better respond to the needs of our community. A good example of this is the evaluation of extrication tool placements on front line apparatus. Historical data indicated that if tool placement was realigned, the department would most likely achieve better outcomes in its response metrics for extrication assignments. Ongoing evaluation of data continues to inform changes that will improve response metrics.

The downtown rescue engines (Rescue 1 and 2) are the primary technical rescue crews and operate as a cohesive team for disciplines including rope rescue, confined space, collapse, and trench rescue.

The GRFD technical rescue team has 36 members, spread across three shifts. Much of the team's focus is to increase the amount of training that is done both on shift and off. The team's goal is to provide all members training at least monthly. Members continued to receive training outside the department, while also working with our community partners.

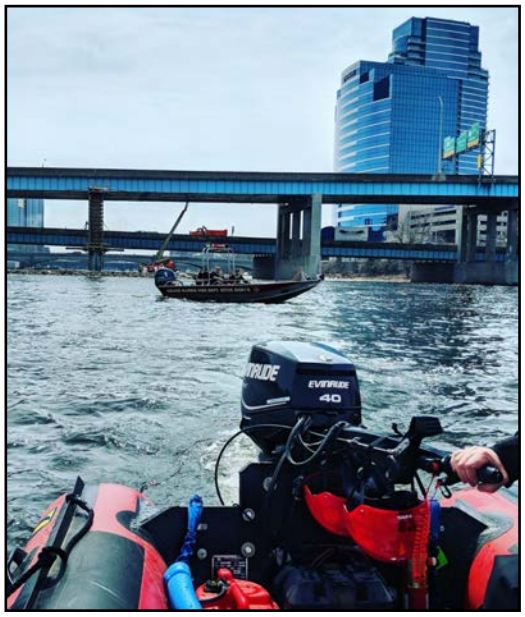
Construction around the city offers unique training opportunities as well as hazards. Exterior renovations to the Amway Grand Hotel provided opportunities for members to work with the contractors to understand and develop response plans for tower operations. Underground construction in the Heartside area of the city allows team members to train with Consumers Energy, inside the high voltage vaults that exist beneath the city streets. The City of Grand Rapids is an excellent example of the ever changing response landscape of technical rescue. The GRFD will continue to train for and adapt to the new hazards that are encountered.

Callbacks for technicians and specialists occur as deemed necessary by the battalion chief after consulting with the on duty technical rescue subject matter expert (SME).

Water Rescue

Bridge Street serves as the primary water rescue station and is supplemented by the Plainfield and Monroe fire stations. The water rescue team is composed of 36 members. The department provides swift water, lake and ice rescue capabilities, and is currently training to provide dive rescue services. A variety of watercraft are utilized to cope with fluctuating water conditions.

The water rescue team responds to an average of around 10 calls per year. The team trains over 500 hours per year to keep its skill set at a very high level. The department is committed to constantly re-evaluating our response capabilities to ensure that the citizens and visitors to the City of Grand Rapids can enjoy water recreational activities in a safe manner. There is currently an initiative to bring the rapids back to the river. This project has the potential to bring many more people to the area to enjoy new sporting opportunities.



The Grand River restoration project is designed to bring back a more natural environment to our waterway by restoring a 2.5-mile stretch of the river to its original character. From Ann Street to Fulton Street, the project will reveal an 18-foot drop in dramatic fashion, with water flowing over and around boulders, and natural wildlife habitats. With the return of the rapids, a new riverfront will be revealed.

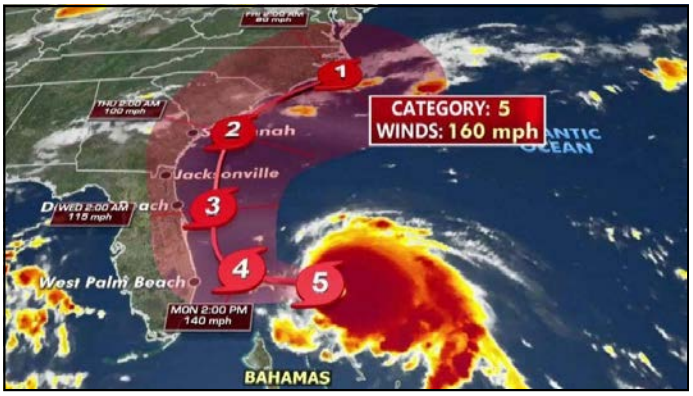
Vehicle and Machine Extrication

Engine 10, Engine 5 and Rescue Engine 1 are the primary vehicle extrication crews. These crews are also supported by our ladder and platform companies who have stabilization and light extrication capabilities. Partnerships with the private sector are also having a positive effect on our metrics. Having multiple training sites located around the city allows crews to train in or near their response districts. This translates to increased reliability, concentration, and distribution metrics.

Michigan Task Force -1

Four of our six Task Force -1 team members are level one deployable, meaning they attained the proper training levels set forth by the Federal Emergency Management Agency to be deployed as part of a team during a natural or man-made disaster. Team members have been deployed to respond to Hurricane Dorian in Flagler County and Jacksonville, Florida as well as Raleigh, North Carolina to assist with disaster relief and damage assessment.

Urban Search & Rescue
MI-TF1
Michigan



Training Division

Continuing Education and Professional Development

The Grand Rapids Fire Department places a high emphasis on the training of its members to meet the needs of the agency and the diverse community that it serves. As one of the five areas of focus for the organization's strategic plan, a large amount of time and resources are committed to increasing the knowledge, skills, and abilities required to deal with the diverse emergency conditions faced by personnel while on duty. The robust training schedule is consistent with the department's mission of valuing people by saving lives, protecting property and responding to the needs of the community. While the organization has consistently provided training opportunities for its employees, the last several years have seen the training division continue to assess its course offerings and more clearly align the training requirements for personnel based upon rank and tactical discipline.

The Training Division provides a wide array of training and continuing education. The training program is designed to support the effectiveness and safety of our personnel. Recent examples include initial training for Rescue Task Force response and the use of the newly acquired personal escape or "bailout" kits.

The training division also supports professional development opportunities. Multiple leadership and command classes are offered at the GRFD regional training center. In addition to local course offerings, many mid to senior level officers choose to attend regional or national level conferences, professional development courses aimed at managing officers, and the National Fire Academy.

The department hosts ICS/NIMS courses offered by external agencies. The Training Center also hosted a Quality Improvement through Accreditation workshop which provided insight into the accreditation process for personnel both within and outside the GRFD.

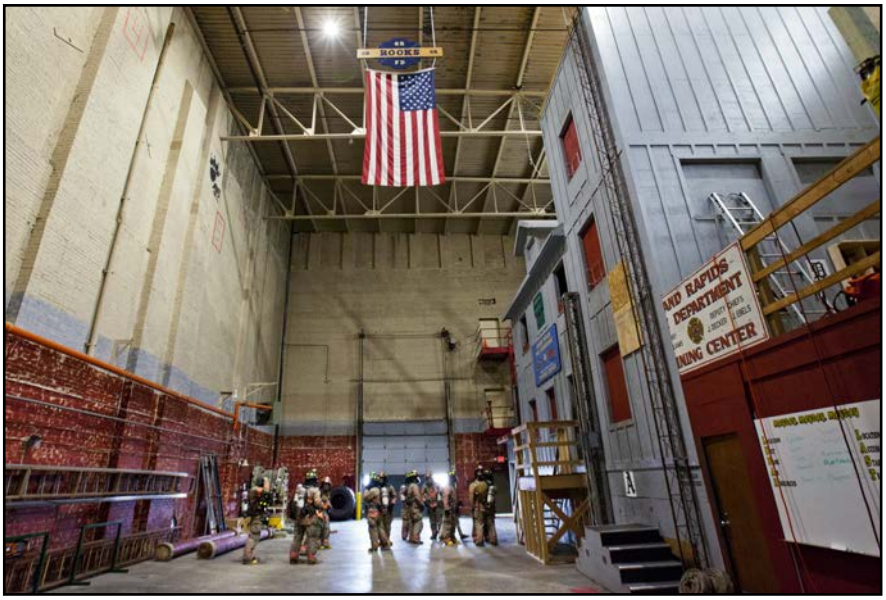
Recruit Academies

Recruit academies typically begin in late summer and conclude at the end of the year. Over 16-18 weeks, recruits complete the requirements for Michigan Firefighter 1 and 2 certification and receive orientation about daily duties in the GRFD. Recruits also achieve certification as Basic EMT's during the academy. The Training Division assists department members with either attaining or maintaining their MFFTC Instructor I certification by providing instructional opportunities during the academy.

GRFD Training Center

The GRFD training center consists of classrooms, an indoor fireground training prop, and a multitude of supporting equipment. The training center is used by several organizations outside the GRFD and for additional programs. In particular, the department helps to increase city employee and citizen safety through CPR classes, confined space entry certification, and education and inspections for the operators of mobile food vehicles. Support of other organizations and activities includes:

- Grand Rapids Police Department
- Kent County Sheriff
- Drug Enforcement Agency
- Michigan Volunteer Defense Force
- Kent County Community Emergency Response Team
- Wyoming Fire Department
- GRFD Summer Youth Academy



Wellness

Wellness is one of five pillars with the department's strategic plan, and is overseen by the assistant chief of administration. All members are given annual wellness and fitness education. Department personnel receive ongoing education about mental and physical health via hands on training and multimedia presentations. All employees receive annual awareness training explaining the city's employee assistance program, which provides services for employees in need of mental health counseling. The department also maintains a critical incident stress management (CISM) team to provide help for members after traumatic events. GRFD policy and the IAFF Bargaining Agreement both speak to the fitness and wellness of employees.

2020 participants in the O2X grant-funded wellness workshop

Each fire station and the training center are equipped with areas dedicated to physical fitness, with a variety of weight training and aerobic equipment. The City of Grand Rapids Health and Wellness SharePoint page also offers fitness training which GRFD personnel are eligible to receive.

Continuing work for the Wellness program includes:

- Evaluating exercise equipment needs and performing required maintenance
- Promoting participation in city wellness challenges
- Scheduling and managing the annual GRFD physicals with our occupational health provider. In 2019 as a part of pursuing excellence in health and wellness, the Fire Service Joint Labor Management Wellness-Fitness Initiative recommended screening for the necessity of, and providing as identified, cardiac exercise stress testing for our members was implemented.
- Improving our annual physicals to align with NFPA 1581
- Oversight and support of the Critical Incident Stress Management/Behavioral Health Team, which includes peer support and employee assistance programs
- Enhancing awareness of cancer prevention measures during Safety Stand Down weeks. .
- A wellness/fitness program manager was named to ensure compliance with NFPA 1583. Equipment Operator Vince Lorelli was a natural selection, with his Bachelors of Science in exercise programs and personal training certifications. Vince is supported by Equipment Operator Dan Weatherwax.
- We participated in the hiring process for Citywide Wellness Coordinator Jessica Welch.

Fire Chief Programs

Budget

The GRFD follows appropriate direction for budget direction and planning. Detailed processes from the city's chief financial officer provide a solid foundation for budget planning. The process begins with the city manager and his executive team reviewing and gaining consensus relative to forecasted income tax, property tax, and other sources of revenue. The fire department has strived to increase the transparency of its operations including budgetary management. The management of the budget has transitioned to a "team of teams" approach. The department conducts a weekly management walk and the budget board that shows the current state of not only the programs, but the overall budget status. The budget process is communicated to the entire organization with status updates via Teams meetings held by the fire chief.

The GRFD budget process involves a large amount of input from various groups at multiple levels throughout the organization. The GRFD utilizes a method known as policy deployment, which aligns the short- and long-range work to the vision and values of the organization. This starts with the strategic planning process which takes general operating, programmatic and capital expenditures into consideration. A biweekly budget analysis compares projected vs. actual expenditures and percentage of budget consumed vs. time of fiscal year elapsed.

Honor Guard/ Pipes and Drums/Awards Committee

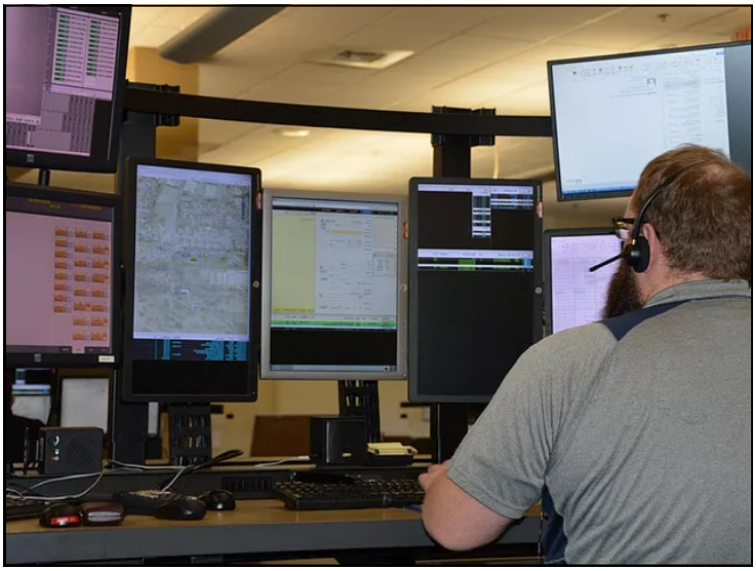
The Honor Guard is comprised of 13 members who volunteer their time to represent the Grand Rapids Fire Department at fire department functions, retiree funerals and other events. These consist of parades, the firefighter of the year ceremony, awards ceremonies, and the occasional posting of colors at community events like the 9-11 salute, and the Polish festival. The Pipes and Drums corps is a recent addition to the department, and participates in ceremonies and parades.

The awards committee encourages and reviews award nominations for the following awards: Medal of Honor, Medal of Merit, Commendation Medal, Achievement Medal, Unit Citation, Medical Award, Live Birth Award, Civic Award, and Distinguished Service Recognitions. The committee conducts investigations and interviews to verify information to ensure that the proper awards are given out to the deserving people.

Deputy Chief of Operations Programs

Dispatch Liaison

The deputy chief of operations and planning division staff meet regularly with personnel from the Grand Rapids Emergency Communications Center (dispatch). Ongoing areas of focus include:



- Radio system improvements - the Kent County Dispatch Authority (KCDA) contracted with Motorola to build out an 800 MHz radio system that is connected to the Michigan Public Safety Communications System. The planning team, along with radio program personnel, worked with the KCDA technical steering committee to ensure the move to the new system meets our operational needs.
- CAD (computer aided dispatch) problem reports - When suppression personnel identify potential errors in incident recommendations or CAD functionality, the team works to assess the issue and communicate findings back to suppression personnel. This process led to the discovery of numerous mapping issues and the need to adjust street speeds within CAD.

Radio Program

The goal of the Grand Rapids Fire Department radio program is to improve training, maintenance, and communication within the entire department.

The fire department deploys approximately 80 mobile radios and 140 portable radios. In the past two years the radio program expanded from two personnel to eight. This expansion will streamline training and maintenance for the entire department. The growth of the program will aid in a smooth succession in the years to follow.

All public safety agencies in Kent County are in the process of implementing a migration from a 700 MHz to an 800 MHz radio system. This has been a long process with many different parts. For the past two years, program managers have been attending weekly meetings with the Kent County Dispatch Authority to make this a smooth transition. The 800 MHz system was successfully brought on line in late 2020.

Unmanned Aerial Vehicle

The newest GRFD program addition is the UAV program. Several department personnel are trained as pilots. UAV's are stored on the battalion chief's cars and can be deployed to any incident in our city within minutes. UAV's are equipped with optical and infrared cameras. Some examples of UAV utilization have been: river monitoring for ice and flooding conditions, response to larger fires, and hazardous materials incidents for aerial reconnaissance.

Self Contained Breathing Apparatus

The SCBA program is based at LaGrave Station. GRFD team members are trained as technicians by Scott Fire and Safety. Every SCBA is flow tested annually, including specialty team equipment and police equipment. Batteries are changed every six months on all SCBAs. The team is handling more warranty repairs than in the past few years since acquiring new equipment in 2016 Air bottles are cycled through hydrostatic testing per the manufacturer's schedule. Team members at Covell and Burton stations coordinate annual face piece fit testing for all personnel. The team works with Scott Fire and Safety to maintain the functionality and reliability of the compressor and fill stations. In summary, the SCBA program has worked to keep our equipment reliable and compliant with the latest industry standards.

GRFD Safety Committee

The GRFD Joint Labor – Management Safety Committee investigates accidents and injuries, responds to member safety concerns, and makes recommendations to the Fire Chief to improve safety.

Ove the last five years the committee has investigated an average of 22 crashes involving fire department apparatus and other vehicles, as well as 52 reported member injuries each year. Based in part on these reports, the committee issues quarterly bulletins, with recommendations and reminders such as:

- Proper use of PPE such as eye protection, safety vests, and gloves.
- Proper accident and injury reporting.
- Post-incident decontamination.
- Personal hygiene - decontamination of computers, iPads, and phones.

The Committee received safety concerns regarding various issues, including:

- Wearing of complete PPE during responses.
- Staging during alarm responses.
- Alteration of PPE items.
- Stress tests as part of the annual physical examination.
- Member safety during the annual MDA activities.

The discussion of these concerns by the committee prompts recommendations, reminders, changes in procedure, and the purchase of safety-related equipment. The committee makes recommendations to the Fire Chief such as:

- Recommended improvements to station diesel exhaust collection systems.
- Recommended improvements to the emergency lighting on Utility 2.
- Recommended additions/repairs to the grab handles on several apparatus.

Deputy Chief of Support Services Programs

The deputy chief of support services is the owner of the Support Services section of the strategic plan, with support from the battalion chiefs. The deputy chief also conducts quality assurance oversight for the Prevention and Wellness pillars.

Human Resources

Support Services coordinates with the Human Resources (HR) department to facilitate recruitment, selection and promotional processes, communicate employee benefits, update job descriptions, manage risk management activities, and oversee labor relations issues.

This office works with HR to conduct civil service examinations. This includes developing and coordinating job specific assessments for all positions, conducting interviews, observing skills demonstrations, and rating oral presentations and operational assessments.

Recruitment and Outreach

The Grand Rapids Fire Department aims for excellence in the delivery of emergency services for our city and the surrounding communities. To aim for excellence as a group, we look to find excellence in individuals. One of the core goals of the Recruitment and Outreach Program is to find the best firefighter candidates for *this* community.

The program completed its first year as a stand-alone program in 2019. The recruitment team manages the JROTC program, conducts a high school summer youth academy, and is working towards establishing an explorer program, a new initiative that provides longer term exposure to the fire service. The team attends general community events and specific recruiting events in the Grand Rapids metro area.

The team works hard to attract candidates, both locally and nationwide. In 2019, the GRFD was able to hire a class of firefighter recruits resulting from an intense search for the best candidates for Grand Rapids. These recruits were pulled from an initial pool of over 1,000 applicants and completed a 22-week course certifying them as firefighters and basic EMTs. Work continues with HR to build a sustainable hiring model that can evolve as the needs of the city and GRFD change.

Along with finding people who are directly interested in working in the GRFD, another understated, yet extremely important purpose of the Recruitment and Outreach program is developing connections within the community, with other City of Grand Rapids employees, and with local businesses. As fire departments across the nation face challenges, it is absolutely vital that they have the support of local people to succeed. Networking with local organizations provides a continuous supply of quality candidates to protect this city. The team strives to educate the community about the fine work that the GRFD does.

Assistant Chief of Administration Programs

Apparatus

The Grand Rapids Fire Department maintains a diverse inventory of apparatus and fleet vehicles to support the needs of operations, administration, training, and prevention personnel. Fire suppression personnel operate platforms, ladders, engines, and battalion chief cars as staffed apparatus. Administrative, prevention and training personnel utilize sedans, vans, and pickup trucks based on the needs of the service. The GRFD Apparatus Replacement Plan provides a schedule for apparatus and support vehicle replacement through 2047.

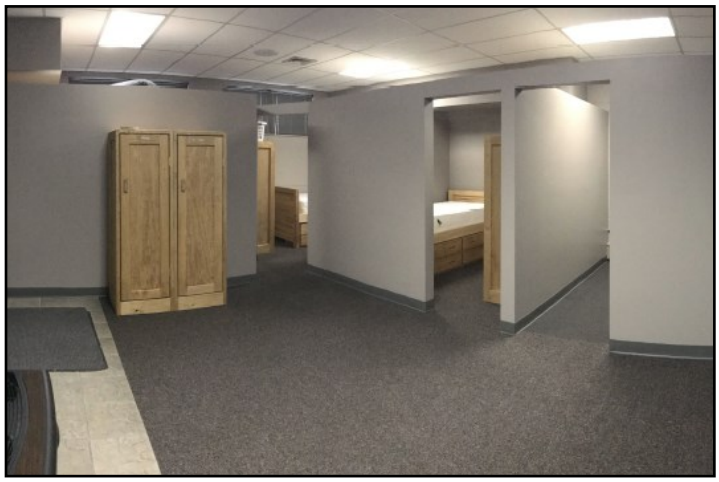
Based upon an urgent need to retool the fleet and oversight of the program after recent personnel turnover, 15 new and used apparatus were purchased during 2020 at a cost of approximately $5 Million dollars. Annual funding into the plan has been adjusted to ensure proper liquidity, and the organizational structure has changed drastically.

The assistant chief oversees the finances of the fleet, the fire captain of fleet oversees the purchasing and management of the fleet, and the recently formed emergency vehicle technician (EVT) team performs all tasks needed to place apparatus into service, decommission apparatus, or make major programmatic changes such as swapping out SCBA seats or radios. Routine maintenance is handled by a recently expanded vendor list, providing three separate options to get our apparatus serviced and repaired.

Facilities

Major physical facilities projects in the GRFD involve multiple internal and external layers. Any major project appears before the city commission to receive approval before moving forward. Much like the fleet, the fire stations in Grand Rapids had suffered from years of underfunding and maintenance. With the reorganization of the management structure of the fleet and facilities division, the assistant chief oversees long rang planning and finances, the building Captain oversees day to day management of the 11 fire stations, training center, and administration, and the newly formed Fire Station Technician (FST) team assists on projects ranging from landscaping, tree removal, framing, painting, fabricating, etc. The members take great pride in their work and are generally more cost effective than using outside contractors. External vendors are utilized for specialties such as plumbing, electrical, or projects that exceed the capability or scope of our internal team.

Again, like the apparatus plan, a long range facilities plan is being drafted and will be completed during 2021 with the assistance of interns from the University of Michigan Industrial and Operations Engineering program. Funding was recently doubled to account for the backlog of maintenance issues, with projections showing that within 3 years all major HVAC, roof, concrete, and generator projects will be caught up and work will continue on remodels in the stations to provide more privacy and comfort for our employees, with an emphasis on wellness and sleep hygiene. A recent example is the remodeling of the dorm at Covell station to provide a better sleeping environment rather than the wide open dorms found at all of our stations.



2020 Covell Station dormitory remodel project

Additional work that has taken place in the recent past to address the condition of fire stations includes the resurrection of the annual fire station inspection. Once a year, each station has been inspected by the assistant chief, building captain, station captain, and several other members of the department. At first the action items list was overwhelming, with literally dozens of work orders generated at each station. Each subsequent year has seen the lists dwindle as the general condition of our stations continues to improve with increased oversight and funding.

Accreditation

The GRFD is an active member of the accreditation community, serving on the Center for Public Safety Excellence (CPSE) educational taskforce, providing peer assessors for site visits to other agencies, and working with the Michigan-Ohio-Indiana consortium to support departments seeking accreditation.

The planning division facilitates the accreditation process for the GRFD. Activities include annual reviews of the self -assessment manual, organizing the community risk assessment process and critical tasking reviews, program appraisals, assembly of the annual compliance report and organizational activities supporting the development and implementation of the strategic plan.

Planning

The planning division facilitates the department's strategic, operational, and budget meeting cycle and helps to organize special projects throughout the year. The mission statement for the planning division is to provide information which facilitates decision making throughout the department.

- Strategic and Operational Planning - the planning division organizes two strategic plan review meetings each year. Thanks to the efforts of our 36 member strategic planning review team, the department is able to prioritize efforts to keep the needle moving on the strategic and operational plans. The planning division also coordinates risk assessment and critical tasking reviews for the fire suppression, EMS, hazardous materials and technical rescue programs.
- The division works with our advanced life support (ALS) agency partners to analyze response data and alarm handling processes in an effort to identify and reduce inefficiencies in the prehospital medical system.

City Strategic Plan

As the City of Grand Rapids developed its first strategic plan over the last two years, the team enlisted the assistance of the GRFD, as well as many other city departments and leaders. This coordinated effort to develop community goals and objectives is familiar territory to the fire department, as the GRFD already actively manages a strategic plan.

- The planning division provides objective lead support and review for the city's strategic plan, providing updates and feedback on operational metrics that support the plan.

Insurance Services Office (ISO)

The department is rated as a Class 1 ISO agency. The planning division conducts annual reviews of the ISO documentation to ensure consistency for the next round of assessments. During assessments, the planning division acts as the liaison for the ISO field representative and assembles all of the documentation necessary to support the Fire Suppression Rating Schedule classification scoring.

Lean

The fire department promotes lean methodology throughout the City of Grand Rapids, with several other city departments adopting elements of our planning and management system.

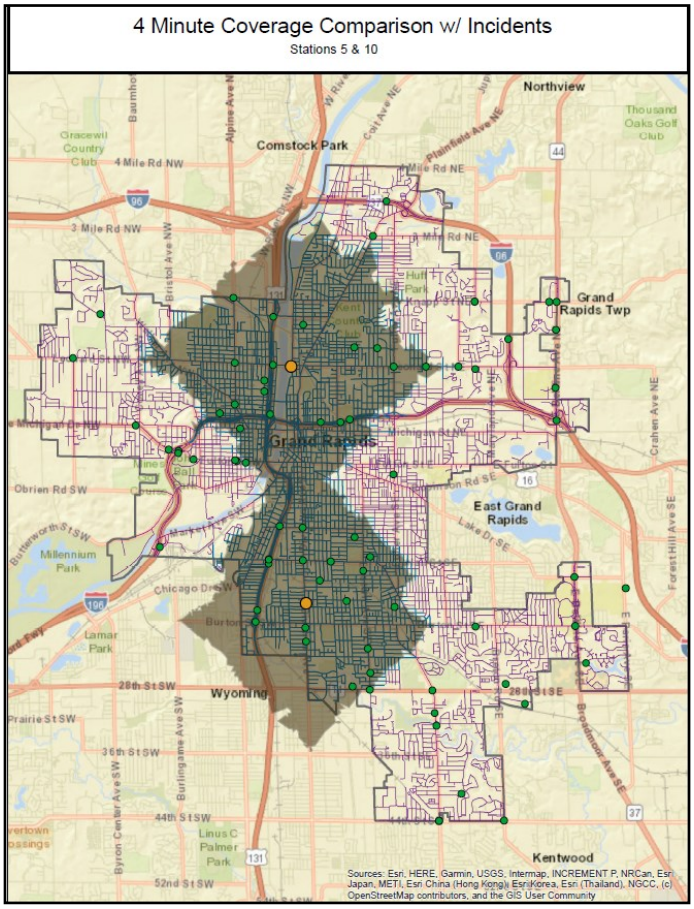
- Managing for Daily Improvement - The planning division hosts many outside groups during Monday management walks and continues to deliver A3 problem solving courses for the city each year.
- The planning division works with department staff to build process maps and standard work documents for all job functions. This work helps with the onboarding for new support staff such as payroll office assistants, and also supports training for new programs throughout the organization.

Information Technology/RMS/GIS/Data Analysis

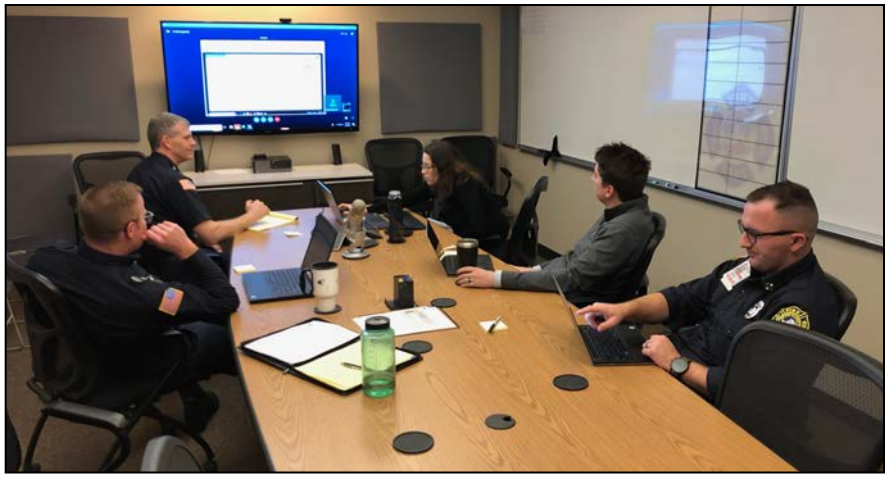
Technology resources include servers, networks, station and apparatus computers, and any ancillary equipment required to support them. Technical support for the department is provided by one information systems coordinator (ISC) dedicated to the TeleStaff payroll and staffing software, CAD support, and hardware or software needs for stations and apparatus. Further support is provided by a performance & management reporting specialist (PMRS) who is dedicated to the Image Trend (incident and inspection reporting) and Target Solutions (training and asset management) records management systems, in addition to GIS and data analysis. Supplementary support of agency technology needs is provided by the city's IT department, which maintains the servers and networks necessary to fulfill information management system requirements.

Ongoing work for the Information Technology/RMS/ GIS/Data Analysis team includes:

- Updating mobile data terminals to current versions of CAD
- Ensuring all department computers are compliant with city security protocols
- Coordinating with external partners to investigate new technology
- Completing the cyclical replacement of all hardware
- Analysis of concentration data for continuous improvement in response.
- GIS mapping and analysis for performance metrics
- Assembling data for grant and NFPA survey programs
- Serving as a member of the NFPA Technical Committee on Fire Service Analysts and Informational Technology Specialists Professional Qualifications.
- Data analysis for the annual report and CPSE annual compliance report baseline performance tables.



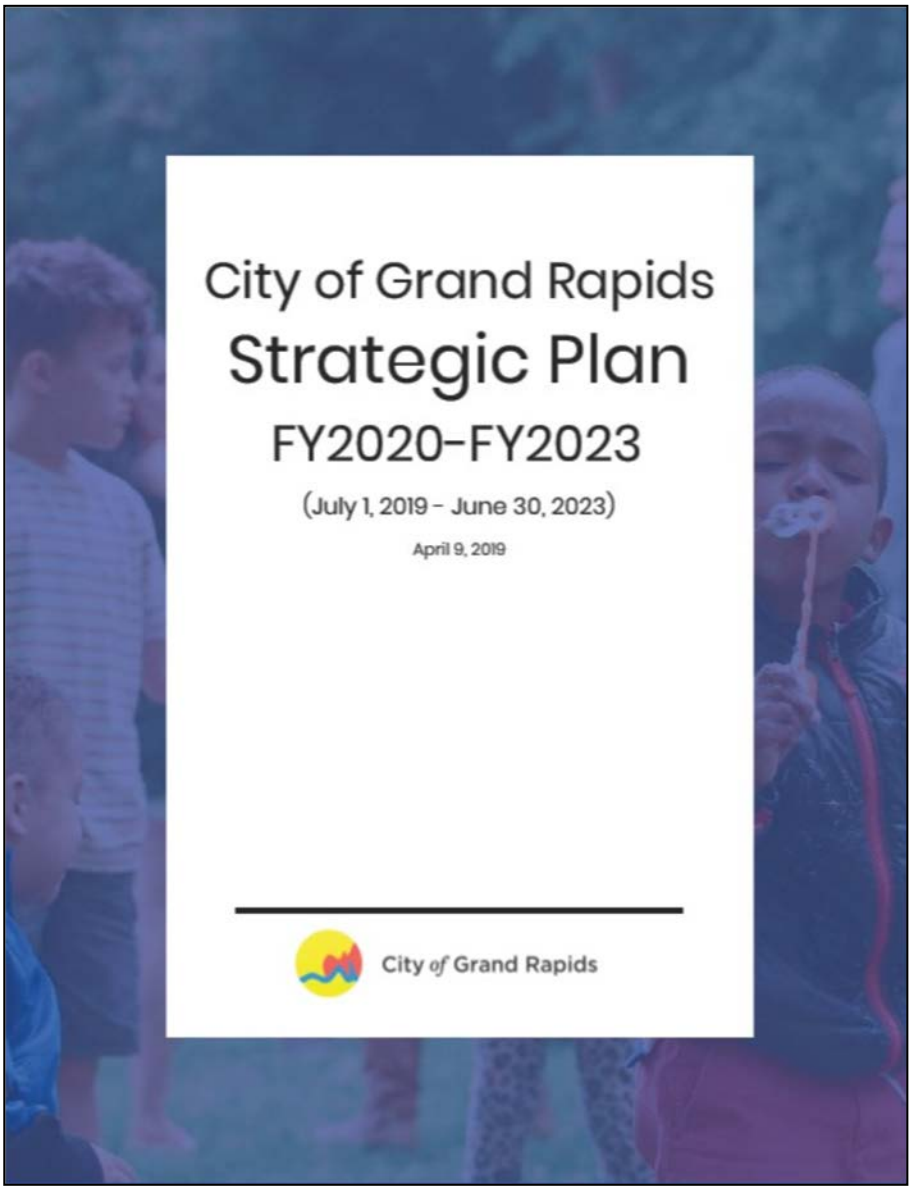
- Image Trend configuration to ensure incident reporting is NFIRS and NEMSIS compliant
- Image Trend configuration for fire prevention inspection activities
- Target Solutions configuration and implementation for training records
- Support for station, apparatus, equipment, and inventory checks in addition to maintenance requests



Community Expectations

City Strategic Plan Alignment

The City of Grand Rapids recently went through the process of creating its first strategic plan. Leaders from the GRFD were an integral part of that process and ensured that the existing department plan aligned with the city's during the formulation process. The city's plan contains six priorities which encompass Governmental Excellence, Economic Prosperity and Affordability, Engaged and Connected Community, Health and Environment, Mobility, and Safe Community. While the department's primary alignment is within the Safe Community area of focus, there are connections with all six priorities.



The city's vision statement is "Grand Rapids will be nationally recognized as an equitable, welcoming, innovative and collaborative city with a robust economy, safe and healthy community, and the opportunity for a high quality of life for all."

The city's mission statement is "To elevate quality of life through excellent City services."

GRFD Mission, Vision, and Values statements

The GRFD worked with its internal membership, agency partners and community stakeholders to gather input that shaped a reassessment of the department's mission, vision and values statements. The strategic planning team decided that while the existing values still represented the department well, updates to the department's mission and vision statements were warranted based on what was learned during the community stakeholder meeting.

Values - Honesty, Integrity, Loyalty, Teamwork and Excellence

Mission - The Grand Rapids Fire Department values people by saving lives, protecting property, and responding to the needs of our community.

Vision - Providing world class fire services for our community by employing a diverse workforce which respects, values, and develops our members.

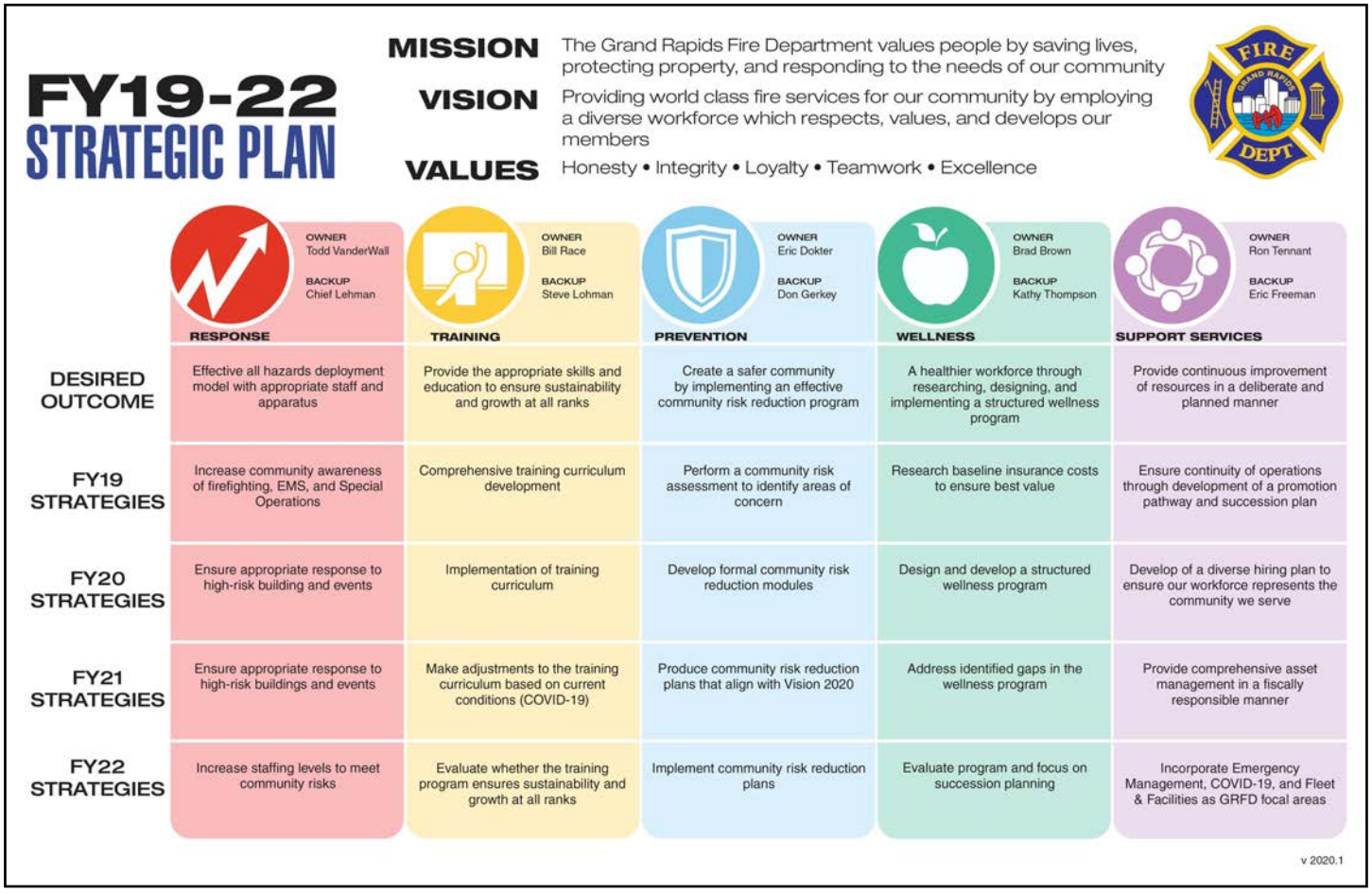
Department Strategic Plan

The current departmental strategic plan started with a three year cycle and was stretched to four years due to the impacts of Covid-19. The FY19-22 strategic plan is a community and employee driven one page document that defines a clear path to improvement over four years and centers on the main areas of focus in the organization including response, training, prevention, wellness and support services. The strategic planning team comprised of 36 individuals from every rank of the organization created 5 desired outcomes and 15 associated strategies to achieve them. In addition, an accompanying five page operational plan further breaks down agency outcomes into 58 goals and 323 tasks with delegated owners, support personnel, and a projected time frame of inception and completion.

This plan has been disseminated to every work station in the GRFD (11 stations, administrative offices, prevention division and training division) and is posted prominently on the department's external website and on the city's internal SharePoint site. The department's management system is aligned to the strategic plan.

Outcomes for the organization in the plan include:

- Effective all hazards deployment model with appropriate staff and apparatus
- Provide the appropriate skills and education to ensure sustainability and growth at all ranks
- Create a safer community by implementing an effective community risk reduction program
- A healthier workforce through researching, designing, and implementing a structured wellness program
- Provide continuous improvement of resources in a deliberate and planned manner



Insurance Services Office Compliance

By accurately identifying a community's ability to suppress fires, the Insurance Services Office (ISO) helps communities assess their public fire-protection services. The system provides an impartial, nationwide standard that helps fire departments plan and budget for facilities, equipment, and training. Communities with better public protection are typically able to offer lower fire insurance premiums. The Public Protection Classification (PPC) program provides motivation for communities that choose to improve their firefighting services.

FSRS Item	Earned Credit	Credit Available
Emergency Communications		
414. Credit for Emergency Reporting	3.00	3
422. Credit for Telecommunicators	3.64	4
432. Credit for Dispatch Circuits	2.70	3
440. Credit for Emergency Communications	9.34	10
Fire Department		
513. Credit for Engine Companies	5.84	6
523. Credit for Reserve Pumpers	0.48	0.5
532. Credit for Pumper Capacity	3.00	3
549. Credit for Ladder Service	3.86	4
553. Credit for Reserve Ladder and Service Trucks	0.43	0.5
561. Credit for Deployment Analysis	9.30	10
571. Credit for Company Personnel	8.95	15
581. Credit for Training	8.46	9
730. Credit for Operational Considerations	2.00	2
590. Credit for Fire Department	42.32	50
Water Supply		
616. Credit for Supply System	27.22	30
621. Credit for Hydrants	2.97	3
631. Credit for Inspection and Flow Testing	6.20	7
640. Credit for Water Supply	36.39	40
Divergence	-1.27	--
1050. Community Risk Reduction	4.31	5.50
Total Credit	91.09	105.5

2018 Fire Suppression Rating Schedule Scoring Matrix

In addition to city plans, internal GRFD plans, and the accreditation process, the department places a large emphasis on its ISO rating. By actively participating in the ISO evaluation process, the GRFD assists insurance companies with having the most accurate information possible on fire risks in the community, which in turn impacts the citizens. For several decades the department maintained a class “3” PPC rating on a scale of 1 (best) to 10 (worst). In 2011, a comprehensive evaluation of the fire department, the communications center and the water distribution system was undertaken. In May of 2012, the City of Grand Rapids received an ISO rating of “Class 2”.

In 2018, the department contacted ISO for another evaluation, this time scoring high enough to be ranked a “Class 1” department. Grand Rapids is the only class 1 and internationally accredited department in the state of Michigan and one of 102 agencies in the country to hold both of these rankings.

2018 Class 1 Presentation at LaGrave Station

Accreditation Compliance

The GRFD uses the accreditation process to drive continuous improvement within the organization. By institutionalizing processes that ensure compliance with Commission on Fire Accreditation International recommendations, the department has developed a stable baseline against which improvements can be measured. Activities associated with the accreditation process include:

- Organizing the community risk assessment process
- Annual reviews of Self-Assessment Manual criterions with the owners of programs
- Compiling information for inclusion in annual program appraisals and the department's annual report
- Conducting annual critical tasking reviews for the fire suppression, EMS, hazardous materials and technical rescue programs
- Publishing updates to the Standards of Coverage risk assessment section
- Gathering data and reviewing performance for the CFAI Annual Compliance Report
- Organizational activities supporting the development and implementation of the Strategic Plan

The GRFD is an active member of the accreditation community, serving on the Center for Public Safety Excellence (CPSE) educational taskforce, providing peer assessors for site visits to other agencies, delivering educational sessions at CPSE events such as the Excellence Conference, and working with the Michigan-Ohio-Indiana consortium to support departments that are seeking to align with the accreditation model.

Section C - All Hazard Community Risk Assessment

Risk Assessment Process

Community Risk Input Factors

Geospatial Risk Factors

Natural Risk Hazards

Manmade Hazards

Physical Assets Protected

Development and Population Growth

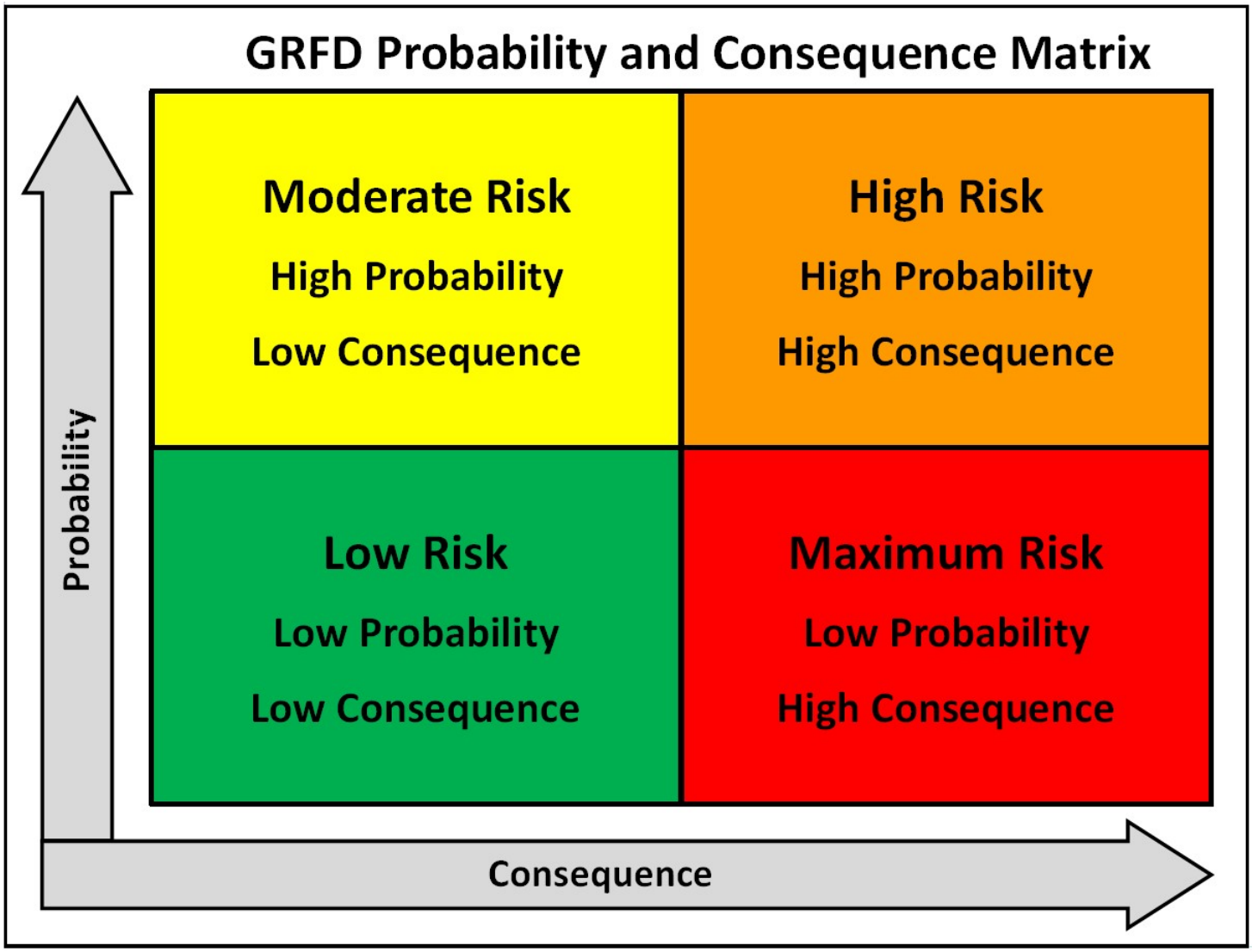
Historical Service Demand and Probability Analysis

Risk Assessment Process

The purpose of this section is to describe the process used by the GRFD in performing an analysis of the community it serves and its potential risks using real world factors that are both physical and theoretical. To perform a comprehensive risk assessment, it was necessary to analyze physical, economic, sociologic and demographic aspects of the area served. The factors that drive the service needs are examined in a precise and scientific manner to determine the capabilities necessary to adequately address the risks that are present. The assessment of risk is critical for the determination of the number and placement of resources, and the mitigation measures that are required by the GRFD.

The risks that the department faces can be natural or man-made and fall in various locations on the probability and consequence matrix. Where these risks are located on the matrix has a direct impact on how resources are located around the city (distribution) and the overall amount of resources required to mitigate the incident (concentration) effectively through the use of the staffing and deployment model.

The likelihood of an event occurring is located on the vertical axis (probability) with the impact to the community being rated on the horizontal axis (consequence). Each of the major natural and manmade risks evaluated received a clearly defined probability and consequence ranking.

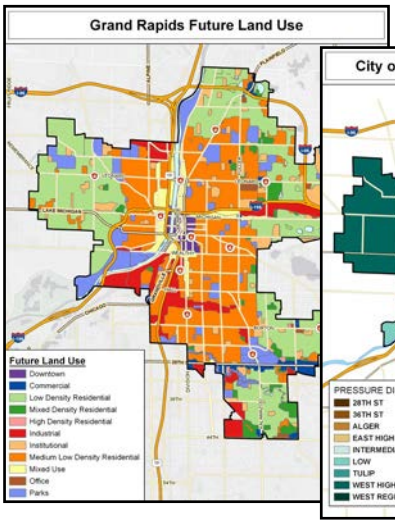


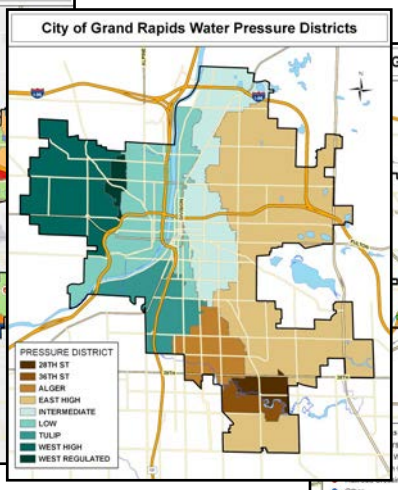
Community Risk Input Factors

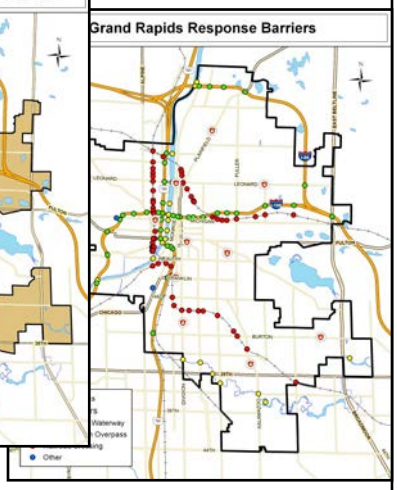
Risk factors in the community were analyzed with historical and statistical data, and trending was established based on the type of call and location of the incident. General categories of risk included overall geospatial characteristics of the community, natural hazards and manmade hazards.

Geospatial Risk Factors

- Political Boundaries
- Growth Boundaries
- Construction Limitations
- Critical Infrastructure
- Electrical
- Energy Production
- Water System
- Emergency Communications
- Response Barriers
- Rural Interface

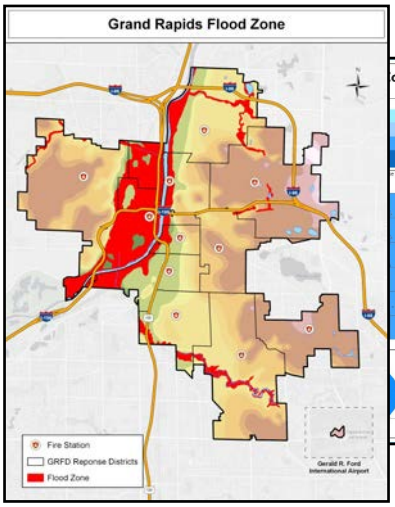


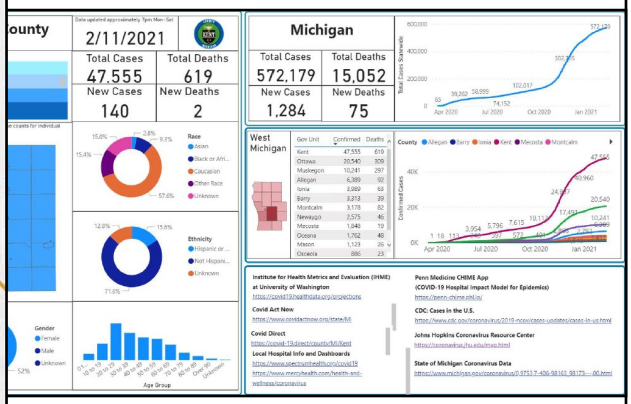




Natural Hazards

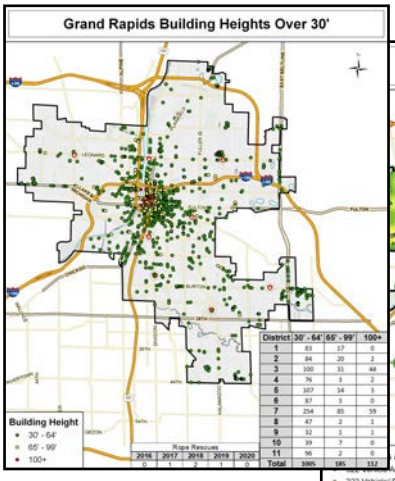
- Earthquake
- Flood Events
- Wind Events
- Winter Weather Events
- Contagious Diseases

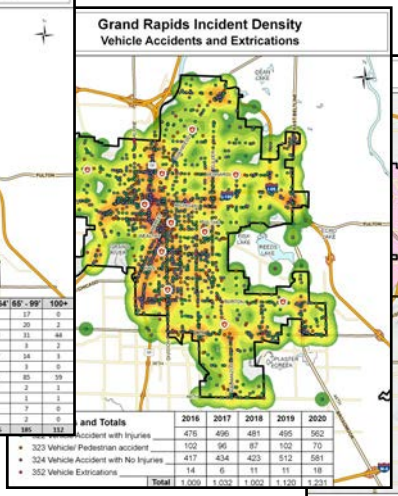


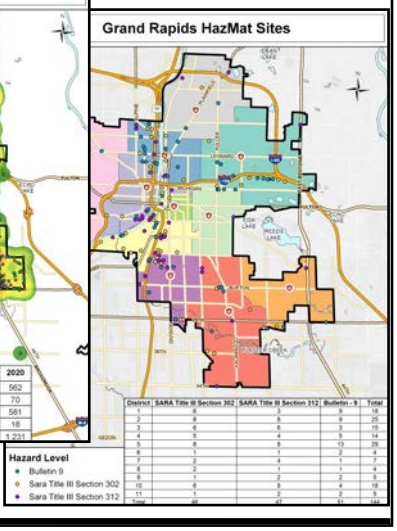


Manmade Risk Hazards

- Historic Districts
- Road Networks
- Passenger and Freight Lines
- Airport
- Heliports
- Fires
- EMS
- Hazardous Materials
- Technical Rescue





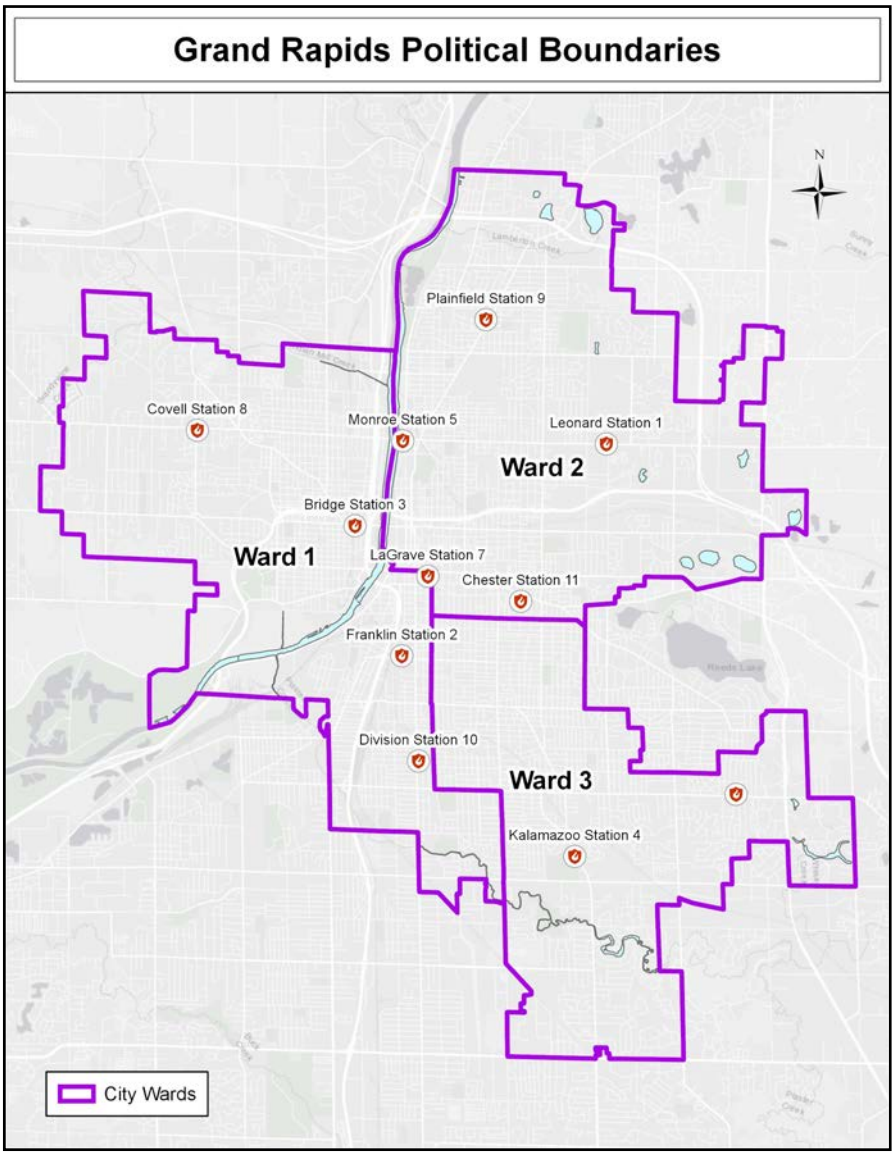


Low Risk
Low Probability
Low Consequence

Geospatial Risk Factors:

Political and Growth Boundaries

The City of Grand Rapids utilizes a three ward system stemming from the 1916 city charter. This charter provides for the Commission-Manager form of municipal government. Within this form of government, two part time commissioners are elected to four year terms from each of the city's three wards, with half of these seats up for election every two years. The Commission sets policy for the city, and is responsible for hiring the City Manager and other appointed officials. It is quite common for the GRFD to report out on statistics or programs based upon wards. Station districts frequently stretch across ward lines.



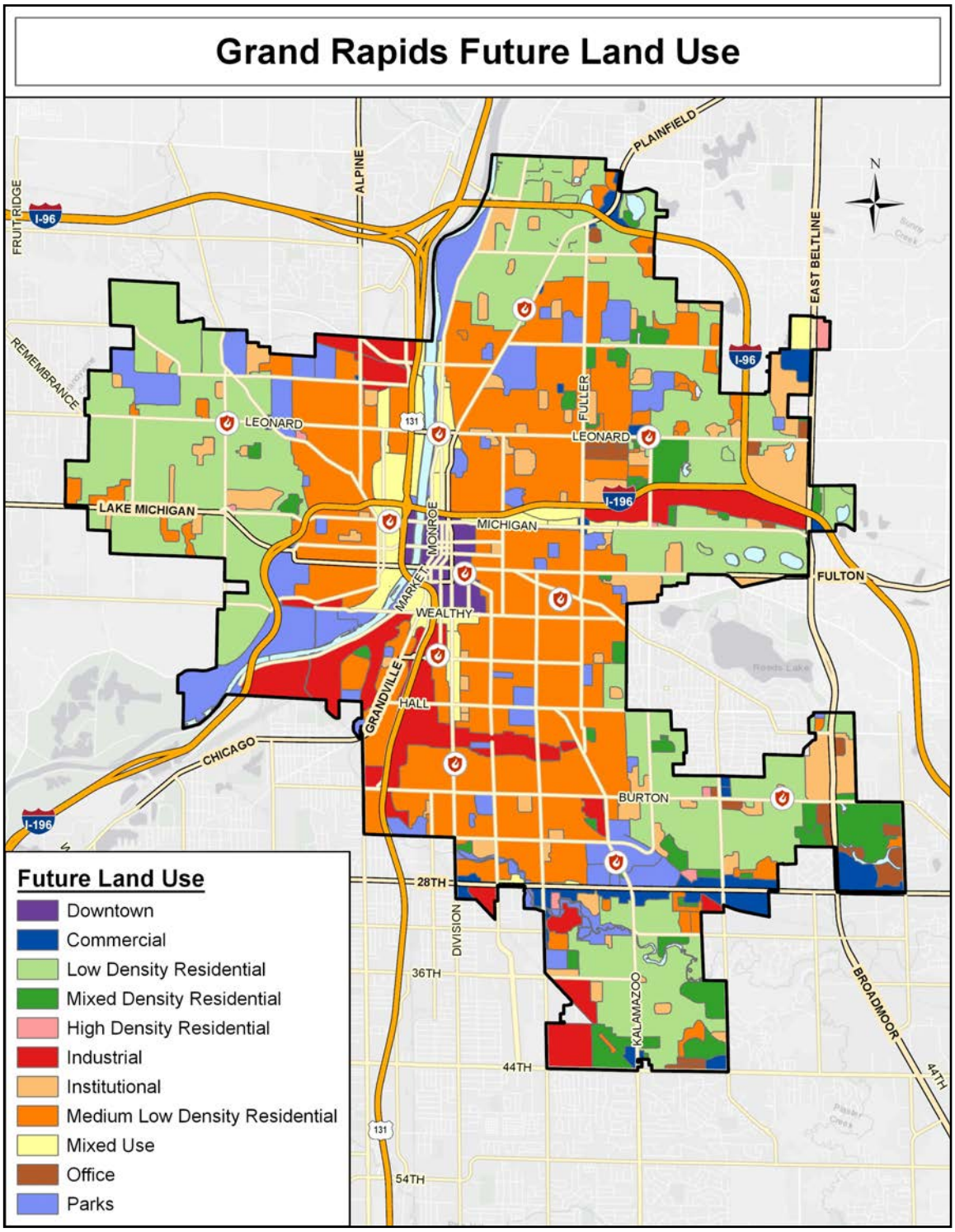
The city is limited in it's outward expansion, as it is landlocked on all sides by other cities and/or townships. Development takes place in the form of infrequent annexations or redevelopment. An example of this is the GR Forward initiative, which emphasizes increased density within the existing footprint of downtown. GR Forward clearly defines the community's priorities for city building in the downtown region. The overall risk profile for the city is more defined by vertical growth rather than urban sprawl.

Low Risk
Low Probability
Low Consequence

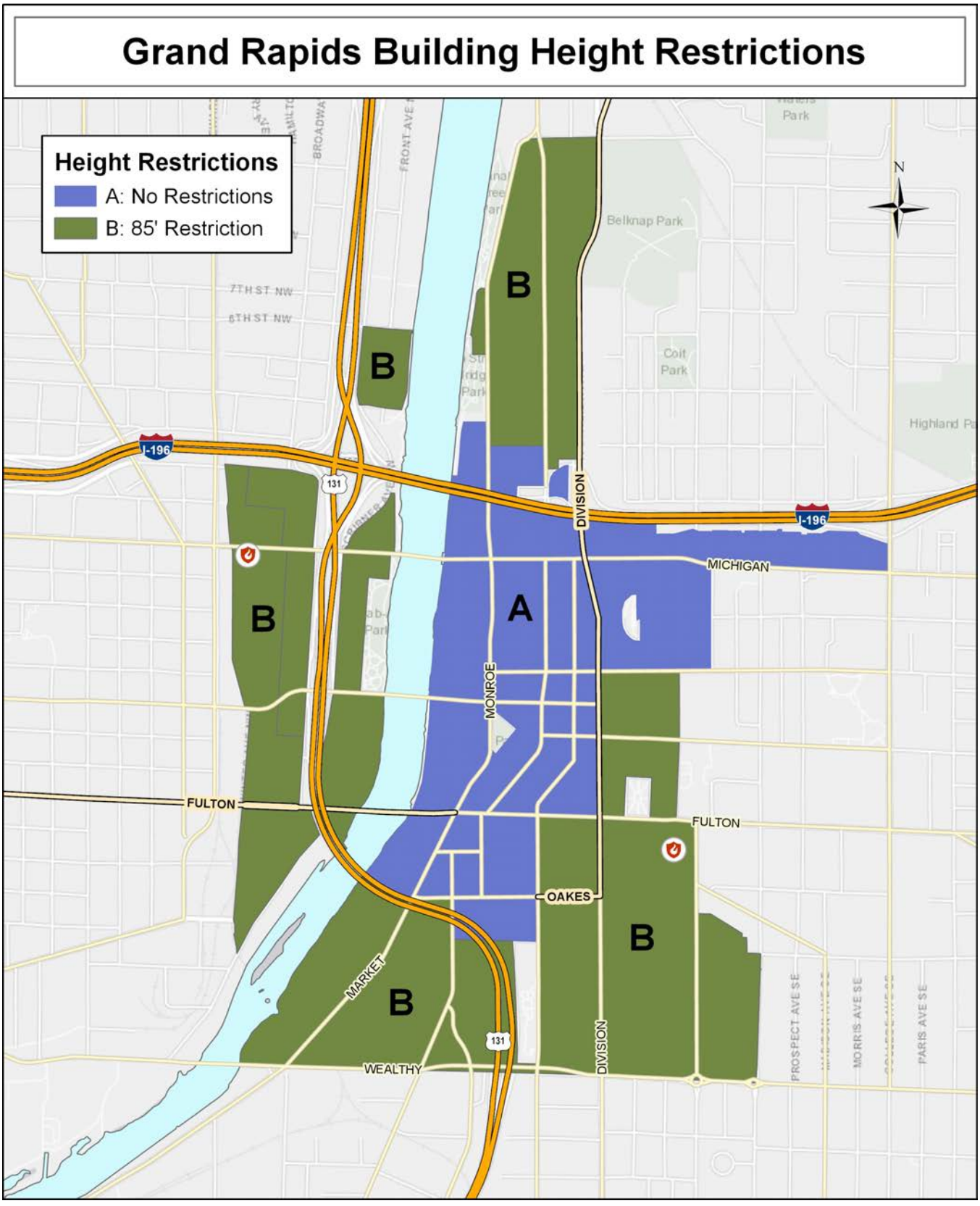
Geospatial Risk Factors:

Construction Limitations

The city maintains a comprehensive future land use map for Grand Rapids, which is divided into 11 types of land use. The map below depicts projected land use areas, which gives direction to the department on which types of construction to expect throughout the city. Construction types are predictable and monitored by the Fire Prevention Division.



In addition to land use zoning restrictions, there are height restrictions placed upon buildings in the downtown area. In the traditional neighborhood—city center (TN-CC) there are two designations regarding height limitations. In the overlay district designated height (OD-DH) zone A there are no height restrictions. In OD-DH zone B there is a limit of 85ft., which could be extended up to 175 ft. if certain building elements align with the city's master plan.



Maximum Risk
Low Probability
High Consequence

Geospatial Risk Factors:
Critical Infrastructure

Overview

Failure of critical public or private utility infrastructure can result in a temporary loss of essential functions and/or services that last from just a few minutes to days or more at a time. Public and private utility infrastructure provides essential life supporting services such as: electric power, natural gas, heating and air conditioning, water, sewage disposal and treatment, storm drainage, communications and transportation.

Electric

Electrical power outages in the Greater Grand Rapids area are common. Consumers Power estimates approximately three incidents per year in which 1,000 or more customers are without power for more than 12 hours. The economic impact of electrical outage is significant in downtown Grand Rapids. All GRFD fire stations have emergency backup generators or an alternative electrical supply. Systems automatically switch on in the event of an electrical interruption, and are sufficient to power all core functions in the stations. In addition, the Grand Rapids Police Department emergency communications center and all radio towers have redundant backup systems in place to ensure critical communications can continue to take place.

Energy Production

Covanta and Vicinity Energy provide electricity and steam heat to many customers in the downtown area, including both of the large hospital complexes, and several large hotels and office buildings. Interruptions to this service can have major impacts on business activities in the core of the city.

Water

Loss of functional water system infrastructure would most likely be secondary to the loss of electrical power. Single point interruptions such as a main break can be circumvented with the use of looped mains and linked systems. Grand Rapids utilizes both of these, in addition to multiple redundancy and backup up components to ensure outages are minimized and quickly remedied. Backup generators are able to supply enough power for the treatment system to produce 70 million gallons per day, with the added benefit of supplying electrical power to run all treatment processes and control systems.

Sewer

Loss of sanitary sewer infrastructure can lead to significant environmental, health and safety risks, and even to a public health crisis by allowing the unchecked growth of pathogens. The City of Grand Rapids has spent over $200 Million on combined sewer separation projects, resulting in a significant positive impacts on health, safety and environmental quality.

Emergency Communications

The emergency communications system in Grand Rapids has multiple backups including battery power, generators and various transmit and receive sites located throughout the area.

Moderate Risk
High Probability
Low Consequence

Geospatial Risk Factors:

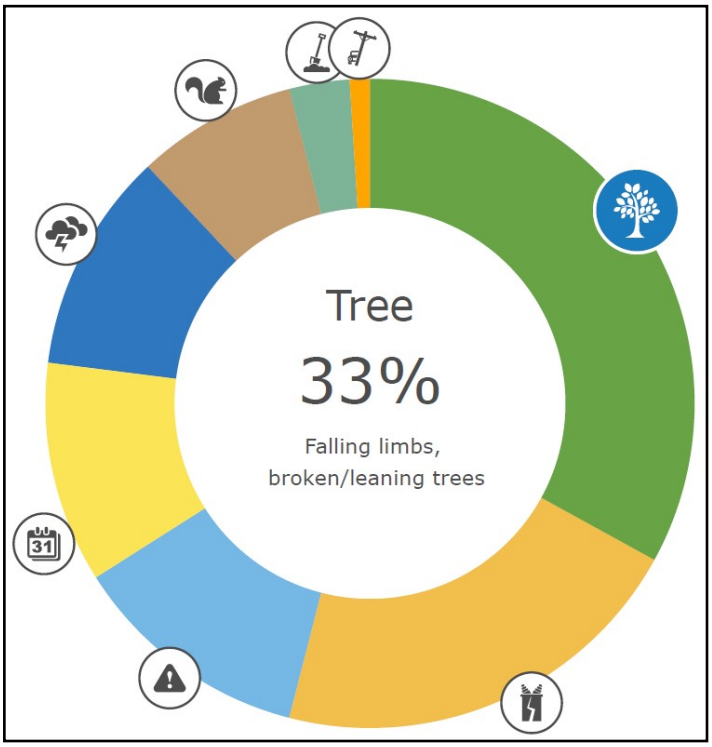
Electrical Power Grid

Small electrical outages occur frequently due to storm events and tie up multiple units to secure the various sites until Consumers Energy assumes responsibility for the scene. The City of Grand Rapids maintains its own power grid for street lighting, traffic signals and back up power for some city buildings.

Consumers Energy and the City of Grand Rapids do not disseminate grid maps of their infrastructure due to security concerns. The city does make its GIS grid available to internal stakeholders such as the fire department.

According to Consumers Power the most frequent causes for outages are listed below:

- **Trees:** Falling limbs, broken/leaning trees - 33%
- **Equipment**: Wear & tear requiring repair or replacement - 21%
- **Other**: Fire damage, accidents etc. - 12%
- **Planned**: required to safely perform scheduled work - 11%
- **Weather**: Storms that include wind, rain, lightning , snow and ice - 11%
- **Wildlife**: Accidental contact with lines & equip - 8%
- **Public**: damage from digging or tree trimming - 3%
- **Car Accidents**: cars hitting utility poles - 1%



Maximum Risk
Low Probability
High Consequence

Geospatial Risk Factors:

Energy Production – Covanta and Vicinity Steam and Electrical Generation

Covanta Waste to Energy

Located in the southwest corner of Grand Rapids, Michigan, the facility is an award winning waste-to-energy plant. The facility is owned by Kent County and serves residents of Grand Rapids, East Grand Rapids, Grandville, Kentwood, Walker and Wyoming with reliable and sustainable waste management. Every year, the facility processes more than 185,000 tons of waste that would otherwise have ended up in landfills.

The process takes non-hazardous waste, otherwise destined for landfills, and combusts it to generate steam for electricity generation. Ash is processed to recover metal for recycling while all gases are collected, filtered and cleaned before being released safely into the atmosphere. The facility produces 16 megawatts of electricity 24/7 - enough to power 10,000 homes for a year. It also recovers 2,800 tons of metal for recycling annually - enough to build 2,000 cars. This facility conducts multiple confined space entries each year. There are also hazardous processes and electrical hazards associated with the site.

Vicinity Energy Steam Production

Erected in 1897, the Fulton Street steam plant has fueled the growth of the local economy over the last century by supplying resilient thermal energy to local businesses and industries in Grand Rapids. Used in space heating and cooling, domestic hot and cooled water, humidification, and sterilization, Vicinity Energy's innovative district energy system supplies reliable thermal energy to a variety of customers in downtown Grand Rapids - including the Amway Grand Hotel, the Devos Place Convention Center, the Van Andel Research Institute and St. Mary's Hospital.

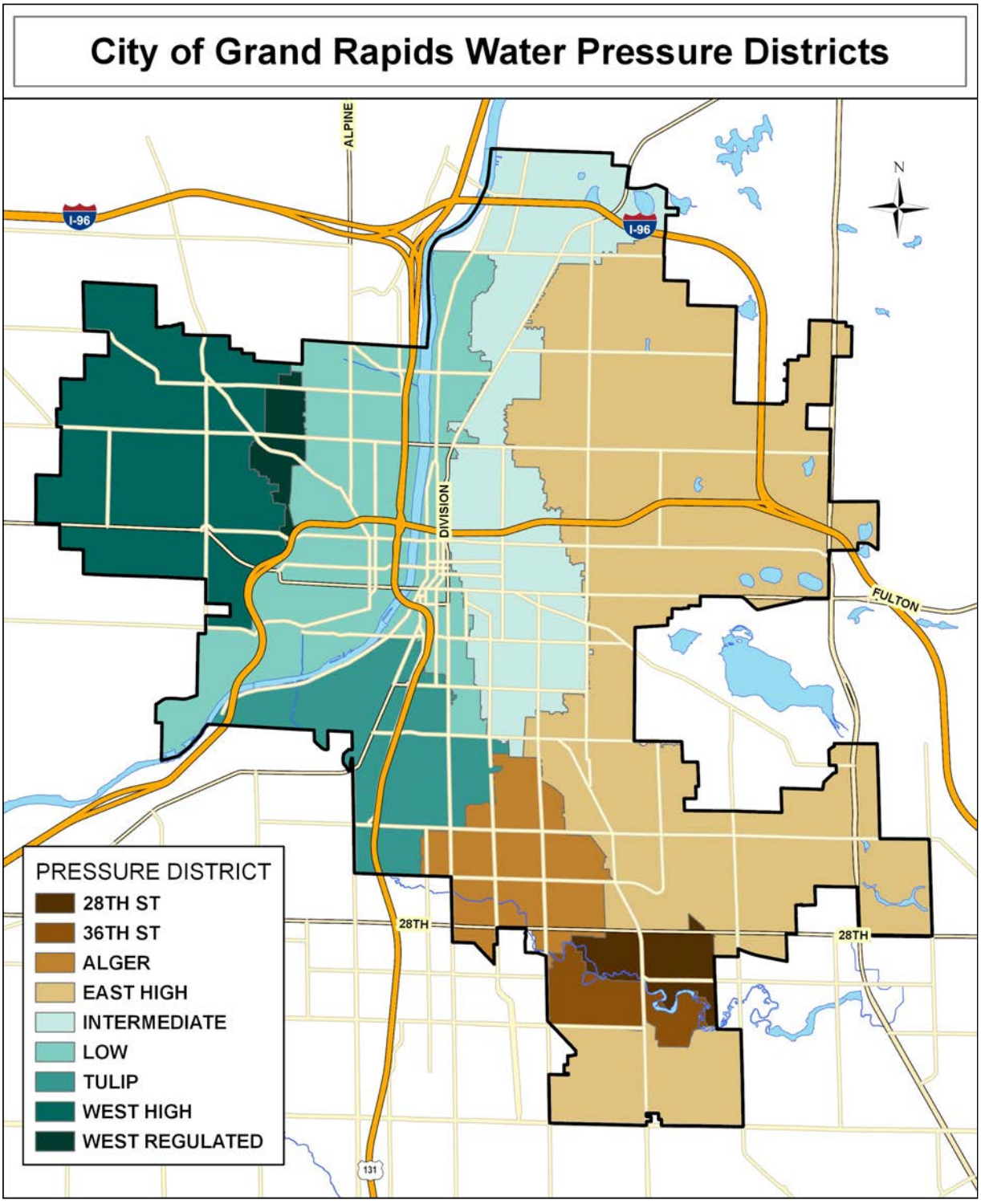
This facility presents multiple hazards including high voltage electrical transmission lines in the building, large scale gas combustion devices and hazardous materials storage. The facility also conducts numerous confined space entries every year.

Disruptions to service can have major impacts on customers who are reliant on the consistent delivery of steam for building heating.

Maximum Risk
Low Probability
High Consequence

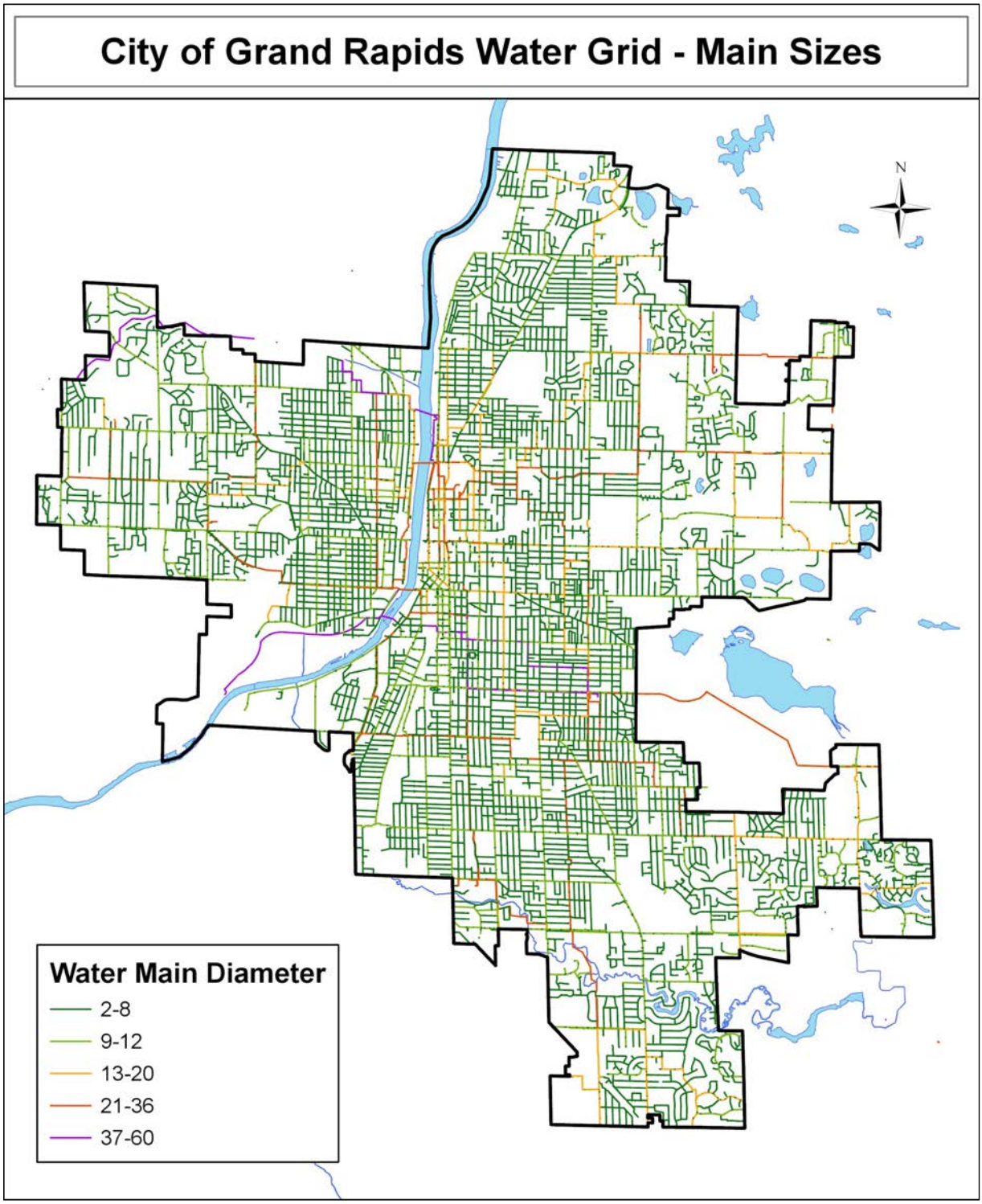
Geospatial Risk Factors:
Water System

The City of Grand Rapids operates several interconnected pressure systems that span the city and range from high pressure mains all the way to a regulated pressure main. These interconnections provide a safety factor through system redundancy. GRFD suppression personnel receive training on how this system can support water supply during emergency operations.



Maximum Risk **Low Probability** **High Consequence**	Geospatial Risk Factors: Water System

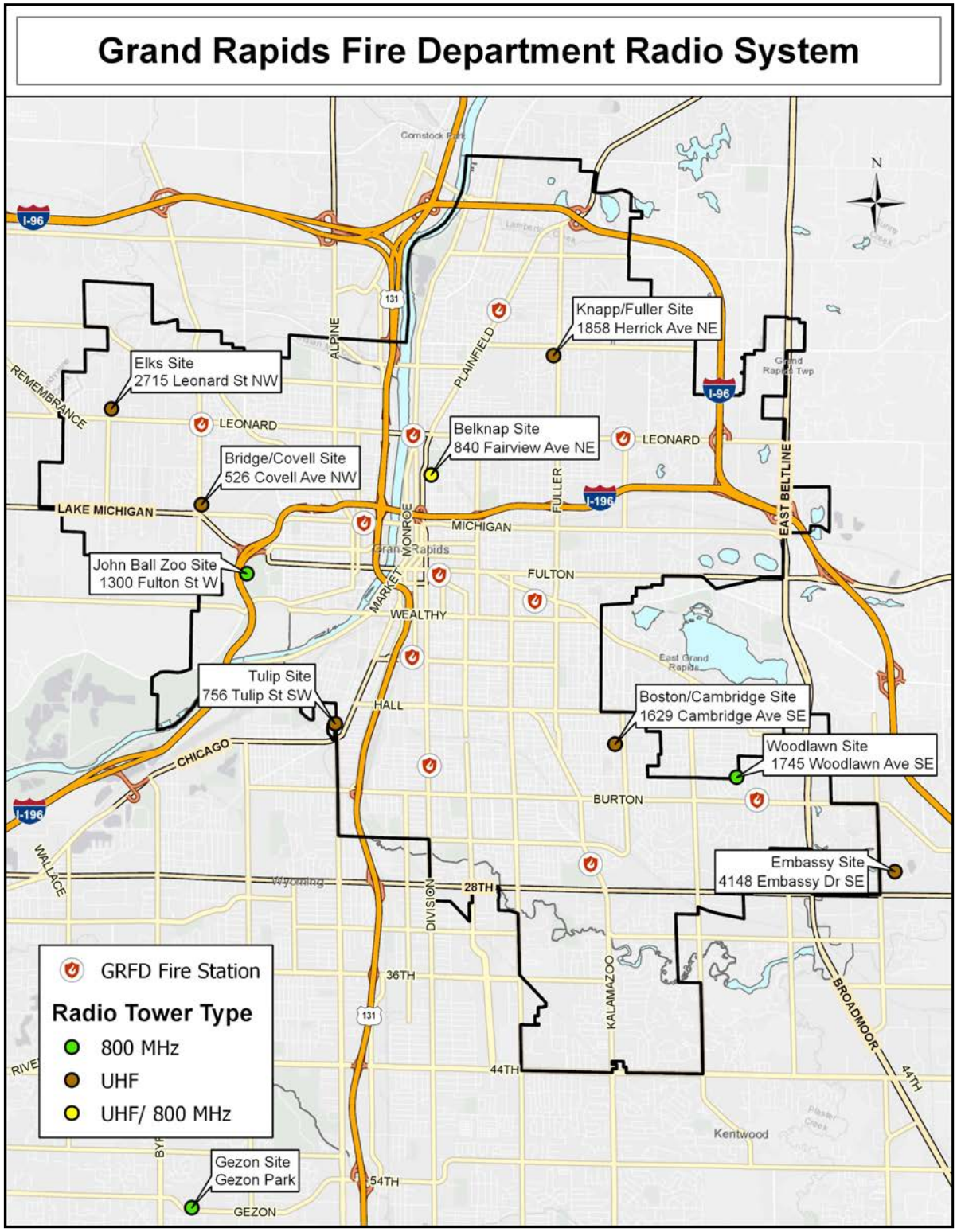
Main sizes for the system span from smaller residential lines with 2 inch diameters all the way to 60 inch supply mains from the water treatment plant at Lake Michigan.



Maximum Risk
Low Probability
High Consequence

Geospatial Risk Factors:
Emergency Communications

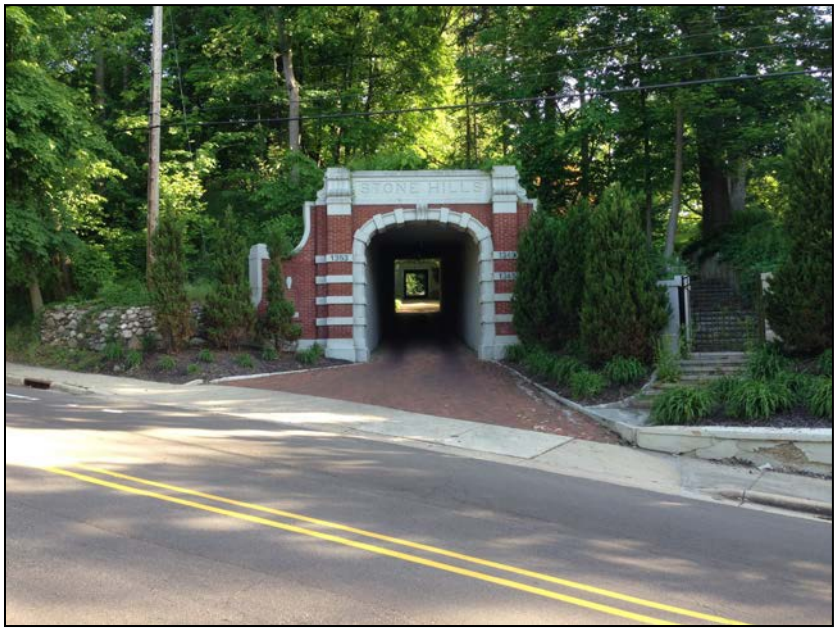
Multiple redundancies and the ability for the Kent County dispatching center to serve as a backup public safety answering point lend the communications system a high degree of reliability. However, if multiple systems did fail, it would have a far reaching and negative impact on emergency operations.



Low Risk
Low Probability
Low Consequence

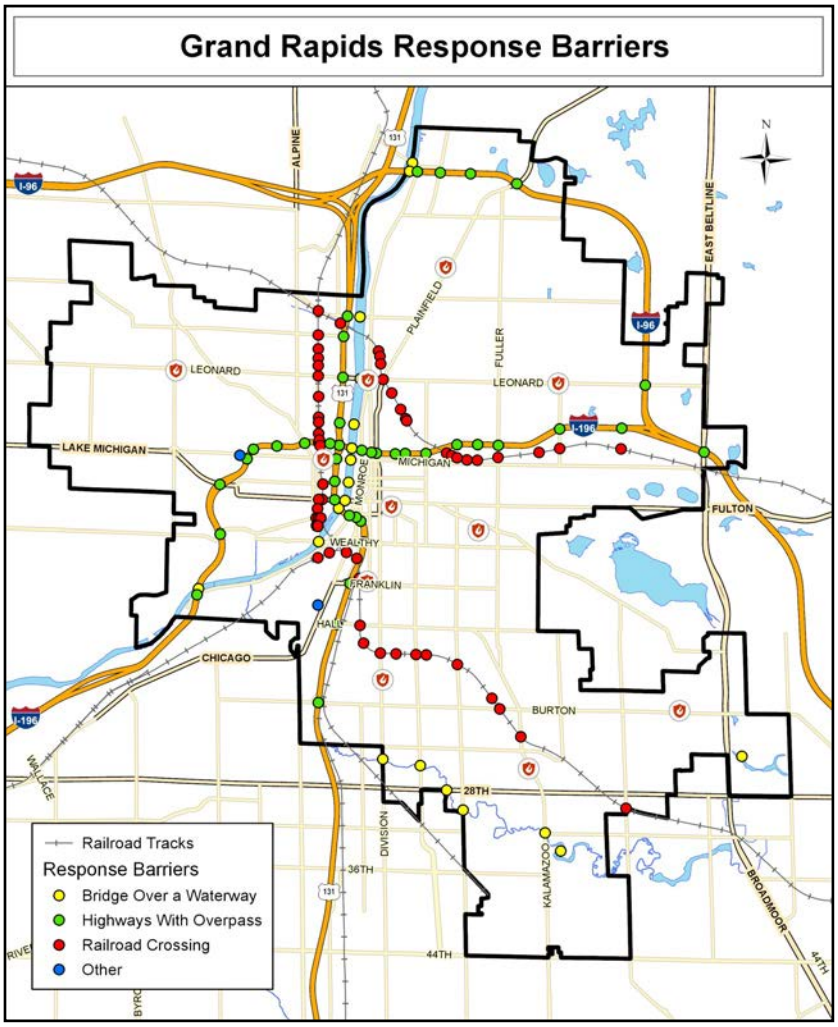
Geospatial Risk Factors:

Response Barriers



Entrance to the Stone Hills neighborhood in Bridge district

The GRFD has evaluated several different types of response barriers including bridges over waterways, railway crossings and highway overpasses. There are currently 19 bridge crossings over water, 56 railroad crossings and 41 highway overpasses. In addition to each crew learning the travel barriers in their district, it is common practice to notify dispatch if a traffic impediment is encountered enroute (such as a train), so that an additional unit can be dispatched to minimize response delays for the incident. Additional barriers, such as dead end streets or where certain blocks start/stop in regards to addressing, are communicated to crews in a department issued map book carried on every apparatus.

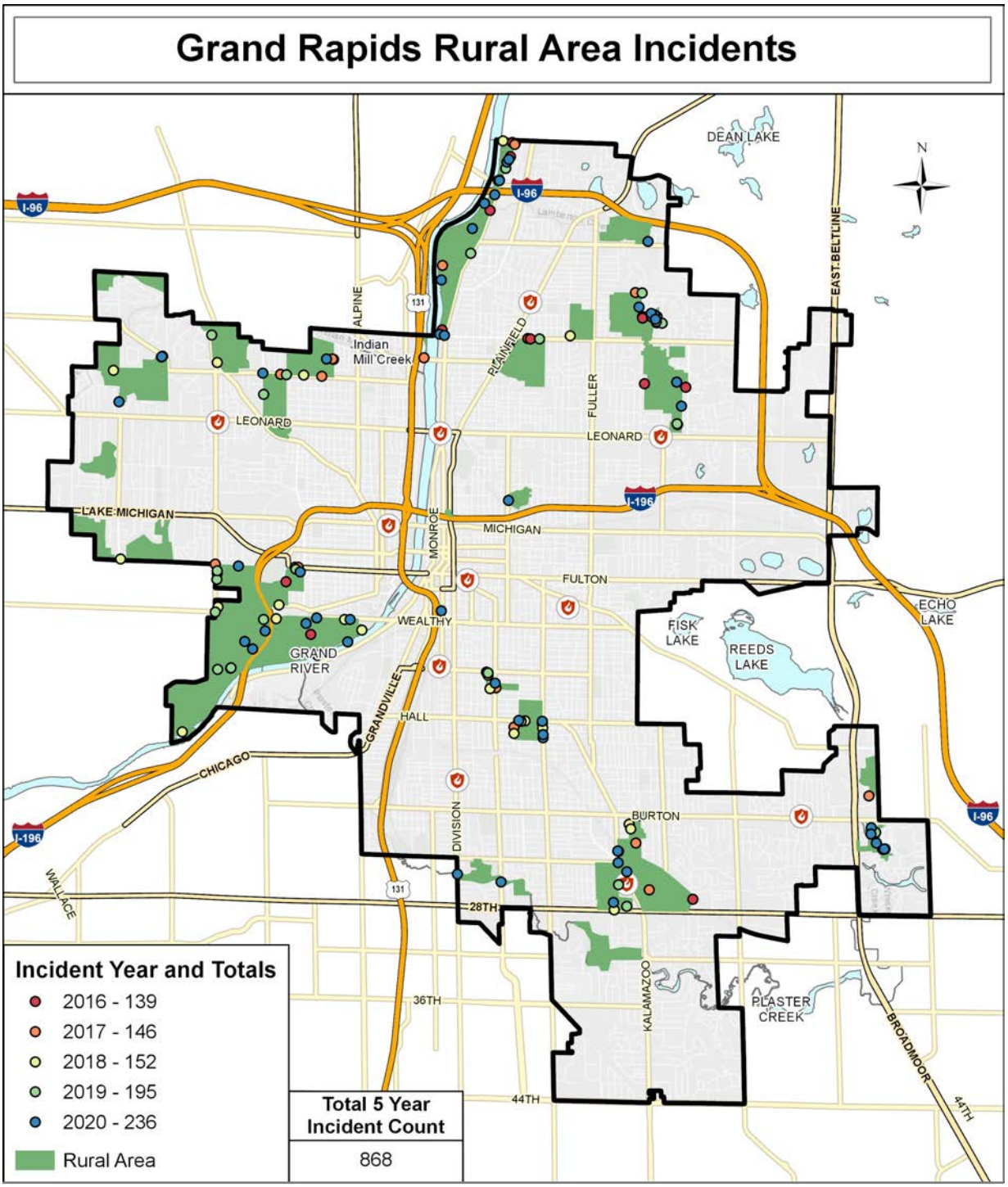


A few special considerations are the grade of some streets, which require parking apparatus on adjacent streets and hand carrying equipment during the winter months; and some bridges with weight restrictions. Suppression staff frequently identify homes with limited access, and these are identified in CAD with special recommendations for extra staffing. For instance, three homes with limited access located in Bridge Street's district, required a standard operating guideline (201-41 Stone Hills) to ensure effective incident mitigation in that area.

Response Barriers by District					
District	Highway with Overpass	Bridge over Water	Railroad Crossing	Other	Totals
1	6	0	6	0	12
2	2	0	6	1	9
3	11	7	15	0	33
4	0	4	4	0	8
5	10	3	19	0	32
6	0	1	0	0	1
7	4	0	0	0	4
8	2	0	0	1	3
9	4	2	0	0	6
10	2	2	6	0	10
Totals	41	19	56	2	118

Low Risk **Low Probability** **Low Consequence**	Geospatial Risk Factors: Rural Interface

The City of Grand Rapids is located in an urban setting and is surrounded by urban and suburban type cities. Areas defined as “rural” by population densities are city parks, golf courses or refuse collection sites. A very small amount of low risk emergencies take place in these areas each year, generally accounting for less than 1% of total call volume, and are largely attributed to medical emergencies, cancelled enroute incidents, or providing assistance to the police for various situations.



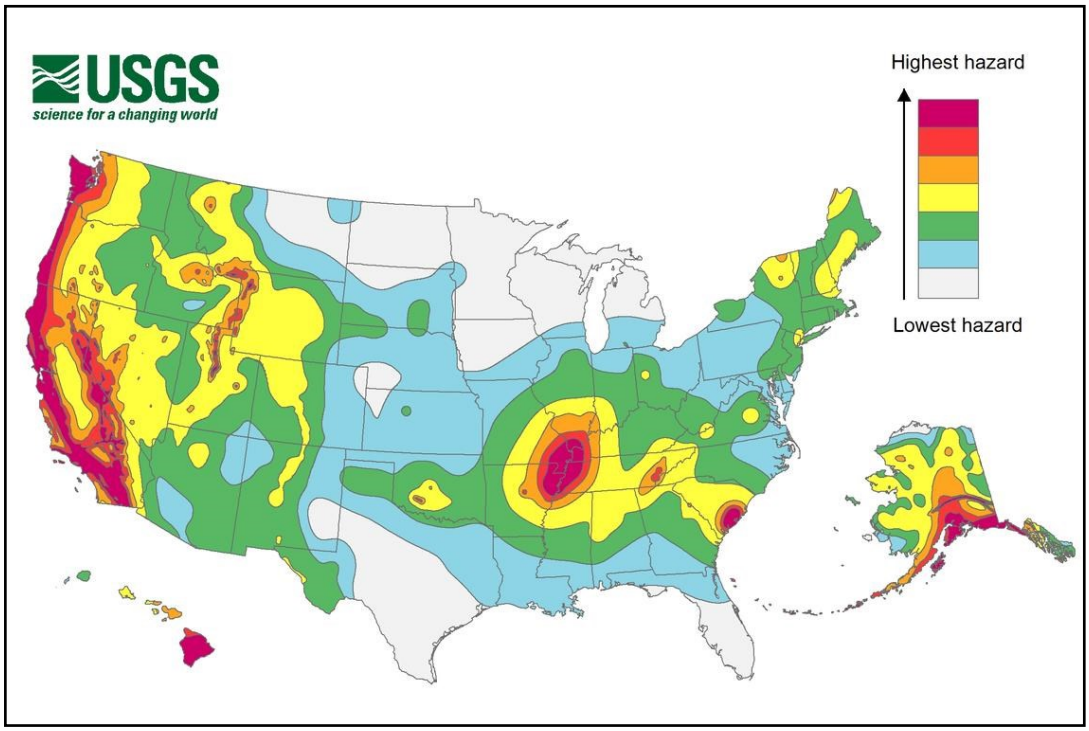
Low Risk
Low Probability
Low Consequence

Natural Risk Hazards:
Earthquakes

The City of Grand Rapids experienced a 4.2 magnitude earthquake in May of 2015, with no injuries or damage reported. The highest magnitude earthquake ever recorded in the city was a 4.6 in 1947 that only saw a few minor injuries. According to the United States Geological Services, there is a 0.23% chance of a major earthquake in Grand Rapids within the next 50 years, indicating a very low risk.

Two federal programs are in place for Michigan communities in the event of a disastrous earthquake. The first is the National Response Framework, which brings federal assistance through FEMA. The NRF outlines roles for 27 federal agencies in disaster response and recovery. The second is Executive Order 12699, the Seismic Safety of Federal and Federally-Assisted or Regulated New Building Construction law, which requires appropriate seismic design and construction of new federal buildings or those receiving federal assistance.

The USGS hazard map below is showing peak ground accelerations having a 2 percent probability of being exceeded in 50 years, for a firm rock site. The map is based on the most recent USGS models for the contiguous U.S. (2018), Hawaii (1998), and Alaska (2007). The models are based on seismicity and fault-slip rates, and take into account the frequency of earthquakes of various magnitudes. Locally, the hazard may be greater than shown, because site geology may amplify ground motions.



Maximum Risk
Low Probability
High Consequence

Natural Risk Hazards:

Flood Events

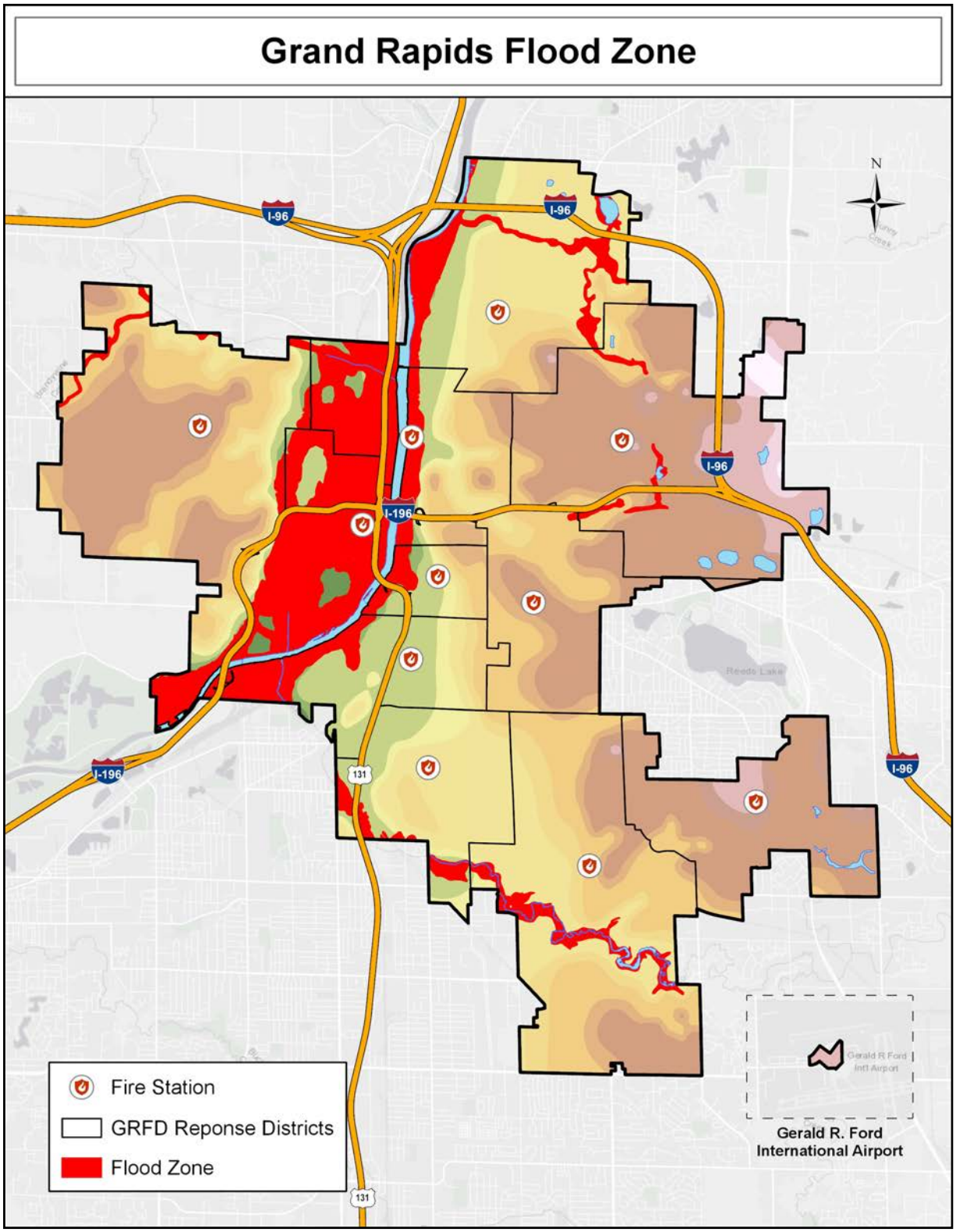
The flood stage for the Grand River in Grand Rapids is 18 feet. A list of the most recent and historic river levels is shown on the right, with 2013 showing the river level at 21.85 ft., the highest since 1901, when records were recorded by the National Weather Service. Grand Rapids has received a draft report from FEMA concerning the Levee Analysis and Mapping Plan (LAMP) for the Grand River, providing the City with information on necessary improvements to meet the organization's floodwall requirements. Grand Rapids was one of 25 pilot communities in the nation to participate in the process. As a result of the study, the city invested $4.2 million in flood wall improvements in 2014/2015.

Flood Categories (in feet)	
Major Flood Stage	23
Moderate Flood Stage	21
Flood Stage	18
Action Stage	12

River Level	Impact
25.5	Expect major flooding downtown with high water impacting the Van Andel Museum
25	High water impacts the Waste Water Treatment Plant in Grand Rapids*Raised from 21.69 due to restoration of berm to 3 ft. above 100 year flood stage level
23	Expect major flooding of residential areas above and below Downtown Grand Rapids
21	Expect moderate to major flooding in the area, Ann Street, and the City Dikes. Major flooding of homes and structures occurs upstream in Comstock Park and downstream of Grand Rapids to Robinson Township
18	Expect minor flooding of basements in low lying areas in Grand Rapids. Moderate flooding of homes and structures occurs upstream at Comstock Park and downstream in Robinson Township
16.5	Expect minor flooding in Grandville
15	Expect minor flooding to occur in low lying areas upstream and downstream of Grand Rapids, especially in the areas of North Park, Comstock Park, and Robinson Township. Some seepage into basements of businesses in Grand Rapids occurs
14	Expect minor flooding to occur in low lying areas upstream and downstream of Grand Rapids, especially in the areas of North Park and Comstock Park.
12	River is bankfull upstream and downstream of flood walls in Downtown Grand Rapids. Portions of the Kent Trail and Indian Mounds Drive flooded in Grandville

Recent Crests	Historic Crests
(1) 15.72 ft on 03/18/2019	(1) 21.85 ft on 04/22/2013
(2) 20.67 ft on 02/25/2018	(2) 20.67 ft on 02/25/2018
(3) 17.90 ft on 04/10/2017	(3) 19.64 ft on 03/01/1985
(4) 12.31 ft on 04/04/2016	(4) 19.54 ft on 05/27/2004
(5) 10.26 ft on 03/17/2015	(5) 19.50 ft on 03/28/1904
(6) 12.79 ft on 03/25/2014	(6) 19.29 ft on 03/08/1976
(7) 21.85 ft on 04/22/2013	(7) 19.25 ft on 10/04/1986
(8) 11.09 ft on 03/06/2012	(8) 19.25 ft on 04/03/1960
(9) 16.34 ft on 05/01/2011	(9) 18.83 ft on 03/19/1982
(10) 13.19 ft on 03/16/2010	(10) 18.60 ft on 06/09/1905
(11) 17.29 ft on 05/01/2009	(11) 17.90 ft on 04/10/2017
(12) 17.84 ft on 12/31/2008	(12) 17.87 ft on 02/25/1997
(13) 13.04 ft on 04/15/2008	(13) 17.84 ft on 12/31/2008
(14) 13.93 ft on 03/16/2007	(14) 17.70 ft on 05/13/1956
(15) 13.71 ft on 03/17/2006	(15) 17.42 ft on 03/17/1986
(16) 14.27 ft on 01/17/2005	(16) 17.42 ft on 05/22/2000
(17) 19.54 ft on 05/27/2004	(17) 17.29 ft on 05/01/2009
(18) 8.23 ft on 04/07/2003	(18) 17.03 ft on 03/23/1948
(19) 13.04 ft on 03/13/2002	(19) 16.87 ft on 03/09/1974
(20) 16.07 ft on 02/14/2001	(20) 16.85 ft on 03/01/1971
(21) 17.42 ft on 05/22/2000	(21) 16.82 ft on 04/24/1975
(22) 15.15 ft on 04/27/1999	(22) 16.55 ft on 01/05/1973
(23) 13.50 ft on 03/23/1998	(23) 16.49 ft on 03/16/1990
(24) 17.87 ft on 02/25/1997	(24) 16.43 ft on 04/09/1947
(25) 15.00 ft on 06/22/1996	(25) 16.40 ft on 03/18/1918
(26) 12.60 ft on 11/09/1995	(26) 16.40 ft on 03/20/1919
(27) 13.62 ft on 02/24/1994	(27) 16.34 ft on 05/01/2011
(28) 16.10 ft on 04/24/1993	(28) 16.19 ft on 04/12/1965
(29) 12.34 ft on 04/30/1992	(29) 16.10 ft on 04/24/1993
(30) 15.40 ft on 12/02/1990	(30) 16.07 ft on 02/14/2001
(31) 16.49 ft on 03/16/1990	(31) 16.00 ft on 04/07/1912
(32) 15.20 ft on 06/05/1989	(32) 15.80 ft on 03/30/1916
(33) 12.12 ft on 04/11/1988	(33) 15.72 ft on 03/18/2019
(34) 19.25 ft on 10/04/1986	(34) 15.47 ft on 03/23/1962
(35) 17.42 ft on 03/17/1986	(35) 15.41 ft on 03/10/1979
(36) 19.64 ft on 03/01/1985	(36) 15.40 ft on 12/02/1990
(37) 11.38 ft on 02/16/1984	(37) 15.34 ft on 02/23/1981
(38) 13.81 ft on 04/17/1983	(38) 15.30 ft on 03/15/1908
(39) 18.83 ft on 03/19/1982	(39) 15.23 ft on 02/06/1968
(40) 15.34 ft on 02/23/1981	(40) 15.20 ft on 06/05/1989
(41) 9.40 ft on 04/12/1980	(41) 15.15 ft on 04/27/1999
(42) 15.41 ft on 03/10/1979	(42) 15.13 ft on 03/20/1942
(43) 15.09 ft on 04/04/1978	(43) 15.10 ft on 01/24/1907
(44) 9.64 ft on 03/10/1977	(44) 15.09 ft on 04/04/1978
(45) 19.29 ft on 03/08/1976	(45) 15.00 ft on 06/22/1996
(46) 16.82 ft on 04/24/1975	(46) 14.90 ft on 03/17/1920
(47) 16.87 ft on 03/09/1974	(47) 14.85 ft on 05/04/1909
(48) 16.55 ft on 01/05/1973	(48) 14.41 ft on 03/25/1959
(49) 14.34 ft on 04/21/1972	(49) 14.34 ft on 04/21/1972
(50) 16.85 ft on 03/01/1971	(50) 14.27 ft on 01/17/2005

Late winter and spring floods are by far the most common in Michigan due to frontal systems that produce light to moderate rain fall at the same time that snowmelt is occurring. The Grand River in Grand Rapids crests in about 5.5 days. A sharp rise may occur in the first 24 hours due to the contribution from local tributaries and urban areas. The next 2 days will show a slow rise or leveling off trend until the water from upstream makes its way down to Grand Rapids. The crest in Grand Rapids is mostly a function of the water from the Thornapple River joining the Grand River in Ada. While the Rogue River is not a major contributor to the crest at Grand Rapids, it can add about a foot to the crest in the city.

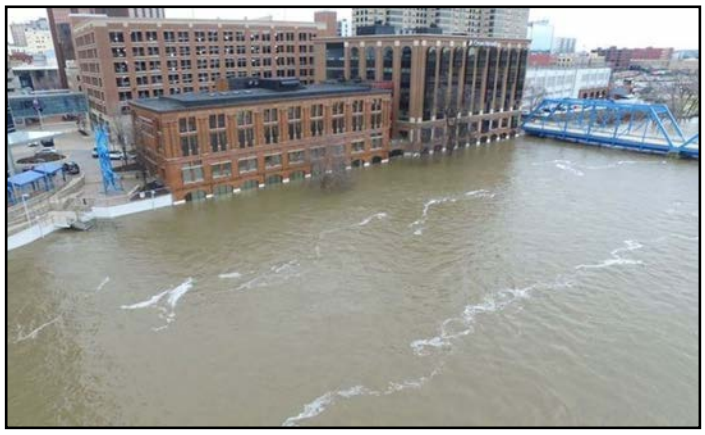


In Kent County, it is possible to identify all the properties in identified floodplains through the use of county property information. A computerized analysis assessed the location of many thousands of potentially flood prone properties in relation to the officially mapped floodplains, and these properties were then sorted by community and structure type (as well as properties with no built structures). The following table provides the results of this analysis for Kent County. Properties that overlap with identified flood plains were all counted here, but that doesn't necessarily mean that the locations of built structures on those properties were also in the flood plain, or were vulnerable to flooding. The following table provides a liberal estimate of the number and types of properties potentially at-risk from flood plain-related events in Kent County. There are several small streams and creeks in the Grand Rapids metropolitan area, such as Plaster Creek and Lamberton Creek, that tend to flood whenever one to two inches of rainfall occur over several hours within distinct urban drainage basins.

Properties Located within Flood Plains						
Grand	Residential	Industrial	Commercial	Agricultural	Tax-Exempt	Vacant
Rapids	8,234	211	992		290	436
Data from the Hazard Mitigation Plan for Kent and Ottawa Counties - 2017						

The risk of urban flooding exists, and is difficult to pinpoint due to its diffuse and systemic origins, but is generally decreasing due to the effects of combined sewer overflow projects and the use of green spaces. Urban flooding is concentrated in urban areas, so it is not surprising that this is the most common flooding event affecting the metropolitan Grand Rapids area. What were once common urban flooding incidents have been reduced in frequency and severity by the adoption of a new waste water philosophy separating storm water run-off from the sanitary sewer system. This 27 year project, costing over $400 million dollars, was completed in 2015. This has been a great success and a model for communities across the country according to the West Michigan Environmental Action Council.

No. 3 Hose Cart fording a flooded Bridge St. in 1904



A railroad trestle with direct water impingement and a view of downtown buildings during flooding in February of 2018

Maximum Risk
Low Probability
High Consequence

Natural Risk Hazards:
Wind Events

Tornadoes occur in Kent County on an infrequent basis, with approximately one tornado touching down every two years. Grand Rapids is at a lower risk for tornadoes based on the city's location and upon examining historical data. The largest tornado to ever hit Grand Rapids was an F5 in 1956 that caused 340 injuries and 18 deaths. In 2015 an EF-1 tornado passed just south of the city, leaving a path of moderate destruction in the neighboring cities of Kentwood and Wyoming. A wind storm event on September 11, 2019 brought sustained winds of 65-80 MPH, with gusts of 100 MPH in the downtown area.

Radar loop from 4:00 to 9:30 PM 9/11/2019. Note the line of storms that went through Grand Rapids, Michigan, where the most concentrated damage was reported.

Improved public education in tornado safety, through community efforts and media coverage, has increased the public's awareness of potential hazards from tornadoes and their response to those hazards. The National Weather Service has improved warning lead times from six to thirteen minutes. Local TV can also provide advanced warning with Doppler radar. City and county upgrades have also recently taken place for the tornado siren system, with the two public safety answering points (PSAP) able to activate the sirens in either locale. The sirens also perform automatic diagnostic checks and report back to a monitoring system in the PSAP about their status. Education and early awareness need to be continually improved to mitigate tornado hazards. Injuries can also occur after a tornado, as a result of extended rescue and debris removal efforts.

Storm damage on Fairview Avenue NE from a wind storm event on September 11, 2019

Moderate Risk
High Probability
Low Consequence

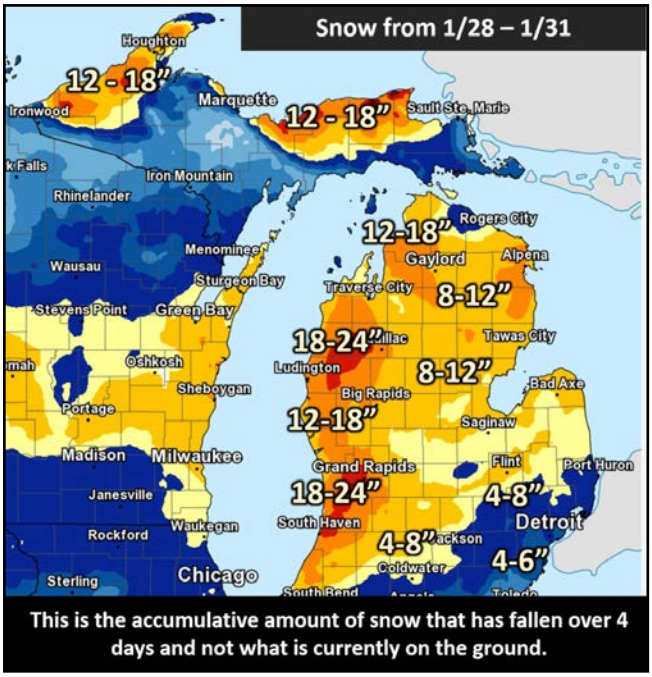
Natural Risk Hazards:

Winter Weather Events

Due to its proximity to Lake Michigan, Grand Rapids regularly experiences significant snowfalls and strong winds, posing an ever present danger to residents of the area. Deep, drifting snows frequently affect the entire area, disrupting normal life and serving as an impediment to travel. Snow plowing, snow removal, vehicle damage from snow and ice caused accidents, and damage from ice storms have a significant economic impact on the area.

Strong winds that usually flow from west to east are filled with moisture and can quickly create blizzard like conditions with winds exceeding 35 mph and visibility falling below 1/4 mile. In addition to travel delays, cancelled flights, and automobile accidents; heart attacks while shoveling snow, slips, trips and falls on icy surfaces, frostbite, broken tree limbs, downed power lines and roof collapses from snow and ice build up are also concerns.

Fire crews regularly head out in the rough winter weather to shovel fire hydrants and ensure they are accessible during these winter events. Recently, the water department has been adding flags to the major travel routes to ease the visual location of fire hydrants, as plow trucks traveling these roads can easily pile up several feet of snow, totally obscuring the hydrant. The city also encourages citizens to “Adopt-a Hydrant” and maintain the area around hydrants year-round.



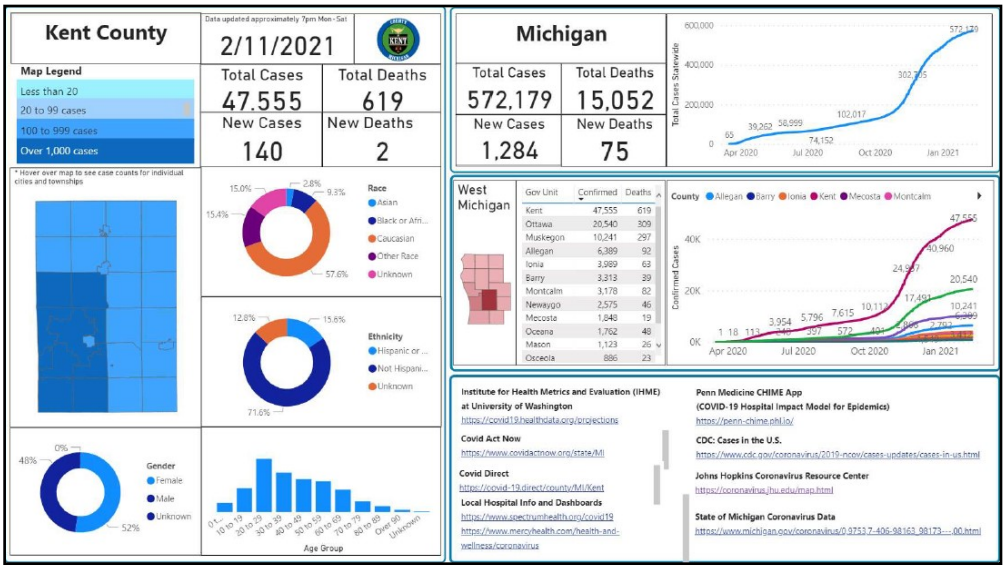
This is the accumulative amount of snow that has fallen over 4 days and not what is currently on the ground.

High Risk
High Probability
High Consequence

Natural Risk Hazards:

Contagious Disease Outbreaks

COVID -19



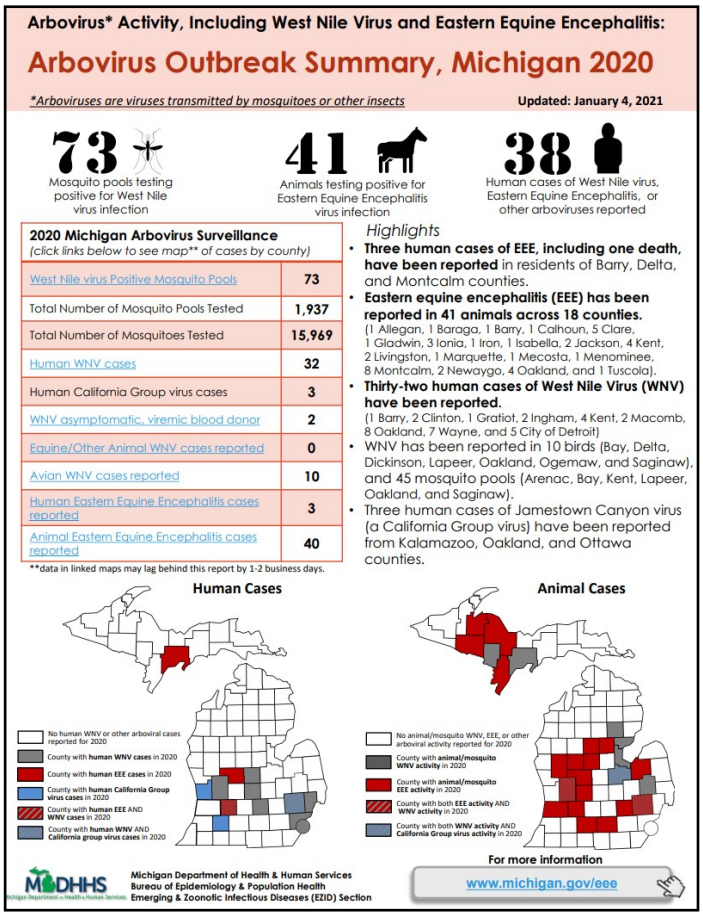
Like every other aspect of society, COVID-19 had a significant impact on the Grand Rapids Fire Department. A significant amount of time and resources were focused on dealing with the impact of the disease, and many of the personnel related side affects that resulted. The Center for Disease Control, Kent County Health Department, and Governor of Michigan Executive orders all directed the actions we had to take to continue to provide our services to the community in a safe manner. Primary among these responsibilities were dealing with employee's infected by COVID-19, employees who had close contact with those infected, employees who had symptoms but were not yet diagnosed, and those exposed on scene to a patient diagnosed or potentially having COVID-19.

Eastern Equine Encephalitis

In late summer and autumn of 2020, Michigan experienced an outbreak of Eastern Equine Encephalitis (EEE). EEE is one of the most dangerous mosquito-borne diseases in the United States, with a 33 percent fatality rate in people who become ill. There were 3 human cases (including one death), and 41 animal cases in Michigan in 2020. EEE virus is a rare cause of brain infections (encephalitis). Only a few cases are reported in the United States each year.

West Nile Virus

West Nile Virus (WNV) is carried by certain types of mosquitoes in Michigan. It is a potentially serious disease that can affect anyone, but people over age 60 are more likely to get the more severe form of WNV illness. The risk of bites from infected mosquitoes is highest for people who work or play outdoors. Wearing insect repellent when outdoors (especially at dawn and dusk) is important to prevent WNV. In Michigan, outbreaks of WNV have been occurring every summer since 2002.



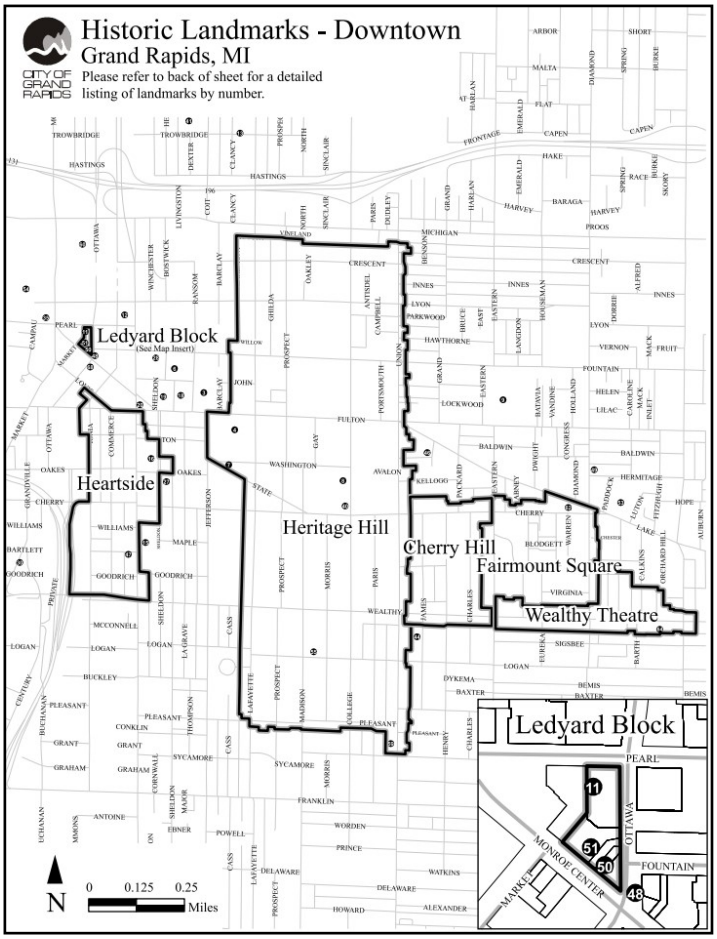
High Risk
High Probability
High Consequence

Manmade Hazards:

Historic Districts

The city is home to six historic districts, each containing numerous unique and irreplaceable structures. The Heritage Hill district is one of the oldest and largest historic districts in the United States, encompassing 1,300 homes and 3,500 acres. Nearly every style of American architecture, from Greek Revival to Prairie is represented in the district.

Challenges related to these areas involve the varied construction types that can be encountered. Many of the homes are balloon frame construction, allowing faster fire spread, and have had many renovations over the years. Other challenges include old knob and tube electrical, slate shingles with unusual roof lines, and hidden void spaces.



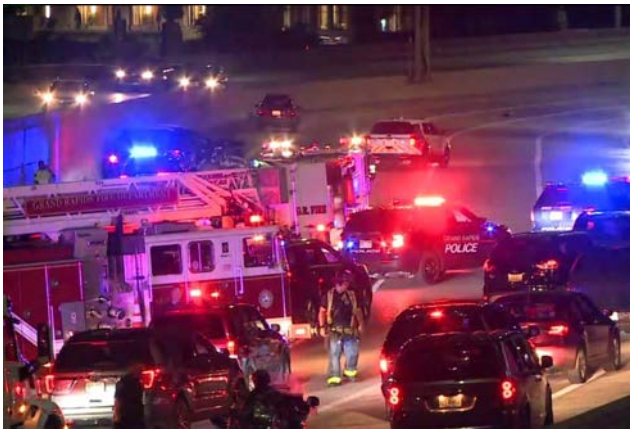
Moderate Risk
High Probability
Low Consequence

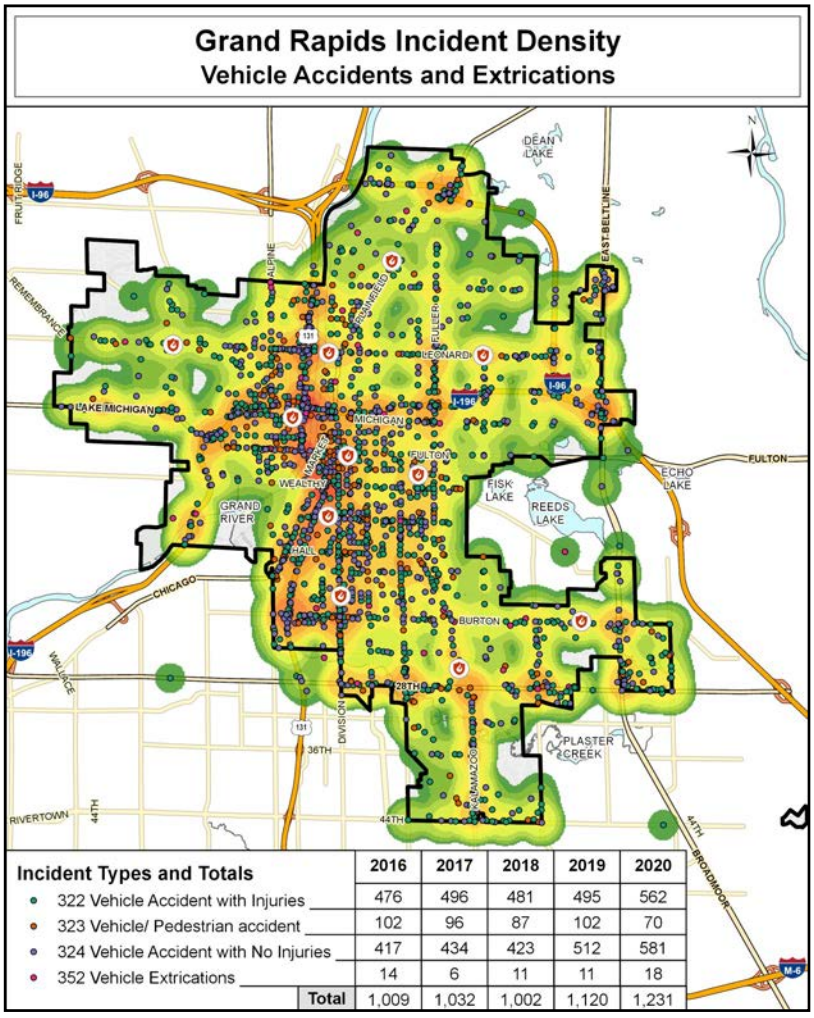
Manmade Hazards:

Transportation Network - Roads

There are 823 total road miles located within the city of Grand Rapids, but many of them pose difficulties in travel due to their condition. In 2014, Grand Rapids voters approved a dedicated road millage to address the crumbling roads and increase safety for both motorists and responding emergency apparatus, raising almost $9 million dollars a year to support the continued work. In 2015, 63% of the roads were in poor condition, resulting in travel speeds much less than the posted limit. Since then the street system has improved to 61% good or fair condition. The goal is to have 70 percent of them in good or fair condition by 2031. The city maintains an online road closure map to keep internal and external stakeholders aware of road closures and traffic impediments.

A call density map with associated table shows emergency incident activity on the roads that pass through Grand Rapids. 2019 MDOT data indicates that 118,129 vehicles utilize US-131 daily, and 103,169 travel on I-96. The busiest surface roads are 28th Street near US-131, which sees 44,707 cars daily, and the East Beltline near I-96 with 46,598. Wealthy Street between US-131 and Division Avenue sees approximately 32,000 cars a day.





Incident Types and Totals	2016	2017	2018	2019	2020
322 Vehicle Accident with Injuries	476	496	481	495	562
323 Vehicle/ Pedestrian accident	102	96	87	102	70
324 Vehicle Accident with No Injuries	417	434	423	512	581
352 Vehicle Extrications	14	6	11	11	18
Total	1,009	1,032	1,002	1,120	1,231

Maximum Risk **Low Probability** **High Consequence**	Manmade Hazards: Transportation Network Commercial and Passenger Rail

Grand Rapids is a major terminal on the west side of the state for railway traffic. Both passenger and freight railways operate in and around the city, with hundreds of railcars passing through daily on approximately 25 miles of active rails.

Passenger

The Vernon J. Ehlers Amtrak station is located at 440 Century Avenue SW in the area of US -131 and Wealthy Street, next to the Rapid Central Station. The station is named after a former West Michigan U.S. representative. The current site is adjacent to the main bus transfer station in downtown Grand Rapids, simplifying transfers for passengers switching between the two systems. It allows trains to board passengers without blocking roads, which was a problem at the old station on the corner of Wealthy Street and Market Avenue. This often served as an impediment to emergency responders. The Grand Rapids Amtrak station averaged about 40,000 passengers in 2018 and 2019. Ridership was reduced in 2020 due to Covid-19 protocols.

Maximum Risk
Low Probability
High Consequence

Manmade Hazards:

Transportation Network
Commercial and Passenger Rail

CSX Transportation, the only Class 1 railroad in the city, operates the primary rail line running through Grand Rapids. Their yard, located at 945 Freeman Ave. SW, serves as a major classification yard for traffic going between Detroit and Chicago and the entire southern Michigan area. This hub is also home to a bulk service transfer terminal that off-loads jet fuel on a daily basis. The GRFD periodically assesses the hazardous commodities traveling through the City on CSX, and utilizes this information to ensure we are prepared for a response based on risk and likelihood. In 2015, the top 7 hazardous commodities transported accounted for over 75% of the hazardous commodities shipped through Grand Rapids. In order of quantity, they include Sulfuric Acid, Liquefied Petroleum Gases, Elevated Temperature Liquids, Ferrous Chloride Solution, Butane, Xylenes and Hydrochloric Acid.

Three Class 3 short lines operate in the City of Grand Rapids. The **Grand Elk Railroad,** a Watco owned short line, operates a line into Grand Rapids from the south, originating in Elkhart Indiana, and ending here in Grand Rapids. This line handles interchange traffic with the Grand Rapids Eastern, as well as miscellaneous bulk commodities ranging from grain to coal and plastic pellets at or near their yard facility, which is located at 1440 Hynes Ave SW, along US131 just south of downtown. The **Grand Rapids Eastern Railroad** operates across the north half of the City, with a line that originates in Grand Rapids and ends in Lowell. Grain and raw materials for Amway are transported on this line. **Marquette LLC** enters the city on track rights from the north over CSX. They service a variety of customers between Grand Rapids, Ludington and Manistee with a mix of paper products and mostly non-hazardous chemical material shipments. Both the Grand Rapids Eastern and Marquette companies are owned by national short line rail conglomerate Genesee & Wyoming.

Year	Fire	EMS	Other	Total
2016	3	9	2	14
2017	1	7	1	9
2018	3	12	2	17
2019	1	9	3	13
2020	10	13	3	26

Although quite rare, as evidenced by the incident table located to the left, the GRFD has responded to several train related incidents including train vs. car accidents, train vs. pedestrian accidents, rail car fires and hazardous materials incidents. Given the amount of rail lines in the city, the amount of passengers and freight traversing the rails, and the interactions between surface streets, a specialized risk and response is warranted.

Maximum Risk
Low Probability
High Consequence

Manmade Hazards:

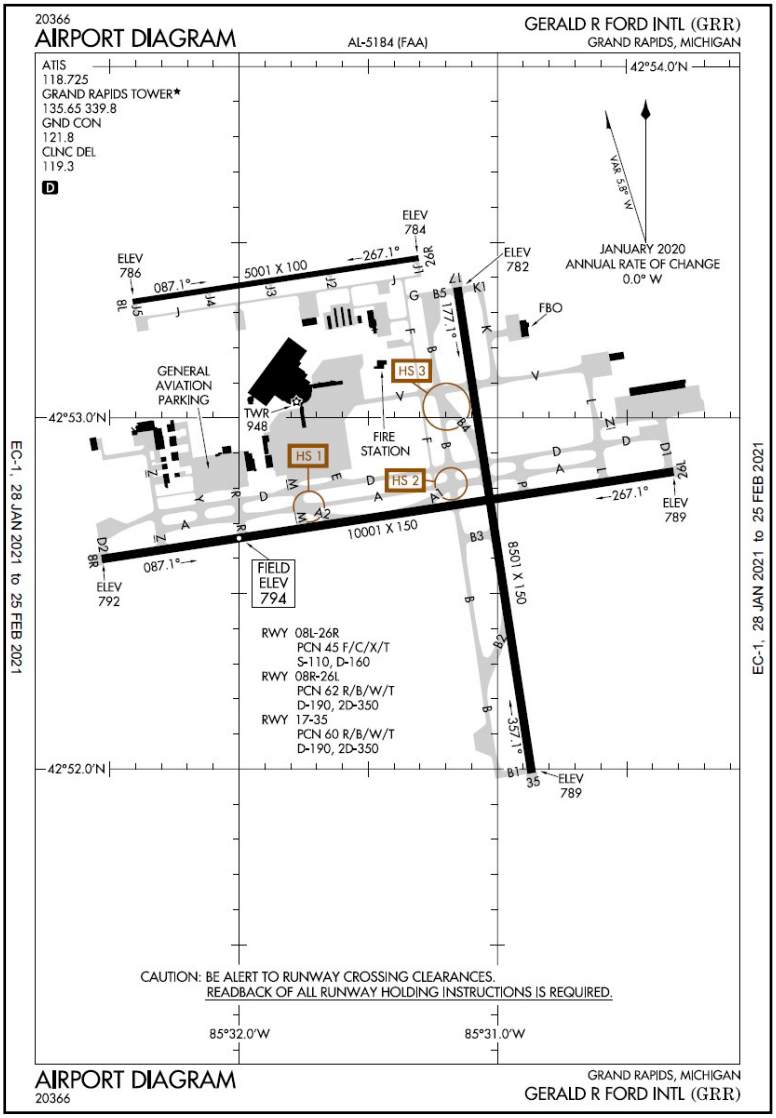
Transportation Network - Airport

The Gerald. R Ford International Airport (GRR) is the second busiest commercial airport in Michigan, behind the Detroit Wayne County (DTW) airport, and is located approximately 13 miles southeast of downtown Grand Rapids in Cascade Township. The airport operates an independent fire department, specifically trained for aircraft emergencies, separate from the GRFD. The airport terminal, tower, parking structure and aviation school all reside on City of Grand Rapids property.

Gerald R. Ford International Airport operates three runways. They provide passenger and commercial freight air service with over 230 daily flights. 3.59 million passengers arrive and depart annually, with six passenger airlines and 30 non stop destinations across the United States and Canada.

The GRFD has worked for years to provide an effective and efficient response to emergencies located on city property at the airport through a diverse mix of resources.

Standard Operating Guideline (SOG 201-42) is in place to direct emergency incident response and includes automatic aid response from the surrounding jurisdictions of the Airport FD, Kentwood FD and Cascade FD. The Airport FD provides response on all emergencies and serves as both incident command and the investigative group. The GRFD will respond for confirmed structure fires, if an aircraft crash is imminent (Alert 3), for large EMS incidents, special operations, or as requested by the investigative group. Grand Rapids responded to one call for service at the airport between 2016 and 2020.



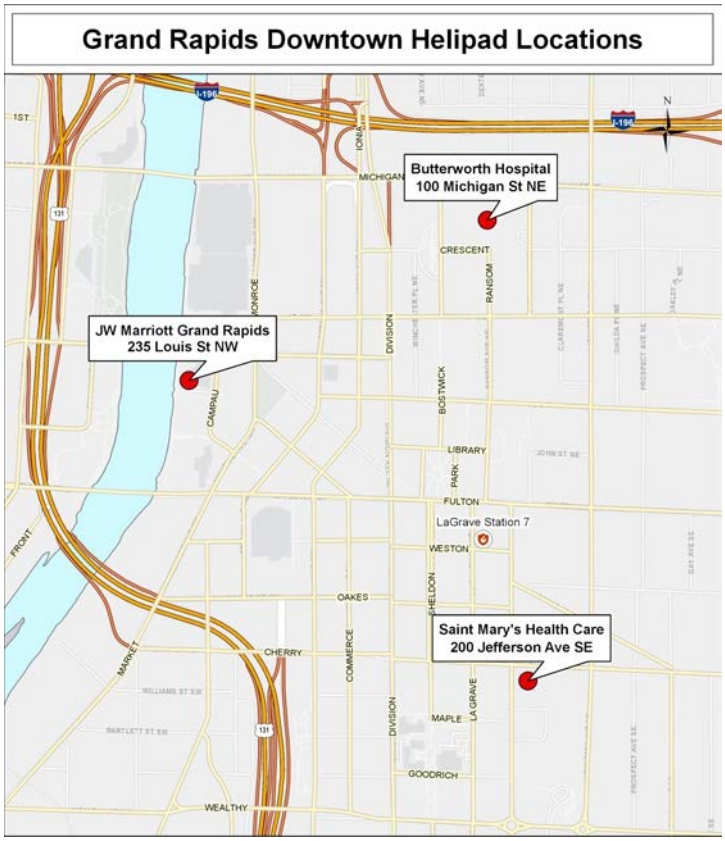
Maximum Risk
Low Probability
High Consequence

Manmade Hazards:

Transportation Network - Heliports

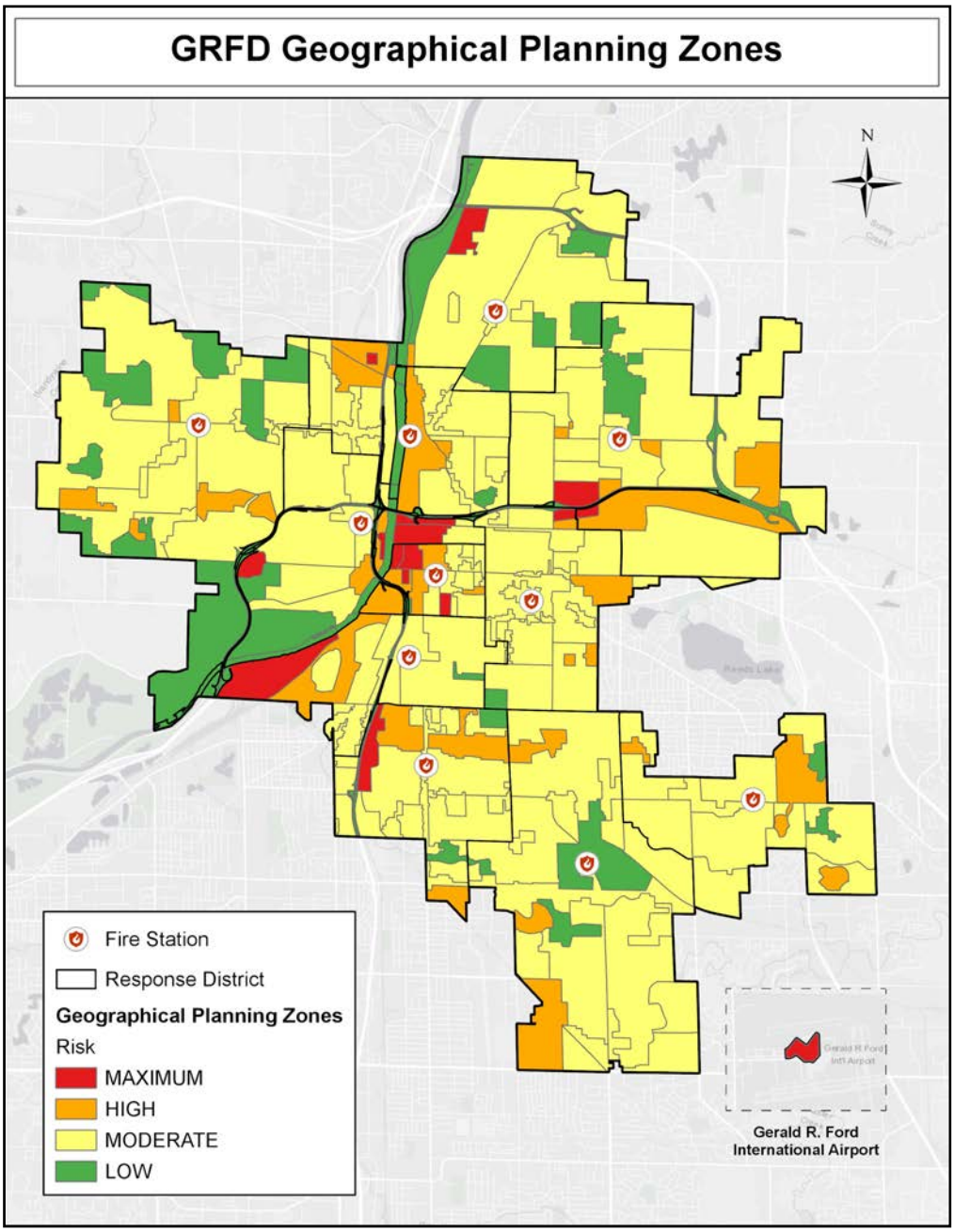
While the airport is located southeast of the city, there are still hazards present in the air above the city. There are three helipads in the downtown area, located at the JW Marriott Hotel, Butterworth Hospital, and St. Mary's Hospital. Having one of the best medical hubs in the Midwest, patients from outside of the immediate area frequently travel to Grand Rapids for its hospital systems. Spectrum Health operates Aero Med, which is Michigan's only flight-physician staffed air medical transport program. Operating two Sikorsky S-76 helicopters, a flight team consisting of physicians and nurses is available 24 hours a day, seven days a week in Grand Rapids, with peak load staffing adding a second unit in Big Rapids, MI. Aero Med is nationally recognized and accredited by the Commission on Accreditation of Medical Transport Systems, logging more than 19,370 safe patient flights and 18,800 safe flight hours, earning safety awards for 25 consecutive years.

Aero Med conducts frequent training exercises in the downtown area. Although the risk is extremely low, on May 29th, 2008 an Aero Med helicopter crashed atop the 11 story section of Spectrum Health Butterworth hospital during a training run. Both the pilot and the federal aviation official passenger survived without serious injuries, but the incident did serve as a stark reminder of the potential risk to the city, hospital, and first responders that a potential aviation related incident is possible in Grand Rapids.



Geographical Planning Zone Development

Geographical planning zones (GPZ's) were developed by working closely with each station captain to group occupancies within their first due district into comparable zones. Multiple revisions included input from the planning division, station personnel and chief officers. The resulting product is 282 GPZ's across the city. The borders of the GPZ's were designed to fit within the first due areas to ease data analysis at the citywide, first due and GPZ level. The city is comprised of 85 low risk GPZ's, 148 moderate risk FMZ's, 34 high risk GPZ's and 15 maximum risk GPZ's.

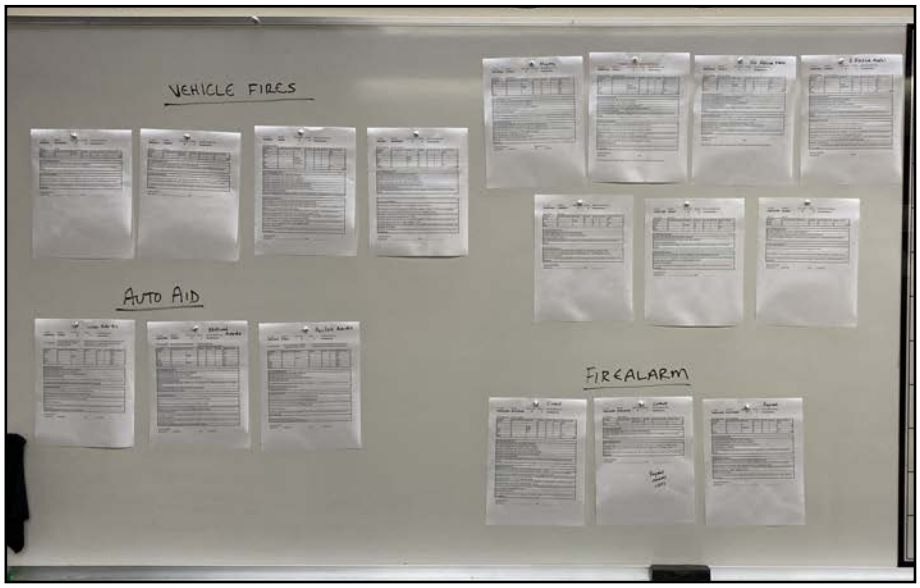


The GRFD categorizes fire risk in each geographical planning zone (GPZ) using the GRFD Fire Risk Matrix (see pg. 92). Each of the 282 zones is classified as either low, moderate, high, or maximum risk. The matrix identifies and assesses the economic, social, and environmental impacts to an individual occupancy in the event of a fire. Areas of similar building types are classified together to form the geographical planning zones. Maximum risk buildings are identified for each first due district in Section D - Current Deployment and Performance.

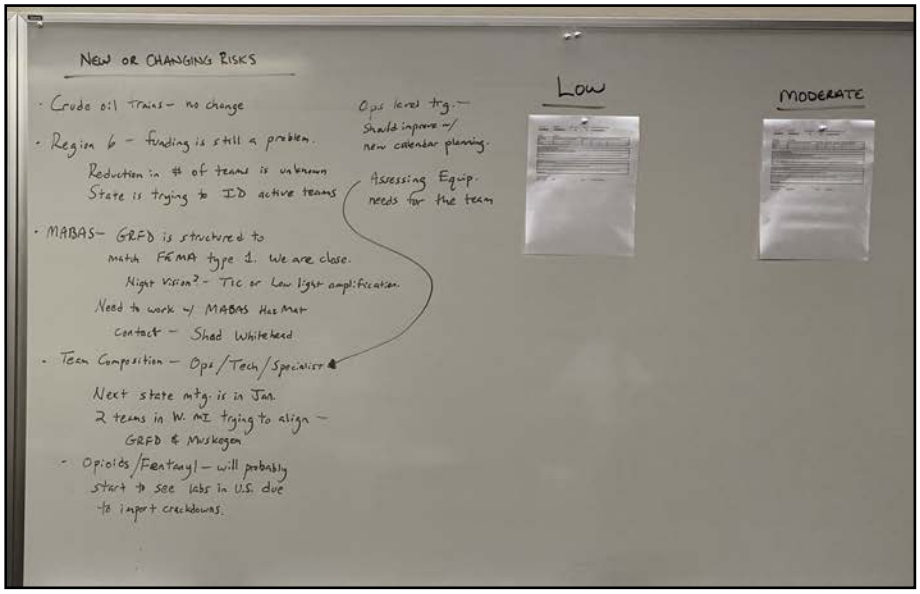
Risk Assessment and Critical Task Analysis Process

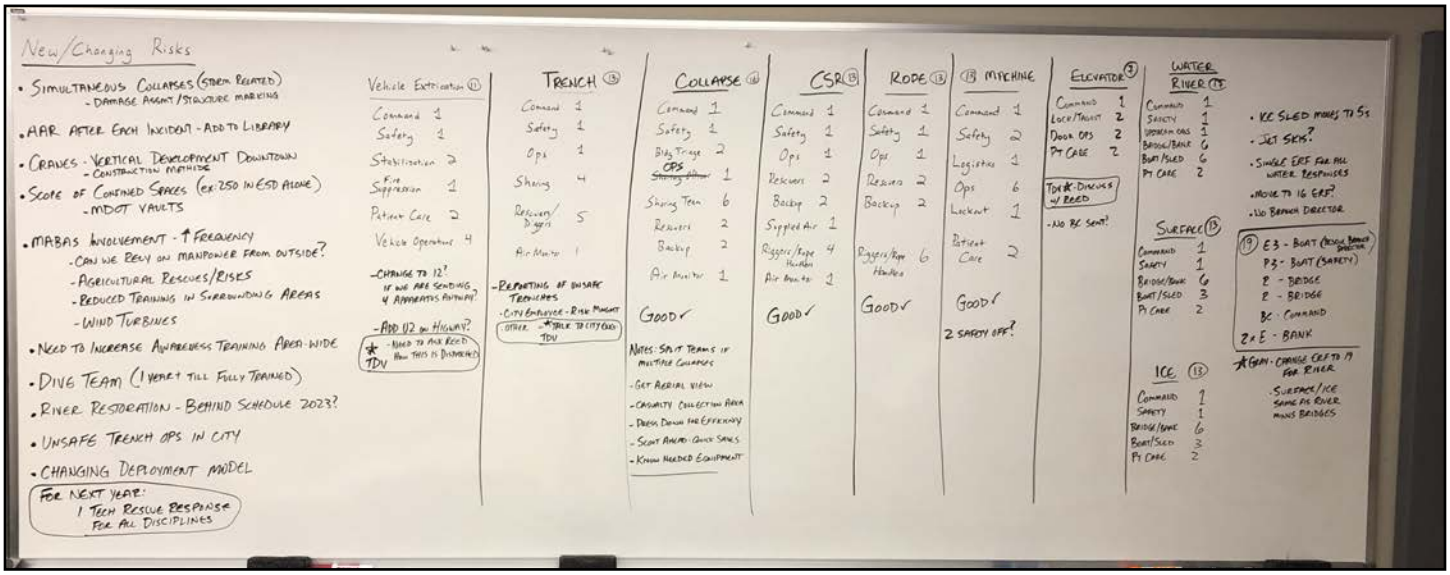
The department utilizes its annual risk assessment and critical tasking review meetings for the fire, EMS, hazardous materials, and technical rescue programs to determine and document categories and classes of risks throughout the city.

These meetings are also used to assess whether the current effective response force (ERF) can perform the critical tasking necessary to mitigate the hazards associated with each hazard and risk level. The department uses after action reviews for structure fires, technical rescues, and hazardous material incidents to evaluate the effectiveness of first due and initial assignments in achieving incident goals. The EMS program evaluates hands on training activities for critical tasking, and monitors metrics such as return of spontaneous circulation (ROSC) to assess the effectiveness of initial assignments for cardiac arrest incidents. Changes to critical tasking and ERF's are documented in annual updates to the standards of coverage. Dispatch recommendations are modified to reflect the ERF's identified during the critical tasking reviews.



Photographs from risk assessment and critical tasking meetings



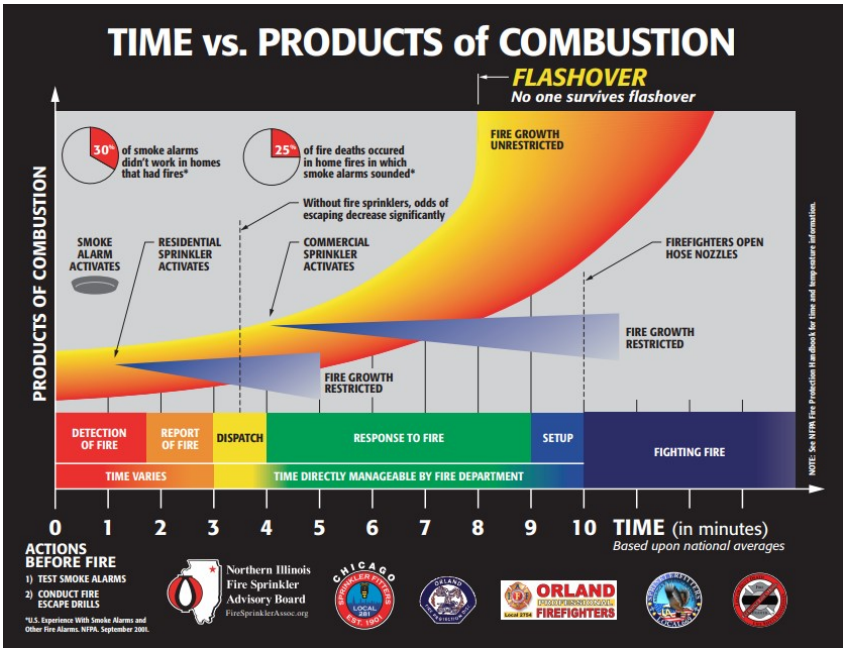


High Risk
High Probability
High Consequence

Manmade Hazards:
Structure Fires

Fire suppression is one of the most visible response services that the GRFD provides, and at the very core of our existence. As evidenced by the flashover curve and exacerbated by modern furnishings and construction methods, fires are an extremely time sensitive emergency. Fires accounted for 2.66% of incidents and 16.42% of deployed hours over the last five years.

The GRFD has classified the risk of fires into four main categories: low, moderate, high and maximum. These rankings are applied to individual occupancies and to areas of like type buildings. These classifications are incorporated into the geographical planning zone system that allows for a granular level view of the fire risk within Grand Rapids.



GRFD Fire Risk Matrix

Moderate Risk Fire

Economic– Modest damage, brief service interruption

Social- Limited number of people affected (11-50)

Environmental– Some impact with short term effects

Examples- Single family residences, small apartments, offices, retail, schools, smaller churches

High Risk Fire

Economic– Serious damage, some services unavailable

Social– Significant number of people affected (51-100)

Environmental -Serious impact with mid to long term effects

Examples– Large churches, large industrial buildings, high rise apartments/offices, large retail

Low Risk Fire

Economic– Minimal damage, possible service delay

Social—Low number of people affected (0-10)

Environmental– Minor impact with no lasting effects

Examples– Car fires, grass/brush fires, dumpster fires, storage building/shed fires, trash fires

Maximum Risk Fire

Economic-Extensive damage, major services disabled

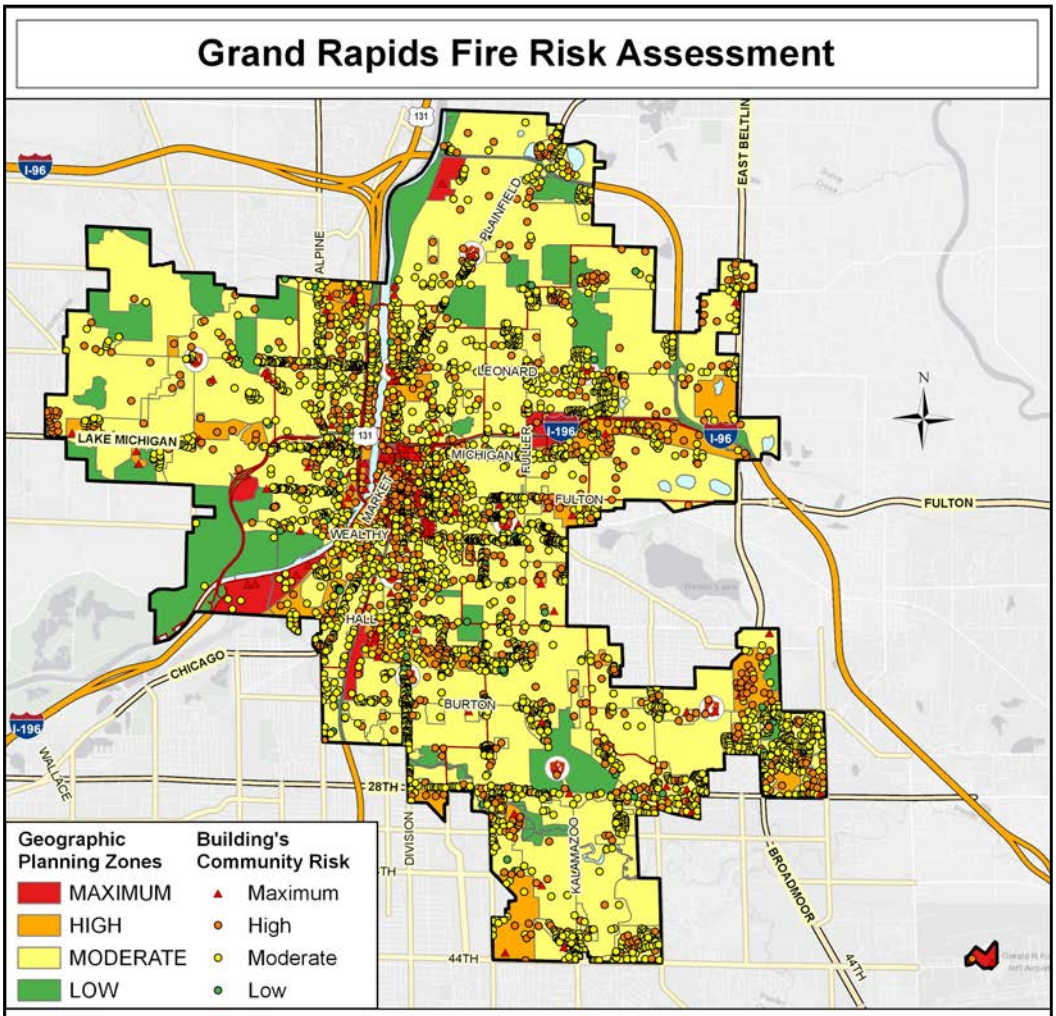
Social– Very large number of people affected (>100)

Environmental– Severe long term or permanent damage

Examples– Water treatment plant, chemical manufacturing, large health care facilities, city buildings, historic sites

The GRFD approaches the risk assessment for fires with a large scale team approach that utilizes clearly defined parameters and participation from every fire suppression crew in the city. Risk assessments are performed on every commercial building in the city. Crews identify buildings with working sprinkler systems, verify any high risk buildings with a premise warning in dispatch and assess any building located in a high or maximum risk fire management zone. Initial risk assessments were completed with an in-house GIS tool. Crews now utilize iPads with a cloud based RMS application to gather the following information:

- Building Address/Name
- Number of Floors Above Grade
- Number of Floors Below Grade
- Length of Building
- Width of Building
- Risk Based Upon Officer Evaluation when Compared to the Fire Risk Matrix
- Exposures
- Use of the Building
- Sprinklered Status
- NFPA Construction Class
- Notes by Fire Officer
- Special Building Features
- Special Building Hazards



Buildings per Community Risk Type

District	Low	% of City Low	Moderate	% of City Moderate	High	% of City High	Maximum	% of City Maximum	Total	% of City
1	4	5.00%	372	10.68%	133	13.34%	6	3.80%	515	10.92%
2	7	8.75%	305	8.76%	62	6.22%	10	6.33%	384	8.14%
3	8	10.00%	324	9.30%	93	9.33%	27	19.09%	452	9.58%
4	16	20.00%	483	13.87%	130	13.04%	10	6.33%	639	13.54%
5	7	6.25%	432	12.40%	80	8.02%	17	10.76%	536	11.36%
6	4	5.00%	368	10.57%	99	9.93%	11	6.96%	482	10.22%
7	5	6.25%	244	7.01%	154	15.45%	35	22.15%	438	9.28%
8	3	3.75%	130	3.73%	55	5.52%	13	8.23%	201	4.26%
9	2	2.50%	146	4.19%	47	4.71%	4	2.53%	199	4.22%
10	16	20.00%	293	8.41%	72	7.22%	16	10.13%	397	8.41%
11	8	10.00%	386	11.08%	72	7.22%	9	5.70%	475	10.07%
Total	80		3,483		997		158		4,718	

Critical Tasking and Effective Response Forces

General Description - The GRFD approaches response to fires in a tiered fashion. Below is the description of what a low, moderate, high, or maximum response is, with corresponding critical tasking in the Effective Response Force for Fires table.

Low – This type of fire is a low risk/value incident such as a dumpster, car, or brush fire. It requires a single unit with pumping capability to effectively respond and mitigate. A rescue, an engine, or a ladder/ platform with three personnel may respond.

Moderate – This is a residential or small commercial structure fire and calls for six apparatus (typically four engines, one rescue, and one ladder or platform) and a battalion chief, for a total of 19 personnel.

High – Large structures including high rise fires, expansive industrial occupancies or other buildings requiring additional personnel to accomplish multiple simultaneous tasks. This type of response calls for an additional rescue and ladder or platform company over a normal moderate response, for a total of eight apparatus (typically four engines, two rescues, and two ladders or platforms) and two battalion chiefs, for a total of 26 personnel.

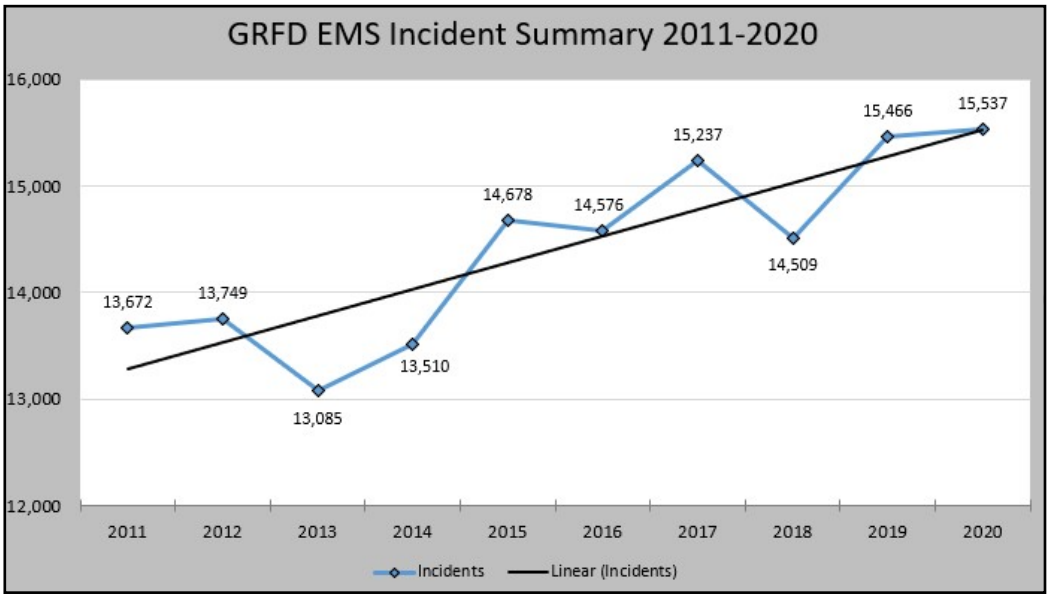
Maximum – Occupancies such as the Van Andel arena, a hazardous materials manufacturing facility, hospitals, or other structures such as city hall bring the maximum established initial response consisting of 35 personnel on six engines, two rescues, three ladders or platforms, and two battalion chiefs.

Effective Response Force for Fires				
Task	**Maximum**	**High**	**Moderate**	**Low**
Command	1	1	1	1
Safety Officer	1	1	1	1*
Fire Attack/Pump Operator			3	1
Water Supply/Backup Line			3	1
RIC or Search and Rescue			2	
Rapid Intervention Crew (RIC)	3	3	3	
Forcible Entry/Search & Rescue	12	6	3	
Ventilation	3	3	3	
Water Supply	3	3		
Lobby Control/Operations Chief	1	1		
Forward Ascent Suppression Team	5	5		
Operations Support	3	3		
Treatment Triage Transport	3			
ERF Personnel Totals	**35**	**26**	**19**	**3**

* For low risk incidents, the command and safety tasks may be combined in one position.

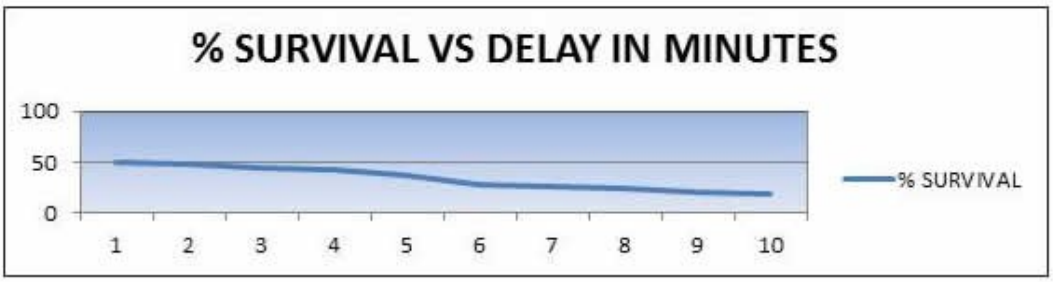
Moderate Risk
High Probability
Low Consequence

Manmade Hazards:
Emergency Medical Services



Emergency medical incidents comprise 64.20% of the call volume and 56.61% of the deployed hours for emergency incidents in the Grand Rapids Fire Department over the last five years. Over 15,000 calls for assistance are responded to for medical emergencies annually. The GRFD arrives first on scene approximately 80% of the time and initiates command, provides basic life support, stabilizes the patient and assists the private advanced life support agencies once on scene.

Time is a critical element when responding to true medical emergencies, with the chance of survival for a cardiac arrest dropping precipitously with every passing minute. To combat this time sensitive element, the GRFD has conducted numerous CPR classes for city employees and community groups and coordinated a citywide automatic external defibrillation project to get AED's in all city buildings. The Kent County Emergency Medical Services Authority created the ECHO protocol, requiring the closest resources to respond to life threatening emergencies, regardless of jurisdictional boundaries.

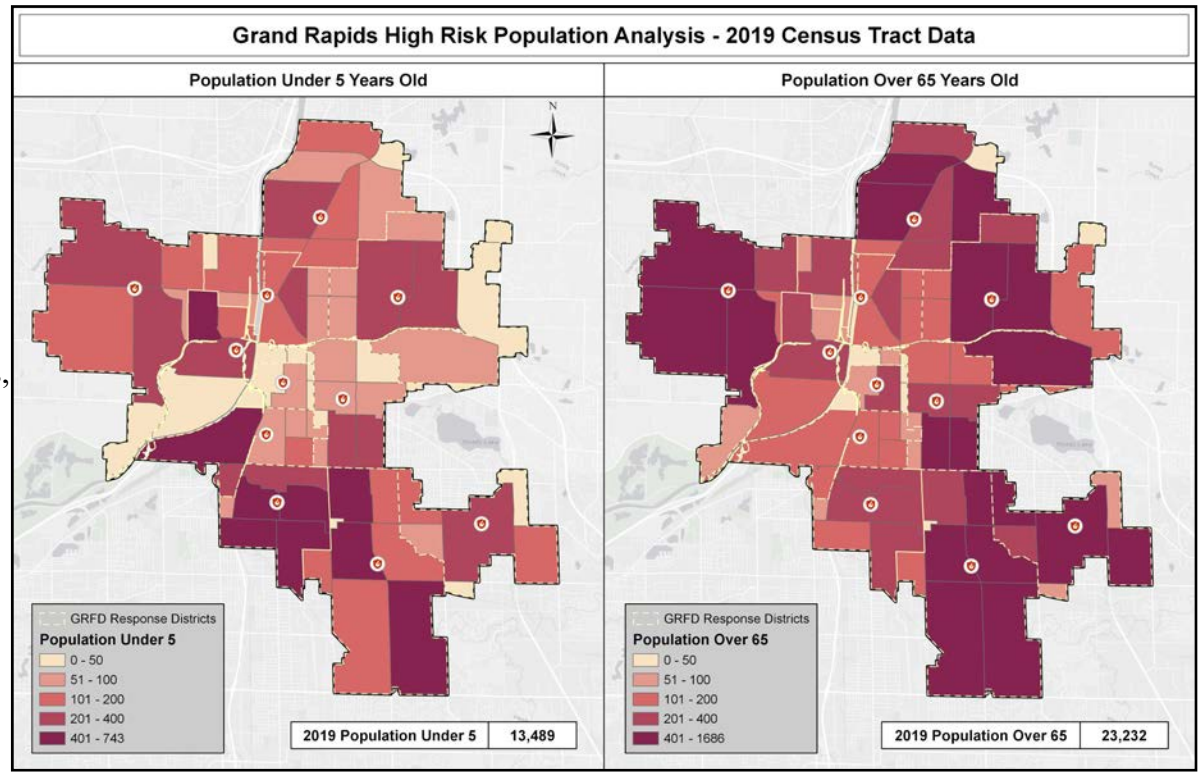


DETECTION OF COLLAPSE	REPORT OF ALARM 911 OR DIRECT	EMS/FIRE RESPONSE TIME			
		DISPATCH UNITS	TURN OUT	RESPONSE TIME	SET UP
TIME VARIES	TIME DIRECTLY MANAGEABLE				

The potential survival rate for cardiac arrests, which is one of the most serious medical emergencies an individual can experience, is only at 50% by the time a fire apparatus leaves the station, making prevention efforts a crucial piece of achieving positive patient outcomes.

When evaluating the steady rise in emergency medical calls over the last few decades, it is readily apparent that the workload demand of these calls will continue to rise. The GRFD is actively working with community partners to reduce or eliminate many of the lower risk/severity calls for help by channeling the patient into a more appropriate method of care.

At risk populations were analyzed, focusing specifically on the age groups of under 5 years of age and over 65 years of age, with data gathered from the 2019 US Census Bureau 5-year estimates.



Infants and young children are susceptible to many types of injuries that warrant special attention. Individuals in this age range are susceptible to falls, drowning, traumatic brain injuries or other types of emergency medical issues. Motor vehicle crashes are the leading cause of death, which is why the GRFD partners with local agencies to facilitate safe car seat installation clinics at the Kalamazoo Ave. fire station. The largest concentrations of infants and children reside in the Division (10), Kalamazoo (4), Plainfield (9), Franklin (2), Chester (11), Bridge (3), Monroe (5), and Covell (8) station districts.

District	1	2	3	4	5	6	7	8	9	10	11	City Wide
Under 5	1,079	1,203	925	2,138	1,142	747	135	1,103	1,225	2,628	1,164	13,489
Over 65	2,897	825	1,021	4,239	1,063	2,436	363	4,153	2,934	1,336	1,965	23,232

Falls continue to be the most common cause of injury related death for older adults. Preventive efforts for this risk include public safety presentations at many of the elderly housing venues within the city. The highest concentrations of elderly adults are located in the Kalamazoo (4), Covell (8), Plainfield (9), Leonard (1), and Burton (6) station districts.

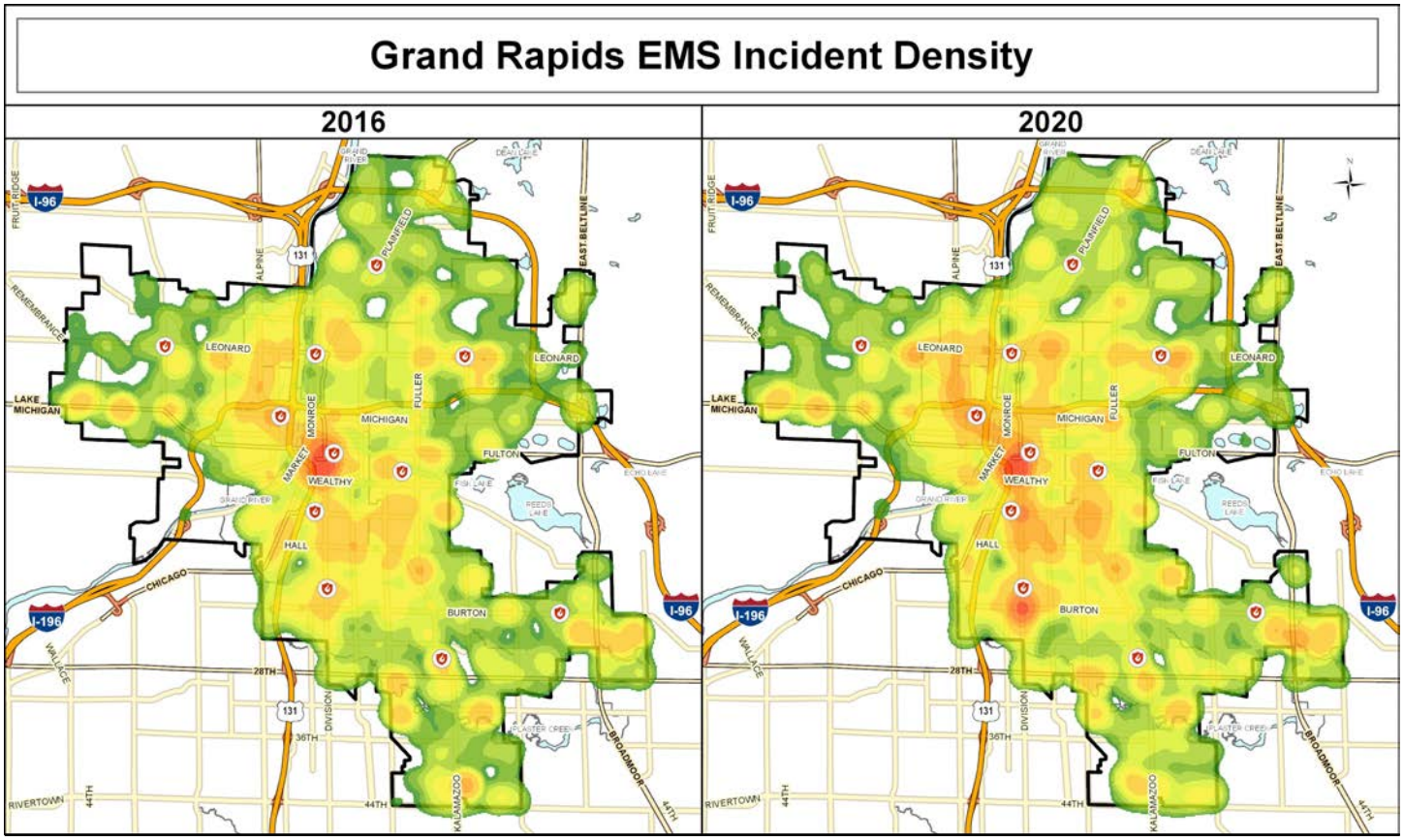
To further breakdown the EMS risk in the community, the GRFD evaluated emergency medical incidents from 2020 using chief complaint data from dispatch. The data was extrapolated down to the district level and highlighted some interesting trends. In the table on the following page, the top five chief complaints for the city are highlighted in yellow and are: breathing problems (19.44%), altered mental status (9.73%), falls (9.39%), unknown problem/person down (9.28%), and chest pain (6.82%).

The top five call types for each district are highlighted in grey, with some trends outside of the overall top complaints. Districts 1, 2, and 7 have a higher concentration of seizure complaints, while district 8 had a higher concentration of motor vehicle crashes compared to overall district call volume. Of special note is cardiac arrest events, with district 4 sustaining 21 during 2020, district 1 experiencing 17, district 11 having 16, district 8 with 14, district 2 seeing 13, and district 3 at 10. This type of information allows for a greater focus on prevention efforts within each respective station district and ensures that the proper resources are sent to these emergencies.

Chief Complaint by District for 2020														
Incident Complaint Reported By Dispatch	District 1	District 2	District 3	District 4	District 5	District 6	District 7	District 8	District 9	District 10	District 11	Mutual Aid	Citywide Total	Citywide %
Abdominal Pain/Problems	13	13	15	19	14	16	22	14	5	31	20	1	183	1.27%
ACHR - Accident Hit & Run	2	3	2	2	1	1	1	0	2	9	2	0	25	0.17%
ACIN - Accidental Injury	4	7	9	4	5	12	3	1	2	7	4	0	58	0.40%
Alcohol Detox/Withdrawal	2	2	7	6	7	2	9	0	6	2	8	0	51	0.35%
Alcohol intoxication	8	30	69	12	27	1	56	1	6	82	21	0	313	2.17%
Allergic Reaction/Stings	11	6	4	8	5	3	9	4	2	5	10	0	67	0.46%
Altered Mental Status (AMS) / (DLOC)	137	106	132	164	118	142	145	120	81	106	151	1	1,403	9.73%
Animal Bite	1	1	2	3	0	0	0	0	0	1	0	0	8	0.06%
Anxiety Attack	0	4	5	5	3	4	3	1	1	8	2	0	36	0.25%
Assault - Sexual	0	0	1	0	0	0	0	0	0	0	1	0	2	0.01%
Assault (Threat of attack)	4	26	14	5	25	2	13	2	0	30	12	0	133	0.92%
Assault with a Deadly Weapon	1	8	10	0	10	1	6	0	2	4	3	0	45	0.31%
Back Pain (Non-Traumatic)	7	5	9	7	5	4	9	5	3	11	4	0	69	0.48%
Battery (actual attack)	2	2	4	7	2	0	17	0	0	18	9	0	61	0.42%
Bleeding	8	10	11	19	7	11	12	10	12	18	14	0	132	0.92%
Breathing Problem	276	255	210	323	286	153	320	222	142	352	262	3	2,804	19.44%
Burns/Explosion	0	1	3	2	4	0	1	0	0	1	6	0	18	0.12%
Carbon Monoxide	1	0	3	0	0	2	1	0	2	2	0	0	11	0.08%
Cardiac Arrest - Possible DOA	1	1	3	2	6	0	5	2	6	0	2	0	28	0.19%
Cardiac Arrest / Death	17	13	10	21	8	6	5	14	7	5	16	0	122	0.85%
Cardiac dysrhythmia	9	1	3	6	0	13	3	5	3	1	2	0	46	0.32%
CHAB - Child Abuse	1	0	0	0	0	0	0	0	0	0	0	0	1	0.01%
Chest Pain (Non-Traumatic)	92	86	99	92	91	59	161	77	39	90	96	1	983	6.82%
Choking	6	6	6	5	6	6	5	9	6	7	8	0	70	0.49%
Chronic Illness / Medical Condition	1	4	1	2	0	0	1	0	0	2	2	0	13	0.09%
Convulsions / Seizure	45	75	84	59	42	19	133	24	20	77	54	0	632	4.38%
Dehydration	0	1	1	0	0	0	1	0	1	3	0	0	7	0.05%
Diabetic Problem	21	18	12	26	8	8	15	9	14	14	22	0	167	1.16%
Diarrhea	0	0	0	0	1	0	0	0	0	0	1	0	2	0.01%
Dizziness	9	4	5	8	4	10	9	5	2	6	7	0	69	0.48%
Drowning / Diving / SCUBA Accident	0	0	2	0	0	0	0	0	0	0	0	0	2	0.01%
Epistaxis (Nosebleed)	3	4	2	5	5	2	1	13	1	1	10	0	47	0.33%
Excessive Heat	0	0	0	0	0	0	0	0	0	0	1	0	1	0.01%
Extrication / Entrapped	2	0	1	3	2	1	0	0	1	1	1	0	12	0.08%
Eye Problem/Injury	1	0	2	2	1	0	1	0	0	0	0	0	7	0.05%
Falls	146	71	112	176	89	152	129	187	94	113	85	1	1,355	9.39%
Fever	3	2	4	3	4	2	3	3	4	2	5	0	35	0.24%
Fire	0	3	1	1	0	0	0	0	2	2	0	0	9	0.06%
Fracture	0	0	0	2	0	1	0	0	0	3	0	0	6	0.04%
GI Bleed	7	2	5	10	1	6	3	12	2	0	1	0	49	0.34%
Gunshot	0	10	5	7	3	0	1	0	1	9	10	0	46	0.32%
Hanging	0	0	0	0	0	1	0	0	0	1	0	0	2	0.01%
Hazardous Condition	0	0	0	0	1	1	1	0	0	0	1	0	4	0.03%
Head Injury	6	8	2	4	3	2	6	0	0	2	3	0	36	0.25%
Headache	1	3	4	6	4	6	6	4	1	9	14	0	58	0.40%
Heart Problems/AICD	9	4	9	12	4	6	7	7	3	8	2	0	71	0.49%
Heat/Cold Exposure	1	3	1	4	2	0	7	0	1	6	2	0	27	0.19%
Hemorrhage/Laceration	5	5	16	7	11	3	5	6	1	10	8	0	77	0.53%
Hypotension / hypertension	2	2	3	4	0	3	3	6	2	2	2	0	29	0.20%
Industrial Accident	0	0	1	1	0	0	0	0	0	1	0	0	3	0.02%
Invalid Assist/Lifting Assist	29	8	38	42	16	6	7	24	13	7	22	0	212	1.47%
Medical Alarm	0	3	0	1	1	3	1	2	2	1	0	0	14	0.10%
Medication Reaction (Not Allergic)	0	1	3	1	2	0	1	0	2	0	1	0	11	0.08%
Motor Vehicle Crash	41	62	73	70	34	15	52	38	16	73	57	1	532	3.69%
Motorcycle Collision	4	7	3	6	2	1	3	1	2	9	8	0	46	0.32%
Mutual Aid-Medical	0	0	0	1	0	0	0	0	0	0	0	0	1	0.01%
Nausea/Vomiting	15	7	17	18	21	16	14	6	8	28	7	0	157	1.09%
No Other Appropriate Choice	3	17	14	12	23	1	19	7	2	8	5	1	112	0.78%
Other	2	2	2	4	4	3	4	1	2	6	3	1	34	0.24%
Overdose/Poisoning/Ingestion	13	32	41	20	33	10	38	6	18	27	25	0	263	1.82%
Pain	10	9	12	13	10	4	15	1	3	15	11	0	103	0.71%
Pandemic/Epidemic/Outbreak	0	1	3	0	1	3	2	3	4	1	0	0	18	0.12%
Pediatric - Abdominal pain	0	0	0	0	0	0	0	0	0	0	1	0	1	0.01%
Pediatric - Cardiac Arrest	0	2	0	0	0	0	0	0	0	1	3	0	6	0.04%
Pediatric - Seizure	0	6	3	2	2	1	1	5	1	3	0	0	24	0.17%
Pediatric - Trauma	2	8	3	1	3	1	4	2	3	2	4	0	33	0.23%
Pediatric - Unresponsive	0	3	1	0	2	0	0	0	0	0	2	0	8	0.06%
Pediatric Fever	0	1	0	1	0	0	0	0	0	0	1	0	3	0.02%
Penetrating Wounds	0	0	0	0	0	0	0	0	1	0	1	0	2	0.01%
Possible DOA	0	0	3	0	2	0	1	1	0	1	1	0	9	0.06%
Pregnancy/Childbirth/Miscarriage	12	7	9	18	9	3	7	2	0	14	11	2	94	0.65%
Psychiatric Problem	15	24	27	15	33	8	27	11	14	13	26	0	213	1.48%
Public Service	1	0	3	0	0	0	0	0	0	1	0	0	5	0.03%
Respiratory Arrest	1	2	0	5	3	2	0	4	1	2	0	0	20	0.14%
Septic Shock	1	0	0	0	0	0	1	0	0	0	0	0	2	0.01%
Sick Person	3	55	31	14	19	1	14	6	11	27	23	0	204	1.41%
Stab/Penetrating Trauma	2	3	0	1	5	2	2	0	0	4	4	0	23	0.16%
Stabbing	1	7	4	5	1	1	1	0	0	14	5	0	39	0.27%
Standby	0	0	1	0	0	0	0	0	0	0	0	0	1	0.01%
Sting/Envenomation	1	0	0	0	0	0	0	0	0	0	0	0	1	0.01%
Stroke/CVA	33	18	14	31	22	18	15	36	17	13	19	0	236	1.64%
Syncope/near-fainting	10	4	9	17	2	7	4	5	1	7	7	1	74	0.51%
Traffic/Transportation Incident	37	53	21	62	60	18	24	8	29	101	41	0	454	3.15%
Traumatic Injury	3	19	9	11	14	1	13	9	3	12	9	0	103	0.71%
Unconscious/Fainting	2	7	15	6	7	9	11	4	2	11	4	0	78	0.54%
Unknown Problem/Person Down	36	197	259	82	144	20	224	32	21	223	100	0	1,338	9.28%
Unresponsive	32	29	33	41	45	25	56	22	17	47	47	1	395	2.74%
Urinary problem	1	0	1	3	1	2	0	0	2	0	1	0	11	0.08%
Walkin (EMS Related)	0	1	2	0	2	0	0	0	0	0	0	0	5	0.03%
Weakness/Lethargic	5	5	14	15	2	8	9	7	7	8	9	0	89	0.62%
Welfare Check	1	0	1	2	0	2	0	1	0	2	0	1	10	0.07%
Well Person Check	1	1	1	0	1	0	0	1	0	0	0	0	5	0.03%
Totals	1,182	1,406	1,574	1,574	1,341	852	1,708	1,008	679	1,743	1,342	15	14,424	100.00%

EMS Historical Incident Density Comparison

A major indicator of EMS risk is based upon historical data and the incident volume experienced in certain geographical locations. This comparison of annual hot spot maps shows the change between 2016 and 2020. Although many of the hottest areas have not changed, some areas in the southeast part of the city have seen change based upon the implementation of declination agreements with high demand facilities.



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EMS Incidents by District by Year						
District	**2016**	**2017**	**2018**	**2019**	**2020**	**Total**
1	1,323	1,273	1,303	1,398	1,334	6,631
2	1,166	1,212	1,204	1,399	1,456	6,437
3	1,516	1,678	1,345	1,636	1,782	7,957
4	1,907	1,820	2,006	1,923	1,780	9,436
5	1,121	1,239	1,216	1,200	1,387	6,163
6	958	999	995	969	980	4,901
7	2,366	2,492	2,098	2,041	1,759	10,756
8	1,014	1,117	1,067	1,119	1,035	5,352
9	617	719	630	691	694	3,351
10	1,164	1,288	1,238	1,558	1,784	7,032
11	1,375	1,343	1,269	1,392	1,432	6,811
Total	14,527	15,180	14,371	15,326	15,423	**74,827**

NFIRS Incidents 300-324, 371, 3111

Critical Tasking and Effective Response Forces

General Description - The GRFD approaches an emergency medical incident in a tiered fashion. Below is the description of what a low, moderate, high or maximum response is, with corresponding critical tasking in the Effective Response Force for EMS table.

Low – This type of medical incident constitutes the vast majority of responses and consists of an engine, rescue engine or aerial device responding with 3 personnel to serve as medical first responders. Duties include scene size up, incident evaluation, providing basic life support, and patient stabilization until the private advanced life support agency arrives.

Moderate – This level of medical emergency includes cardiac or respiratory arrest, imminent child birth, falls over 10 ft., obese patients requiring lifting assistance, or traumatic injuries. At least two units respond to this type of incident to accomplish the critical tasks needed in a timely manner.

High – Incidents involving 3 or more patients as the result of a shooting, vehicle accident or other type of catalyst that requires multiple units to respond. These units are accompanied by a battalion chief.

Maximum – This is a mass casualty type incident that involves multiple vehicles or patients and sends at least five units with a battalion chief. The EMS coordinator is also notified.

Effective Response Force for EMS				
Task	**Maximum**	**High**	**Moderate**	**Low**
Command	1	1	1	1
Safety	1	1*	1*	1*
Patient Information	2	1	1	1*
Patient Care	11	7	4	2
Triage	2	1		
Operations Branch Director	1	1		
Public Information Officer	1			
ERF Personnel Totals	**19**	**11**	**6**	**3**

* For low and moderate risk incidents, the command, safety, and patient information tasks may be combined in one position.

Maximum Risk **Low Probability** **High Consequence**	Manmade Hazards: Hazardous Materials

The potential release of hazardous materials exists wherever that material may be located. A higher potential for release coincides with storage sites at fixed facilities and along transportation routes, such as major roadways and rail lines. Hazardous materials are chemical substances which, if released or misused, can pose a threat to people, property, or the environment. These chemicals are used in industry, agriculture, medicine, research, and consumer goods. As many as 500,000 products pose physical or health hazards and can be defined as "hazardous chemicals." Each year, over 1,000 new synthetic chemicals are introduced. Hazardous materials come in the form of explosives, flammable and combustible substances, poisons, and radioactive materials. These substances are most often released as a result of transportation accidents or because of chemical accidents in manufacturing plants. Hazardous materials are contained and used at fixed sites and are shipped by all modes of transportation, including transmission pipelines.

In addition to the major highways and rail systems which see a wide variety of chemicals traveling via semi truck or rail car on a daily basis, Grand Rapids is home to Haviland Products Company, the area's largest chemical products company. It serves the industrial market with specialty blending, packaging, and distribution of a wide variety of chemical products, including industrial cleaners, specialty products for anodizing aluminum, electroplating, and basic chemicals for making pharmaceuticals, food, furniture, automobiles, and most other manufactured products.

Per the Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III – Emergency Planning and Community Right-To-Know, the GRFD is aware of the types and amounts of chemicals in use at fixed facilities. This information is managed by the department's hazardous materials planner and disseminated with hard copy and electronic format reports. Annually, each crew reviews the facilities containing hazardous materials within their district. The information that is received by department personnel is classified in three different ways:

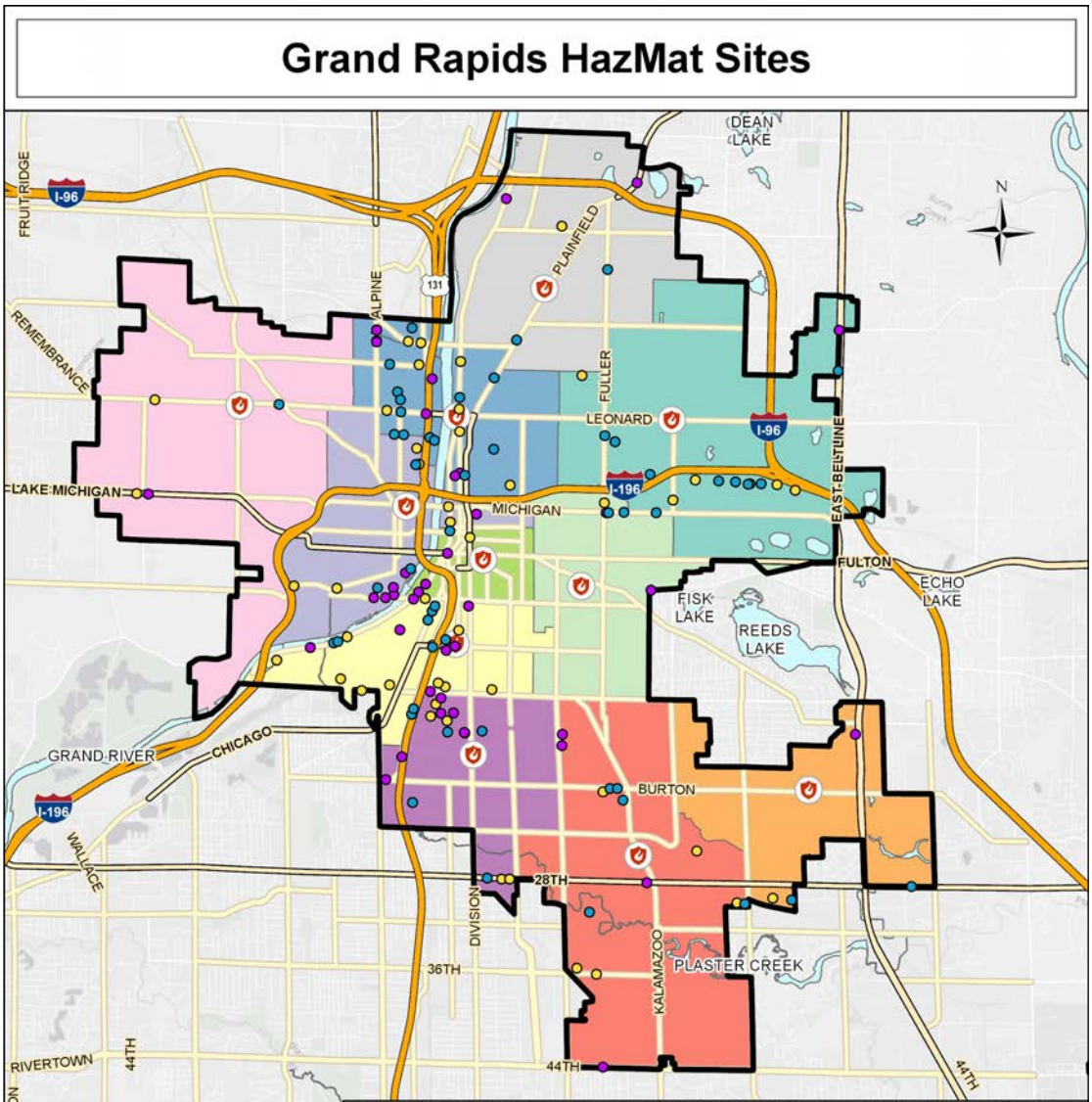
State of Michigan Fire Marshal Bulletin - 9
This requires that a facility handling hazardous chemicals must provide a list of the hazardous chemicals on site and a material safety data sheet (MSDS) for each chemical on the list. The facility must also provide the location and quantity of any hazardous chemicals specified by the fire chief after a review of the list.

SARA Title III Section 302
This requires any facility having an Extremely Hazardous Substance (EHS) exceeding its Threshold Planning Quantity (TPQ) to report to the State, which will in turn report to the Local Emergency Planning Committee (LEPC) so that an Off-Site Response Plan can be drawn up. The plan will then be distributed to the local fire department having jurisdiction.

SARA Title III Section 312 Tier II

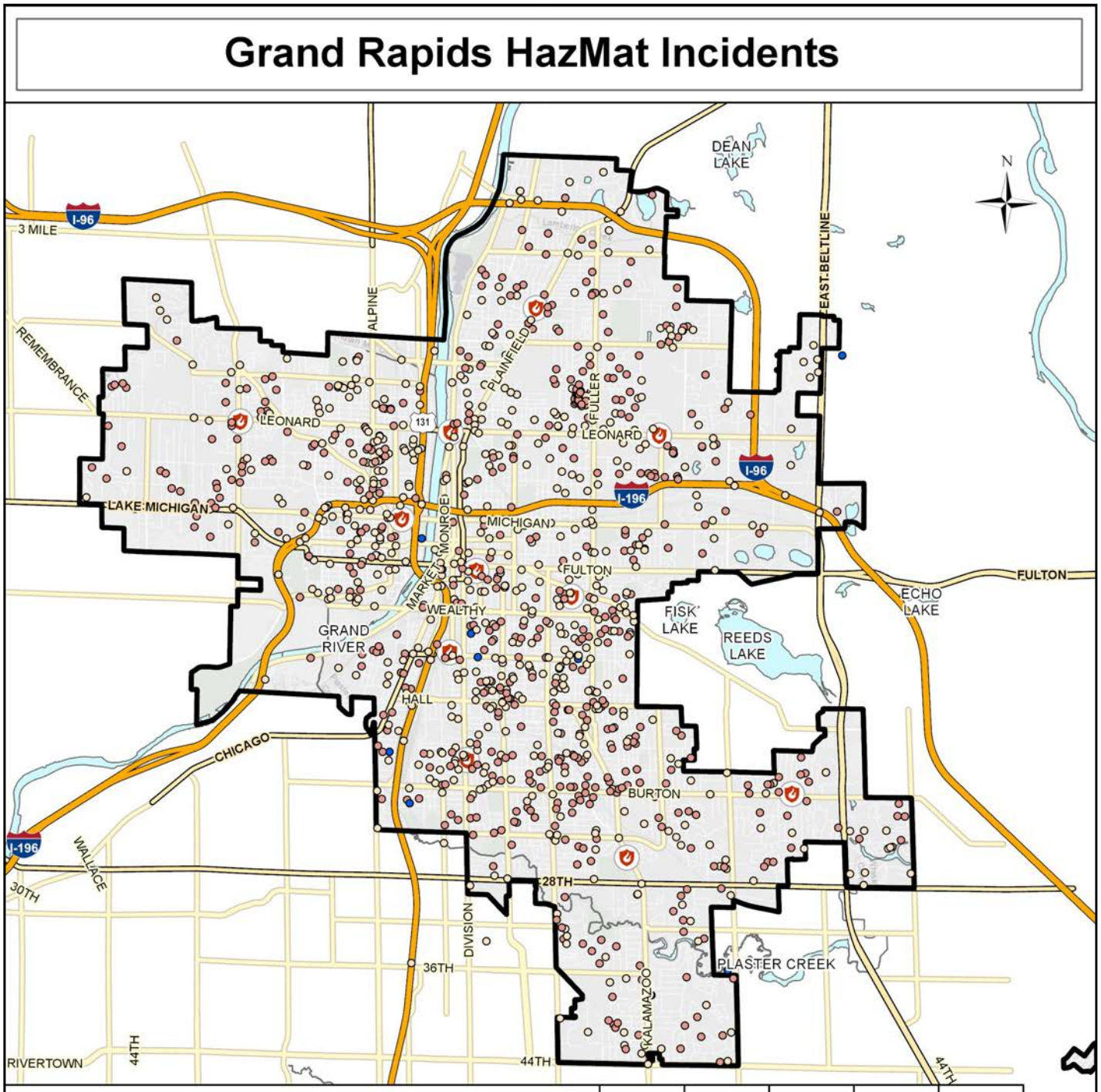
This requires a facility to provide information to the State, on chemicals stored, used, or manufactured on site. This information includes the chemical name or common name on the MSDS, an estimate of the maximum quantity on site at any given time in one year, an estimate of the daily average on site for one year, a description of the manner of storage, and the location that the product is stored.

The GRFD Hazardous materials planner keeps track of several types of reporting mechanisms within the city regarding hazardous materials, ensuring compliance with local, state and federal laws. Grand Rapids contains 46 SARA Title III-302 locations, 47 SARA Title III-312 locations and 51 State of Michigan Bulletin 9 locations. Crews have access to this information on the department's SharePoint site and annually review the associated plans and locations within their district.



District	SARA Title III Section 302	SARA Title III Section 312	Bulletin - 9	Total
1	6	3	9	18
2	8	8	9	25
3	6	6	3	15
4	5	4	5	14
5	8	8	13	29
6	1	1	2	4
7	2	4	1	7
8	2	1	1	4
9	1	2	2	5
10	6	8	4	18
11	1	2	2	5
Total	46	47	51	144

The majority of hazardous materials type incidents that the GRFD responds to are gasoline/diesel leaks, or carbon monoxide responses and are investigatory in nature. These types of incidents are managed by normal suppression personnel. Several times a year, moderate, high or maximum responses are required to remediate larger fuel spills, mitigate actual chemical releases, or investigate potential weapons of mass destruction materials found within the jurisdiction.



HazMat Types	2016	2017	2018	2019	2020
410 - 413 Combustible/ Flammable spills & leaks	125	103	121	136	133
420 - 424 Chemical release/ reaction/ toxic condition	122	85	99	129	142
430 - 431 Radioactive condition	0	0	0	0	0
451 Biological hazard	2	2	3	1	3
Total	249	190	223	266	278

Critical Tasking and Effective Response Forces

General Description - The GRFD approaches a hazardous materials response in a tiered fashion. Below is the description of what a low, moderate, high or maximum response is, with corresponding critical tasking in the Effective Response Force table.

Low – Small spills of less than 32 gallons from a passenger type vehicle of common hydrocarbon materials such as gasoline, fuel oil or diesel fuel. The material can be diked or absorbed utilizing equipment normally carried on a first due engine, rescue or ladder/platform company. Small spills of antifreeze, transmission fluid, etc. at the scene of a motor vehicle accident would also fall under this category.

Moderate – Large spills over 32 gallons of common hydrocarbon materials such as gasoline, fuel oil, or diesel fuel from a large commercial vehicle. This level of response requires a first due company, a battalion chief, and GRH01 (a response vehicle with specialized hazardous materials equipment) with at least one hazmat technician.

High – Confirmed or unconfirmed chemical spill, leak or release. This level of call requires a minimum of 5 hazmat technicians to establish a total effective response force of 13 personnel. Equipment required is the first due unit, GRH01, a battalion chief, and two additional suppression units. The hazmat planner will also be notified and may respond to provide liaison and administrative assistance. Additional suppression units may be required to accomplish ancillary tasks unrelated to the primary hazardous materials issue.

Maximum – A suspected Weapons of Mass Destruction (WMD) or Chemical, Biological, Radiological, Nuclear or Explosive (CBRNE) type release requires a deployment of two hazardous materials technicians and a battalion chief to perform the initial rapid assessment. These personnel will focus on determining whether a release has occurred. Upon the determination of a WMD or CBRNE release, an effective response force for a high risk hazardous material incident will be deployed. This hazmat ERF will likely be supplemented by a normal structure fire response of 19 personnel to provide extra personnel for scene management. The hazmat planner will also be notified on this type of incident.

Effective Response Force for Hazardous Material Incidents				
Task	**Maximum**	**High**	**Moderate**	**Low**
Command/Safety	1	1	1	1
Research	2	1		
Perimeter Control		3		2
Hazard Mitigation		5	6	
Decontamination		3		
ERF Personnel Totals	**3**	**13**	**7**	**3**
Certification Requirements	Minimum 2 HazMat Technicians	Minimum 5 HazMat Technicians	Minimum 1 HazMat Technician	

Maximum Risk
Low Probability
High Consequence

Manmade Hazards:

Technical Rescue - Collapse

Grand Rapids has been experiencing significant redevelopment in the downtown region over the past decade. The city consistently ranks as one of the hottest housing markets in the nation. Thousands of apartment units have been added to the housing stock in the downtown area, with many cranes being employed to build these high rise structures. Renovations to existing buildings are another aspect of the construction boom in the downtown area. This brings with it a collapse risk during the construction phase and a continued risk due to the increased population density and resulting call volume increase.

Another risk in the community relating to collapse are vehicles traveling at a high rate of speed on the narrow city streets and losing control, crashing into structures.

The technical rescue team consists of 36 members trained to the light/medium collapse rescue level, with 18 of them trained to the heavy collapse level. The entire organization has received awareness level training.

The effective response force for this type of risk has been identified as 16 personnel with a minimum of 8 technician level responders.

Collapse rescue training at an acquired building

Collapse Rescue Incidents				
2016	2017	2018	2019	2020
0	6	1	0	3

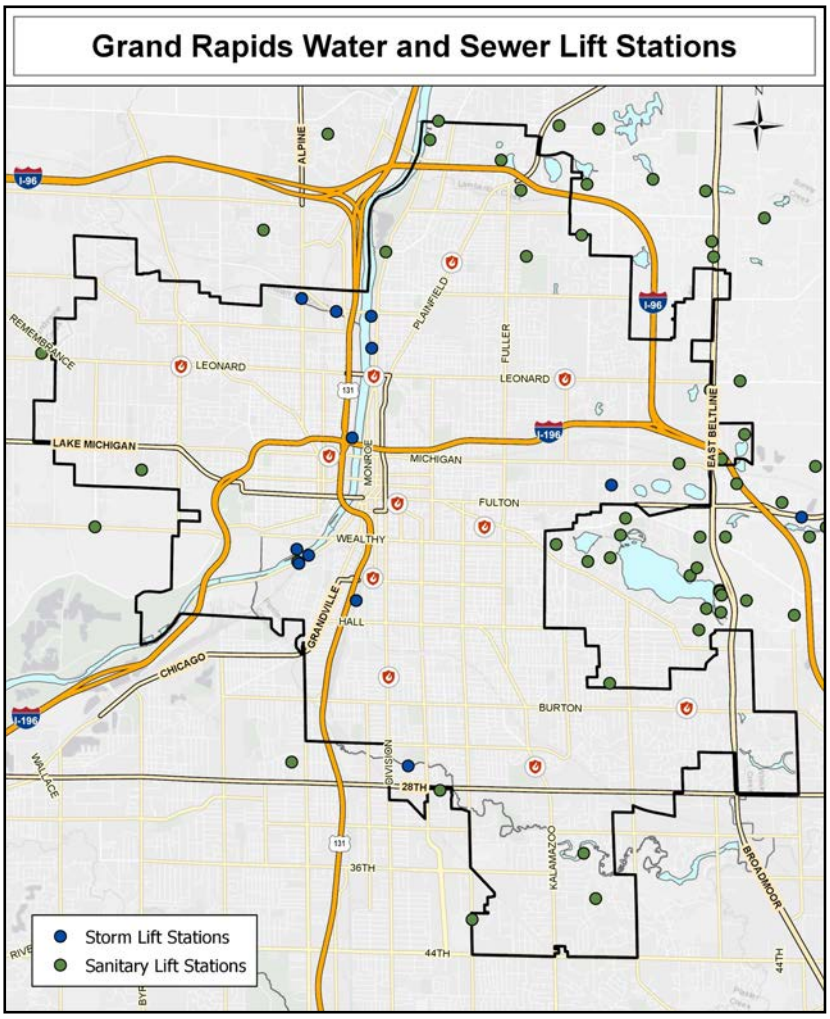
Effective Response Force for Technical Rescue- Collapse	
Task	**Special**
Command	1
Safety	1
Operations Officer	1
Building Triage	2
Shoring Team	6
Rescuers	2
Backup Rescuers	2
Air Monitoring	1
ERF Personnel Totals	**16**
***Minimum of 8 Technician Level Responders**	

Maximum Risk
Low Probability
High Consequence

Manmade Hazards:

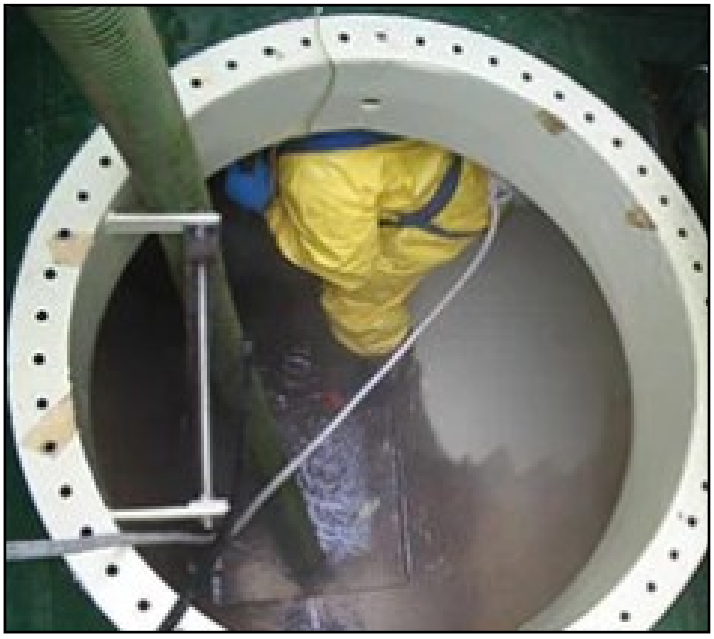
Technical Rescue - Confined Space

Thousands of confined space entries are conducted each year within the City of Grand Rapids by both city employees and private companies such as Vicinity Energy, which produces steam power used for heating and cooling over 130 businesses in the downtown area. The GRFD serves as the primary rescue team for these entries with a core team of 36 technician level responders. The GRFD often conducts interagency training scenarios and follows Standard Operating Guideline 201-44, which addresses technical rescue incident responses. Although the actual call volume is very low, the risk for this type of emergency is abundant, especially in the core of the city. The map to the right illustrates potential confined space entry points for water and sewer system employees.



Confined Space Incidents				
2016	2017	2018	2019	2020
0	0	0	0	2

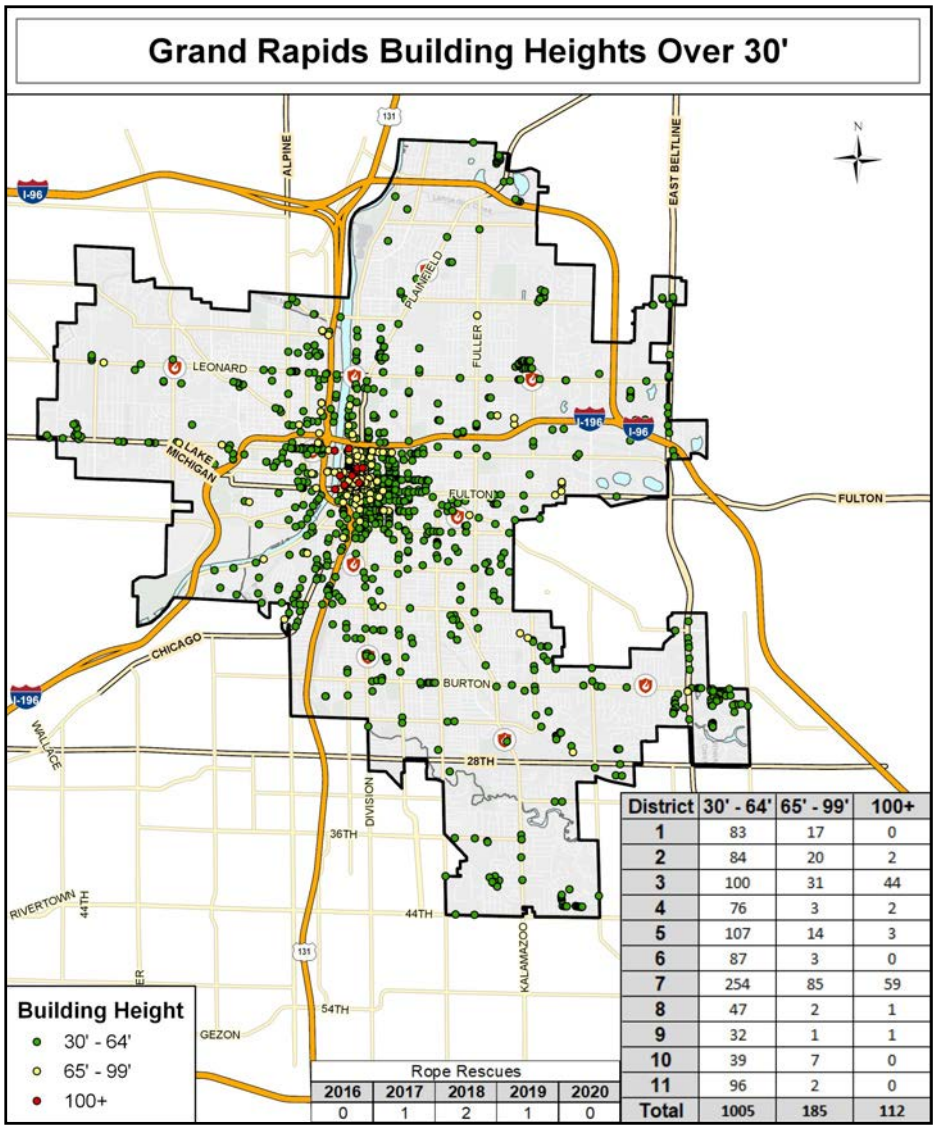
Effective Response Force for Technical Rescue- Confined Space	
Task	**Special**
Command	1
Safety	1
Operations Officer	1
Rescuers	2
Backup Rescuers	2
Supplied Air Attendant	1
Riggers/Rope Handlers	4
Air Monitoring	1
ERF Personnel Totals	**13**
***Minimum of 8 Technician Level Responders**	



Maximum Risk
Low Probability
High Consequence

Manmade Hazards:

Technical Rescue - Rope



Rope Rescues				
2016	2017	2018	2019	2020
0	1	2	1	0

District	30' - 64'	65' - 99'	100+
1	83	17	0
2	84	20	2
3	100	31	44
4	76	3	2
5	107	14	3
6	87	3	0
7	254	85	59
8	47	2	1
9	32	1	1
10	39	7	0
11	96	2	0
Total	1005	185	112

There are 36 technician level rope rescue personnel in the GRFD. This team coordinates with the confined space rescue team, with specialized training for above grade rope rescue incidents. They are supplemented by suppression personnel, who are trained to the awareness level.

Once again, as with many technical rescue disciplines, the actual occurrence of incidents is minimal, although the risk of an emergency located high above grade is a frequent occurrence, with window washers and construction personnel often working high above the ground at one of the city's 1,005 buildings over 30 feet tall, 185 buildings over 65 feet tall and 112 buildings outside the reach of aerial devices at over 100 feet tall.

Effective Response Force for Technical Rescue-High Angle Rope	
Task	**Special**
Command	1
Safety	1
Operations Officer	1
Rescuers	2
Backup Rescuers	2
Riggers/Rope Handlers	6
ERF Personnel Totals	**13**
***Minimum of 8 Technician Level Responders**	

Maximum Risk
Low Probability
High Consequence

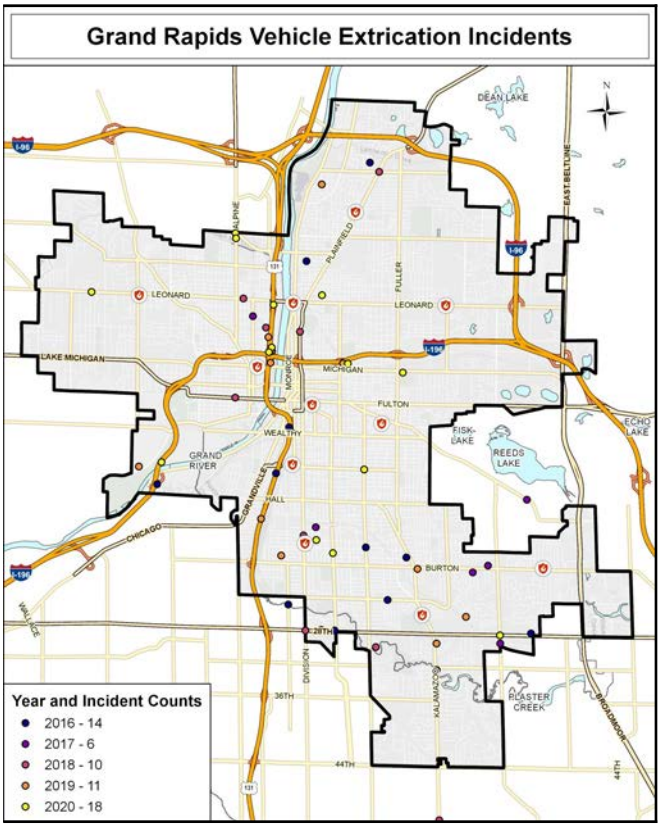
Manmade Hazards:

Technical Rescue - Vehicle Extrication
Machine Extrication

Vehicle Extrication

With several major highways and high speed travel routes throughout the city, the risk of vehicle accidents with entrapments are ever present. Three apparatus carry heavy extrication equipment, with support from other on-scene personnel. Working with local salvage yards, the personnel perform multiple scenarios annually to hone their vehicle extrication skills. The work of the effective response force is guided by Standard Operating Guideline 201-13 Vehicle Accident/Extrication and SOG 201-08 Traffic Blocking for Roadway Incidents.

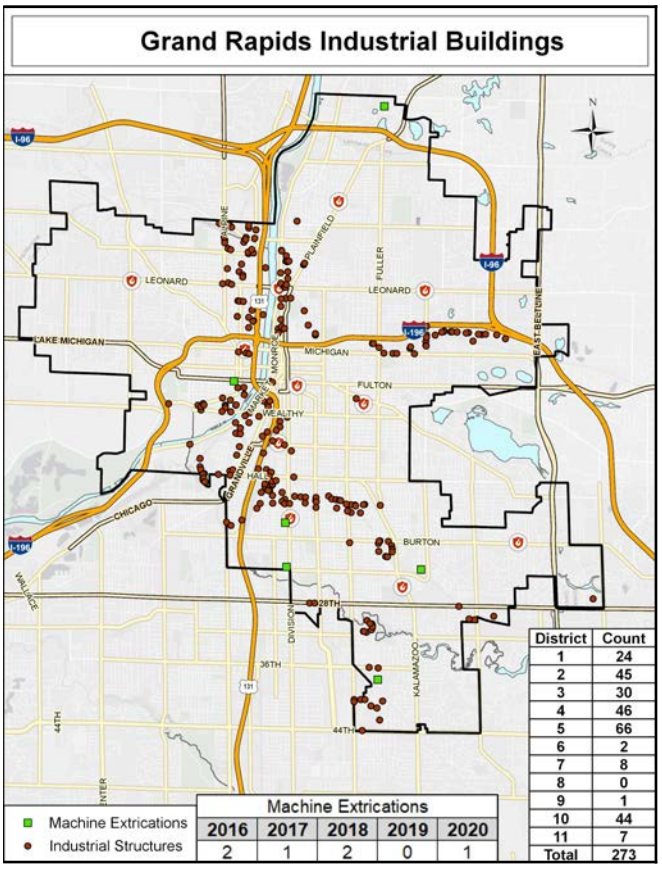
Effective Response Force for Technical Rescue- Vehicle Extrication	
Task	**Special**
Command	1
Safety	1
Stabilization	2
Suppression Standby	1
Patient Care	2
Vehicle Operations	4
ERF Personnel Totals	**11**



Machine Extrication

Several members of the department have received special industrial extrication training, with the rescue engines also serving as the primary unit for industrial accidents. Although quite rare as evidenced by the machine extrication incident counts, there are 664 industrial facilities located throughout the jurisdiction with a multitude of processes that pose a potential risk to workers and first responders.

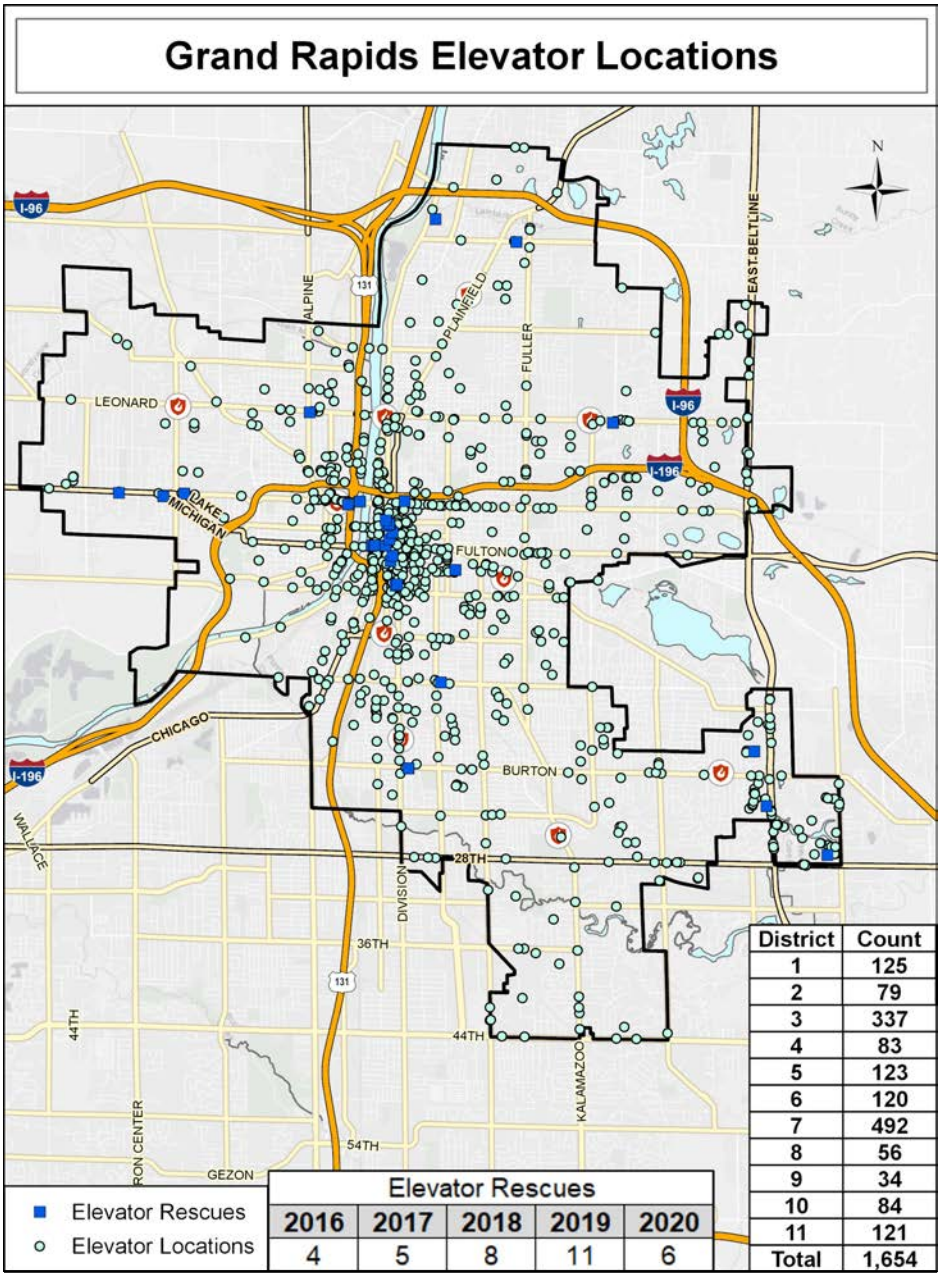
Effective Response Force for Technical Rescue- Machine Extrication	
Task	**Special**
Command	1
Safety	2
Logistics	1
Operations	6
Lockout/Tagout	1
Patient Care	2
ERF Personnel Totals	**13**



High Risk
High Probability
High Consequence

Manmade Hazards:

Technical Rescue - Elevator Incidents



Elevator Rescues					
2016	2017	2018	2019	2020
4	5	8	11	6

District	Count
1	125
2	79
3	337
4	83
5	123
6	120
7	492
8	56
9	34
10	84
11	121
Total	1,654

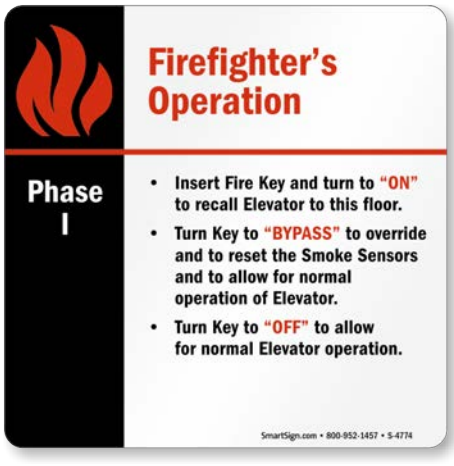
Standard Operating Guideline (SOG) 201-24 guides responses to elevator emergencies within the city of Grand Rapids.

Elevator emergencies are classified into two types: an imminent emergency, which will utilize primary rescue techniques; and a non-time sensitive emergency, which utilizes secondary rescue techniques.

If there is not a medical emergency present and no immediate threat to the occupants in the elevator/building, the dispatcher will contact the appropriate elevator company to mitigate the stuck elevator.

Given that there are 1,654 elevators in the city and the tens of thousands of trips made daily, the actual call volume is minor, constituting a handful of elevator responses each year by the GRFD. The effective response force for elevator emergencies is seven personnel.

Effective Response Force for Technical Rescue- Elevator	
Task	**Special**
Command	1
Lockout/Tagout	2
Door Operations	2
Patient Care	2
ERF Personnel Totals	7

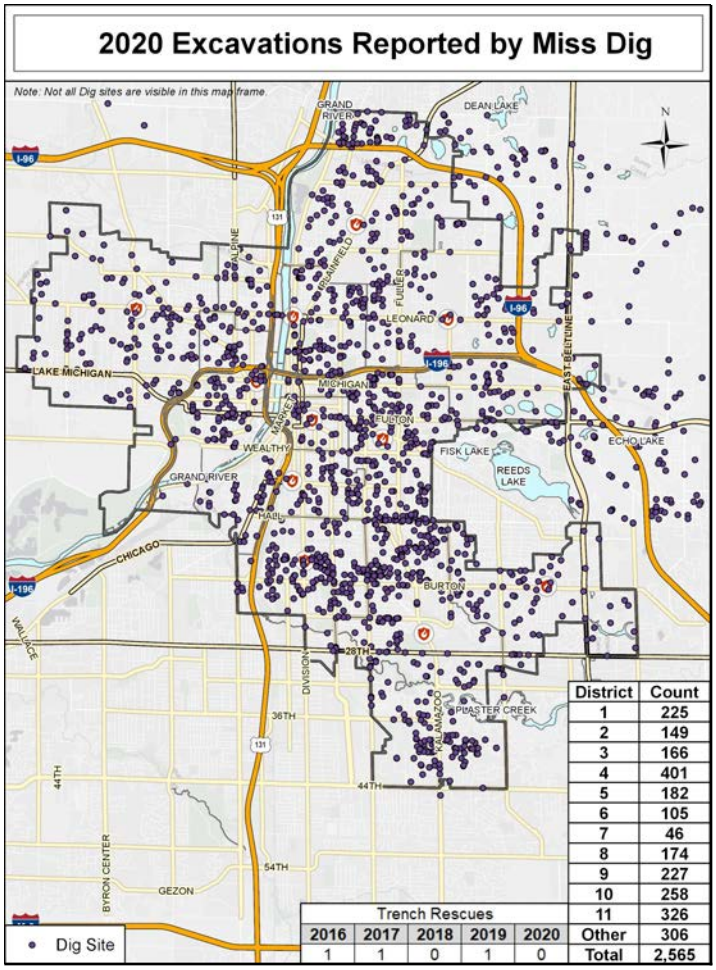


Maximum Risk
Low Probability
High Consequence

Manmade Hazards:

Technical Rescue - Trench

In 2020, the City of Grand Rapids received 16,303 requests for identification of underground utilities through Miss Dig, the state's utility notification system. City of Grand Rapids water system and traffic signal employees, as well as numerous private contractors, dig thousands of trenches each year, and with that comes the risk of a trench collapse, entrapping the workers. In 2020 there were 2,565 trenching operations in the city and surrounding region. The GRFD prepares for this by training the entire department to trench awareness level, 36 members to the operational or technician level, and two at the instructor level for extreme trenches. The effective response force for this type of risk has been identified as 13 personnel with a minimum of eight technician level responders.



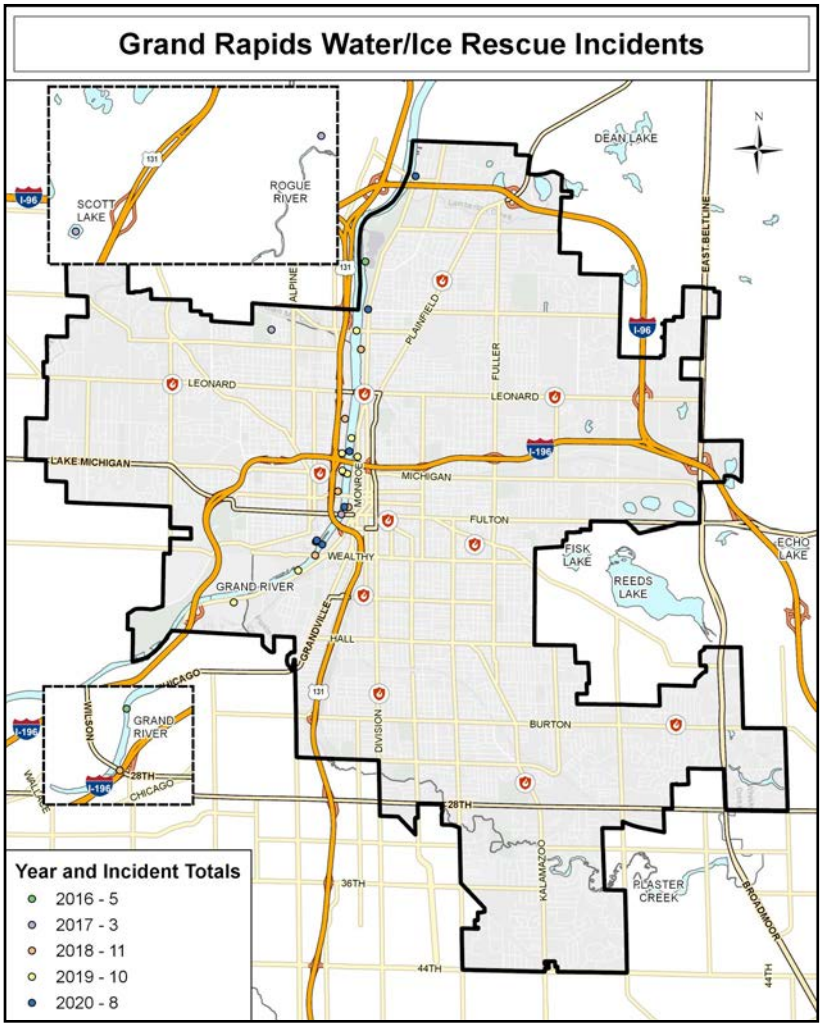
Effective Response Force for Technical Rescue- Trench	
Task	**Special**
Command	1
Safety	1
Operations Officer	1
Shoring Team	4
Rescuers/Diggers	5
Air Monitoring	1
ERF Personnel Totals	**13**
***Minimum of 8 Technician Level Responders**	

Maximum Risk
Low Probability
High Consequence

Manmade Hazards:

Technical Rescue - Swift Water, Lake and Ice

The majority of water rescue incidents are located in the Grand River, which flows through downtown and serves as one of the best fishing locations in the area. The dams located downtown produce strong currents and undertow, serving as a potential risk to those enjoying the river.



Standard Operating Guideline 201-30 covers water/ice rescue operations, SOG 201-31 relates to boat based water rescue and SOG 201-32 is focused on bridge based water rescue.

The Bridge Street fire station is the primary water rescue station, with the Monroe Avenue station serving as a backup. The entire department is trained to the awareness level for swift water rescue, and a 36 member technician team is based out of Bridge Street station. The boats are deployed approximately 30 times a year, with roughly 10 actual water rescues occurring each year.

Effective Response Force for Technical Rescue-Water

Task	Special		
	River	Lake	Ice
Command	1	1	1
Rescue Branch Director	1	1	1
Safety Officer	1	1	1
Bridge Operations	6		
Boat/Sled Operations	4	4	4
Bank Operations	6	12	12
ERF Personnel Totals	**19**	**19**	**19**

Physical Assets Protected

The GRFD analyzed a large amount of data from multiple sources to define the type, amount and risk of physical assets protected. The average age of structures in the city is 82 years old, with many fire station districts protecting structures well over one hundred years old. Over 124 million square feet of property is on record in the city assessor's office with a value of over 4.9 billion dollars. One important note is in district 7, which is the main downtown district, over 23% of the buildings do not have a taxable value on record due to their building type (exempt) or through participation in brownfield districts or other programs. This district also contains many structures of historic value that pose a special risk to the community including the oldest structure in Grand Rapids. Once a law office constructed in 1836, it is now part of the public museum system.

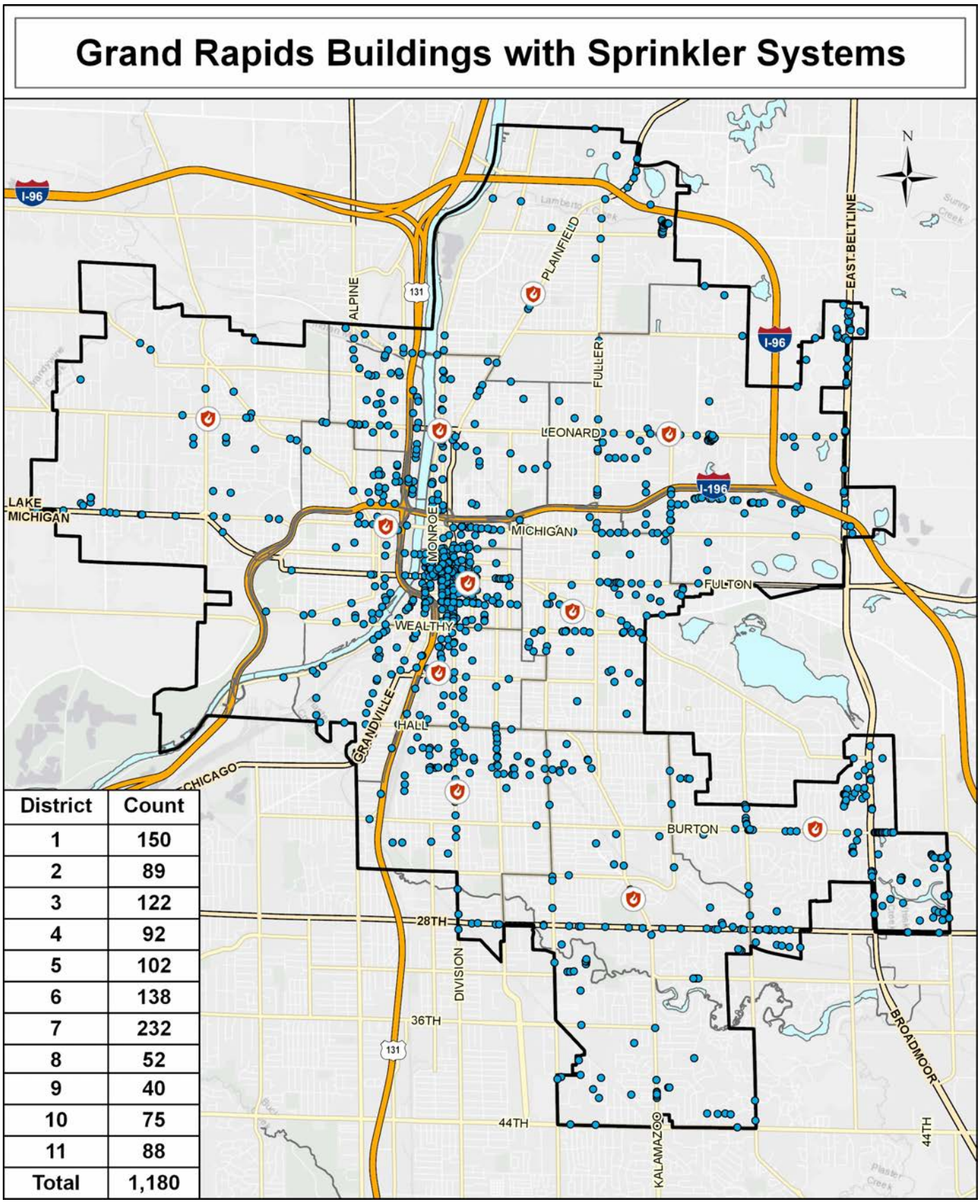
District	Average Age (Years)	Average Sq Ft	Total Sq Ft	NFF over 3500	#FLS	Taxable Value
1	56	1,932	9,971,825	153	150	$556,477,234
2	98	2,523	8,511,009	133	89	$187,765,735
3	104	2,683	14,820,301	121	122	$471,795,956
4	66	1,971	18,714,838	190	92	$689,752,527
5	103	1,955	10,775,559	244	102	$374,258,083
6	53	2,781	8,325,565	148	138	$463,567,871
7	91	6,326	9,862,595	164	232	$502,047,435
8	64	1,514	10,500,828	78	52	$501,347,445
9	74	1,361	8,742,571	46	40	$426,164,084
10	95	1,895	10,266,722	126	75	$259,575,195
11	102	1,823	13,780,945	82	88	$517,905,750
Total	**82**	**2,433**	**124,272,758**	**1,485**	**1,180**	**$4,950,657,315**

From a risk perspective, buildings were evaluated for needed fire flow (NFF). Aligning with the insurance services office (ISO) rating schedule, buildings that required over 3,500 GPM were identified and preplans conducted/updated to ensure fire crews have the most accurate data available when performing fire suppression activities. In addition to NFF, buildings that contain sprinkler systems, known as fire and life safety systems (FLS) were also identified and factored into the risk assessment.

District	Residential	Industrial	Commercial	Exempt	Total
1	4,890	24	198	50	5,162
2	2,868	45	244	216	3,373
3	4,972	30	430	91	5,523
4	8,999	42	408	48	9,497
5	4,878	66	474	94	5,512
6	2,763	2	210	19	2,994
7	937	8	435	179	1,559
8	6,831	0	91	16	6,938
9	6,289	1	125	7	6,422
10	5,019	44	306	50	5,419
11	7,060	7	443	51	7,561
Total	**55,506**	**269**	**3,364**	**821**	**59,960**

Using data from the assessor's office, structures were separated into the four main categories on record including residential, industrial, commercial and exempt (non profit, government) buildings.

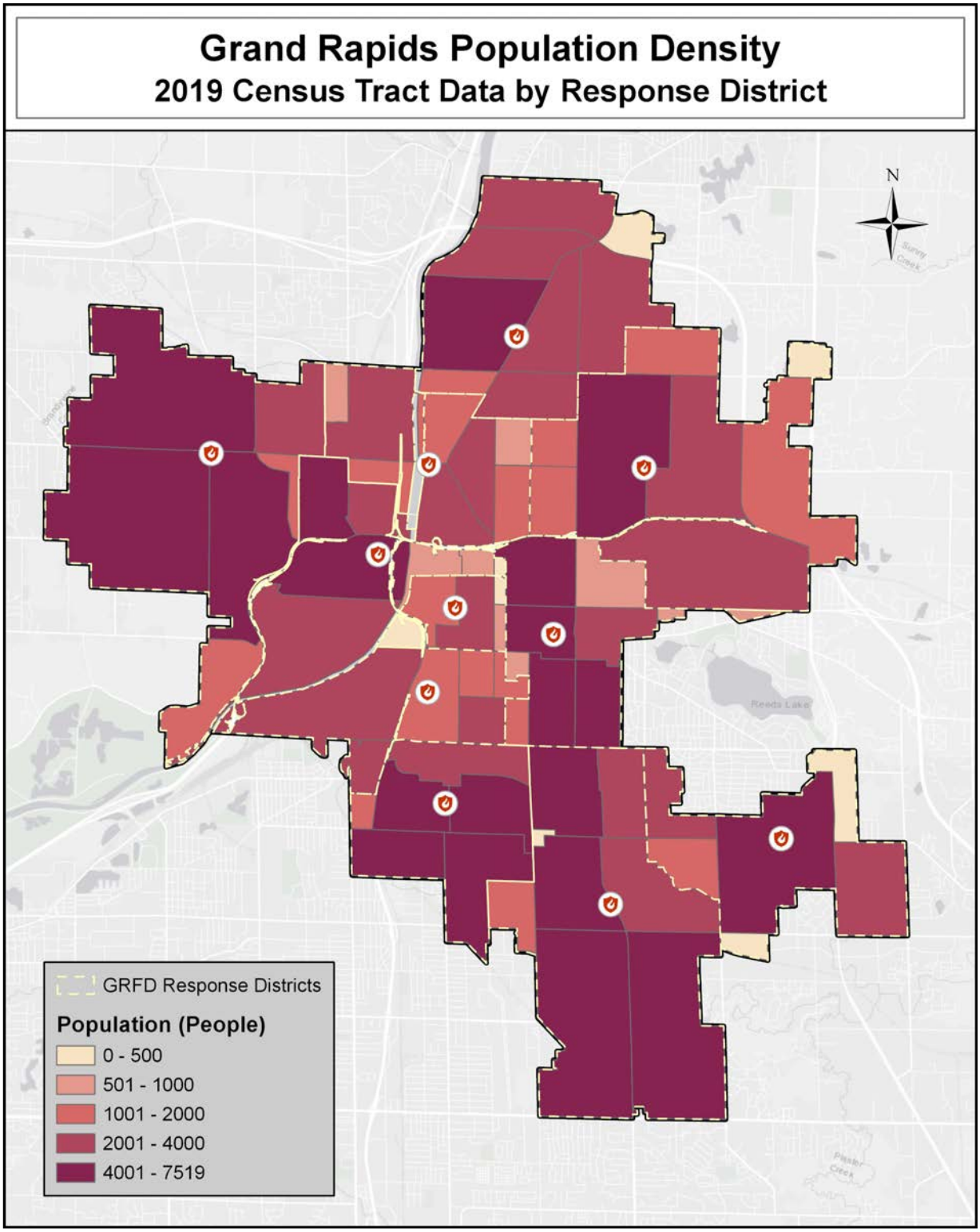
This map displays a visual representation of buildings with sprinkler systems in the city. This information is considered when categories of risk (low, moderate. high. maximum) are assigned during the risk assessment process for commercial buildings.



District	Count
1	150
2	89
3	122
4	92
5	102
6	138
7	232
8	52
9	40
10	75
11	88
Total	1,180

Development and Population Growth

In 2000, Grand Rapids had 196,831 people, dropping to 188,040 for the 2010 census. The 2020 estimate for the city has risen to 201,013 which shows significant growth compared to the pre-recession levels. The city also experiences an overall daytime surge of approximately 17% for workers entering the jurisdiction, resulting in over 235,000 people occupying Grand Rapids during the workday. The map below displays census tract data broken out at the station district level. This analysis is based on data gathered from the 2019 US Census Bureau 5-year estimates. The city is predominately urban, with small pockets of rural designations for parks and industrial areas.



Temporal Analysis 2016 - 2020 All Alarm Types								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	684	465	440	467	458	454	566	3,534
01:00-01:59	678	379	377	416	421	414	634	3,319
02:00-02:59	569	353	382	362	375	368	605	3,014
03:00-03:59	428	302	297	314	316	341	396	2,394
04:00-04:59	391	275	309	293	289	355	340	2,252
05:00-05:59	335	306	352	300	294	351	315	2,253
06:00-06:59	356	367	410	442	425	419	421	2,840
07:00-07:59	433	505	534	534	536	543	426	3,511
08:00-08:59	562	722	735	683	672	667	514	4,555
09:00-09:59	643	794	809	827	852	756	638	5,319
10:00-10:59	731	824	845	890	915	867	704	5,776
11:00-11:59	764	927	884	948	1,005	875	800	6,203
12:00-12:59	832	932	944	1,002	946	914	844	6,414
13:00-13:59	831	895	974	1,075	966	953	885	6,579
14:00-14:59	812	960	968	1,015	978	973	835	6,541
15:00-15:59	805	951	1,014	963	948	1,024	906	6,611
16:00-16:59	788	969	1,002	1,020	971	998	898	6,646
17:00-17:59	880	979	992	994	949	1,025	982	6,801
18:00-18:59	876	884	834	907	939	873	936	6,249
19:00-19:59	811	786	851	858	852	859	880	5,897
20:00-20:59	836	770	797	829	803	913	863	5,811
21:00-21:59	757	734	713	751	768	817	854	5,394
22:00-22:59	677	627	623	654	669	718	812	4,780
23:00-23:59	542	540	524	585	535	660	722	4,108
Total	16,021	16,246	16,610	17,129	16,882	17,137	16,776	116,801

Temporal Analysis 2016 - 2020 EMS Alarm Types								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	418	281	269	284	278	271	362	2,163
01:00-01:59	433	243	230	257	257	272	391	2,083
02:00-02:59	338	222	234	208	242	209	350	1,803
03:00-03:59	266	192	193	191	213	211	237	1,503
04:00-04:59	248	192	208	173	188	228	205	1,442
05:00-05:59	229	208	232	197	198	203	209	1,476
06:00-06:59	228	261	277	255	282	257	272	1,832
07:00-07:59	286	353	348	348	354	344	261	2,294
08:00-08:59	373	471	491	421	453	407	330	2,946
09:00-09:59	416	540	543	531	521	485	415	3,451
10:00-10:59	490	554	583	567	560	565	460	3,779
11:00-11:59	512	643	589	614	652	589	552	4,151
12:00-12:59	553	603	607	598	610	617	554	4,142
13:00-13:59	545	573	626	682	631	613	578	4,248
14:00-14:59	509	607	648	644	614	633	513	4,168
15:00-15:59	515	630	674	640	601	690	576	4,326
16:00-16:59	502	647	659	660	627	653	576	4,324
17:00-17:59	562	593	673	637	611	654	602	4,332
18:00-18:59	556	569	522	582	587	533	584	3,933
19:00-19:59	538	501	530	525	551	560	547	3,752
20:00-20:59	509	516	534	547	524	586	558	3,774
21:00-21:59	455	475	476	466	512	538	530	3,452
22:00-22:59	424	411	372	386	422	462	533	3,010
23:00-23:59	340	346	339	345	345	409	461	2,585
Total	10,245	10,631	10,857	10,758	10,833	10,989	10,656	74,969

Temporal Analysis 2016 - 2020 Fire Alarm Types								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	20	16	17	12	15	14	11	105
01:00-01:59	16	8	13	9	10	16	13	85
02:00-02:59	14	9	8	9	15	11	15	81
03:00-03:59	16	10	8	9	6	10	9	68
04:00-04:59	14	6	10	10	9	9	17	75
05:00-05:59	12	7	5	8	1	7	3	43
06:00-06:59	12	9	9	13	9	11	14	77
07:00-07:59	14	8	13	13	5	7	9	69
08:00-08:59	12	12	9	11	9	10	7	70
09:00-09:59	21	16	13	18	8	14	15	105
10:00-10:59	14	21	9	21	18	10	19	112
11:00-11:59	15	18	13	24	13	24	26	133
12:00-12:59	23	20	25	20	12	18	20	138
13:00-13:59	38	21	23	21	21	27	23	174
14:00-14:59	31	23	22	29	23	23	32	183
15:00-15:59	20	24	23	24	25	23	28	167
16:00-16:59	26	23	22	30	25	26	21	173
17:00-17:59	43	39	36	27	35	27	34	241
18:00-18:59	38	36	30	31	35	35	36	241
19:00-19:59	23	28	29	32	26	24	31	193
20:00-20:59	31	28	25	24	20	28	25	181
21:00-21:59	25	25	21	20	17	19	27	154
22:00-22:59	15	19	14	16	19	20	23	126
23:00-23:59	10	13	18	8	16	20	26	111
Total	503	439	415	439	392	433	484	3,105

Temporal Analysis 2016 - 2020 Other Alarm Types								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	246	168	154	171	165	169	193	1,266
01:00-01:59	229	128	134	150	154	126	230	1,151
02:00-02:59	217	122	140	145	118	148	240	1,130
03:00-03:59	146	100	96	114	97	120	150	823
04:00-04:59	129	77	91	110	92	118	118	735
05:00-05:59	94	91	115	95	95	141	103	734
06:00-06:59	116	97	124	174	134	151	135	931
07:00-07:59	133	144	173	173	177	192	156	1,148
08:00-08:59	177	239	235	251	210	250	177	1,539
09:00-09:59	206	238	253	278	323	257	208	1,763
10:00-10:59	227	249	253	302	337	292	225	1,885
11:00-11:59	237	266	282	310	340	262	222	1,919
12:00-12:59	256	309	312	384	324	279	270	2,134
13:00-13:59	248	301	325	372	314	313	284	2,157
14:00-14:59	272	330	298	342	341	317	290	2,190
15:00-15:59	270	297	317	299	322	311	302	2,118
16:00-16:59	260	299	321	330	319	319	301	2,149
17:00-17:59	275	347	283	330	303	344	346	2,228
18:00-18:59	282	279	282	294	317	305	316	2,075
19:00-19:59	250	257	292	301	275	275	302	1,952
20:00-20:59	296	226	238	258	259	299	280	1,856
21:00-21:59	277	234	216	265	239	260	297	1,788
22:00-22:59	238	197	237	252	228	236	256	1,644
23:00-23:59	192	181	167	232	174	231	235	1,412
Total	5,273	5,176	5,338	5,932	5,657	5,715	5,636	38,727

Historical Service Demand and Probability Analysis

Service Demand

Types of incidents are broken down by the NFIRS (national fire incident reporting system) codes for each year. The coloring scheme (temporal analysis) utilizes a temperature theme, with the hotter (red) colors indicating more incidents occurring for that type of call.

Total Incidents by Type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Fires	689	648	751	557	580	617	661	615	608	555	666
Overpressure/Rupture	36	43	36	36	45	43	51	191	202	158	113
EMS/Rescue	12,601	13,672	13,749	13,085	13,510	14,792	14,687	15,345	14,509	15,465	15,539
Hazardous Conditions	747	791	647	1,035	990	898	1,166	1,155	1,006	1,574	1,006
Service Call	1,653	1,921	2,366	2,037	2,003	1,368	1,492	1,704	1,542	1,252	1,053
Good Intent	2,294	2,679	3,193	3,085	3,143	2,976	3,315	3,462	3,033	3,258	3,252
False Alarm/Calls	1,581	1,670	1,609	1,579	1,600	1,555	1,774	1,537	1,487	1,849	1,488
Severe Weather	16	12	2	3	9	4	14	10	6	11	2
Special Incident	17	17	19	5	5	3	6	1	2	2	1
Total	19,634	21,453	22,372	21,422	21,885	22,256	23,166	24,020	22,395	24,124	23,120

Simultaneous Calls

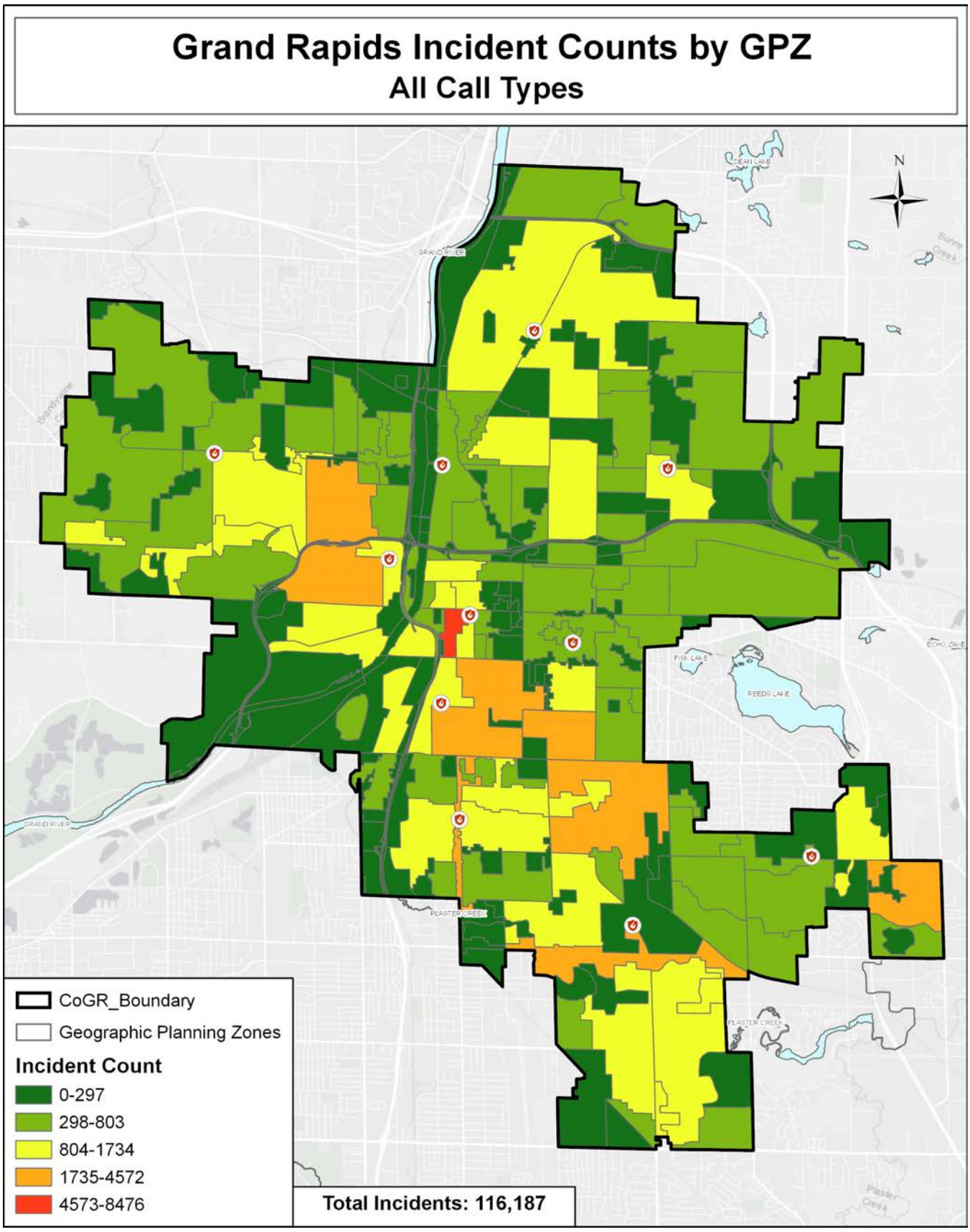
Simultaneous incidents serve as a decision point for both the distribution and concentration of resources. When multiple alarms occur in a single first due district, either a second unit in that district or resources from adjoining districts must be utilized for response.

Simultaneous Call Percentage by Station District										
Station	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1 - Leonard	4.95%	5.64%	6.86%	8.70%	6.97%	9.23%	7.70%	7.57%	12.89%	8.79%
2 - Franklin	6.39%	6.52%	5.03%	5.60%	7.30%	6.61%	7.05%	7.35%	7.85%	7.10%
3 - Bridge	9.14%	9.00%	9.07%	9.54%	10.19%	10.01%	11.49%	9.62%	10.62%	10.18%
4 - Kalamazoo	8.92%	9.87%	11.31%	10.79%	11.56%	12.73%	13.70%	22.65%	13.07%	10.27%
5 - Monroe	4.74%	5.89%	6.90%	5.37%	8.59%	8.25%	6.75%	7.45%	11.69%	8.41%
6 - Burton	4.16%	4.29%	4.85%	4.43%	6.07%	4.80%	5.50%	6.07%	6.90%	5.97%
7 - LaGrave	10.50%	10.97%	9.72%	10.32%	7.45%	9.81%	10.49%	11.71%	11.22%	7.88%
8 - Covell	6.31%	7.40%	6.52%	7.22%	7.28%	7.31%	9.39%	7.84%	13.15%	7.45%
9 - Plainfield	4.39%	2.69%	3.62%	4.14%	6.68%	3.96%	5.27%	4.59%	10.40%	5.51%
10 - Division	7.69%	6.72%	8.70%	6.71%	7.18%	9.53%	9.31%	8.00%	9.38%	9.91%
11 - Chester	6.12%	4.88%	7.69%	8.57%	7.05%	9.00%	11.59%	8.61%	11.80%	8.10%

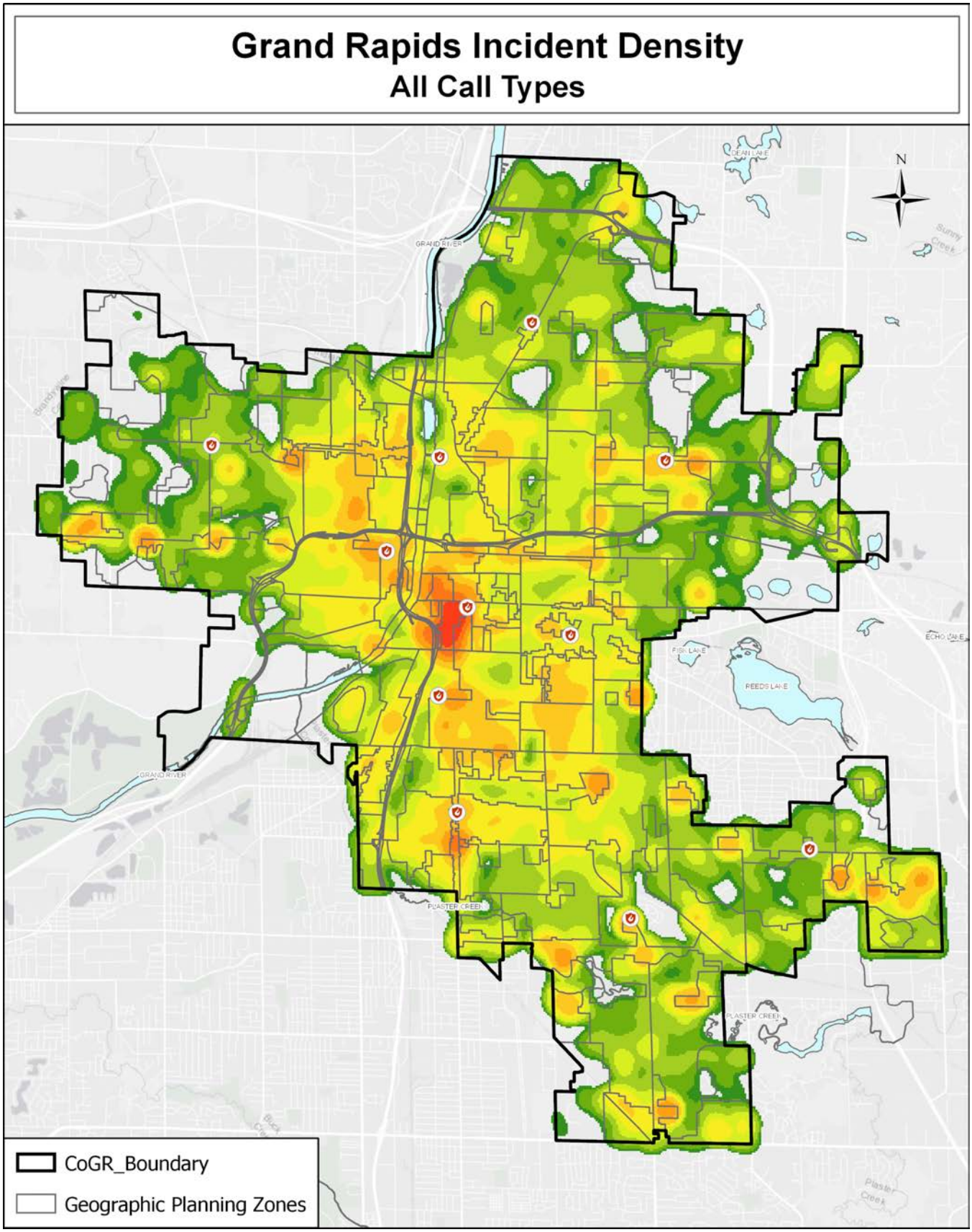
Temporal Analysis

The tables on the following page display a temporal view of service demand based on time of day, day of week for the various incident types (all calls, fires, EMS, and other call types). Hotter colors represent heavier service demand for incidents during the 2016-2020 timeframe. Service demand is highest during the day when people are active. EMS volume is fairly evenly spread between the hours of 9 AM through 10 PM. Fire calls are more heavily weighted in the evening, when more people are at home using heating devices and preparing meals.

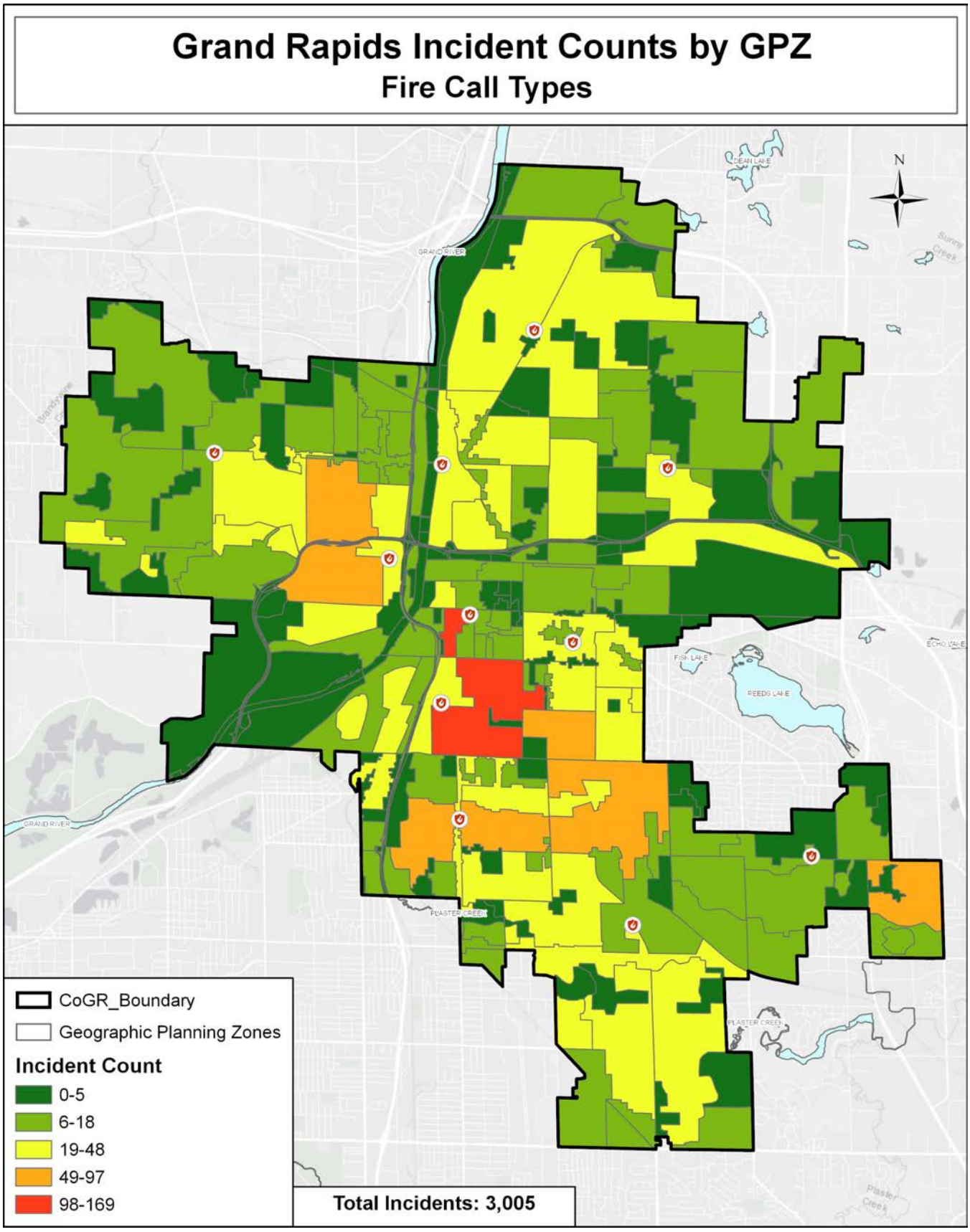
All call types for 2016-2020 were analyzed and sorted by incident count within each Geographical Planning Zone. This view of historical data contrasted with the accompanying incident density map highlights the service demand and risk within the jurisdiction.



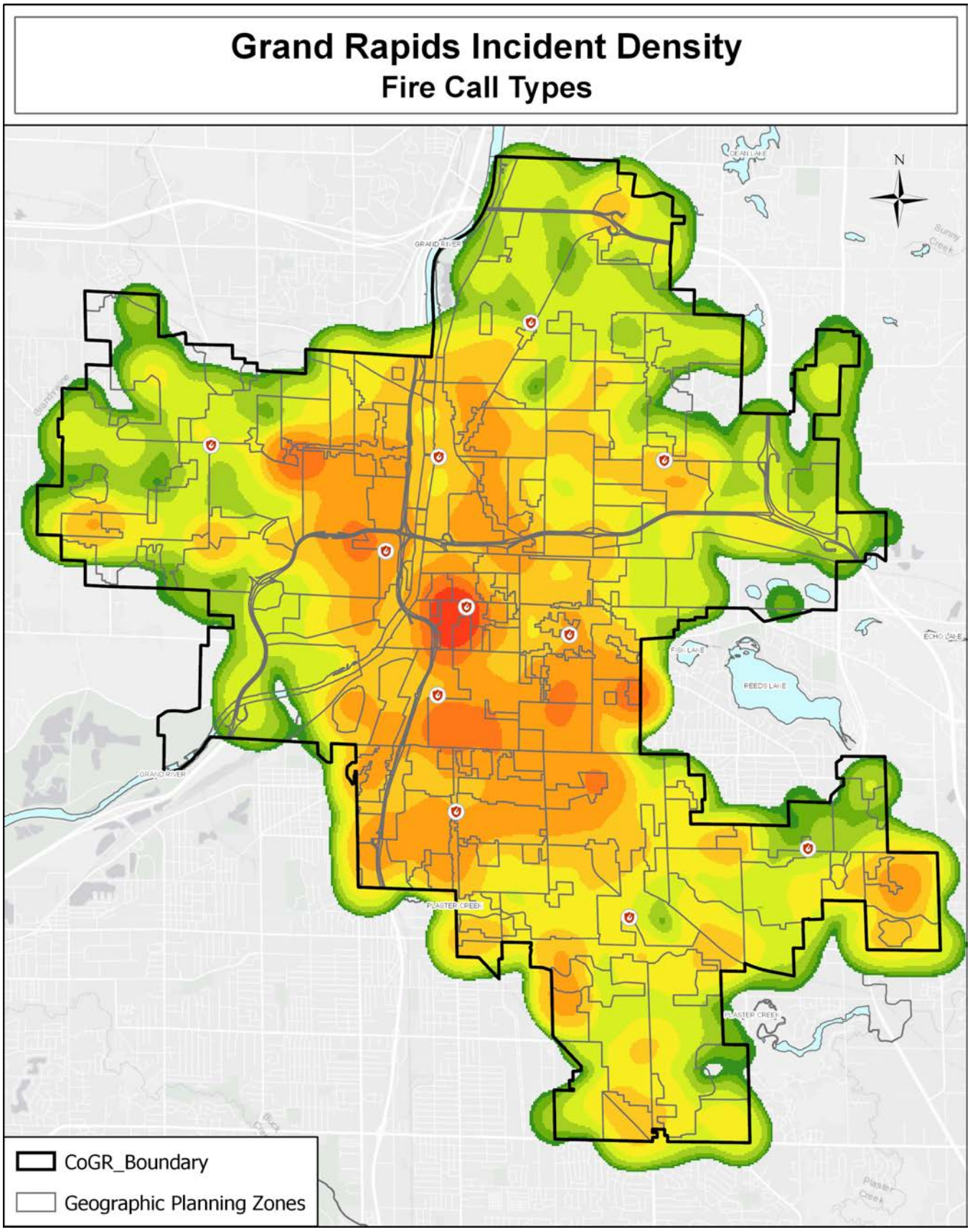
This view displays incident density for all call types across the jurisdiction between 2016-2020 analyzed and sorted with Geographical Planning Zones. This reveals a more naturalistic distribution of incident data and incident hotspots than the incident count by GPZ view.



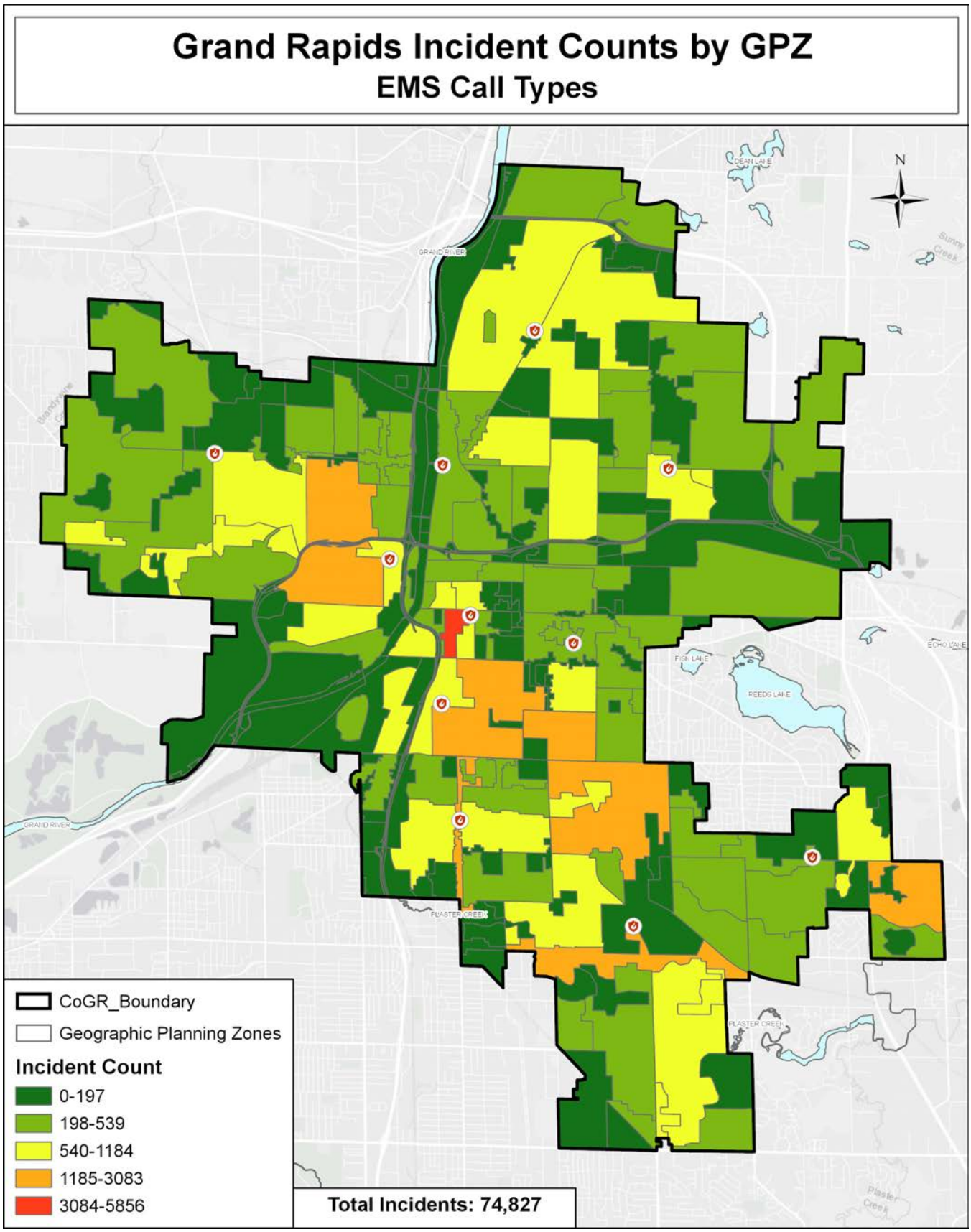
All fire call types for 2016-2020 were analyzed and sorted by incident count within each Geographical Planning Zone. This view of historical data contrasted with the accompanying incident density map highlights the service demand and risk for fire incidents within the jurisdiction.



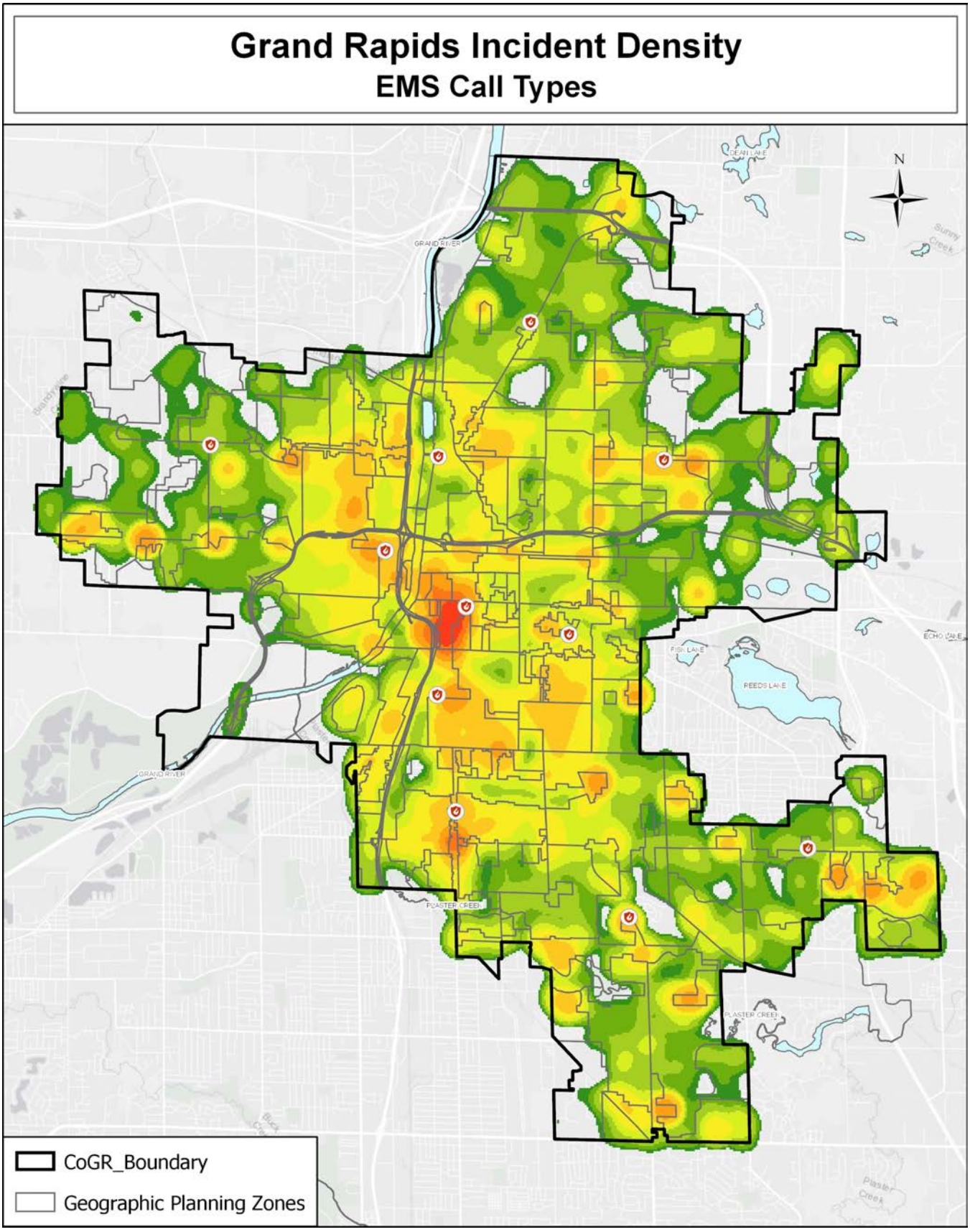
This view displays fire incident density for all call types across the jurisdiction between 2016-2020 analyzed and sorted with Geographical Planning Zones. This reveals a more naturalistic distribution of incident data and incident hotspots than the fire incident count by GPZ view.



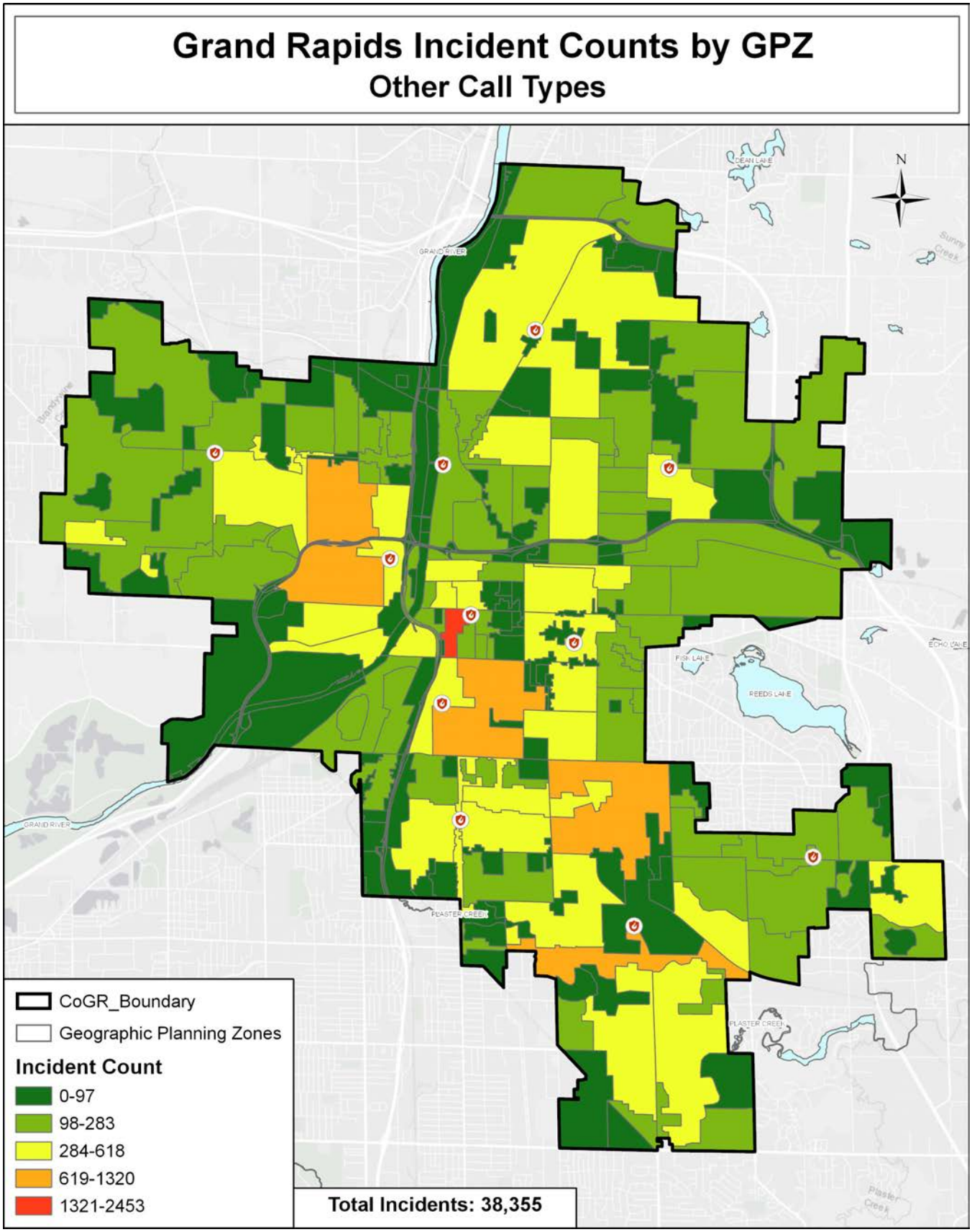
All EMS call types for 2016-2020 were analyzed and sorted by incident count within each Geographical Planning Zone. This view of historical data contrasted with the accompanying incident density map highlights the service demand and risk for EMS incidents within the jurisdiction.



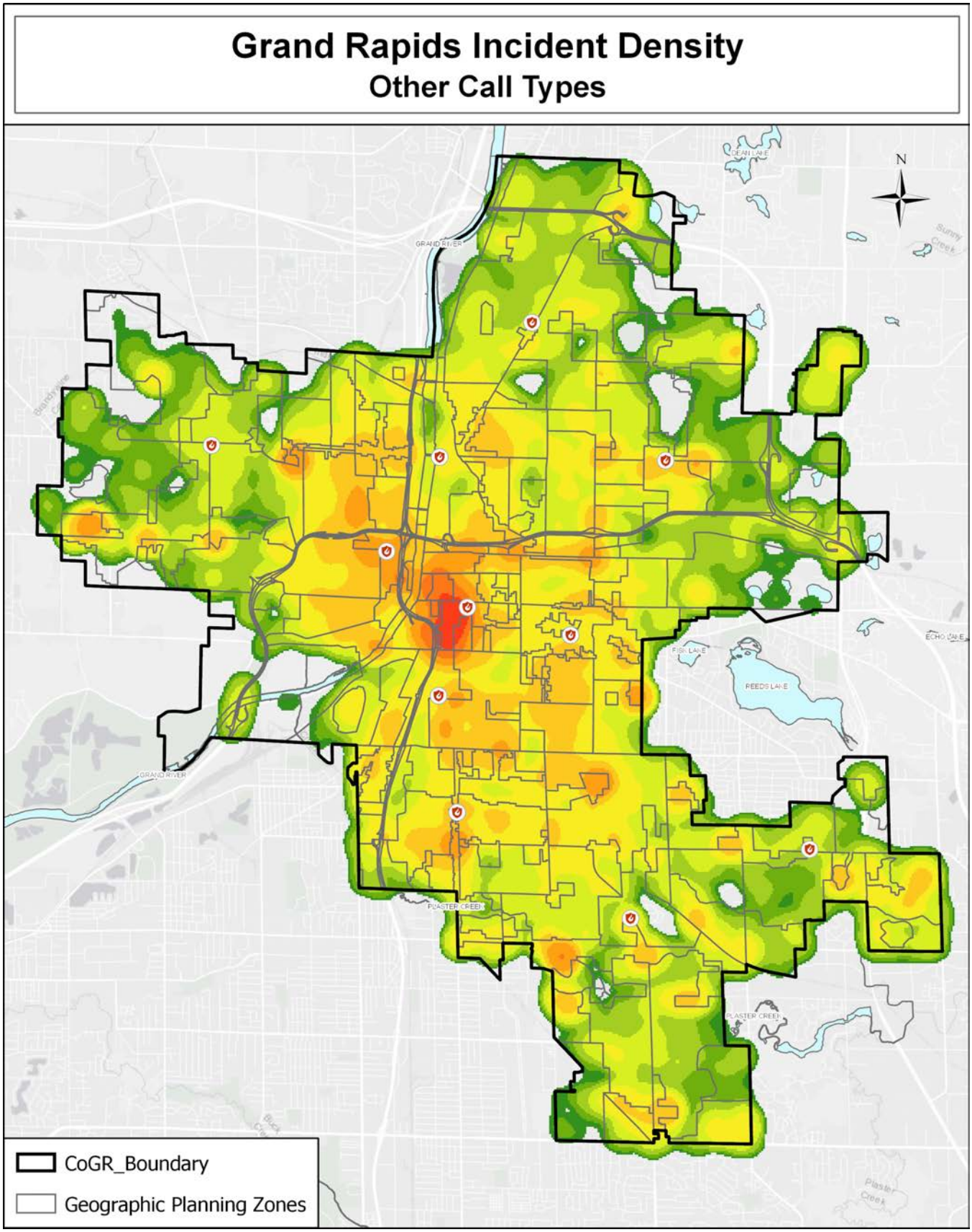
This view displays EMS incident density for all call types across the jurisdiction between 2016-2020 analyzed and sorted with Geographical Planning Zones. This reveals a more naturalistic distribution of incident data and incident hotspots than the EMS incident count by GPZ view.



All other call types for 2016-2020 were analyzed and sorted by incident count within each Geographical Planning Zone. Other call types encompass hazardous materials, technical rescue and any other incident type. This view of historical data contrasted with the accompanying incident density map highlights the service demand and risk for other incidents within the jurisdiction.



This view displays fire incident density for other call types across the jurisdiction between 2016-2020 analyzed and sorted with Geographical Planning Zones. This reveals a more naturalistic distribution of incident data and incident hotspots than the other incident count by GPZ view.



Section D - Current Deployment and Performance

Current Deployment Model

Human Resources

Frontline Apparatus Resources

Performance Measurements

Emergency Communications

Distribution Analysis

Concentration Analysis

Incident Demand by District

Reliability Analysis

Simultaneous Analysis

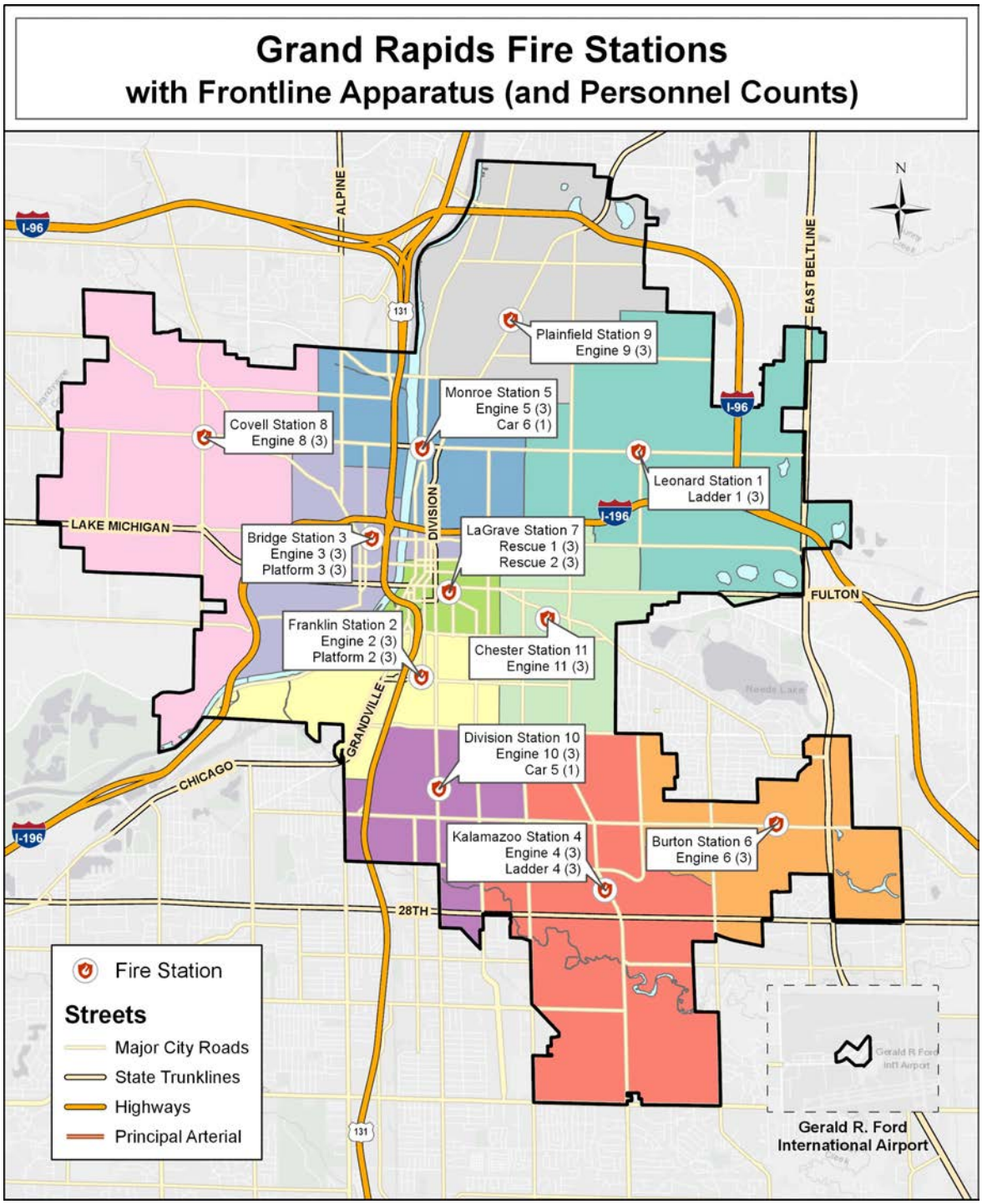
Station Level Analysis

Current Deployment Model

The purpose of this section is to closely examine the performance of the current emergency response delivery system through various critical data elements. When looking at system performance, it is important to understand the environment in which the various stations and apparatus are operating. These differences have a direct impact on the type of apparatus employed, the number of apparatus at a particular station and even the staffing levels in the particular station. This section opens with a jurisdiction wide view of metrics, takes a closer look at each district's performance, and concludes with a comparability study of other agencies.

The Grand Rapids Fire Department provides a full spectrum of both emergency and non-emergency services to the citizens of Grand Rapids, as well as special operations and hazardous materials responses throughout the region. Outcomes are enhanced through automatic and mutual aid agreements with neighboring jurisdictions.

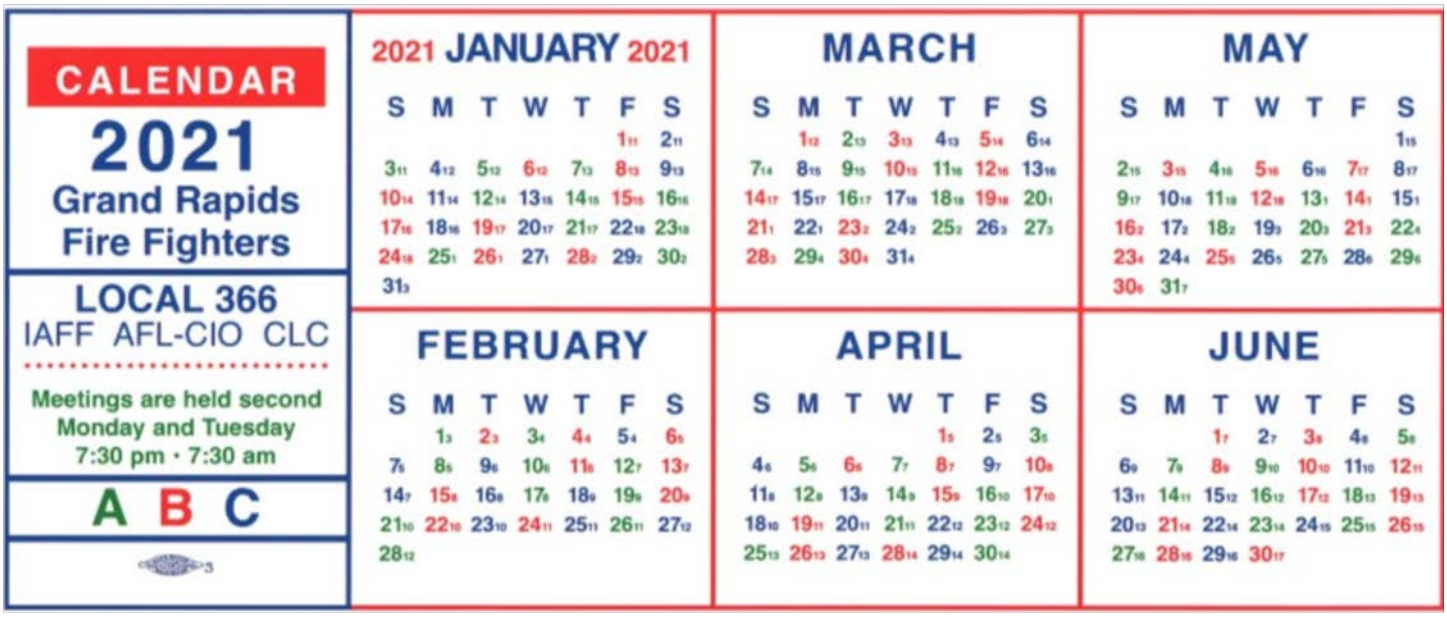
Resources are deployed from 11 strategically located fire stations housing a wide variety of equipment. The following map indicates the fire station locations, first due response districts and details the frontline apparatus with minimum number of personnel.



Human Resources

The GRFD has seen its staffing levels stabilize over the last five years. The deployment model has been adapted to improve performance and facilitate training needs. As of 2015, a hiring model was put in place which has maintained overall staffing levels at 196-206 personnel, with a current median goal of 201 total authorized strength. 172 personnel are assigned to suppression.

Suppression personnel work 24 hour shifts. The current cycle of work days can be seen in the shift calendar below. The department uses a three-shift schedule, with each shift working 24-hour periods. The shift rotation is one day on, one day off, one day on, one day off, one day on, four days off which makes up a nine-day cycle. Suppression personnel are assigned one leave day on every 20th scheduled shift. This schedule can be seen in the shift calendar below with the shift colors of green (A), red (B) and blue (C) representing the three different shifts and the small subscript numbers representing the leave day.



This level of suppression staffing has provided a solid foundation of daily resources to align with the department's core performance measures. It has been identified that a key operational metric for both emergency and non-emergency outcomes is to have 15 suppression units (each with three crew) and two battalion chief cars in service every day, staffed with a minimum of 47 personnel.

The daily staffing model is dynamic, allowing for additional units to be placed in service when additional staff is available, or for additional crew on key apparatus to support core fire department services. An example would be placing additional units in service during high call volume or staffing up an apparatus to provide flexibility to cross staff non-frontline units like Utility 2, which is staffed with one firefighter to provide blocking on the freeway system. Although this model requires an active level of management, it makes the most efficacious use of the resources allocated to the GRFD.

Frontline Apparatus Resources

Car Two cars staffed with a battalion chief are on duty each shift. One is responsible for the north half of the city and operates out of the Monroe Ave. fire station and one is charged with supervising the southern side of the city and runs out of the Division Ave. fire station. In addition to emergency responses and personnel management, they also supervise many non emergency programs.

Engine A piece of fire apparatus staffed with an officer, equipment operator and firefighter that carries water, medical equipment and tools to the scene of an emergency. The primary function of this crew at fires is to establish a water supply, search for people in the interior of a structure and apply water with hose lines to extinguish the fire. Engines are in service at nine of eleven stations in the city.

Ladder This fire apparatus is staffed with an officer, equipment operator and firefighter. It operates as an engine or aerial device based upon the needs of the emergency. These aerial devices extend 75 to 109 feet in the air and are capable of providing an elevated stream of water via their own fire pump. The city has two ladders in service which are located at the Kalamazoo and Leonard stations.

Platform This fire apparatus is staffed with an officer, equipment operator and firefighter. This is the largest of our fire apparatus and carries specialized equipment for ventilation, smoke removal, overhaul and vehicle extrication. These aerial devices extend to 104 feet in the air and are capable of providing an elevated stream of water .

Rescue Engine A special type of engine that is staffed with a fire officer, equipment operator and one firefighter. In addition to regular engine duties, the two rescue engines located at LaGrave Ave. station are the lead apparatus for all technical rescue incidents.

Performance Measurements

The GRFD views performance at multiple levels to gain a wide perspective of its emergency and non-emergency efficiency. Performance is measured against adopted benchmark objectives, and for other metrics such as district reliability, simultaneous call volume, and unit hour utilization. Initial geographical performance is at the city wide level and includes all fire stations and responding apparatus within the 45.3 square miles of the city. The next level analyzed is at the first due station response area, where each of the eleven fire station districts is assessed and key metrics are reviewed. Incident data is also broken down by responding unit, shift (A, B, or C) and even time of day, day of week to gain a holistic view of that first due district's performance.

Benchmark Perfomance Objectives			Fires	EMS	Hazardous Materials	Technical Rescues
Alarm Handling	Incident Creation until Units are Notified		1:30	2:00	1:30	1:30
Turnout Time	Units Notified until Units are Enroute		1:30	1:30	1:30	1:30
Travel Time	Distribution 1st Unit Arrival	All Types	4:00	4:00	4:00	4:00
	Concentration All Unit On Scene Effective Response Force Assembled	Moderate Risk	8:00	6:00	9:00	9:00
		High Risk	10:00	8:00	9:00	9:00
		Maximum Risk	12:00	8:00	9:00	9:00
Total Response Time	Distribution 1st Unit Arrival	All Types	7:00	7:30	7:00	7:00
	Concentration All Unit On Scene Effective Response Force Assembled	Moderate Risk	11:00	9:30	12:00	12:00
		High Risk	13:00	11:30	12:00	12:00
		Maximum Risk	15:00	11:30	12:00	12:00

The GRFD then further divides the first due areas into geographical planning zones and categorizes them based upon risk levels of low, moderate, high and maximum. These planning zones fit within the first due districts and are divided by like characteristics including population density, building construction, occupancy type and incident demand. The GRFD currently has 282 geographical planning zones that assist with fine tuning emergency response levels and non-emergency functions such as risk reduction efforts.

The final level of analysis is granular in nature and is used on an as needed basis for program evaluation or call reduction efforts. On a weekly basis, data is queried to locate repeat calls at a certain addresses or to visualize all specific incident types regardless of location. This data is vital to making informed decisions regarding unit deployment or program changes.

Emergency Communications

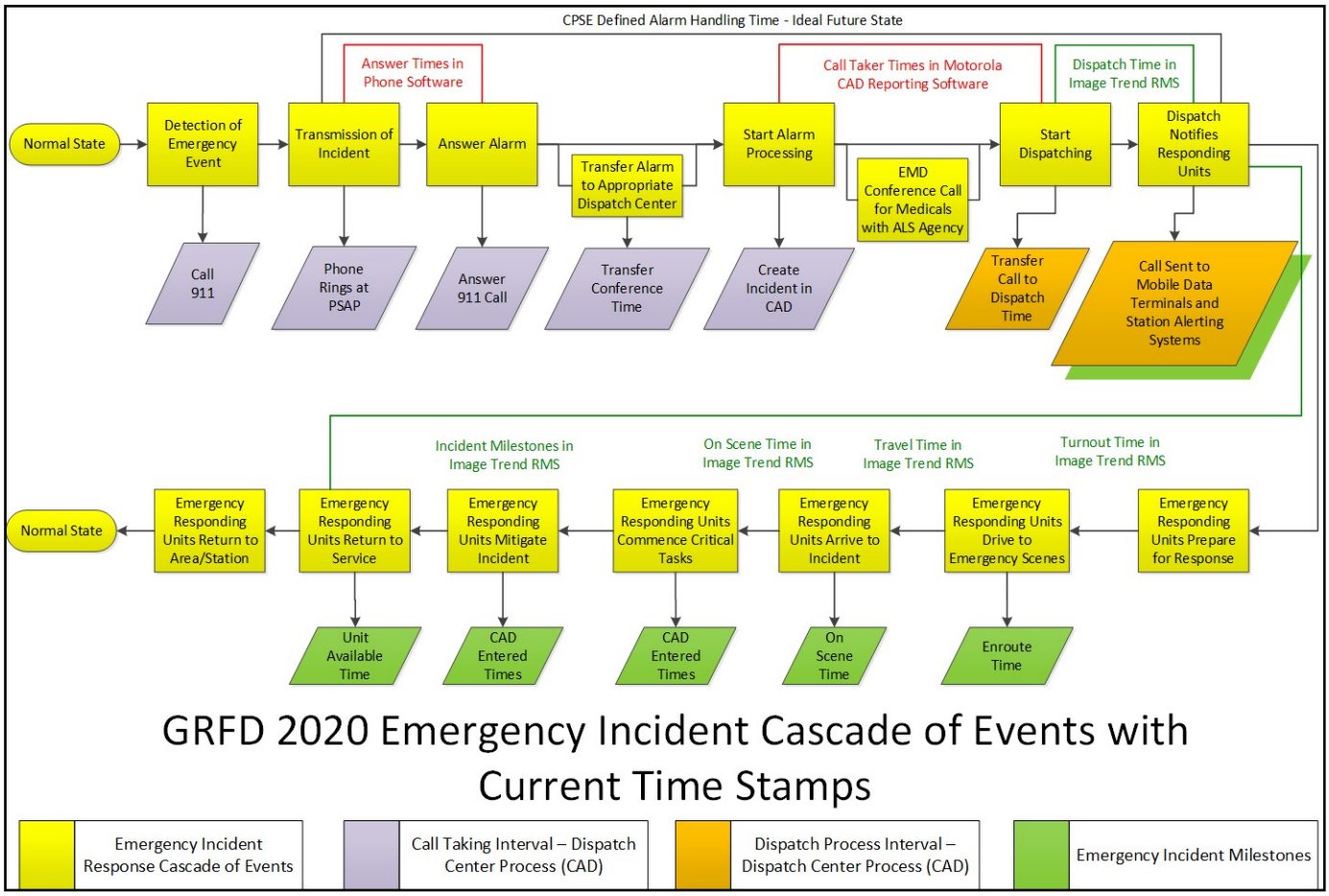
Alarm Handling Process

The establishment of community baselines is an extremely important aspect when creating a comprehensive standards of coverage. By clearly defining the level of performance currently in place, the GRFD can identify its desired outcomes for certain performance metrics and develop goals and action plans to achieve them. The following section shows a process map of the emergency incident response cascade of events, a breakdown of dispatch phone answering data with current constraints and a four year snapshot of performance for major milestones experienced within fire, EMS and rescue incidents. The data gathered by the GRFD continues to increase in quality and reporting mechanisms are constantly refined, with fire officers receiving education on the importance of properly filling out response records.

Currently, the GRFD is able to track response times beginning at the time an emergency incident is created by a call taker at the communications center, until unit arrival on scene.

Many operational changes have occurred in the police managed communications center over the last five years, including an upgrade of the phone system and implementation of major upgrades to the Computer Aided Dispatch (CAD) system.

Since 2015, the GRFD has been trying to capture phone ring and answering times and link those metrics to the total response time, incorporating them into the initial call taking time. Current technological limitations do not permit integration of those times. The department has successfully incorporated incident create times into its baseline database. Incident create times are blended with data from the department's internal records management system (RMS), to document the continuum of response data from incident creation until unit arrival on scene.



Continuous Improvement Process

The Grand Rapids Fire Department and Grand Rapids Emergency Communications Center are active participants in an iterative continuous improvement process. Weekly meetings are used to discuss performance, identify operational gaps, and collaborate on root cause analysis and problem solving.

The Motorola Premier One CAD system went live in December of 2012, resulting in the current level of analysis which began in 2013. The alarm processing time (from incident create until the alarm data is entered and sent to the fire dispatcher) is currently tracked only in the Motorola CAD system and is not exported into the fire department's cloud based RMS system. Current protocols in the communications center have ensured that incidents aren't created until a call has been answered. Fire department access to the reporting capabilities of Motorola CAD has provided the ability to integrate this information into the department's internal database and has proven adequate to assess adherence to the incident creation protocol. The communications center utilizes its own quality assurance system to track performance compliance. The accuracy of the emergency communications center data has been verified and has been closely monitored for many years as part of the center's internal quality assurance program.

To lend perspective to the one dispatch time element that is not linked directly to the fire department baseline data (phone answering), charts were created showing the current level of call answering performance. Grand Rapids Communications Center data indicates that call answering times meet or exceed NFPA recommendations for this piece of the call taking process, however they are not currently incorporated in the baseline data tables for the fire department, as this data element is not linked to CAD or fire department incident records.

Alarm Answering (Ring to Pickup)						
	2017	2018	2019	2020	2017-2020	NFPA Recommended
Alarm Answering-95%	95.31	95.78	95.11	95.92	95.53	00:15
Alarm Answering-99%	99.59	99.71	99.62	99.70	99.66	00:40

Once an incident is created in CAD, the remaining call processing intervals can be tracked in the Motorola database, which is accessible by GRFD personnel and incorporated in baseline performance tables. After the call taker does the initial coding of the incident, it is transferred to the fire dispatcher. At this point all times are tracked in both Motorola and the department's RMS system (Image Trend).

NFPA 1221 section 7.4.4 addresses alarm transfers, with a goal of not exceeding 30 seconds. Call takers for the Grand Rapids Communications Center do not assign response codes for the 74,986 EMS calls that the GRFD responded to over the last five years. Instead call takers conference each call with the appropriate ambulance company and stay on the line while the call is coded. Once the level of medical response is determined, the call is coded and sent to fire dispatch. The exception to this is for Med "0" calls, where basic information is quickly sent to the fire dispatcher to speed up the response for critical EMS calls that will certainly end up in a full fire department and EMS response including call types such as chest pain, cardiac arrest or difficulty breathing. Med 0's accounted for 3,980 runs (21.72%) in 2020. The department has actively worked with communication center personnel and ALS agencies to find ways to decrease alarm handling times for EMS incidents.

Performance for alarm handling processes for reported structure fire incidents has steadily improved over the last five years.

Distribution Analysis

Geographical Analysis

District	Population	% of City	Square Miles	% of City	Road Miles	% of City	Dwelling Units	% of City	Hydrants	% of City
1	18,499	9.59%	6.93	15.30%	90.10	10.94%	7,765	9.75%	931	12.30%
2	12,517	6.49%	2.61	5.76%	60.25	7.32%	4,392	5.52%	541	7.15%
3	15,803	8.19%	3.26	7.19%	79.46	9.65%	7,106	8.92%	585	7.73%
4	30,019	15.56%	6.76	14.94%	113.95	13.84%	12,289	15.43%	1,138	15.04%
5	14,041	7.28%	2.89	6.39%	71.80	8.72%	6,485	8.14%	624	8.25%
6	13,779	7.14%	3.48	7.68%	56.02	6.80%	5,554	6.97%	637	8.42%
7	5,014	2.60%	0.93	2.04%	24.97	3.03%	3,258	4.09%	286	3.78%
8	20,155	10.45%	7.29	16.10%	99.16	12.04%	9,253	11.62%	907	11.99%
9	18,194	9.43%	5.17	11.41%	77.57	9.42%	7,664	9.62%	711	9.40%
10	21,243	11.01%	2.94	6.50%	67.79	8.23%	6,242	7.84%	545	7.20%
11	23,698	12.28%	3.03	6.69%	82.42	10.01%	9,621	12.08%	662	8.75%
Total	**192,962**		**45.28**		**823.49**		**79,629**		**7,567**	

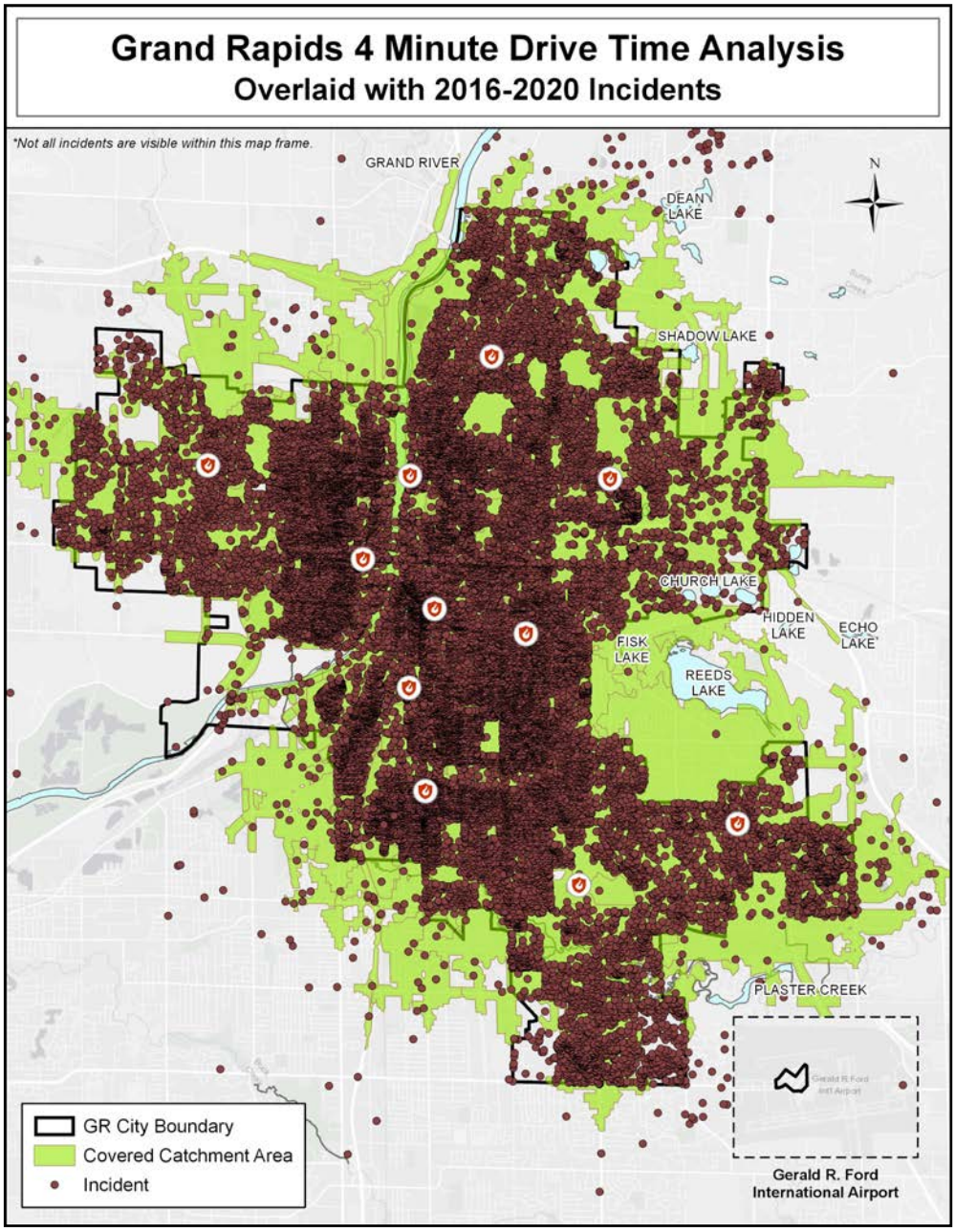
There are 11 station districts in the City of Grand Rapids, each with unique characteristics. Population varies between 5,014 residents to 30,019 residents. This analysis is based on data gathered from the 2019 US Census Bureau 5-year estimates. Square miles also range from less than a square mile in the downtown district with multiple high risk occupancies and a surging daytime population to over 7 square miles on the far northwest side of town. District 4 is notable for its amount of road miles at 113.95, often an indicator of a high volume of vehicle accidents. Also of particular note is the number of dwelling units in district 4, at 12,289 they constitute 15.43% of the city's overall housing stock. Distribution is a key factor for expedient response, with a first unit travel time benchmark of 4 minutes. Drive time coverage was assessed using the same GIS street speed layer used by the CAD (computer-aided dispatch) system. Based on an analysis of CAD data, coverage of road miles averages 97.24%, with 94.93% of dwelling units covered. Outliers for dwelling unit coverage include District 4 (Kalamazoo Ave.) at 88.77% and district 8 (Covell Ave.) at 83.30%.

District	Square Miles Covered	% of District Covered	Road Miles Covered	% of District Road Miles Covered	Dwelling Units Covered	% of Dwelling Units Covered
1	6.39	92.24%	87.79	97.44%	7,410	95.43%
2	2.40	92.13%	59.34	98.50%	4,239	96.52%
3	2.83	86.97%	79.35	99.85%	6,771	95.29%
4	5.84	86.33%	100.34	88.06%	10,909	88.77%
5	2.88	99.62%	71.73	99.90%	6,464	99.68%
6	3.37	96.99%	55.83	99.66%	5,494	98.92%
7	0.93	100.00%	24.97	100.00%	3,258	100.00%
8	5.75	78.93%	93.59	94.38%	7,708	83.30%
9	4.97	96.08%	77.16	99.47%	7,478	97.57%
10	2.94	100.00%	68.24	100.66%	6,241	99.98%
11	3.03	99.93%	82.38	99.95%	9,616	99.95%
Total	**41**	**91.28%**	**800.72**	**97.24%**	**75,588**	**94.93%**

Travel Time Analysis

This map is showing the 4 minute benchmark for first unit travel times overlaid with incident data from 2016-2020. All drive times in this section are based on the street speed layer used by CAD (computer-aided dispatch). The 11 stations in Grand Rapids are positioned to cover over 98.33% of the incidents within the 4 minute travel time parameter based on the CAD speeds.

While most stations are projected in the high 90's for percentage of coverage based on drive times, real world conditions show that performance is lagging in five districts that are geographically too large to accomplish that. Station 1, Station 4, Station 6, Station 8 and Station 9 all have very large districts and many incidents fall outside of the targeted travel time range. Baseline tables for the most common incident types are detailed on the station district pages later in this section.



Station 1 (Leonard St.) has a distribution travel time of 5:37 for EMS low and 6:47 for fire low incidents.

Station 4 (Kalamazoo Ave.) has travel times of 5:52 for EMS low and 5:39 for fire low incidents.

Station 6 (Burton Ave.) has travel times of 5:40 for EMS low and 5:06 for fire low incidents.

Station 8 (Covell Ave.) has travel times of 5:21 for EMS low and 5:24 for fire low incidents.

Station 9 (Plainfield Ave.) has travel times of 5:33 for EMS low and 6:33 for fire low incidents.

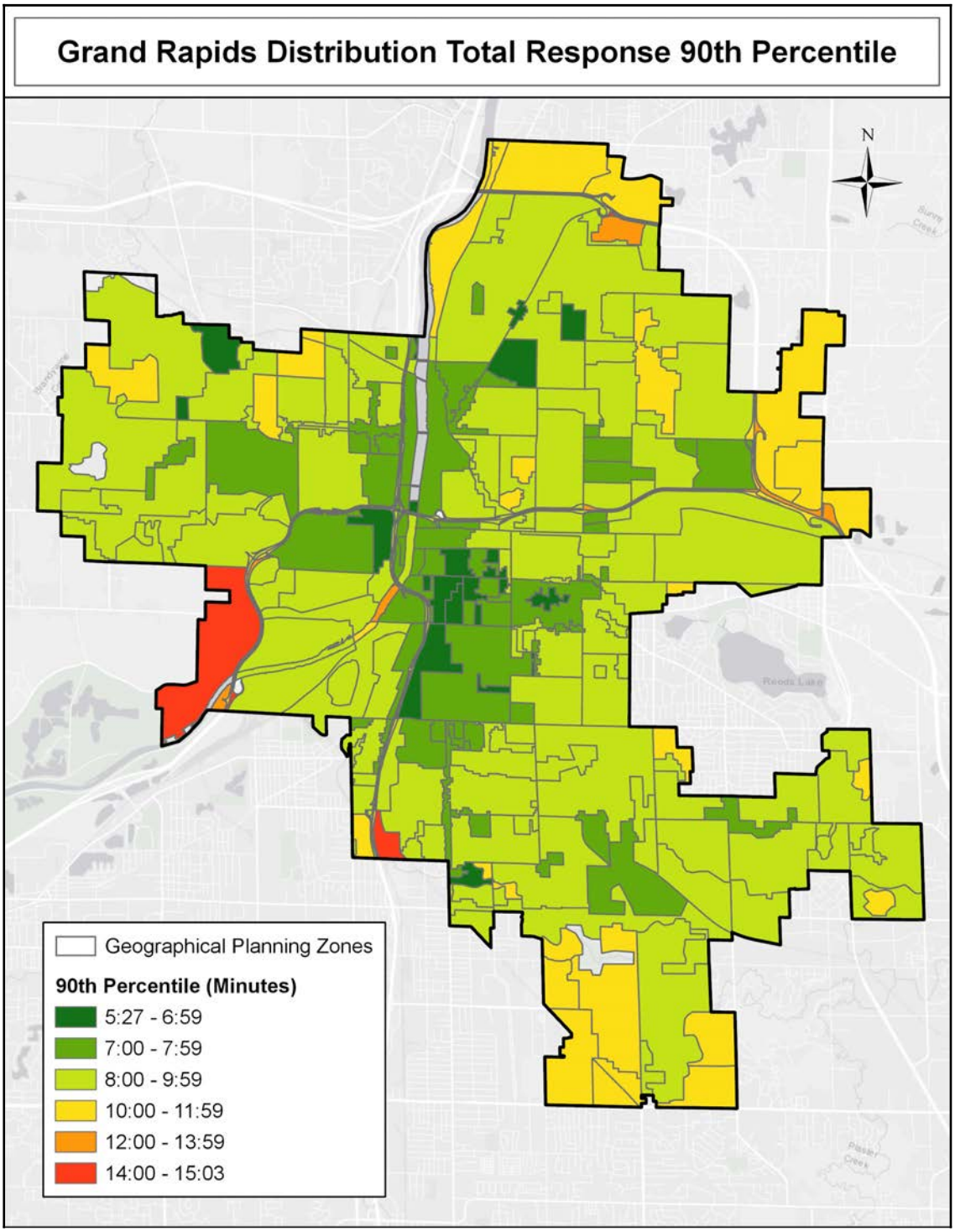
District	2016			2017			2018			2019			2020		
	Total District	Incidents in Coverage	% Incidents Covered	Total District	Incidents in Coverage	% Incidents Covered	Total District	Incidents in Coverage	% Incidents Covered	Total District	Incidents in Coverage	% Incidents Covered	Total District	Incidents in Coverage	% Incidents Covered
1	2,015	1,999	99.21%	1,922	1,919	99.84%	1,958	1,945	99.34%	2,189	2,171	99.18%	1,896	1,882	99.26%
2	1,875	1,871	99.79%	1,914	1,908	99.69%	1,880	1,876	99.79%	2,009	2,006	99.85%	2,058	2,058	100.00%
3	2,725	2,723	99.93%	2,801	2,800	99.96%	2,487	2,486	99.96%	2,720	2,719	99.96%	2,778	2,775	99.89%
4	2,985	2,828	94.74%	3,073	2,887	93.95%	2,981	2,784	93.39%	3,043	2,815	92.51%	2,843	2,632	92.58%
5	1,805	1,805	100.00%	1,889	1,889	100.00%	1,899	1,899	100.00%	1,915	1,815	94.78%	2,029	2,029	100.00%
6	1,310	1,310	100.00%	1,416	1,414	99.86%	1,350	1,347	99.78%	1,443	1,440	99.79%	1,406	1,400	99.57%
7	3,648	3,648	100.00%	3,801	3,801	100.00%	3,227	3,227	100.00%	3,091	3,091	100.00%	2,591	2,591	100.00%
8	1,574	1,551	98.54%	1,682	1,664	98.93%	1,632	1,597	97.86%	1,931	1,898	98.29%	1,545	1,514	97.99%
9	959	955	99.58%	1,063	1,061	99.81%	1,003	997	99.40%	1,167	1,165	99.83%	1,105	1,101	99.64%
10	1,899	1,899	100.00%	2,019	2,019	100.00%	1,859	1,859	100.00%	2,216	2,216	100.00%	2,551	2,551	100.00%
11	2,212	2,212	100.00%	2,269	2,269	100.00%	1,999	1,999	100.00%	2,296	2,296	100.00%	2,233	2,233	100.00%
Other	156	N/A	N/A	160	N/A	N/A	112	N/A	N/A	102	N/A	N/A	85	N/A	N/A
Total	23,163	22,801	98.44%	24,009	23,631	98.43%	22,387	22,016	98.34%	24,122	23,632	97.97%	23,120	22,766	98.47%

Distribution Percentile by Geographical Planning Zone

In addition to viewing response times at the citywide and first due districts, the GRFD also analyzes response times at the geographical planning zone (GPZ) level. These zones can be compared/contrasted to the actual incident data. This map details distribution percentiles for total response time at the GPZ level. Areas without color had no incident date to report.

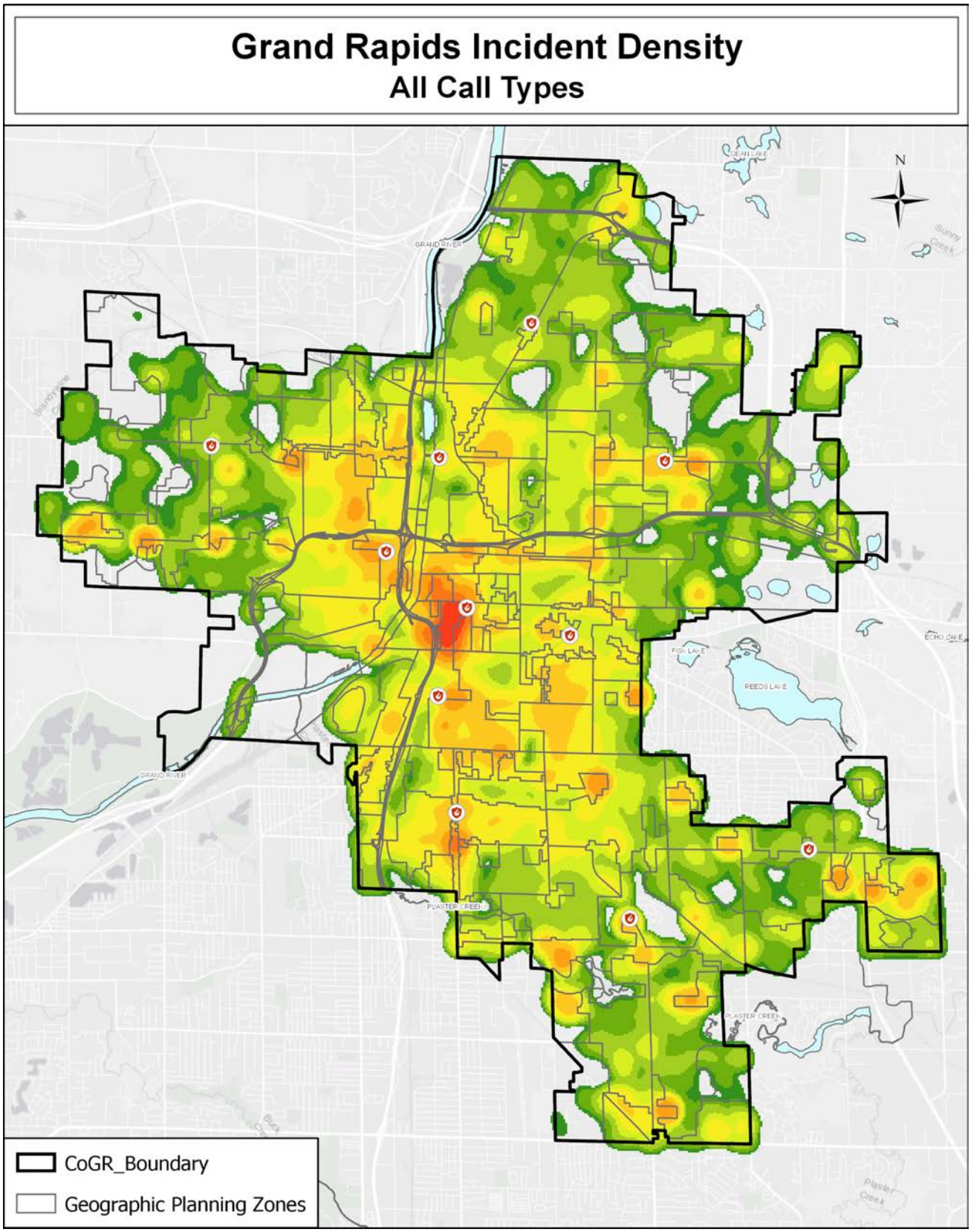
Some areas of the city are showing distribution 90th percentiles in the 14:00 to 15:05 minute interval. These are unpopulated areas and are primarily parkland with limited access for emergency vehicles. Areas in orange and yellow are primarily located on the edges of the city, with predictable delays in response based on travel times and accessibility to expressways.

Other areas in yellow on the fringes of the city are experiencing increasing call volumes as development of both commercial and residential units continues to increase. Citywide performance indicators also add perspective to different types of units and their response performance. For instance, in the northeast corner of the city, the first responding unit is a ladder, with noticeably slower response times.



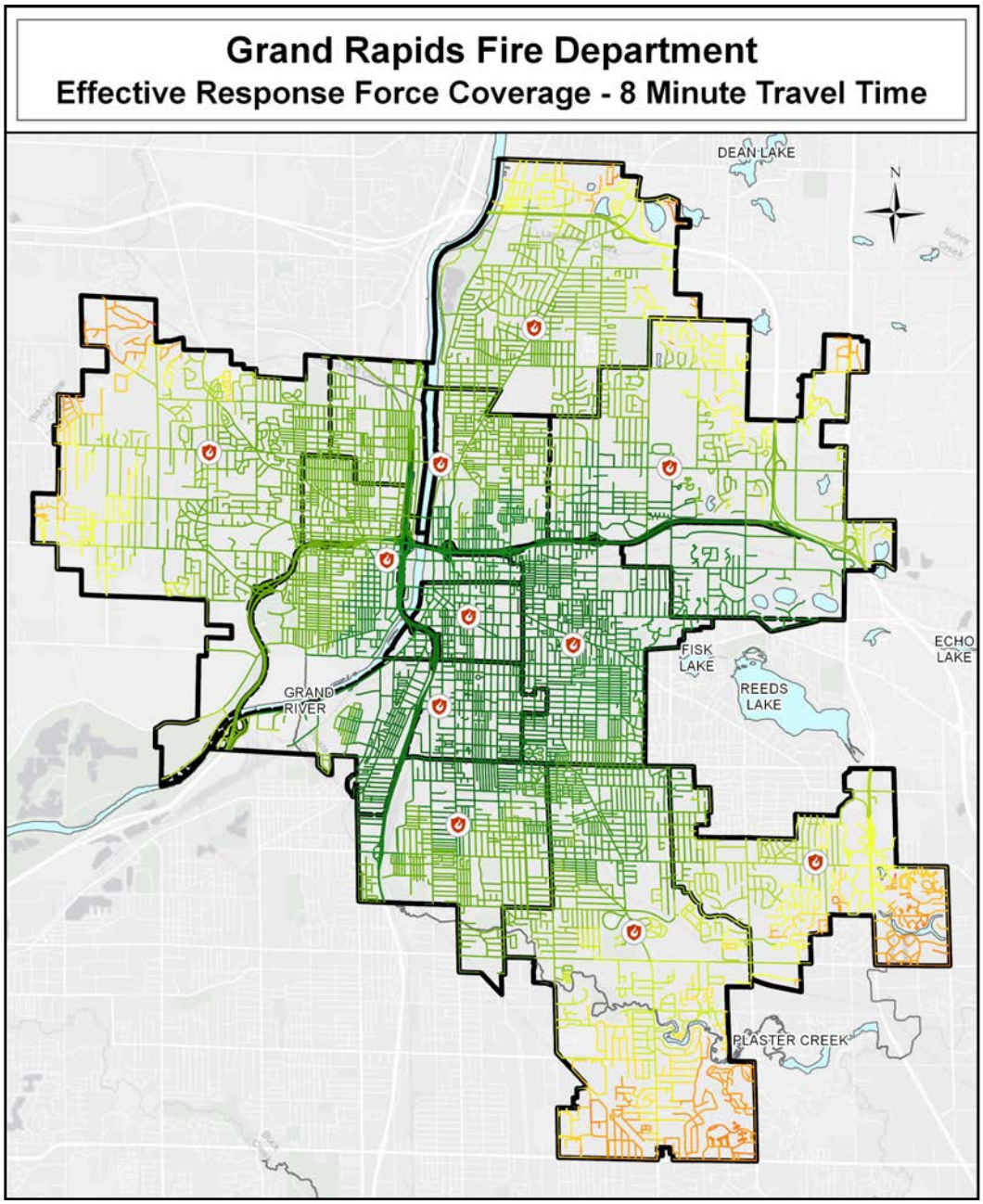
Incident Frequency/Density

This view shows overall call volume across the jurisdiction, overlaying the data on top of the geographical planning zone (GPZ) level. It is notable that some very small zones are red in color, indicating a high level of incident density as compared to the size of the GPZ. The bright red area in the middle of the map is the Heartside neighborhood within the LaGrave district.



Concentration Analysis

Another factor when evaluating emergency response is not only the first unit (distribution), but the effective response force (concentration). This map depicts the number of units that can be assembled in specific parts of the city within the multiple unit benchmark travel time of 8 minutes. Predictably, the core of the city can assemble many units within 8 minutes of travel time, as indicated by the green color. As you reach the fringes of the city, fewer units can meet the benchmark goal of 8 minutes, indicated by the yellow, orange and red colors. Each district section has a more detailed view of this map. The table below shows a breakdown by district.



Units	Leonard	Franklin	Bridge	Kalamazoo	Monroe	Burton	LaGrave	Covell	Plainfield	Division	Chester
1	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
2	100.00%	100.00%	100.00%	100.00%	100.00%	99.93%	100.00%	99.91%	100.00%	100.00%	100.00%
3	100.00%	100.00%	100.00%	100.00%	100.00%	99.93%	100.00%	99.91%	100.00%	100.00%	100.00%
4	100.00%	100.00%	100.00%	97.06%	100.00%	98.55%	100.00%	99.91%	99.10%	100.00%	100.00%
5	99.59%	100.00%	100.00%	83.07%	100.00%	90.01%	100.00%	95.26%	98.84%	100.00%	100.00%
6	98.35%	100.00%	100.00%	83.07%	100.00%	81.89%	100.00%	95.21%	97.45%	100.00%	100.00%
7	98.12%	100.00%	100.00%	79.79%	100.00%	77.27%	100.00%	90.42%	96.91%	100.00%	100.00%
8	96.80%	100.00%	100.00%	67.71%	100.00%	73.09%	100.00%	87.69%	94.12%	100.00%	100.00%
9	86.65%	100.00%	100.00%	67.11%	100.00%	48.13%	100.00%	78.13%	82.61%	100.00%	100.00%
10	79.45%	100.00%	100.00%	50.04%	100.00%	48.13%	100.00%	75.43%	78.72%	100.00%	100.00%
11	78.59%	99.08%	100.00%	47.45%	100.00%	11.85%	100.00%	58.98%	77.09%	100.00%	100.00%
12	60.19%	95.70%	100.00%	40.63%	100.00%	11.85%	100.00%	47.87%	36.67%	100.00%	100.00%
13	41.48%	89.62%	33.80%	28.62%	23.44%	2.77%	99.91%	0.00%	0.13%	50.41%	99.84%
14	31.72%	86.60%	33.80%	0.47%	23.44%	0.00%	99.91%	0.00%	0.13%	33.94%	87.67%
15	17.59%	78.96%	2.16%	0.00%	0.00%	0.00%	61.20%	0.00%	0.00%	25.82%	58.99%

Incident Demand by District

Incident demand by district is a great way to look at where resources have historically been needed. With Bridge, Kalamazoo and LaGrave stations accounting for 38.35% of all incidents in the entire city, it is imperative that districts 3, 4 and 7 maintain multiple units to deal with this service demand.

Fire

Franklin, Bridge, Kalamazoo, Division and Chester districts have the highest fire call volumes, with a combined 55.97% of city totals. Monroe and LaGrave account for another 19.90% of total fire calls.

EMS

EMS call volumes closely mirror the total incident counts. Considering the fact that EMS is 64.20% of service demand, that correlation in no accident. These call volumes are largely driven by district socio-economic characteristics. Bridge and LaGrave have large populations of underinsured individuals, while Kalamazoo district has the highest population count of the city.

Other Call Types

These incidents consist of hazardous materials, technical rescues and many other call types such as hazardous conditions, service calls, good intents, false alarms, and severe weather or natural disaster events.

Incidents by Type and District

	District	2016	2017	2018	2019	2020	Total	% of Citywide Incidents
All	1	2,015	1,922	1,958	2,189	1,896	9,980	8.54%
	2	1,875	1,914	1,880	2,009	2,058	9,736	8.34%
	3	2,725	2,801	2,487	2,720	2,778	13,511	11.57%
	4	2,985	3,073	2,981	3,043	2,843	14,925	12.78%
	5	1,805	1,889	1,899	1,915	2,029	9,537	8.17%
	6	1,310	1,416	1,350	1,443	1,406	6,925	5.93%
	7	3,648	3,801	3,227	3,091	2,591	16,358	14.01%
	8	1,574	1,682	1,632	1,931	1,545	8,364	7.16%
	9	959	1,063	1,003	1,167	1,105	5,297	4.54%
	10	1,899	2,019	1,859	2,216	2,551	10,544	9.03%
	11	2,212	2,269	1,999	2,296	2,233	11,009	9.43%
	Other	156	160	112	102	85	615	0.53%
	Total	**23,163**	**24,009**	**22,387**	**24,122**	**23,120**	**116,801**	

Incidents by Type and District

	District	2016	2017	2018	2019	2020	Total	% of Citywide Fire Incidents
Fire	1	38	24	28	38	57	185	5.96%
	2	71	52	73	55	78	329	10.60%
	3	69	72	69	53	64	327	10.53%
	4	87	90	60	74	72	383	12.33%
	5	67	59	59	55	52	292	9.40%
	6	26	31	28	40	35	160	5.15%
	7	83	56	48	55	62	304	9.79%
	8	34	45	54	38	34	205	6.60%
	9	17	31	25	24	24	121	3.90%
	10	73	83	69	51	77	353	11.37%
	11	75	62	67	57	85	346	11.14%
	Other	21	10	28	15	26	100	3.22%
	Total	**661**	**615**	**608**	**555**	**666**	**3,105**	

Incidents by Type and District

	District	2016	2017	2018	2019	2020	Total	% of Citywide EMS Incidents
EMS	1	1,323	1,273	1,303	1,398	1,334	6,631	8.84%
	2	1,166	1,212	1,204	1,399	1,456	6,437	8.58%
	3	1,516	1,678	1,345	1,636	1,782	7,957	10.61%
	4	1,907	1,820	2,006	1,923	1,780	9,436	12.58%
	5	1,121	1,239	1,216	1,200	1,387	6,163	8.22%
	6	958	999	995	969	980	4,901	6.54%
	7	2,366	2,492	2,098	2,041	1,759	10,756	14.34%
	8	1,014	1,117	1,067	1,119	1,035	5,352	7.14%
	9	617	719	630	691	694	3,351	4.47%
	10	1,164	1,288	1,238	1,558	1,784	7,032	9.38%
	11	1,375	1,343	1,269	1,392	1,432	6,811	9.08%
	Other	47	47	22	23	20	159	0.21%
	Total	**14,574**	**15,227**	**14,393**	**15,349**	**15,443**	**74,986**	

Incidents by Type and District

	District	2016	2017	2018	2019	2020	Total	% of Citywide Other Incidents
Other Call Types	1	654	625	627	753	505	3,164	8.17%
	2	638	650	603	555	524	2,970	7.67%
	3	1,140	1,051	1,073	1,031	932	5,227	13.50%
	4	991	1,163	915	1,046	991	5,106	13.19%
	5	617	591	624	660	590	3,082	7.96%
	6	326	386	327	434	391	1,864	4.82%
	7	1,199	1,253	1,081	995	770	5,298	13.69%
	8	526	520	511	774	476	2,807	7.25%
	9	325	313	348	452	387	1,825	4.71%
	10	662	648	552	607	690	3,159	8.16%
	11	762	864	663	847	716	3,852	9.95%
	Other	88	103	62	64	39	356	0.92%
	Total	**7,928**	**8,167**	**7,386**	**8,218**	**7,011**	**38,710**	

Reliability Analysis

Reliability metrics lend perspective to how many times a district remains self sufficient for incidents within their district, versus how many times other stations respond in to assist. An example of this in the data table below would be how often Platform 3 or Engine 3 is available to answer alarms within 3's (Bridge Street) station district. When reliability metrics fall too low, it may indicate the need to adjust the deployment model to meet the service demand.

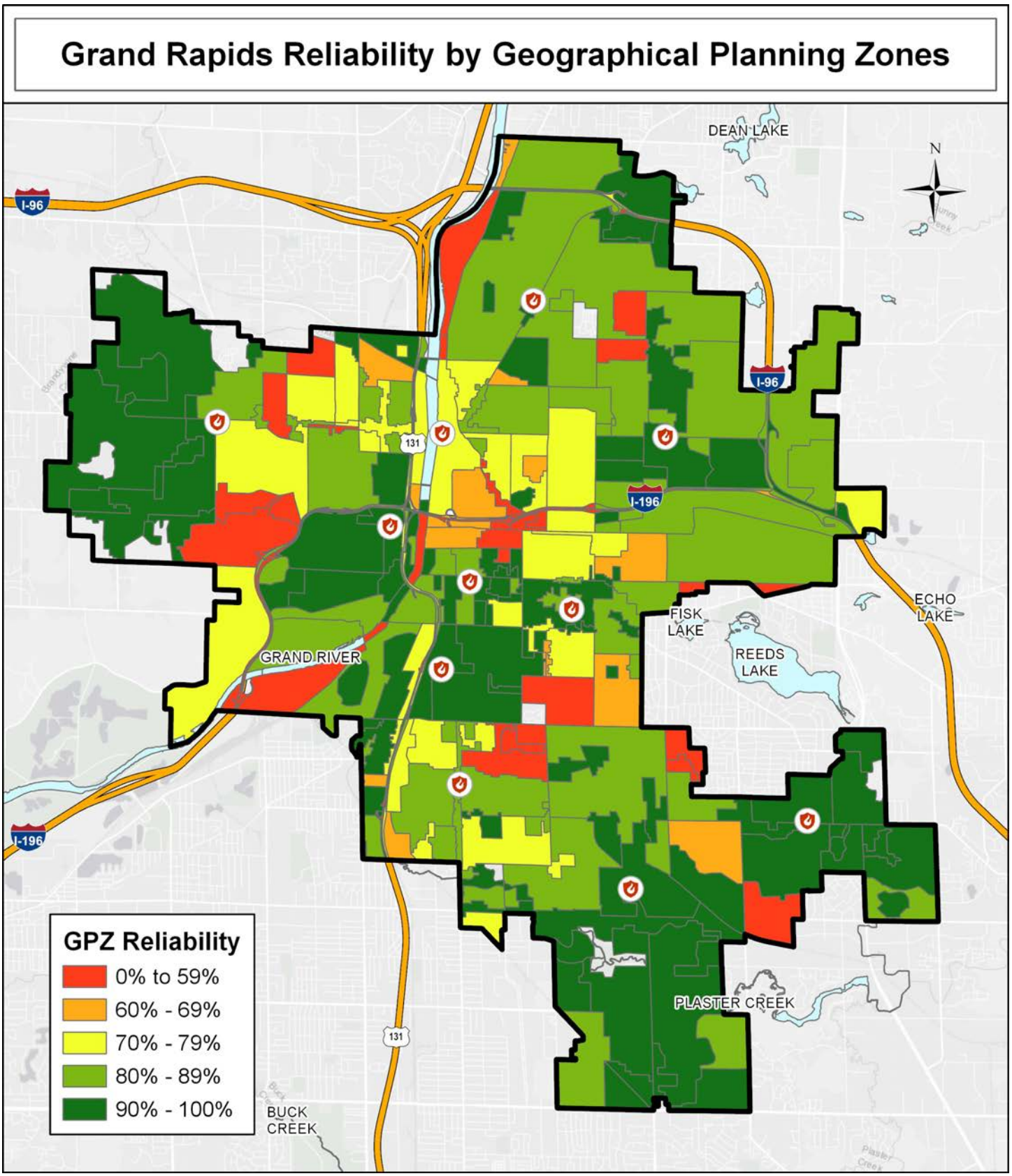
	2016			2017			2018			2019			2020		
Year	Incident Count	1st Due Unit Available	% Reliable	Incident Count	1st Due Unit Available	% Reliable	Incident Count	1st Due Unit Available	% Reliable	Incident Count	1st Due Unit Available	% Reliable	Incident Count	1st Due Unit Available	% Reliable
1	1994	1755	88.01%	1913	1506	78.72%	1957	1640	83.80%	2185	1722	78.81%	1897	1583	83.45%
2	1863	1676	89.96%	1896	1582	83.44%	1873	1664	88.84%	2003	1766	88.17%	2067	1836	88.82%
3	2713	2462	90.75%	2780	2296	82.59%	2474	1987	80.32%	2711	2158	79.60%	2784	2271	81.57%
4	2984	2816	94.37%	3061	2685	87.72%	2981	2640	88.56%	3042	2768	90.99%	2849	2613	91.72%
5	1800	1441	80.06%	1880	1487	79.10%	1895	1460	77.04%	1908	1385	72.59%	2036	1556	76.42%
6	1309	1140	87.09%	1414	1192	84.30%	1349	1156	85.69%	1442	1202	83.36%	1408	1189	84.45%
7	3591	3308	92.12%	3776	3360	88.98%	3224	2814	87.28%	3091	2659	86.02%	2597	2314	89.10%
8	1569	1368	87.19%	1675	1320	78.81%	1625	1295	79.69%	1927	1482	76.91%	1545	1233	79.81%
9	957	836	87.36%	1063	910	85.61%	1000	845	84.50%	1163	949	81.60%	1113	948	85.18%
10	1890	1579	83.54%	2006	1627	81.11%	1854	1519	81.93%	2214	1684	76.06%	2553	2067	80.96%
11	2206	1836	83.23%	2261	1714	75.81%	1996	1512	75.75%	2295	1656	72.16%	2237	1474	65.89%
Total	22876	20217	88.38%	23725	19679	82.95%	22228	18532	83.37%	23981	19431	81.03%	23086	19084	82.66%

Reliability was very stable from 2011 to 2016, with most districts hovering near the 90% mark on a consistent basis. The introduction of automatic resource location (ARL) in 2017 had a major impact on this metric. ARL uses unit location and projected response times to select units, rather than relying on fixed recommendations based on district boundaries. The result of this system is that even though a unit may be available in their own station, another unit is chosen based on response time and unit status. A unit that is traveling through a district has a much greater chance of being selected due to the reduction of turn out time or the potential that they are just closer to the incident than the station district's own unit. This is actually a benefit to the community, ensuring the quickest possible response to calls for help.

Station	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1 - Leonard	90.32%	93.51%	92.07%	84.49%	86.99%	88.01%	78.72%	83.80%	78.81%	83.45%
2 - Franklin	90.60%	91.53%	90.84%	87.22%	95.78%	89.96%	83.44%	88.84%	88.17%	88.82%
3 - Bridge	87.19%	93.36%	85.06%	88.34%	92.62%	90.75%	82.59%	80.32%	79.60%	81.57%
4 - Kalamazoo	91.17%	93.32%	94.83%	90.76%	95.43%	94.37%	87.72%	88.56%	90.99%	91.72%
5 - Monroe	86.38%	94.07%	88.60%	81.17%	85.80%	80.06%	79.10%	77.04%	72.59%	76.42%
6 - Burton	87.26%	93.05%	90.43%	84.02%	87.16%	87.09%	84.30%	85.69%	83.36%	84.45%
7 - LaGrave	90.79%	92.77%	92.79%	85.41%	83.50%	92.12%	88.98%	87.28%	86.02%	89.10%
8 - Covell	88.29%	92.05%	86.09%	82.40%	85.82%	87.19%	78.81%	79.69%	76.91%	79.81%
9 - Plainfield	91.58%	91.09%	92.11%	81.78%	90.09%	87.36%	85.61%	84.50%	81.60%	85.18%
10 - Division	84.77%	91.98%	87.98%	82.55%	83.90%	83.54%	81.11%	81.93%	76.06%	80.96%
11 - Chester	82.72%	88.91%	88.71%	79.45%	83.39%	83.23%	75.81%	75.75%	72.16%	65.89%
Citywide	92.33%	89.96%	84.33%	88.20%	88.55%	88.38%	82.95%	83.37%	81.03%	82.66%

While reliability has stabilized since the introduction of Automatic Resource Location in 2017, it has highlighted the need to redraw district lines based on the realities of how CAD makes recommendations. This is particularly evident in Chester district, where the reliability has fallen below the 70% mark.
At the geographical planning zone level, as seen in the following map, reliability metrics closely mirror overall incident density. In zones with greater call volumes the reliability tends to suffer, as units from other districts are called in more frequently to provide assistance.

This map shows district reliability at the geographical planning zone level. Areas without color had no incident data to report.



Apparatus Responses

Apparatus response counts are an important metric when evaluating workloads, as a district may not be extremely busy within their first due area, but may provide critical second and even third unit responses to neighboring districts. As seen in the table below, four districts consistently have higher apparatus response counts; Franklin (2's), Bridge (3's), Kalamazoo (4's) and LaGrave (7's). These are also the districts that are typically staffed with two suppression units to accommodate this workload. Apparatus with less than 1% of total responses were not included in the data tables at the bottom of the page.

2016 - 2020 Citywide Apparatus Responses

District	2016	2017	2018	2019	2020	Total	% of Citywide Responses
1 - Leonard	2,202	1,804	1,983	2,208	1,971	10,168	6.40%
2 - Franklin	4,781	4,939	5,125	4,569	4,754	24,168	15.20%
3 - Bridge	4,078	4,124	3,716	4,074	3,913	19,905	12.52%
4 - Kalamazoo	3,794	3,641	3,607	3,993	3,854	18,889	11.88%
5 - Monroe	3,043	3,072	3,107	3,241	3,230	15,693	9.87%
6 - Burton	1,416	1,471	1,400	1,496	1,403	7,186	4.52%
7 - LaGrave	5,172	5,473	4,705	4,732	4,259	24,341	15.31%
8 - Covell	1,583	1,530	1,481	1,734	1,455	7,783	4.90%
9 - Plainfield	1,271	1,326	1,245	1,396	1,330	6,568	4.13%
10 - Division	2,058	2,184	2,073	3,213	3,556	13,084	8.23%
11 - Chester	2,379	2,514	2,166	2,268	1,853	11,180	7.03%
Totals	31,777	32,078	30,608	32,924	31,578	158,965	

2016 Apparatus Responses

Unit Name	Responses	% of Total Responses
Engine 11	2,379	7.49%
Engine 2	2,329	7.33%
Rescue 5	2,160	6.80%
Rescue 10	2,054	6.46%
Ladder 1/Platform 1	1,925	6.06%
Rescue 7	1,765	5.55%
Squad 7	1,703	5.36%
Squad 4	1,628	5.12%
Engine 8	1,583	4.98%
Engine 3	1,443	4.54%
Engine 6	1,416	4.46%
Ladder 3/Platform 3	1,319	4.15%
Squad 3	1,281	4.03%
Engine 9	1,267	3.99%
Ladder 4	1,168	3.68%
Ladder 2/Platform 2	1,012	3.18%
Medic 7	1,008	3.17%
Engine 4	991	3.12%
Car 6	882	2.78%
Car 5	859	2.70%
Engine 7	638	2.01%
Utility 2	547	1.72%

2017 Apparatus Responses

Unit Name	Responses	% of Total Responses
Engine 3	2,797	8.72%
Engine 4	2,708	8.45%
Squad 7	2,630	8.20%
Engine 11	2,514	7.84%
Engine 2	2,285	7.13%
Rescue 5	2,232	6.96%
Rescue 10	2,184	6.81%
Rescue 7	1,740	5.43%
Ladder 1/Platform 1	1,633	5.09%
Engine 8	1,530	4.77%
Engine 6	1,471	4.59%
Engine 9	1,323	4.13%
Ladder 3/Platform 3	1,292	4.03%
Platform 2	1,037	3.23%
Car 5	928	2.89%
Engine 7	921	2.87%
Ladder 4/ Platform 4	916	2.86%
Car 6	840	2.62%
Utility 2	631	1.97%

2018 Apparatus Responses

Unit Name	Responses	% of Total Responses
Squad 7	2,859	10.31%
Engine 4	2,628	9.48%
Engine 3	2,401	8.66%
Engine 2	2,272	8.19%
Rescue 5	2,200	7.94%
Engine 11	2,166	7.81%
Rescue 10	2,073	7.48%
Ladder 1/Platform 1	1,851	6.68%
Rescue 7	1,593	5.75%
Engine 8	1,481	5.34%
Engine 6	1,400	5.05%
Ladder 3/Platform 3	1,264	4.56%
Engine 9	1,239	4.47%
Platform 2	1,185	4.27%
Car 5	1,000	3.61%
Ladder 4/Platform 4	967	3.49%
Car 6	907	3.27%
Utility 2	644	2.32%

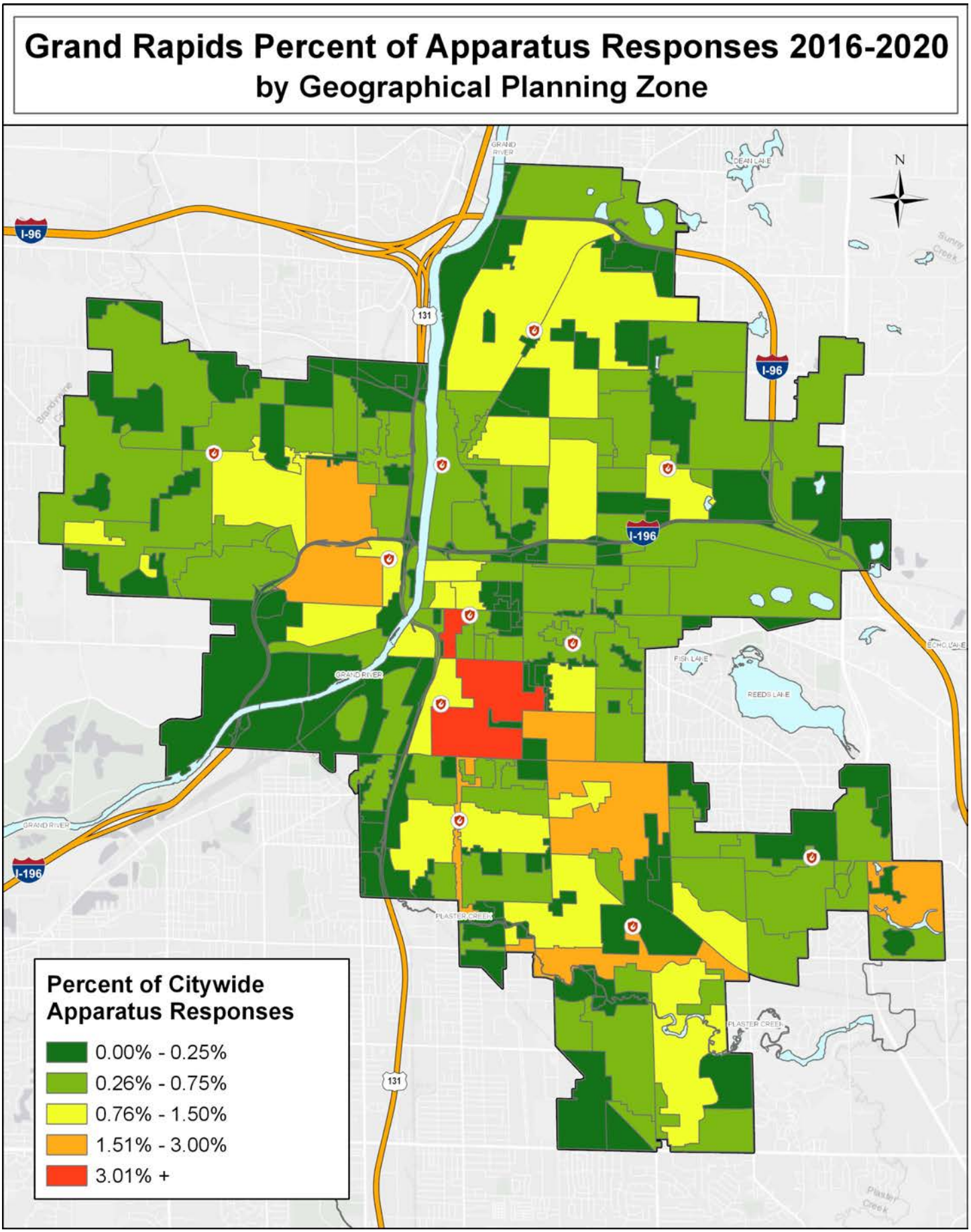
2019 Apparatus Responses

Unit Name	Responses	% of Total Responses
Engine 3	2,672	9.65%
Engine 2	2,626	9.49%
Engine 4	2,519	9.10%
Engine 7	2,373	8.57%
Rescue 7	2,296	8.29%
Engine 11	2,268	8.19%
Rescue 5	2,175	7.86%
Ladder 1	2,167	7.83%
Rescue 10	2,133	7.70%
Engine 8	1,734	6.26%
Engine 6	1,496	5.40%
Ladder 4/Platform 4	1,453	5.25%
Engine 9	1,390	5.02%
Platform 2	1,349	4.87%
Ladder 3/Platform 3	1,339	4.84%
Car 5	1,080	3.90%
Car 6	1,066	3.85%
Utility 2	582	2.10%

2020 Apparatus Responses

Unit Name	Responses	% of Total Responses
Engine 2	2,888	9.15%
Engine 3	2,696	8.54%
Engine 4	2,664	8.44%
Engine 10/Rescue 10	2,501	7.92%
Engine 5/Rescue 5	2,254	7.14%
Rescue 7/Rescue 1	2,156	6.83%
Engine 7/Rescue 2	2,028	6.42%
Ladder 1	1,949	6.17%
Engine 11	1,853	5.87%
Engine 8	1,455	4.61%
Engine 6	1,403	4.44%
Engine 9	1,329	4.21%
Platform 2	1,320	4.18%
Ladder 4/Platform 4	1,174	3.72%
Ladder 3/Platform 3	1,174	3.72%
Car 5	1,055	3.34%
Car 6	975	3.09%
Utility 2	520	1.65%

This map shows the percentage of apparatus responses at the geographical planning zone level.



Apparatus Deployed Hours

Another perspective is not only the count of incidents, but the amount of time a unit is deployed on an emergency scene. In addition to the three districts mentioned for incident volume (3, 4, and 7), another trend emerges with station 2. This station accounted for the highest total amount of deployed time. This is in part due to a battalion chief (from 2016-2018) and Utility 2 responding from this station, in addition to Engine 2 and Platform 2. Utility 2 logs extended deployment times due to its role as a blocker for freeway incidents. Apparatus with less than 1% deployed time were not included in the data tables at the bottom.

2016 - 2020 Citywide Apparatus Deployed Hours

Station	2016	2017	2018	2019	2020	Total	% of Citywide Deployed Hours
1 - Leonard	667:43:30	579:36:39	599:14:33	752:01:12	659:44:06	3258:20:00	6.71%
2 - Franklin	1607:15:46	1689:10:50	1709:38:05	1537:53:44	1599:29:27	8143:27:52	16.77%
3 - Bridge	1098:03:43	1173:25:39	1132:05:33	1250:33:14	1159:52:48	5814:00:57	11.97%
4 - Kalamazoo	1243:57:12	1176:18:51	1111:29:02	1279:40:19	1171:26:50	5982:52:14	12.32%
5 - Monroe	984:13:33	955:58:52	971:38:01	1037:26:29	1020:44:00	4970:00:55	10.23%
6 - Burton	473:12:55	462:00:30	456:41:36	495:15:38	440:08:30	2327:19:09	4.79%
7 - LaGrave	1228:40:15	1335:10:24	1199:34:01	1333:36:58	1148:05:50	6245:07:28	12.86%
8 - Covell	536:17:26	489:16:25	499:12:02	565:22:41	500:38:39	2590:47:13	5.33%
9 - Plainfield	445:14:56	401:12:28	408:02:03	428:37:06	420:24:28	2103:31:01	4.33%
10 - Division	598:00:32	647:16:33	572:15:59	1000:15:26	1062:31:08	3880:19:38	7.99%
11 - Chester	667:07:52	736:19:51	602:05:04	667:40:43	576:43:39	3249:57:09	6.69%
Totals	9549:47:40	9645:47:02	9261:55:59	10348:23:30	9759:49:25	48565:43:36	

2016 Apparatus Deployed Hours

Unit Name	Deployed Hours	% of Total Hours
Engine 11	667:07:52	6.99%
Engine 2	661:18:34	6.92%
Rescue 5	660:24:00	6.92%
Rescue 10	594:46:55	6.23%
Ladder 1/Platform 1	591:01:55	6.19%
Engine 8	536:17:26	5.62%
Squad 4	515:12:28	5.40%
Engine 6	473:12:55	4.96%
Rescue 7	454:45:58	4.76%
Engine 9	443:39:13	4.65%
Ladder 4	405:07:13	4.24%
Ladder 3/Platform 3	399:19:58	4.18%
Squad 7	365:31:01	3.83%
Engine 3	358:56:17	3.76%
Ladder 2/Platform 2	323:52:32	3.39%
Car 6	323:27:07	3.39%
Car 5	321:38:44	3.37%
Squad 3	320:19:05	3.35%
Engine 4	314:19:59	3.29%
Utility 2	280:29:12	2.94%
Medic 7	197:23:01	2.07%
Engine 7	163:36:17	1.71%

2017 Apparatus Deployed Hours

Unit Name	Deployed Hours	% of Total Hours
Engine 4	833:21:52	8.65%
Engine 3	746:16:13	7.74%
Engine 11	736:19:51	7.64%
Engine 2	660:21:39	6.85%
Rescue 10	647:16:33	6.72%
Rescue 5	645:02:24	6.69%
Squad 7	566:17:49	5.88%
Ladder 1/Platform 1	523:51:16	5.44%
Engine 8	489:16:25	5.08%
Engine 6	462:00:30	4.79%
Rescue 7	453:39:41	4.71%
Ladder 3/Platform 3	405:41:13	4.21%
Engine 9	400:21:10	4.15%
Car 5	345:58:58	3.59%
Platform 2	341:14:39	3.54%
Ladder 4/ Platform 4	326:10:57	3.38%
Car 6	310:56:28	3.23%
Utility 2	306:02:29	3.18%
Engine 7	220:58:59	2.29%

2018 Apparatus Deployed Hours

Unit Name	Deployed Hours	% of Total Hours
Engine 4	777:56:49	8.40%
Squad 7	685:58:18	7.41%
Engine 3	674:50:30	7.29%
Engine 2	660:46:03	7.14%
Rescue 5	645:35:14	6.97%
Engine 11	602:05:04	6.50%
Rescue 10	572:15:59	6.18%
Ladder 1/Platform 1	555:08:41	6.00%
Engine 8	499:12:02	5.39%
Engine 6	456:41:36	4.93%
Rescue 7	433:08:11	4.68%
Ladder 3/Platform 3	416:06:29	4.50%
Engine 9	405:56:55	4.39%
Platform 2	364:55:37	3.94%
Car 5	339:11:25	3.66%
Utility 2	328:35:24	3.55%
Car 6	326:02:47	3.52%
Ladder 4/Platform 4	322:54:59	3.49%

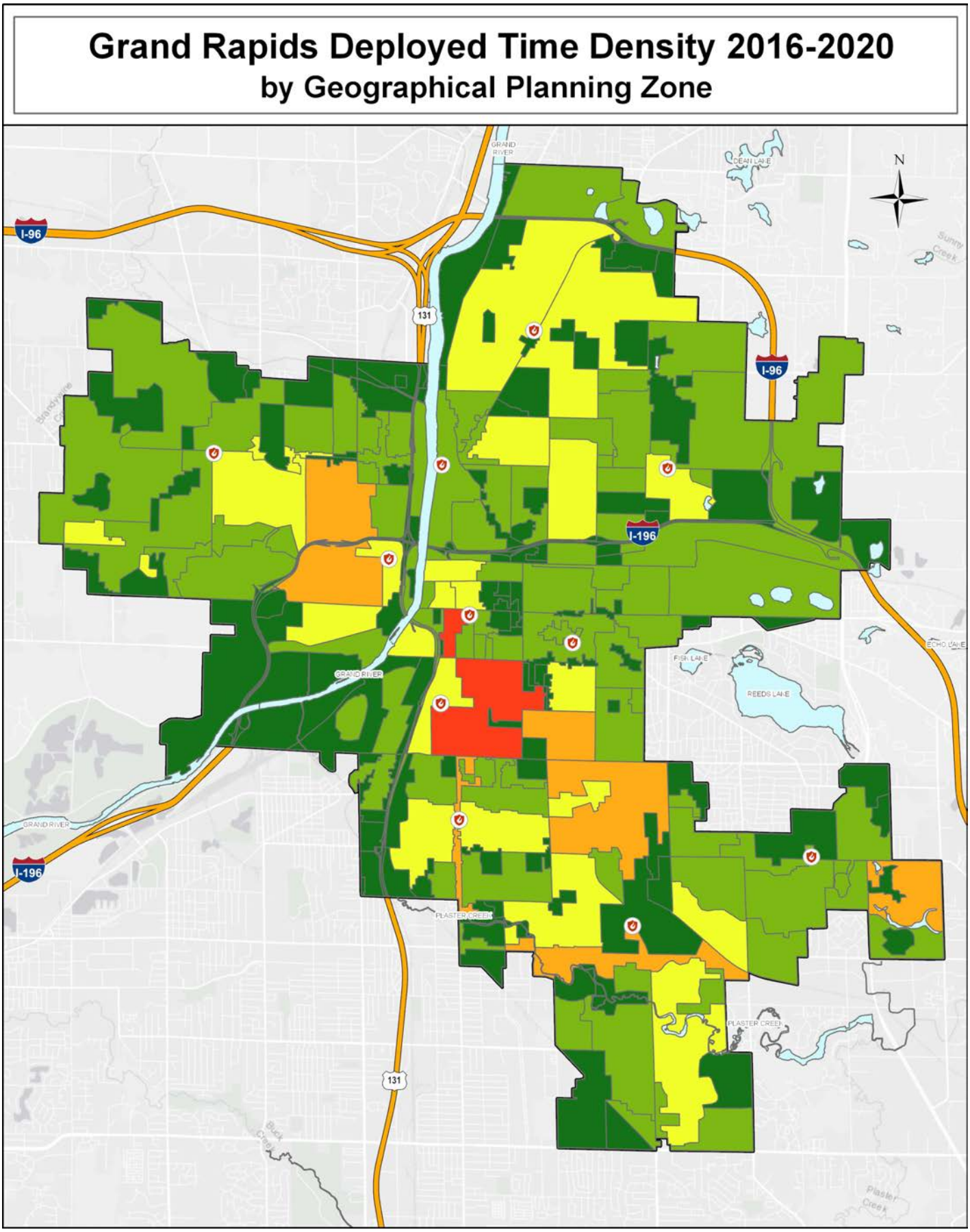
2019 Apparatus Deployed Hours

Unit Name	Deployed Hours	% of Total Hours
Engine 4	792:57:48	7.65%
Engine 2	760:21:46	7.33%
Engine 3	758:46:58	7.32%
Ladder 1	710:22:22	6.85%
Rescue 5	682:51:46	6.58%
Engine 7	672:38:08	6.49%
Engine 11	667:40:43	6.44%
Rescue 10	641:05:25	6.18%
Rescue 7	608:50:29	5.87%
Engine 8	565:22:41	5.45%
Engine 6	495:15:38	4.78%
Ladder 4/Platform 4	459:50:12	4.43%
Platform 2	446:02:19	4.30%
Ladder 3/Platform 3	426:33:52	4.11%
Engine 9	424:44:10	4.10%
Car 5	359:10:01	3.46%
Car 6	354:34:43	3.42%
Utility 2	316:05:24	3.05%

2020 Apparatus Deployed Hours

Unit Name	Deployed Hours	% of Total Hours
Engine 2	851:29:58	8.72%
Engine 4	765:19:46	7.84%
Engine 3	741:12:21	7.59%
Engine 10/Rescue 10	719:53:06	7.37%
Engine 5/Rescue 5	710:00:52	7.27%
Ladder 1	640:37:24	6.56%
Engine 11	576:43:39	5.91%
Rescue 7/Rescue 1	542:51:34	5.56%
Engine 7/Rescue 2	542:25:22	5.56%
Engine 8	500:38:39	5.13%
Engine 6	440:08:30	4.51%
Platform 2	423:19:27	4.34%
Engine 9	418:44:03	4.29%
Ladder 4/Platform 4	381:42:58	3.91%
Ladder 3/Platform 3	370:56:20	3.80%
Car 5	342:38:02	3.51%
Car 6	309:37:32	3.17%
Utility 2	300:34:36	3.08%

In addition to looking at deployed time by district and apparatus, viewing at the geographical planning zone level shows where the GRFD is allocating the largest amount of time within very specific zones.



Unit Hour Utilization – Availability

Although emergency response and deployed hours are a very important focus for the GRFD, another factor analyzed is both the emergency and non-emergency unit hour utilization (UHU). This measurement assesses how much time a unit is committed out of a 24 hour shift by dividing the emergency and non-emergency hours by the total hours in the shift, resulting in a utilization factor that is displayed as a percentage. If a unit was busy for the entire 24 hours, they would have a factor of 1, indicating 100% activity. Aligning with the organization's pillars, daily focus is targeted on the response, training, prevention, wellness and support services areas. 67% of a suppression crew's 24 hour day is generally pre-scheduled.

Activity	Hours
Training	2
Prevention	2
Maintenance	2.5
Wellness	1
Meals	2
Breaks	0.5
Sleep	6
Total	16
UHU	0.67

Factoring in emergency response UHU's is a contributing factor to several districts requiring the deployment of two apparatus. As a unit crosses the .15 threshold (2,500 emergency responses per year) other actions are investigated to assist the unit with meeting both their emergency and non-emergency workloads. As units near the 3,000 response per year level (.18 UHU), measures have to be taken to ensure non-emergency outcomes such as training or prevention remain possible to accomplish. An example of this has been implemented in the Kalamazoo district, where the ladder is now responding to calls traditionally assigned to the engine in an effort to balance the workload between the two apparatus. The emergency UHU's in the tables to the right and below were calculated by using actual deployed times on an incident, plus a fifteen minute allocation for each call to return to the station, complete required paperwork, and restock the apparatus to ensure it is ready for the next emergency incident.

Citywide Apparatus UHU	
Unit	2016
Engine 11	0.14
Engine 2	0.14
Rescue 5	0.13
Engine 10/Rescue 10	0.12
Ladder 1/Platform 1	0.12
Engine 8	0.10
Squad 4	0.10
Rescue 7	0.10
Engine 6	0.09
Squad 7	0.09
Engine 9	0.09
Ladder 3/Platform 3	0.08
Engine 3	0.08
Ladder 4/Platform 4	0.08
Squad 3	0.07
Ladder 2/Platform 2	0.06
Engine 4	0.06
Car 6	0.06
Car 5	0.06
Medic 7	0.05
Utility 2	0.05
Engine 7/Rescue 2	0.04
Medic 1	0.01

Citywide Apparatus UHU	
Unit	2017
Engine 4	0.17
Engine 3	0.16
Engine 11	0.15
Engine 2	0.14
Squad 7	0.14
Rescue 5	0.14
Engine 10/Rescue 10	0.13
Ladder 1/Platform 1	0.10
Rescue 7	0.10
Engine 8	0.10
Engine 6	0.09
Engine 9	0.08
Ladder 3/Platform 3	0.08
Ladder 2/Platform 2	0.07
Car 5	0.07
Ladder 4/Platform 4	0.06
Car 6	0.06
Utility 2	0.05
Engine 7/Rescue 2	0.05
Medic 7	0.01
Squad 1	0.01

Citywide Apparatus UHU	
Unit	2018
Engine 4	0.16
Squad 7	0.16
Engine 3	0.14
Engine 2	0.14
Rescue 5	0.13
Engine 11	0.13
Engine 11	0.13
Engine 10/Rescue 10	0.12
Ladder 1/Platform 1	0.11
Engine 8	0.10
Rescue 7	0.09
Engine 6	0.09
Ladder 3/Platform 3	0.08
Engine 9	0.08
Ladder 2/Platform 2	0.07
Car 5	0.07
Ladder 4/Platform 4	0.06
Car 6	0.06
Utility 2	0.06
Engine 7/Rescue 2	0.01
Squad 1	0.01

Citywide Apparatus UHU	
Unit	2019
Engine 3	0.16
Engine 4	0.16
Engine 2	0.16
Engine 7/Rescue 2	0.14
Ladder 1/Platform 1	0.14
Engine 11	0.14
Rescue 5	0.14
Rescue 7	0.13
Engine 10/Rescue 10	0.13
Engine 8	0.11
Engine 6	0.10
Ladder 4/Platform 4	0.09
Ladder 2/Platform 2	0.09
Engine 9	0.09
Ladder 3/Platform 3	0.09
Car 5	0.07
Car 6	0.07
Utility 2	0.05
Brush 3	0.01

Citywide Apparatus UHU	
Unit	2020
Engine 2	0.18
Engine 4	0.16
Engine 3	0.16
Engine 10/Rescue 10	0.15
Engine 5/Rescue 5	0.14
Ladder 1/Platform 1	0.13
Rescue 7/Rescue 1	0.12
Engine 7/Rescue 2	0.12
Engine 11	0.12
Engine 8	0.10
Engine 6	0.09
Ladder 2/Platform 2	0.08
Engine 9	0.08
Ladder 4/Platform 4	0.08
Ladder 3/Platform 3	0.07
Car 5	0.07
Car 6	0.06
Utility 2	0.05

Simultaneous Analysis

Simultaneous alarms arise when a second emergency incident occurs within a defined area while a preceding incident is still underway. Stations with high simultaneous alarm rates often require a second unit in house to assist. This metric is viewed at the citywide level (when one alarm is dispatched, there is a 57.88% chance of another alarm occurring somewhere in the city), at the station level, and at the geographical planning zone level. Simultaneous call level can also be impacted by major storms, when multiple calls for assistance are generated within a short time frame. This effect can be seen in 2019, when severe weather in February and September caused a large increase of calls.

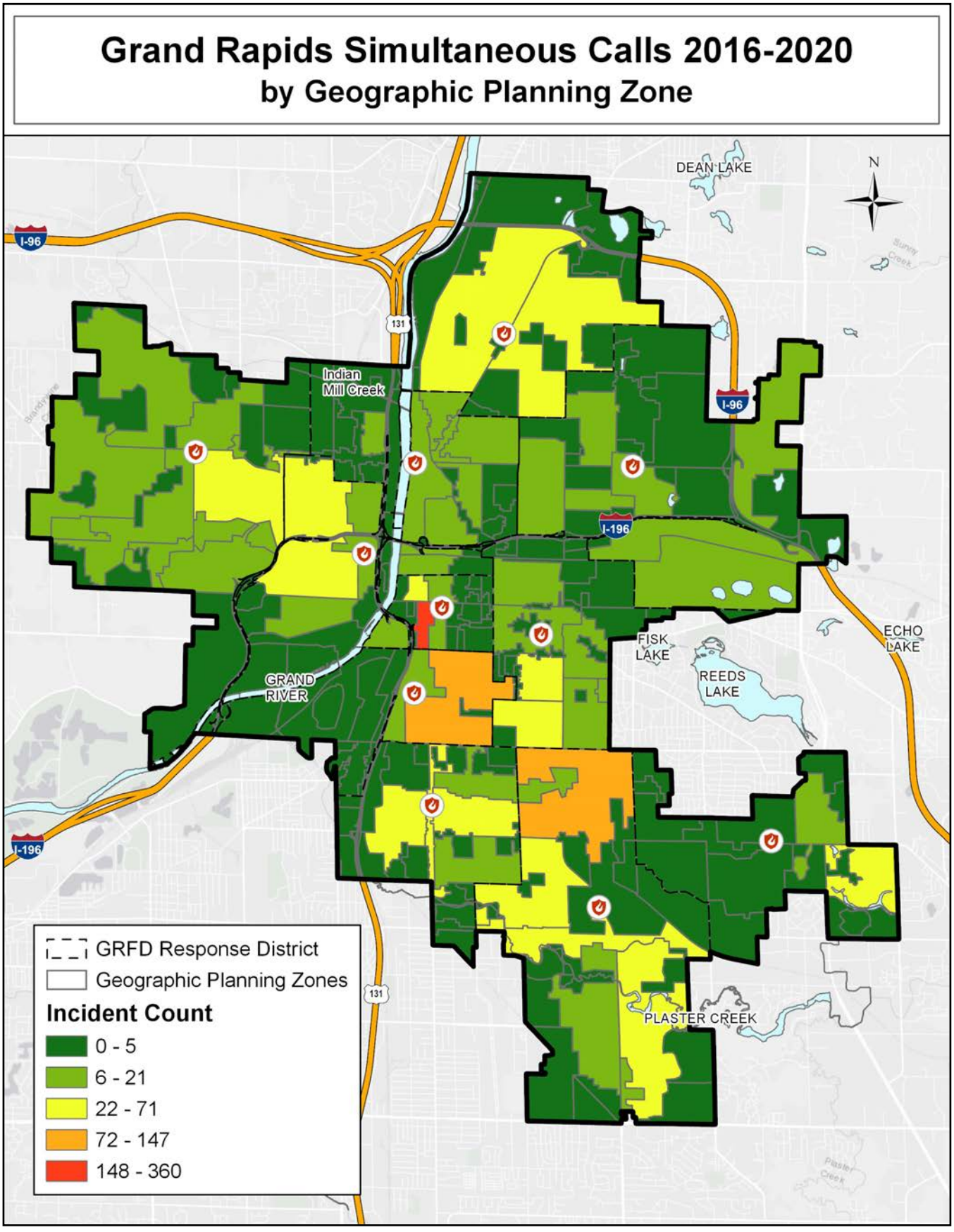
At the station district level, many locations have simultaneous percentages near 10%. Bridge St. (3's), Kalamazoo Ave. (4's) , and LaGrave Ave. (7's) have seen consistently higher simultaneous alarm rates over a ten year period. Recent trends have seen some districts (1's, 10's and 11's) steadily increasing. This will continue to be an area of focus, as the second unit into these areas will be responding from quite a distance to answer the second alarm.

City Wide Simultaneous Alarm Percentages	
2011	54.80%
2012	56.04%
2013	51.81%
2014	56.18%
2015	55.29%
2016	60.04%
2017	59.60%
2018	63.15%
2019	61.05%
2020	57.88%

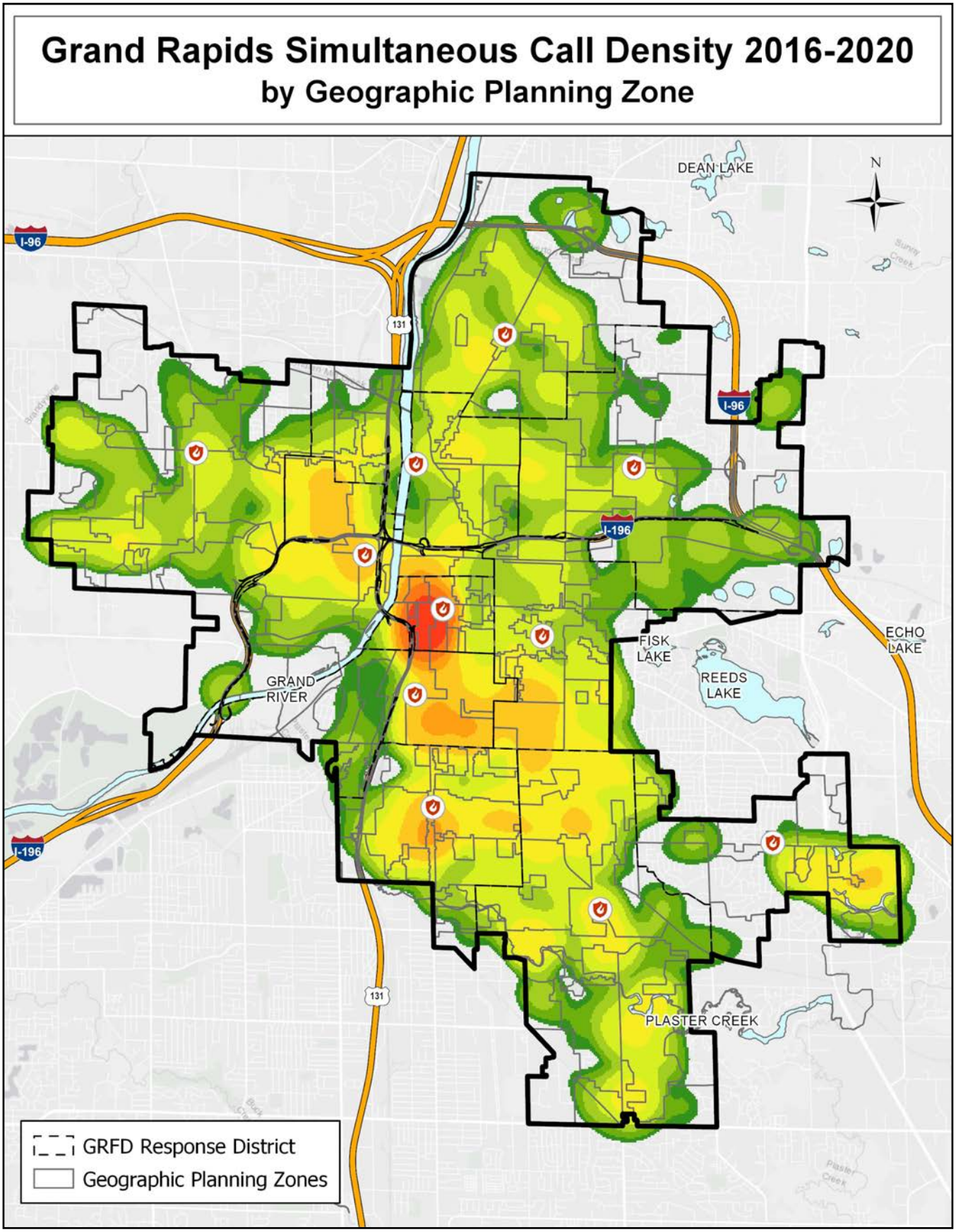
Simultaneous Call Percentage by Station District										
Station	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1 - Leonard	4.95%	5.64%	6.86%	8.70%	6.97%	9.23%	7.70%	7.57%	12.89%	8.79%
2 - Franklin	6.39%	6.52%	5.03%	5.60%	7.30%	6.61%	7.05%	7.35%	7.85%	7.10%
3 - Bridge	9.14%	9.00%	9.07%	9.54%	10.19%	10.01%	11.49%	9.62%	10.62%	10.18%
4 - Kalamazoo	8.92%	9.87%	11.31%	10.79%	11.56%	12.73%	13.70%	22.65%	13.07%	10.27%
5 - Monroe	4.74%	5.89%	6.90%	5.37%	8.59%	8.25%	6.75%	7.45%	11.69%	8.41%
6 - Burton	4.16%	4.29%	4.85%	4.43%	6.07%	4.80%	5.50%	6.07%	6.90%	5.97%
7 - LaGrave	10.50%	10.97%	9.72%	10.32%	7.45%	9.81%	10.49%	11.71%	11.22%	7.88%
8 - Covell	6.31%	7.40%	6.52%	7.22%	7.28%	7.31%	9.39%	7.84%	13.15%	7.45%
9 - Plainfield	4.39%	2.69%	3.62%	4.14%	6.68%	3.96%	5.27%	4.59%	10.40%	5.51%
10 - Division	7.69%	6.72%	8.70%	6.71%	7.18%	9.53%	9.31%	8.00%	9.38%	9.91%
11 - Chester	6.12%	4.88%	7.69%	8.57%	7.05%	9.00%	11.59%	8.61%	11.80%	8.10%

Simultaneous Call Volume by Station District										
Station	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1 - Leonard	97	93	131	157	130	186	148	149	283	167
2 - Franklin	111	101	76	93	124	124	135	134	154	142
3 - Bridge	232	198	238	266	272	273	322	235	284	278
4 - Kalamazoo	237	228	312	281	312	380	421	676	398	292
5 - Monroe	84	100	129	99	165	149	128	142	224	171
6 - Burton	48	43	58	54	79	63	78	82	100	84
7 - LaGrave	357	334	317	365	342	358	399	387	354	211
8 - Covell	107	117	106	117	115	115	158	128	254	115
9 - Plainfield	42	21	31	38	61	38	56	46	122	61
10 - Division	136	107	153	119	134	181	188	149	208	253
11 - Chester	101	68	149	171	144	199	263	174	274	182

This map shows the count of simultaneous incidents within each geographical planning zone over the last five years.



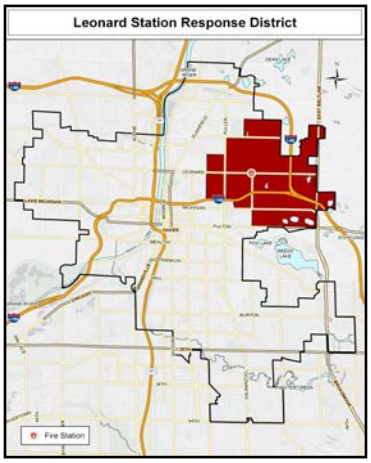
This heat map shows the comparative density of simultaneous incidents across the jurisdiction over the last five years.

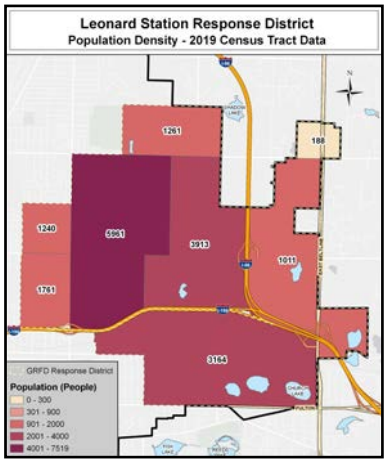



TRU
BUILDING
CONCEPTS


ARE YOU READY...?

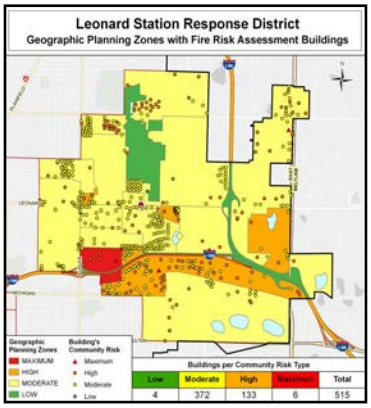
Station Level Analysis

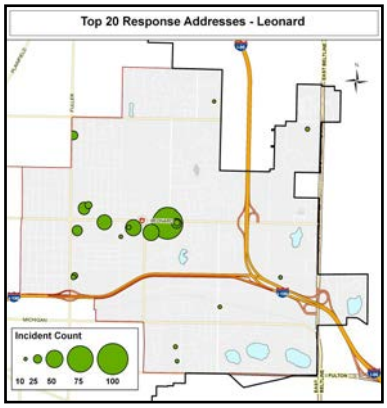




Response District - This page contains a basic overview of the district and contains a map which shows the fire district in relation to the city boundaries.

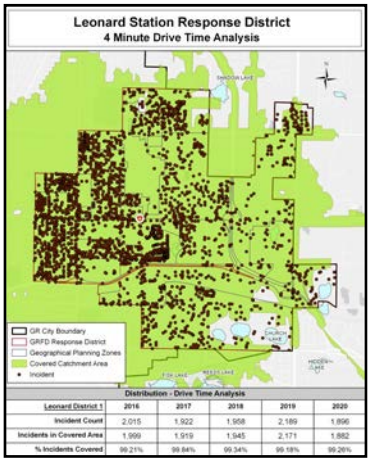
Population Density - Information about district demographics is presented in tabular form along with a map displaying 2019 Census tract population data within the fire district.

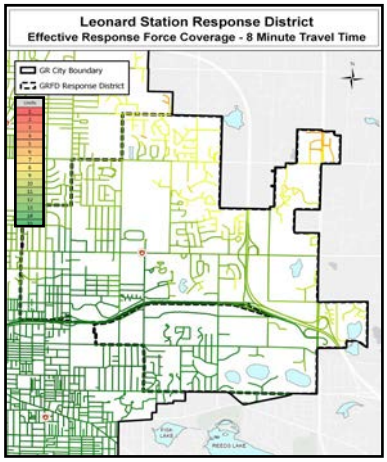




Risk Assessment - Geographic planning zones for the district are defined, along with the risk classifications. Taxable values for four categories of structures are presented in a table.

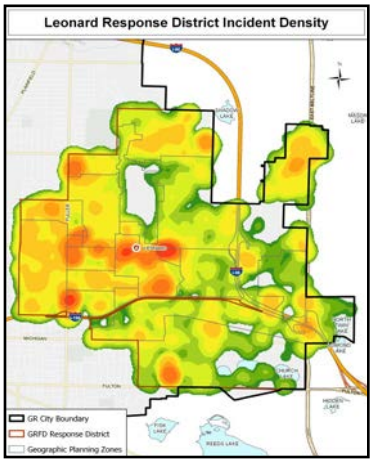
Specific Location Risks - The top 20 addresses for all incident types are shown with incident counts included. A narrative of various risks is supplemented by a table listing all of the maximum risk structures in the district.





Distribution - This map shows the anticipated district coverage from the station within 4 minutes of drive time. Drive times for this section are based on street speeds used by CAD. Actual incidents are plotted against this catchment area.

Concentration - This map shows the ability to assemble an effective response force (ERF) within an eight minute travel time in given areas of the district.



Temporal Analysis 2016 - 2020 EMS

Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	23	26	20	23	32	16	22	162
01:00-01:59	22	23	17	18	13	26	25	144
02:00-02:59	18	15	25	15	15	12	30	130
03:00-03:59	19	18	20	12	22	16	15	122
04:00-04:59	14	20	18	19	17	20	17	125
05:00-05:59	26	18	17	21	28	19	18	147
06:00-06:59	25	31	23	30	24	25	33	191
07:00-07:59	39	41	46	36	38	38	27	265
08:00-08:59	25	52	50	58	57	57	34	333
09:00-09:59	43	50	67	56	55	52	37	360
10:00-10:59	55	57	84	57	60	49	54	416
11:00-11:59	52	63	50	60	51	65	42	383
12:00-12:59	49	57	58	56	63	59	42	384
13:00-13:59	61	61	60	67	56	51	36	392
14:00-14:59	41	48	53	62	60	62	40	366
15:00-15:59	44	54	64	42	61	64	38	367
16:00-16:59	44	60	73	62	62	59	43	403
17:00-17:59	41	59	61	45	51	56	49	362
18:00-18:59	50	35	35	48	52	39	56	315
19:00-19:59	38	33	38	46	46	55	40	296
20:00-20:59	40	39	49	39	47	46	35	295
21:00-21:59	42	37	36	44	47	29	42	277
22:00-22:59	43	30	31	36	30	30	32	232
23:00-23:59	22	22	26	12	27	32	23	164
Total	876	949	1,021	964	1,014	977	830	6,631

Response Data - This heat map of all incidents shows the historical incident volume across the district. There are also data tables for station and apparatus service demand.

Temporal and Baseline Analysis - This table provides historical information on the day and time of incidents. Reliability and simultaneous data are presented, along with baseline performance for the district.

LEONARD RESPONSE DISTRICT - 01

Quick Facts

Station 1 ..... Leonard Street Fire Station

Address .....1755 Leonard St. NE

Station Built.....1981

Frontline Apparatus ..... Ladder 1

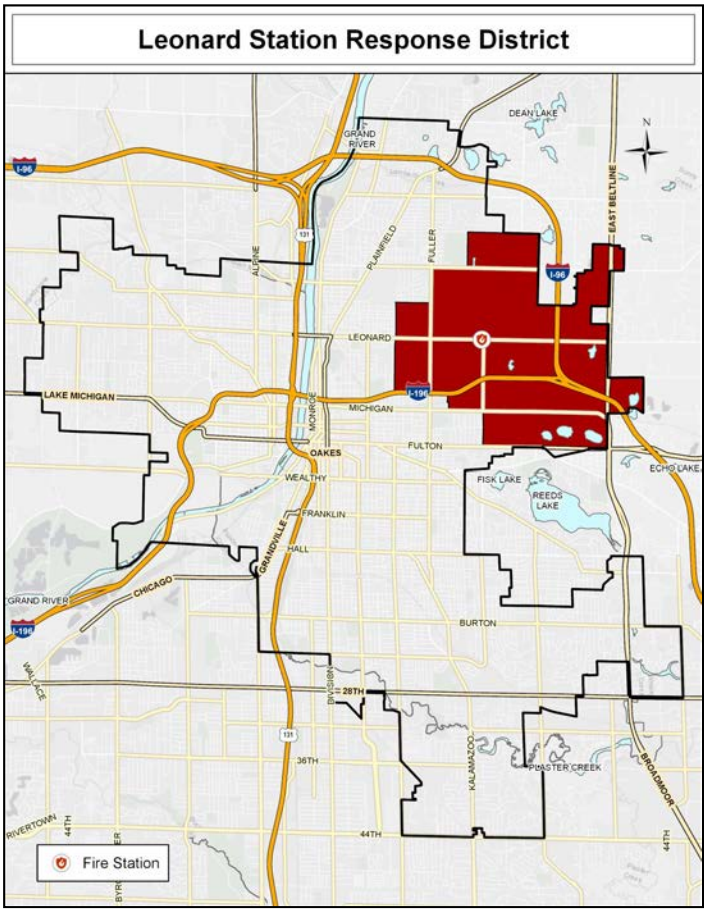
Reserve Apparatus.....Reserve Engine 13

Cross Staffed Apparatus ..... Brush Unit 1

Square Miles.....6.92

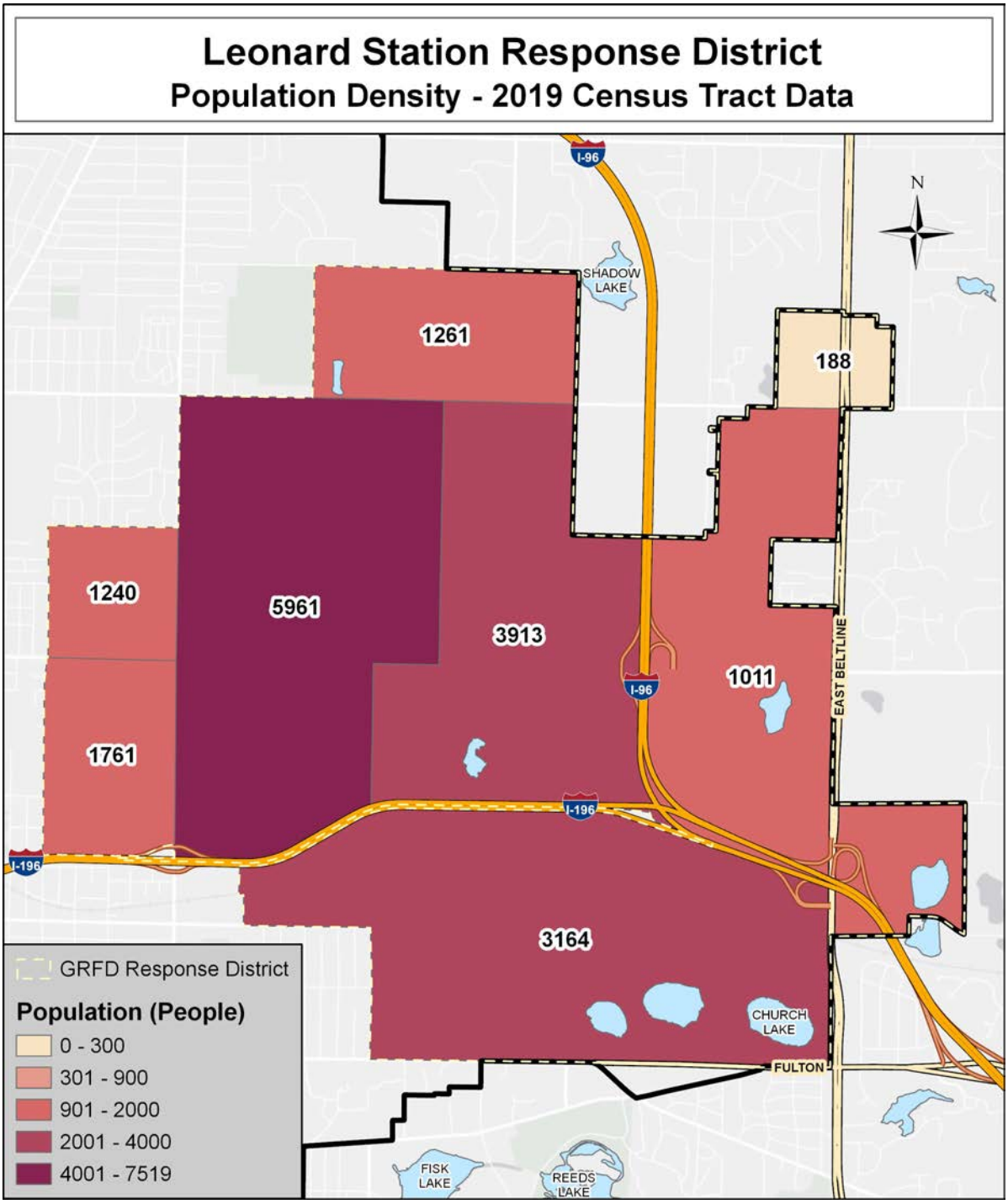
Road Miles.....85.89

Hydrants.....931



District Characteristics:

The second largest district in Grand Rapids is situated in a heavily residential area, with pockets of commercial zones and a small industrial area mainly clustered around the expressway (I-196) running through the southern portion of the district. Cornerstone University calls the south-east corner of the district home. This station is the easternmost of three stations situated on Leonard Street, a major east-west road in the northern section of the city.



Population/Demographics:

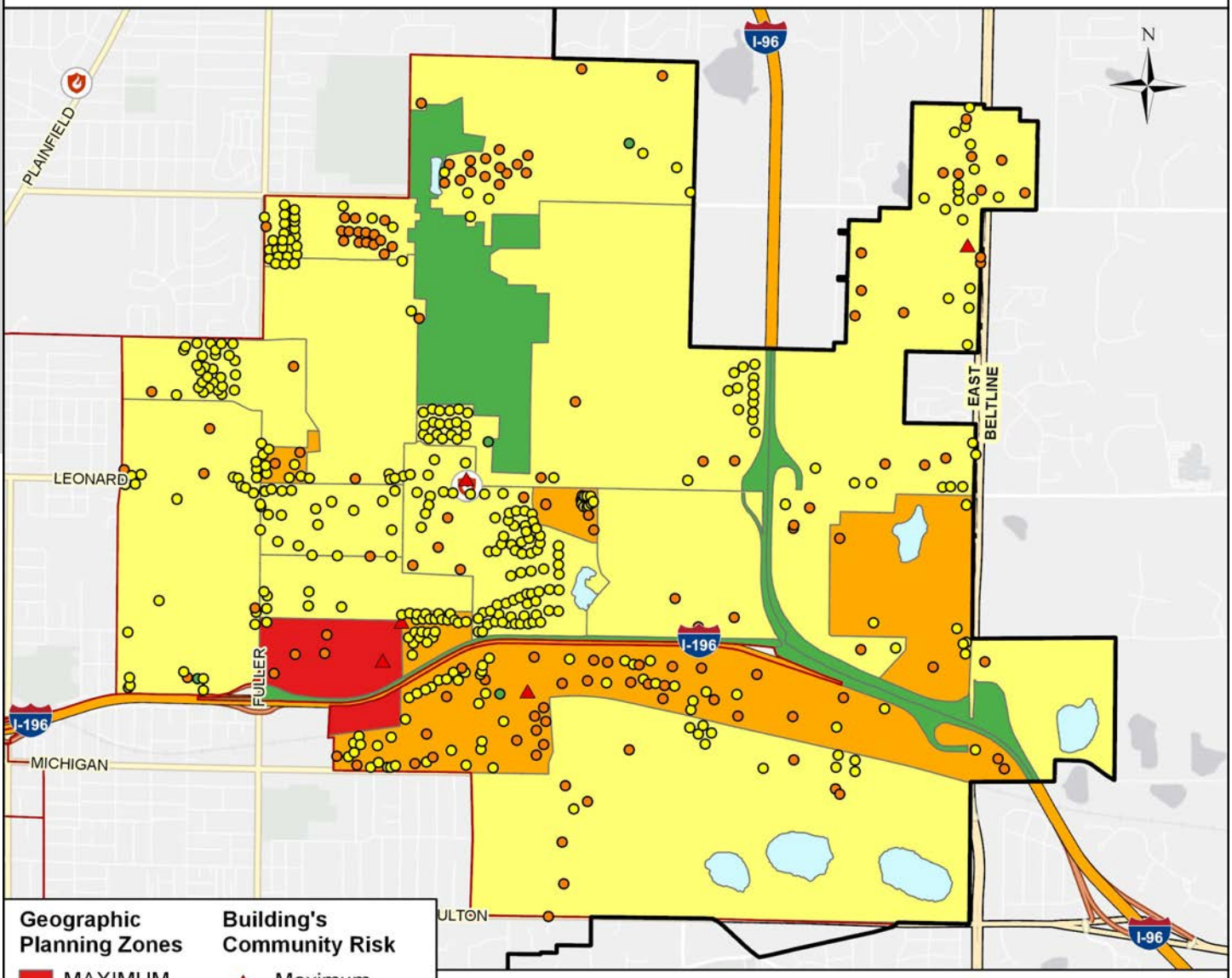
The Leonard station response district contains 18,499 residents and comprises 9.59% of the city's population. Population density is 2,699 people per square mile. This analysis is based on data gathered from the 2019 US Census Bureau 5-year estimates. The district is predominately urban, with a small rural designation in the northeast corner due to a concentration of commercial activity.

District	Population	< 5 Years Old	< 18 Years Old	> 65 Years Old	Median Age	White	Black or African American	American Indian or Alaskan Native	Asian	Hispanic
1	18,499	1,079	3,699	2,897	36	13,089	3,851	24	503	825
GR Total	192,962	13,489	43,300	23,232	31	129,942	35,575	680	4,519	31,357
% of City	9.59%	8.00%	8.54%	12.47%	115.64%	10.07%	10.83%	3.53%	11.13%	2.63%

LEONARD RESPONSE DISTRICT - 01

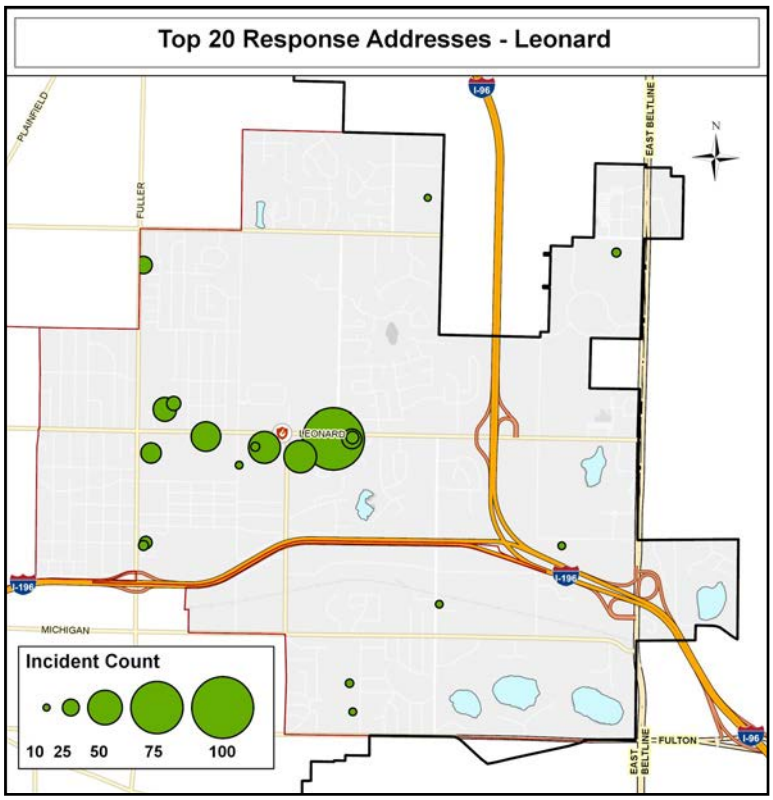
Leonard Station Response District

Geographic Planning Zones with Fire Risk Assessment Buildings



Buildings per Community Risk Type				
Low	Moderate	High	Maximum	Total
4	372	133	6	515

District	Residential Occupancies	Industrial Occupancies	Commercial Occupancies	Tax Exempt	Total Square Ft	Taxable Value	Average Building Age (Years)	Needed Fire Flow over 3500 GPM	Sprinklered Buildings
1	4,890	24	198	50	9,971,825	$556,477,234	56.02	153	150
Citywide	55,506	269	3,364	821	124,272,758	4,950,657,315	82.36	1,485	1,180
% of City	8.81%	8.92%	5.89%	6.09%	8.02%	11.24%	68.01%	10.30%	12.71%



Top 20 Response Addresses	Incident Count
2000 LEONARD Street NE	88
1150 PLYMOUTH Avenue NE	47
1700 LEONARD Street NE	46
1450 LEONARD Street NE	43
1315 LEONARD Street NE	34
1230 EKHART Street NE	30
2106 LEONARD Street NE	29
1802 PLUM HOLLOW Lane NE	26
1319 LEONARD Street NE	21
2110 LEONARD Street NE	19
790 FULLER Avenue NE	19
750 FULLER Avenue NE	15
1642 LEONARD Street NE	14
1997 EAST BELTLINE Avenue NE	14
153 LAKESIDE Drive NE	13
1054 BALL Avenue NE	12
111 LAKESIDE Drive NE	12
2902 BRADFORD Street NE	12
540 MARYLAND Court NE	12
2355 KNAPP Street NE	11

Risk Assessment:

Fire: 16.25% of the district's area is classified as high or maximum geographical planning zones for fire risk. There are 153 occupancies with a needed fire flow over 3,500 GPM and the district incorporates 11.24% of the city's taxable value.

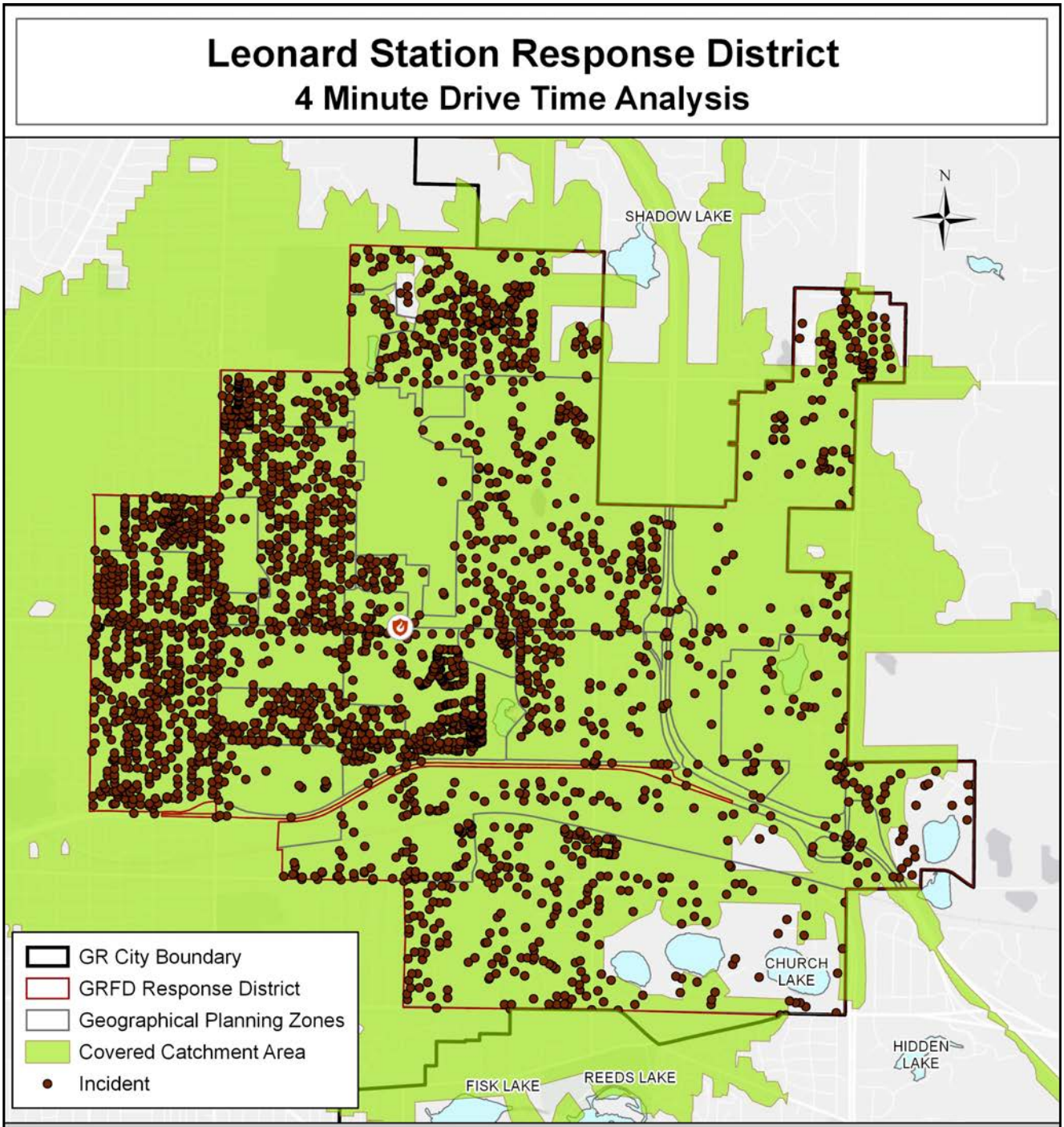
Vehicle accidents: At the intersection of Knapp/East Beltline on the edge of district. I196/I96 changeover, most vehicle accidents were slide offs.

EMS: Crews noted lack of communication with staff on arrival at AFC and nursing homes. Crews also noted sick people at homeless camps in a roadless section of the district along with unsanitary living conditions. The Homeless Outreach Team is aware and actively working with the camp residents. A lack of visible addresses may delay response for building locations in the Bradford/Mason area. Maryland Ct. – Crews anticipate any call in this area to be drug/opioid related. Opioid/drug responses are more likely to occur in vehicles/parking lots than residences. The district has one dialysis center with a high call volume.

Maximum Risk Buildings For Leonard District	
1755 LEONARD ST NE	Leonard Street Fire Station
1900 OAK INDUSTRIAL DR NE	Grand Rapids Water System
1999 EAST BELTLINE AVE NE	Meijer Grocery Store
701 BALL AVE NE	Kent County Sheriff's Office
703 BALL AVE NE	Kent County Correctional Facility
750 FULLER AVE NE	Spectrum Health Rehab & Nursing

Distribution - Four Minute Drive Time Analysis

The majority of call volume for this district is relatively close to the station. Recent commercial development in the outlying areas of the district, along with analysis of the drive times for catchment areas, has highlighted the distribution challenges in a district of this size. Analysis of drive times in this section are based on the street speed layer used by CAD (computer-aided dispatch).

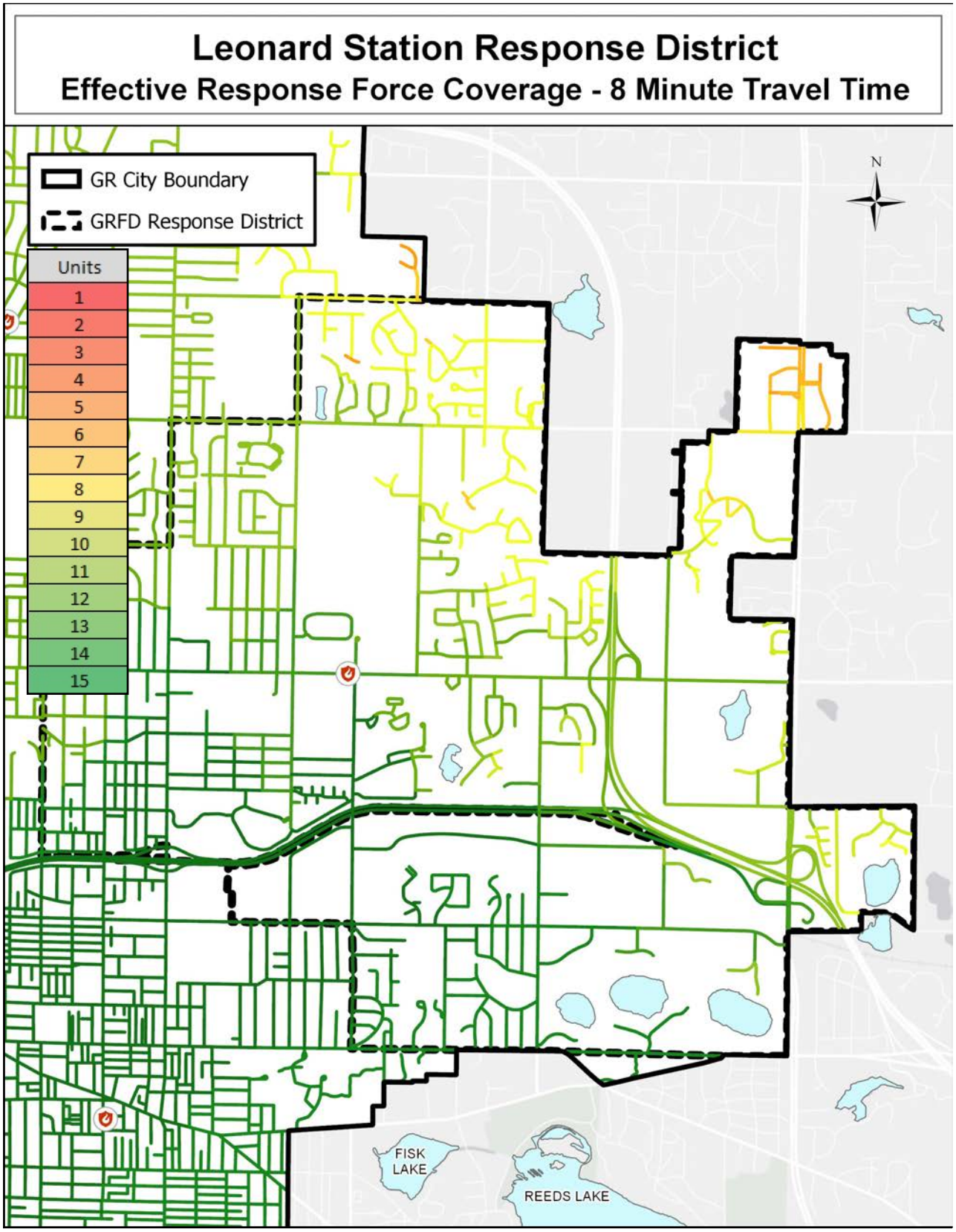


Distribution - Drive Time Analysis

Leonard District 1	2016	2017	2018	2019	2020
Incident Count	2,015	1,922	1,958	2,189	1,896
Incidents in Covered Area	1,999	1,919	1,945	2,171	1,882
% Incidents Covered	99.21%	99.84%	99.34%	99.18%	99.26%

Concentration - District Effective Response Force Analysis Map

This map depicts the number of units that can be assembled in the district within the multiple unit benchmark travel time of 8 minutes. Leonard's district has wide variations in effective response force coverage due to the travel times for outlying areas, especially along the eastern border of the district. Leonard only shares a border with three districts, each staffed with one frontline apparatus.



LEONARD RESPONSE DISTRICT - 01

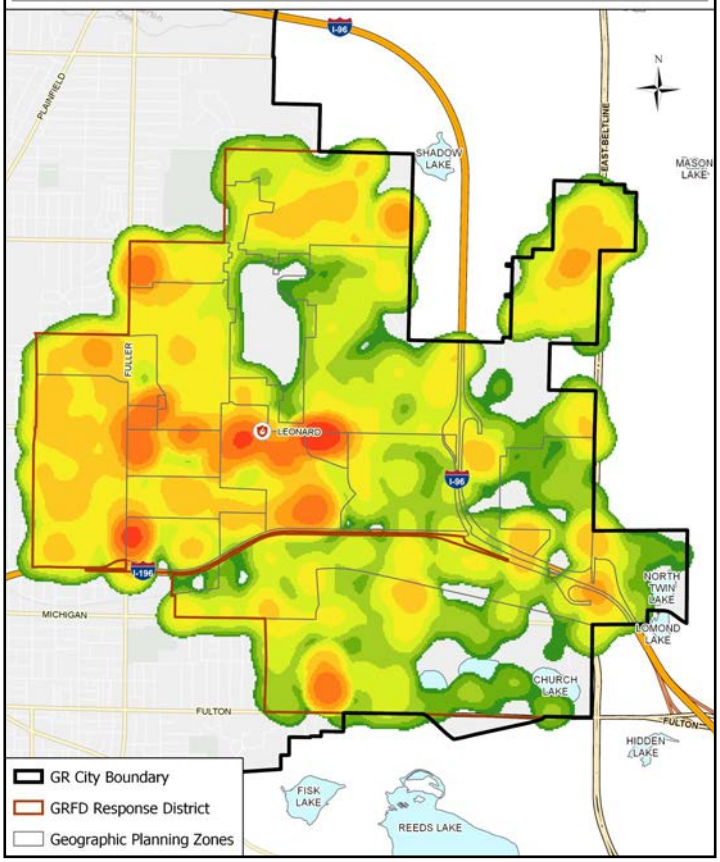
Response Data

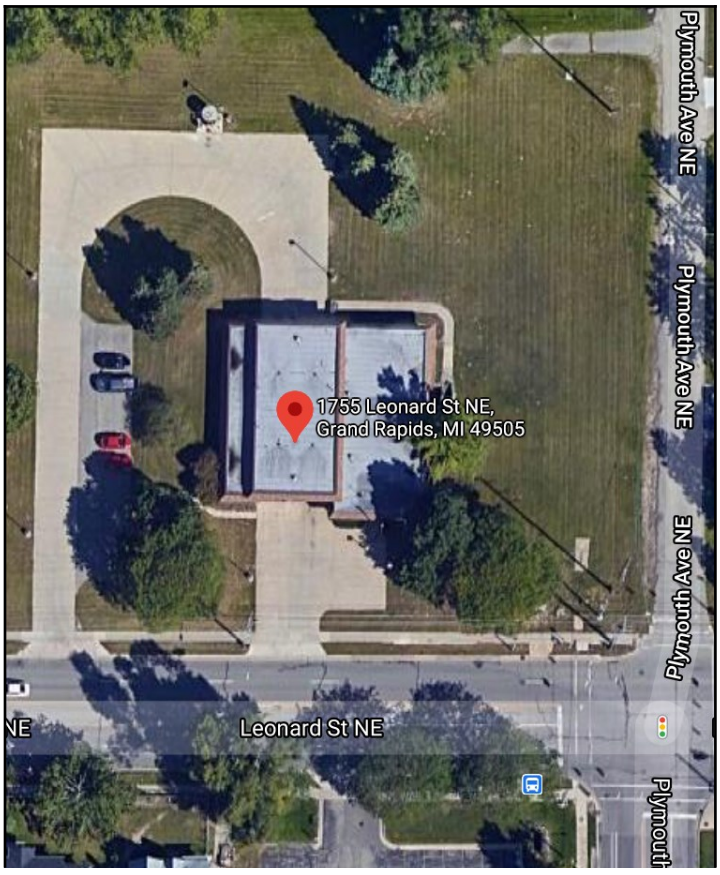
Incident volume in this district has been very consistent over the last five years. Reliability for this district is also consistent, hovering just above 80%. Total response concentration baseline performance for the most common types of incidents shows at 2:58 (fire low) and at :56 (fire moderate) over benchmark. EMS low incidents are at 1:36 over benchmark with EMS moderate incidents running 4:55 over.

Leonard Station Incidents and % of Citywide

Type	2016	2017	2018	2019	2020
Fire	38	24	28	38	57
	5.94%	3.97%	4.83%	7.04%	8.91%
EMS	1,323	1,273	1,303	1,398	1,334
	9.11%	8.39%	9.07%	9.12%	8.65%
Other	654	625	627	753	505
	8.34%	7.75%	8.56%	9.23%	7.24%
Total	2,015	1,922	1,958	2,189	1,896
	8.76%	8.06%	8.79%	9.11%	8.23%
Fire Loss	$310,065	$107,284	$179,878	$395,950	$465,398
	4.98%	1.91%	3.51%	7.31%	7.35%

Leonard Response District Incident Density





Leonard Apparatus Responses

Unit	2016	2017	2018	2019	2020
Ladder 1/Platform 1	1,925	1,634	1,851	2,167	1,949
Engine 1	74	43		11	13
Brush 1	3	5	9	27	8
Squad 1		123	87		
Medic 1	199				
Utility 1				3	1
Total Responses	2,202	1,805	1,983	2,208	1,971
% of City Responses	6.93%	5.62%	6.48%	6.71%	6.24%
Total Deployed Hours	667:43:30	582:31:46	599:14:33	752:01:12	659:44:06
% of City Deployed Hours	6.99%	6.01%	6.47%	7.27%	6.76%

Leonard Apparatus Unit Hour Utilization

Unit	2016	2017	2018	2019	2020
Ladder 1/Platform 1	0.12	0.10	0.11	0.14	0.13
Engine 1	0.00	0.00	0.00	0.00	0.00
Brush 1	0.00	0.00	0.00	0.00	0.00
Squad 1	0.00	0.01	0.01	0.00	0.00
Medic 1	0.01	0.00	0.00	0.00	0.00
Utility 1	0.00	0.00	0.00	0.00	0.00

Temporal Analysis 2016 - 2020 EMS								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	23	26	20	23	32	16	22	162
01:00-01:59	22	23	17	18	13	26	25	144
02:00-02:59	18	15	25	15	15	12	30	130
03:00-03:59	19	18	20	12	22	16	15	122
04:00-04:59	14	20	18	19	17	20	17	125
05:00-05:59	26	18	17	21	28	19	18	147
06:00-06:59	25	31	23	30	24	25	33	191
07:00-07:59	39	41	46	36	38	38	27	265
08:00-08:59	25	52	50	58	57	57	34	333
09:00-09:59	43	50	67	56	55	52	37	360
10:00-10:59	55	57	84	57	60	49	54	416
11:00-11:59	52	63	50	60	51	65	42	383
12:00-12:59	49	57	58	56	63	59	42	384
13:00-13:59	61	61	60	67	56	51	36	392
14:00-14:59	41	48	53	62	60	62	40	366
15:00-15:59	44	54	64	42	61	64	38	367
16:00-16:59	44	60	73	62	62	59	43	403
17:00-17:59	41	59	61	45	51	56	49	362
18:00-18:59	50	35	35	48	52	39	56	315
19:00-19:59	38	33	38	46	46	55	40	296
20:00-20:59	40	39	49	39	47	46	35	295
21:00-21:59	42	37	36	44	47	29	42	277
22:00-22:59	43	30	31	36	30	30	32	232
23:00-23:59	22	22	26	12	27	32	23	164
Total	876	949	1,021	964	1,014	977	830	6,631

Temporal Analysis 2016 - 2020 Fire								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	2	1	0	0	1	0	2	6
01:00-01:59	1	1	2	1	1	1	0	7
02:00-02:59	0	1	0	0	0	0	1	2
03:00-03:59	0	0	1	0	0	2	0	3
04:00-04:59	0	0	1	0	1	1	0	3
05:00-05:59	0	0	0	1	0	0	0	1
06:00-06:59	0	0	1	0	1	2	1	5
07:00-07:59	0	1	1	2	0	1	1	6
08:00-08:59	0	1	0	0	2	1	0	4
09:00-09:59	0	2	0	3	0	3	1	9
10:00-10:59	1	2	0	0	2	0	0	5
11:00-11:59	1	1	3	1	2	2	1	11
12:00-12:59	0	0	2	3	1	0	1	7
13:00-13:59	3	0	0	2	0	0	2	7
14:00-14:59	3	2	0	2	1	5	1	14
15:00-15:59	1	2	1	2	1	3	0	10
16:00-16:59	3	2	2	1	2	1	2	13
17:00-17:59	2	3	2	2	1	0	0	10
18:00-18:59	2	0	2	2	3	6	3	18
19:00-19:59	2	2	1	1	4	3	2	15
20:00-20:59	0	1	2	1	0	3	2	9
21:00-21:59	2	2	0	2	1	1	1	9
22:00-22:59	0	0	1	1	1	0	1	4
23:00-23:59	1	1	2	0	2	0	1	7
Total	24	25	24	27	27	35	23	185

Leonard Reliability & Simultaneous Performance					
Type	2016	2017	2018	2019	2020
Reliability %	86.47%	76.36%	81.29%	78.69%	83.45%
Citywide Reliability %	88.38%	82.95%	83.37%	81.03%	82.66%
Simultaneous Incident Count	186	148	149	283	167
Simultaneous Incident %	9.23%	7.70%	7.57%	12.89%	8.79%

Leonard Response District 90th Percentile Baseline Performance						
Category	Alarm Handling	Turnout	Travel Distribution	Travel Concentration	Total Response Time Distribution	Total Response Time Concentration
Fire						
Low	2:42	1:52	6:47	6:47	9:58	9:58
Moderate	1:45	2:01	4:21	9:13	7:14	11:56
EMS						
Low	3:07	1:42	5:37	5:37	9:06	9:06
Moderate	3:13	1:58	7:57	10:44	12:11	14:25

FRANKLIN RESPONSE DISTRICT - 02

Quick Facts

Station 2 ..... Franklin Street Fire Station

Address ..... 115 Franklin St. SW

Station Built 1979

Frontline Apparatus ..... Engine 2, Platform 2

Cross Staffed Apparatus ..... HazMat 1

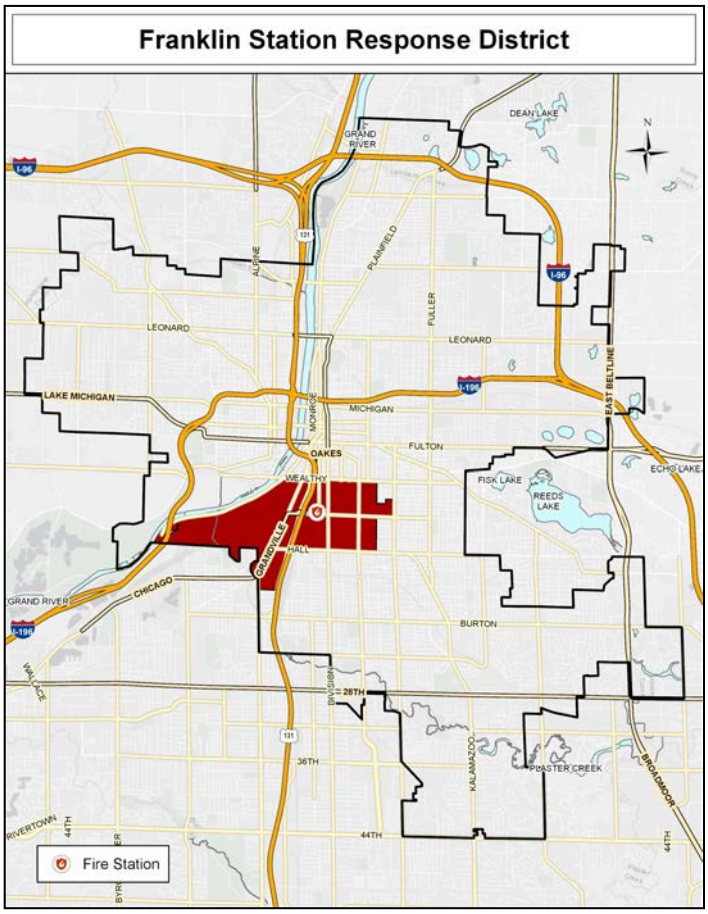
..... HazMat 2

..... Utility 2

Square Miles 2.60

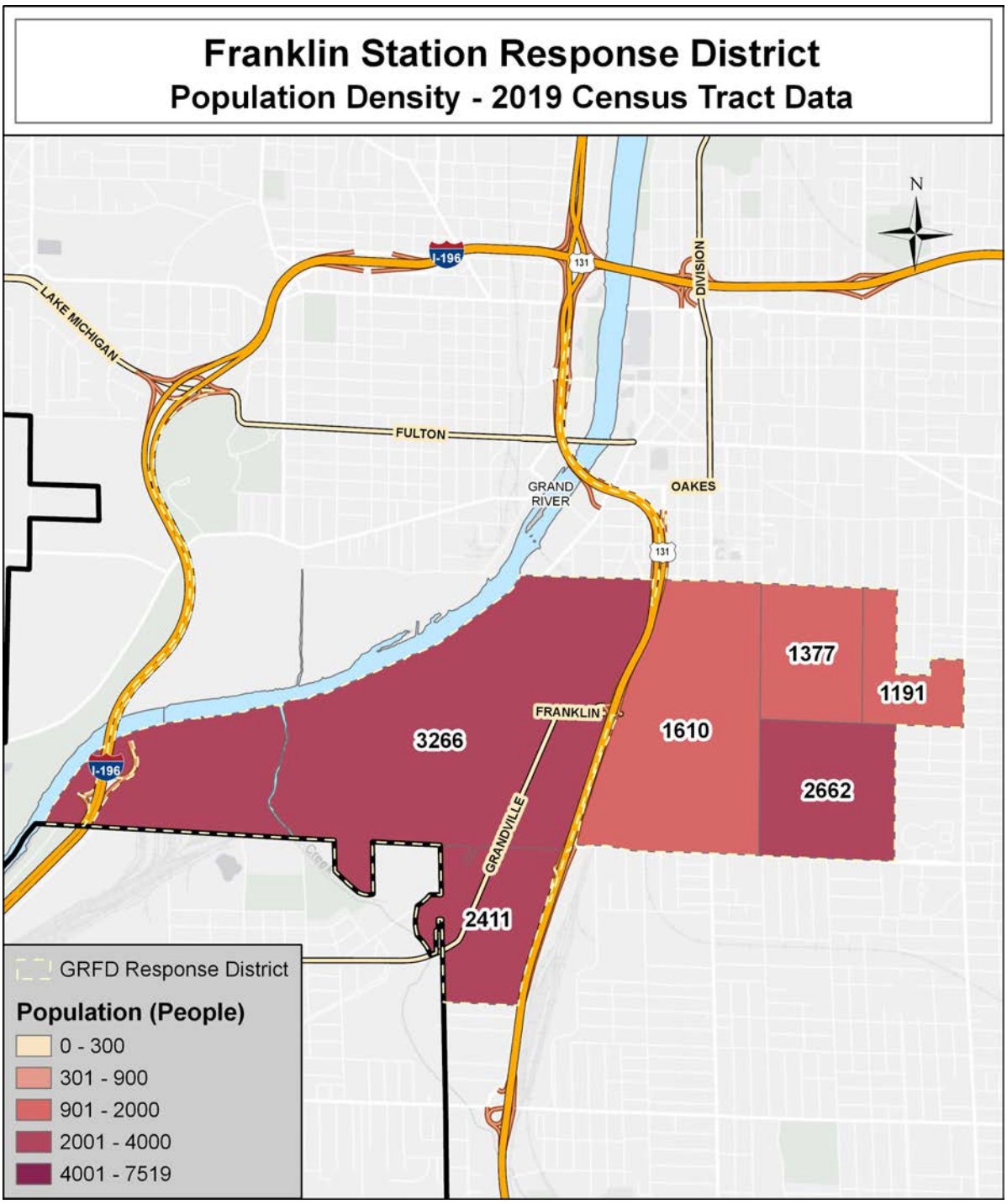
Road Miles 62.25

Hydrants 541



District Characteristics:

Franklin Station is located just south of downtown, in an area with heavy industrial use. The station is home to one engine, an aerial unit, and the hazardous materials response team. This station also houses Utility 2, a repurposed service vehicle with a traffic attenuator, used to control traffic and provide a safety buffer for responders in high speed environments. Franklin station has convenient access to US-131, the primary north-south expressway running through the city.



Population/Demographics:

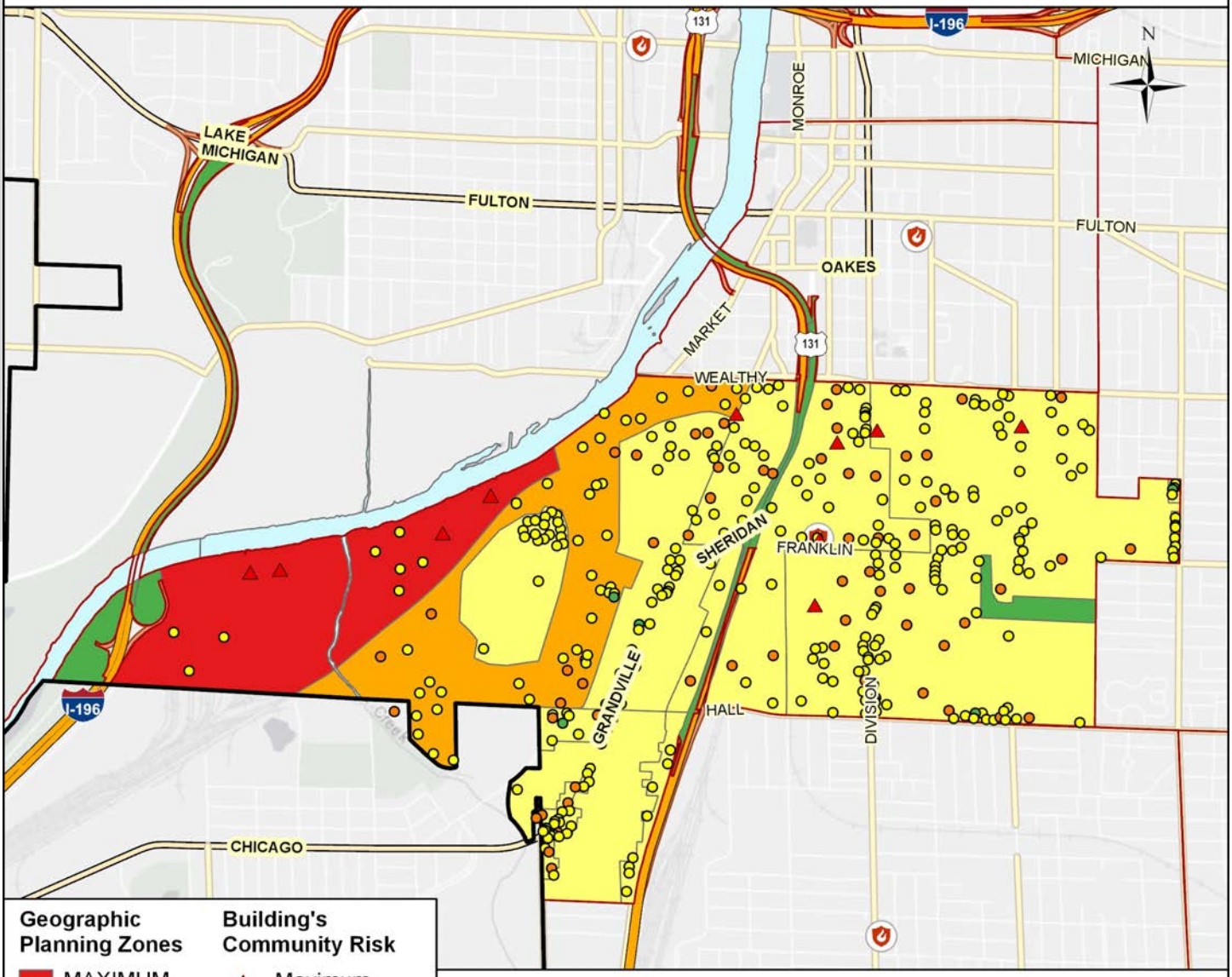
The Franklin station response district contains 12,517 residents and comprises 6.49% of the city's population. Population density is 4,796 people per square mile. This analysis is based on data gathered from the 2019 US Census Bureau 5-year estimates. The district is predominately urban, however the west end of the district near the river is considered rural due to a heavily industrialized area.

District	Population	< 5 Years Old	< 18 Years Old	> 65 Years Old	Median Age	White	Black or African American	American Indian or Alaskan Native	Asian	Hispanic
2	12,517	1,203	3,901	825	28	5,975	3,327	81	127	5,669
GR Total	192,962	13,489	43,300	23,232	31	129,942	35,575	680	4,519	31,357
% of City	6.49%	8.92%	9.01%	3.55%	91.04%	4.60%	9.35%	11.91%	2.81%	18.08%

FRANKLIN RESPONSE DISTRICT - 02

Franklin Station Response District

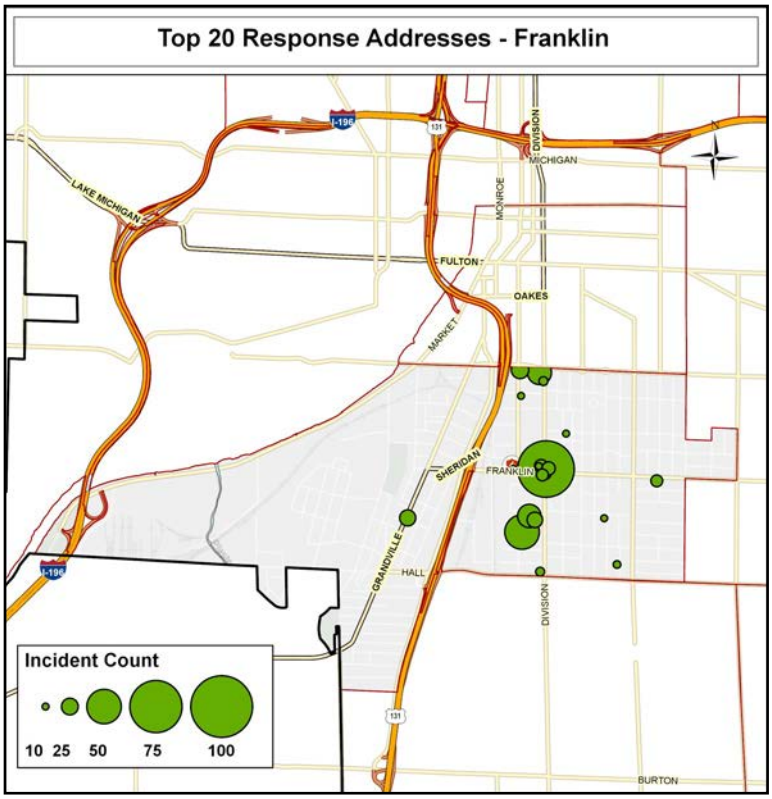
Geographic Planning Zones with Fire Risk Assessment Buildings



Buildings per Community Risk Type

Low	Moderate	High	Maximum	Total
7	305	62	10	384

District	Residential Occupancies	Industrial Occupancies	Commercial Occupancies	Tax Exempt	Total Square Ft	Taxable Value	Average Building Age (Years)	Needed Fire Flow over 3500 GPM	Sprinklered Buildings
2	2,868	45	244	216	8,511,009	$187,765,735	97.53	133	89
Citywide	55,506	269	3,364	821	124,272,758	4,950,657,315	82.36	1,485	1,180
% of City	5.17%	16.73%	7.25%	26.31%	6.85%	3.79%	118.42%	8.96%	7.54%



Top 20 Response Addresses	Incident Count
760 South DIVISION Avenue	81
1024 IONIA Avenue SW	50
415 South DIVISION Avenue	35
10 DELAWARE Street SW	34
400 IONIA Avenue SW	26
944 GRANDVILLE Avenue SW	24
6 DELAWARE Street SW	23
South DIVISION Avenue	21
747 South DIVISION Avenue	20
750 South DIVISION Avenue	20
801 COLLEGE Avenue SE	18
803 South DIVISION Avenue	18
1 HALL Street SW	14
425 South DIVISION Avenue	14
115 FRANKLIN Street SW	13
1143 PROSPECT Avenue SE	12
1001 LAFAYETTE Avenue SE	11
101 PLEASANT Street SE	11
40 LOGAN Street SW	11
743 South DIVISION Avenue	11

Risk Assessment:

Due to Automatic Resource Location, Engine 2 is frequently responding outside of its traditional borders.

Fire: 28.89% of the district is classified as a high or maximum risk geographical planning zone. There are 133 occupancies with a needed fire flow over 3,500 GPM and the district contains 3.79% of the city's taxable property.

Vehicle accidents: Utility 2 deployment reduces the crew on the engine or platform. This impacts the availability of those apparatus.

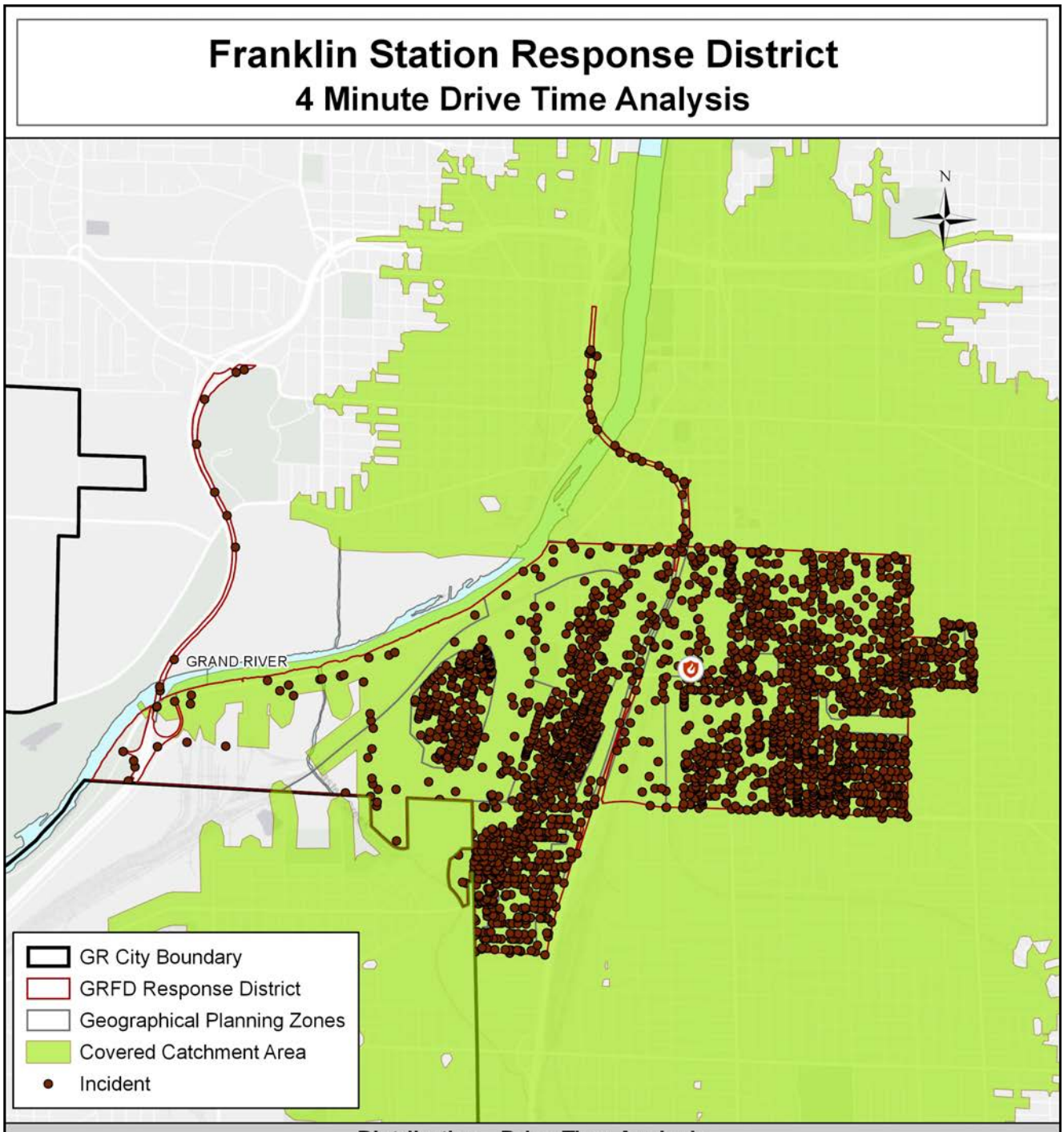
EMS: High violence areas for the district include the intersection of Franklin/Division and Marshall south of Hall. Patients are often transported privately before EMS arrives. There are many calls for service along the bus routes for inebriated individuals.

Maximum Risk Buildings For Franklin District

130 DELAWARE ST SW	New Hope Baptist Church
1300 MARKET AVE SW	Grand Rapids Wastewater Treatment Plant
1550 MARKET AVE SW	Grand Rapids Wastewater Treatment Plant
215 FRANKLIN ST SW	Franklin Street Fire Station
41 BUCKLEY ST SW	O'Leary Paint Company
446 GRANDVILLE AVE SW	ANYI Management Company
450 MADISON AVE SE	Meyer May House
512 S DIVISION AVE	Grand Rapids University Prep Academy
741 MARKET AVE SW	Market Avenue Retention Basin
950 MARKET AVE SW	Kent County Waste-to-Energy Facility

Distribution - Four Minute Drive Time Analysis

Drive time analysis for Franklin's district shows good coverage, with an average of 99% of incidents falling within compliance measures. One trouble spot for this district is the Black Hills area, an "island" of homes located in an industrial zone with limited access. Analysis of drive times in this section are based on the street speed layer used by CAD (computer-aided dispatch).

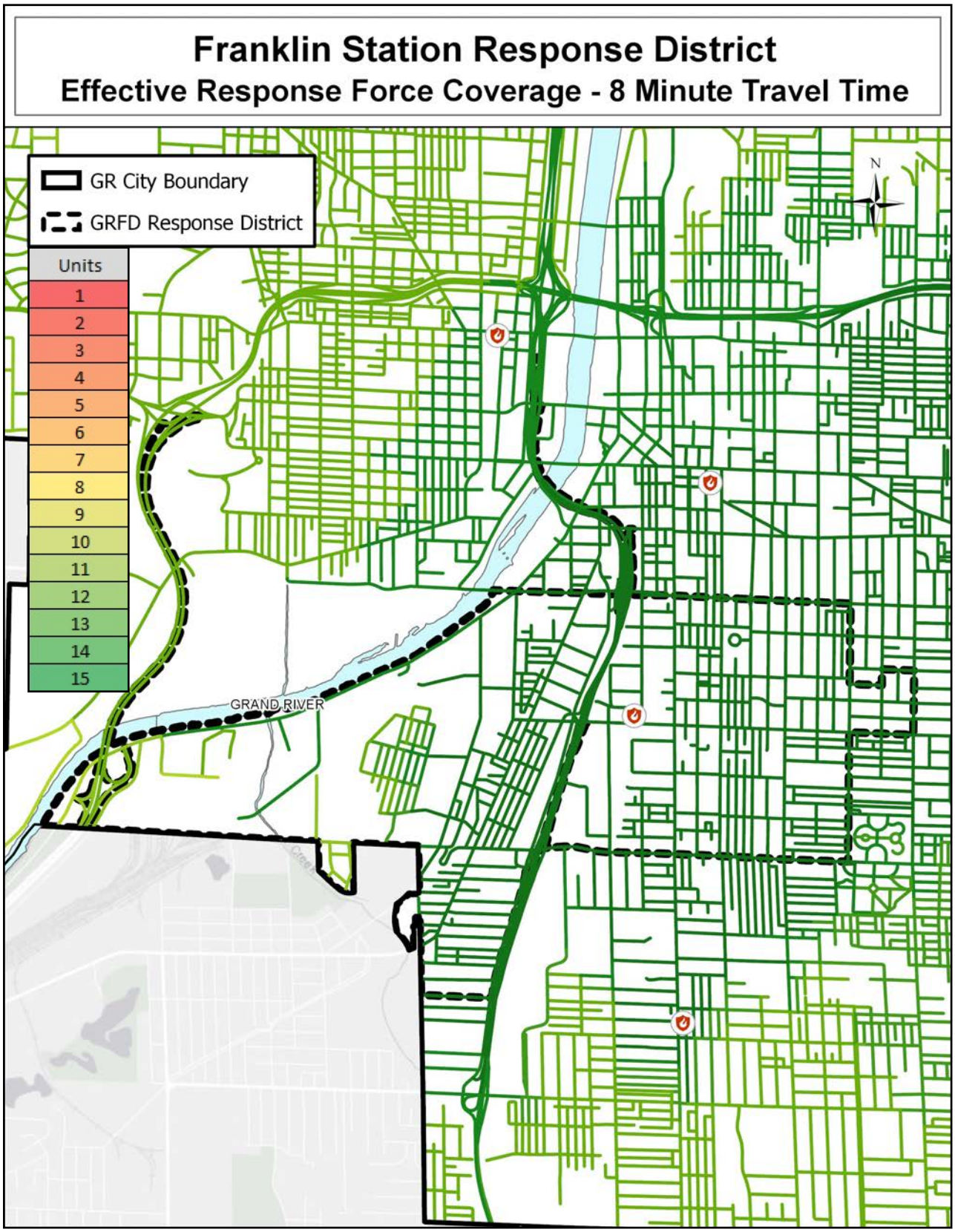


Distribution - Drive Time Analysis

Franklin District 2	2016	2017	2018	2019	2020
Incident Count	1,875	1,914	1,880	2,009	2,058
Incidents in Covered Area	1,871	1,908	1,876	2,006	2,058
% Incidents Covered	99.79%	99.69%	99.79%	99.85%	100.00%

Concentration - District Effective Response Force Analysis Map

This map depicts the number of units that can be assembled in the district within the multiple unit benchmark travel time of 8 minutes. Concentration data for Franklin district highlight its central location in the city. With four contiguous districts, a significant percentage of the district has exemplary effective response force coverage.



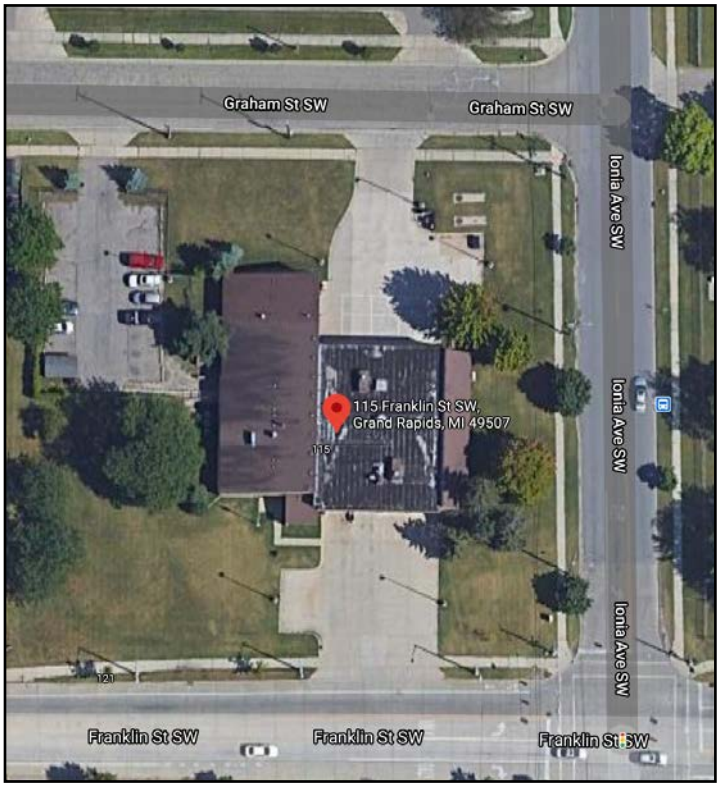
FRANKLIN RESPONSE DISTRICT - 02

Response Data

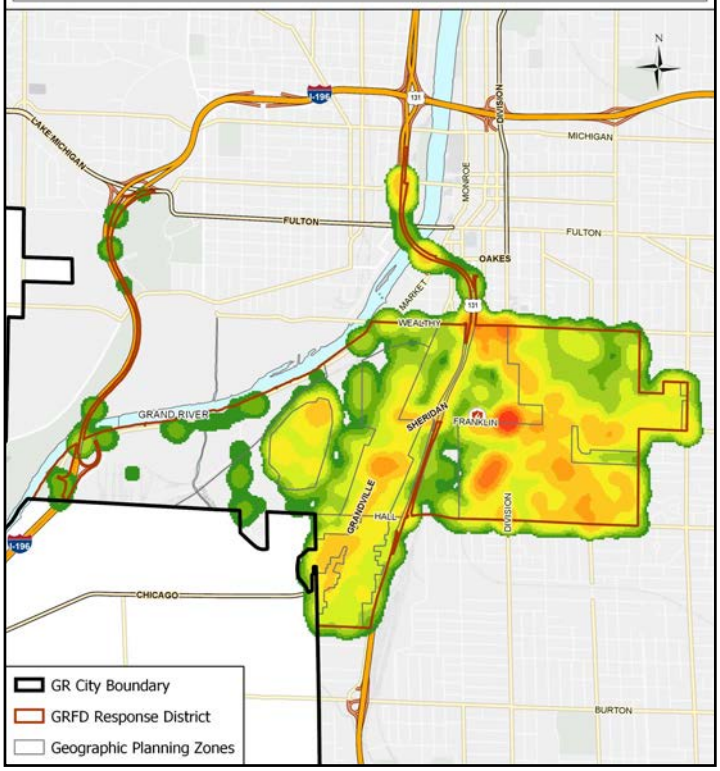
Increases in apparatus responses resulted from Automatic Resource Location and adjustments to street speeds in the district. Analysis showed that units from Franklin could respond more rapidly to sections of adjacent districts. Baseline performance for the most common types of incidents show very good compliance with benchmarks, with the exception of EMS moderate, which is running 1:12 over.

Franklin Station Incidents and % of Citywide

Type	2016	2017	2018	2019	2020
Fire	71	52	73	55	78
	11.09%	8.60%	12.59%	10.19%	12.19%
EMS	1,166	1,212	1,204	1,399	1,456
	8.03%	7.98%	8.38%	9.13%	9.44%
Other	638	650	603	555	524
	8.14%	8.06%	8.23%	6.81%	7.52%
Total	1,875	1,914	1,880	2,009	2,058
	8.15%	8.03%	8.44%	8.36%	8.93%
Fire Loss	$230,977	$1,725,003	$496,556	$326,460	$1,152,701
	3.71%	30.69%	9.70%	6.03%	18.20%



Franklin Response District Incident Density



Franklin Apparatus Responses

Unit	2016	2017	2018	2019	2020
Engine 2	2,329	2,286	2,272	2,626	2,888
Ladder 2/Platform 2	1,012	1,038	1,185	1,349	1,320
Car 5	859	929	1,000		
Utility 2	547	631	644	582	520
Medic 2	19	43	14		
HazMat 1					12
HazMat 2				2	14
HazMat 61	15	16	10	10	
Total Responses	4,781	4,943	5,125	4,569	4,754
% of City Responses	15.05%	15.40%	16.74%	13.88%	15.05%
Total Deployed Hours	1607:15:46	1706:02:06	1709:38:05	1537:53:44	1599:29:27
% of City Deployed Hours	16.83%	17.60%	18.46%	14.86%	16.39%

Franklin Apparatus Unit Hour Utilization

Unit	2016	2017	2018	2019	2020
Engine 2	0.14	0.14	0.14	0.16	0.18
Ladder 2/Platform 2	0.06	0.07	0.07	0.09	0.08
Car 5	0.06	0.07	0.07	0.07	0.07
Utility 2	0.05	0.05	0.06	0.05	0.05
Medic 2	0.00	0.00	0.00	0.00	0.00
HazMat 1	0.00	0.00	0.00	0.00	0.00
HazMat 2	0.00	0.00	0.00	0.00	0.00
HazMat 61	0.00	0.00	0.00	0.00	0.00

Temporal Analysis 2016 - 2020 EMS								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	27	35	28	30	26	22	38	206
01:00-01:59	38	23	22	25	22	21	31	182
02:00-02:59	32	32	24	32	37	25	36	218
03:00-03:59	28	13	15	26	17	17	18	134
04:00-04:59	30	13	7	19	17	13	16	115
05:00-05:59	15	22	18	11	15	15	17	113
06:00-06:59	19	16	20	16	23	25	21	140
07:00-07:59	19	24	24	33	33	25	20	178
08:00-08:59	33	26	43	23	34	37	20	216
09:00-09:59	28	35	40	42	41	35	38	259
10:00-10:59	39	33	48	44	46	52	23	285
11:00-11:59	46	54	41	49	56	41	48	335
12:00-12:59	48	41	52	53	50	54	55	353
13:00-13:59	47	51	46	55	52	53	57	361
14:00-14:59	43	49	69	48	41	54	46	350
15:00-15:59	58	72	54	55	48	57	53	397
16:00-16:59	45	55	62	58	59	47	34	360
17:00-17:59	58	50	56	47	55	63	61	390
18:00-18:59	56	44	53	43	46	46	57	345
19:00-19:59	57	40	53	41	46	44	50	331
20:00-20:59	41	58	43	54	44	41	58	339
21:00-21:59	40	52	45	46	41	56	39	319
22:00-22:59	43	41	34	35	34	33	47	267
23:00-23:59	37	30	29	39	29	40	39	243
Total	927	909	926	924	912	916	922	6,436

Temporal Analysis 2016 - 2020 Fire								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	1	2	3	0	2	2	1	11
01:00-01:59	2	0	2	1	2	2	1	10
02:00-02:59	1	0	4	3	2	1	3	14
03:00-03:59	3	2	1	0	0	1	2	9
04:00-04:59	2	1	1	1	1	1	1	8
05:00-05:59	0	1	1	0	0	1	1	4
06:00-06:59	1	2	1	2	2	1	3	12
07:00-07:59	0	0	2	2	0	0	2	6
08:00-08:59	0	1	0	1	0	1	1	4
09:00-09:59	3	0	0	3	1	0	2	9
10:00-10:59	0	0	0	2	1	1	4	8
11:00-11:59	1	4	1	1	1	5	3	16
12:00-12:59	1	3	4	2	2	2	1	15
13:00-13:59	5	5	0	1	2	0	0	13
14:00-14:59	1	3	3	5	4	4	2	22
15:00-15:59	1	0	1	3	1	2	7	15
16:00-16:59	2	3	2	5	2	2	3	19
17:00-17:59	4	3	5	3	7	1	4	27
18:00-18:59	5	8	3	2	7	2	2	29
19:00-19:59	2	3	2	5	2	1	1	16
20:00-20:59	3	1	1	2	0	2	5	14
21:00-21:59	2	0	4	4	2	3	3	18
22:00-22:59	2	3	3	3	4	5	2	22
23:00-23:59	1	3	2	0	2	0	0	8
Total	43	48	46	51	47	40	54	329

Franklin Reliability & Simultaneous Performance					
Type	2016	2017	2018	2019	2020
Reliability %	94.77%	81.62%	87.25%	89.02%	88.82%
Citywide Reliability %	88.38%	82.95%	83.37%	81.03%	82.66%
Simultaneous Incident Count	124	135	134	154	142
Simultaneous Incident %	6.61%	7.05%	7.35%	7.85%	7.10%

Franklin Response District 90th Percentile Baseline Performance						
Category	Alarm Handling	Turnout	Travel Distribution	Travel Concentration	Total Response Time Distribution	Total Response Time Concentration
Fire						
Low	2:01	1:44	4:49	4:53	7:41	7:50
Moderate	1:40	1:53	3:41	7:32	6:14	10:07
EMS						
Low	3:19	1:42	4:17	4:17	8:03	8:03
Moderate	2:59	1:57	5:08	7:01	8:18	10:42

BRIDGE RESPONSE DISTRICT - 03

Quick Facts

Station 3 .....Bridge Street Fire Station

Address .....500 Bridge St. NW

Station Built.....1966

Frontline Apparatus ..... Engine 3, Platform 3

Cross Staffed Apparatus ..... Water 3

.....Dive 3

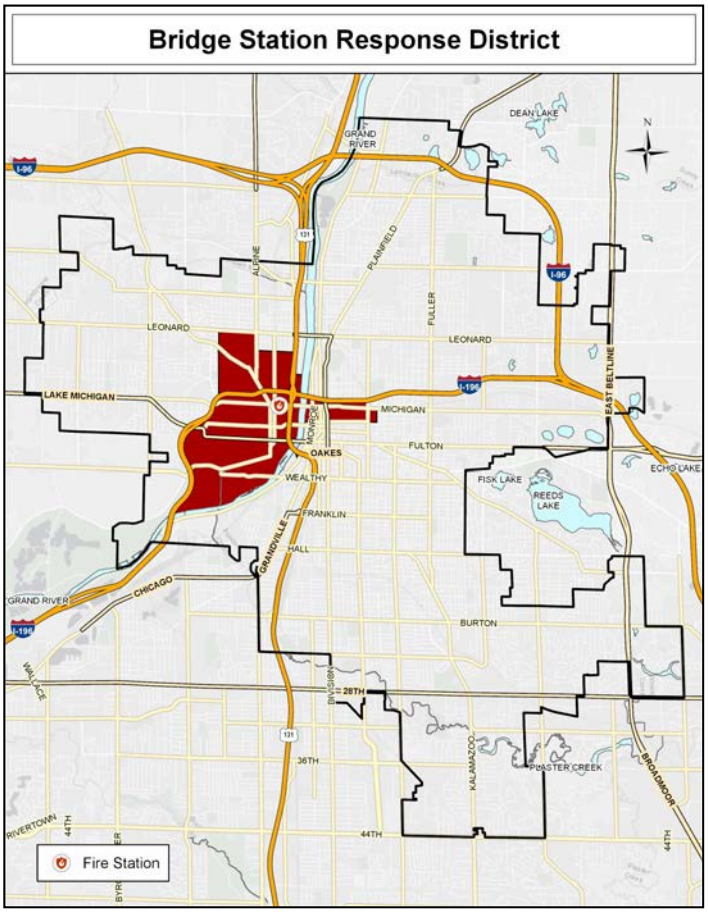
..... Boat 1, Boat 2, Boat 3

.....Brush Unit 3

Square Miles.....3.26

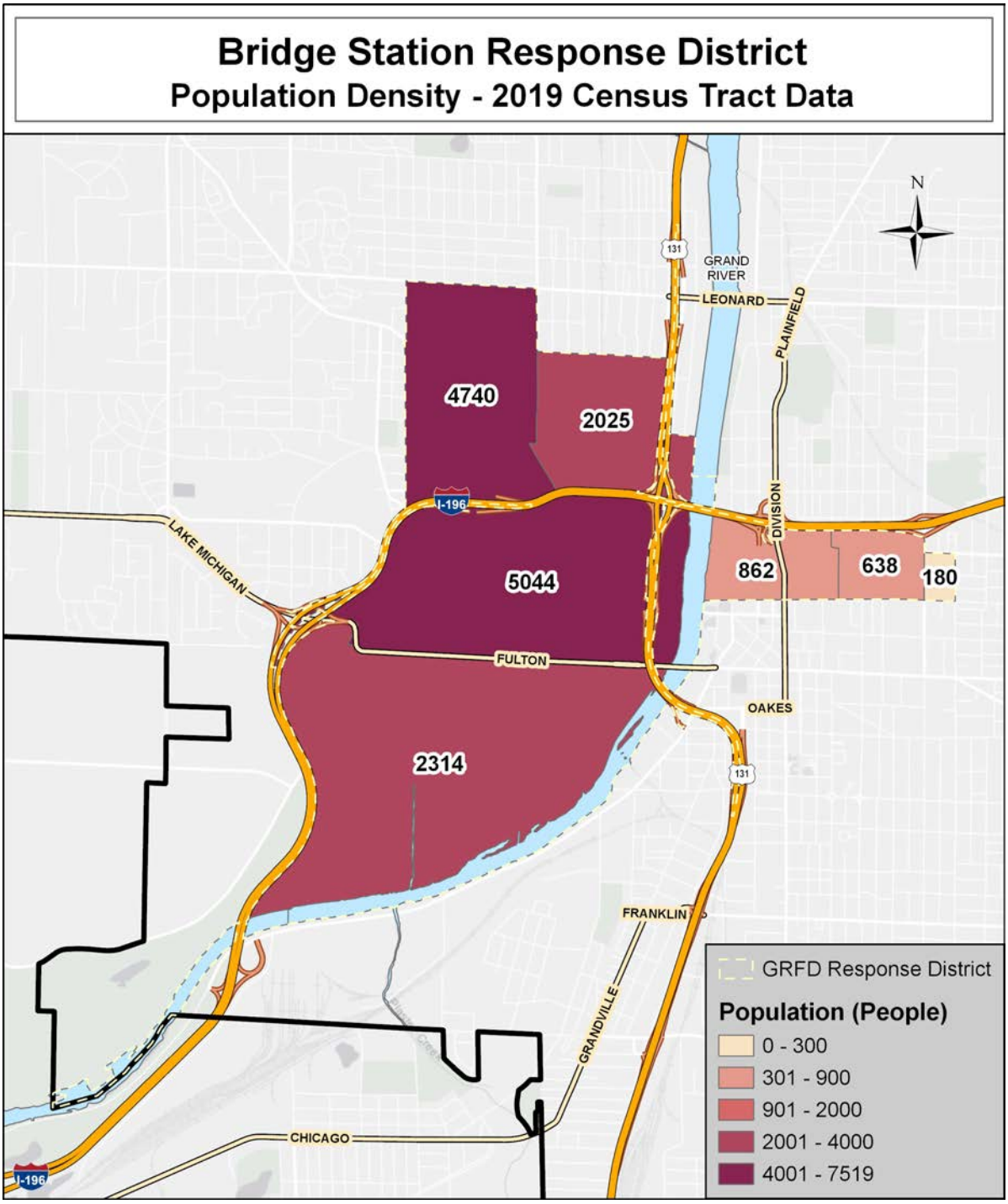
Road Miles.....80.49

Hydrants.....585



District Characteristics:

Bridge Street station is located just west of the Grand River and downtown Grand Rapids in a bustling retail commercial zone. Bridge Street station is home to the department's primary water rescue team. The river is accessible at several spots below the 6th Street dam in the downtown area. The dam splits the river into northern and southern sections, each with their own operational response characteristics. Grand Valley State University maintains a large downtown campus just south of the station. Bridge district is also home to the Medical Mile, a health care service and research zone on the east side of the Grand River.



Population/Demographics:

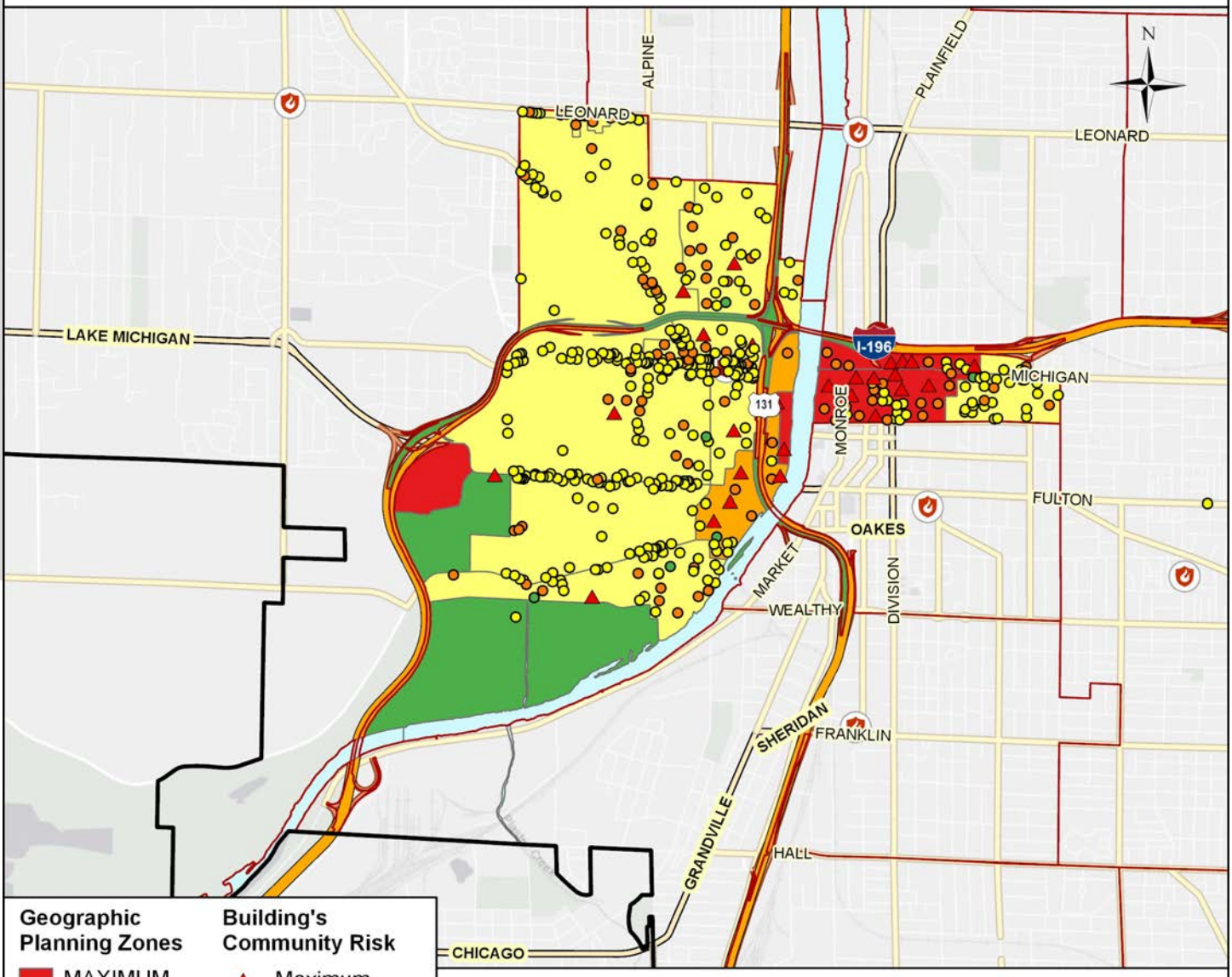
The Bridge station response district contains 15,803 residents and comprises 8.19% of the city's population. Population density is 4,847 people per square mile. This analysis is based on data gathered from the 2019 US Census Bureau 5-year estimates. The district is predominately urban, with small regions of rural designations for parks and commercial/industrial areas.

District	Population	< 5 Years Old	< 18 Years Old	> 65 Years Old	Median Age	White	Black or African American	American Indian or Alaskan Native	Asian	Hispanic
3	15,803	925	3,249	1,021	29	11,536	1,773	69	332	2,750
GR Total	192,962	13,489	43,300	23,232	31	129,942	35,575	680	4,519	31,357
% of City	8.19%	6.86%	7.50%	4.39%	94.79%	8.88%	4.98%	10.15%	7.35%	8.77%

BRIDGE RESPONSE DISTRICT - 03

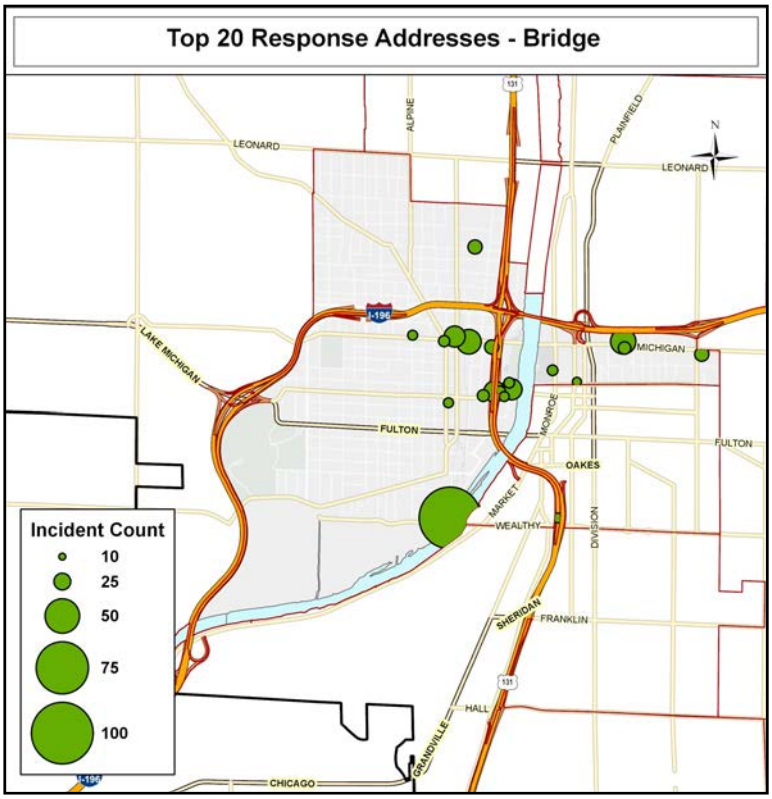
Bridge Station Response District

Geographic Planning Zones with Fire Risk Assessment Buildings



Buildings per Community Risk Type				
Low	Moderate	High	Maximum	Total
8	324	93	27	452

District	Residential Occupancies	Industrial Occupancies	Commercial Occupancies	Tax Exempt	Total Square Ft	Taxable Value	Average Building Age (Years)	Needed Fire Flow over 3500 GPM	Sprinklered Buildings
3	4,972	30	430	91	14,820,301	$471,795,956	104.36	121	122
Citywide	55,506	269	3,364	821	124,272,758	4,950,657,315	82.36	1,485	1,180
% of City	8.96%	11.15%	12.78%	11.08%	11.93%	9.53%	126.71%	8.15%	10.34%



Top 20 Response Addresses	Incident Count
322 FRONT Avenue SW	107
145 MICHIGAN Street NE	37
500 BRIDGE Street NW	36
210 FRONT Avenue NW	31
405 SEWARD Avenue NW	31
PEARL UNDER US-131	31
349 MOUNT VERNON Avenue NW	21
514 MICHIGAN Street NE	21
555 7TH Street NW	21
100 MICHIGAN Street NE	19
410 PEARL Street NW	18
PEARL Street NW	18
634 BRIDGE Street NW	17
303 MONROE Avenue NW	16
303 PEARL Street NW	16
110 LEXINGTON Avenue NW	15
310 PEARL Street NW	15
761 BRIDGE Street NW	15
US-131 SB NO WEALTHY	15
180 OTTAWA Avenue NW	14

Risk Assessment:

Fire: 11.41% of the district's area is classified as a high or maximum risk geographical planning zone. There are 121 occupancies with a needed fire flow over 3,500 GPM and 9.53% of the city's taxable property value lies within the district.

Vehicle accidents: The response area is centered at the highway interchanges of 196/131 and the S curve. Pileup accidents are common in these areas.

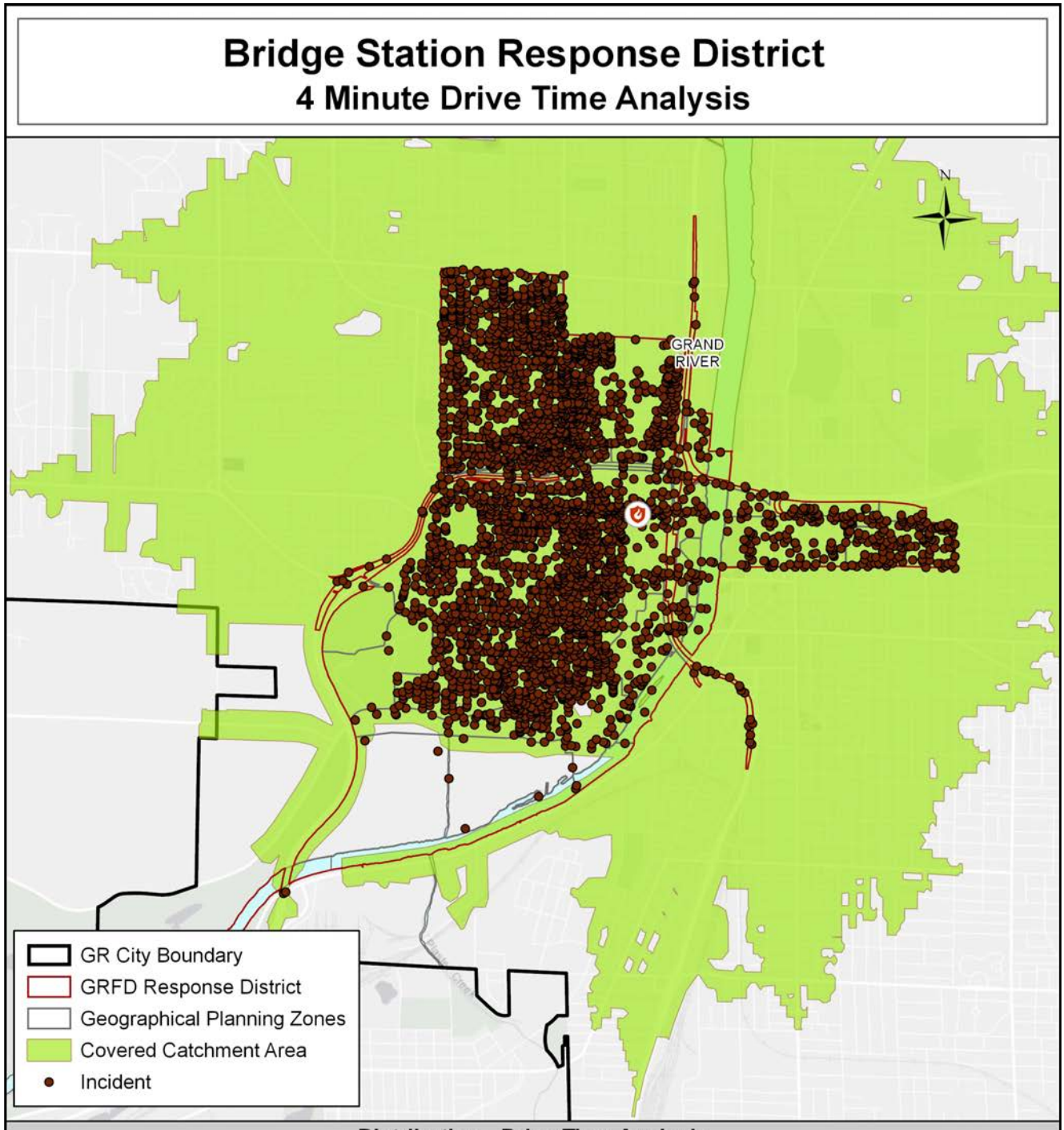
EMS: Station walk-ups are a common occurrence due to location. Crews are working under the assumption that patients at Exodus (322 Front SW) are COVID positive. Isolated pockets at south end of district seem to be where most COVID positive incidents are located. Homeless camps are located along the river. There are many calls for service around the YMCA for inebriated individuals. The women's shelter at 761 Bridge is a superuser location for EMS. John Ball Zoo patient access issues due to location.

Maximum Risk Buildings For Bridge District

100 MICHIGAN ST NE	Spectrum Health Hospitals Butterworth	333 BOSTWICK AVE NE	Van Andel Institute
110 MICHIGAN ST NW	United States District Court	35 MICHIGAN ST NE	Helen DeVos Children's Hospital
1300 W FULTON ST	Bissell Tree House	350 OTTAWA AVE NW	State Office Building
15 MICHIGAN ST NE	MSU College of Human Medicine	401 W FULTON ST	GVSU Richard M. DeVos Center
180 OTTAWA AVE NW	Kent County Courthouse	423 1ST ST NW	St. Mary's Catholic Church
2 MICHIGAN ST NE	Immanuel Lutheran Church	456 6TH ST NW	Consumers Power Substation
25 MICHIGAN ST NE	Spectrum Health Family Medicine Residency	475 LAKE MICHIGAN DR NW	David D. Hunting Branch YMCA
272 PEARL ST NW	Grand Rapids Public Museum	500 BRIDGE ST NW (GRFD 03)	Bridge Street Fire Station
300 MONROE AVE NW	City/County Administrative Complex	520 WATSON ST SW	Sterile Systems
301 MICHIGAN ST NE	GVSU Kirkhof College of Nursing	601 1ST ST NW	Rockford Construction
303 MONROE AVE NW	DeVos Place Convention Hall	654 DAVIS AVE NW	Basilica of Saint Adalbert
303 PEARL ST NW	Gerald R. Ford Presidential Museum	943 SIBLEY ST NW	Sibley Elementary School
305 W FULTON ST	GVSU Kennedy Hall of Engineering	977 WEALTHY ST SW	Kent County Recycling Facility
32 WINTER AVE NW	GVSU Pew Campus		

Distribution - Four Minute Drive Time Analysis

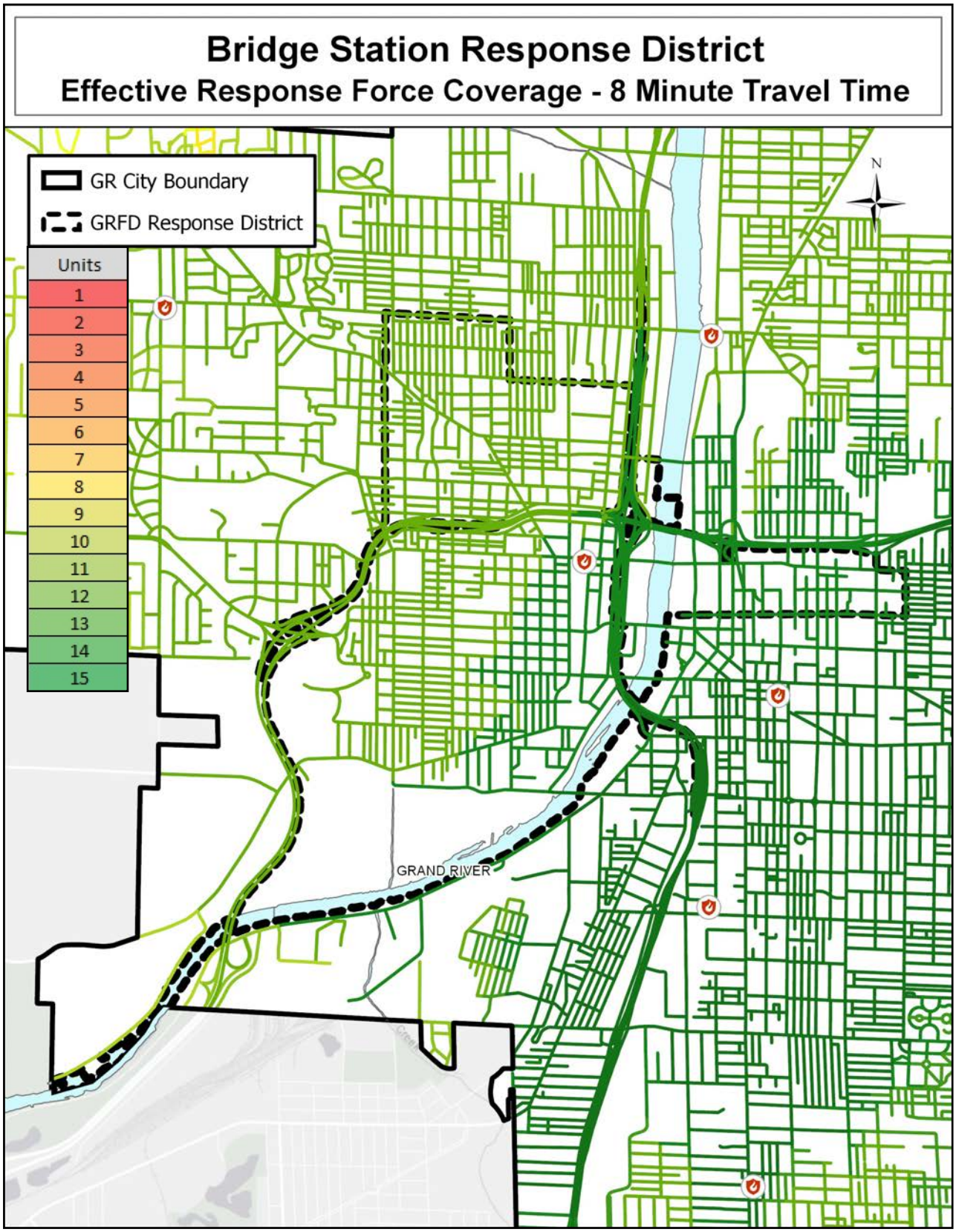
Distribution metrics for Bridge district are very good, with over 99% of incidents covered for compliance measures within the catchment area/drive time analysis. With two expressways crossing the district, there are some road network challenges with numerous dead end streets. Analysis of drive times in this section are based on the street speed layer used by CAD (computer-aided dispatch).



Distribution - Drive Time Analysis					
Bridge District 3	2016	2017	2018	2019	2020
Incident Count	2,725	2,801	2,487	2,720	2,778
Incidents in Covered Area	2,723	2,800	2,486	2,719	2,775
% Incidents Covered	99.93%	99.96%	99.96%	99.96%	99.89%

Concentration - District Effective Response Force Analysis Map

This map depicts the number of units that can be assembled in the district within the multiple unit benchmark travel time of 8 minutes. Effective response force data for Bridge district affirms it's central location in the city. With five contiguous districts, a significant percentage of the district has excellent effective response force coverage.



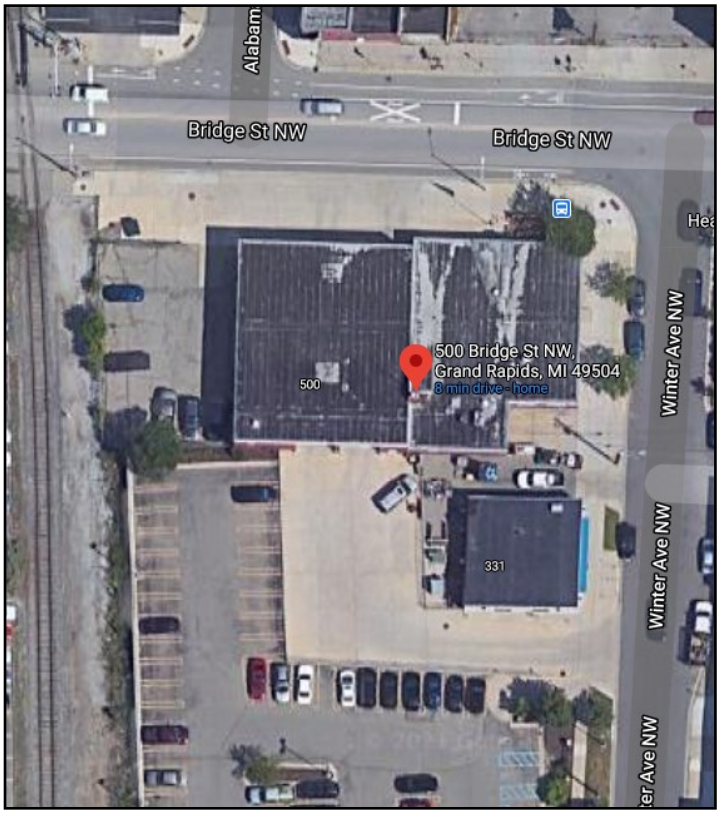
BRIDGE RESPONSE DISTRICT - 03

Response Data

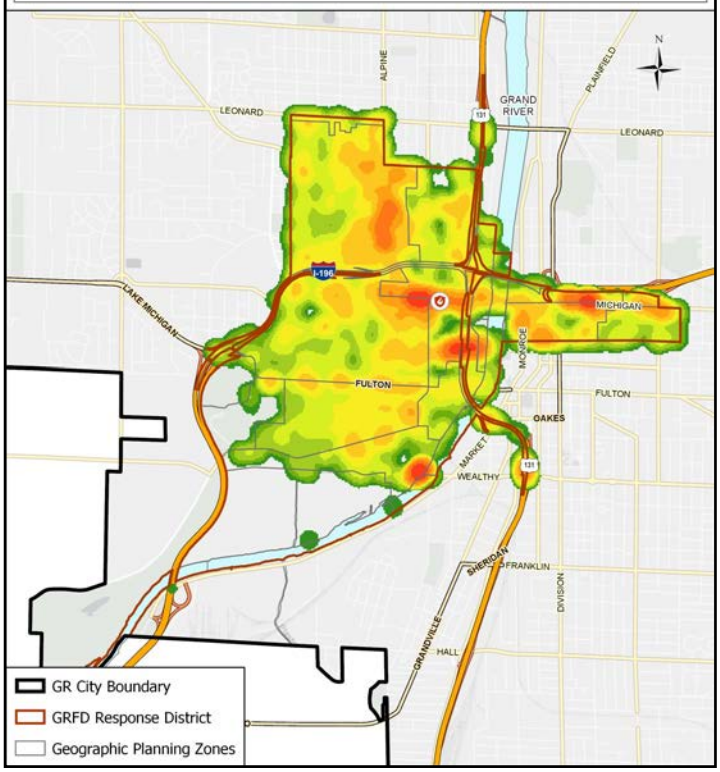
The proximity to downtown and overall socio-economic makeup of the district contribute to a high incident volume for the district. The central location also contributes to the overall apparatus responses for this district. Baseline performance for the most common types of incidents show very good compliance with benchmarks, all metrics are running within one minute of the benchmark times.

Bridge Station Incidents and % of Citywide

Type	2016	2017	2018	2019	2020
Fire	69	72	69	53	64
	10.78%	11.90%	11.90%	9.81%	10.00%
EMS	1,516	1,678	1,345	1,636	1,782
	10.44%	11.05%	9.36%	10.67%	11.55%
Other	1140	1051	1073	1031	932
	14.54%	13.03%	14.65%	12.64%	13.37%
Total	2,725	2,801	2,487	2,720	2,778
	11.84%	11.74%	11.16%	11.32%	12.06%
Fire Loss	$1,353,264	$376,605	$1,082,736	$408,897	$314,214
	21.73%	6.70%	21.15%	7.55%	4.96%



Bridge Response District Incident Density



Bridge Apparatus Responses

Unit	2016	2017	2018	2019	2020
Engine 3	1,443	2,798	2,401	2,672	2,696
Ladder 3/Platform 3	1,319	1,293	1,264	1,339	1,174
Squad 3	1,281	14	3	3	2
Water 47/Dive 3	11	8	22	17	13
Water 49/Water 3	11	8	19	16	16
Brush 3	8	5	7	27	12
Medic 3	5				
Total Responses	4,078	4,126	3,716	4,074	3,913
% of City Responses	12.83%	12.85%	12.14%	12.37%	12.39%
Total Deployed Hours	1098:03:43	1177:06:07	1132:05:33	1250:33:14	1159:52:48
% of City Deployed Hours	11.50%	12.14%	12.22%	12.08%	11.88%

Bridge Apparatus Unit Hour Utilization

Unit	2016	2017	2018	2019	2020
Engine 3	0.08	0.16	0.14	0.16	0.16
Ladder 3/Platform 3	0.08	0.08	0.08	0.09	0.07
Squad 3	0.07	0.00	0.00	0.00	0.00
Water 47/Dive 3	0.00	0.00	0.00	0.00	0.00
Water 49/Water 3	0.00	0.00	0.00	0.00	0.00
Brush 3	0.00	0.00	0.00	0.01	0.00
Medic 3	0.00	0.00	0.00	0.00	0.00

Temporal Analysis 2016 - 2020 EMS								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	57	33	28	39	28	18	44	247
01:00-01:59	47	19	21	29	27	37	46	226
02:00-02:59	44	16	30	19	22	27	29	187
03:00-03:59	23	18	19	19	16	22	31	148
04:00-04:59	21	22	16	20	17	23	19	138
05:00-05:59	17	17	23	22	9	22	22	132
06:00-06:59	14	18	31	25	24	18	21	151
07:00-07:59	25	42	23	31	36	19	26	202
08:00-08:59	24	39	56	54	59	45	38	315
09:00-09:59	34	47	78	56	61	56	52	384
10:00-10:59	52	61	73	57	61	60	50	414
11:00-11:59	48	48	73	69	85	64	68	455
12:00-12:59	60	65	68	63	76	66	57	455
13:00-13:59	44	54	67	73	86	79	71	474
14:00-14:59	55	66	66	75	76	73	52	463
15:00-15:59	58	72	81	80	59	67	60	477
16:00-16:59	63	83	74	79	69	67	67	502
17:00-17:59	73	52	87	80	66	81	51	490
18:00-18:59	40	59	48	55	57	57	51	367
19:00-19:59	42	54	52	50	64	57	65	384
20:00-20:59	47	51	52	53	65	55	58	381
21:00-21:59	61	49	49	47	61	46	56	369
22:00-22:59	30	39	43	45	56	55	57	325
23:00-23:59	29	38	34	41	34	45	50	271
Total	1,008	1,062	1,192	1,181	1,214	1,159	1,141	7,957

Temporal Analysis 2016 - 2020 Fire								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	2	1	3	1	5	1	2	15
01:00-01:59	2	1	3	0	1	3	4	14
02:00-02:59	3	2	1	3	5	0	2	16
03:00-03:59	0	1	1	2	1	1	1	7
04:00-04:59	2	2	1	3	3	0	2	13
05:00-05:59	1	0	0	0	0	2	0	3
06:00-06:59	3	1	0	0	0	2	3	9
07:00-07:59	3	1	1	0	0	1	0	6
08:00-08:59	0	3	3	2	0	1	1	10
09:00-09:59	2	3	1	0	1	1	0	8
10:00-10:59	0	1	1	4	2	1	2	11
11:00-11:59	1	1	1	2	1	2	3	11
12:00-12:59	2	2	1	0	0	1	3	9
13:00-13:59	5	4	2	2	2	2	0	17
14:00-14:59	2	4	2	4	4	4	3	23
15:00-15:59	2	5	4	1	3	2	1	18
16:00-16:59	2	4	3	3	4	3	1	20
17:00-17:59	5	5	2	3	1	3	2	21
18:00-18:59	3	0	3	1	3	5	5	20
19:00-19:59	2	2	0	1	3	3	4	15
20:00-20:59	2	3	3	1	1	3	3	16
21:00-21:59	2	6	2	2	0	3	2	17
22:00-22:59	0	3	1	3	0	3	5	15
23:00-23:59	2	0	2	0	1	1	7	13
Total	48	55	41	38	41	48	56	327

Bridge Reliability & Simultaneous Performance					
Type	2016	2017	2018	2019	2020
Reliability %	92.07%	79.83%	78.04%	80.14%	81.57%
Citywide Reliability %	88.38%	82.95%	83.37%	81.03%	82.66%
Simultaneous Incident Count	273	322	235	284	278
Simultaneous Incident %	10.01%	11.49%	9.62%	10.62%	10.18%

Bridge Response District 90th Percentile Baseline Performance						
Category	Alarm Handling	Turnout	Travel Distribution	Travel Concentration	Total Response Time Distribution	Total Response Time Concentration
Fire						
Low	2:27	1:56	4:38	4:38	7:58	7:58
Moderate	1:45	1:53	3:24	7:45	5:53	9:44
EMS						
Low	3:13	1:44	4:20	4:20	7:59	7:59
Moderate	2:48	2:05	5:08	6:38	8:30	9:56

KALAMAZOO RESPONSE DISTRICT - 04

Quick Facts

Station 4 ..... Kalamazoo Avenue Fire Station

Address ..... 2541 Kalamazoo Ave. SE

Station Built.....1987

Frontline Apparatus ..... Engine 4, Ladder 4

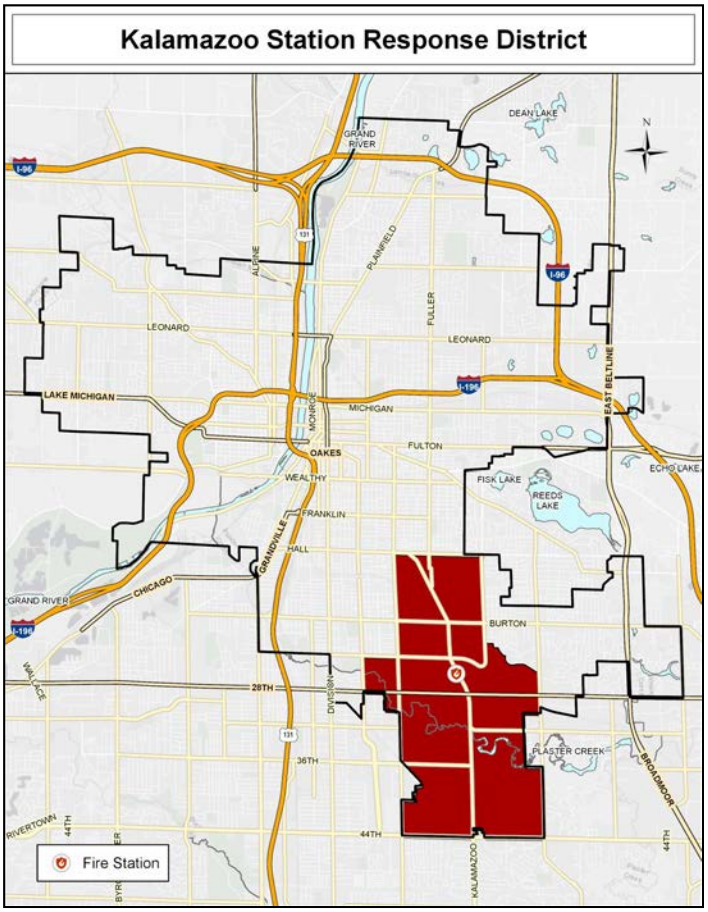
Cross Staffed Apparatus ..... Brush Unit 4

..... Support Unit 1 (Heavy Rescue)

Square Miles.....6.76

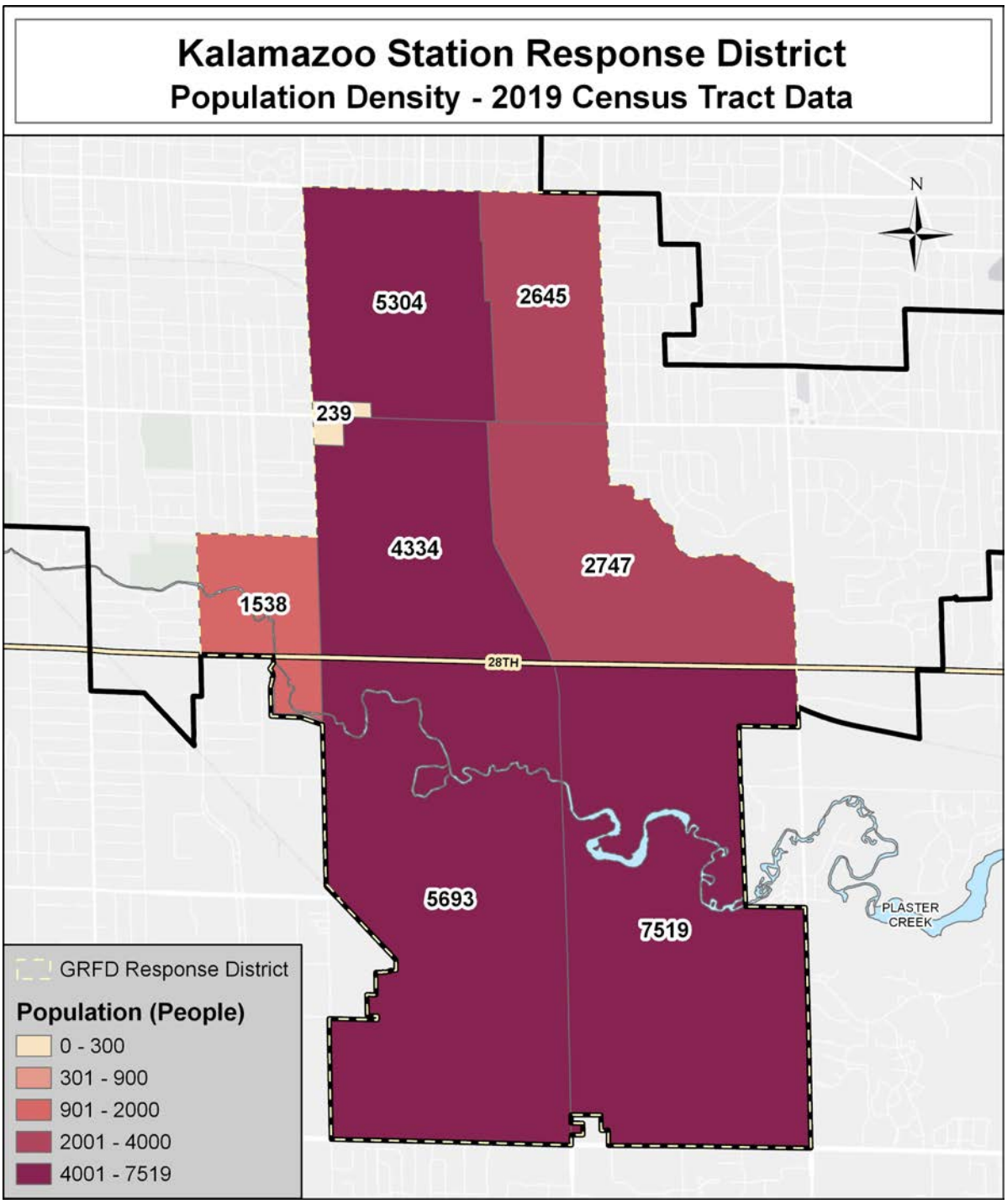
Road Miles.....115.31

Hydrants.....1,138



District Characteristics:

Kalamazoo Avenue station contains the largest percentage of the city's population, and has a mix of residential, commercial and light/heavy industrial occupancies extending south to the city limits. Kalamazoo's district is bisected by 28th street, a major east-west artery and commercial hub on the southern end of the city. The station houses an engine, an aerial unit, a brush unit, and the department's heavy rescue truck.



Population/Demographics:

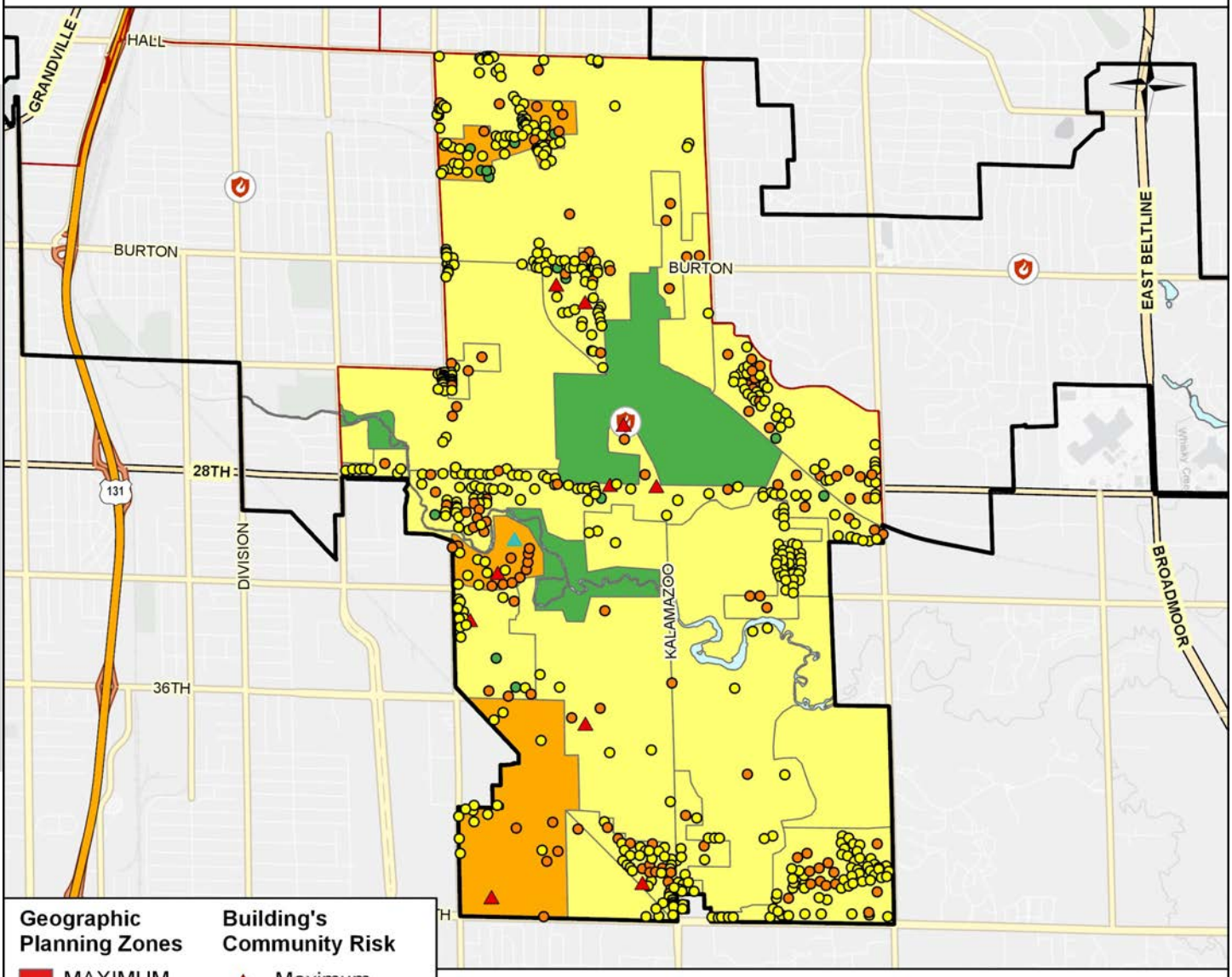
The Kalamazoo station response district contains 30,019 residents and comprises 15.56% of the city's population. Population density is 4,441 people per square mile. This analysis is based on data gathered from the 2019 US Census Bureau 5-year estimates. The district is predominately urban, with small zones of rural designations for parks and commercial/industrial areas.

District	Population	< 5 Years Old	< 18 Years Old	> 65 Years Old	Median Age	White	Black or African American	American Indian or Alaskan Native	Asian	Hispanic
4	30,019	2,138	7,165	4,239	33	17,629	8,851	16	1,485	2,787
GR Total	192,962	13,489	43,300	23,232	31	129,942	35,575	680	4,519	31,357
% of City	15.56%	15.85%	16.55%	18.25%	108.79%	13.57%	24.88%	2.35%	32.86%	8.89%

KALAMAZOO RESPONSE DISTRICT - 04

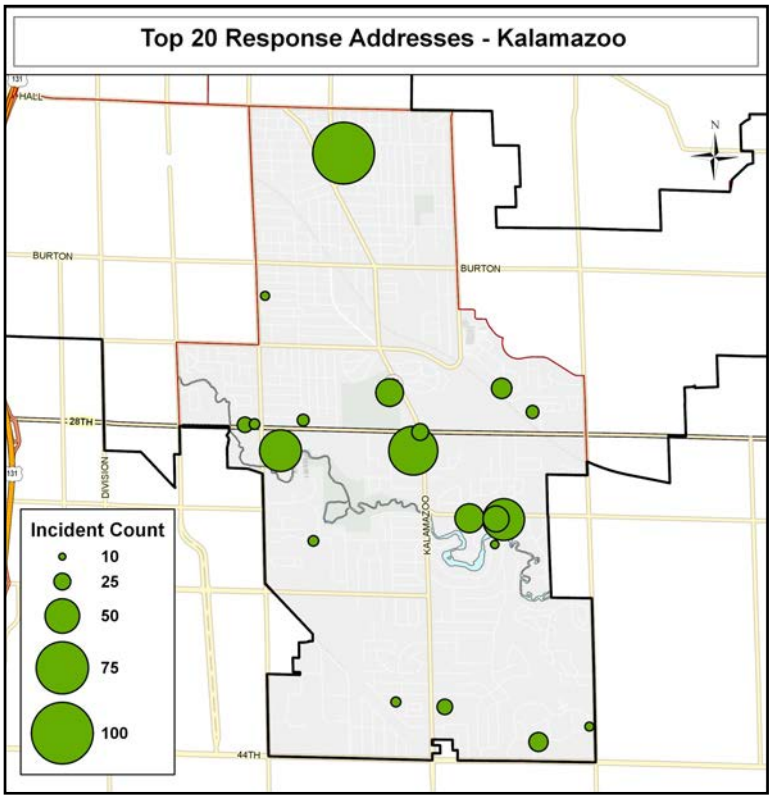
Kalamazoo Station Response District

Geographic Planning Zones with Fire Risk Assessment Buildings



Buildings per Community Risk Type				
Low	Moderate	High	Maximum	Total
16	483	130	11	640

District	Residential Occupancies	Industrial Occupancies	Commercial Occupancies	Tax Exempt	Total Square Ft	Taxable Value	Average Building Age (Years)	Needed Fire Flow over 3500 GPM	Sprinklered Buildings
4	8,999	42	408	48	18,714,838	$689,752,527	65.74	190	92
Citywide	55,506	269	3,364	821	124,272,758	4,950,657,315	82.36	1,485	1,180
% of City	16.21%	15.61%	12.13%	5.85%	15.06%	13.93%	79.82%	12.79%	7.80%



Top 20 Response Addresses	Incident Count
1440 FULLER Avenue SE	133
1540 28TH Street SE	70
2000 32ND Street SE	60
2902 MARSHALL Avenue SE	60
1900 32ND Street SE	42
2619 KALAMAZOO Avenue SE	40
1950 32ND Street SE	38
2000 SAGINAW Road SE	30
4340 CALLANDER Drive SE	28
28TH Street SE	25
4118 KALAMAZOO Avenue SE	23
705 28TH Street SE	23
2745 BIRCHCREST Drive SE	19
1015 28TH Street SE	18
1022 33RD Street SE	16
727 28TH Street SE	16
4134 OAK PARK Drive SE	15
4238 EASTCASTLE Court SE	14
821 JOSLIN Street SE	14
1948 MILLBANK Street SE	13

Risk Assessment:

Fire: 9.49% of the district's area is classified as a high or maximum risk geographical planning zone. There are 190 occupancies with a needed fire flow over 3,500 GPM and 13.93% of the city's taxable value lies within the district.

Vehicle accidents: Hotspots include the Kalamazoo Avenue, 28th St, and 44th St. corridors at major intersections; both MVAs and pedestrians struck are common.

EMS: There are dialysis centers at 4340 Calendar St. and 705 28th St. The district contains numerous AFC homes. There are homeless camps along the railroad line and in the cemetery near the station. Opioid hotspots include the restrooms at Meijer, Walgreens, and CVS; and residences on 33rd/32nd/ and Pastiche. The district also contains many senior living and low income housing centers with high call volumes.

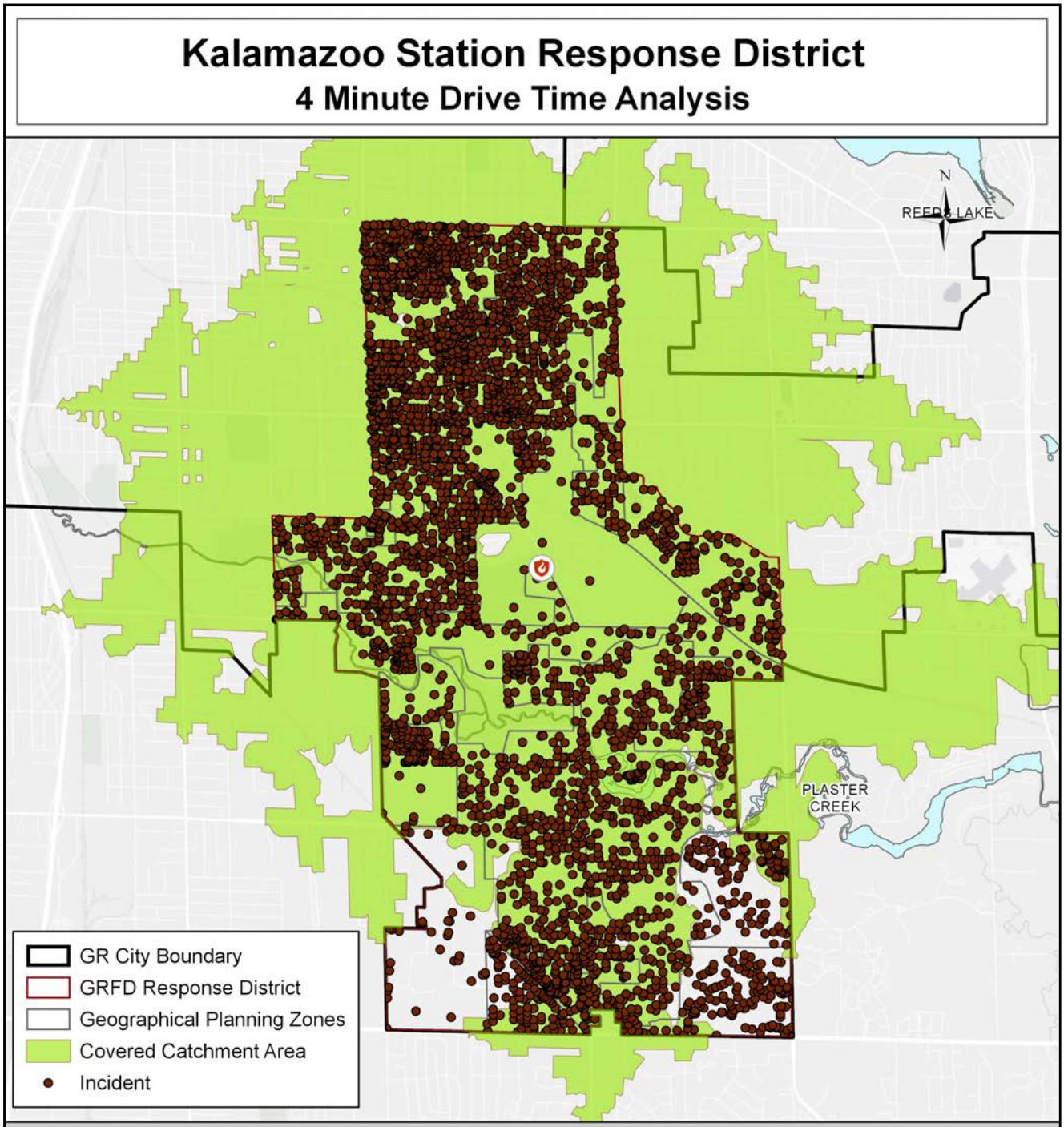
Maximum Risk Buildings For Kalamazoo District

1160 BURTON ST SE	MASTER FINISH COMPANY
1410 28TH ST SE	MNM TRANSPORT SERVICES
1540 28TH ST SE	Meijer Grocery Store
2020 NEWARK AVE SE	Steel Supply & Engineering
2541 KALAMAZOO AVE SE	Kalamazoo Avenue Fire Station
3120 KEN O SHA IND CT SE	Action Mold & Machining Inc
3662 POINSETTIA AVE SE	New Branches Charter Academy
4249 OAK PARK DR SE	L & N Carpet Cleaning
830 33RD ST SE	Pf3 Paint Supply
901 44TH ST SE	Steelcase Inc.
1060 KEN O SHA IND PARK DR SE	G A Richards Company

KALAMAZOO RESPONSE DISTRICT - 04

Distribution - Four Minute Drive Time Analysis

Distribution metrics for Kalamazoo district are an area of focus. Station location and the size of the district, in addition to the volume and placement of incidents, have demonstrated a need for more analysis of this district's deployment model. Analysis of drive times in this section are based on the street speed layer used by CAD (computer-aided dispatch).

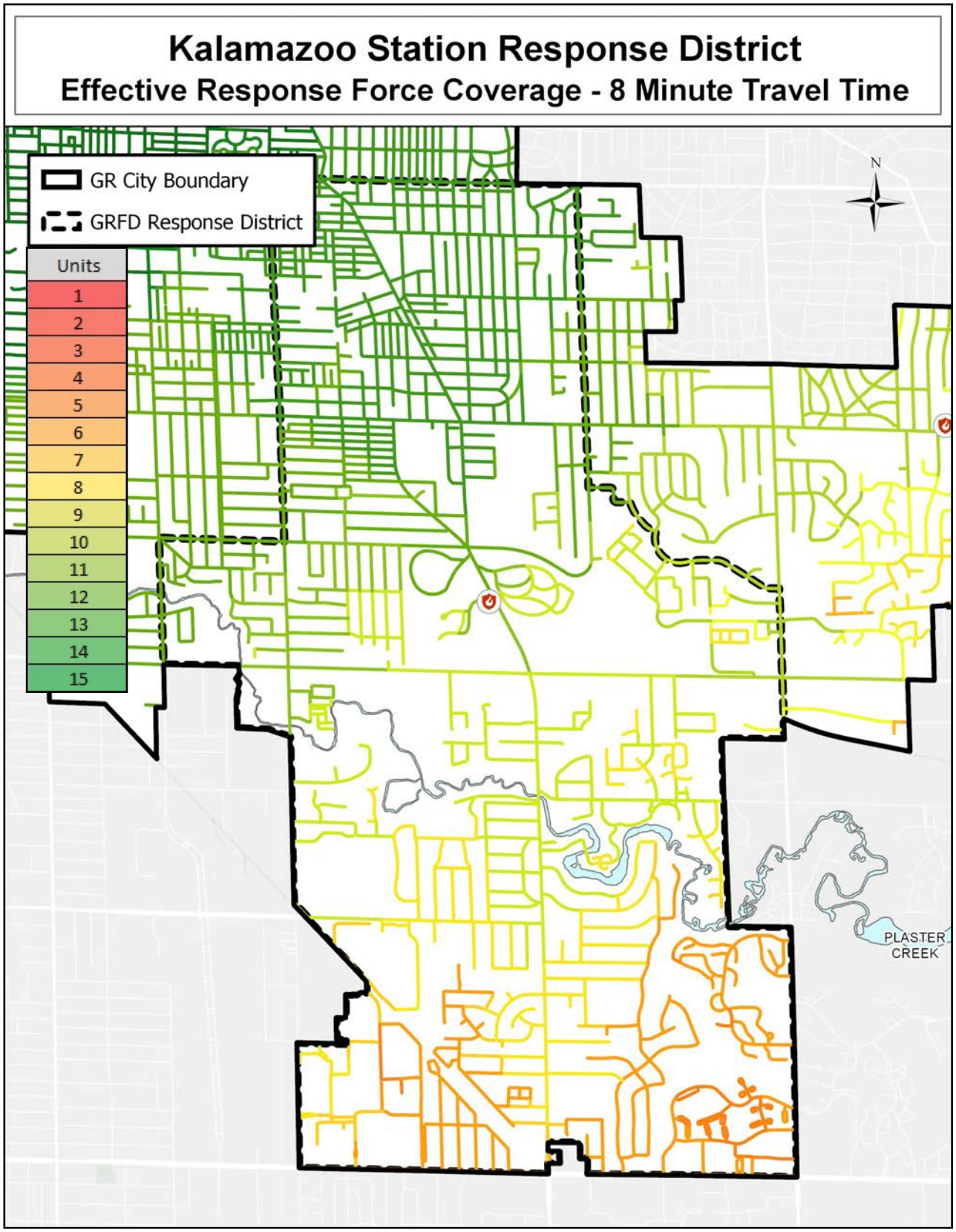


Distribution - Drive Time Analysis

Kalamazoo District 4	2016	2017	2018	2019	2020
Incident Count	2,985	3,073	2,981	3,043	2,843
Incidents in Covered Area	2,828	2,887	2,784	2,815	2,632
% Incidents Covered	94.74%	93.95%	93.39%	92.51%	92.58%

Concentration - District Effective Response Force Analysis Map

This map depicts the number of units that can be assembled in the district within the multiple unit benchmark travel time of 8 minutes. Due to the configuration of the district and the distance to outlying areas, Kalamazoo's district has significant variations in effective response force coverage. This is very evident on the southern border.



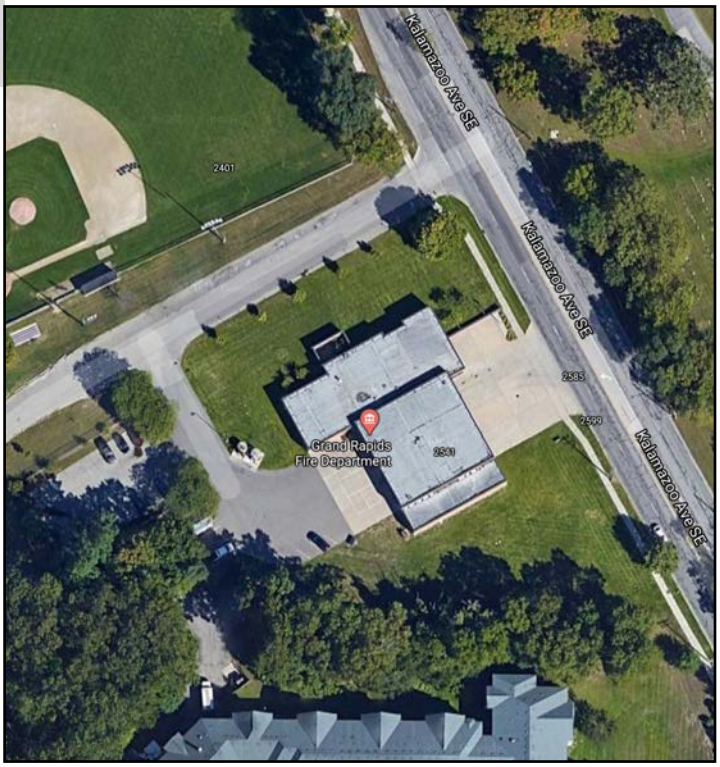
KALAMAZOO RESPONSE DISTRICT - 04

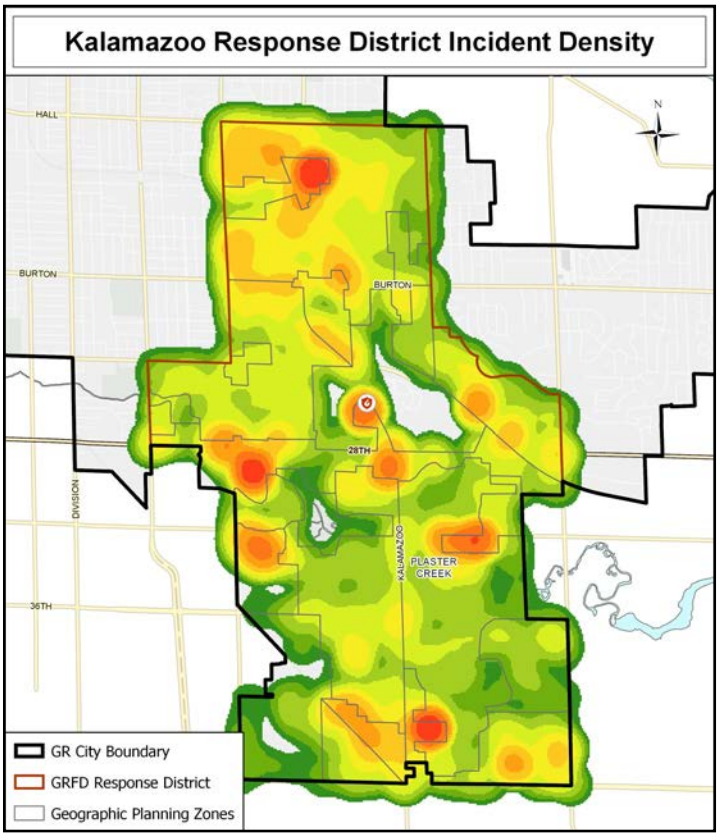
Response Data

Incident volume in this district has been very consistent over the last five years, trending with citywide numbers. Baseline performance is impacted by the district size and station placement. Metrics for the most common types of incidents show fire low incidents at 1:57 and fire moderate at 3:14 over benchmark. EMS low incidents are at 2:13 over benchmark with EMS moderate incidents running :42 under.

Kalamazoo Station Incidents and % of Citywide

Type	2016	2017	2018	2019	2020
Fire	87	90	60	74	72
	13.59%	14.88%	10.34%	13.70%	11.25%
EMS	1,907	1,820	2,006	1,923	1,780
	13.13%	11.99%	13.96%	12.55%	11.54%
Other	991	1163	915	1046	991
	12.64%	14.42%	12.49%	12.83%	14.21%
Total	2,985	3,073	2,981	3,043	2,843
	12.97%	12.89%	13.38%	12.67%	12.34%
Fire Loss	$935,268	$329,388	$310,988	$955,221	$647,345
	15.02%	5.86%	6.07%	17.64%	10.22%





Kalamazoo Apparatus Responses

Unit	2016	2017	2018	2019	2020
Engine 4	991	2,709	2,628	2,519	2,664
Ladder 4/Platform 4	1,168	917	967	1,453	1,174
Squad 4	1,628				
Brush 4	5	16	11	19	11
Heavy Rescue 1	2	1	1		
Support 1				2	5
Total Responses	3,794	3,643	3,607	3,993	3,854
% of City Responses	11.94%	11.35%	11.78%	12.13%	12.20%
Total Deployed Hours	1243:57:12	1179:56:14	1111:29:02	1279:40:19	1171:26:50
% of City Deployed Hours	13.03%	12.17%	12.00%	12.37%	12.00%

Kalamazoo Apparatus Unit Hour Utilization

Unit	2016	2017	2018	2019	2020
Engine 4	0.06	0.17	0.16	0.16	0.16
Ladder 4/Platform 4	0.08	0.06	0.06	0.09	0.08
Squad 4	0.10	0.00	0.00	0.00	0.00
Brush 4	0.00	0.00	0.00	0.00	0.00
Heavy Rescue 1	0.00	0.00	0.00	0.00	0.00
Support 1	0.00	0.00	0.00	0.00	0.00

Temporal Analysis 2016 - 2020 EMS								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	60	40	38	32	36	36	48	290
01:00-01:59	49	35	34	29	31	37	46	261
02:00-02:59	35	28	22	27	27	26	37	202
03:00-03:59	38	32	27	33	32	33	30	225
04:00-04:59	39	20	33	23	27	29	26	197
05:00-05:59	26	24	26	26	36	29	23	190
06:00-06:59	29	46	30	37	41	32	41	256
07:00-07:59	39	52	38	39	34	57	36	295
08:00-08:59	64	71	75	55	60	50	43	418
09:00-09:59	61	81	61	72	61	56	63	455
10:00-10:59	56	78	75	87	78	78	70	522
11:00-11:59	68	98	76	81	85	78	65	551
12:00-12:59	81	80	77	80	64	63	69	514
13:00-13:59	54	79	83	83	85	65	76	525
14:00-14:59	62	82	74	84	70	75	59	506
15:00-15:59	65	77	92	61	75	73	75	518
16:00-16:59	52	85	77	66	81	82	74	517
17:00-17:59	57	65	84	76	79	68	66	495
18:00-18:59	69	71	57	86	72	72	49	476
19:00-19:59	64	60	53	69	72	62	72	452
20:00-20:59	50	60	68	70	52	84	76	460
21:00-21:59	53	44	51	62	58	69	76	413
22:00-22:59	56	53	40	55	61	53	77	395
23:00-23:59	40	49	37	46	41	41	47	301
Total	1,267	1,410	1,328	1,379	1,358	1,348	1,344	9,434

Temporal Analysis 2016 - 2020 Fire								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	3	1	2	3	1	2	1	13
01:00-01:59	3	1	1	5	0	1	1	12
02:00-02:59	0	2	1	0	2	0	0	5
03:00-03:59	2	0	0	3	0	3	1	9
04:00-04:59	2	0	1	0	0	2	4	9
05:00-05:59	3	0	1	3	0	2	0	9
06:00-06:59	0	1	1	1	0	1	0	4
07:00-07:59	1	0	1	1	2	1	0	6
08:00-08:59	1	1	2	0	0	1	0	5
09:00-09:59	2	2	2	1	2	2	0	11
10:00-10:59	2	6	2	3	0	0	3	16
11:00-11:59	2	4	3	3	2	1	3	18
12:00-12:59	5	2	2	1	2	1	3	16
13:00-13:59	5	2	5	3	1	3	3	22
14:00-14:59	6	3	3	6	1	2	2	23
15:00-15:59	0	1	0	4	1	6	5	17
16:00-16:59	4	1	4	2	1	2	1	15
17:00-17:59	2	7	8	6	2	7	3	35
18:00-18:59	6	6	2	9	7	2	5	37
19:00-19:59	5	6	5	5	2	5	6	34
20:00-20:59	2	4	0	5	2	3	2	18
21:00-21:59	1	3	6	1	4	3	3	21
22:00-22:59	3	0	3	2	2	2	4	16
23:00-23:59	2	1	2	1	1	2	3	12
Total	62	54	57	68	35	54	53	383

Kalamazoo Reliability & Simultaneous Performance					
Type	2016	2017	2018	2019	2020
Reliability %	95.34%	86.92%	87.90%	90.93%	91.72%
Citywide Reliability %	88.38%	82.95%	83.37%	81.03%	82.66%
Simultaneous Incident Count	380	421	676	398	292
Simultaneous Incident %	12.73%	13.70%	22.65%	13.07%	10.27%

Kalamazoo Response District 90th Percentile Baseline Performance						
Category	Alarm Handling	Turnout	Travel Distribution	Travel Concentration	Total Response Time Distribution	Total Response Time Concentration
Fire						
Low	2:20	1:57	5:39	5:39	8:57	8:57
Moderate	1:56	1:52	5:06	10:42	7:51	14:14
EMS						
Low	3:27	1:46	5:52	5:52	9:43	9:43
Moderate	2:53	1:52	4:44	5:34	8:09	8:48

MONROE RESPONSE DISTRICT - 05

Quick Facts

Station 5 ..... Monroe Avenue Fire Station

Address ..... 1181 Monroe Ave. NW

Station Built 1982

Frontline Apparatus ..... Engine 5, Car 6

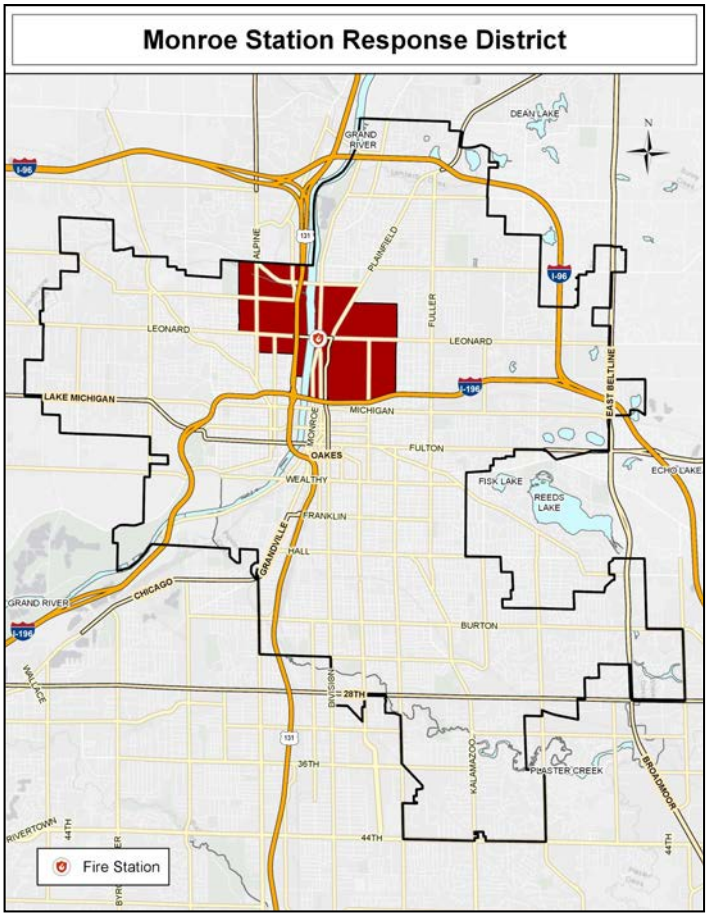
Cross Staffed Apparatus ..... Water 5

..... Boat 4

Square Miles 2.89

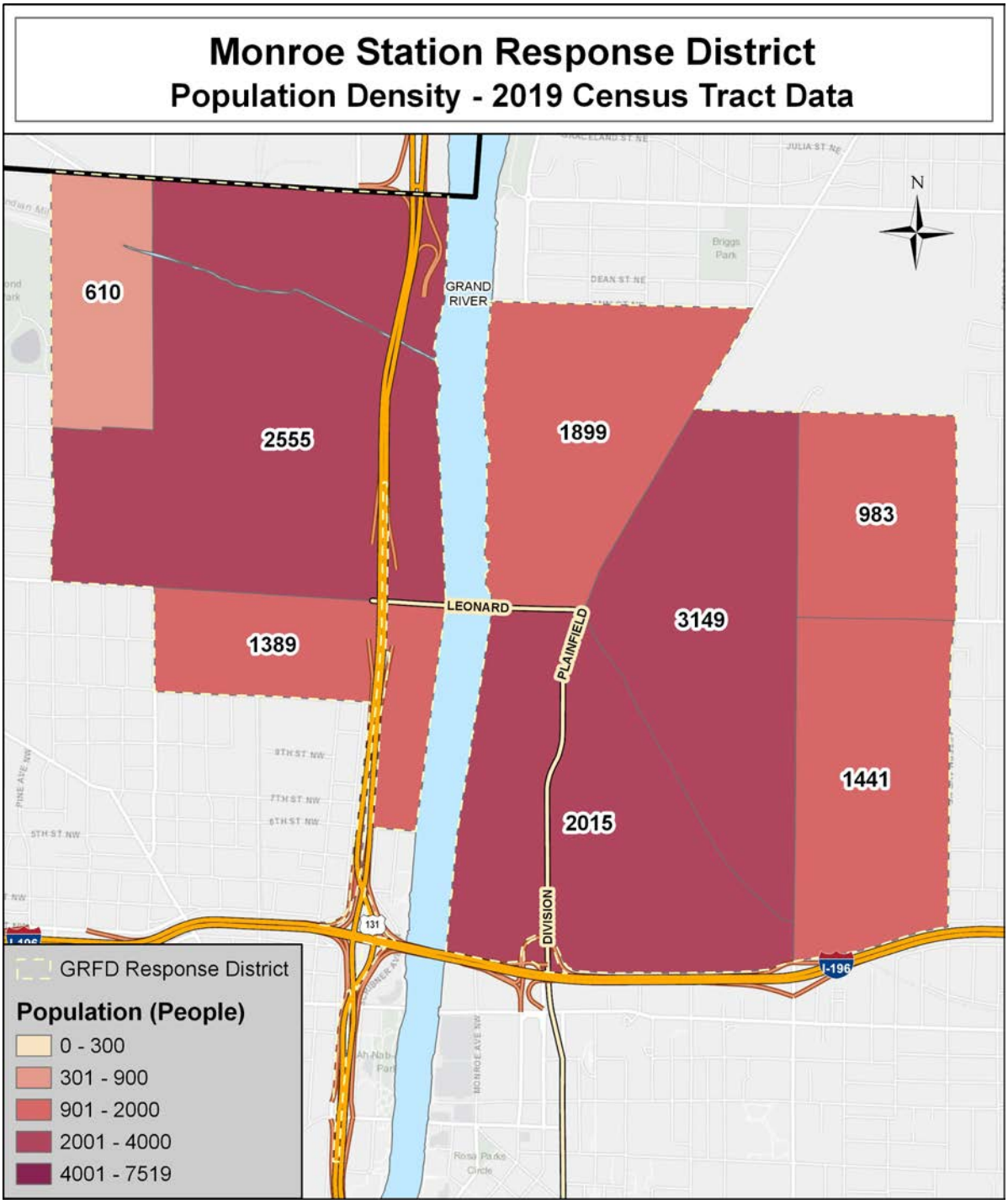
Road Miles 72.71

Hydrants 624



District Characteristics:

Monroe Avenue station is positioned just north of downtown. The southern half of the district is comprised of heavy industrial occupancies, mixed with old furniture factories redeveloped into residential use. The northern half of the district has a mix of residential, commercial and light industrial occupancies. The Grand River divides the district into east and west sections. This station is one of three placed along Leonard Street, one of the few streets that runs throughout the length of the city. Monroe station houses one of the city's three extrication engines, and frequently responds on the freeway.



Population/Demographics:

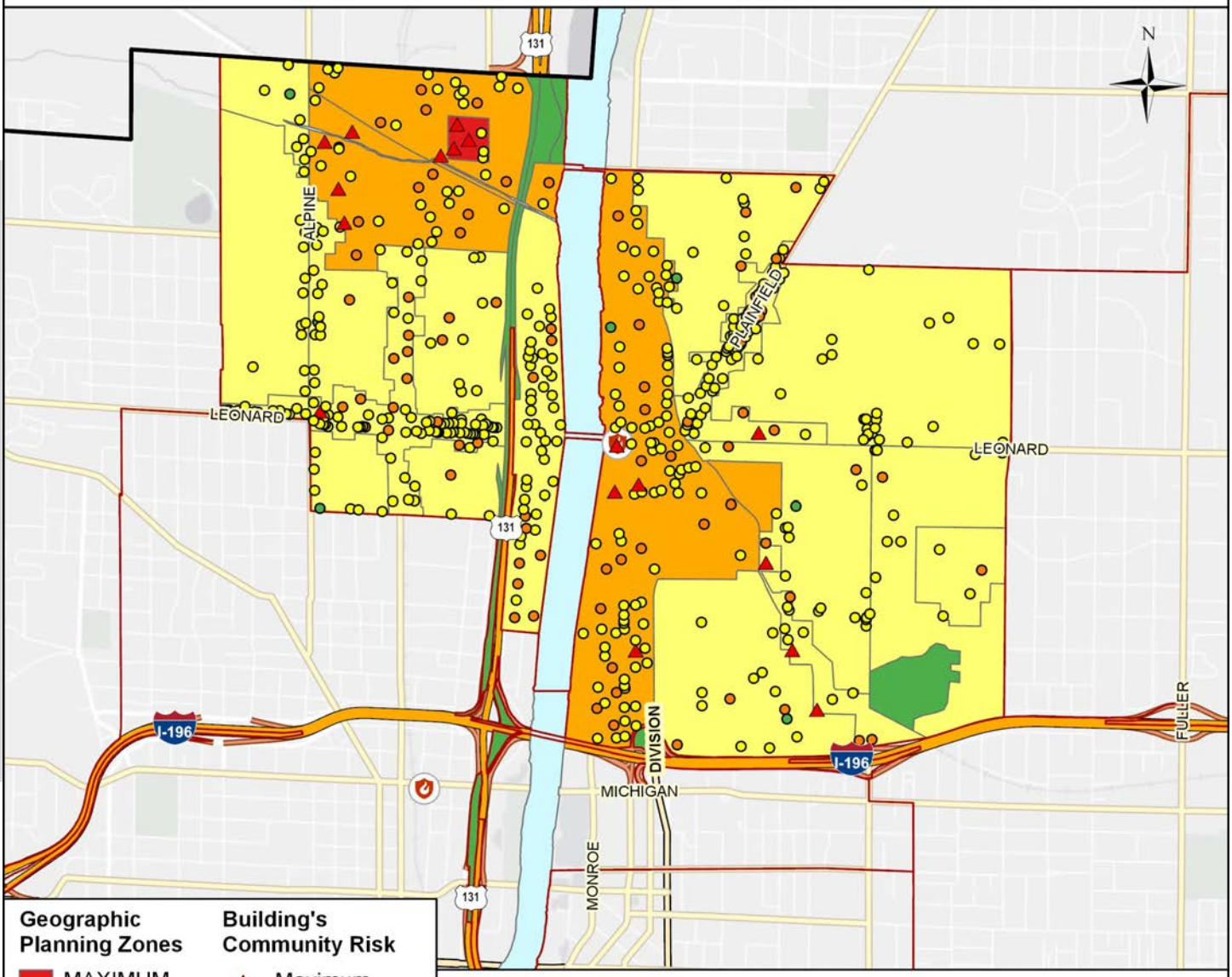
The Monroe station response district contains 14,041 residents and comprises 7.28% of the city's population. Population density is 4,858 people per square mile. This analysis is based on data gathered from the 2019 US Census Bureau 5-year estimates. The district is predominately urban, with small pockets of rural designations for parks and commercial/industrial areas.

District	Population	< 5 Years Old	< 18 Years Old	> 65 Years Old	Median Age	White	Black or African American	American Indian or Alaskan Native	Asian	Hispanic
5	14,041	1,142	3,269	1,063	30	9,893	1,867	71	252	2,462
GR Total	192,962	13,489	43,300	23,232	31	129,942	35,575	680	4,519	31,357
% of City	7.28%	8.47%	7.55%	4.58%	97.72%	7.61%	5.25%	10.44%	5.58%	7.85%

MONROE RESPONSE DISTRICT - 05

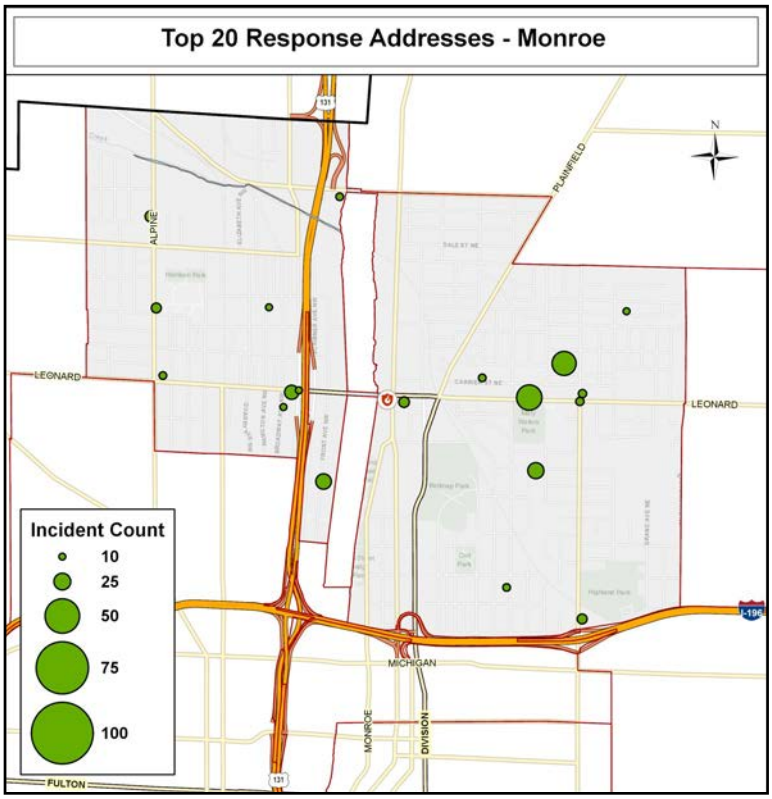
Monroe Station Response District

Geographic Planning Zones with Fire Risk Assessment Buildings



Buildings per Community Risk Type				
Low	Moderate	High	Maximum	Total
7	432	80	17	536

District	Residential Occupancies	Industrial Occupancies	Commercial Occupancies	Tax Exempt	Total Square Ft	Taxable Value	Average Building Age (Years)	Needed Fire Flow over 3500 GPM	Sprinklered Buildings
5	4,878	66	474	94	10,775,559	$374,258,083	103.23	244	102
Citywide	55,506	269	3,364	821	124,272,758	4,950,657,315	82.36	1,485	1,180
% of City	8.79%	24.54%	14.09%	11.45%	8.67%	7.56%	125.34%	16.43%	8.64%



Top 20 Response Addresses	Incident Count
385 LEONARD Street NE	37
1305 FORD Avenue NE	35
344 CEDAR Street NE	24
936 FRONT Avenue NW	23
400 LEONARD Street NW	21
1647 ALPINE Avenue NW	17
1140 MONROE Avenue NW	16
1400 ALPINE Avenue NW	15
510 COLLEGE Avenue NE	15
1210 COLLEGE Avenue NE	13
COLLEGE Avenue NE	13
LEONARD Street NE	13
205 CARRIER Street NE	12
270 ANN Street NW	12
629 LAFAYETTE Avenue NE	12
747 LEONARD Street NW	12
LEONARD Street NW	11
1130 BROADWAY Avenue NW	10
1424 UNION Avenue NE	10
1434 HAMILTON Avenue NW	10

Risk Assessment:

Fire: 24.97% of the district's area is classified as a high or maximum risk geographical planning zone. There are 244 occupancies with a needed fire flow over 3,500 GPM and 7.56% of the city's taxable value is situated within the district.

Vehicle accidents: A high risk zone is US-131 – between the I-196 interchange to Ann Street.

EMS: Homeless camps are located at Leonard/Plainfield along the railroad tracks; and along the river behind 330 Ann. High frequency users are at the Leonard St. underpass at US-131, and at bus stops on the Leonard corridor. There are opioid hotspots in the 1300 block of Muskegon and Davis Avenues. These locations also have violent patient risks due to opioid use and trafficking.

Hazardous Materials: The district is home to Haviland Enterprises, a large manufacturer and distributor of pool supplies and other household cleaning products. This facility has experienced several releases over the last five years.

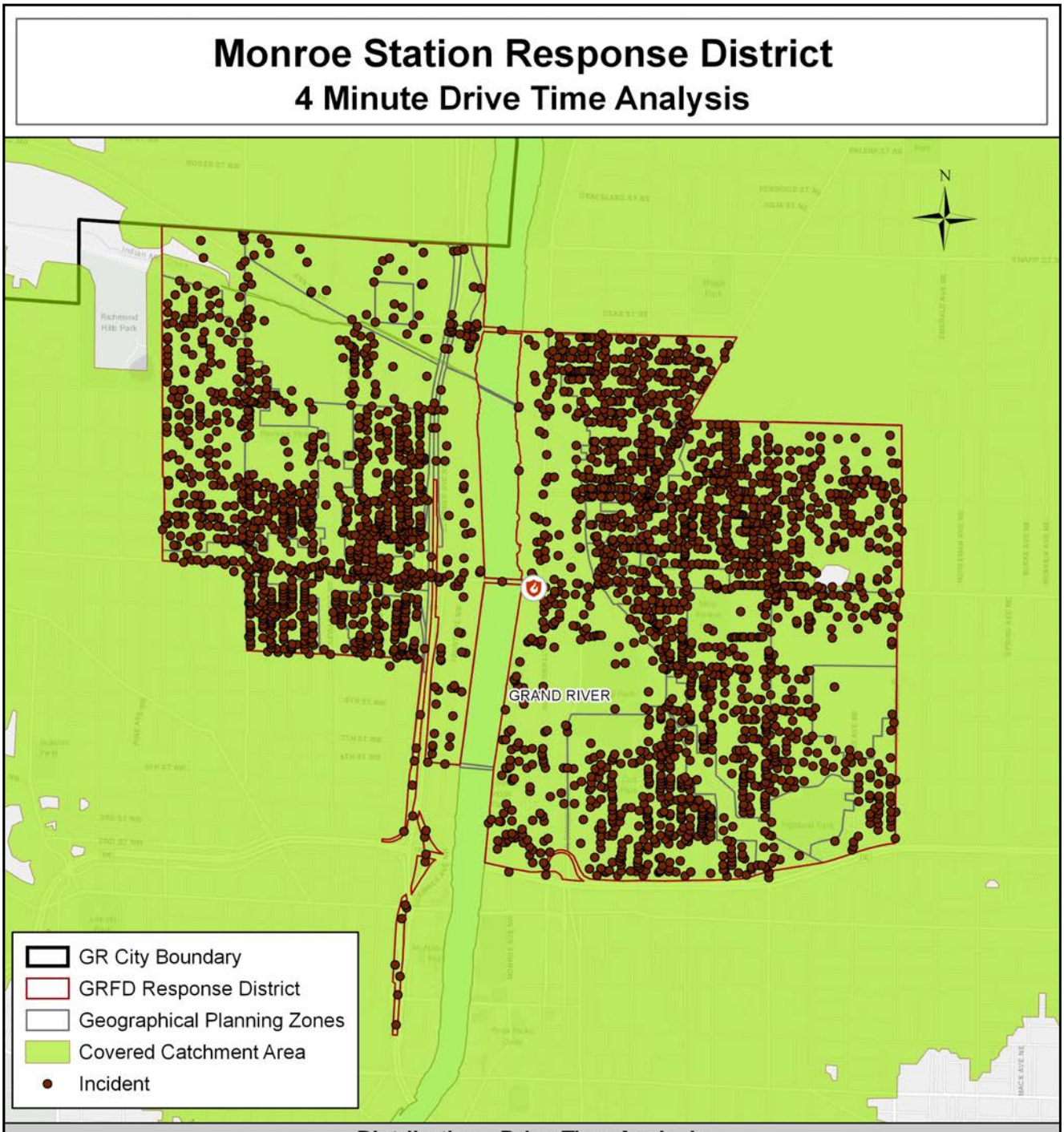
Maximum Risk Buildings For Monroe District

1101 MONROE AVE NW	Grand Rapids Water System Pumping Station	421 ANN ST NW	Haviland Enterprises, Inc.
1120 MONROE AVE NW	City of Grand Rapids Development Center	451 ANN ST NW	Haviland Enterprises, Inc.
1181 MONROE AVE NW	Monroe Avenue Fire Station	521 ANN ST NW	Haviland Enterprises, Inc.
1641 DAVIS AVE NW	Cannon Machine Inc	613 NORTH AVE NE	Midwest Plating Co Inc
1700 ALPINE AVE NW	GRAND RAPIDS FOAM	736 OTTAWA AVE NW	Di-Anodic Finishing Corporation
1776 ALPINE AVE NW	Crystal Flash	738 LAFAYETTE AVE NE	Midwest Plating Co.
1835 STERLING AVE NW	Haviland Enterprises, Inc.	747 LEONARD ST NW	SHELL GAS STATION
1860 ALPINE AVE NW	PADNOS Recycling	900 CLANCY AVE NE	Thierica
224 CARRIER ST NE	St Alphonsus Parish		

MONROE RESPONSE DISTRICT - 05

Distribution - Four Minute Drive Time Analysis

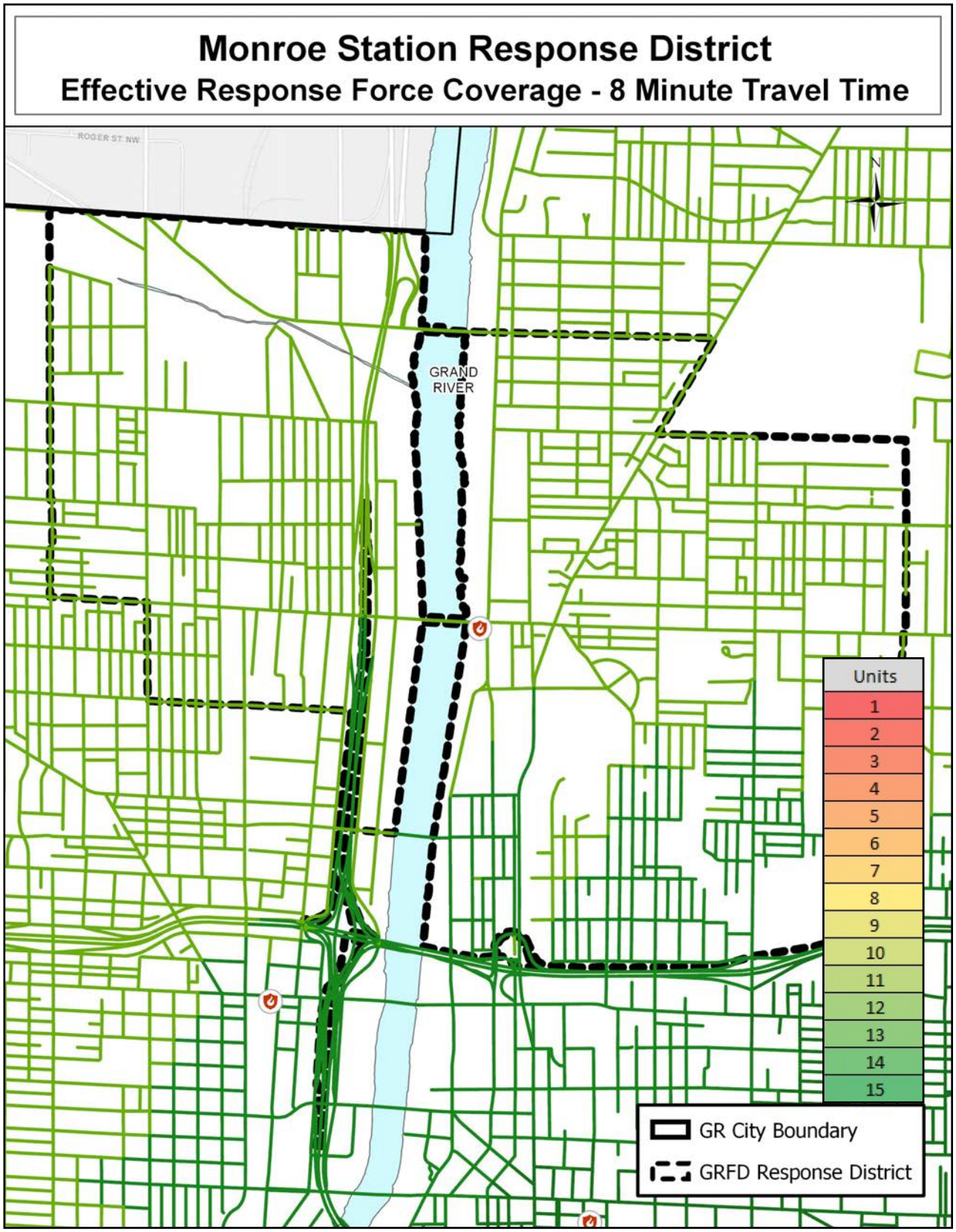
Station location and the size of the district lead to optimal distribution metrics. The last five years saw incidents falling within catchment coverage areas with a 100% compliance rate. The district is split by the Grand River, which leads to some delays in actual performance. Analysis of drive times in this section are based on the street speed layer used by CAD (computer-aided dispatch).



Distribution - Drive Time Analysis					
Monroe District 5	2016	2017	2018	2019	2020
Incident Count	1,805	1,889	1,899	1,915	2,029
Incidents in Covered Area	1,805	1,889	1,899	1,915	2,029
% Incidents Covered	100.00%	100.00%	100.00%	100.00%	100.00%

Concentration - District Effective Response Force Analysis Map

This map depicts the number of units that can be assembled in the district within the multiple unit benchmark travel time of 8 minutes. Surrounded on all sides by other city districts, the effective response force data for Monroe district is excellent. Additionally, two of the neighboring districts are staffed with two frontline units.

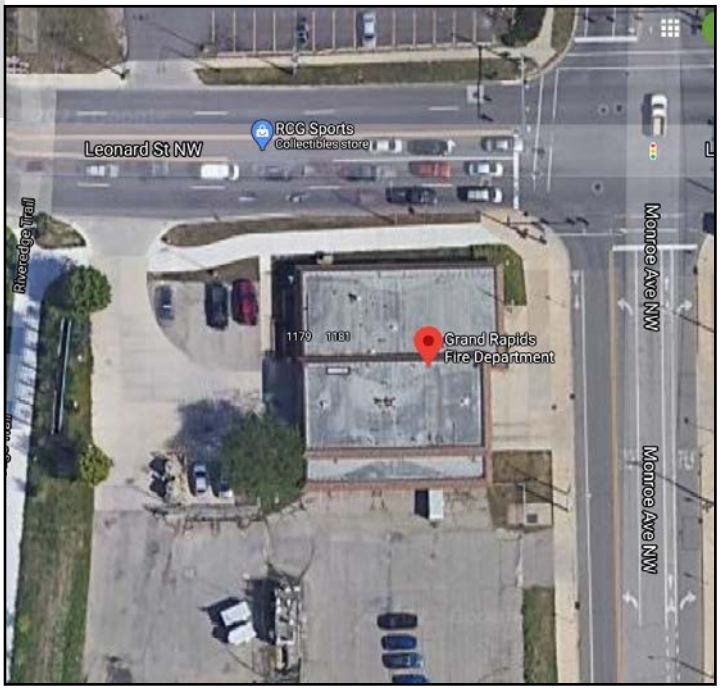


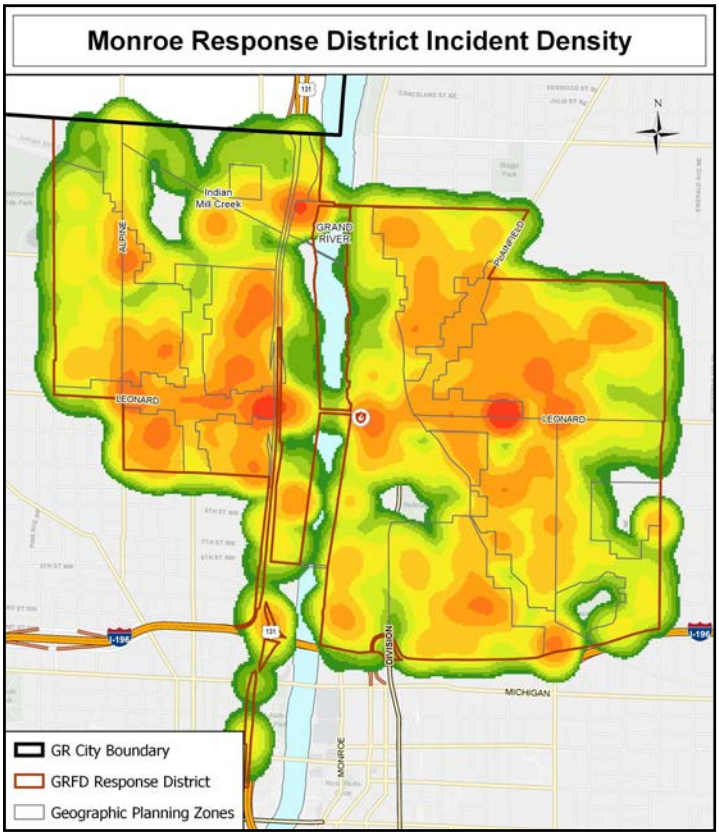
Response Data

Incident counts for the Monroe district have been consistently averaging around 1,900 annually. As home to a battalion chief and rescue engine, apparatus response counts are much higher, typically running closer to 2,800 per year. Baseline performance for the most common types of incidents show very good compliance with benchmarks, with the exception of EMS moderate, which is running 1:45 over.

Monroe Station Incidents and % of Citywide

Type	2016	2017	2018	2019	2020
Fire	67	59	59	55	52
	10.47%	9.75%	10.17%	10.19%	8.13%
EMS	1,121	1,239	1,216	1,200	1,387
	7.72%	8.16%	8.46%	7.83%	8.99%
Other	617	591	624	660	590
	7.87%	7.33%	8.52%	8.09%	8.46%
Total	1,805	1,889	1,899	1,915	2,029
	7.85%	7.92%	8.53%	7.97%	8.81%
Fire Loss	$1,062,794	$334,655	$1,047,065	$569,871	$252,067
	17.07%	5.95%	20.45%	10.52%	3.98%





Monroe Apparatus Responses

Unit	2016	2017	2018	2019	2020
Engine 5/Rescue 5	2,160	2,233	2,200	2,175	2,254
Car 6	882	841	907	1,066	975
Medic 5	1				
Water 5					1
Total Responses	3,043	3,074	3,107	3,241	3,230
% of City Responses	9.58%	9.58%	10.15%	9.84%	10.23%
Total Deployed Hours	984:13:33	961:11:39	971:38:01	1037:26:29	1020:44:00
% of City Deployed Hours	10.31%	9.91%	10.49%	10.03%	10.46%

Monroe Apparatus Unit Hour Utilization

Unit	2016	2017	2018	2019	2020
Engine 5/Rescue 5	0.13	0.13	0.13	0.14	0.14
Car 6	0.06	0.06	0.06	0.07	0.06
Medic 5	0.00	0.00	0.00	0.00	0.00
Water 5	0.00	0.00	0.00	0.00	0.00

Temporal Analysis 2016 - 2020 EMS								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	32	28	28	20	30	28	35	201
01:00-01:59	43	17	24	27	34	24	24	193
02:00-02:59	28	15	19	17	18	14	31	142
03:00-03:59	20	21	24	15	19	16	25	140
04:00-04:59	23	13	13	14	28	21	20	132
05:00-05:59	22	16	26	18	13	22	18	135
06:00-06:59	22	16	19	20	20	18	20	135
07:00-07:59	24	24	33	39	21	21	20	182
08:00-08:59	30	26	42	32	33	35	23	221
09:00-09:59	27	35	27	39	25	36	31	220
10:00-10:59	36	43	35	30	44	44	34	266
11:00-11:59	38	36	51	38	45	48	36	292
12:00-12:59	45	49	41	50	42	44	40	311
13:00-13:59	43	46	60	52	34	48	53	336
14:00-14:59	55	46	46	48	53	54	31	333
15:00-15:59	45	56	43	63	49	58	57	371
16:00-16:59	44	63	49	61	46	53	66	382
17:00-17:59	49	53	51	51	59	52	55	370
18:00-18:59	51	58	44	47	51	51	45	347
19:00-19:59	56	37	51	44	43	42	44	317
20:00-20:59	50	31	54	56	43	52	49	335
21:00-21:59	37	38	31	37	38	40	43	264
22:00-22:59	35	38	37	40	38	43	45	276
23:00-23:59	34	28	33	39	36	41	50	261
Total	889	833	881	897	862	905	895	6,162

Temporal Analysis 2016 - 2020 Fire								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	3	2	1	1	0	1	1	9
01:00-01:59	1	1	1	0	1	3	2	9
02:00-02:59	2	0	0	1	0	3	4	10
03:00-03:59	1	1	0	0	1	1	1	5
04:00-04:59	1	0	0	2	1	0	1	5
05:00-05:59	4	0	1	2	0	0	0	7
06:00-06:59	0	1	1	0	1	1	1	5
07:00-07:59	2	1	0	1	1	0	1	6
08:00-08:59	1	2	1	1	0	2	1	8
09:00-09:59	2	4	2	4	1	1	2	16
10:00-10:59	0	2	1	2	4	1	1	11
11:00-11:59	2	0	2	3	1	4	1	13
12:00-12:59	6	4	2	1	0	1	2	16
13:00-13:59	3	1	3	1	1	2	2	13
14:00-14:59	3	5	1	3	5	1	1	19
15:00-15:59	2	4	3	1	1	3	3	17
16:00-16:59	2	0	2	3	2	2	1	12
17:00-17:59	4	3	1	1	3	0	4	16
18:00-18:59	2	5	4	1	1	6	4	23
19:00-19:59	1	1	4	4	5	1	2	18
20:00-20:59	7	2	1	1	5	0	1	17
21:00-21:59	3	0	1	3	0	3	4	14
22:00-22:59	0	2	0	1	3	4	0	10
23:00-23:59	1	1	2	0	2	4	3	13
Total	53	42	34	37	39	44	43	292

Monroe Reliability & Simultaneous Performance					
Type	2016	2017	2018	2019	2020
Reliability %	79.59%	76.35%	74.56%	72.68%	76.42%
Citywide Reliability %	88.38%	82.95%	83.37%	81.03%	82.66%
Simultaneous Incident Count	149	128	142	224	171
Simultaneous Incident %	8.25%	6.75%	7.45%	11.69%	8.41%

Monroe Response District 90th Percentile Baseline Performance						
Category	Alarm Handling	Turnout	Travel Distribution	Travel Concentration	Total Response Time Distribution	Total Response Time Concentration
Fire						
Low	2:06	1:59	4:53	4:53	7:56	7:56
Moderate	1:46	2:00	3:45	7:22	6:19	10:48
EMS						
Low	3:11	1:41	4:42	4:42	8:18	8:18
Moderate	2:50	1:48	5:34	7:56	8:59	11:15

BURTON RESPONSE DISTRICT - 06

Quick Facts

Station 6 .....Burton Street Fire Station

Address .....2941 Burton St. SE

Station Built.....1981

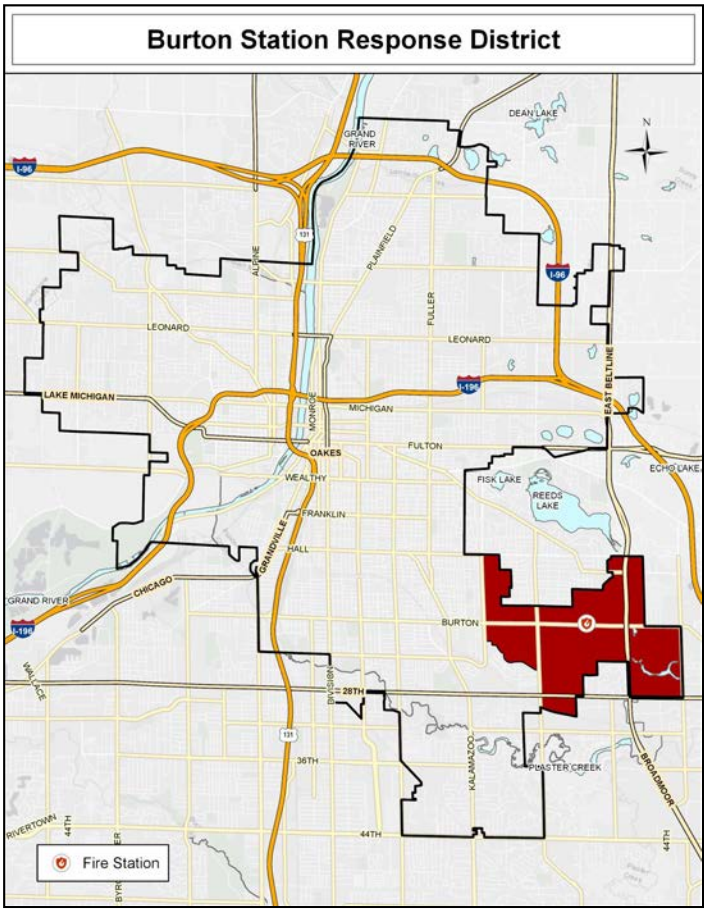
Frontline Apparatus .....Engine 6

Reserve Apparatus.....Reserve Platform 5

Square Miles.....3.54

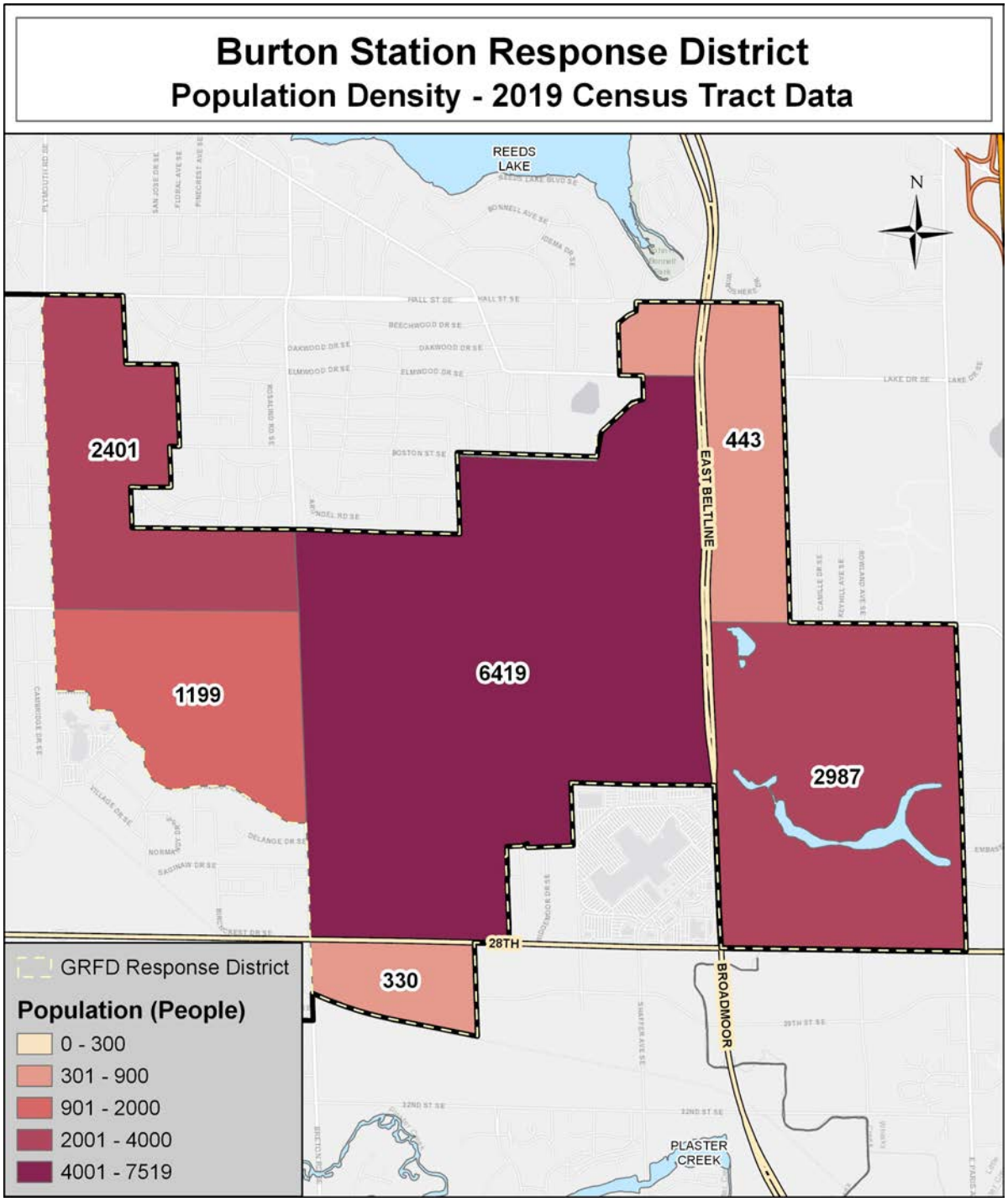
Road Miles.....56.46

Hydrants.....637



District Characteristics:

Burton Street station is located in a densely residential environment, with pockets of large retail occupancies on its western and south-eastern boundaries. The East Beltline, an important north-south artery for the transportation system, runs through the district; and 28th Street, one of the most highly trafficked roads in Michigan, runs along the southern boundary. Calvin College is situated just east of the station. This district is also home to several large retirement communities.



BURTON RESPONSE DISTRICT - 06

Population/Demographics:

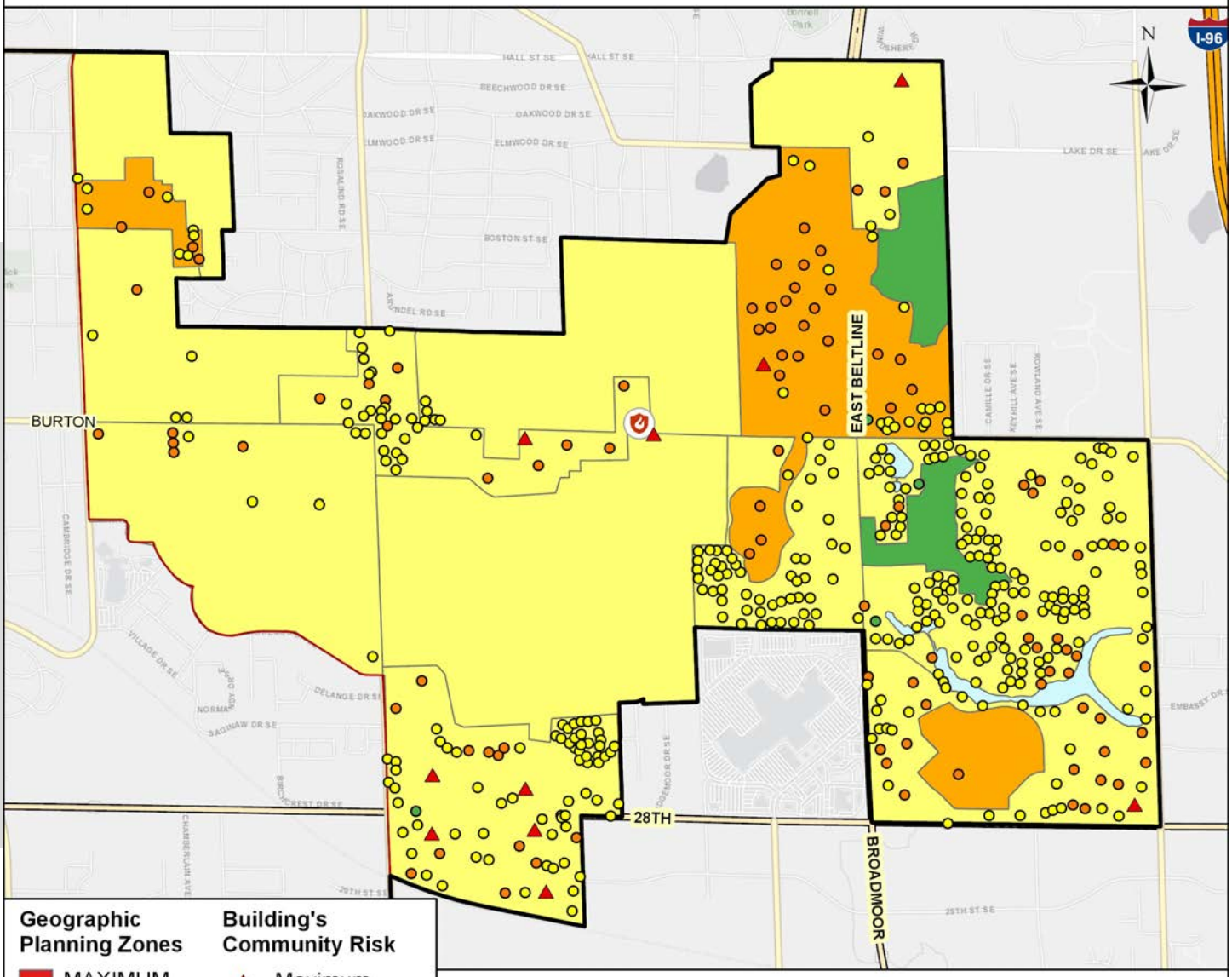
The Burton station response district contains 13,799 residents and comprises 7.14% of the city's population. Population density is 3,965 people per square mile. This analysis is based on data gathered from the 2019 US Census Bureau 5-year estimates. The district is predominately urban, with small pockets of rural designations for parks and commercial areas.

District	Population	< 5 Years Old	< 18 Years Old	> 65 Years Old	Median Age	White	Black or African American	American Indian or Alaskan Native	Asian	Hispanic
6	13,779	747	2,248	2,436	34	10,057	2,354	75	769	688
GR Total	192,962	13,489	43,300	23,232	31	129,942	35,575	680	4,519	31,357
% of City	7.14%	5.54%	5.19%	10.49%	109.12%	7.74%	6.62%	11.03%	17.02%	2.19%

BURTON RESPONSE DISTRICT - 06

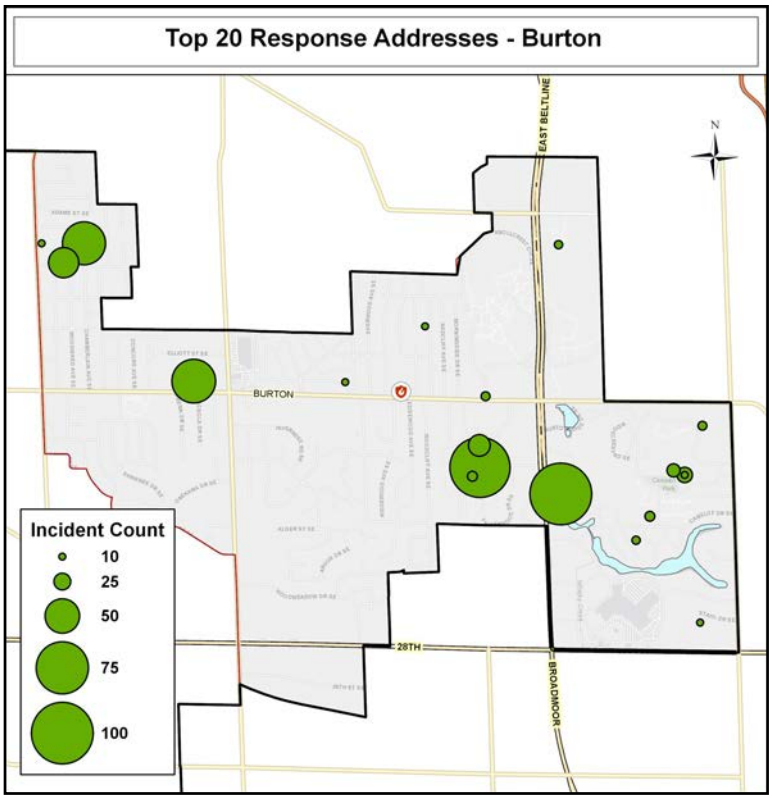
Burton Station Response District

Geographic Planning Zones with Fire Risk Assessment Buildings



Buildings per Community Risk Type				
Low	Moderate	High	Maximum	Total
4	368	99	11	482

District	Residential Occupancies	Industrial Occupancies	Commercial Occupancies	Tax Exempt	Total Square Ft	Taxable Value	Average Building Age (Years)	Needed Fire Flow over 3500 GPM	Sprinklered Buildings
6	2,763	2	210	19	8,325,565	$463,567,871	52.62	148	138
Citywide	55,506	269	3,364	821	124,272,758	4,950,657,315	82.36	1,485	1,180
% of City	4.98%	0.74%	6.24%	2.31%	6.70%	9.36%	63.89%	9.97%	11.69%



Top 20 Response Addresses	Incident Count
2320 EAST BELTLINE Avenue SE	173
2121 RAYBROOK Avenue SE	86
2305 BURTON Street SE	63
1919 BOSTON Street SE	62
1845 BOSTON Street SE	44
2105 RAYBROOK Avenue SE	32
3962 WHISPERING Way SE	23
3956 WHISPERING Way SE	20
2111 RAYBROOK Avenue SE	15
2399 CHARRING CROSS Drive SE	15
3201 BURTON Street SE	14
3901 WHISPERING Way SE	14
1490 EAST BELTLINE Avenue SE	13
3666 CAMELOT Drive SE	13
1745 WOODCLIFF Avenue SE	10
3964 WHISPERING Way SE	10
1520 PLYMOUTH Avenue SE	9
3920 STAHL Drive SE	8
2747 ARDMORE Street SE	7
EAST BELTLINE Avenue SE	7

Risk Assessment:

Fire: 14.41% of the district's area is classified as a high or maximum risk geographical planning zone. There are 148 occupancies with a needed fire flow over 3,500 GPM and 9.36% of the city's taxable property is in the district. Engine 6 is also the first due GRFD unit to the airport.

Vehicle accidents: Hotspots include the intersections of Burton and East Beltline, Burton and Breton, and along the 28th St. corridor.

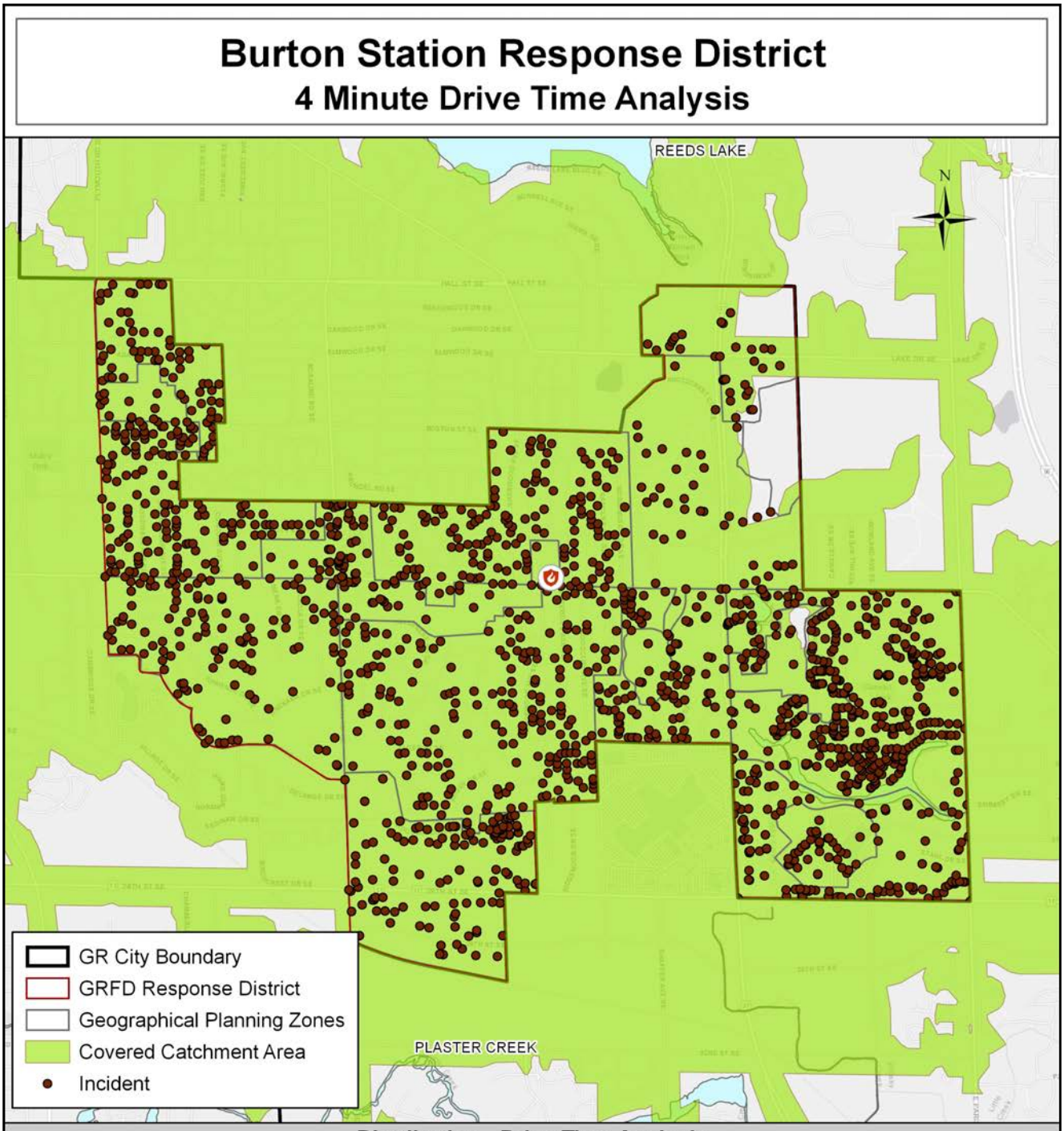
EMS: The district is home to numerous senior and low income living centers. The SKILD nursing center on the East Beltline generates many calls for non-emergent transport. Raybrook Manor is a large senior center that was isolating Covid-19 patients on site. No exposure issues were noted with that location. Beacon Hill Retirement community was trying to direct EMS crews to an entrance without 24 hour access. Crews corrected that issue with better CAD routing and coordination with facility management.

Maximum Risk Buildings For Burton District

1300 EAST BELTLINE AVE SE	Immanuel Reformed Church
2450 28TH ST SE	Pro Fireworks
2525 28TH ST SE	Berger Chevrolet
2655 28TH ST SE	TODD WENZEL PROPERTIES LLC
2700 28TH ST SE	Leslie's Swimming Pool Supplies
2700 29TH ST SE	Todd Wenzel Collision & Appearance Center
2706 BURTON ST SE	Arbor Glen Residential
2941 BURTON ST SE	Burton Street Fire Station
3201 BURTON ST SE	Calvin University
3923 28TH ST SE	Phantom Fireworks
5500 44TH ST SE Building 200	MAYDAY AVIONICS, INC.

Distribution - Four Minute Drive Time Analysis

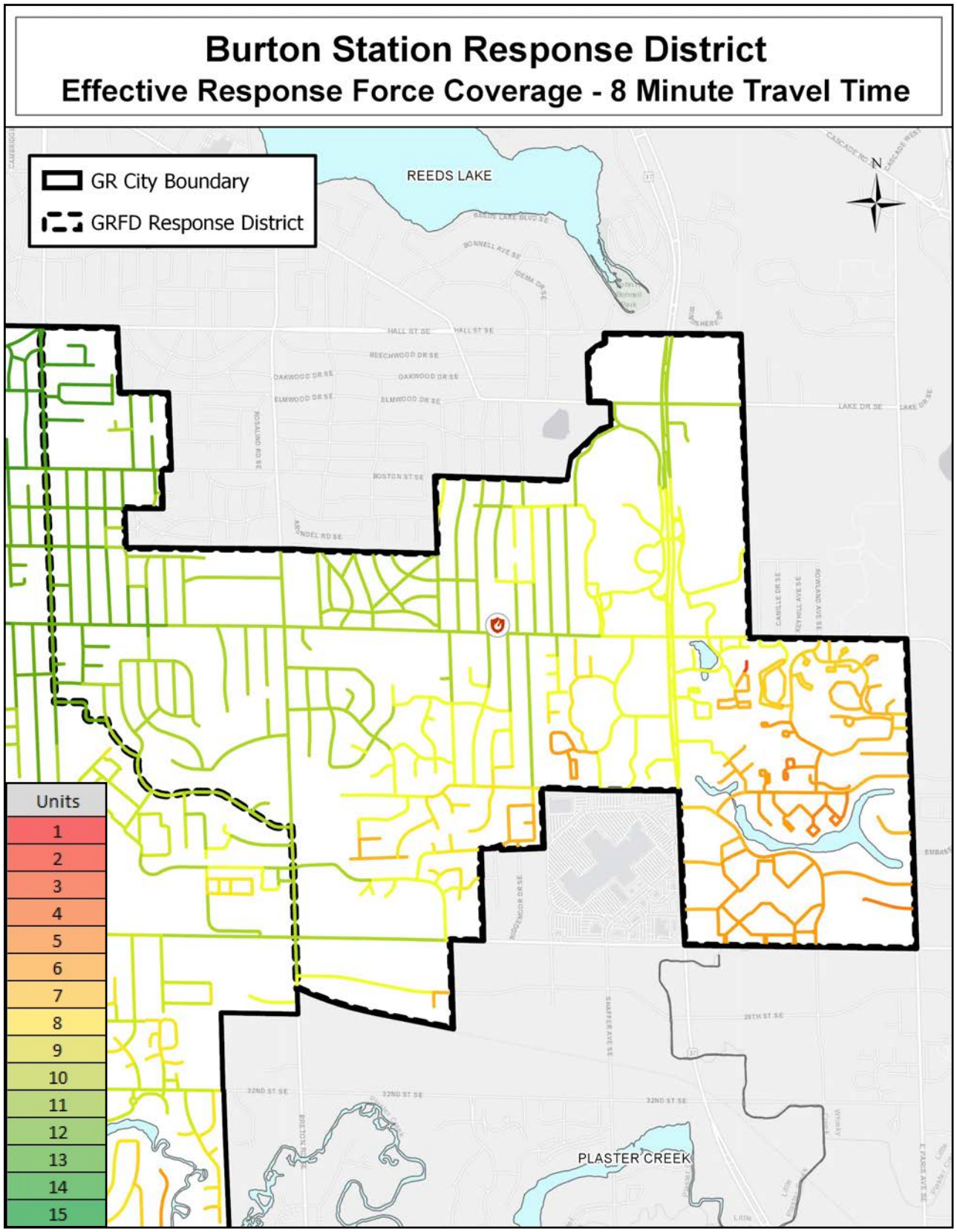
Overall metrics for distribution, as shown by drive time analysis, are very good, reaching the 99% level over the last five years. A sustained increase in the volume of incidents in the south-eastern corner of the district indicates a need for ongoing evaluation. Analysis of drive times in this section are based on the street speed layer used by CAD (computer-aided dispatch).



Distribution - Drive Time Analysis					
Burton District 6	2016	2017	2018	2019	2020
Incident Count	1,310	1,416	1,350	1,443	1,406
Incidents in Covered Area	1,310	1,414	1,347	1,440	1,400
% Incidents Covered	100.00%	99.86%	99.78%	99.79%	99.57%

Concentration - District Effective Response Force Analysis Map

This map depicts the number of units that can be assembled in the district within the multiple unit benchmark travel time of 8 minutes. As with other outlying districts, Burton's concentration metrics diverge from compliance towards the outskirts of the city. The eastern edge of the district is very isolated from neighboring districts. Automatic mutual aid is supplied by the City of Kentwood.



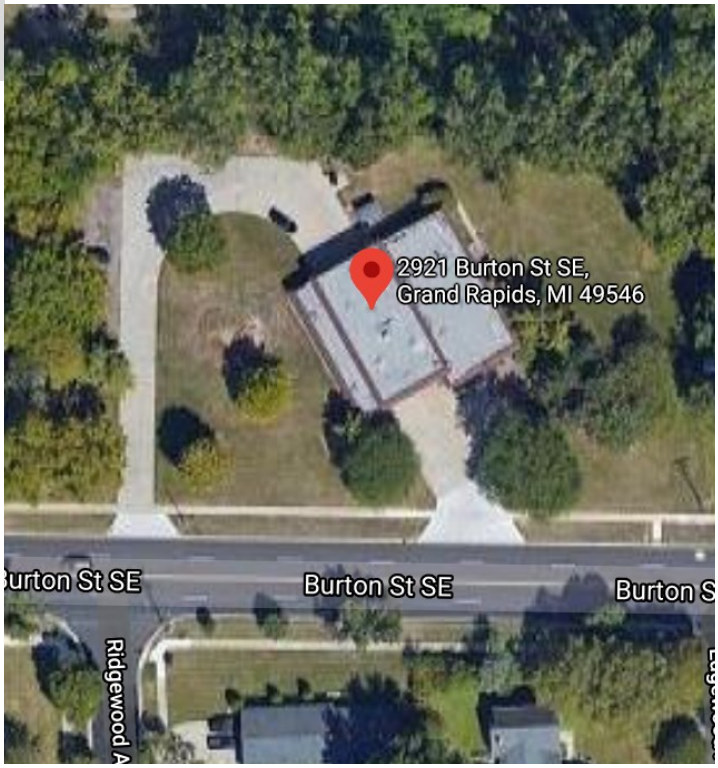
BURTON RESPONSE DISTRICT - 06

Response Data

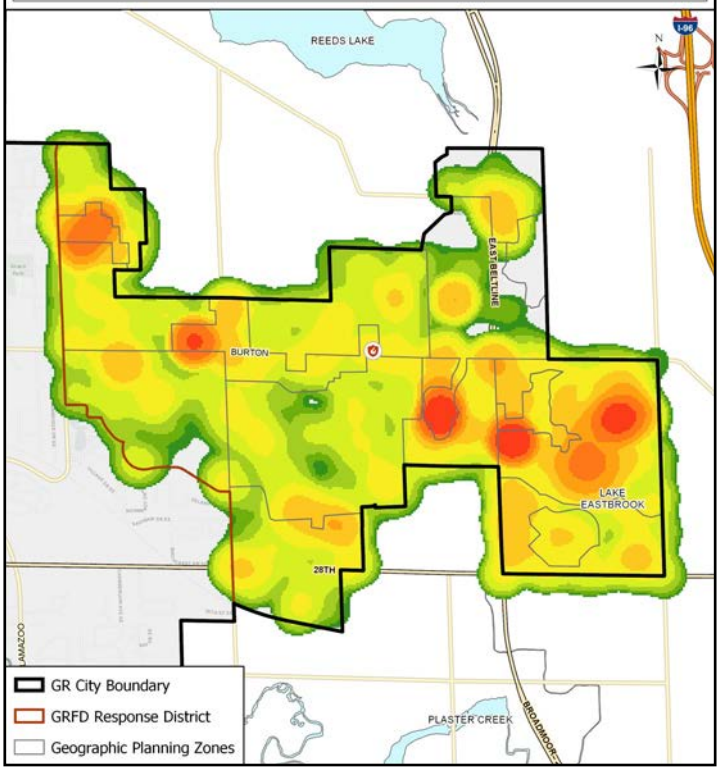
Burton District averages 1,400 incidents per year. Engine 6 responses trend with that count, as the unit doesn't travel out of district often. Baseline performance for the most common types of incidents shows fire low incidents at :36 over, and fire moderate at 3:17 over benchmark. EMS low incidents are at 1:56 over benchmark and EMS moderate incidents running :41 over. Impacts to performance in this district include large incident hotspots on the other side of a busy state trunkline, the East Beltline.

Burton Station Incidents and % of Citywide

Type	2016	2017	2018	2019	2020
Fire	26	31	28	40	35
	4.06%	5.12%	4.83%	7.41%	5.47%
EMS	958	999	995	969	980
	6.59%	6.58%	6.92%	6.32%	6.35%
Other	326	386	327	434	391
	4.16%	4.79%	4.46%	5.32%	5.61%
Total	1,310	1,416	1,350	1,443	1,406
	5.69%	5.94%	6.06%	6.01%	6.10%
Fire Loss	$51,379	$46,389	$378,943	$508,895	$111,372
	0.83%	0.83%	7.40%	9.40%	1.76%



Burton Response District Incident Density



Burton Apparatus Responses

Unit	2016	2017	2018	2019	2020
Engine 6	1,416	1,472	1,400	1,496	1,403
Total Responses	1,416	1,472	1,400	1,496	1,403
% of City Responses	4.46%	4.59%	4.57%	4.54%	4.44%
Total Deployed Hours	473:12:55	462:57:09	456:41:36	495:15:38	440:08:30
% of City Deployed Hours	4.96%	4.78%	4.93%	4.79%	4.51%

Burton Apparatus Unit Hour Utilization

Unit	2016	2017	2018	2019	2020
Engine 6	0.09	0.09	0.09	0.10	0.09

Temporal Analysis 2016 - 2020 EMS								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	22	23	19	12	17	13	15	121
01:00-01:59	20	15	11	21	11	13	25	116
02:00-02:59	14	12	21	13	16	6	19	101
03:00-03:59	21	7	15	14	18	15	13	103
04:00-04:59	16	14	14	10	13	19	15	101
05:00-05:59	23	18	9	17	11	9	20	107
06:00-06:59	17	17	19	13	14	17	12	109
07:00-07:59	20	23	22	32	27	33	17	174
08:00-08:59	34	46	39	22	35	33	36	245
09:00-09:59	35	50	42	36	45	41	28	277
10:00-10:59	38	43	43	41	39	38	39	281
11:00-11:59	32	51	54	54	48	34	39	312
12:00-12:59	32	54	47	30	50	43	43	299
13:00-13:59	34	35	54	53	48	38	45	307
14:00-14:59	29	41	45	36	38	42	43	274
15:00-15:59	26	39	37	45	31	44	27	249
16:00-16:59	25	42	26	36	29	38	33	229
17:00-17:59	40	35	44	35	45	34	31	264
18:00-18:59	35	35	37	33	34	43	40	257
19:00-19:59	27	34	33	33	25	26	30	208
20:00-20:59	40	31	35	27	37	41	29	240
21:00-21:59	26	39	27	21	25	42	27	207
22:00-22:59	24	29	17	19	20	32	39	180
23:00-23:59	19	17	9	27	18	21	26	137
Total	649	750	719	680	694	715	691	4,898

Temporal Analysis 2016 - 2020 Fire								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	0	1	2	0	1	1	1	6
01:00-01:59	0	0	1	0	1	2	0	4
02:00-02:59	0	0	0	0	0	0	0	0
03:00-03:59	2	0	0	0	0	1	1	4
04:00-04:59	1	0	0	0	0	0	1	2
05:00-05:59	0	0	0	0	0	0	0	0
06:00-06:59	0	1	0	0	1	0	1	3
07:00-07:59	2	0	1	2	0	0	0	5
08:00-08:59	0	0	0	0	1	0	0	1
09:00-09:59	2	0	1	1	0	1	1	6
10:00-10:59	1	0	2	3	1	0	0	7
11:00-11:59	2	1	0	3	0	0	2	8
12:00-12:59	1	1	2	0	0	2	1	7
13:00-13:59	1	0	1	3	0	1	2	8
14:00-14:59	0	0	3	1	0	0	5	9
15:00-15:59	3	0	1	3	2	0	3	12
16:00-16:59	2	2	0	3	1	3	0	11
17:00-17:59	4	1	4	1	3	0	2	15
18:00-18:59	1	3	3	4	0	2	2	15
19:00-19:59	2	5	1	0	4	0	2	14
20:00-20:59	4	2	1	0	1	1	0	9
21:00-21:59	3	0	0	1	0	2	0	6
22:00-22:59	0	1	0	0	1	0	0	2
23:00-23:59	1	0	1	1	0	2	1	6
Total	32	18	24	26	17	18	25	160

Burton Reliability & Simultaneous Performance					
Type	2016	2017	2018	2019	2020
Reliability %	88.06%	83.30%	84.24%	83.41%	84.45%
Citywide Reliability %	88.38%	82.95%	83.37%	81.03%	82.66%
Simultaneous Incident Count	63	78	82	100	84
Simultaneous Incident %	4.80%	5.50%	6.07%	6.90%	5.97%

Burton Response District 90th Percentile Baseline Performance						
Category	Alarm Handling	Turnout	Travel Distribution	Travel Concentration	Total Response Time Distribution	Total Response Time Concentration
Fire						
Low	1:58	1:49	5:06	5:05	7:36	7:36
Moderate	1:53	1:58	5:11	11:45	7:45	14:17
EMS						
Low	3:26	1:35	5:40	5:40	9:23	9:24
Moderate	3:16	1:38	5:33	7:22	8:27	10:11

LAGRAVE RESPONSE DISTRICT - 07

Quick Facts

Station 7 .....LaGrave Avenue Fire Station

Address .....38 LaGrave Ave. SE

Station Built.....1910

Frontline Apparatus .....Rescue 1, Rescue 2

Reserve Apparatus..... Rescue 3

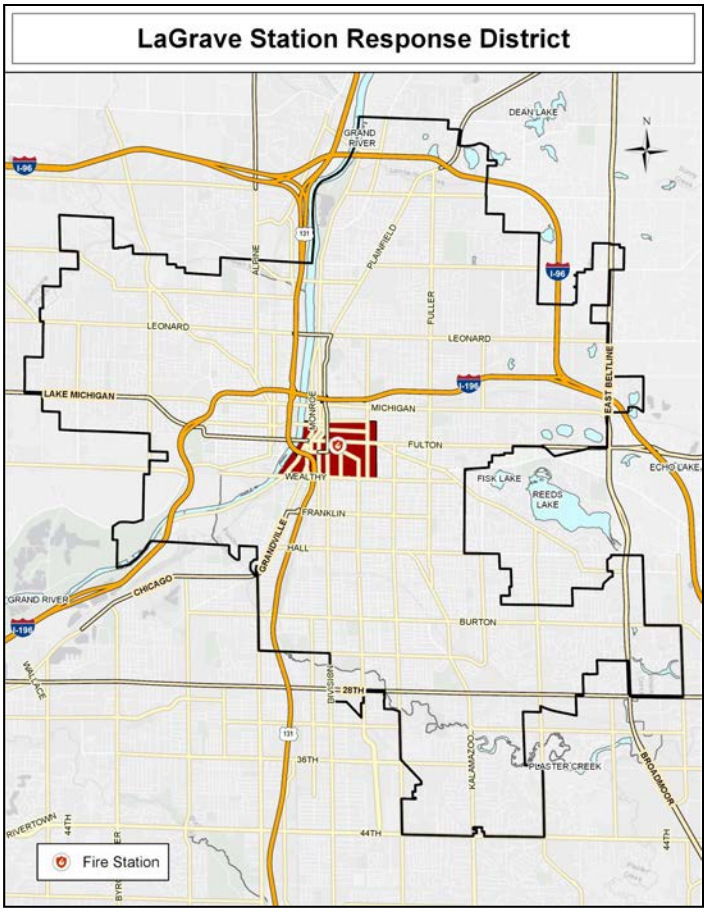
Cross Staffed Apparatus ..... Utility 7

..... Air Delivery Vehicle 7

Square Miles..... .93

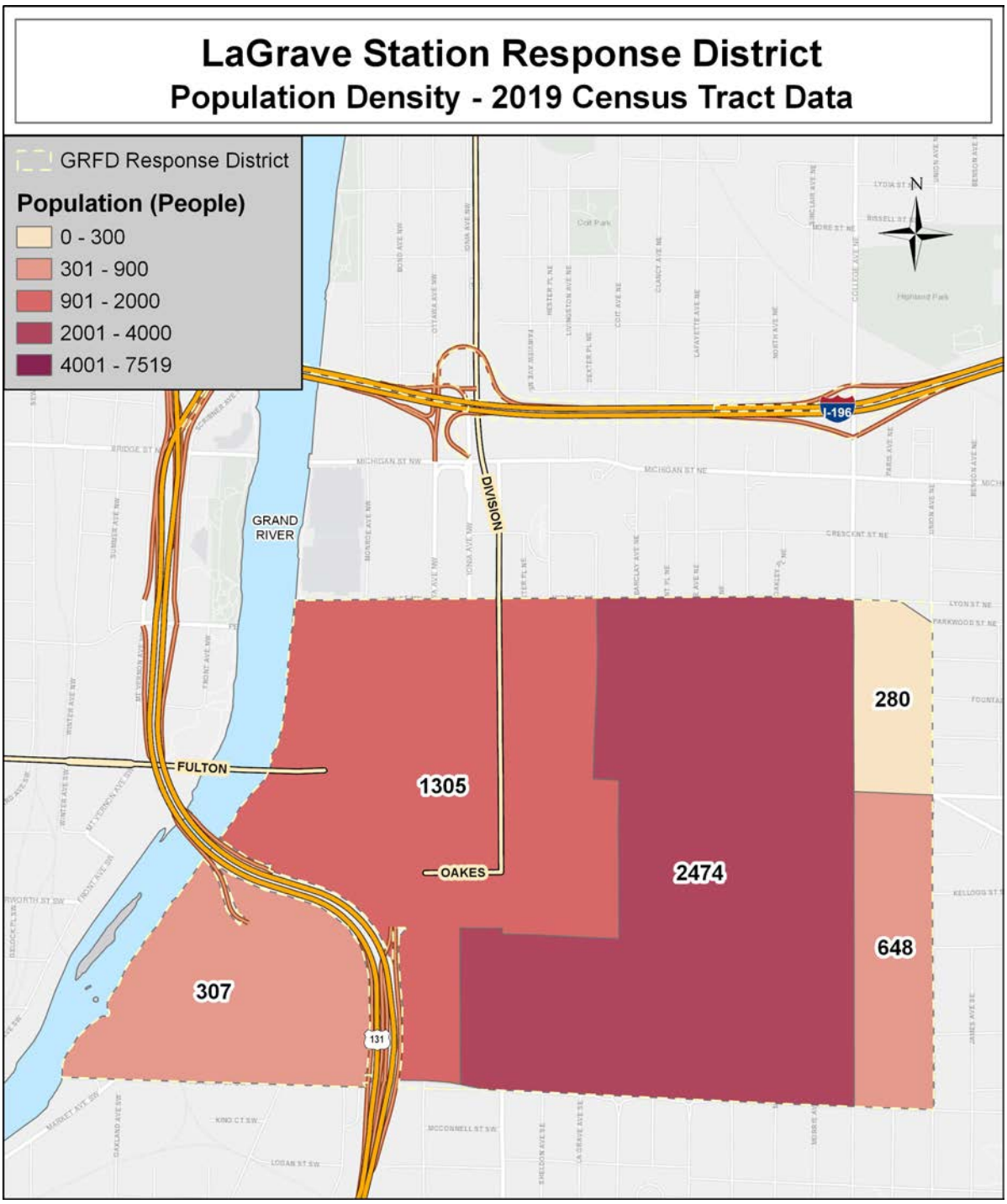
Road Miles.....26.08

Hydrants.....286



District Characteristics:

LaGrave Avenue station sits in the heart of downtown Grand Rapids and also serves as the administrative offices for the Grand Rapids Fire Department. LaGrave station is the second oldest station in use in the city, built in 1910. Crews from LaGrave are cross-trained in many technical rescue disciplines. The district is home to several colleges and museums, as well as 2 major hospital systems. While LaGrave is the smallest district, it also experiences the city's highest call volume.



Population/Demographics:

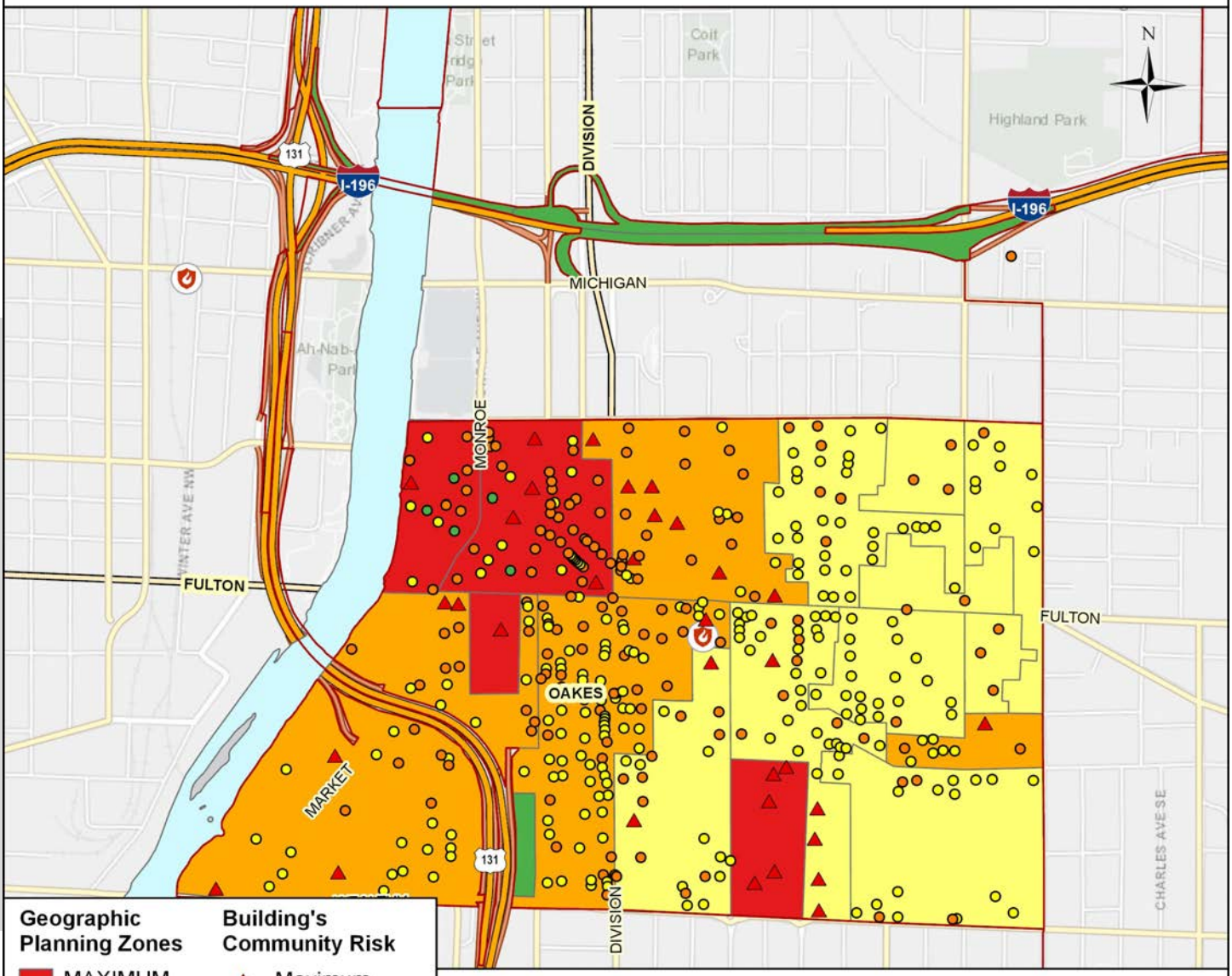
The LaGrave station response district contains 5,014 residents and comprises 2.60% of the city's population. Population density is 5,391 people per square mile. This district also has a large daily influx of workers. This analysis is based on data gathered from the 2019 US Census Bureau 5-year estimates. The district is predominately urban, with rural designations for parks and commercial/industrial areas.

District	Population	< 5 Years Old	< 18 Years Old	> 65 Years Old	Median Age	White	Black or African American	American Indian or Alaskan Native	Asian	Hispanic
7	5,014	135	424	363	30	3,914	589	17	159	498
GR Total	192,962	13,489	43,300	23,232	31	129,942	35,575	680	4,519	31,357
% of City	2.60%	1.00%	0.98%	1.56%	98.70%	3.01%	1.66%	2.50%	3.52%	1.59%

LAGRAVE RESPONSE DISTRICT - 07

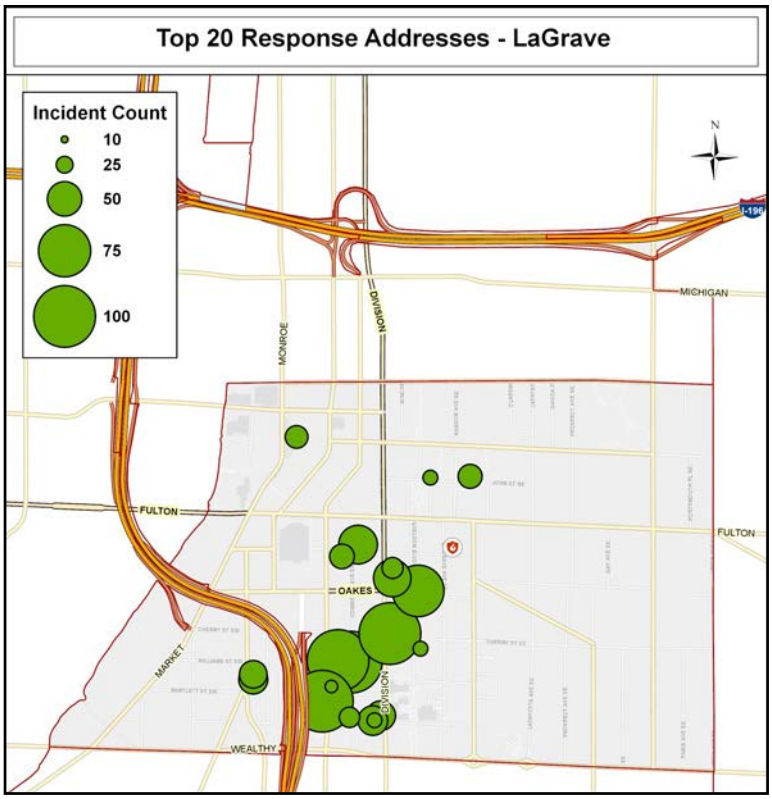
LaGrave Station Response District

Geographic Planning Zones with Fire Risk Assessment Buildings



Buildings per Community Risk Type				
Low	Moderate	High	Maximum	Total
5	244	154	34	437

District	Residential Occupancies	Industrial Occupancies	Commercial Occupancies	Tax Exempt	Total Square Ft	Taxable Value	Average Building Age (Years)	Needed Fire Flow over 3500 GPM	Sprinklered Buildings
7	937	8	435	179	9,862,595	$502,047,435	91.26	164	232
Citywide	55,506	269	3,364	821	124,272,758	4,950,657,315	82.36	1,485	1,180
% of City	1.69%	2.97%	12.93%	21.80%	7.94%	10.14%	110.81%	11.04%	19.66%



Top 20 Response Addresses	Incident Count
225 COMMERCE Avenue SW	261
47 WILLIAMS Street SW	173
301 IONIA Avenue SW	118
144 South DIVISION Avenue	99
72 SHELDON Avenue SE	74
21 WESTON Street SW	56
60 South DIVISION Avenue	54
309 South DIVISION Avenue	43
310 COMMERCE Avenue SW	43
250 GRANDVILLE Avenue SW	42
250 GRANDVILLE Avenue SW	40
50 WESTON Street SW	36
50 RANSOM Avenue NE	35
131 MONROE CENTER Street NW	33
54 South DIVISION Avenue	31
315 COMMERCE Avenue SW	30
100 CHERRY Street SE	22
111 LIBRARY Street NE	22
310 COMMERCE Avenue SW	22
250 IONIA Avenue SW	19

Risk Assessment:

Fire: 52.98% of the district's area is classified as a high or maximum risk geographical planning zone. There are 164 occupancies with a needed fire flow over 3,500 GPM and 10.14% of the city's taxable value is in this district.

Vehicle accidents: US-131 through the S-curve, road design leads to higher risk. Weather dependent.

EMS: There is a large vulnerable population (no routine health care, lack of meds/insurance). Typical downtown missions and a public inebriation center. Adding RNs on site could improve triage, and may reduce call volume. Heartside Park is a known congregation area for homeless. While the entire district is an opioid hotspot, the problem is decreasing. In vehicle overdoses are common.

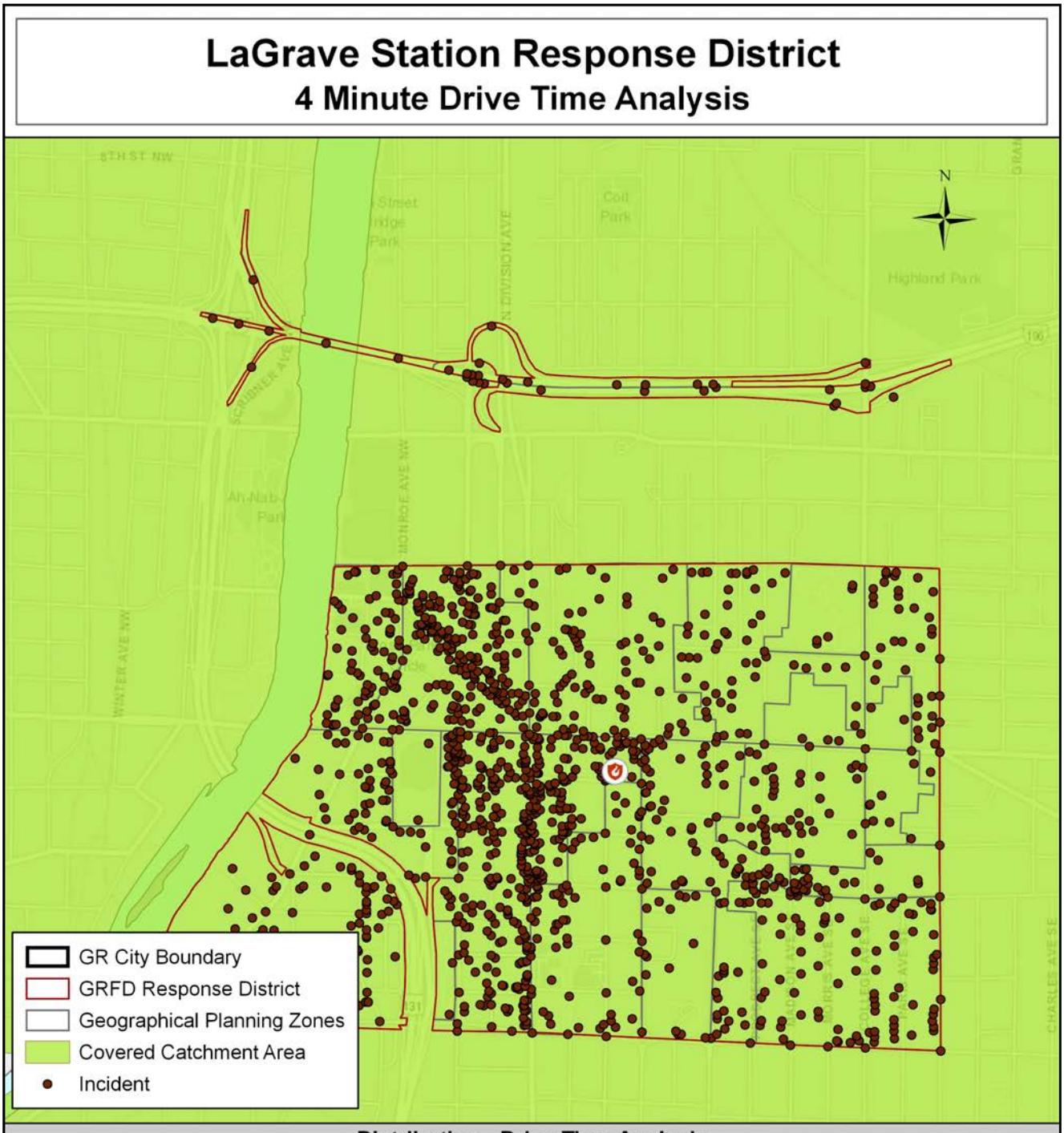
Special Events: The district is home to many festivals and concert venues with large numbers of attendees.

Maximum Risk Buildings For LaGrave District

1 MONROE CENTER ST NW	Grand Rapids Police Department	235 LOUIS CAMPAU NW	JW Marriott Hotel
101 MONROE CENTER ST NW	Grand Rapids Art Museum	235 WEALTHY ST SE	Mary Free Bed Rehabilitation Hospital
111 LIBRARY ST NE	Grand Rapids Public Library	24 FOUNTAIN ST NE	Fountain Street Church
114 N DIVISION AVE	AT&T Michigan	24 RANSOM AVE NE	St. Cecilia Music Center
120 COLLEGE AVE SE	Wood TV 8 Studios	250 CHERRY ST SE	Mercy Health Lacks Cancer Center
125 OTTAWA AVE NW	The Ledyard Building	260 JEFFERSON AVE SE	Mercy Health Physician Partners
130 W FULTON ST	Van Andel Arena	300 LAFAYETTE AVE SE	Wege Internal Medicine and Residency
143 BOSTWICK AVE NE	Grand Rapids Community College	301 SHELDON BLVD SE	Cathedral of Saint Andrew
156 W FULTON ST	Vicinity Energy Steam Plant	310 LAFAYETTE AVE SE	Grand River Endoscopy Center
161 OTTAWA AVE NW	Homewood Suites by Hilton	333 WEALTHY ST SW	Grand Rapids Bus Services
17 Pearl ST NW	Kendall College of Art and Design	34 N DIVISION AVE	Grand Rapids Civic Theater
2 MARKET AVE SW	234 Market Apartments	350 LAFAYETTE AVE SE	Orthopaedic Associates of Michigan
200 JEFFERSON AVE SE	ST MARYS MERCY MEDICAL CENTER	360 LAFAYETTE AVE SE	Mary Free Bed Orthotics and Prosthetics
201 MARKET AVE SW	Grand Rapids Public Service Department	38 LaGrave AVE SE	LaGrave Avenue Fire Station
220 CHERRY ST SE	Mercy Health Hauenstein Neuroscience	47 JEFFERSON AVE SE	Westminster Presbyterian Church
223 Washington ST SE	Grand Rapids City Archives	505 CHERRY ST SE	Hillmount Condos
233 E FULTON ST	Masonic Center	509 WEALTHY ST SW	Grand Rapids Energy, Lighting, and Comm's

Distribution - Four Minute Drive Time Analysis

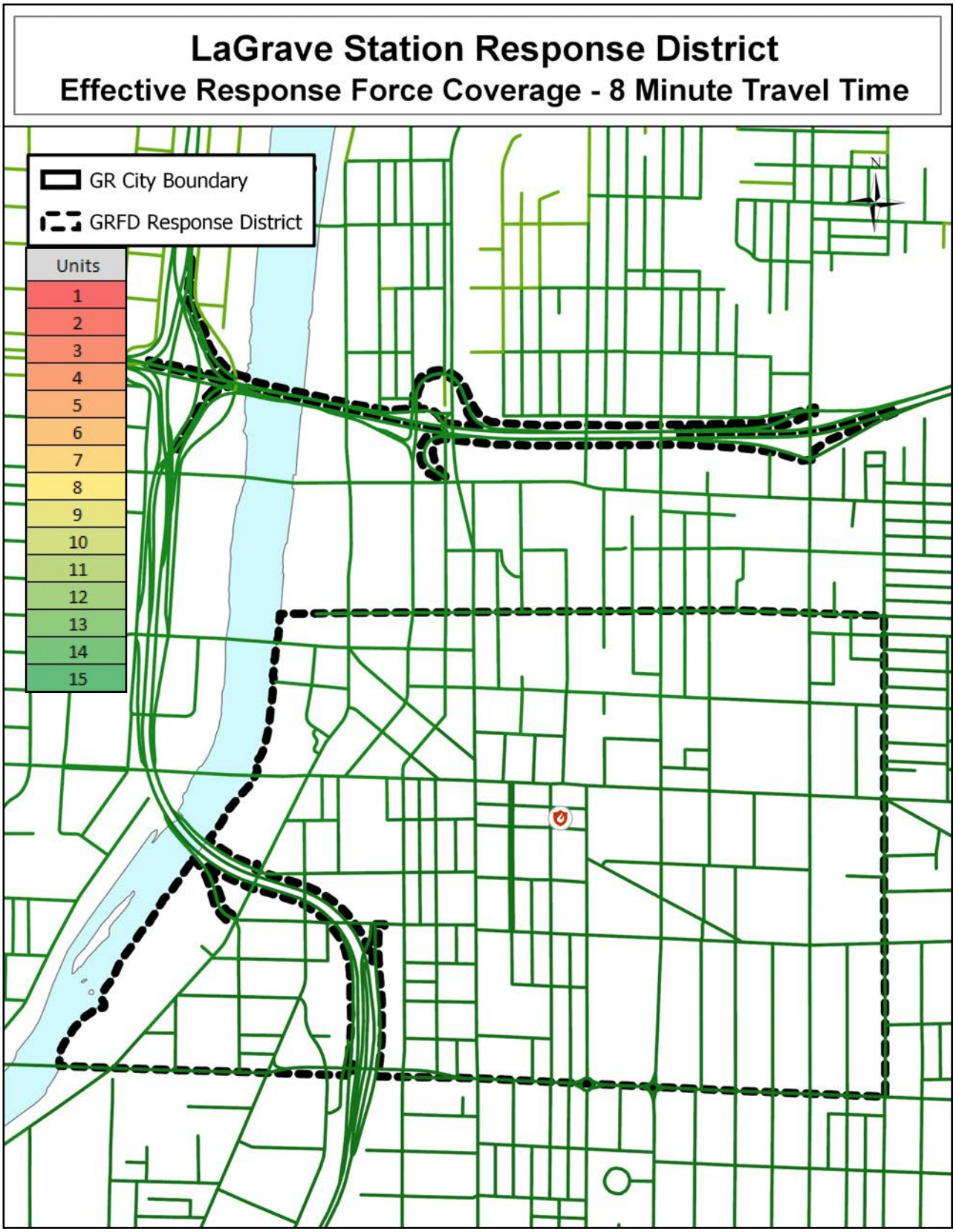
Drive time analysis for LaGrave district shows exemplary coverage, with a 100% rate of incidents exhibiting compliance for drive times. Challenges for travel times in LaGrave include the downtown traffic volume, boulevard street design, and a high percentage of one way streets. Analysis of drive times in this section are based on the street speed layer used by CAD (computer-aided dispatch).



Distribution - Drive Time Analysis					
LaGrave District 7	2016	2017	2018	2019	2020
Incident Count	3,648	3,801	3,227	3,091	2,591
Incidents in Covered Area	3,648	3,801	3,227	3,091	2,591
% Incidents Covered	100.00%	100.00%	100.00%	100.00%	100.00%

Concentration - District Effective Response Force Analysis

This map depicts the number of units that can be assembled in the district within the multiple unit benchmark travel time of 8 minutes. Effective response force coverage for the district is also very good, with multiple units stationed close to the downtown area. LaGrave and two neighboring districts each have two frontline units.

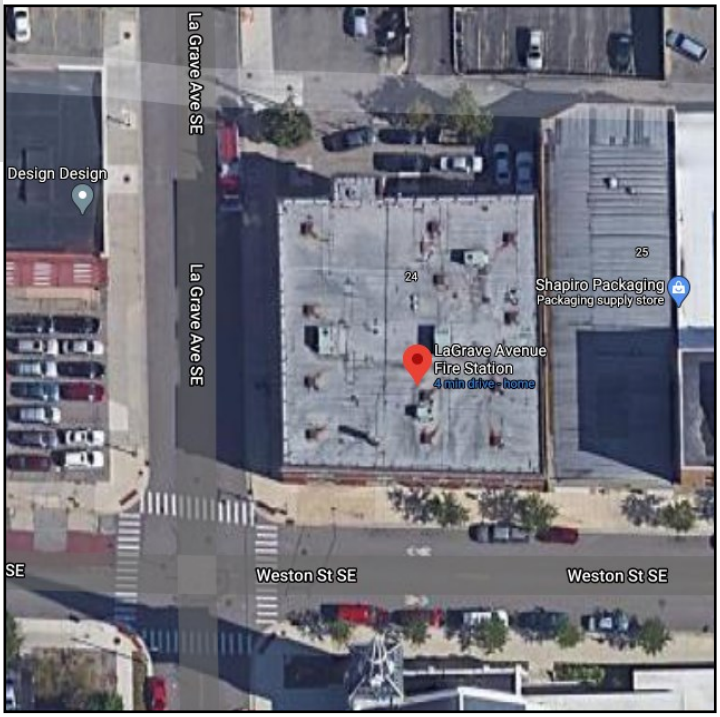


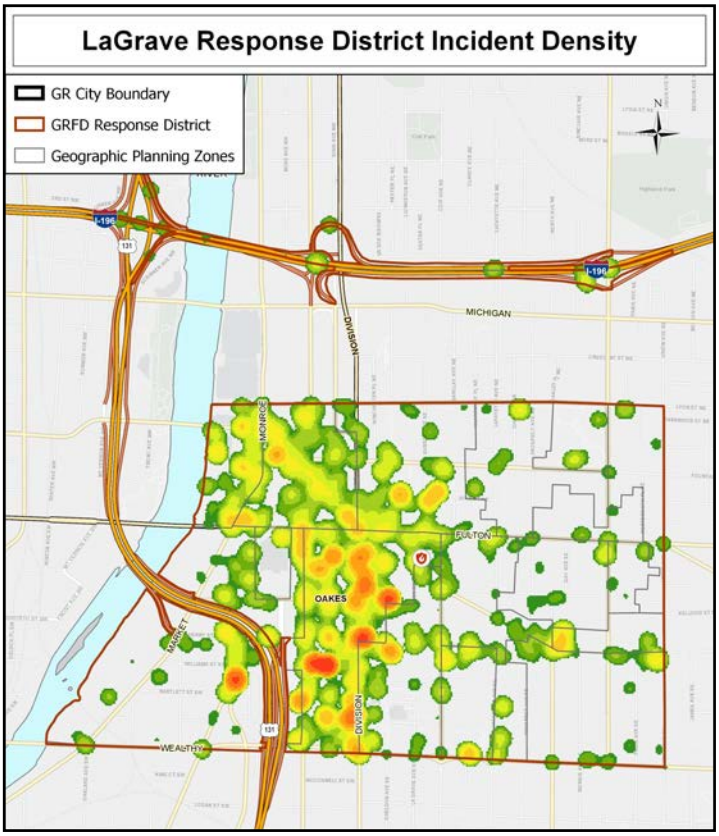
Response Data

Although LaGrave is the smallest district in the city, at less than one square mile, it boasts the highest incident volume. LaGrave district averages close to 3,000 calls per year. Apparatus response counts are also high, with the rescue engine responding to every multiple unit fire response, and the majority of technical rescue incidents in the city. Baseline performance for the most common types of incidents show very good compliance with benchmarks, all metrics are below or just above benchmark times, with EMS moderate running 1:14 over.

LaGrave Station Incidents and % of Citywide

Type	2016	2017	2018	2019	2020
Fire	83	56	48	55	62
	12.97%	9.26%	8.28%	10.19%	9.69%
EMS	2,366	2,492	2,098	2,041	1,759
	16.29%	16.42%	14.60%	13.32%	11.41%
Other	1199	1253	1081	995	770
	15.29%	15.54%	14.76%	12.20%	11.04%
Total	3,648	3,801	3,227	3,091	2,591
	15.86%	15.94%	14.49%	12.87%	11.25%
Fire Loss	$314,630	$323,887	$174,373	$221,476	$653,626
	5.05%	5.76%	3.41%	4.09%	10.32%





LaGrave Apparatus Responses

Unit	2016	2017	2018	2019	2020
Engine 7/Rescue 2	638	922	207	2,373	2,028
Rescue 7/Rescue 1	1,765	1,741	1,593	2,296	2,156
Squad 7	1,703	2,630	2,859	17	1
Medic 7	1,008	126	10		
ADV 7	40	29	25	32	36
Utility 7	18	29	11	14	5
Reserve Engine 15					21
Reserve Engine 16					12
Total Responses	5,172	5,477	4,705	4,732	4,259
% of City Responses	16.28%	17.06%	15.37%	14.37%	13.49%
Total Deployed Hours	1228:40:15	1342:06:39	1199:34:01	1333:36:58	1148:05:50
% of City Deployed Hours	12.87%	13.84%	12.95%	12.89%	11.76%

LaGrave Apparatus Unit Hour Utilization

Unit	2016	2017	2018	2019	2020
Engine 7/Rescue 2	0.04	0.05	0.01	0.14	0.12
Rescue 7/Rescue 1	0.10	0.10	0.09	0.13	0.12
Squad 7	0.09	0.14	0.16	0.00	0.00
Medic 7	0.05	0.01	0.00	0.00	0.00
ADV 7	0.00	0.00	0.00	0.00	0.00
Utility 7	0.00	0.00	0.00	0.00	0.00
Reserve Engine 15	0.00	0.00	0.00	0.00	0.00
Reserve Engine 16	0.00	0.00	0.00	0.00	0.00

Temporal Analysis 2016 - 2020 EMS								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	76	29	38	38	25	45	60	311
01:00-01:59	96	25	37	32	38	37	65	330
02:00-02:59	67	31	29	24	32	38	54	275
03:00-03:59	35	24	19	14	27	22	24	165
04:00-04:59	21	19	27	16	12	15	21	131
05:00-05:59	23	27	38	20	27	18	31	184
06:00-06:59	42	33	37	34	47	52	43	288
07:00-07:59	31	33	40	43	40	45	39	271
08:00-08:59	40	43	55	43	40	39	37	297
09:00-09:59	39	71	69	69	57	60	51	416
10:00-10:59	55	66	71	76	62	66	46	442
11:00-11:59	68	82	83	83	94	91	68	569
12:00-12:59	71	86	90	86	83	93	78	587
13:00-13:59	81	80	91	100	95	108	83	638
14:00-14:59	80	82	111	94	112	104	72	655
15:00-15:59	78	82	98	104	93	116	79	650
16:00-16:59	71	92	94	100	108	103	102	670
17:00-17:59	88	85	83	97	87	109	117	666
18:00-18:59	84	88	88	103	98	83	100	644
19:00-19:59	86	72	93	95	104	90	87	627
20:00-20:59	94	79	87	70	86	95	86	597
21:00-21:59	55	63	84	65	98	87	81	533
22:00-22:59	59	50	48	44	48	82	79	410
23:00-23:59	43	45	53	46	52	74	88	401
Total	1,483	1,387	1,563	1,496	1,565	1,672	1,591	10,757

Temporal Analysis 2016 - 2020 Fire								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	3	1	1	1	2	3	0	11
01:00-01:59	2	3	0	0	0	1	3	9
02:00-02:59	4	0	0	2	2	3	2	13
03:00-03:59	2	0	1	2	1	1	1	8
04:00-04:59	2	0	2	0	1	1	2	8
05:00-05:59	1	2	1	0	0	0	0	4
06:00-06:59	3	0	0	0	0	2	1	6
07:00-07:59	1	0	0	1	1	0	0	3
08:00-08:59	4	0	2	1	3	0	0	10
09:00-09:59	3	1	1	2	1	0	2	10
10:00-10:59	3	1	1	2	2	1	1	11
11:00-11:59	1	1	0	0	0	2	3	7
12:00-12:59	2	4	1	2	0	3	2	14
13:00-13:59	3	2	4	5	1	4	4	23
14:00-14:59	2	0	1	2	2	2	3	12
15:00-15:59	4	2	4	4	2	2	2	20
16:00-16:59	1	3	1	1	2	4	2	14
17:00-17:59	4	3	3	3	4	6	4	27
18:00-18:59	3	4	2	0	5	2	1	17
19:00-19:59	2	0	3	2	0	0	2	9
20:00-20:59	2	8	3	3	2	3	2	23
21:00-21:59	3	7	4	1	0	1	3	19
22:00-22:59	2	3	0	1	2	1	2	11
23:00-23:59	0	3	2	0	2	1	7	15
Total	57	48	37	35	35	43	49	304

LaGrave Reliability & Simultaneous Performance					
Type	2016	2017	2018	2019	2020
Reliability %	91.20%	88.29%	85.30%	85.50%	89.10%
Citywide Reliability %	88.38%	82.95%	83.37%	81.03%	82.66%
Simultaneous Incident Count	358	399	387	354	211
Simultaneous Incident %	9.81%	10.49%	11.71%	11.22%	7.88%

LaGrave Response District 90th Percentile Baseline Performance						
Category	Alarm Handling	Turnout	Travel Distribution	Travel Concentration	Total Response Time Distribution	Total Response Time Concentration
Fire						
Low	2:16	1:54	3:43	3:43	6:52	6:52
Moderate	1:42	1:57	3:15	7:19	6:00	11:10
EMS						
Low	3:04	1:37	3:18	3:18	6:58	6:58
Moderate	3:22	1:47	5:28	6:59	8:54	10:44

COVELL RESPONSE DISTRICT - 08

Quick Facts

Station 8 ..... Covell Avenue Fire Station

Address ..... 1154 Covell Ave. NW

Station Built 1987

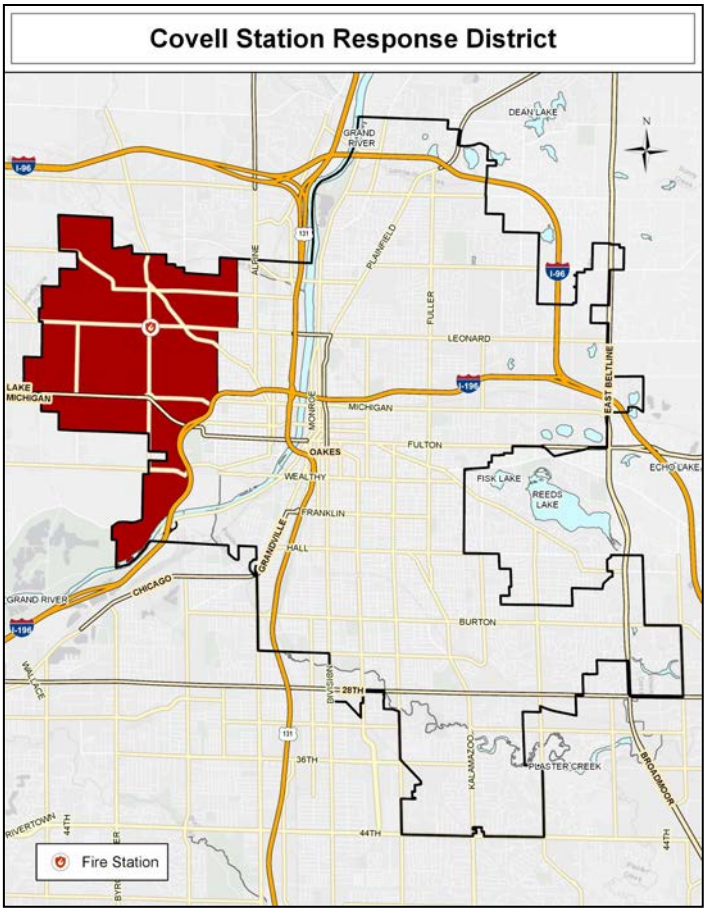
Frontline Apparatus ..... Engine 8

Reserve Apparatus ..... Reserve Engine 15

Square Miles 7.29

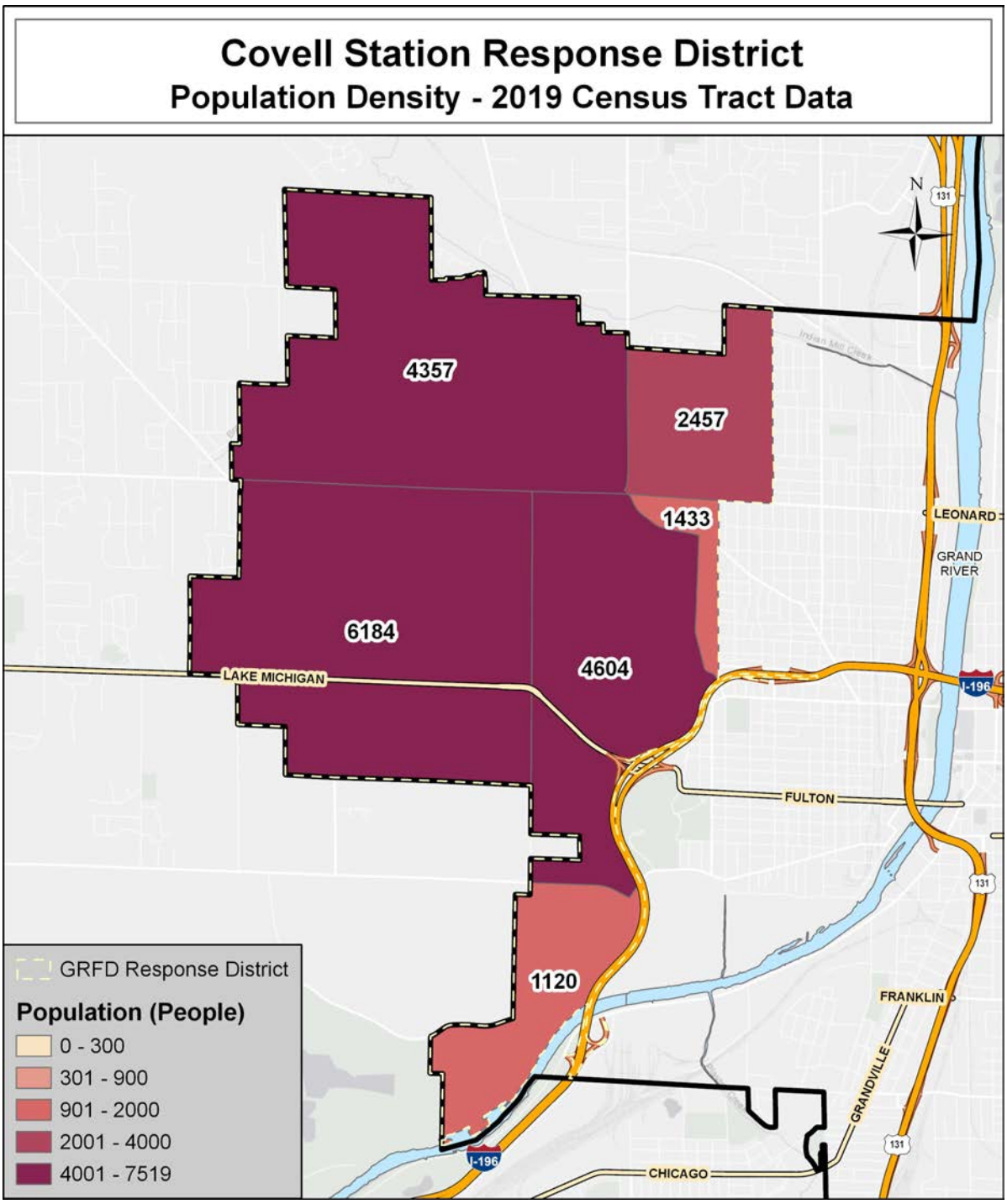
Road Miles 98.39

Hydrants 907



District Characteristics:

Covell Avenue station is in a predominantly residential section of Grand Rapids. Covell is the westernmost of three stations located on Leonard Street. There are strips of commercial properties along Leonard Street and Lake Michigan Drive. Covell district also encompasses several large retirement communities, which drive a majority of the call volume in the district. At 7.29 square miles, Covell is the largest district in the city.



COVELL RESPONSE DISTRICT - 08

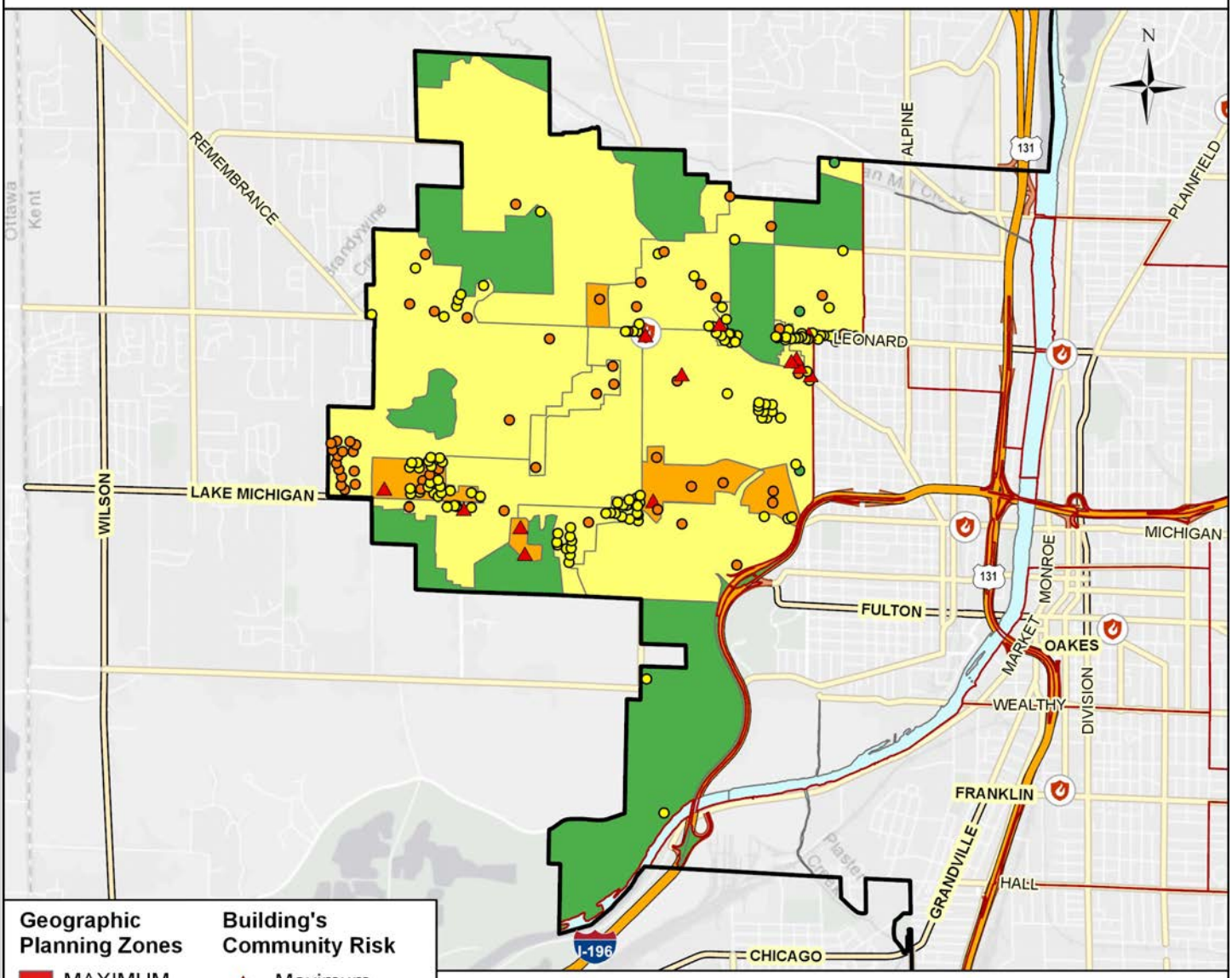
Population/Demographics:

The Covell station response district contains 20,155 residents and comprises 10.45% of the city's population. Population density is 2,765 people per square mile. This analysis is based on data gathered from the 2019 US Census Bureau 5-year estimates. The district is predominately urban, with small pockets of rural designations for parks and commercial areas.

District	Population	< 5 Years Old	< 18 Years Old	> 65 Years Old	Median Age	White	Black or African American	American Indian or Alaskan Native	Asian	Hispanic
8	20,155	1,103	3,907	4,153	38	18,211	725	31	164	1,040
GR Total	192,962	13,489	43,300	23,232	31	129,942	35,575	680	4,519	31,357
% of City	10.45%	8.18%	9.02%	17.88%	122.31%	14.01%	2.04%	4.56%	3.63%	3.32%

Covell Station Response District

Geographic Planning Zones with Fire Risk Assessment Buildings

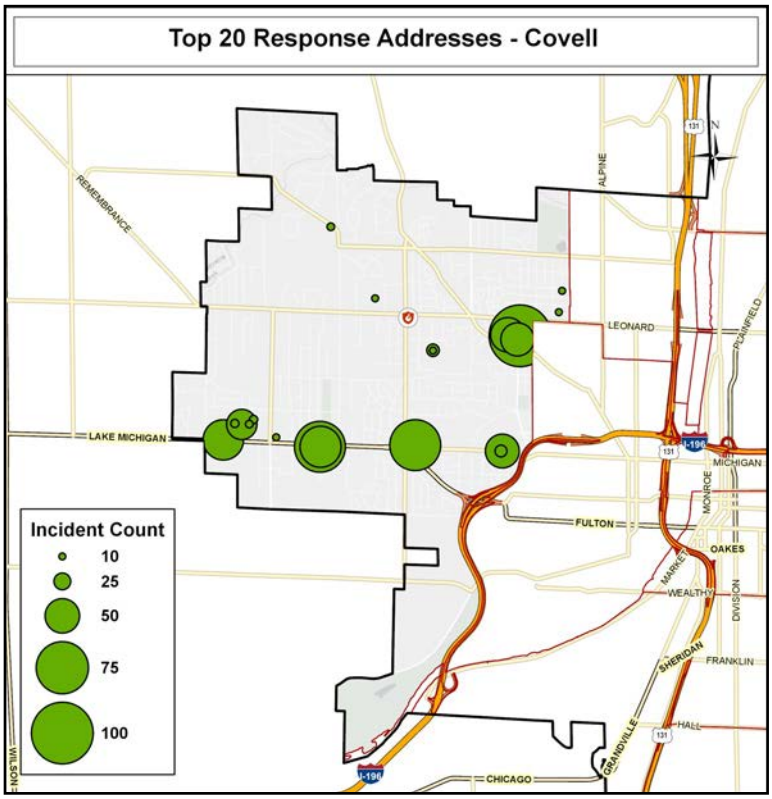


Buildings per Community Risk Type

Low	Moderate	High	Maximum	Total
3	130	55	13	201

COVELL RESPONSE DISTRICT - 08

District	Residential Occupancies	Industrial Occupancies	Commercial Occupancies	Tax Exempt	Total Square Ft	Taxable Value	Average Building Age (Years)	Needed Fire Flow over 3500 GPM	Sprinklered Buildings
8	6,831	0	91	16	10,500,828	$501,347,445	64.25	78	52
Citywide	55,506	269	3,364	821	124,272,758	4,950,657,315	82.36	1,485	1,180
% of City	12.31%	0.00%	2.71%	1.95%	8.45%	10.13%	78.01%	5.25%	4.41%



Top 20 Response Addresses	Incident Count
1305 WALKER Avenue NW	104
1925 BRIDGE Street NW	73
2510 LAKE MICHIGAN Drive NW	73
2520 LAKE MICHIGAN Drive NW	59
3121 LAKE MICHIGAN Drive NW	58
1400 MORGAN Street NW	50
1425 BRIDGE Street NW	49
1315 WALKER Avenue NW	48
490 CLOVER RIDGE Avenue NW	44
1000 EDISON Avenue NW	19
1511 BRIDGE Street NW	18
510 CLOVER RIDGE Avenue NW	13
510 MARSH RIDGE Drive NW	13
2440 RICHMOND Street NW	12
501 MARSH RIDGE Drive NW	12
2161 LEONARD Street NW	11
1026 MYRTLE Street NW	10
2755 LAKE MICHIGAN Drive NW	10
930 EDISON Avenue NW	10
1039 COURTNEY Street NW	8

COVELL RESPONSE DISTRICT - 08

Risk Assessment:

Fire: 4.36 % of the district's area is classified as a high or maximum risk geographical planning zone. There are 78 occupancies with a needed fire flow over 3,500 GPM and 10.13% of the city's taxable value is found within the district.

Vehicle accidents: Laker Line busses and general traffic on Lake Michigan Drive. Not first due on the highway since ARL was implemented.

EMS: The district is home to many senior living centers and accompanying nursing home facilities. These locations are high frequency call generators. Most facilities are well staffed with capable employees.

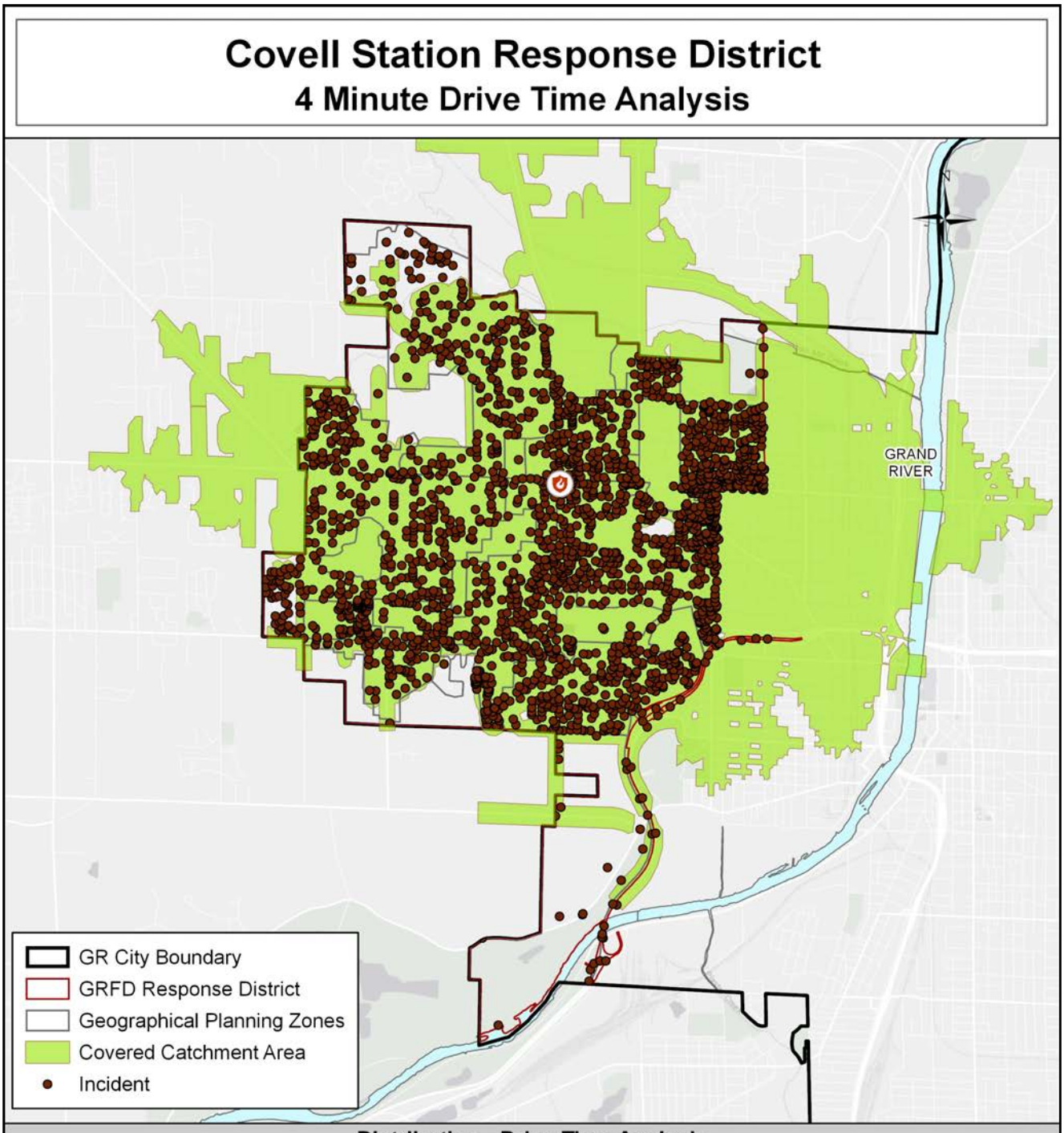
Schools: The district is home to the highest number elementary and secondary schools, presenting a high active shooter risk.

Maximum Risk Buildings For Covell District

1010 EDISON AVE NW	Edison Assisted Living Center	1608 WALKER AVE NW	Tom's Service Center
1154 COVELL AVE NW	Covell Avenue Fire Station	1925 BRIDGE ST NW	Grandview Apartments
1227 LEONARD ST NW	Lentz Auto Repair	2510 LAKE MICHIGAN DR NW	Covenant Village of the Great Lakes
1229 WALKER AVE NW	WALKER MOBIL MART	2520 LAKE MICHIGAN DR NW	Covenant Village of the Great Lakes
1275 WALKER AVE NW	Villa Maria Retirement Community	2750 LAKE MICHIGAN DR NW	Covenant Village of the Great Lakes
1305 WALKER AVE NW	Villa Maria Retirement Community	3121 LAKE MICHIGAN DR NW	Lincoln Square
1315 WALKER AVE NW	Villa Maria Retirement Community		

Distribution - Four Minute Drive Time Analysis

Evaluation of the catchment areas for Covell demonstrated drive time compliance rates around 98% over the last five years. While development is taking place on the western edge of the district, the majority of calls are still occurring relatively close to the station. Analysis of drive times in this section are based on the street speed layer used by CAD (computer-aided dispatch).

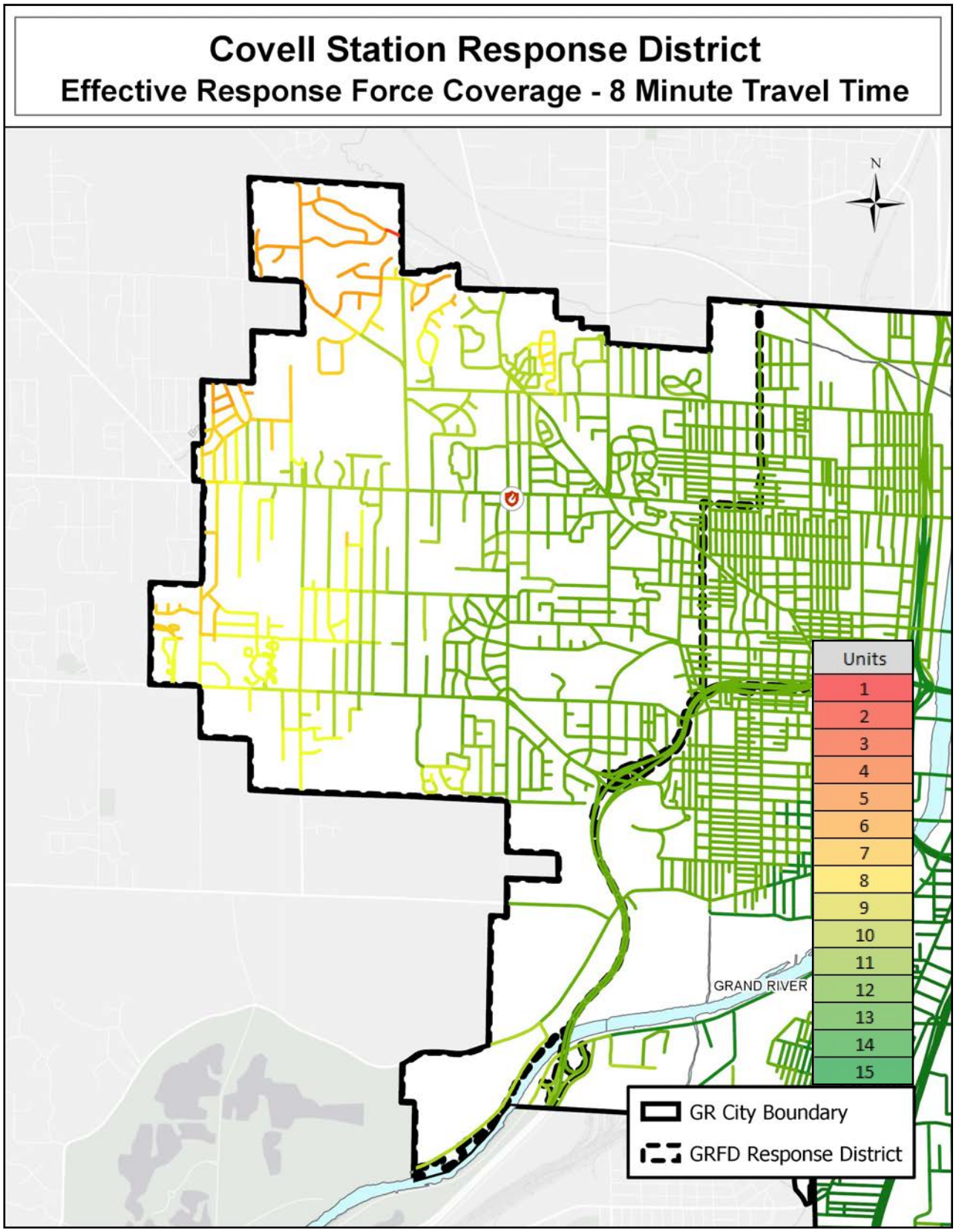


Distribution - Drive Time Analysis

Covell District 8	2016	2017	2018	2019	2020
Incident Count	1,574	1,682	1,632	1,931	1,545
Incidents in Covered Area	1,551	1,664	1,597	1,898	1,514
% Incidents Covered	98.54%	98.93%	97.86%	98.29%	97.99%

Concentration - District Effective Response Force Analysis Map

This map depicts the number of units that can be assembled in the district within the multiple unit benchmark travel time of 8 minutes. As noted for other outlying districts, Covell's concentration metrics veer away from compliance rates at the boundaries of the city. In this case the western edge of the district is affected. Automatic mutual aid is supplied by the City of Walker.

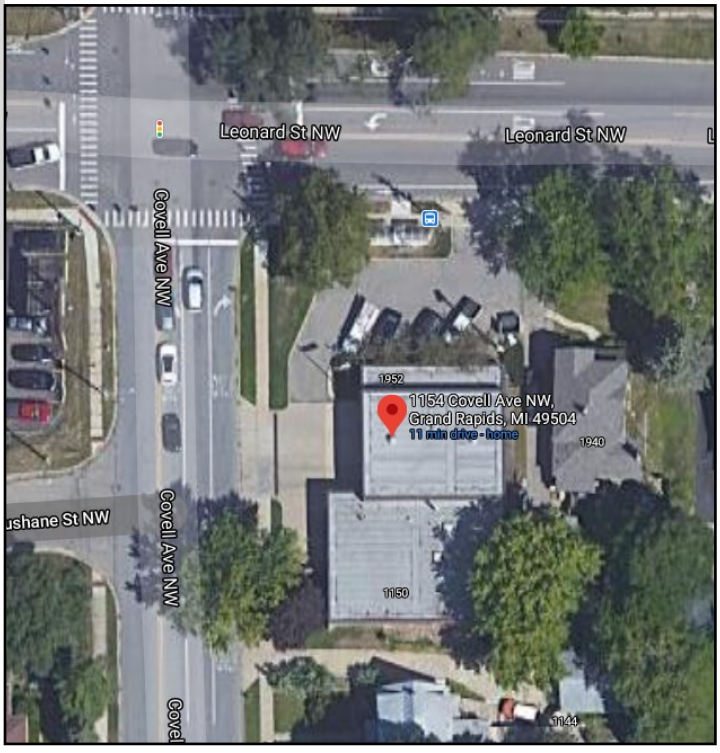


Response Data

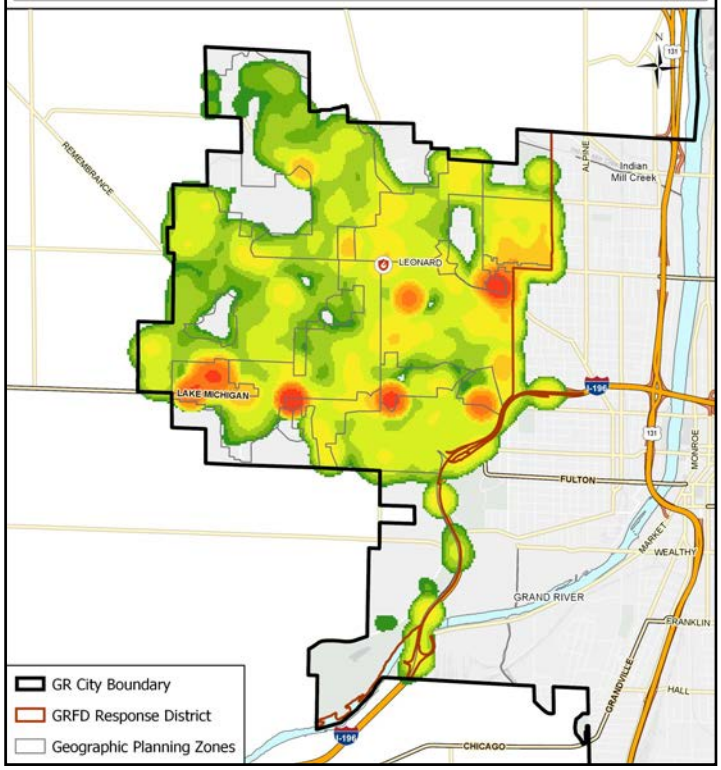
Covell district has averaged about 1,600 calls, with a spike of 1,900 incident in 2019. Apparatus responses are lower than incidents, indicating a need for help from surrounding districts to cover the call volume. This is supported by the reliability metric running at 80%. Baseline performance shows fire low incidents at 1:34 over, and fire moderate at 2:04 over benchmark. EMS low incidents are at 1:26 over benchmark and EMS moderate incidents are running 2:36 over.

Covell Station Incidents and % of Citywide

Type	2016	2017	2018	2019	2020
Fire	34	45	54	38	34
	5.31%	7.44%	9.31%	7.04%	5.31%
EMS	1,014	1,117	1,067	1,119	1,035
	6.98%	7.36%	7.42%	7.30%	6.71%
Other	526	520	511	774	476
	6.71%	6.45%	6.98%	9.49%	6.83%
Total	1,574	1,682	1,632	1,931	1,545
	6.84%	7.05%	7.33%	8.04%	6.71%
Fire Loss	$225,858	$122,787	$310,880	$454,685	$478,263
	3.63%	2.18%	6.07%	8.39%	7.55%



Covell Response District Incident Density



Covell Apparatus Responses

Unit	2016	2017	2018	2019	2020
Engine 8	1,583	1,531	1,481	1,734	1,455
Total Responses	1,583	1,531	1,481	1,734	1,455
% of City Responses	4.98%	4.77%	4.84%	5.27%	4.61%
Total Deployed Hours	536:17:26	491:24:32	499:12:02	565:22:41	500:38:39
% of City Deployed Hours	5.62%	5.07%	5.39%	5.46%	5.13%

Covell Apparatus Unit Hour Utilization

Unit	2016	2017	2018	2019	2020
Engine 8	0.10	0.10	0.10	0.11	0.10

Temporal Analysis 2016 - 2020 EMS								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	28	9	6	14	17	21	17	112
01:00-01:59	12	22	17	21	13	22	26	133
02:00-02:59	31	21	10	15	19	14	19	129
03:00-03:59	21	9	12	14	12	20	14	102
04:00-04:59	10	26	24	16	9	23	14	122
05:00-05:59	15	16	20	20	15	24	14	124
06:00-06:59	22	21	16	21	22	7	13	122
07:00-07:59	29	25	37	33	32	31	21	208
08:00-08:59	43	50	31	44	43	33	34	278
09:00-09:59	50	33	40	37	50	56	43	309
10:00-10:59	48	47	51	42	53	43	35	319
11:00-11:59	41	64	44	49	49	47	32	326
12:00-12:59	53	43	43	49	50	51	36	325
13:00-13:59	48	50	39	57	47	39	31	311
14:00-14:59	31	58	52	36	41	37	33	288
15:00-15:59	38	36	41	46	48	42	37	288
16:00-16:59	48	38	49	51	39	43	32	300
17:00-17:59	32	34	45	38	40	35	27	251
18:00-18:59	36	43	23	31	43	28	38	242
19:00-19:59	41	41	33	30	31	34	37	247
20:00-20:59	40	41	28	29	35	36	32	241
21:00-21:59	32	38	25	24	30	30	27	206
22:00-22:59	29	33	25	33	24	28	29	201
23:00-23:59	22	32	23	24	18	21	25	165
Total	800	830	734	774	780	765	666	5,349

Temporal Analysis 2016 - 2020 Fire								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	2	2	0	0	1	0	1	6
01:00-01:59	0	0	0	1	2	1	0	4
02:00-02:59	0	2	0	0	1	1	0	4
03:00-03:59	0	0	0	0	1	0	0	1
04:00-04:59	0	0	2	0	0	1	0	3
05:00-05:59	0	1	1	0	1	0	0	3
06:00-06:59	2	1	1	2	0	1	0	7
07:00-07:59	1	0	1	0	0	0	0	2
08:00-08:59	2	1	0	1	0	0	4	8
09:00-09:59	1	1	3	2	0	0	0	7
10:00-10:59	2	3	0	2	0	3	2	12
11:00-11:59	2	0	0	2	1	3	3	11
12:00-12:59	4	1	2	1	0	4	2	14
13:00-13:59	4	1	3	1	3	5	1	18
14:00-14:59	3	2	3	2	1	1	1	13
15:00-15:59	2	1	2	0	3	1	0	9
16:00-16:59	2	2	2	1	3	0	2	12
17:00-17:59	4	1	1	1	5	3	2	17
18:00-18:59	3	1	3	3	2	2	2	16
19:00-19:59	2	2	2	0	1	1	1	9
20:00-20:59	3	2	4	0	0	1	3	13
21:00-21:59	1	1	0	2	1	0	1	6
22:00-22:59	0	2	1	1	1	1	1	7
23:00-23:59	0	0	0	1	1	1	0	3
Total	40	27	31	23	28	30	26	205

Covell Reliability & Simultaneous Performance					
Type	2016	2017	2018	2019	2020
Reliability %	85.01%	77.53%	78.43%	76.87%	79.81%
Citywide Reliability %	88.38%	82.95%	83.37%	81.03%	82.66%
Simultaneous Incident Count	115	158	128	254	115
Simultaneous Incident %	7.31%	9.39%	7.84%	13.15%	7.45%

Covell Response District 90th Percentile Baseline Performance						
Category	Alarm Handling	Turnout	Travel Distribution	Travel Concentration	Total Response Time Distribution	Total Response Time Concentration
Fire						
Low	2:30	1:51	5:24	5:24	8:34	8:34
Moderate	1:36	1:49	5:44	9:51	8:26	13:04
EMS						
Low	3:04	1:41	5:21	5:21	8:56	8:56
Moderate	2:59	1:51	7:11	8:48	10:45	12:06

Quick Facts

Station 9 ..... Plainfield Avenue Fire Station

Address ..... 2251 Plainfield Ave. NE

Station Built..... 1951

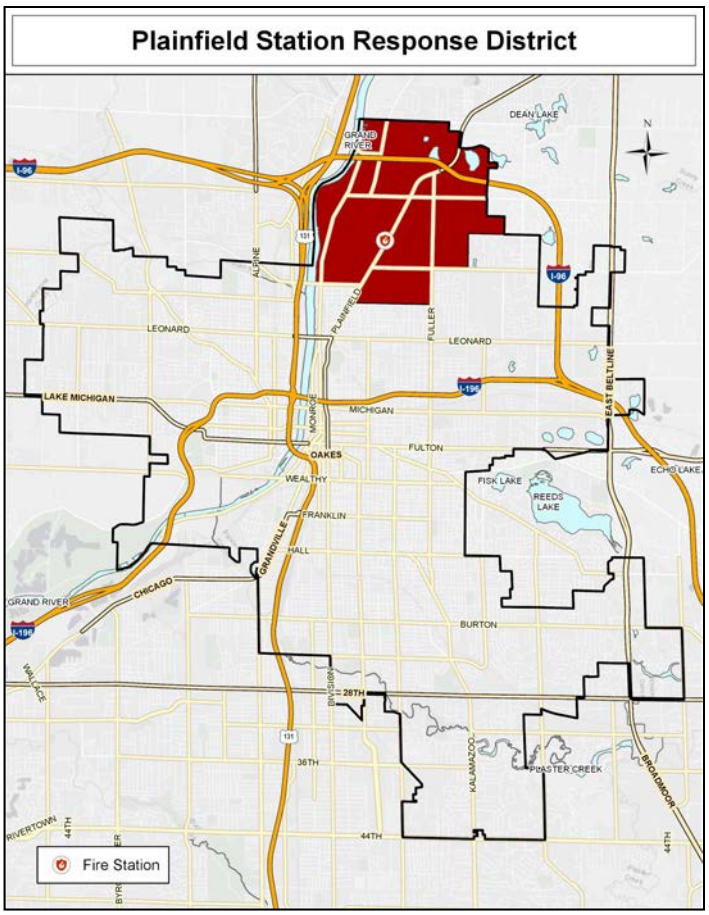
Frontline Apparatus .....Engine 9

Cross Staffed/ Reserve Apparatus ..... None

Square Miles..... 5.17

Road Miles..... 77.48

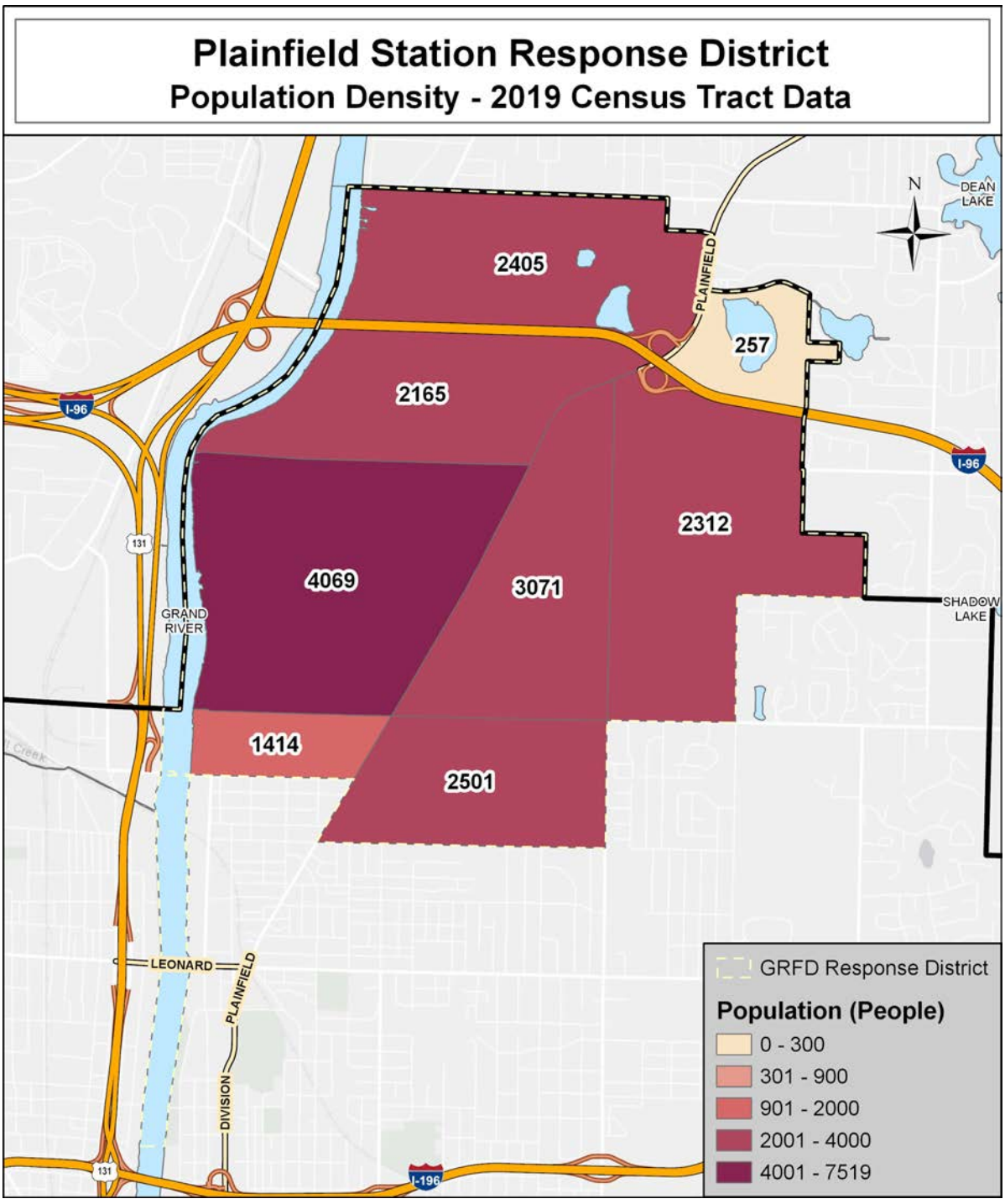
Hydrants..... 711



District Characteristics:

Plainfield Avenue station is in the northernmost section of the city. The area is mostly residential, with pockets of commercial occupancies located along major thoroughfares. Situated just east of the Grand River, there are three boat launches in Plainfield's district which provide access to the northern section of the river, above the 6th Street dam in the downtown area.

PLAINFIELD RESPONSE DISTRICT - 09



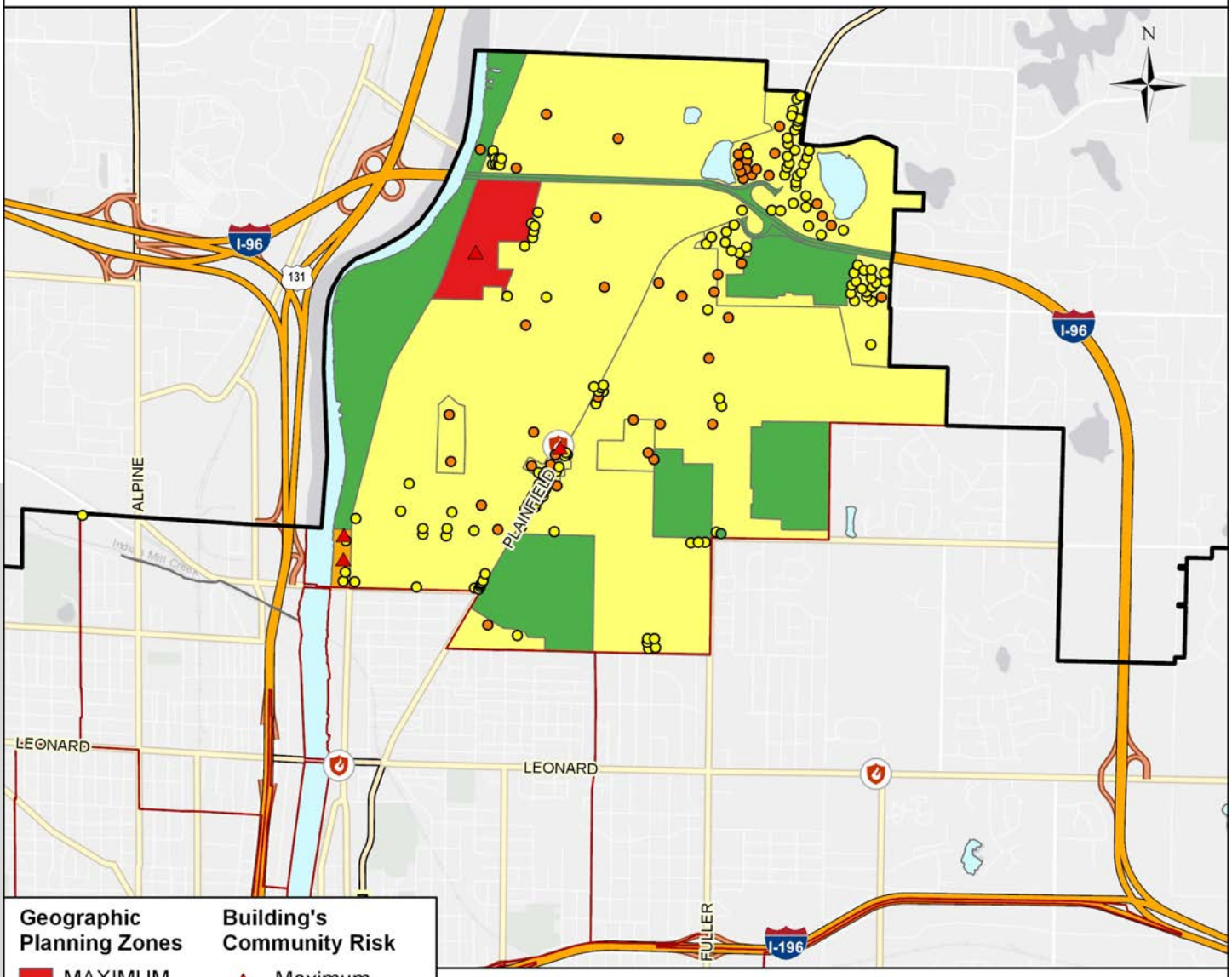
Population/Demographics:

The Plainfield station response district contains 18,194 residents and comprises 9.43% of the city's population. Population density is 3,519 people per square mile. This analysis is based on data gathered from the 2019 US Census Bureau 5-year estimates. The district is predominately urban, with small zones of rural designations for parks and commercial/industrial areas.

District	Population	< 5 Years Old	< 18 Years Old	> 65 Years Old	Median Age	White	Black or African American	American Indian or Alaskan Native	Asian	Hispanic
9	18,194	1,225	3,604	2,934	37	15,544	1,256	37	375	1,130
GR Total	192,962	13,489	43,300	23,232	31	129,942	35,575	680	4,519	31,357
% of City	9.43%	9.08%	8.32%	12.63%	121.34%	11.96%	3.53%	5.44%	8.30%	3.60%

Plainfield Station Response District

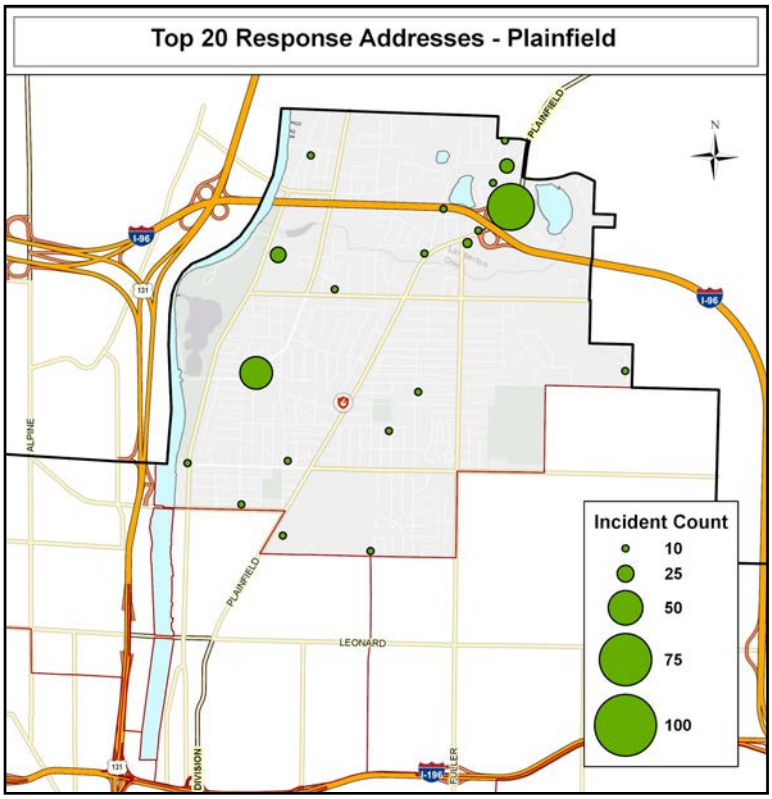
Geographic Planning Zones with Fire Risk Assessment Buildings



Buildings per Community Risk Type				
Low	Moderate	High	Maximum	Total
2	146	47	4	199

PLAINFIELD RESPONSE DISTRICT - 09

District	Residential Occupancies	Industrial Occupancies	Commercial Occupancies	Tax Exempt	Total Square Ft	Taxable Value	Average Building Age (Years)	Needed Fire Flow over 3500 GPM	Sprinklered Buildings
9	6,289	1	125	7	8,742,571	$426,164,084	74.01	46	40
Citywide	55,506	269	3,364	821	124,272,758	4,950,657,315	82.36	1,485	1,180
% of City	11.33%	0.37%	3.72%	0.85%	7.03%	8.61%	89.87%	3.10%	3.39%



Top 20 Response Addresses	Incident Count
3221 PLAINFIELD Avenue NE	67
2420 COIT Avenue NE	47
3000 MONROE Avenue NE	23
1361 ELMDALE Street NE	21
3100 PLAINFIELD Avenue NE	14
3360 RIVERVIEW Avenue NE	9
1381 PARKWAY Drive NE	8
1810 COIT Avenue NE	8
I-96 EB WO PLAINFIELD	7
1005 DORROLL Street NE	6
1617 West KENTVIEW Drive NE	6
1720 PLAINFIELD Avenue NE	6
3257 SOFT WATER LAKE Drive NE	6
1961 MONROE Avenue NW	5
2151 EMERALD Avenue NE	5
2475 SUMMIT RIDGE Drive NE	5
2818 EDGEWOOD Avenue NE	5
3127 PLAINFIELD Avenue NE	5
414 GRACELAND Street NE	5
1022 LAMBERTON Street NE	4

Risk Assessment:

Fire: 3.01% of the district's area is classified as a high or maximum risk geographical planning zone. There are 46 occupancies with a needed fire flow over 3,500 GPM and 8.61% of the city's taxable value is in the district.

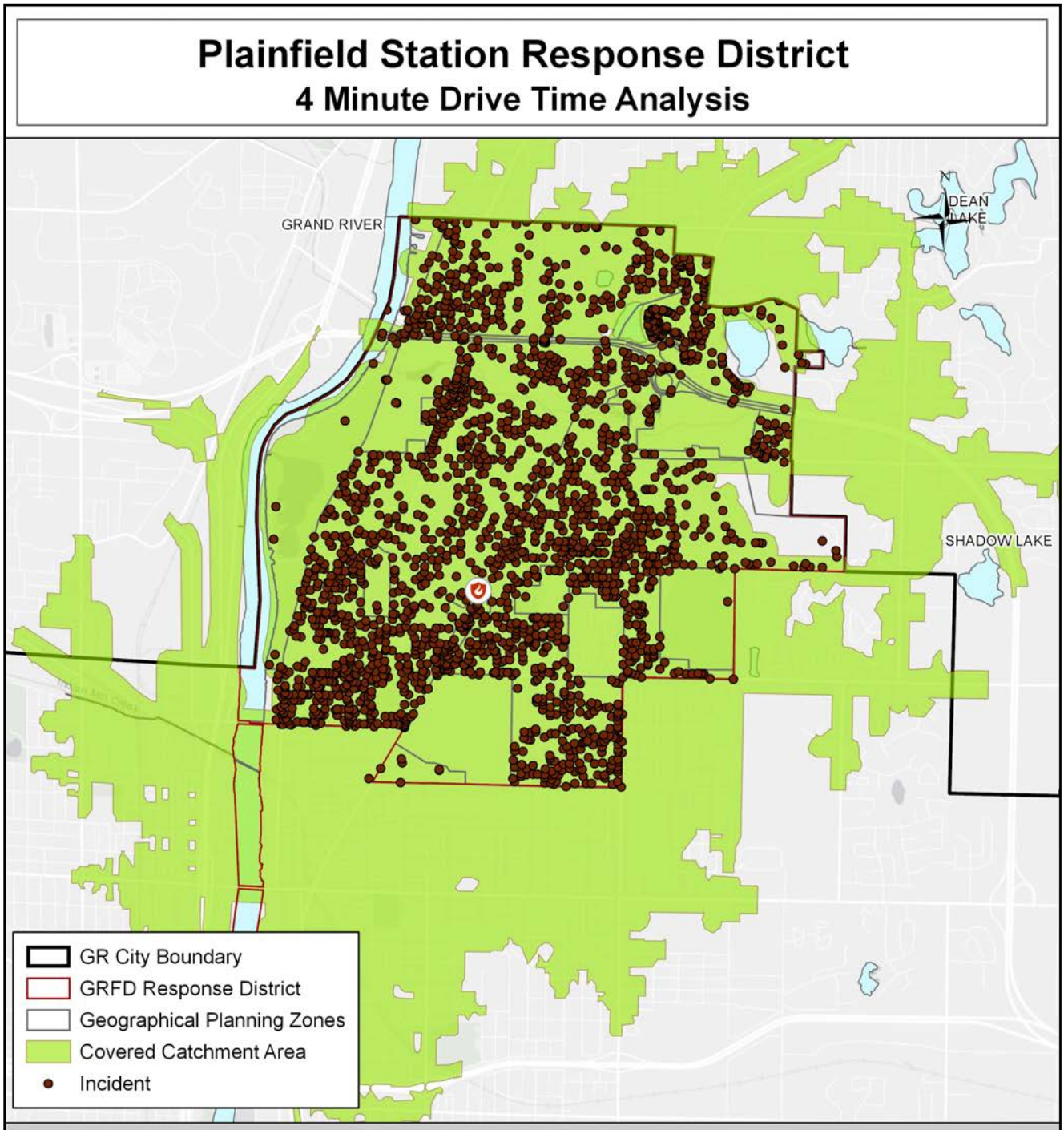
Vehicle accidents: Mostly along the I-96 corridor. Not as many accidents in this district.

EMS: The Motel 6 and Knights Inn on Plainfield are utilized for transitional housing. Generating a high call volume for EMS. The Vista Springs senior living center near the station also generates a high call volume. The Veterans Home on Monroe Avenue used to be a driver of EMS and fire calls, but better management and facility upgrade have decreased calls for service there.

Maximum Risk Buildings For Plainfield District	
1863 MONROE AVE NW	US Marine Corps Reserve Center
1953 MONROE AVE NW	AppleTree Learning Center
2251 PLAINFIELD AVE NE	Plainfield Avenue Fire Station
3000 MONROE AVE NE	Grand Rapids Home For Veterans

Distribution - Four Minute Drive Time Analysis

Plainfield district drive time analysis revealed compliance rates close to 99% over the last five years. Access to the northern section of the district, impeded by I-96, an expressway running east-west through the district, has an notable impact on actual performance. Analysis of drive times in this section are based on the street speed layer used by CAD (computer-aided dispatch).

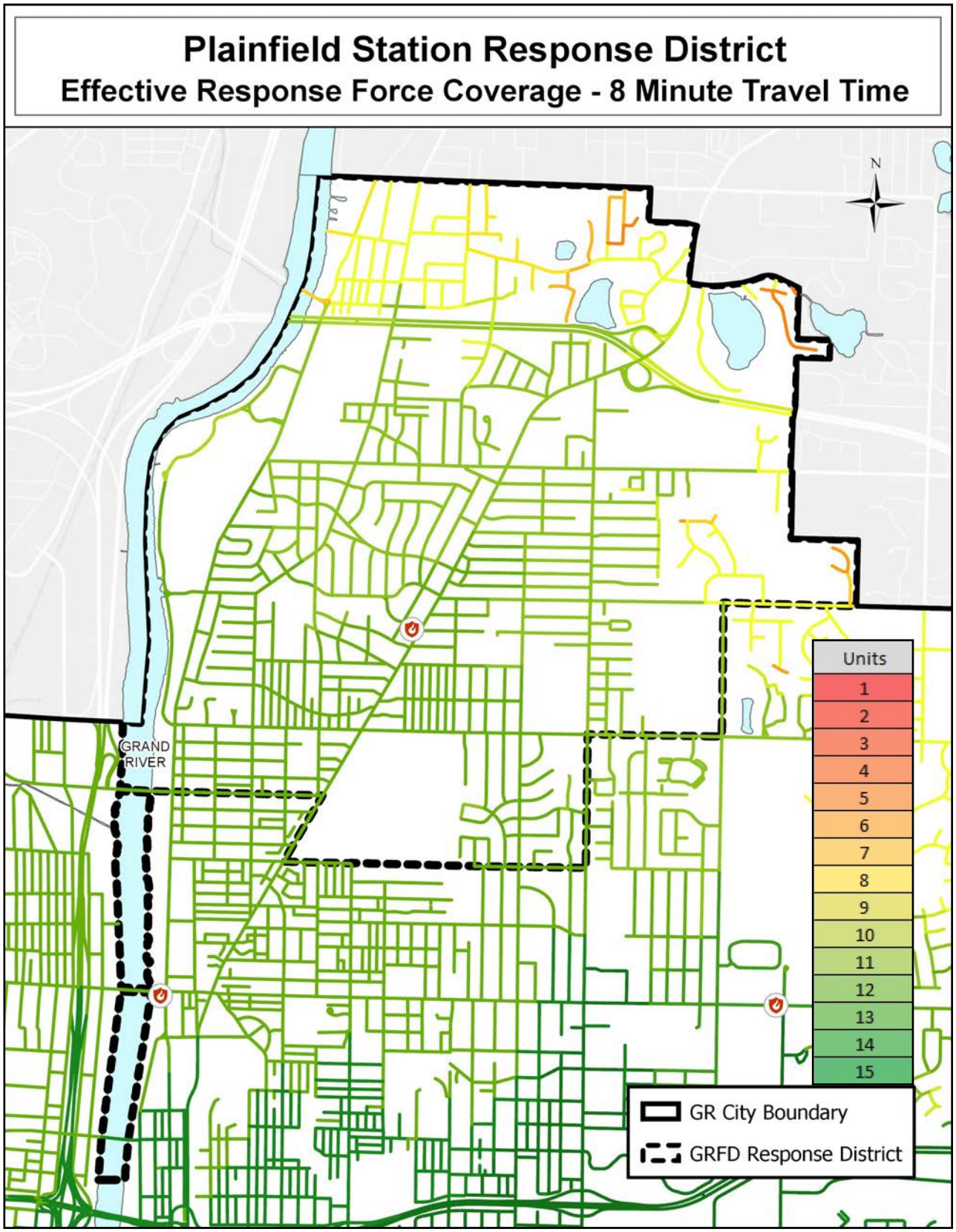


Distribution - Drive Time Analysis

Plainfield District 9	2016	2017	2018	2019	2020
Incident Count	959	1,063	1,003	1,167	1,105
Incidents in Covered Area	955	1,061	997	1,165	1,101
% Incidents Covered	99.58%	99.81%	99.40%	99.83%	99.64%

Concentration - District Effective Response Force Analysis Map

This map depicts the number of units that can be assembled in the district within the multiple unit benchmark travel time of 8 minutes. Similar to other outlying districts, Plainfield's concentration metrics exhibit lower compliance rates at the boundaries of the city. This is most notable at the northern border of the district. Automatic mutual aid is supplied by Plainfield Township from the north.

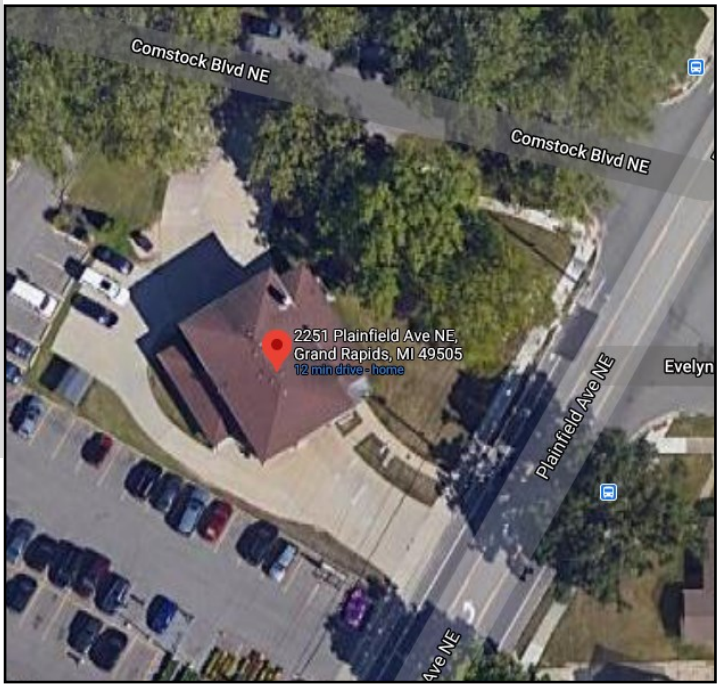


Response Data

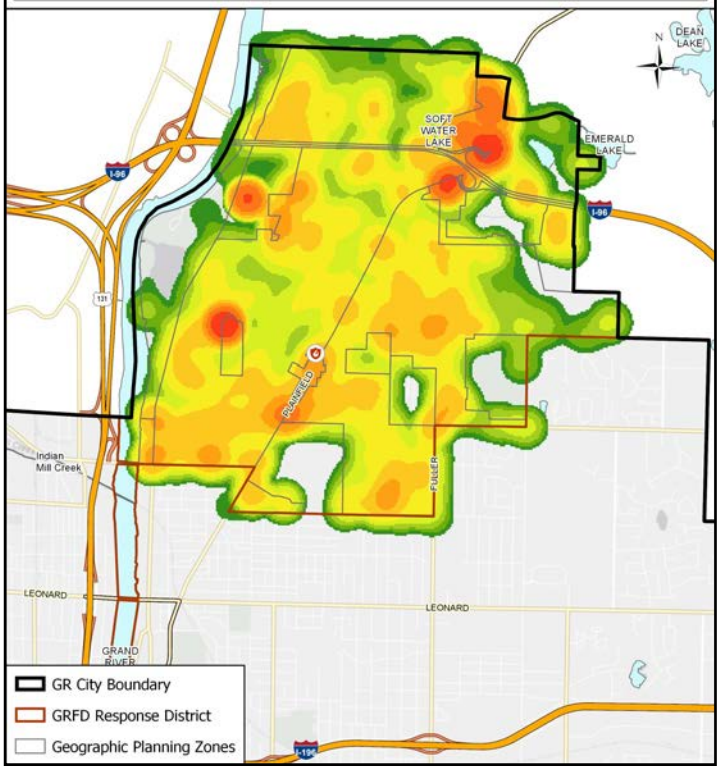
At around 1,100 incidents per year, Plainfield district has the lightest call volume in the city. Apparatus responses average close to 1,300 per year. Baseline performance shows fire low incidents at 1:58 over, and fire moderate at 3:16 over benchmark. EMS low incidents are at 1:44 over benchmark and EMS moderate incidents are running 2:59 over. A hot spot of activity on the far northeast corner of the district is impacting these metrics.

Plainfield Station Incidents and % of Citywide

Type	2016	2017	2018	2019	2020
Fire	17	31	25	24	24
	2.66%	5.12%	4.31%	4.44%	3.75%
EMS	617	719	630	691	694
	4.25%	4.74%	4.38%	4.51%	4.50%
Other	325	313	348	452	387
	4.15%	3.88%	4.75%	5.54%	5.55%
Total	959	1,063	1,003	1,167	1,105
	4.17%	4.46%	4.50%	4.86%	4.80%
Fire Loss	$531,531	$446,260	$109,972	$48,648	$120,230
	8.54%	7.94%	2.15%	0.90%	1.90%



Plainfield Response District Incident Density



Plainfield Apparatus Responses

Unit	2016	2017	2018	2019	2020
Engine 9	1,267	1,324	1,239	1,390	1,329
Water 9	4	3	6	6	1
Total Responses	1,271	1,327	1,245	1,396	1,330
% of City Responses	4.00%	4.13%	4.07%	4.24%	4.21%
Total Deployed Hours	445:14:56	402:42:25	408:02:03	428:37:06	420:24:28
% of City Deployed Hours	4.66%	4.15%	4.41%	4.14%	4.31%

Plainfield Apparatus Unit Hour Utilization

Unit	2016	2017	2018	2019	2020
Engine 9	0.09	0.08	0.08	0.09	0.08
Water 9	0.00	0.00	0.00	0.00	0.00

PLAINFIELD RESPONSE DISTRICT - 09

Temporal Analysis 2016 - 2020 EMS								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	16	10	10	17	15	10	14	92
01:00-01:59	16	10	6	8	12	8	24	84
02:00-02:59	13	7	10	12	9	7	13	71
03:00-03:59	8	12	4	10	9	8	11	62
04:00-04:59	15	11	9	10	13	14	10	82
05:00-05:59	8	14	7	7	7	6	6	55
06:00-06:59	8	12	17	15	12	13	15	92
07:00-07:59	13	22	13	11	25	19	10	113
08:00-08:59	13	30	22	21	18	16	17	137
09:00-09:59	16	26	26	26	28	20	11	153
10:00-10:59	25	34	20	32	25	32	19	187
11:00-11:59	18	21	26	23	29	23	24	164
12:00-12:59	31	24	31	33	29	31	26	205
13:00-13:59	22	27	23	31	24	26	26	179
14:00-14:59	23	29	24	35	23	24	22	180
15:00-15:59	18	24	27	25	35	36	24	189
16:00-16:59	16	26	26	21	18	29	29	165
17:00-17:59	26	30	30	36	22	35	28	207
18:00-18:59	23	27	28	17	27	21	21	164
19:00-19:59	26	35	24	19	25	31	15	175
20:00-20:59	17	29	28	29	22	30	27	182
21:00-21:59	17	22	27	25	30	22	32	175
22:00-22:59	11	17	19	17	19	25	24	132
23:00-23:59	21	17	19	9	13	12	16	107
Total	420	516	476	489	489	498	464	3,352

Temporal Analysis 2016 - 2020 Fire								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	2	0	1	1	0	1	0	5
01:00-01:59	0	0	0	0	0	0	1	1
02:00-02:59	0	1	0	0	0	0	1	2
03:00-03:59	0	0	0	0	0	0	0	0
04:00-04:59	0	0	0	1	0	0	2	3
05:00-05:59	0	0	0	0	0	0	0	0
06:00-06:59	1	0	0	2	0	0	1	4
07:00-07:59	0	1	0	3	0	0	0	4
08:00-08:59	0	0	0	2	0	1	0	3
09:00-09:59	1	0	0	0	0	2	0	3
10:00-10:59	1	1	0	0	1	1	1	5
11:00-11:59	1	1	0	0	1	0	0	3
12:00-12:59	0	0	1	1	2	1	0	5
13:00-13:59	4	2	1	1	1	0	1	10
14:00-14:59	3	1	2	0	0	0	1	7
15:00-15:59	2	0	1	1	2	1	1	8
16:00-16:59	1	0	1	1	0	0	2	5
17:00-17:59	4	1	2	1	0	1	1	10
18:00-18:59	2	0	2	2	1	3	1	11
19:00-19:59	1	0	3	3	0	2	1	10
20:00-20:59	2	0	1	3	0	2	1	9
21:00-21:59	2	1	0	0	1	0	1	5
22:00-22:59	0	1	0	1	0	2	0	4
23:00-23:59	1	0	1	0	0	1	1	4
Total	28	10	16	23	9	18	17	121

Plainfield Reliability & Simultaneous Performance					
Type	2016	2017	2018	2019	2020
Reliability %	86.70%	84.50%	82.81%	81.37%	85.18%
Citywide Reliability %	88.38%	82.95%	83.37%	81.03%	82.66%
Simultaneous Incident Count	38	56	46	122	61
Simultaneous Incident %	3.96%	5.27%	4.59%	10.40%	5.51%

Plainfield Response District 90th Percentile Baseline Performance						
Category	Alarm Handling	Turnout	Travel Distribution	Travel Concentration	Total Response Time Distribution	Total Response Time Concentration
Fire						
Low	2:01	2:14	6:33	6:41	8:58	8:58
Moderate	2:07	1:52	4:43	11:45	7:34	14:16
EMS						
Low	3:20	1:39	5:33	5:33	9:13	9:14
Moderate	2:52	1:52	7:12	9:17	10:41	12:29

Quick Facts

Station 10 ..... Division Avenue Fire Station

Address ..... 1734 S. Division Ave.

Station Built 1926

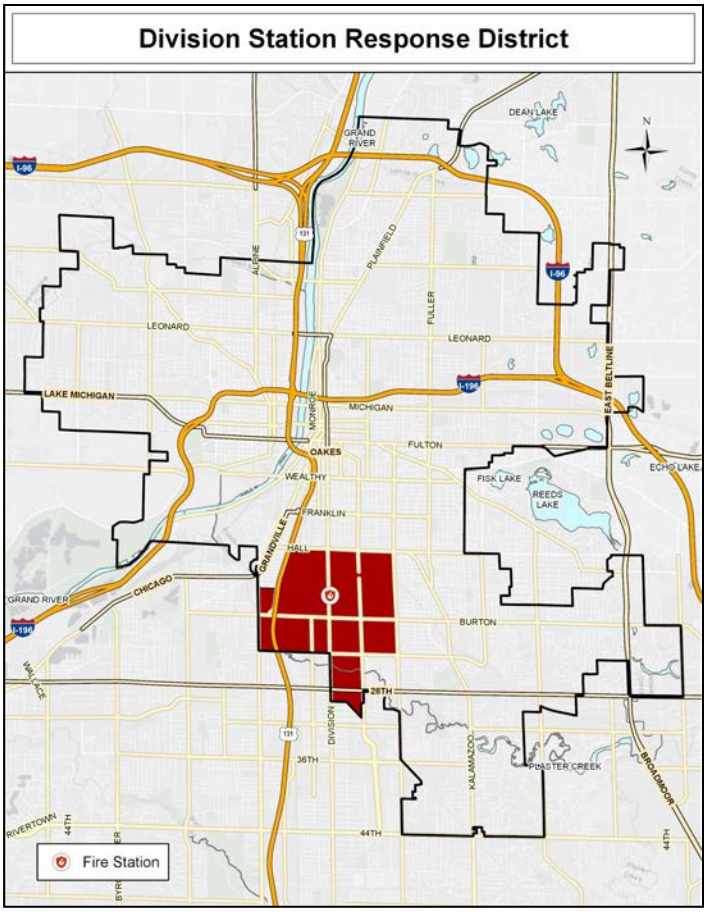
Frontline Apparatus ..... Engine 10, Car 5

Cross Staffed/ Reserve Apparatus ..... None

Square Miles 2.95

Road Miles 69.66

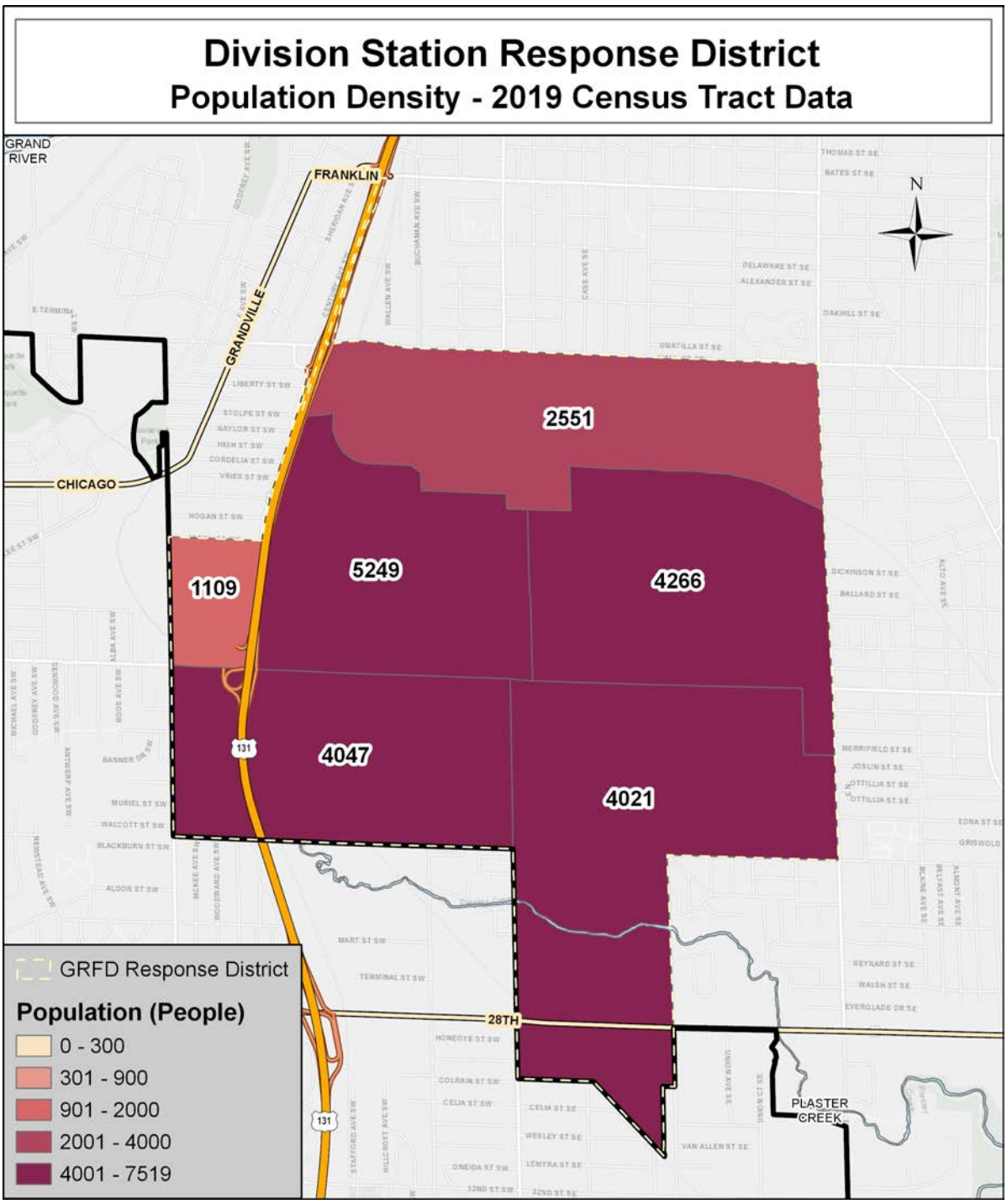
Hydrants 545



District Characteristics:

Division Avenue's district hosts a mix of residential, commercial and light/heavy industrial occupancies. Due to its close proximity to the US-131 expressway, the station houses one of the city's vehicle extrication engines, which are all outfitted with specialized extrication equipment. Engine 10 is also the lead unit for industrial machine extrications. Built in 1926, this was the first station in Grand Rapids constructed solely for motorized response vehicles. The city recently purchased a large piece of property just south of the station which will be the new home for Engine 10 and Car 5.

DIVISION RESPONSE DISTRICT - 10



DIVISION RESPONSE DISTRICT - 10

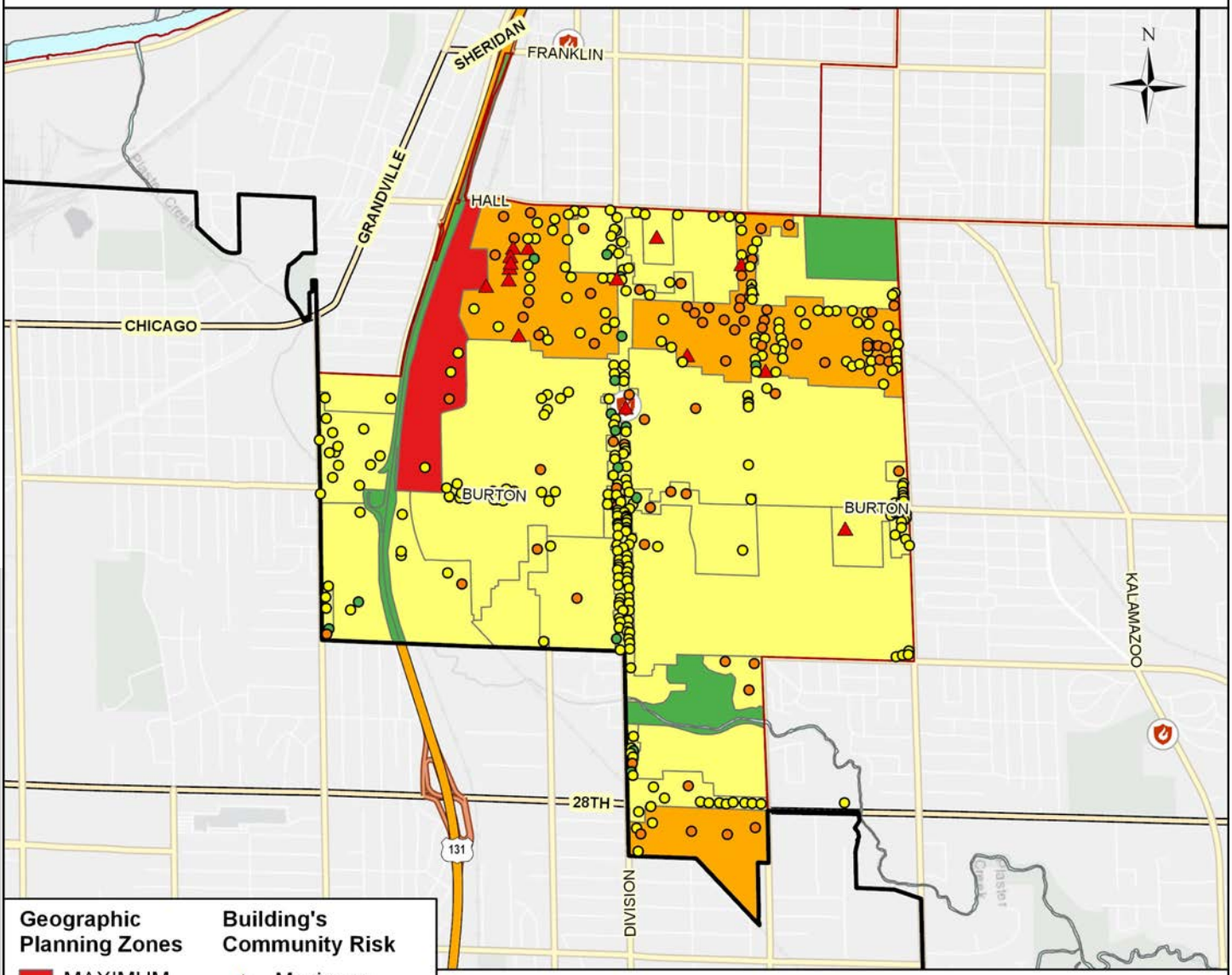
Population/Demographics:

The Division station response district contains 21,243 residents and comprises 11.01% of the city's population. Population density is 7,225 people per square mile. This analysis is based on data gathered from the 2019 US Census Bureau 5-year estimates. The district is predominately urban, with small pockets of rural designations for parks and commercial/industrial areas.

District	Population	< 5 Years Old	< 18 Years Old	> 65 Years Old	Median Age	White	Black or African American	American Indian or Alaskan Native	Asian	Hispanic
10	21,243	2,628	7,258	1,336	27	9,274	4,587	148	82	11,611
GR Total	192,962	13,489	43,300	23,232	31	129,942	35,575	680	4,519	31,357
% of City	11.01%	19.48%	16.76%	5.75%	87.62%	7.14%	12.89%	21.76%	1.81%	37.03%

Division Station Response District

Geographic Planning Zones with Fire Risk Assessment Buildings

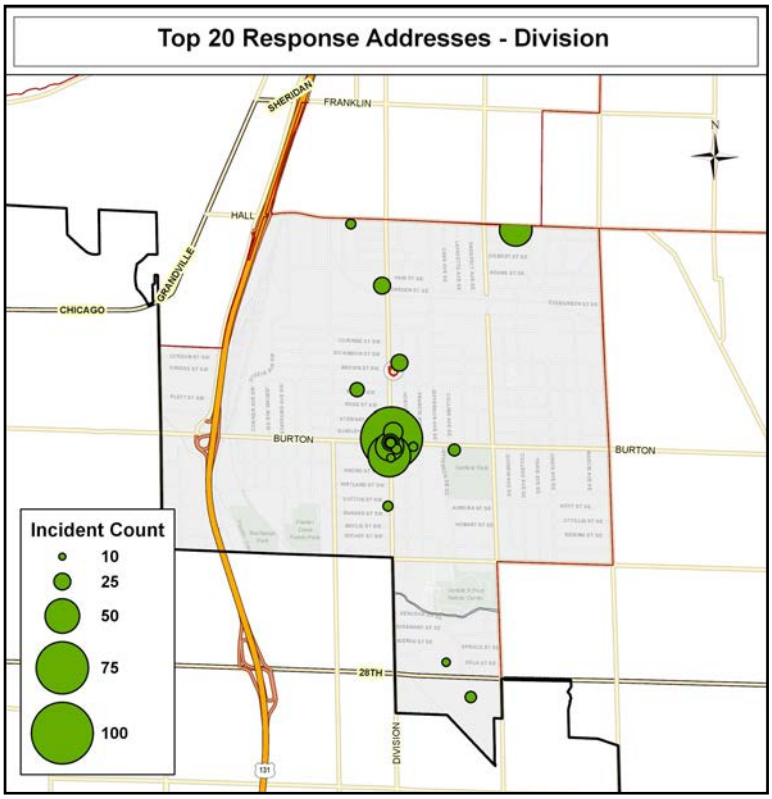


Buildings per Community Risk Type

Low	Moderate	High	Maximum	Total
16	293	72	16	397

DIVISION RESPONSE DISTRICT - 10

District	Residential Occupancies	Industrial Occupancies	Commercial Occupancies	Tax Exempt	Total Square Ft	Taxable Value	Average Building Age (Years)	Needed Fire Flow over 3500 GPM	Sprinklered Buildings
10	5,019	44	306	50	10,266,722	$259,575,195	94.61	126	75
Citywide	55,506	269	3,364	821	124,272,758	4,950,657,315	82.36	1,485	1,180
% of City	9.04%	16.36%	9.10%	6.09%	8.26%	5.24%	114.88%	8.48%	6.36%



Top 20 Response Addresses	Incident Count
1980 South DIVISION Avenue	194
2025 South DIVISION Avenue	61
500 HALL Street SE	47
2015 South DIVISION Avenue	41
1954 South DIVISION Avenue	28
1491 South DIVISION Avenue	25
1706 South DIVISION Avenue	25
BURTON Street SW	25
103 ELM Street SW	21
South DIVISION Avenue	19
334 BURTON Street SE	18
South DIVISION Avenue	18
310 28TH Street SE	17
110 HALL Street SW	15
2004 South DIVISION Avenue	15
2211 South DIVISION Avenue	15
BURTON Street SE	15
100 BURTON Street SE	14
171 28TH Street SE	13
South DIVISION Avenue	13

Risk Assessment:

Fire: 22.52% of the district's area is classified as a high or maximum risk geographical planning zone. There are 126 occupancies with a needed fire flow over 3,500 GPM and 5.24% of the city's taxable value is located in the district.

Vehicle accidents: High risk incidents on US-131 from Burton to Clyde Park. The frequency of crashes on Division Avenue south of Burton to Andre is more troubling than the severity.

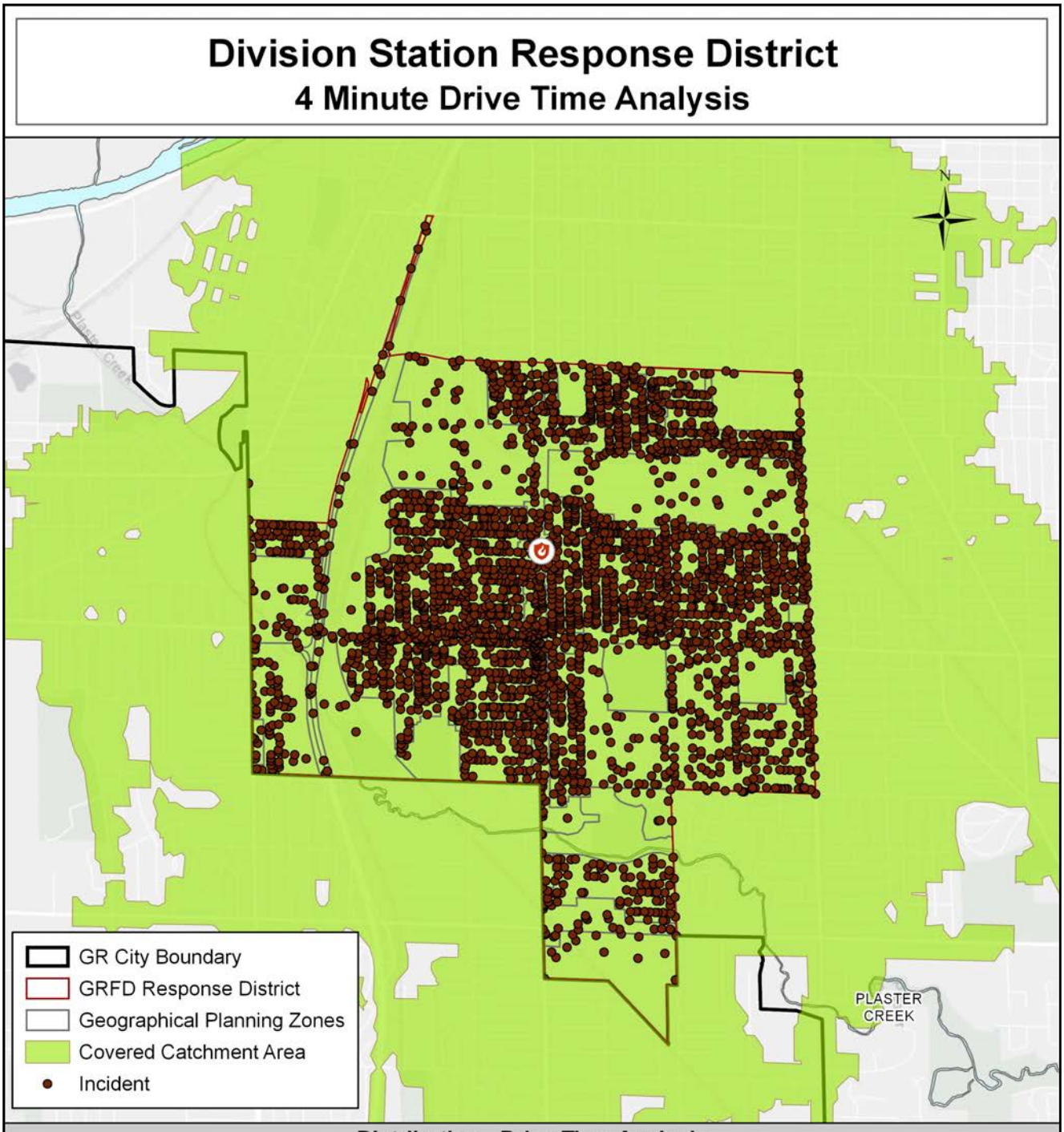
EMS: A new Samaritas senior living center just opened at the old Diocese on Burton near Eastern. It is too soon to determine if this will be a call driver. There is a homeless camp on Division and 28th near the train tracks, one individual with frequent calls. The district has been working through a recent increase in call volume at bus stops near Burton and Division due to public inebriation. The crews are working with the transit authority to address inappropriate use of the stops. There is some IV drug use in the district, but no notable repeat users of EMS services.

Maximum Risk Buildings For Division District

110 HALL ST SE	Gerald R. Ford Job Corps Center	1415 S DIVISION AVE	Double O Inc.
1266 WALLEN AVE SW	Thedecc Company	1415 STEELE AVE SW	Arkema Coating Resins
1309 MADISON AVE SE	Madison Area Neighborhood Assoc.	1547 BUCHANAN AVE SW	X Treme Demolition Inc
1310 WALLEN AVE SW	DECC Coatings	1627 GODWIN AVE SE	Saenz Tire Repair & Sales
1311 BUCHANAN AVE SW	Steel Tech	1734 S DIVISION AVE	Division Avenue Fire Station
1326 WALLEN AVE SW	DECC Company Inc.	217 EUGENE ST SE	WHS STG
1331 PHILLIPS AVE SW	DECC Coatings	236 STEVENS ST SW	Cascades Enviropac
1414 MADISON AVE SE	1420 Madison LLC	600 BURTON ST SE	Samaritas Affordable Living

Distribution - Four Minute Drive Time Analysis

A study of drive times indicated that 100% of incidents fall within catchment area compliance standards. Actual performance is impacted by restricted access to and across the expressway, which runs through the western edge of the district. Analysis of drive times in this section are based on the street speed layer used by CAD (computer-aided dispatch).



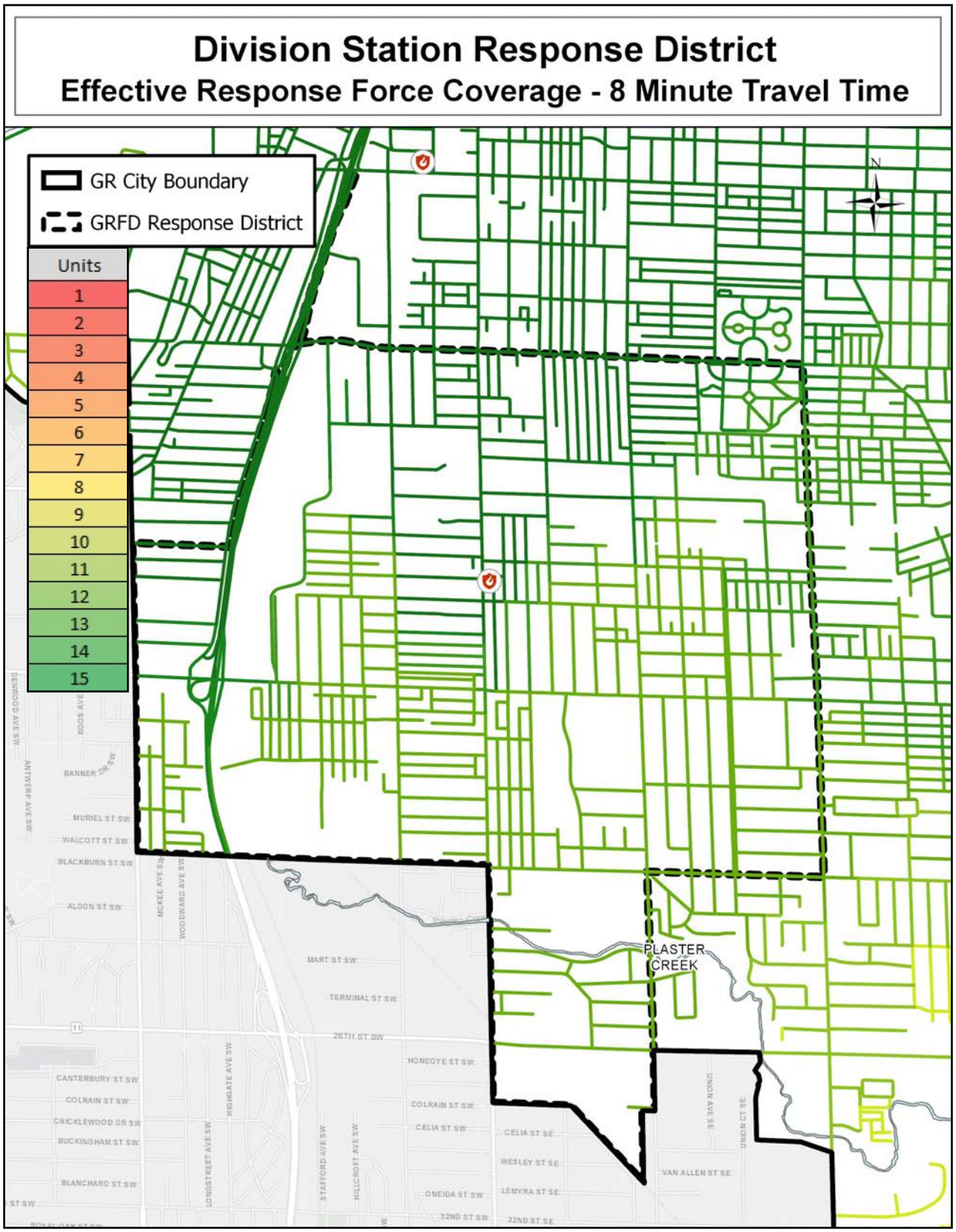
Distribution - Drive Time Analysis

Division District 10	2016	2017	2018	2019	2020
Incident Count	1,899	2,019	1,859	2,216	2,551
Incidents in Covered Area	1,899	2,019	1,859	2,216	2,551
% Incidents Covered	100.00%	100.00%	100.00%	100.00%	100.00%

DIVISION RESPONSE DISTRICT - 10

Concentration - District Effective Response Force Analysis Map

This map depicts the number of units that can be assembled in the district within the multiple unit benchmark travel time of 8 minutes. The ability to gather an effective response force is very good for Division district, with a slight variation from the northern boundary to the southern periphery of the district. Division is bordered by two districts with two frontline apparatus.

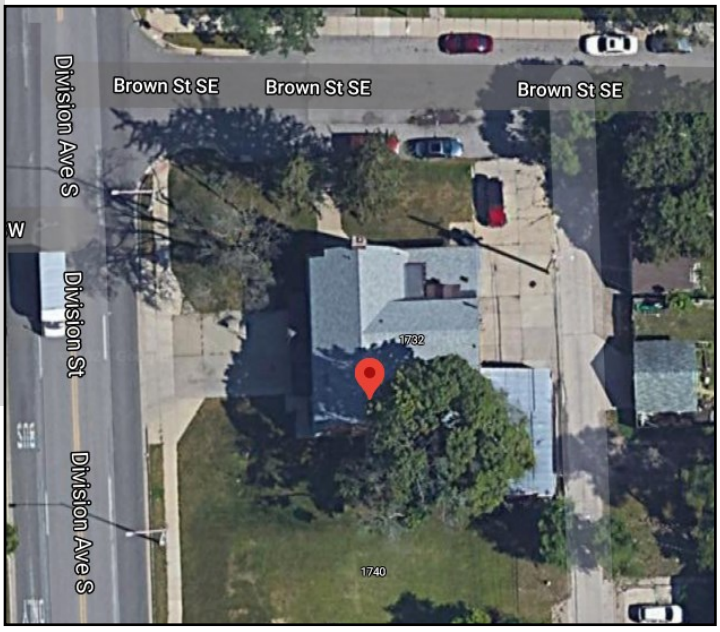


Response Data

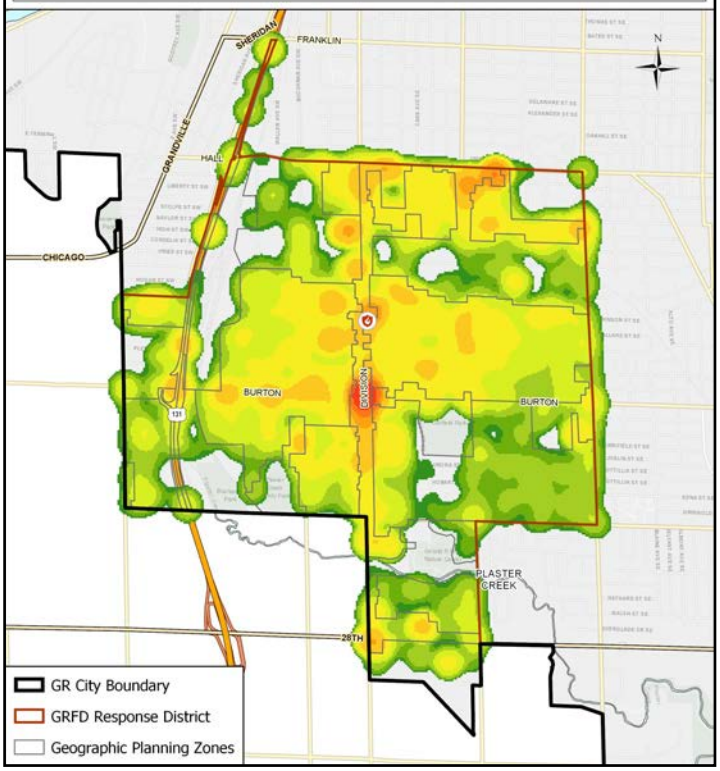
Division district has averaged close to 2,000 incidents over the last five years, with a large jump in 2020 due to shifting demographics of the homeless population. Apparatus responses for the district have fluctuated as different deployment models for battalion chiefs have been implemented. Baseline performance shows fire low incidents at 1:17 over, and fire moderate at :22 below the benchmark. EMS low incidents are at 1:01 over benchmark and EMS moderate incidents are running 2:26 over.

Division Station Incidents and % of Citywide

Type	2016	2017	2018	2019	2020
Fire	73	83	69	51	77
	11.41%	13.72%	11.90%	9.44%	12.03%
EMS	1,164	1,288	1,238	1,558	1,784
	8.01%	8.48%	8.61%	10.17%	11.57%
Other	662	648	552	607	690
	8.44%	8.04%	7.54%	7.44%	9.90%
Total	1,899	2,019	1,859	2,216	2,551
	8.25%	8.47%	8.35%	9.23%	11.07%
Fire Loss	$739,196	$447,180	$512,056	$493,763	$1,009,941
	11.87%	7.96%	10.00%	9.12%	15.94%



Division Response District Incident Density



Division Apparatus Responses

Unit	2016	2017	2018	2019	2020
Engine 10/Rescue 10	2,054	2,185	2,073	2,133	2,501
Car 5				1,080	1,055
Medic 10	4				
Total Responses	2,058	2,185	2,073	3,213	3,556
% of City Responses	6.48%	6.81%	6.77%	9.76%	11.26%
Total Deployed Hours	598:00:32	649:45:52	572:15:59	1000:15:26	1062:31:08
% of City Deployed Hours	6.26%	6.70%	6.18%	9.67%	10.89%

Division Apparatus Unit Hour Utilization

Unit	2016	2017	2018	2019	2020
Engine 10/Rescue 10	0.12	0.13	0.12	0.13	0.15
Car 5	0.06	0.07	0.07	0.07	0.07
Medic 10	0.00	0.00	0.00	0.00	0.00

DIVISION RESPONSE DISTRICT - 10

Temporal Analysis 2016 - 2020 EMS								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	34	25	29	31	28	23	43	213
01:00-01:59	45	26	20	21	30	26	38	206
02:00-02:59	22	21	20	18	21	14	37	153
03:00-03:59	33	14	20	17	18	24	31	157
04:00-04:59	32	20	21	16	17	30	24	160
05:00-05:59	27	20	34	13	22	16	19	151
06:00-06:59	20	29	29	16	25	29	28	176
07:00-07:59	15	31	34	24	34	21	15	174
08:00-08:59	36	44	38	32	37	30	23	240
09:00-09:59	46	52	41	47	39	26	31	282
10:00-10:59	39	27	25	55	37	43	50	276
11:00-11:59	63	56	36	55	53	50	58	371
12:00-12:59	44	42	45	49	47	48	60	335
13:00-13:59	64	48	49	52	46	58	56	373
14:00-14:59	52	53	44	63	48	51	55	366
15:00-15:59	44	63	68	59	63	65	65	427
16:00-16:59	52	45	63	57	58	70	51	396
17:00-17:59	45	67	70	74	53	63	67	439
18:00-18:59	50	62	60	60	56	48	67	403
19:00-19:59	61	52	62	55	53	67	56	406
20:00-20:59	42	54	43	57	60	72	59	387
21:00-21:59	54	55	53	37	45	56	60	360
22:00-22:59	48	38	38	31	41	51	62	309
23:00-23:59	41	39	34	34	35	37	51	271
Total	1,009	983	976	973	966	1,018	1,106	7,031

Temporal Analysis 2016 - 2020 Fire								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	1	2	1	2	1	1	1	9
01:00-01:59	2	0	2	1	1	2	0	8
02:00-02:59	1	0	2	0	1	1	1	6
03:00-03:59	2	4	3	0	2	0	0	11
04:00-04:59	1	2	1	3	1	1	1	10
05:00-05:59	2	0	0	0	0	2	1	5
06:00-06:59	0	2	1	6	2	1	1	13
07:00-07:59	2	3	2	1	1	2	3	14
08:00-08:59	2	1	0	3	0	1	0	7
09:00-09:59	2	3	1	1	1	1	2	11
10:00-10:59	2	2	1	1	2	2	0	10
11:00-11:59	0	1	1	4	2	3	4	15
12:00-12:59	0	1	4	4	3	1	0	13
13:00-13:59	2	4	1	1	3	4	2	17
14:00-14:59	4	2	2	1	1	2	4	16
15:00-15:59	2	4	2	2	4	1	4	19
16:00-16:59	1	2	2	5	4	7	2	23
17:00-17:59	4	6	4	2	4	3	6	29
18:00-18:59	3	3	2	3	1	0	4	16
19:00-19:59	2	3	4	7	3	4	3	26
20:00-20:59	3	2	5	6	5	2	2	25
21:00-21:59	4	2	4	2	3	3	4	22
22:00-22:59	4	1	0	1	1	1	4	12
23:00-23:59	1	0	1	3	3	7	1	16
Total	47	50	46	59	49	52	50	353

Division Reliability & Simultaneous Performance					
Type	2016	2017	2018	2019	2020
Reliability %	83.27%	78.91%	79.86%	76.04%	80.96%
Citywide Reliability %	88.38%	82.95%	83.37%	81.03%	82.66%
Simultaneous Incident Count	181	188	149	208	253
Simultaneous Incident %	9.53%	9.31%	8.00%	9.38%	9.91%

Division Response District 90th Percentile Baseline Performance						
Category	Alarm Handling	Turnout	Travel Distribution	Travel Concentration	Total Response Time Distribution	Total Response Time Concentration
Fire						
Low	2:24	1:51	5:23	5:23	8:17	8:17
Moderate	1:51	1:55	3:29	7:57	6:11	10:38
EMS						
Low	3:35	1:44	4:33	4:33	8:31	8:31
Moderate	3:09	2:02	6:53	8:37	10:17	11:56

Quick Facts

Station 11 .....Chester Street Fire Station

Address .....1002 Chester St. SE

Station Built.....1902

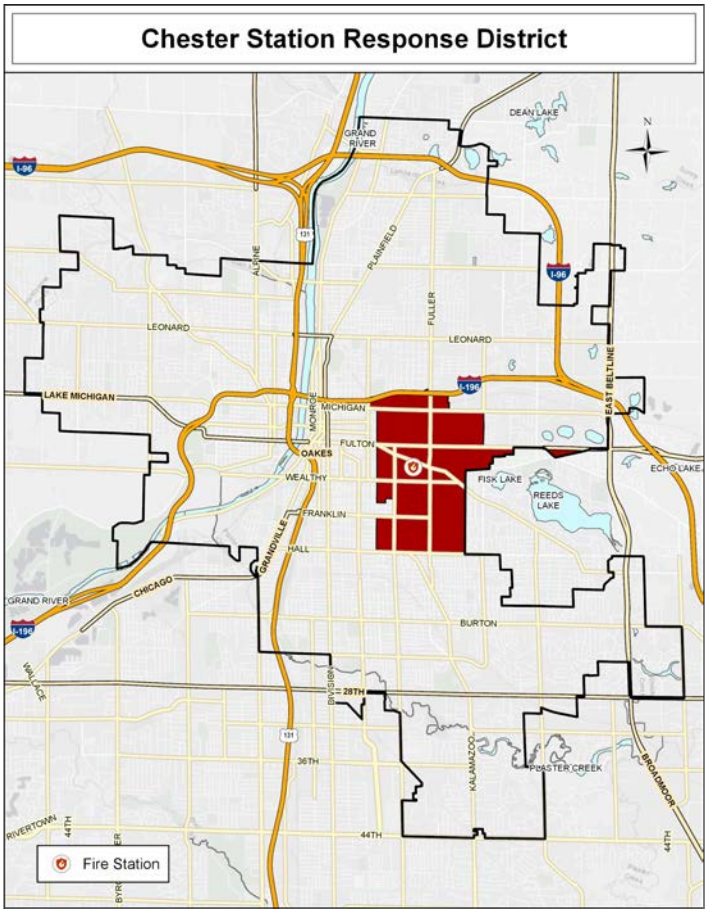
Frontline Apparatus .....Engine 11

Cross Staffed/ Reserve Apparatus ..... None

Square Miles.....3.03

Road Miles.....84.14

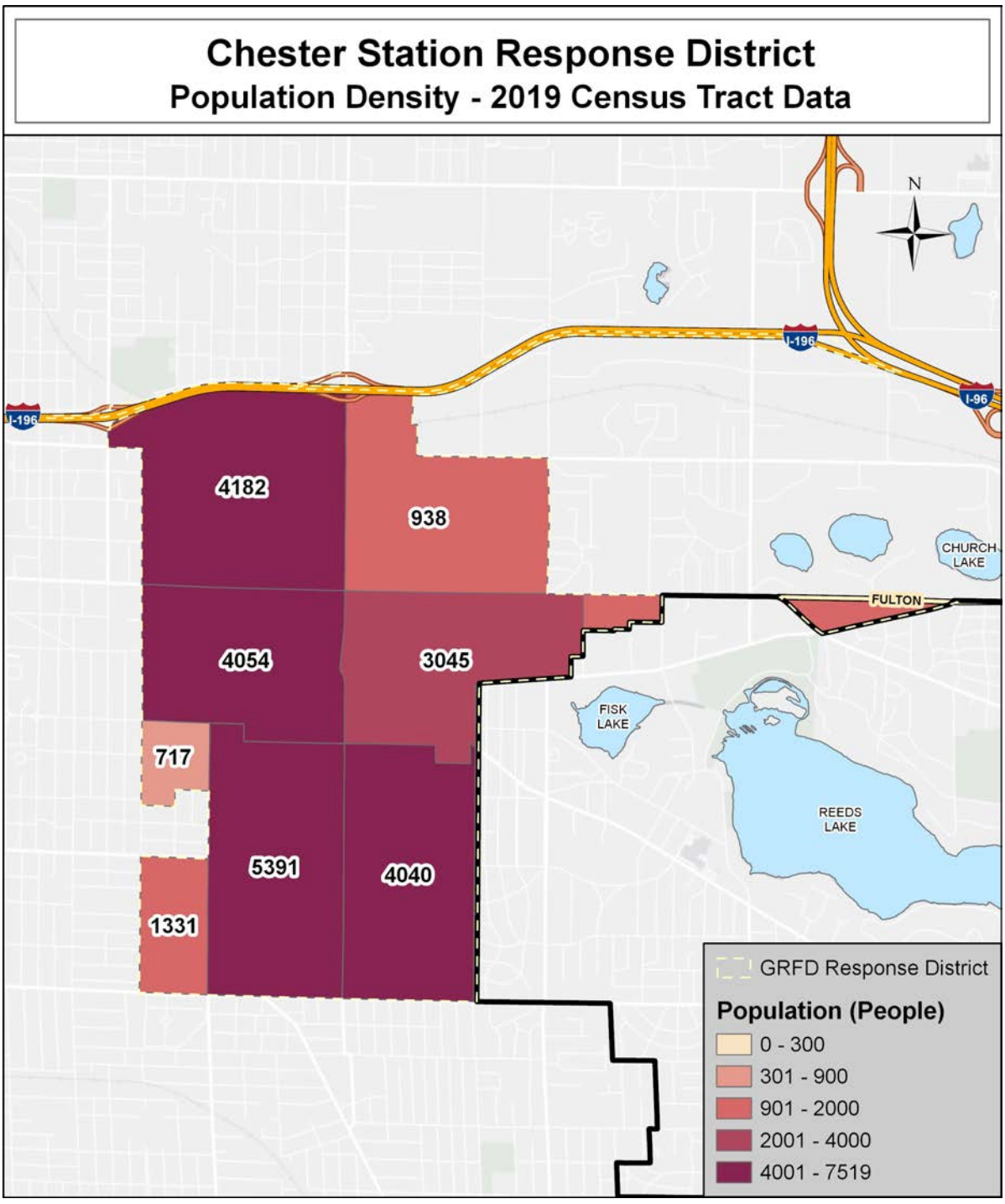
Hydrants.....662



CHESTER RESPONSE DISTRICT - 11

District Characteristics:

Chester Street station, also known as “The Batcave”, resides in a historic preservation district, with numerous architecturally significant homes, and pockets of retail and commercial properties. This district has seen considerable redevelopment of commercial properties over the last fifteen years. Chester station was built in 1902 and is the oldest continuously staffed station in Grand Rapids.
Aquinas University is located on the eastern edge of Chester Street’s district.



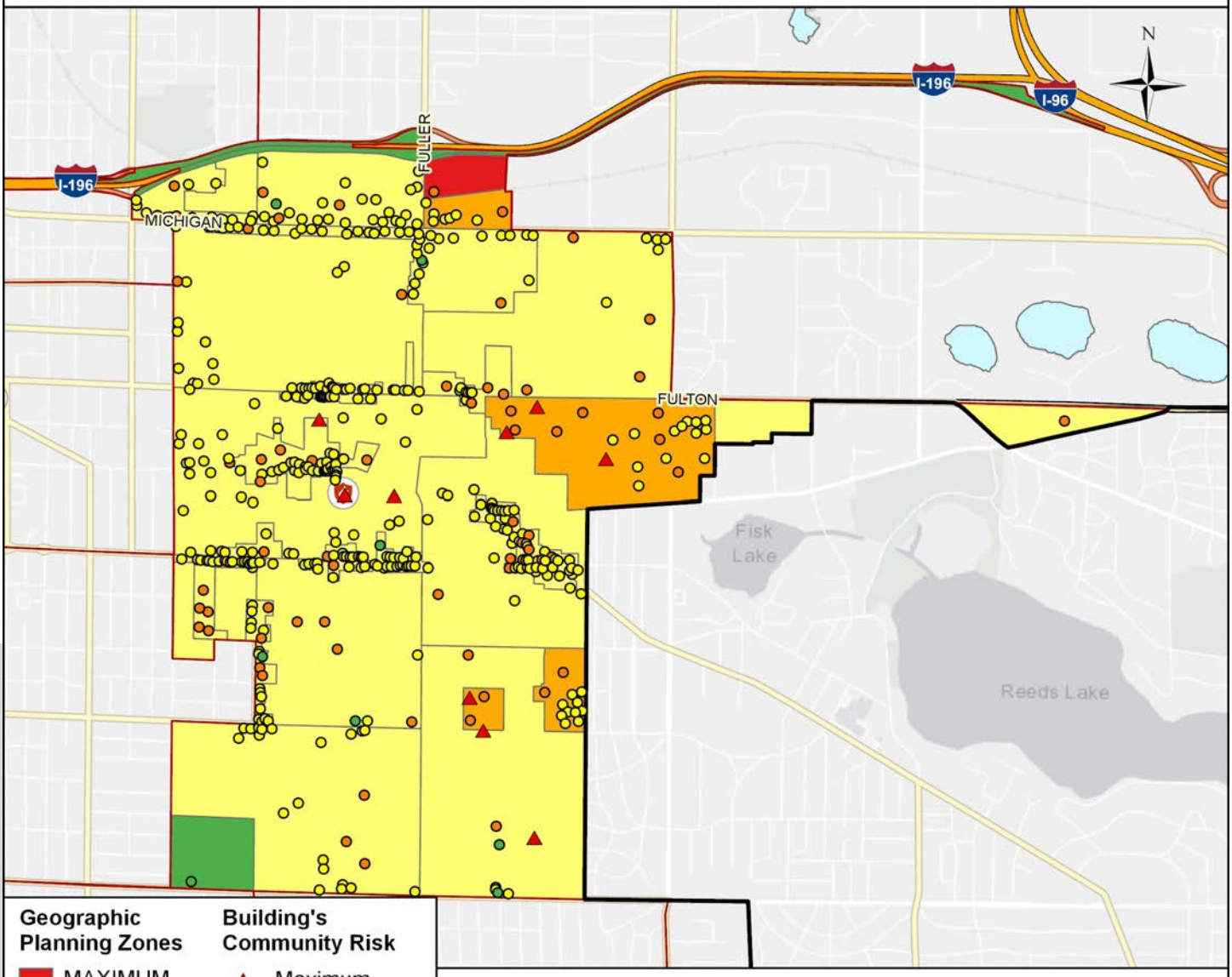
Population/Demographics:

The Chester station response district contains 23,698 residents and comprises 12.28% of the city's population. Population density is 7,821 people per square mile. Chester has the highest density in the city. This analysis is based on data gathered from the 2019 US Census Bureau 5-year estimates. The district is predominately urban, with small pockets of rural designations for parks and commercial/industrial areas.

District	Population	< 5 Years Old	< 18 Years Old	> 65 Years Old	Median Age	White	Black or African American	American Indian or Alaskan Native	Asian	Hispanic
11	23,698	1,164	4,576	1,965	28	14,820	6,395	111	271	1,897
GR Total	192,962	13,489	43,300	23,232	31	129,942	35,575	680	4,519	31,357
% of City	12.28%	8.63%	10.57%	8.46%	92.51%	11.41%	17.98%	16.32%	6.00%	6.05%

Chester Station Response District

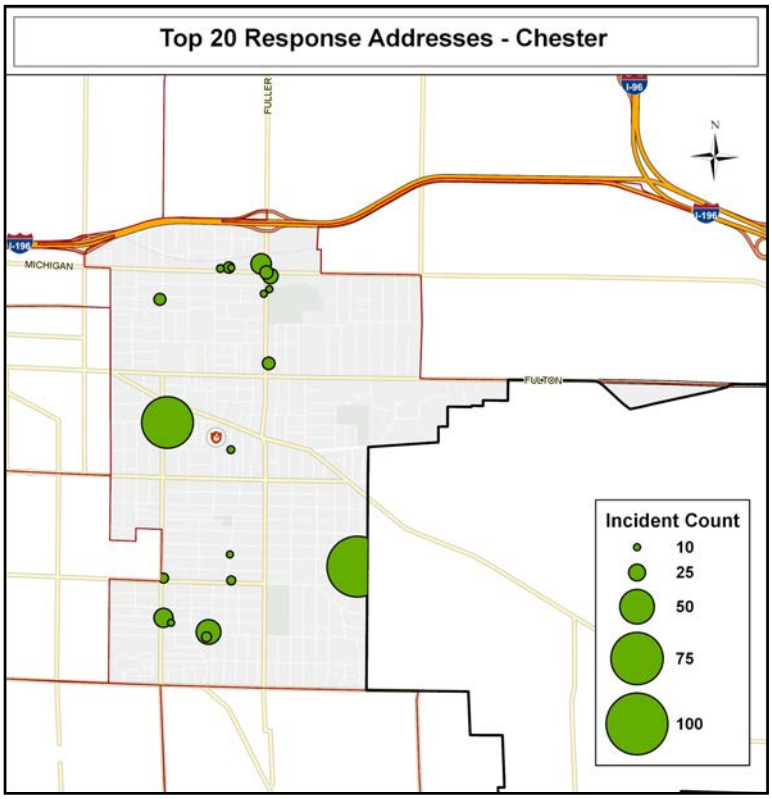
Geographic Planning Zones with Fire Risk Assessment Buildings



Buildings per Community Risk Type				
Low	Moderate	High	Maximum	Total
8	386	72	9	475

CHESTER RESPONSE DISTRICT - 11

District	Residential Occupancies	Industrial Occupancies	Commercial Occupancies	Tax Exempt	Total Square Ft	Taxable Value	Average Building Age (Years)	Needed Fire Flow over 3500 GPM	Sprinklered Buildings
11	7,060	7	443	51	13,780,945	$517,905,750	102.43	82	88
Citywide	55,506	269	3,364	821	124,272,758	4,950,657,315	82.36	1,485	1,180
% of City	12.72%	2.60%	13.17%	6.21%	11.09%	10.46%	124.37%	5.52%	7.46%



Top 20 Response Addresses	Incident Count
1551 FRANKLIN Street SE	87
801 CHERRY Street SE	74
941 ALEXANDER Street SE	36
425 FULLER Avenue NE	30
924 EASTERN Avenue SE	28
1212 MICHIGAN Street NE	23
MICHIGAN Street NE	20
1215 East FULTON Street	19
758 INNES Street NE	18
1037 MICHIGAN Street NE	17
801 FRANKLIN Street SE	15
936 ALEXANDER Street SE	15
1043 FRANKLIN Street SE	14
1003 MICHIGAN Street NE	12
1040 FAIRMOUNT Street SE	12
1041 THOMAS Street SE	11
820 WATKINS Street SE	11
1037 MICHIGAN Street NE	10
300 FULLER Avenue NE	10
321 FULLER Avenue NE	10

Risk Assessment:

Fire: 9.21% of the district's area is classified as a high or maximum risk geographical planning zone. There are 82 occupancies with a needed fire flow over 3,500 GPM and 10.46% of the city's taxable value can be found in the district.

Vehicle accidents: E11 is sent to the majority of crashes on the East Beltline. Crews noted that I-196/I-96 interchange is more likely to have slide offs, East Beltline crashes are more likely to have injuries.

EMS: Clark retirement home is a large complex with a high EMS call volume. The intersection of Michigan and Fuller, mainly near Walgreens, has a high homeless presence and is a busy intersection in general. Fuller Park is a homeless congregating area due to the availability of toilet and shower facilities. Various camps are located along the nearby railroad tracks and in adjacent wooded areas, also in Wilcox Park near Aquinas College. The DaVita Dialysis center is a major call driver for the district.

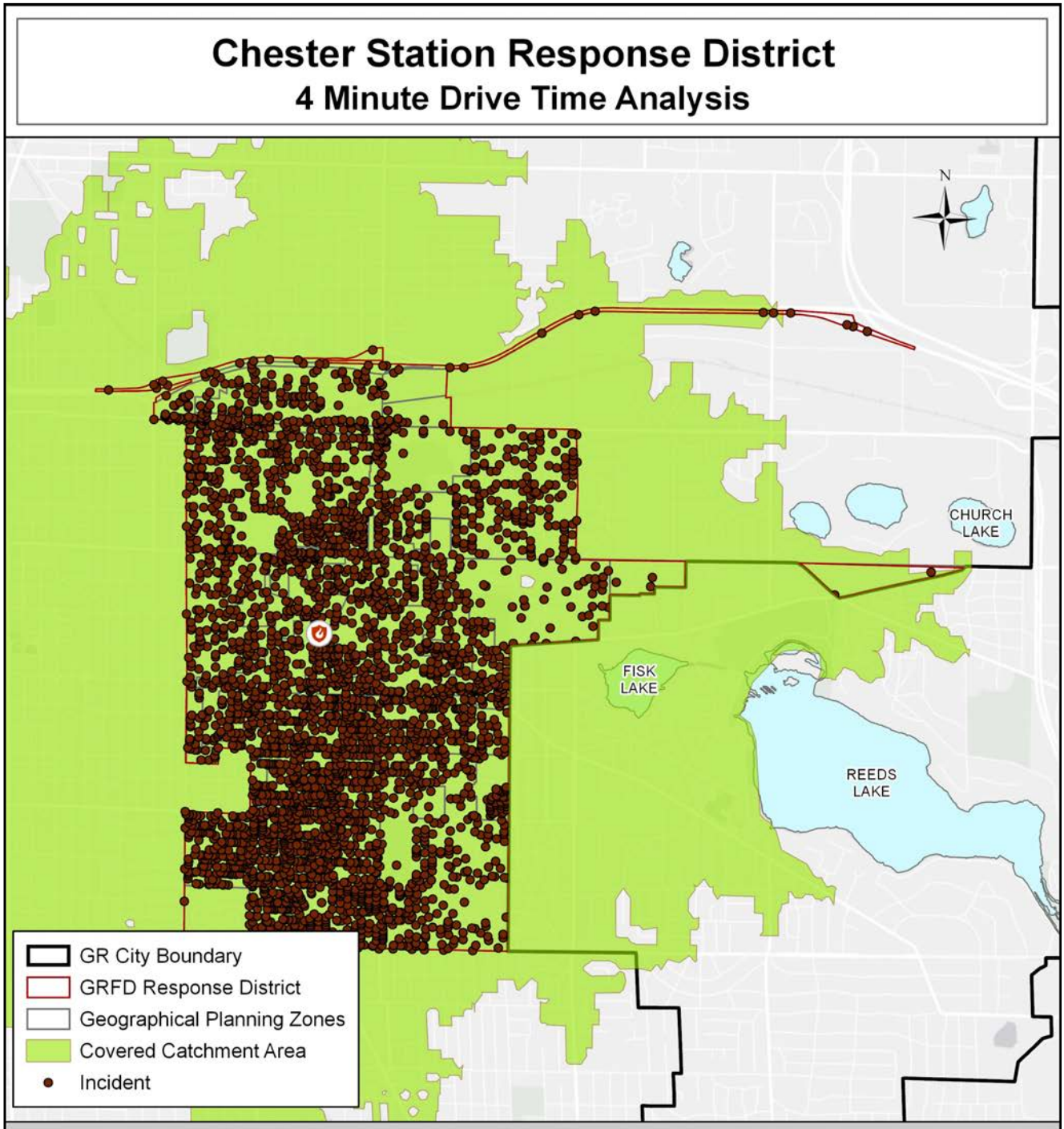
Special Events: Martin Luther King Jr. Park hosts many large events throughout the year.

Maximum Risk Buildings For Chester District

1002 CHESTER ST SE	Chester Street Fire Station
1050 IROQUOIS DR SE	Grand Rapids Christian Elementary School
1100 LAKE DR SE	Trinity United Methodist Church
1331 FRANKLIN ST SE	Grand Rapids Public Schools Administration
1429 WILCOX PARK DR SE	Saint Thomas the Apostle School
1530 E FULTON ST	Children's Healing Center
1607 ROBINSON RD SE	Aquinas College
710 BENJAMIN AVE SE	Campus Elementary School
940 BALDWIN ST SE	Congress Elementary School

Distribution - Four Minute Drive Time Analysis

Assessment of drive times for the Chester catchment area demonstrated compliance rates at 100% for incident data from the last five years. Drive times in this district are impacted by narrow streets, and the station's location, which is not on a major thoroughfare. Analysis of drive times in this section are based on the street speed layer used by CAD (computer-aided dispatch).



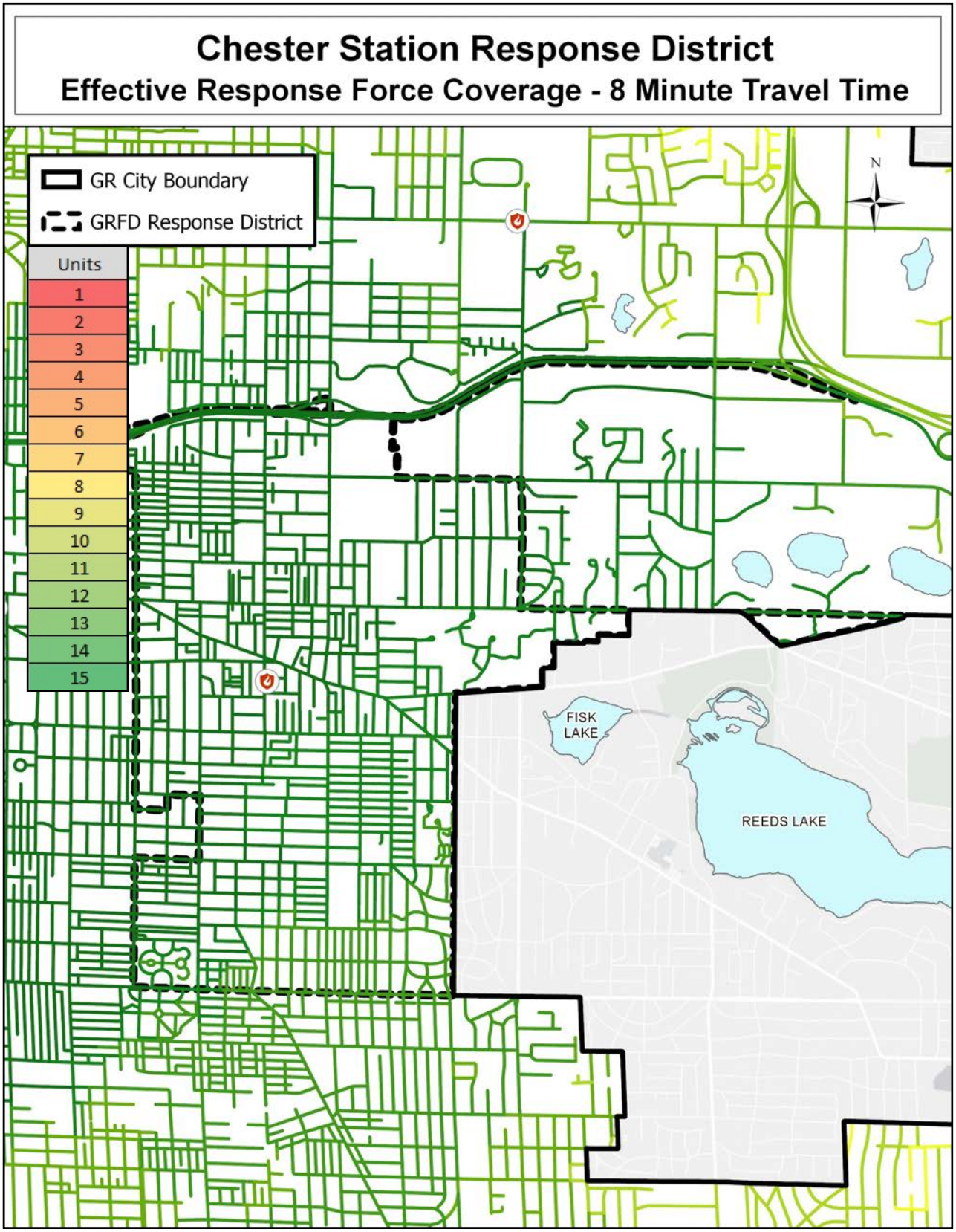
Distribution - Drive Time Analysis

Chester District 11	2016	2017	2018	2019	2020
Incident Count	2,212	2,269	1,999	2,296	2,233
Incidents in Covered Area	2,212	2,269	1,999	2,296	2,233
% Incidents Covered	100.00%	100.00%	100.00%	100.00%	100.00%

CHESTER RESPONSE DISTRICT - 11

Concentration - District Effective Response Force Analysis Map

This map depicts the number of units that can be assembled in the district within the multiple unit benchmark travel time of 8 minutes. As to be expected for a district sharing borders with seven other districts, Chester exhibits very high compliance rates for effective response force requirements. Chester shares borders with four districts that have two frontline apparatus.



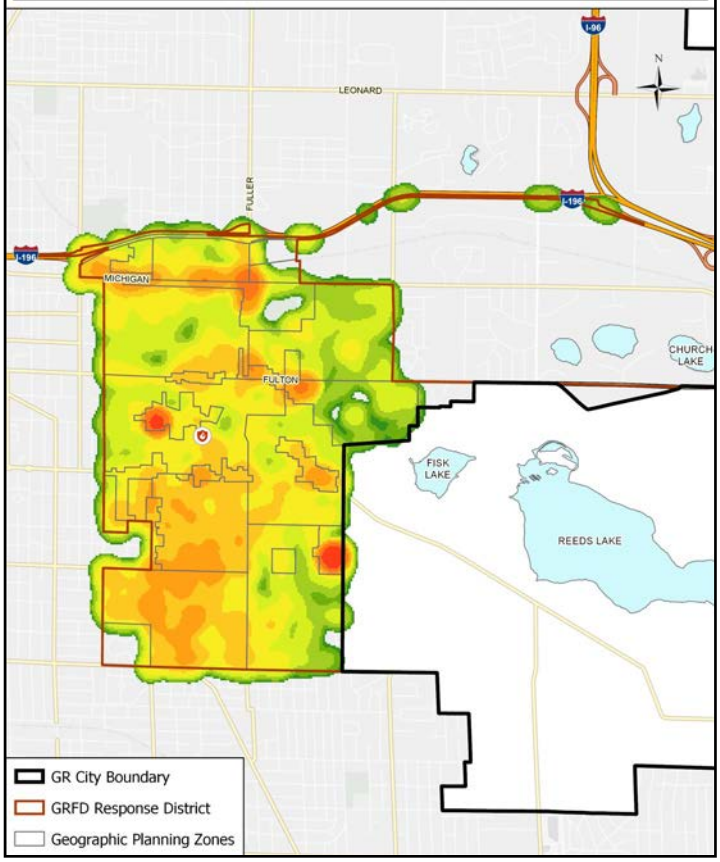
Response Data

Chester district shows consistent incident counts hovering near 2,200 per year. Apparatus responses cluster in that same range. Baseline performance shows fire low incidents at 1:23 over, and fire moderate at 1:23 below the benchmark, which would be concomitant with the concentration analysis. EMS low incidents are at :55 over benchmark and EMS moderate incidents are running 1:51 over.

Chester Station Incidents and % of Citywide

Type	2016	2017	2018	2019	2020
Fire	75	62	67	57	85
	11.72%	10.25%	11.55%	10.56%	13.28%
EMS	1,375	1,343	1,269	1,392	1,432
	9.47%	8.85%	8.83%	9.08%	9.28%
Other	762	864	663	847	716
	9.72%	10.71%	9.05%	10.39%	10.27%
Total	2,212	2,269	1,999	2,296	2,233
	9.61%	9.51%	8.97%	9.56%	9.69%
Fire Loss	$472,597	$1,361,931	$515,701	$1,032,423	$1,129,144
	7.59%	24.23%	10.07%	19.06%	17.83%

Chester Response District Incident Density



Chester Apparatus Responses

Unit	2016	2017	2018	2019	2020
Engine 11	2,379	2,515	2,166	2,268	1,853
Total Responses	2,379	2,515	2,166	2,268	1,853
% of City Responses	7.49%	7.84%	7.08%	6.89%	5.87%
Total Deployed Hours	667:07:52	739:07:09	602:05:04	667:40:43	576:43:39
% of City Deployed Hours	6.99%	7.62%	6.50%	6.45%	5.91%

Chester Apparatus Unit Hour Utilization

Unit	2016	2017	2018	2019	2020
Engine 11	0.14	0.15	0.13	0.14	0.12

CHESTER RESPONSE DISTRICT - 11

Temporal Analysis 2016 - 2020 EMS								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	43	22	25	28	24	39	26	207
01:00-01:59	45	27	21	26	25	21	37	202
02:00-02:59	33	24	24	16	25	24	45	191
03:00-03:59	19	24	18	17	23	18	24	143
04:00-04:59	26	14	25	9	18	21	23	136
05:00-05:59	27	16	14	22	15	22	20	136
06:00-06:59	10	22	36	27	29	21	25	170
07:00-07:59	32	34	36	27	33	35	30	227
08:00-08:59	30	44	39	37	37	32	25	244
09:00-09:59	37	59	51	51	59	47	29	333
10:00-10:59	47	65	57	45	53	57	38	362
11:00-11:59	36	66	54	53	56	47	72	384
12:00-12:59	36	62	51	48	56	63	44	360
13:00-13:59	46	41	53	59	57	46	44	346
14:00-14:59	38	51	60	60	52	55	55	371
15:00-15:59	40	52	67	57	39	67	61	383
16:00-16:59	41	58	66	68	57	61	44	395
17:00-17:59	53	62	60	58	52	55	49	389
18:00-18:59	62	42	46	57	50	43	58	358
19:00-19:59	40	42	37	43	42	52	51	307
20:00-20:59	46	41	47	62	33	33	47	309
21:00-21:59	38	36	45	57	39	57	43	315
22:00-22:59	45	43	40	31	51	28	42	280
23:00-23:59	31	26	42	26	42	44	46	257
Total	901	973	1,014	984	967	988	978	6,805

Temporal Analysis 2016 - 2020 Fire								
Hour	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Total
00:00-00:59	1	2	3	2	1	1	1	11
01:00-01:59	2	1	1	0	1	0	1	6
02:00-02:59	3	0	0	0	1	2	1	7
03:00-03:59	2	2	0	2	0	0	1	7
04:00-04:59	2	1	1	0	1	2	1	8
05:00-05:59	0	1	0	2	0	0	1	4
06:00-06:59	1	0	1	0	1	0	2	5
07:00-07:59	2	1	3	0	0	2	1	9
08:00-08:59	1	2	1	0	2	1	0	7
09:00-09:59	3	0	1	1	1	2	5	13
10:00-10:59	1	2	0	2	3	0	5	13
11:00-11:59	1	4	0	5	2	1	3	16
12:00-12:59	1	2	3	3	2	1	5	17
13:00-13:59	3	0	2	1	3	4	6	19
14:00-14:59	4	1	2	2	3	2	4	18
15:00-15:59	1	5	3	3	5	2	2	21
16:00-16:59	4	4	3	2	2	2	4	21
17:00-17:59	4	4	3	3	4	3	5	26
18:00-18:59	6	6	2	4	2	5	6	31
19:00-19:59	1	3	4	2	2	2	6	20
20:00-20:59	2	2	3	1	4	6	3	21
21:00-21:59	2	3	0	1	4	0	3	13
22:00-22:59	3	3	5	2	4	0	3	20
23:00-23:59	0	3	3	2	2	1	2	13
Total	50	52	44	40	50	39	71	346

Chester Reliability & Simultaneous Performance					
Type	2016	2017	2018	2019	2020
Reliability %	84.02%	73.76%	72.64%	71.56%	65.89%
Citywide Reliability %	88.38%	82.95%	83.37%	81.03%	82.66%
Simultaneous Incident Count	199	263	174	274	182
Simultaneous Incident %	9.00%	11.59%	8.61%	11.80%	8.10%

Chester Response District 90th Percentile Baseline Performance						
Category	Alarm Handling	Turnout	Travel Distribution	Travel Concentration	Total Response Time Distribution	Total Response Time Concentration
Fire						
Low	1:59	1:48	5:42	5:27	8:23	8:23
Moderate	1:30	1:54	3:57	7:17	6:01	9:37
EMS						
Low	3:03	1:42	5:00	5:00	8:25	8:25
Moderate	3:07	1:55	6:07	7:19	9:49	11:21

Section E - Evaluation of Current Deployment and Performance

Benchmark / Baseline Performance Overview

Performance Statements - Fire

Performance Statements - EMS

Performance Statements - Hazardous Materials

Performance Statements - Technical Rescue

External Agency Comparability

Benchmark / Baseline Performance Overview

The Grand Rapids Fire Department has established benchmark performance objectives and baseline measurements for four major categories of emergency responses including fires, emergency medical services, hazardous materials and technical rescue incidents. These objectives and measures are also tailored by risk level classification for low, moderate, high and maximum risks, including the amount of personnel required (effective response force) to perform the required critical tasking that aligns with both the needs of the incident and departmental policies and standard operating guidelines. Given the relatively even dispersal of the population and the associated density, the GRFD has selected one response time benchmark for the entire city, aligning with the urban time parameters established by the Center for Public Safety Excellence.

In simple terms, the benchmark is the desired level of performance and the baseline is the current level of performance. Rather than using averages for response times, these goals are measured against 90% fractals, aligning with best practices in the fire industry for both the Center for Public Safety Excellence and National Fire Protection Association standards. This measurement style affords a much more accurate view of performance.

The benchmark statements and baseline charts all reflect current departmental practices. It should be noted that as a result of adhering to the comprehensive accreditation process, three main opportunities for improvements in total response time were identified.

- First was to capture all pieces of the alarm handling process to more accurately represent departmental performance. One portion of the alarm handling time (ring time to incident creation) is not available within the computer-aided dispatch (CAD) records management system. This is a top priority for the fire department and communications center to correct, which will result in adjustments to future benchmark/ statements and baseline charts in the alarm handling area.
- The second area of focus is the ability to match risk levels with initial assignments based on CAD alarm types in relation to identified risks. Four clearly defined levels (low, moderate, high, maximum) are utilized and are incorporated into the alarm processing protocols. The department is working with the communications center to assign a risk level to the initial assignment recommendations based on modifying circumstances (what the caller reports) and predetermined risks.
- The third area of improvement involves the location of resources in the Kalamazoo response district. The department identified a performance gap related to travel time in the southern section of this district and has been actively working to provide equitable service delivery in that area.

Historic data presented in the baseline charts represents actual incident data from 2016-2020. Automatic aid units help to satisfy effective response force requirements and assist with meeting benchmarks on the edge of Kentwood, Plainfield and Walker. Baseline data is only available for certain risk levels for each of the four incident types, due to some risk levels not happening frequently enough to produce valid data. These are clearly noted above each table.

Performance Statements - Fire

Benchmark Statements

For **all fire incidents** (low, moderate, high and maximum risk), the 90th percentile of total response time for the arrival of the first due unit, staffed with a minimum of three firefighters, shall be 7 minutes. The first due unit shall be capable of establishing command, sizing up the incident, utilize appropriate tactics in accordance with departmental standard operating guidelines, develop an initial action plan, extend an appropriate hose line and begin initial fire attack or rescue.

For **moderate risk fires**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 19 personnel, shall be 11 minutes. The effective response force shall have the capability to establish command, provide an uninterrupted water supply, advance an attack line and backup line for fire control, establish a rapid intervention crew, complete forcible entry and ventilation, conduct primary and secondary searches, control utilities and perform salvage and overhaul operations. These critical tasks shall be done in a safe manner in accordance with department standard operating guidelines.

For **high risk fires**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 26 personnel, shall be 13 minutes. The effective response force shall have the capability to establish command, provide an uninterrupted water supply, advance an attack line and backup line for fire control, place elevated streams into service, establish a rapid intervention crew, complete forcible entry and ventilation, conduct primary and secondary searches, control utilities and perform salvage and overhaul operations. These critical tasks shall be done in a safe manner in accordance with department standard operating guidelines.

For **maximum risk fires**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 35 personnel, shall be 15 minutes. The effective response force shall have the capability to establish command, provide an uninterrupted water supply, advance multiple attack lines and backup lines for fire control, place elevated streams into service, establish a rapid intervention crew, complete multiple forcible entry and ventilation procedures, conduct primary and secondary searches, control utilities, perform occupant evacuation and perform salvage and overhaul operations. These critical tasks shall be done in a safe manner in accordance with department standard operating guidelines.

Performance Statements - Fire

Baseline Statements

For **all fires** (low, moderate, high and maximum risk), the 90th percentile of total response time for the arrival of the first due unit, staffed with a minimum of three firefighters, was 8 minutes and 25 seconds. The first due unit is capable of establishing command, sizing up the incident, utilizing appropriate tactics in accordance with departmental standard operating guidelines, developing an initial action plan, extending an appropriate hose line and beginning initial fire attack or rescue.

(Low Risk) Fire Suppression - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:02:14	0:02:06	0:02:11	0:02:06	0:02:28	0:02:30
			1,813	398	342	356	371	346
Turnout Time (01:30)	Turnout Time All Units	Urban	0:01:53	0:02:10	0:01:52	0:01:41	0:01:36	0:01:55
			4,100	794	885	709	619	1,093
Travel Time (4:00)	Travel Time 1st Unit Distribution	Urban	0:05:21	0:05:14	0:05:28	0:05:10	0:05:13	0:05:29
			1,645	349	308	332	339	317
	Travel Time ERF Concentration	Urban	0:05:21	0:05:14	0:05:28	0:05:10	0:05:13	0:05:31
			1,645	349	308	332	339	317
Total Response Time (07:00 and 7:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:08:25	0:08:39	0:08:28	0:08:05	0:08:06	0:08:28
			1,645	349	308	332	339	317
	Total Response Time ERF Concentration	Urban	0:08:25	0:08:39	0:08:28	0:08:04	0:08:06	0:08:28
			1,645	349	308	332	339	317

For **moderate risk fires**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 19 personnel, was 12 minutes and 9 seconds. The effective response force has the capability to establish command, provide an uninterrupted water supply, advance an attack line and backup line for fire control, establish a rapid intervention crew, complete forcible entry and ventilation, conduct primary and secondary searches, control utilities and perform salvage and overhaul operations. These critical tasks are done in a safe manner in accordance with department standard operating guidelines.

(Moderate Risk) Fire Suppression - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:01:46	0:01:38	0:01:40	0:01:50	0:01:45	0:02:08
			1,274	267	253	270	217	267
Turnout Time (01:30)	Turnout Time All Units	Urban	0:01:55	0:02:03	0:01:57	0:01:47	0:01:46	0:01:57
			8,560	1,893	1,760	1,717	1,365	1,825
Travel Time (3:45 and 8:00)	Travel Time 1st Unit Distribution	Urban	0:04:19	0:03:58	0:04:17	0:04:14	0:04:31	0:04:35
			1,263	266	250	267	216	264
	Travel Time ERF Concentration	Urban	0:09:20	0:07:48	0:08:52	0:09:50	0:09:35	0:09:15
			515	113	99	122	78	103
Total Response Time (06:45 and 11:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:06:54	0:06:30	0:06:55	0:06:52	0:06:40	0:07:21
			1,263	266	250	267	216	264
	Total Response Time ERF Concentration	Urban	0:12:09	0:10:31	0:11:43	0:12:42	0:11:46	0:12:59
			515	113	99	122	78	103

Performance Statements - Fire

For **high risk fires**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 26 personnel, was 13 minutes and 36 seconds. The effective response force has the capability to establish command, provide an uninterrupted water supply, advance an attack line and backup line for fire control, place elevated streams into service, establish a rapid intervention crew, complete forcible entry and ventilation, conduct primary and secondary searches, control utilities and perform salvage and overhaul operations. These critical tasks are done in a safe manner in accordance with department standard operating guidelines.

(High Risk) Fire Suppression - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:02:02	0:01:51	0:01:40	0:02:34	0:01:56	0:02:19
			278	25	17	20	107	109
Turnout Time (01:30)	Turnout Time All Units	Urban	0:01:58	0:02:18	0:02:13	0:02:00	0:01:48	0:01:56
			2,177	238	149	158	800	832
Travel Time (4:00 and 10:00)	Travel Time 1st Unit Distribution	Urban	0:03:56	0:03:21	0:04:47	0:04:22	0:04:33	0:03:50
			275	25	17	20	105	108
	Travel Time ERF Concentration	Urban	0:09:09	0:07:43	0:06:49	0:09:04	0:08:41	0:11:21
			90	13	6	8	27	36
Total Response Time (07:00 and 13:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:07:06	0:06:11	0:07:01	0:07:15	0:07:42	0:06:50
			275	25	17	20	105	108
	Total Response Time ERF Concentration	Urban	0:13:36	0:11:06	0:08:52	0:12:06	0:12:41	0:16:25
			90	13	6	8	27	36

For **maximum risk fires**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 35 personnel, was not statistically relevant due to the fact that only four incidents occurred where the ERF was assembled. The effective response force has the capability to establish command, provide an uninterrupted water supply, advance multiple attack lines and backup lines for fire control, place elevated streams into service, establish a rapid intervention crew, complete multiple forcible entry and ventilation procedures, conduct primary and secondary searches, control utilities, perform occupant evacuation and perform salvage and overhaul operations. These critical tasks are done in a safe manner in accordance with department standard operating guidelines.

(Maximum Risk) Fire Suppression - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:01:43	0:02:43	0:01:26	0:01:40	0:01:38	0:01:19
			25	8	3	2	7	5
Turnout Time (01:30)	Turnout Time All Units	Urban	0:02:00	0:02:09	0:01:42	0:01:44	0:01:56	0:01:47
			238	83	28	10	72	45
Travel Time (4:00 and 12:00)	Travel Time 1st Unit Distribution	Urban	0:03:49	0:04:05	0:02:40	0:03:52	0:03:29	0:02:56
			24	8	3	1	7	5
	Travel Time ERF Concentration	Urban	0:10:34	0:09:21	N/A	N/A	0:03:33	0:11:06
			4	1	0	0	2	1
Total Response Time (07:00 and 15:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:06:21	0:08:36	0:05:30	0:06:38	0:05:40	0:05:11
			24	8	3	1	7	5
	Total Response Time ERF Concentration	Urban	0:28:14	0:31:41	N/A	N/A	0:19:58	0:17:19
			4	1	0	0	2	1

Performance Statements - Emergency Medical Services (EMS)

Benchmark Statements

For all **emergency medical services incidents** (low, moderate, high and maximum risk), the 90th percentile of total response time for the arrival of the first due unit, staffed with a minimum of three firefighters, shall be 7 minutes and 30 seconds. The first due unit shall be capable of establishing command, sizing up the incident, conducting an initial patient assessment, obtaining vitals and patient medical history, initiating mitigation efforts in accordance with departmental standard operating guidelines and administering patient care until transferred to an advanced life support agency.

For **moderate risk EMS incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 6 personnel, shall be 9 minutes and 30 seconds. The units shall be capable of establishing command, sizing up the incident, conducting as initial patient assessment, obtaining vitals and patient medical history, initiating mitigation efforts in accordance with departmental standard operating guidelines and administering patient care until transferred to an advanced life support agency.

For **high risk EMS incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 11 personnel, shall be 11 minutes and 30 seconds. The units shall be capable of establishing command, sizing up the incident, conducting initial patient assessments for multiple patients, obtaining vitals and patient medical history, initiating mitigation efforts in accordance with departmental standard operating guidelines and administering patient care until transferred to an advanced life support agency.

For **maximum risk EMS incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 19 personnel, shall be 11 minutes and 30 seconds. The units shall be capable of establishing command, sizing up the incident, conducting initial patient assessments for multiple patients, obtaining vitals and patient medical history, initiating mitigation efforts in accordance with departmental standard operating guidelines and administering patient care until transferred to the advanced life support agency.

Performance Statements - Emergency Medical Services (EMS)

Baseline Statements

For all **emergency medical services incidents** (low, moderate, high and maximum risk), the 90th percentile of total response time for the arrival of the first due unit, staffed with a minimum of three firefighters, was 8 minutes and 39 seconds. The first due unit is capable of establishing command, sizing up the incident, conducting an initial patient assessment, obtaining vitals and patient medical history, initiating mitigation efforts in accordance with departmental standard operating guidelines and administering patient care until transferred to an advanced life support agency.

(Low Risk) EMS - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (2:00)	Pick-up to Dispatch	Urban	0:03:16	0:03:31	0:03:20	0:03:14	0:03:08	0:03:05
			86,672	17,353	17,278	16,786	18,042	17,213
Turnout Time (01:30)	Turnout Time All Units	Urban	0:01:42	0:01:56	0:01:44	0:01:34	0:01:31	0:01:38
			83,823	17,119	16,887	16,091	17,344	16,382
Travel Time (4:00)	Travel Time 1st Unit Distribution	Urban	0:05:02	0:05:04	0:05:06	0:05:02	0:04:57	0:05:01
			77,841	15,746	15,615	15,067	16,116	15,297
	Travel Time ERF Concentration	Urban	0:05:02	0:05:04	0:05:06	0:05:02	0:04:57	0:05:01
			77,822	15,746	15,609	15,062	16,111	15,294
Total Response Time (07:30 and 7:30)	Total Response Time 1st Unit on Scene Distribution	Urban	0:08:39	0:09:03	0:08:45	0:08:30	0:08:21	0:08:31
			77,841	15,746	15,615	15,067	16,116	15,297
	Total Response Time ERF Concentration	Urban	0:08:39	0:09:03	0:08:45	0:08:30	0:08:21	0:08:31
			77,822	15,746	15,609	15,062	16,111	15,294

For **moderate risk EMS incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 6 personnel, was 11 minutes and 43 seconds. The units are capable of establishing command, sizing up the incident, conducting as initial patient assessment, obtaining vitals and patient medical history, initiating mitigation efforts in accordance with departmental standard operating guidelines and administering patient care until transferred to an advanced life support agency.

(Moderate Risk) EMS - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (2:00)	Pick-up to Dispatch	Urban	0:03:02	0:03:04	0:03:13	0:02:52	0:02:49	0:03:14
			4115	809	1001	828	787	690
Turnout Time (01:30)	Turnout Time All Units	Urban	0:01:56	0:02:18	0:01:56	0:01:44	0:01:42	0:01:49
			8014	1956	1880	1515	1442	1221
Travel Time (4:00 and 6:00)	Travel Time 1st Unit Distribution	Urban	0:06:18	0:06:04	0:06:32	0:06:08	0:06:27	0:06:14
			3661	770	913	731	657	590
	Travel Time ERF Concentration	Urban	0:08:16	0:08:01	0:08:33	0:08:09	0:08:36	0:08:03
			2627	571	585	566	474	431
Total Response Time (07:30 and 9:30)	Total Response Time 1st Unit on Scene Distribution	Urban	0:09:49	0:09:43	0:10:07	0:09:35	0:09:41	0:09:51
			3661	770	913	731	657	590
	Total Response Time ERF Concentration	Urban	0:11:43	0:11:41	0:12:12	0:11:31	0:11:34	0:11:17
			2627	571	585	566	474	431

Performance Statements - Emergency Medical Services (EMS)

For **high risk EMS incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 11 personnel, was not statistically relevant due to the fact that only nine incidents occurred where the ERF was assembled. The units are capable of establishing command, sizing up the incident, conducting initial patient assessments for multiple patients, obtaining vitals and patient medical history, initiating mitigation efforts in accordance with departmental standard operating guidelines and administering patient care until transferred to an advanced life support agency.

(High Risk) EMS - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (2:00)	Pick-up to Dispatch	Urban	0:03:01	0:02:22	0:03:16	0:03:04	0:02:43	0:03:01
			128	24	30	17	31	26
Turnout Time (01:30)	Turnout Time All Units	Urban	0:02:02	0:02:29	0:03:28	0:01:43	0:01:47	0:01:52
			345	78	74	42	86	65
Travel Time (4:00 and 8:00)	Travel Time 1st Unit Distribution	Urban	0:06:38	0:06:19	0:06:54	0:05:42	0:06:17	0:06:17
			112	22	28	15	23	24
	Travel Time ERF Concentration	Urban	0:09:38	N/A	0:09:46	0:03:22	0:08:26	0:07:50
			9	0	1	1	5	2
Total Response Time (07:30 and 11:30)	Total Response Time 1st Unit on Scene Distribution	Urban	0:10:15	0:09:58	0:09:30	0:11:39	0:10:11	0:08:52
			112	22	28	15	23	24
	Total Response Time ERF Concentration	Urban	0:26:11	N/A	0:26:31	0:26:07	0:13:14	0:10:24
			9	0	1	1	5	2

For **maximum risk EMS incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 19 personnel, was not statistically relevant due to the fact that no incidents occurred where the ERF was assembled. The units are capable of establishing command, sizing up the incident, conducting initial patient assessments for multiple patients, obtaining vitals and patient medical history, initiating mitigation efforts in accordance with departmental standard operating guidelines and administering patient care until transferred to the advanced life support agency.

(Maximum Risk) EMS - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (2:00)	Pick-up to Dispatch	Urban	0:06:48	N/A	0:02:15	N/A	0:07:53	N/A
			3	0	2	0	1	0
Turnout Time (01:30)	Turnout Time All Units	Urban	0:02:18	N/A	0:02:39	N/A	0:01:22	N/A
			12	0	7	0	5	0
Travel Time (4:00 and 8:00)	Travel Time 1st Unit Distribution	Urban	0:04:19	N/A	0:04:30	N/A	0:01:43	N/A
			3	0	2	0	1	0
	Travel Time ERF Concentration	Urban	0:09:38	N/A	0:09:46	0:03:22	0:08:26	0:07:50
			9	0	1	1	5	2
Total Response Time (07:30 and 11:30)	Total Response Time 1st Unit on Scene Distribution	Urban	0:10:14	N/A	0:07:47	N/A	0:10:48	N/A
			3	0	2	0	1	0
	Total Response Time ERF Concentration	Urban	N/A	N/A	N/A	N/A	N/A	N/A
			0	0	0	0	0	0

Performance Statements - Hazardous Materials

Benchmark Statements

For all **hazardous materials incidents** (low, moderate, high and maximum risk), the 90th percentile of total response time for the arrival of the first due unit, staffed with a minimum of three firefighters, shall be 7 minutes. The first due unit shall be capable of establishing command, sizing up the incident, developing an incident action plan in accordance with departmental standard operating guidelines, isolating the hazard, and calling for appropriate assistance from both the GRFD and outside agencies if needed.

For **moderate risk hazardous materials incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 7 personnel, including a minimum of 1 hazardous materials technician, shall be 12 minutes. The units will be capable of establishing command, sizing up the incident, developing an incident action plan in accordance with departmental standard operating guidelines , isolating the hazard, initiating mitigation efforts - including containment and/or offloading of common hydrocarbon materials, and calling for appropriate assistance from both the GRFD and outside agencies if needed.

For **high risk hazardous materials incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 13 personnel, including a minimum of 5 hazardous materials technicians, shall be 12 minutes. The units will be capable of establishing command, sizing up the incident, developing an incident action plan in accordance with departmental standard operating guidelines, researching the hazard, isolating the hazard, initiating mitigation efforts, establishing decontamination actions, and acting as a liaison with other agencies and private sector businesses or residents involved.

For **maximum risk hazardous materials incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 3 personnel, comprised of 2 hazardous materials technicians and a battalion chief, shall be 12 minutes. The units will be capable of establishing command, sizing up the incident, developing an incident action plan in accordance with departmental standard operating guidelines, researching the hazard -including initial monitoring, and calling for appropriate assistance from both the GRFD and outside agencies if needed. Note that this type of response is generally for initial information gathering, with any working event likely triggering a high risk hazardous materials incident effective response force and a moderate or high structural fire response.

Performance Statements - Hazardous Materials

Baseline Statements

For all **hazardous materials incidents** (low, moderate, high and maximum risk), the 90th percentile of total response time for the arrival of the first due unit, staffed with a minimum of three firefighters, was 8 minutes and 49 seconds. The first due unit is capable of establishing command, sizing up the incident, developing an incident action plan in accordance with departmental standard operating guidelines, isolating the hazard, and calling for appropriate assistance from both the GRFD and outside agencies if needed.

(Low Risk) HazMat - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:03:47	0:03:42	0:03:55	0:03:19	0:02:40	0:04:11
			82	28	30	2	6	16
Turnout Time (01:30)	Turnout Time All Units	Urban	0:02:20	0:02:21	0:02:17	0:00:43	0:02:43	0:01:34
			86	26	19	1	21	19
Travel Time (4:00)	Travel Time 1st Unit Distribution	Urban	0:05:31	0:05:31	0:04:43	0:04:32	0:05:39	0:05:12
			44	14	15	1	5	9
	Travel Time ERF Concentration	Urban	0:05:33	0:05:31	0:04:43	0:04:32	0:05:39	0:05:25
			43	14	15	1	5	8
Total Response Time (07:00 and 7:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:08:49	0:09:39	0:08:44	0:08:45	0:07:15	0:08:01
			44	14	15	1	5	9
	Total Response Time ERF Concentration	Urban	0:08:49	0:09:39	0:08:44	0:08:45	0:07:15	0:08:08
			43	14	15	1	5	8

For **moderate risk hazardous materials incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 7 personnel, including a minimum of 1 hazardous materials technician, was not statistically relevant due to the fact that only nine incidents occurred where the ERF was assembled. The units are capable of establishing command, sizing up the incident, developing an incident action plan in accordance with departmental standard operating guidelines, isolating the hazard, initiating mitigation efforts - including containment and/or offloading of common hydrocarbon materials, and calling for appropriate assistance from both the GRFD and outside agencies if needed.

(Moderate Risk) HazMat - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:03:58	0:03:00	0:01:47	0:00:16	0:01:47	0:04:15
			13	4	1	1	3	4
Turnout Time (01:30)	Turnout Time All Units	Urban	0:02:49	0:02:54	0:01:16	0:04:20	0:02:52	0:01:47
			44	18	4	3	10	9
Travel Time (4:00 and 9:00)	Travel Time 1st Unit Distribution	Urban	0:05:12	0:04:06	0:03:59	0:03:43	0:05:25	0:03:15
			11	4	1	1	3	2
	Travel Time ERF Concentration	Urban	0:08:00	0:05:36		0:06:47	0:07:16	0:08:54
			9	4	0	1	2	2
Total Response Time (07:00 and 12:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:09:07	0:08:38	0:06:47	0:05:11	0:08:40	0:08:46
			11	4	1	1	3	2
	Total Response Time ERF Concentration	Urban	0:13:02	0:11:23	N/A	0:08:01	0:10:05	0:14:34
			9	4	0	1	2	2

Performance Statements - Hazardous Materials

For **high risk hazardous materials incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 13 personnel, including a minimum of 5 hazardous materials technicians, was not statistically relevant due to the fact that only three incidents occurred where the ERF was assembled. The units are capable of establishing command, sizing up the incident, developing an incident action plan in accordance with departmental standard operating guidelines, researching the hazard, isolating the hazard, initiating mitigation efforts, establishing decontamination actions, and acting as a liaison with other agencies and private sector businesses or residents involved.

(High Risk) HazMat - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:03:53	0:03:02	N/A	N/A	0:04:09	0:03:04
			5	2	0	0	2	1
Turnout Time (01:30)	Turnout Time All Units	Urban	0:02:10	0:02:19	N/A	N/A	0:01:37	0:02:25
			33	10	0	0	8	15
Travel Time (4:00 and 9:00)	Travel Time 1st Unit Distribution	Urban	0:07:24	0:04:36	N/A	N/A	0:07:59	0:02:22
			4	1	0	0	2	1
	Travel Time ERF Concentration	Urban	0:11:03	0:10:38	N/A	N/A	0:11:10	0:02:38
			3	1	0	0	1	1
Total Response Time (07:00 and 12:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:11:47	0:06:40	N/A	N/A	0:13:05	0:05:35
			4	1	0	0	2	1
	Total Response Time ERF Concentration	Urban	0:16:15	0:14:17	N/A	N/A	0:16:45	0:06:55
			3	1	0	0	1	1

For **maximum risk hazardous materials incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 3 personnel, comprised of 2 hazardous materials technicians and a battalion chief, was not statistically relevant due to the fact that no incidents occurred where the ERF was assembled. The units are capable of establishing command, sizing up the incident, developing an incident action plan in accordance with departmental standard operating guidelines, researching the hazard -including initial monitoring, and calling for appropriate assistance from both the GRFD and outside agencies if needed.

(Maximum Risk) HazMat - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:02:49	0:02:49	N/A	N/A	N/A	N/A
			1	1	0	0	0	0
Turnout Time (01:30)	Turnout Time All Units	Urban	0:01:57	0:01:57	N/A	N/A	N/A	N/A
			9	9	0	0	0	0
Travel Time (4:00 and 9:00)	Travel Time 1st Unit Distribution	Urban	0:04:08	0:04:08	N/A	N/A	N/A	N/A
			1	1	0	0	0	0
	Travel Time ERF Concentration	Urban	N/A	N/A	N/A	N/A	N/A	N/A
			0	0	0	0	0	0
Total Response Time (07:00 and 12:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:07:34	0:07:34	N/A	N/A	N/A	N/A
			1	1	0	0	0	0
	Total Response Time ERF Concentration	Urban	N/A	N/A	N/A	N/A	N/A	N/A
			0	0	0	0	0	0

Performance Statements - Technical Rescue

Benchmark Statement - All

For all **technical rescue incidents**, the 90th percentile of total response time for the arrival of the first due unit, staffed with a minimum of three firefighters, shall be 7 minutes. The first due unit shall be capable of establishing command, sizing up the incident, developing an incident action plan in accordance with departmental standard operating guidelines, denying access to bystanders, and calling for appropriate assistance from both the GRFD and outside agencies if needed.

Baseline Statement - All

For all **technical rescue incidents**, the 90th percentile of total response time for the arrival of the first due unit, staffed with a minimum of three firefighters, is displayed in the table accompanying each rescue type. The first due unit is capable of establishing command, sizing up the incident, developing an incident action plan in accordance with departmental standard operating guidelines, denying access to bystanders, and calling for appropriate assistance from both the GRFD and outside agencies if needed.

Benchmark Statement - Trench

For **trench rescue incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 8 technician level responders, shall be 12 minutes total response time. The units will be capable of establishing command, performing an assessment of the incident, and initiating mitigation activities such as isolating the hazard, and denying access to bystanders.

Baseline Statement - Trench

For **trench rescue incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 8 technician level responders, was not statistically relevant due to the fact that only one incident occurred where the ERF was assembled. The units are capable of establishing command, performing an assessment of the incident, and initiating mitigation activities such as isolating the hazard, and denying access to bystanders.

Trench Rescue - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:01:56	0:01:56	N/A	N/A	N/A	N/A
			1	1	0	0	0	0
Turnout Time (01:30)	Turnout Time All Units	Urban	0:01:58	0:01:58	N/A	N/A	N/A	N/A
			9	9	0	0	0	0
Travel Time (4:00 and 9:00)	Travel Time 1st Unit Distribution	Urban	0:03:07	0:03:07	N/A	N/A	N/A	N/A
			1	1	0	0	0	0
	Travel Time ERF Concentration	Urban	0:04:47	0:04:47	N/A	N/A	N/A	N/A
			1	1	0	0	0	0
Total Response Time (07:00 and 12:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:06:13	0:06:13	N/A	N/A	N/A	N/A
			1	1	0	0	0	0
	Total Response Time ERF Concentration	Urban	0:07:30	0:07:30	N/A	N/A	N/A	N/A
			1	1	0	0	0	0

Performance Statements - Technical Rescue

Benchmark Statement - Collapse

For **collapse rescue incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 8 technician level responders, shall be 12 minutes total response time. The units will be capable of establishing command, performing an assessment of the incident, and initiating mitigation activities such as isolating the hazard, stabilizing the structure and denying access to bystanders.

Collapse Rescue - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:03:17	0:01:30	0:04:44	N/A	N/A	0:01:51
			6	4	1	0	0	1
Turnout Time (01:30)	Turnout Time All Units	Urban	0:02:45	0:01:54	0:00:19	N/A	N/A	0:07:11
			53	38	5	0	0	10
Travel Time (4:00 and 9:00)	Travel Time 1st Unit Distribution	Urban	0:08:03	0:08:56	0:04:32	N/A	N/A	0:03:17
			5	3	1	0	0	1
	Travel Time ERF Concentration	Urban	0:07:33	0:04:13	N/A	N/A	N/A	0:07:56
			2	1	0	0	0	1
Total Response Time (07:00 and 12:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:11:39	0:11:49	0:09:24	N/A	N/A	0:05:24
			5	3	1	0	0	1
	Total Response Time ERF Concentration	Urban	0:12:44	0:07:32	N/A	N/A	N/A	0:13:19
			2	1	0	0	0	1

Baseline Statement - Collapse

For **collapse rescue incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 8 technician level responders, was not statistically relevant due to only two incidents occurring where the ERF was assembled. The units are capable of establishing command, performing an assessment of the incident, and initiating mitigation activities such as isolating the hazard, stabilizing the structure and denying access to bystanders.

Benchmark Statement - Confined Space

For **confined space rescue incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 8 technician level responders, shall be 12 minutes total response time. The units will be capable of establishing command, performing an assessment of the incident, and initiating mitigation activities including deployment of primary and belay rope systems.

Confined Space Rescue - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:03:07	0:02:00	0:03:03	N/A	N/A	0:02:49
			6	2	1	0	0	3
Turnout Time (01:30)	Turnout Time All Units	Urban	0:01:54	0:02:06	0:02:07	N/A	N/A	0:01:24
			40	19	9	0	0	12
Travel Time (4:00 and 9:00)	Travel Time 1st Unit Distribution	Urban	0:06:15	0:02:51	0:06:14	N/A	N/A	0:05:34
			6	2	1	0	0	3
	Travel Time ERF Concentration	Urban	0:10:36	0:07:22	0:08:27	N/A	N/A	0:11:09
			3	1	1	0	0	1
Total Response Time (07:00 and 12:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:11:11	0:05:11	0:12:17	N/A	N/A	0:09:04
			6	2	1	0	0	3
	Total Response Time ERF Concentration	Urban	0:19:32	0:10:58	0:20:58	N/A	N/A	0:13:51
			3	1	1	0	0	1

Baseline Statement - Confined Space

For **confined space rescue incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 8 technician level responders, was not statistically relevant due to only three incidents occurring where the ERF was assembled. The units are capable of establishing command, performing an assessment of the incident, and initiating mitigation activities including deployment of primary and belay rope systems.

Performance Statements - Technical Rescue

Benchmark Statement - Rope

For **rope rescue incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 8 technician level responders, shall be 12 minutes total response time. The units will be capable of establishing command, performing an assessment of the incident, and initiating mitigation activities including deployment of primary and belay rope systems.

Baseline Statement - Rope

For **rope rescue incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 8 technician level responders, was not statistically relevant due to the fact that only four incidents occurred where the ERF was assembled. The units are capable of establishing command, performing an assessment of the incident, and initiating mitigation activities including deployment of primary and belay rope systems.

Rope Rescue - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:04:10	N/A	0:02:39	N/A	0:04:31	0:03:00
			5	0	2	0	2	1
Turnout Time (01:30)	Turnout Time All Units	Urban	0:01:41	N/A	0:01:36	N/A	0:01:39	0:01:30
			30	0	10	0	14	6
Travel Time (4:00 and 9:00)	Travel Time 1st Unit Distribution	Urban	0:05:08	N/A	0:02:47	N/A	0:05:06	0:04:51
			5	0	2	0	1	1
	Travel Time ERF Concentration	Urban	0:26:39	N/A	0:33:04	N/A	0:10:58	0:06:56
			4	0	1	0	2	1
Total Response Time (07:00 and 12:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:10:18	N/A	0:06:09	N/A	0:10:33	0:09:34
			5	0	2	0	2	1
	Total Response Time ERF Concentration	Urban	0:31:43	N/A	0:36:51	N/A	0:16:36	0:19:47
			4	0	1	0	2	1

Benchmark Statement - Elevator

For **elevator incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 7 personnel, shall be 12 minutes. The units will be capable of establishing command, performing an assessment of the incident, initiating mitigation activities such as obtaining elevator keys from the Knox box, locating the elevator machine room, locking out the elevator system, forcing hoist way doors, and rescuing trapped occupants.

Baseline Statement - Elevator

For **elevator incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 7 personnel, was not statistically relevant due to the fact that only eight incidents occurred where the ERF was assembled. The units are capable of establishing command, performing an assessment of the incident, initiating mitigation activities such as obtaining elevator keys from the Knox box, locating the elevator machine room, locking out the elevator system, forcing hoist way doors, and rescuing trapped occupants.

Elevator Rescue - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:02:40	0:02:37	N/A	0:03:10	0:02:24	0:02:35
			11	3	0	5	2	1
Turnout Time (01:30)	Turnout Time All Units	Urban	0:01:49	0:02:11	N/A	0:01:50	0:01:19	0:01:28
			42	10	0	21	7	4
Travel Time (4:00 and 9:00)	Travel Time 1st Unit Distribution	Urban	0:03:10	0:02:28	N/A	0:04:29	0:02:10	0:02:01
			10	3	0	5	1	1
	Travel Time ERF Concentration	Urban	0:08:31	0:08:00	N/A	0:07:28	0:03:08	0:01:56
			8	1	0	5	1	1
Total Response Time (07:00 and 12:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:07:48	0:06:30	N/A	0:07:51	0:05:33	0:06:05
			10	3	0	5	1	1
	Total Response Time ERF Concentration	Urban	0:11:26	0:12:15	N/A	0:10:20	0:06:53	0:09:52
			8	1	0	5	1	1

Performance Statements - Technical Rescue

Benchmark Statement - Vehicle Extrication

For **vehicle extrication incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 11 personnel, shall be 12 minutes. The units will be capable of establishing command, performing an assessment of the incident, blocking the scene for roadway safety, stretching a hose line for possible extinguishment needs, performing patient assessment/treatment, stabilization of the vehicle, and extrication of the patient.

Baseline Statement - Vehicle Extrication

For **vehicle extrication incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 11 personnel, was 16 minutes and 53 seconds. The units are capable of establishing command, performing an assessment of the incident, blocking the scene for roadway safety, stretching a hose line for possible extinguishment needs, performing patient assessment/ treatment, stabilization of the vehicle, and extrication of the patient.

Vehicle Extrication - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:01:54	0:01:31	0:01:30	0:01:43	0:01:54	0:02:38
			229	60	39	43	41	46
Turnout Time (01:30)	Turnout Time All Units	Urban	0:01:58	0:02:18	0:02:01	0:01:46	0:01:38	0:01:50
			1172	342	200	218	215	197
Travel Time (4:00 and 9:00)	Travel Time 1st Unit Distribution	Urban	0:04:50	0:05:05	0:04:51	0:04:52	0:04:51	0:04:39
			225	60	39	43	39	44
	Travel Time ERF Concentration	Urban	0:08:59	0:10:38	0:07:54	0:09:09	0:08:35	0:08:57
			113	32	18	25	17	21
Total Response Time (07:00 and 12:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:08:05	0:07:28	0:08:15	0:08:03	0:07:48	0:08:02
			225	60	39	43	39	44
	Total Response Time ERF Concentration	Urban	0:16:53	0:19:25	0:16:20	0:13:51	0:15:32	0:13:51
			113	32	18	25	17	21

Benchmark Statement - Machine Extrication

For **machine extrication incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 13 personnel, shall be 12 minutes. The units will be capable of establishing command, performing an assessment of the incident, de-energizing equipment, conducting lockout/tag out procedures, performing patient assessment/treatment, and conducting patient disentanglement.

Baseline Statement - Machine Extrication

For **machine extrication incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 13 personnel, was not statistically relevant due to the fact that only two incidents occurred where the ERF was assembled. The units are capable of establishing command, performing an assessment of the incident, de-energizing equipment, conducting lockout/tag out procedures, performing patient assessment/ treatment, and conducting patient disentanglement.

Machine Extrication - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:03:06	N/A	N/A	0:02:59	0:01:01	0:02:43
			7	0	0	1	1	5
Turnout Time (01:30)	Turnout Time All Units	Urban	0:01:43	N/A	N/A	0:01:25	0:01:46	0:01:43
			36	0	0	6	4	26
Travel Time (4:00 and 9:00)	Travel Time 1st Unit Distribution	Urban	0:04:00	N/A	N/A	0:05:10	0:03:14	0:02:47
			7	0	0	1	1	5
	Travel Time ERF Concentration	Urban	0:05:18	N/A	N/A	N/A	N/A	0:05:18
			2	0	0	0	0	2
Total Response Time (07:00 and 12:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:07:12	N/A	N/A	0:08:15	0:04:52	0:06:08
			7	0	0	1	1	5
	Total Response Time ERF Concentration	Urban	0:09:43	N/A	N/A	N/A	N/A	0:09:43
			2	0	0	0	0	2

Performance Statements - Technical Rescue

Benchmark Statement - Water

For **water rescue incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 19 personnel, shall be 11 minutes. The units will be capable of establishing command, performing an assessment of the incident from both upstream and downstream locations, initiating mitigation activities such as deploying throw bags or watercraft, and performing patient rescue and treatment.

Baseline Statements - River / Lake/ Ice

For **river rescue incidents**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 19 personnel, was 20 minutes and 15 seconds. The units are capable of establishing command, performing an assessment of the incident from both upstream and downstream locations, initiating mitigation activities such as deploying throw bags or watercraft, and performing patient rescue and treatment.

For **lake and ice rescues**, the 90th percentile of total response time for the arrival of the effective response force, consisting of 19 personnel, was not statistically relevant due to the fact that no lake or ice rescue incidents occurred where the ERF was assembled,.

River Rescue - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:03:12	0:02:12	0:05:45	0:02:25	0:07:56	0:04:36
			56	10	12	19	6	9
Turnout Time (01:30)	Turnout Time All Units	Urban	0:02:11	0:02:00	0:01:36	0:05:31	0:02:19	0:01:37
			367	81	64	134	32	56
Travel Time (4:00 and 8:00)	Travel Time 1st Unit Distribution	Urban	0:03:42	0:04:10	0:03:00	0:04:01	0:03:12	0:02:51
			50	10	9	19	5	7
	Travel Time ERF Concentration	Urban	0:10:25	0:12:48	0:08:01	0:10:13	0:06:03	0:05:56
			27	7	6	10	1	3
Total Response Time (07:00 and 11:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:07:54	0:07:31	0:05:48	0:07:56	0:15:59	0:07:47
			50	10	9	19	5	7
	Total Response Time ERF Concentration	Urban	0:20:15	0:18:53	1:00:34	0:19:43	0:08:49	0:13:10
			27	7	6	10	1	3

Lake Rescue - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:00:43	N/A	0:00:43	N/A	N/A	N/A
			1	0	1	0	0	0
Turnout Time (01:30)	Turnout Time All Units	Urban	0:01:06	N/A	0:01:06	N/A	N/A	N/A
			4	0	4	0	0	0
Travel Time (4:00 and 8:00)	Travel Time 1st Unit Distribution	Urban	0:02:53	N/A	0:02:53	N/A	N/A	N/A
			1	0	1	0	0	0
	Travel Time ERF Concentration	Urban	N/A	N/A	N/A	N/A	N/A	N/A
			0	0	0	0	0	0
Total Response Time (07:00 and 11:00)	Total Response Time 1st Unit on Scene Distribution	Urban	0:04:32	N/A	0:04:32	N/A	N/A	N/A
			1	0	1	0	0	0
	Total Response Time ERF Concentration	Urban	N/A	N/A	N/A	N/A	N/A	N/A
			0	0	0	0	0	0

Ice Rescue - 90th Percentile Times - Baseline Performance			2016-2020	2020	2019	2018	2017	2016
Alarm Handling (1:30)	Pick-up to Dispatch	Urban	0:02:36	N/A	0:02:36	N/A	N/A	N/A
			1	0	1	0	0	0
Turnout Time (01:30)	Turnout Time All Units	Urban	0:01:06	N/A	0:01:06	N/A	N/A	N/A
			4	0	4	0	0	0
Travel Time (4:00 and 8:00)	Travel Time 1st Unit Distribution	Urban	N/A	N/A	N/A	N/A	N/A	N/A
			0	0	0	0	0	0
	Travel Time ERF Concentration	Urban	N/A	N/A	N/A	N/A	N/A	N/A
			0	0	0	0	0	0
Total Response Time (07:00 and 11:00)	Total Response Time 1st Unit on Scene Distribution	Urban	N/A	N/A	N/A	N/A	N/A	N/A
			0	0	0	0	0	0
	Total Response Time ERF Concentration	Urban	N/A	N/A	N/A	N/A	N/A	N/A
			0	0	0	0	0	0

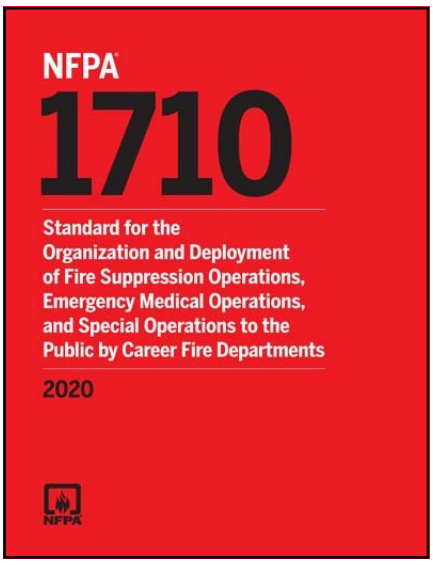
External Agency Comparability

When comparing fire department services amongst various cities and jurisdictions, it is virtually impossible to find an identical match, however the agencies listed below do share some common attributes with the city of Grand Rapids. The number of fire stations and overall annual budgets are similar, however, Grand Rapids does have the highest population density, leading to more calls per square mile and associated risk for our firefighters and citizens.

ISO ratings with the comparison agencies are all "Class 1", indicating similar physical resources and deployment models. One agency (Newport News, VA), provides advanced life support transport services, leading to a higher staffing level to operate the ambulances within the community. Response times vary by each jurisdiction given the differences in the road networks and weather, therefore a comparative analysis was not undertaken on those data elements.

Comparability	Grand Rapids, MI	Newport News, VA	Sioux Falls, SD
City Area (in Sq. Miles)	45.3	68.71	79.63
Population	201,013	178,626	195,850
Population Density	4,437	2,600	2,460
Fire Department Budget	$32,418,005	$36,920,990	$30,943,232
ISO Rating	1	1	1
Accredited Status	Accredited	Accredited	Accredited
Total Incidents	24,124	27,000	13,606
Total personnel	201	386	208
# Stations	11	11	11
Sq. Miles per Station Average	4.12	6.25	7.24

NFPA 1710 (Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Career Fire Departments) recommends industry benchmarks for several elements of the organization. GRFD's Assistant Chief was a voting alternate member representing the IAFC on the 2020 edition. Specifically relating to response times, the GRFD aligns closely with the suggested requirements for travel times and turnout times, but needs to focus on its alarm handling times to meet the benchmark. One area where the fire department pays particular attention is the full effective response force for a structure fire. NFPA bases their recommendation of critical tasking on a 2,000 square foot, two story single family dwelling without a basement. GRFD has identified that their typical structure fire is a 2.5 story single family dwelling with a basement, often with balloon frame construction. This type of risk necessitates addition personnel to accomplish the requisite critical tasking. Overall, the GRFD produces high quality outcomes for its customers, and aligns with the best practices in the fire service.



Section F - Plan for Maintaining and Improving Response Capabilities

Compliance Methodology Model

Plan

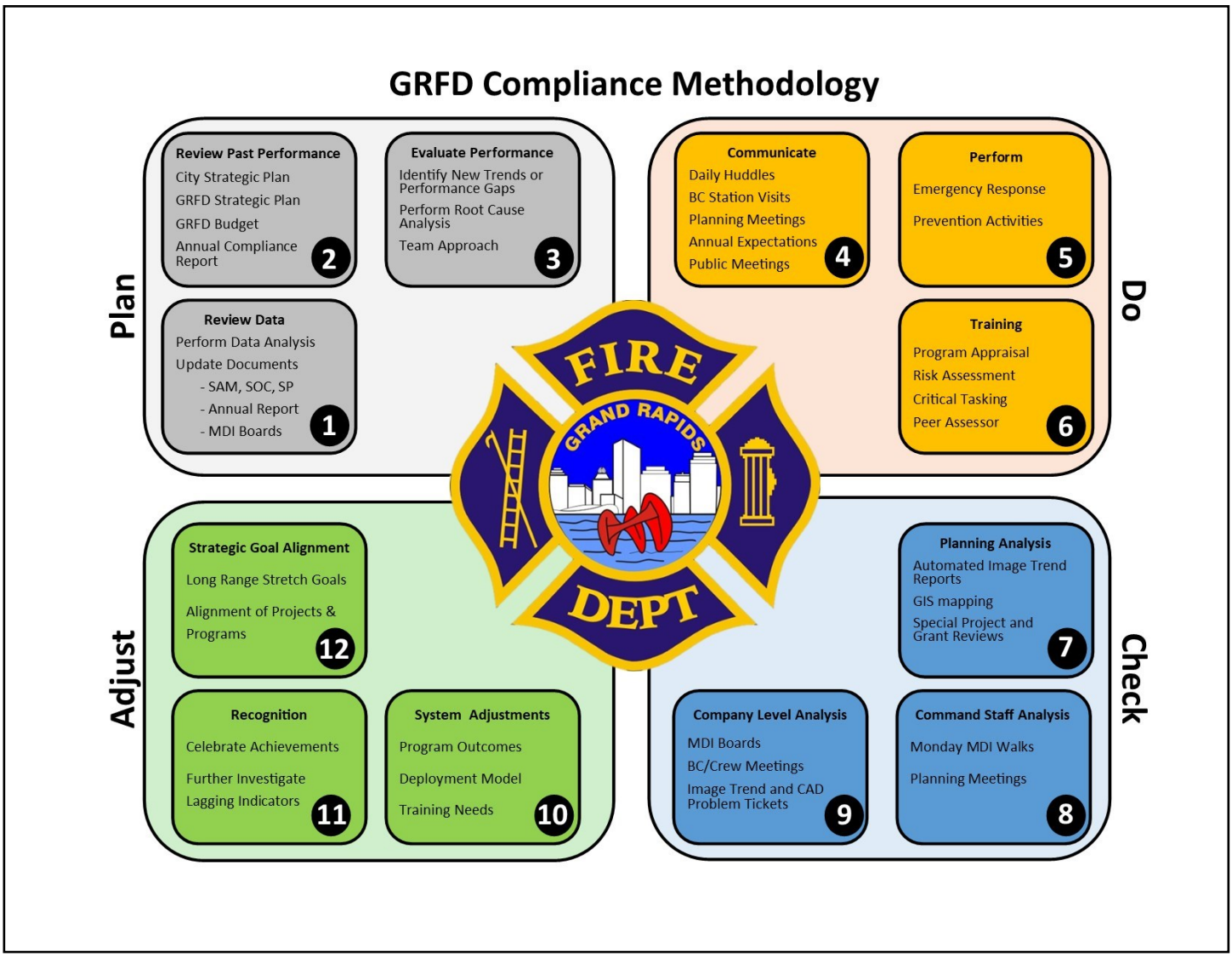
Do

Check

Adjust

Compliance Methodology Model

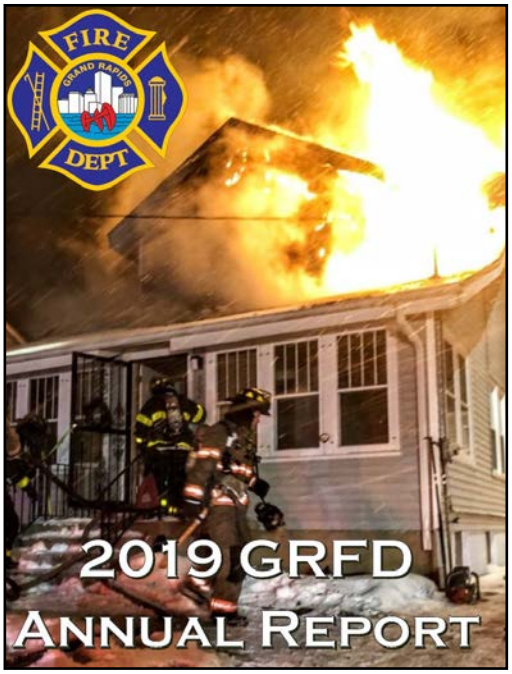
The Grand Rapids Fire Department is a strong proponent of the continuous improvement mindset, with frequent checks and corresponding adjustments taking place to achieve the highest level of outcomes for both internal and external customers. The compliance model aligns with the PDCA (plan-do-check-act) cycle, which is an iterative four step management method promoting a systematic manner of approaching performance improvement . This is accomplished by establishing clear objectives and processes, executing the plan, studying the actual results, then building upon the new baseline to make further positive impacts.



In addition to the PDCA mindset, the GRFD also adheres to a planning management system which promotes incremental improvements and a high level of accountability. Daily team huddles and department wide video meetings are supplemented with weekly and monthly meetings which promote organizational alignment. A team comprised of a wide cross section of the department conducts semi-annual reviews of the strategic plan to identify wins, opportunities and new priorities. These internal meetings are only one piece of communicating performance, as several types of meetings occur within the city structure in a format that is open to the public including public safety, city commission and budgetary meetings. When combined, the frequent communication, transparency, accountability and monitoring of data lead to an organization that is rooted in problem solving, adaptable to rapidly changing environments and continuously providing higher levels of both emergency and non-emergency outcomes.

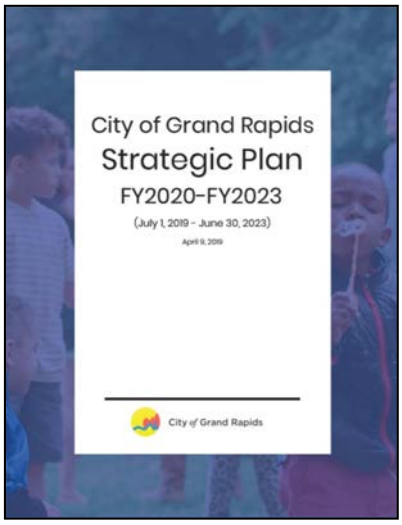
Plan

In this phase of the PDCA process, the planning division conducts the majority of the work in preparation for updating several reports, conducting research, and comparing desired outcomes with actual performance.



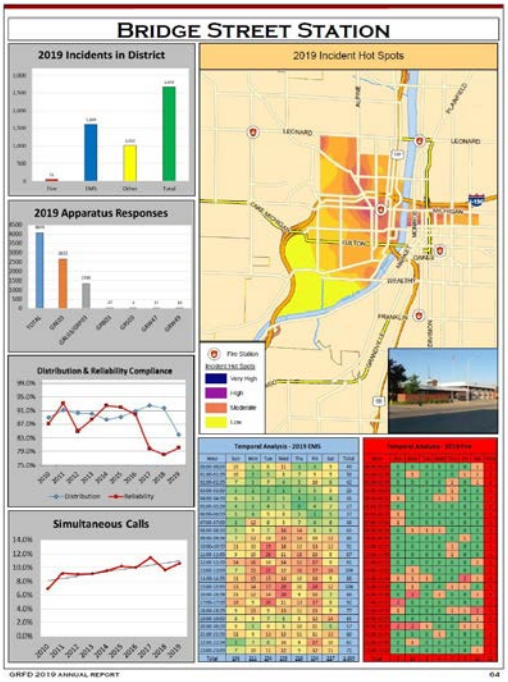
1 - Review Data

Data review occurs on a weekly, monthly, quarterly, annual and as needed basis. Every week, automated reports are generated from the department's Image Trend RMS system, illuminating performance gaps for key metrics such as alarm processing time, turnout time, travel time, distribution, concentration and reliability. The chief officers discuss these reports and look at any trends/outliers to see where corrective action needs to occur. This data is posted in fire administration on the response MDI (managing for daily improvement) board. Data and trends are updated prior to the monthly planning meetings, so decisions can be made on potential deployment or budgetary changes. On an annual basis, a large scale data analysis occurs to update the annual report, which has detailed response statistics at the jurisdiction, first due response district and unit level. This information also serves as the foundation for annual reviews of the Standards of Coverage risk assessment and critical tasking statements to ensure alignment between the SOC and current department practices.



2 - Review Past Performance

The planning division reviews the city strategic plan, where the department is responsible for several program metrics, looks at the projected budget expenditures/targeted outcomes and ensures alignment with the department's internal strategic plan. The planning division prepares the annual reports and CFAI annual compliance reports. This research lends itself to a firm understanding of past performance and provides baselines for further performance evaluation.



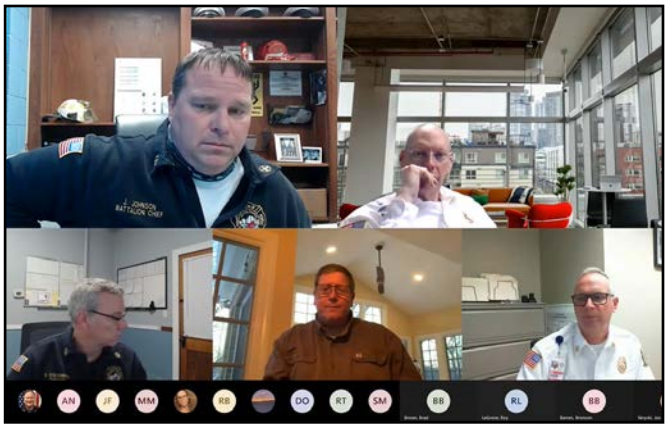
3 - Evaluate Performance

Comparing current and historic data and trends lends perspective to fluctuations in performance and provides the basis for data driven decision making. The planning division is the lead driver of data analysis for the organization. When new trends or deviations are identified, they are brought to the attention of the fire chief and deputy chiefs. Minor problems are addressed by the deputy chiefs, who perform a root cause analysis of the deviation. Larger issues are presented at the monthly command staff meeting where ranks from battalion chief up to the fire chief discuss potential solutions to the problem. Evaluation of performance also takes place on an as needed basis for programs or when deployment changes occur. Specific metrics are identified prior to implementation and the planning division closely monitors and reports out on these drivers to ensure program success.

Do

In this phase of the PDCA process, the operational programs are the center of focus as personnel carry out the important work of providing services to our customers. The main theme of "do" is frequent communication.

4 – Communicate to Stakeholders



Communication is an ongoing process that takes the form of daily team huddles between crews or work groups, and when a battalion chief visits a station to discuss new policies, upcoming training or areas that need attention. Planning meetings include strategic, operational, budgetary and project planning. All planning meetings with the exception of project based plans are mapped out a year in advance and provide a forum for communication. Annual expectations are communicated to both operational and administrative personnel, with many areas relating to accreditation being discussed. Finally, the Standards of Coverage document is presented in a public forum at city council meetings and is frequently referenced at neighborhood and business association meetings.

5 – Perform Operational Activities

Performing in a safe and effective manner captures the essence of the deployment model for the Grand Rapids Fire Department. Prevention activities are designed to limit risk within the city. Standard Operating Guideline (SOG) 201-05 serves as the emergency scene risk management document for the organization. The statements in the SOG outline a thought process in which we will take a reasonable risk to save a life, take some risk to save salvageable property and take no risk for lives or property that are already lost. The established benchmarks in the Standards of Coverage document are ever-present in the performance of our services.

6 – Training

Training is a critical component of maintaining compliance with the established benchmarks in the SOC. Ongoing accreditation training takes place throughout the year in the form of annual program appraisals, which encompass reviews of the self-assessment manual, strategic and operational goals, community risk assessment and critical tasking. The GRFD hosted a self-assessment and standards of coverage workshop in the fall of 2019. Attending members serve as the core accreditation team and are dispersed throughout the department, serving as subject matter experts. Suppression staff receive specialized training to assist in the risk assessment process. Crews evaluate buildings in their jurisdiction for fire risk and operational hazards, directly impacting the Standards of Coverage. Members of the planning division also serve as peer assessors for the Center for Public Safety Excellence and complete annual training requirements to stay abreast of changes with the model.

Check

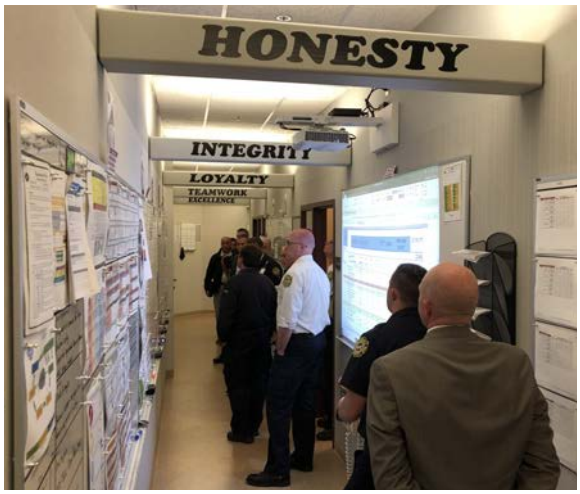
In this phase of the PDCA process, frequent and extensive evaluation occurs to "check" the progress of changes that have occurred. This occurs at multiple levels throughout the organization.

7 - Planning Analysis

Planning analysis occurs through frequent checks for outliers. Performance metrics such as alarm processing, turnout, and travel time, generate weekly automated reports from Image Trend and are e-mailed to appropriate personnel. Outlier events for concentration are evaluated on a monthly basis by the data response team. Another example of automated reports is for incidents when a fire occurs in a home that has received a residential safety assessment from our crews. The planning division, fire marshal and fire chief are notified for follow up with the residents. Geographical Information System mapping occurs whenever deployment model changes are proposed. Special projects and grants often require continual data analysis and feedback.

IMAGETREND® Weekly Travel Time Outliers

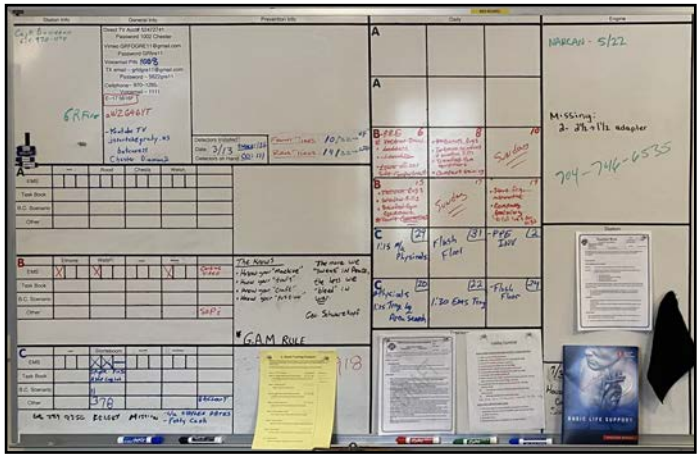
Unit	Unit_Personnel_List	Incident Type	District	Notif_Time_	En_Route_Time	Arrival_Time	Turnout Time	Travel Time
Incident Number: 21-0002082								
Alarm Date/ Time: 2/7/21 12:48:02 AM								
Address: 1303 KELSEY Street NE								
GRE09	Joel Boyer,Ryan Slomp,Michael Walker	311	09	12:48:02 AM	12:50:02 AM	12:55:23 AM	00:02:00	00:05:21
Incident Number: 21-0002085								
Alarm Date/ Time: 2/7/21 3:43:12 AM								
Address: 3471 BROOK Trail SE								
GRE04	Eric Balahoski,Jared Elyea,Justin Holmes	6611	04	3:43:12 AM	3:45:23 AM	3:52:24 AM	00:02:11	00:07:01
Incident Number: 21-0002094								
Alarm Date/ Time: 2/7/21 8:40:06 AM								
Address: 844 WORDEN Street SE								
GRE02	Jessica Denhartigh,Robert Long,Justin Steeby,Charles Benton	321	11	8:40:58 AM	8:41:10 AM	8:47:15 AM	00:00:12	00:06:05
Incident Number: 21-0002106								
Alarm Date/ Time: 2/7/21 11:50:48 AM								
Address: US-131 NB TO BURTON Ramp								
GRE10	Aaron Engelbert,Ryan Sparks,William VanStensel	324	10	11:50:48 AM	11:52:01 AM	11:59:10 AM	00:01:13	00:07:09



8 - Command Staff Analysis

Command staff analysis happens on a weekly basis during the Managing for Daily Improvement (MDI) walks that occur every Monday in fire administration. Key information is discussed for Accreditation, Strategic Planning, Fiscal Resources, Response, Training, Prevention, Wellness, Support Services, EMS, IT and Apparatus/Facilities. Owners discuss achievements, learnings, areas of focus and help needed. If trends or problems are identified, they are explored in more depth during formal planning sessions which occur several times per month in accordance with the department's adopted planning policy and associated calendar.

9 - Company Level Analysis



Company level analysis takes place on a frequent basis as station MDI boards are updated by company officers. In addition to making response, training, prevention and wellness goals visible for the crews, these boards can also serve as a discussion point during shift changes and battalion chief visits to the stations.

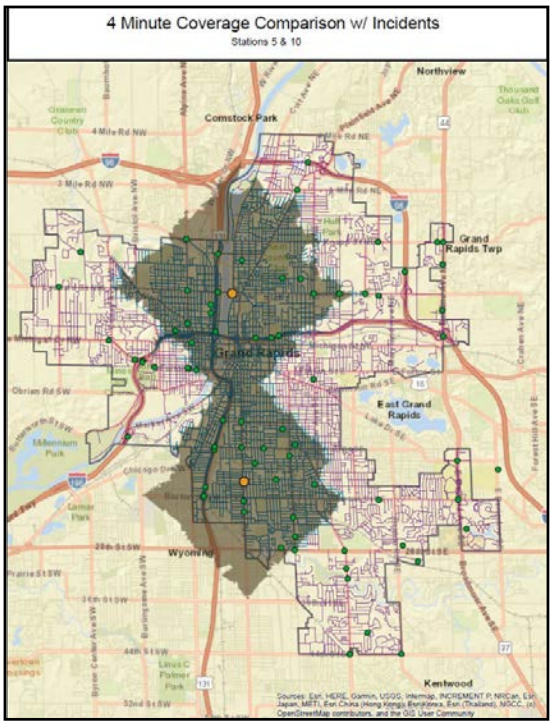
MDI boards also serve as a communication medium for important memorandums or changes in policies and SOG's that need to be posted so that all shifts can easily be notified. Crews use the boards to track station projects, make note of temporary response barriers. and communicate inventory needs to the other shifts.

Planning Division personnel request information on outliers using the Image Trend RMS messaging system. Company officers can submit requests to follow up on CAD performance gaps.

Adjust

In this phase of the PDCA process, adjustments are made to address deficiencies or improve outcomes.

10 - System Adjustments



System Adjustments take place to correct areas where goals are not being met. With frequent data review, incremental changes are frequently made, but with trends that continue in a negative manner, major decisions are made to adjust deployment models or programs. Recent examples include moving the rescue engines to LaGrave station and changing the staffing model to improve training delivery for hazmat and technical rescue team members. The duty draw was changed from an annual to a triennial cycle for similar reasons. Adjustments are closely monitored to see if changes are having the desired effect. If system adjustments do not achieve the desired effect, further research and investigation takes place to decide on the corrective action needed to reach the established goal.

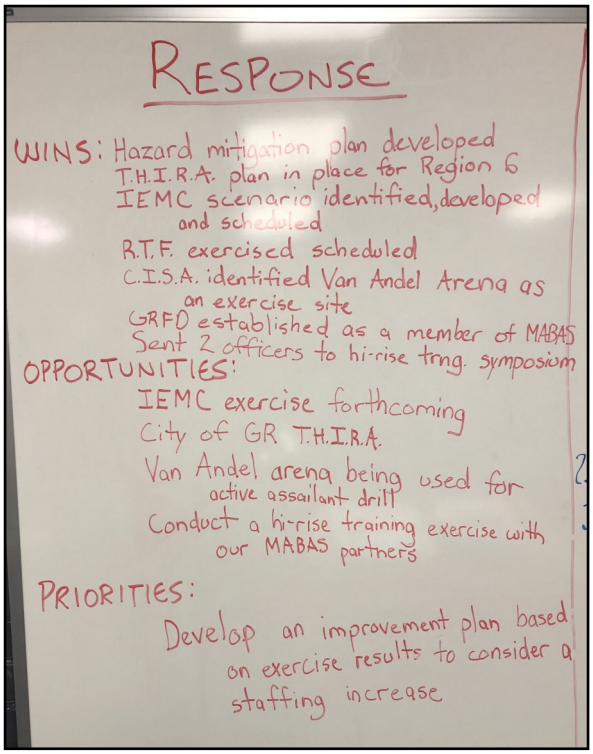
11- Recognition

We recognize the great work of our department by providing positive feedback for a job well done through formal recognition at the annual awards ceremony, in city commission meetings, promotional ceremonies, during daily video meetings and finally through the issuance of small tokens of appreciation such as the departmental challenge coin.

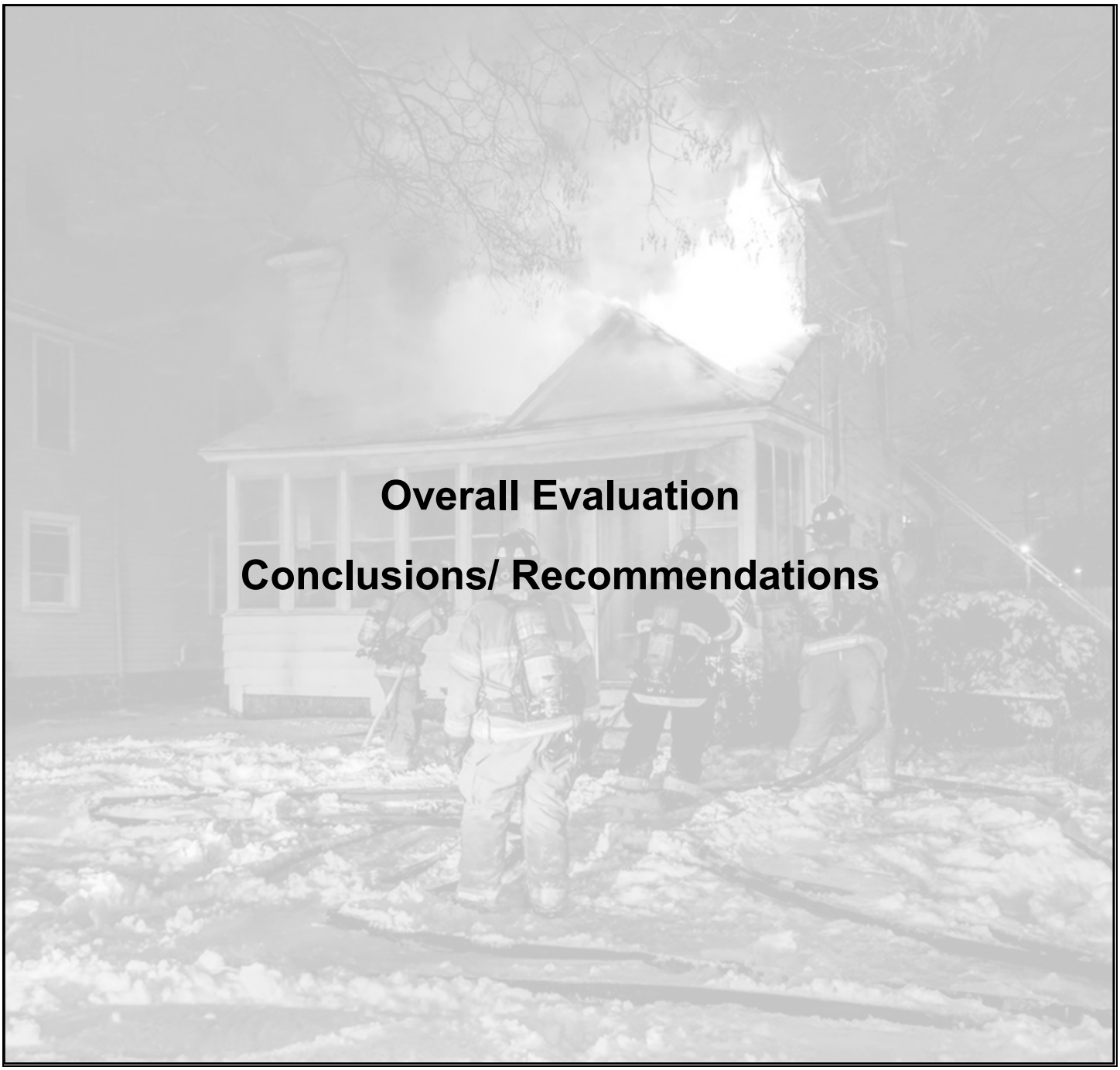
12 - Strategic Goal Alignment

Strategic Goals are frequently checked via the department's strategic planning process. The GRFD operates on a three year strategic planning cycle. The strategic plan is a living document, and is subject to change. When improvements are suggested that need to take place in the short term, the plan can be adjusted to accommodate new projects that help align with predefined departmental goals. Additionally, major initiatives such as station relocation or expensive purchases of apparatus are generally planned out several years in advance.

The GRFD is committed to the accreditation process and has developed a comprehensive compliance methodology with frequent review and communication to align with our mission of valuing people by saving lives, protecting property and responding to the needs of our community.



Section G - Overall Evaluation and Recommendations



Overall Evaluation

Conclusions/ Recommendations

Overall Evaluation

The Grand Rapids Fire Department (GRFD) is an organization with a total authorized staff of 203 personnel who are committed to valuing people by saving lives, protecting property and responding to the needs of our community. This is accomplished by providing a full spectrum of emergency and non-emergency services that align with the risks present in the community. The organization focuses on the five key areas of response, training, prevention, wellness, and support services; The establishment of goals and metrics ensures a high level of performance and outcomes.

Spread out over 45.3 square miles and protecting over 200,00 citizens and an additional 20,000-30,000 workers each day, the GRFD utilizes 11 fire stations and 15 frontline units deployed through a risk-based staffing model, balancing the risks in the community with the financial stewardship required of a modern day fire and rescue organization.

Population growth, continued expansion of building construction, and significant changes to manmade hazards made this an ideal time to revisit the comprehensive standards of coverage process (SOC) and assess the organization's benchmark and baseline performance. The following items were identified during the SOC process and utilize the same Strengths, Opportunities, Aspirations, and Results (SOAR) model that is employed during the GRFD strategic planning process.

Identification of System Strengths, Opportunities, Aspirations, and Results

Strengths

- **Operational Readiness**
- **Human Resources**
- **Community Risk Reduction**
- **Data Analysis**
- **Focus on Customer Service**
- **Company Level Training**
- **Labor and Management Collaboration**

Opportunities

- **More Community Involvement**
- **Increased Staffing**
- **Better Communications with External Partners**
- **Fleet Enhancements**
- **Continued Focus on Staff Wellness**
- **Better Integration of Dispatch Data**

Aspirations

- **Remain Focused on the Community**
- **Professional Development for all Employees**
- **Staffing Levels that Match Community Risks**
- **Enhanced Training and Safety**

Results

- **Deliver High Standards of Service**
- **Maintain Community Risk Reduction Efforts**
- **Improve Internal and External Feedback and Communication**
- **Exhibit Fire Service Leadership**

Conclusions/Recommendations

The GRFD has embraced a continuous improvement mindset, therefore, these recommendations build upon the current best practices in use to directly impact both emergency and non-emergency outcomes.

1. Monitor the Kalamazoo District to identify solutions to lagging distribution and concentration times in that area. Initial recommendations include dividing the district into two first due areas with a station located in the area of Burton Street and Kalamazoo Avenue, and a second station located south of 28th street along the Kalamazoo Avenue corridor. Other opportunities include expanding automatic aid agreements with the Kentwood and Wyoming fire departments to cover incidents not currently within the desired catchment area, and increasing focused prevention efforts.

2. Continue Dispatch Improvements:

- **Capture All Parts of the Alarm Processing Time** to associate phone answering times to incident records.
- **Ensure Correct Data Batching by Risk Level** in dispatch to maintain accurate benchmark and baseline statements and data.
- **Improve Data Collection from CAD** by aligning GRFD geographical planning zones with the CAD map layer to simplify data analysis
- **Improve Tracking of Response Time Metrics** by installing mobile data terminals in all special operations units.
- **Increase the Accuracy of Critical Performance Metric Data** by upgrading Motorola CAD software to utilize geofencing to mark units enroute, continued use of a data review team to address problems with response metrics, continue the use of outlier reports to identify potential problems with mobile data terminal connectivity, and focus education efforts to inform crews and city management/commission about how data is assessed.

3. Continue Risk Assessments and Community Risk Reduction Efforts by evaluating every non-residential structure on a cyclical basis and continued marketing of the residential safety program. Fire suppression crews should collect and report data on commercial occupancies and perform home safety assessments on residential occupancies. Risk assessment information should be available to crews while enroute to an incident.

4. Assess Safety Officer Deployments to create strategies that enhance incident outcomes. The department should consider the use of a full time safety officer position to enhance both emergency and non-emergency outcomes, focusing on the response and wellness pillars. Also continue to explore partnerships with regional agencies to provide these services.

5. Continued Implementation of the Homelessness Outreach Team in specific geographical planning zones. The focus is on partnering with local health care agencies to guide patients into the appropriate care methodology, reducing the impacts of homelessness while reducing risk to both patients and responders, and ensuring appropriate use of the 911 system.

6. Update the Station Notification System The current system is very limited in serviceability and has a lack of modern capabilities such as visual notifications and zoned alerting.

7. Continued Work on Fire Station Construction (Division and Chester), major remodels to remaining stations, and relocation of the fire department training center.

Section H - Appendices

Specialized Unit Resource Descriptions

Specialized Unit Resource Descriptions

B-Units (1,3,4) are principally used for grass fires, and respond with another company. The B-Units are also equipped with plows in the winter for snow removal from fire department facilities and assist other units in gaining access to certain streets during heavy snowfalls.

Boat 1 is a 1999 Wooldridge 21' Aluminum boat with a recently upgraded 200hp Yamaha jet drive motor that is used when water levels in the river are high.

Boat 2 is a 2014 Sea Ark rigid hull boat with a 60hp Evinrude jet drive motor that is deployed as the primary water rescue boat for mid level water conditions.

Boat 3 is a 2013 Zodiac inflatable watercraft with a 40hp Evinrude jet drive motor that is used primarily as a backup/tether craft in conjunction with boat 1 or 2.

Boat 4/Airboat is a 20ft Panther airboat used for water rescue responses when portions of the river are frozen, allowing navigation of the river where traditional boats would not be able to access.

Water 5 is a repurposed squad unit used to tow the airboat. This unit is housed at the Monroe Ave. fire station.

Dive 3 is deployed from the Bridge St. fire station and is a 1991 Chevrolet step van that pulls either boat 1 or 2, based upon river conditions.

Water 3 is a Ford F-350 pickup truck used to tow either boat 2 or 3, based upon river conditions

Specialized Unit Resource Descriptions

HazMat 1/RRT 61 is a 2005 Spencer special response unit that responds to all weapons of mass destruction incidents within the Michigan region 6 area. It is also deployed on large scale hazardous materials incidents within the city.

HazMat 2 is a converted squad unit used to carry additional hazardous material equipment.

Support 1/Heavy Rescue is a 1987 IHC repurposed truck/trailer that contains a large amount of cutting, stabilizing and shoring equipment and is deployed on all major collapse or trench rescue incidents.

Support 2/Air Delivery Vehicle (ADV) is housed at the LaGrave Fire Station. It contains extra SCBA's, additional air bottles, hardline air hoses, an air cart and equipment typically needed for Rapid Intervention Crews (RIC). The ADV can also be used as a rehab facility during inclement weather. Additional equipment consists of a cache of confined space, hazmat and other RIC items.

Mini/Utility 7 is a 1989 Chevrolet K3500 pickup that is specifically designed with a low clearance for fires in parking ramps. It is deployed several times each year from the LaGrave Ave. fire station, which is located downtown.

RSP Truck/Trailer is assigned to the residential safety program (RSP) and is a 2014 F350 with a cap. It is fully wrapped in graphics to match the safety trailer that it pulls to numerous events around the city. Its other use is to deliver RSP supplies to the stations.

Transport 1 is a converted 1997 Thomas bus that serves as not only a way to transport GRFD personnel, but also as a rehab unit on large scale emergencies.

Utility 2 is a 2000 Sterling dump truck that was a former water department vehicle. It has been repurposed to serve as a highway blocking vehicle and tows a traffic attenuator, providing protection for both the fire department and the public.

Grand Rapids Fire Department
2020 Standards of Coverage

For Further Information

Please Contact the GRFD Planning Division

at (616) 456-3900 or

Visit the Website at www.grcity.us/fire