

EXECUTIVE SUMMARY

Sidney City Council had identified a north end fire station as one of their top three priorities at a Council retreat in early 2008. The Fire Chief was directed by the City Manager to conduct an analysis to determine if an additional fire station was needed to serve the community. In order to conduct a thorough analysis of fire and emergency services in the community, a community risk assessment and standard of cover was completed utilizing a template developed by the Commission on Fire Accreditation International (CFAI).

When the City of Sidney initiated the enhanced 9-1-1 system in 1992, fire agency planners developed fire “sectors” across the city. Sectors are small geographic areas such as neighborhoods or commercial sections of the city. This allowed for more accurate data collection and to analyze each specific risk in the sector.

A Community Risk Assessment (CRA) was conducted on each commercial, industrial, and public assembly property in the city. Also included were apartment complexes containing eight units or more. The CRA was conducted by fire agency personnel and consisted of evaluating the following areas: life hazard, community impact, hazard index, water supply, building usage, building construction, number of stories, and square footage. Each of the areas described received a rating score from 1-3, with 1 equating to low risk or impact and 3 being high risk or high impact. This system allowed for an evaluation of over 620 properties. Each address was provided with a CRA rating from 9 for the lowest risk to 24 for the maximum risk.

As a result of the CRA, 30 properties were identified as maximum risk and 130 properties were identified as significant risk. A large number of these properties were located in the downtown area as well as the west end of the city in the commercial and industrial sectors. Maximum risk properties were also identified in the northern area of the city in the Arrowhead Drive area and on Collins Drive.

Non-fire risks such as natural and man-made disasters were also examined. Emergency medical service delivery, hazardous materials exposures, and technical rescue events were also assessed, examining the likelihood of the event, impact on the city, and the impact on the agency.

The science of fire and its impact on structures and inhabitants was examined. Laboratory testing had shown that the phenomenon of flashover was a critical stage of fire growth. Flashover would occur at some time between five and 30 minutes after ignition turning a typical room and contents fire into a structural fire of some magnitude. Due to room temperatures, no human could survive in the room of origin post flashover. The performance goal was to intercede prior to flashover. The EMS performance goal was similar in that in critical situations, the brain devoid of oxygen and circulation begins to die within 4-6 minutes. Interventions included early cardio-pulmonary resuscitation (CPR) and electrical defibrillation. The performance goal was to intervene within 4-6 minutes.

Critical tasking was performed for fire, EMS, and technical rescue operations. As a result of that process, it was determined that 13 personnel are needed to initiate an attack and mitigate a standard one- or two-family dwelling fire. Current staffing levels for the fire agency were 8 minimum and 11 maximum for each shift.

Service level objectives which are defined as distribution and concentration of resources were reviewed based on the CFAI model. It was found that the service area for both existing fire stations had increased due to city growth over the past 15 years. Significant areas of land had been annexed in the southwest portion of the city and in the north and northeast areas. The southwest area was mainly

zoned industrial and the northeast area was zoned residential. Reviewing the city's current distribution of resources, it was found that Fire Station #1 is serving an area one and one-half times greater than Fire Station #2 and protecting three times the number of dwelling units and handling three times the number of calls for service. This is displayed graphically below.

STATION	AREA	ROAD MILES	CALLS FOR SERVICE	DWELLING UNITS
1	61%	74%	78%	76%
2	39%	26%	22%	24%

Concentration can be described as the spacing of multiple resources arranged close enough together so that an initial effective response force can be assembled on scene within acceptable timeframes. The concentration of existing resources was found to be good except in the Riverbend area and the area that lies northeast from Broadway Avenue/Parkwood Street.

Applicable national standards and criteria were reviewed as part of the analysis. It was found that the city currently has a public fire protection classification of 4 from Insurance Services Office (ISO). It was determined that NFPA 1710, *The Standard for Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Departments* to be the most influential national criteria on fire department operations. The standard outlined requirements that address functions and objectives of the department's emergency service delivery, response capabilities, and resources. The CFAI accreditation model uses the response time performance objectives found in NFPA 1710 and developed response performance objectives based on the type of community protected. Sidney was considered a suburban community. Based on published criteria, the agency should strive to meet the following response time objectives: for 90% of all incidents, the first-due unit shall arrive within seven minutes, thirty seconds total reflex time. The response object includes 90 seconds for call processing, 60 seconds for turnout, and 300 seconds (5 minutes) for travel time. Data analysis included 1,486 fire responses by the agency over a three-year reporting period of 2005-2007. The agency's performance against the response criteria was as follows:

<u>Element</u>	<u>Target</u>	<u>Percentage</u>
Call processing	1:30	63%
Turnout time	1:00	10%
Travel time (1 st arriving unit)	5:00	78%

Breaking down the travel time by sectors, it was found that the agency's travel times were:

<u>Element</u>	<u>Sectors</u>	<u>Target</u>	<u>Percentage</u>
Travel time	101-124	5:00	93%
Travel time	201-217	5:00	88%
Travel time	300-313	5:00	55%

The performance gap in service delivery was evident as travel times to the north end of the city were greater than other areas of the city. In the north end area, there was a performance gap of 35%. There were several factors that can influence the performance gap; however the information contained in the sector analysis indicated the travel distance in the 300-313 sectors to be a causative factor. This point was further demonstrated after analyzing the agency's performance against the proposed performance benchmark of seven minutes, thirty seconds total reflex time:

Total Reflex Time		
<u>Sectors</u>	<u>Target</u>	<u>Percentage</u>
101-124	7:30	87%
201-217	7:30	80%
301-313	7:30	51%

As a result of this review of the agency's procedures, levels of risk, deployment criteria, and critical tasking, the recommended community-based total reflex time standard policy for the Sidney Department of Fire & Emergency Services was:

For 90% of all incidents, the first-due fire department unit will arrive within seven minutes, thirty seconds total reflex time.

For fire incidents, the remaining initial alarm assignment will arrive within ten minutes, thirty seconds 90% of the time.

During the data analysis, it was discovered that the agency routinely deals with the problem of "call stacking." It was found that when multiple emergency calls occur within an overlapping time frame, the agency does not have sufficient resources to respond to the incident. The emergency incident then waits until a unit can free themselves to respond, off-duty personnel are recalled to handle the emergency or mutual aid is requested from an outside agency. In 2006, there were 150 instances of simultaneous multiple calls and in 2007 that number increased to 308. During the reporting period, it was found the agency responded to numerous fire emergencies short-handed. There were 31 incidents in which the second-due engine did not respond and 48 incidents in which the ladder did not respond. It was found that call stacking was a contributing factor preventing the agency from meeting the performance goals.

The purpose of the risk assessment and data analysis was to determine if the performance of the agency was consistent throughout the city. The performance was evaluated against standard criteria. A risk assessment and data analysis determined there is a performance gap. The performance gap was determined to be primarily a distribution issue indicating the need for a fire station in the north end of the city. The increase in resources from an additional station would help the agency in meeting the required number of personnel needed for a standard fire attack developed in the firefighting critical task analysis. The additional resources would also improve the agency's ability to reduce the number of stacked calls.

The last component of the report analyzed potential fire station locations. Utilizing the ArcGIS9 Fire Analysis Tool Software, the agency developed planning maps with potential fire stations placed in several different locations. Areas examined as potential fire station locations were:

- Broadway Avenue/Russell Road
- Broadway Avenue/Parkwood Street
- Broadway Avenue/Hoewisher Road
- Wapakoneta Avenue/Hoewisher Road
- East Parkwood Street/Hoewisher Road

As a result of the analysis, the two best areas to locate a third fire station were Broadway Avenue/Hoewisher Road and Broadway Avenue/Parkwood Street. These two locations would have a positive impact on the first-due response time in the north end of the city and also put the city in a position to meet performance goals as the city continues to grow to the north and northeast. These locations

would also help concentration of resources and improve second-due response to the northwest area of the city, Riverbend area, and the area directly north of the downtown. Obtaining land at these exact locations may not be possible; but it is recommended to locate a facility as close to these areas as possible.

PREFACE

The Standard of Cover and Community Risk Assessment document has been an important project. This is the first time in the department's history that an open and true comparison of the department's performance against national standards and criteria has been attempted. This project has identified the true risk in the community that the department is responsible to protect and the necessary resources needed to serve the community.

Only through a cooperative team effort could a project of this magnitude be completed. I would like to recognize and thank those individuals who contributed to this project.

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Deputy Chief Rick Simon
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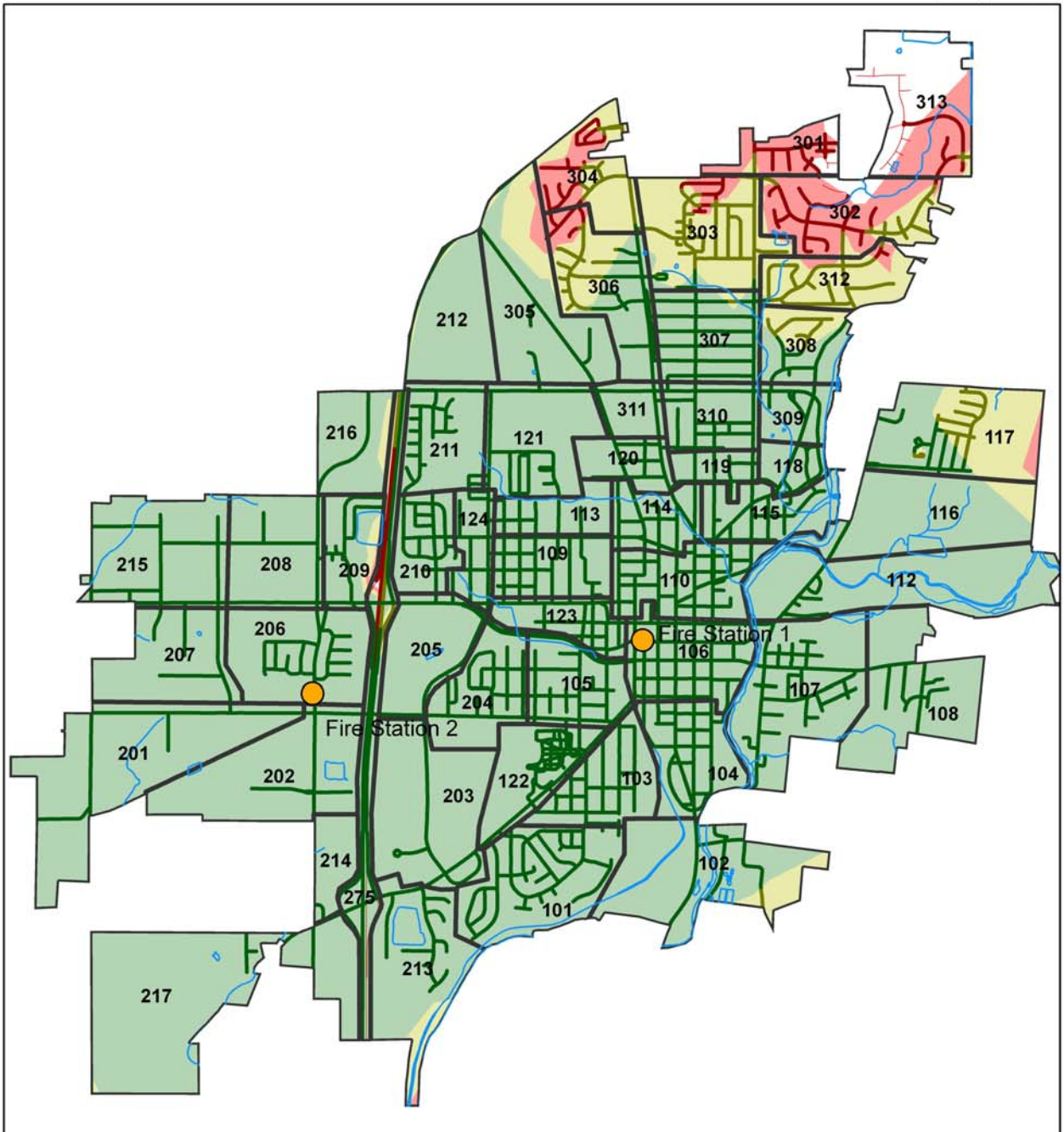
APPENDIX A

DEFINITIONS

AED	Automatic External Defibrillator
AHA	American Heart Association
ALS	Advanced Life Support – EMS service at the paramedic level
AWWA	American Water Works Association
BLS	Basic Life Support – EMS service at the EMT level
CAD	Computer Aided Dispatch
CFAI	Commission on Fire Accreditation International
CPR	Cardio-Pulmonary Resuscitation
CRA	Community Risk Assessment
Engine Co	A fire apparatus which carries hose, nozzles, an on-board water tank, and a pump. The engine company's basic role in tactical operations is to deliver water through hoselines to the fire.
EMS	Emergency Medical Services – ambulance transport and pre-hospital medical Care
FEMA	Federal Emergency Management Agency
GIS	Geographical information system
GPM	Gallons per minute
IC	Incident Commander – the person in charge
ICMA	International City and County Managers Association
IDLH	An area immediately dangerous to life and health
ISO	Insurance Services Office
Ladder Co	A fire apparatus that contains an aerial ladder or elevating platform device, which provides access above ground level or directs elevated master streams. Ladder trucks also carry a complement of ground ladders, and hand and power tools.
Medic Unit	A transport ambulance equipped and staffed at the ALS (paramedic) level.
NFF	Needed fire flow
NFPA	National Fire Protection Association
NIMS	National Incident Management System
NIOSH	National Institute for Occupational Safety & Health
NRP	National Response Plan
NTM	Non-trauma medical
OSHA	Occupational Safety & Health Administration
PSAP	Public safety answering point
TI	Trauma/injury

APPENDIX B

Service Areas for both Fire Stations with Sector Locations (Fig. 4)



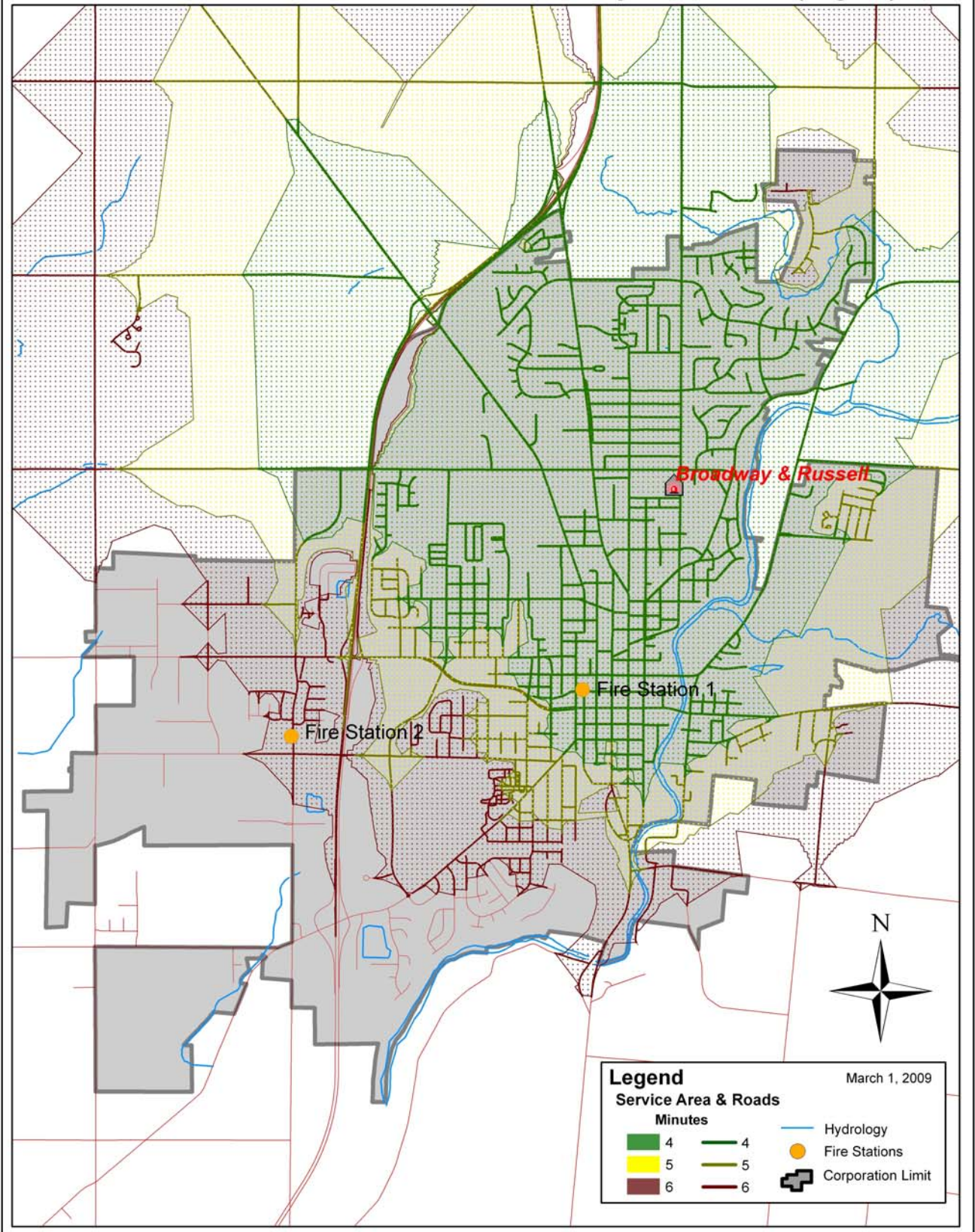
Legend

- Fire Stations
 - Hydrology
 - ▭ Fire Sectors
 - ⬢ Corporation Limit
- Service Area & Roads Minutes**
- | | |
|---|---|
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |

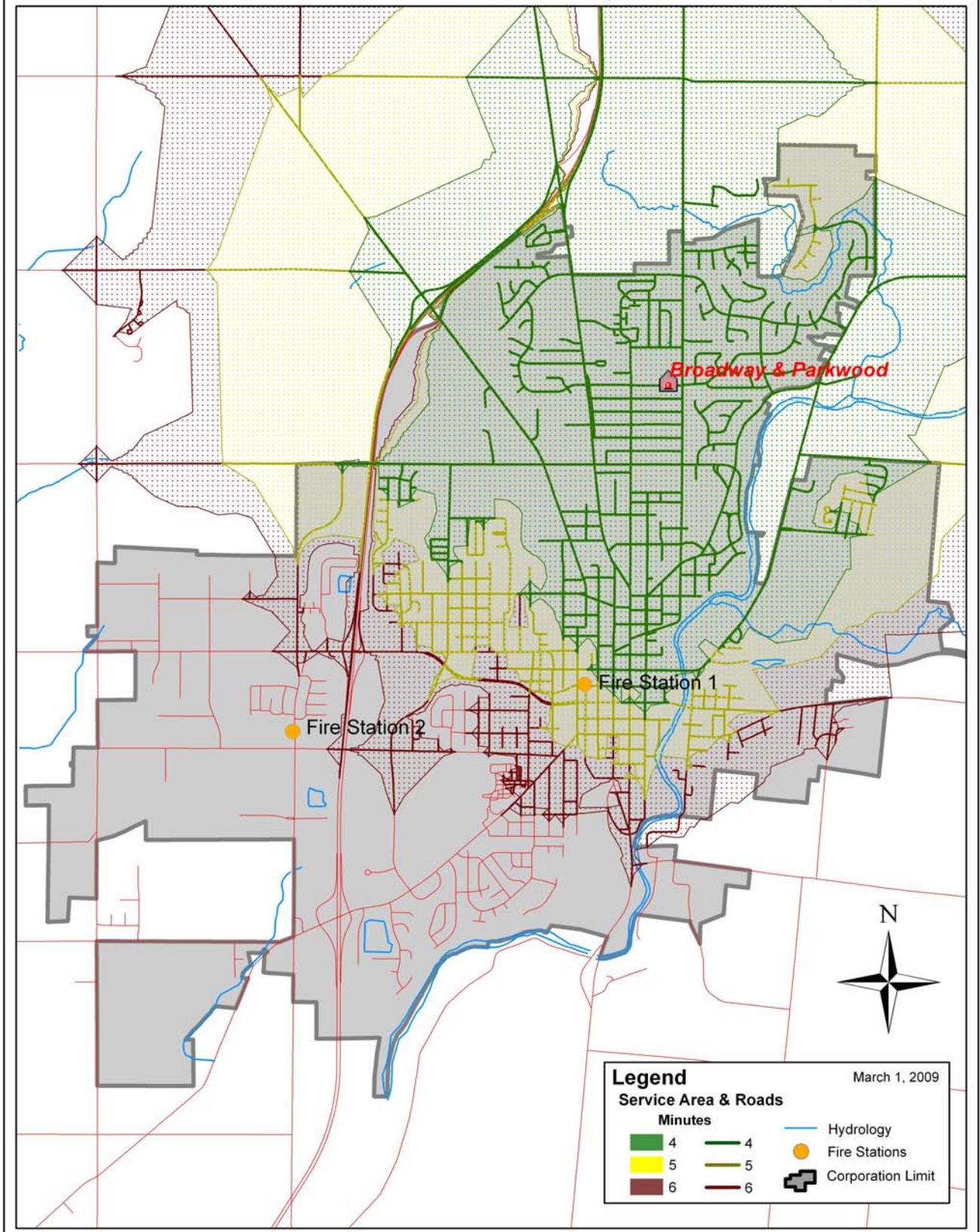


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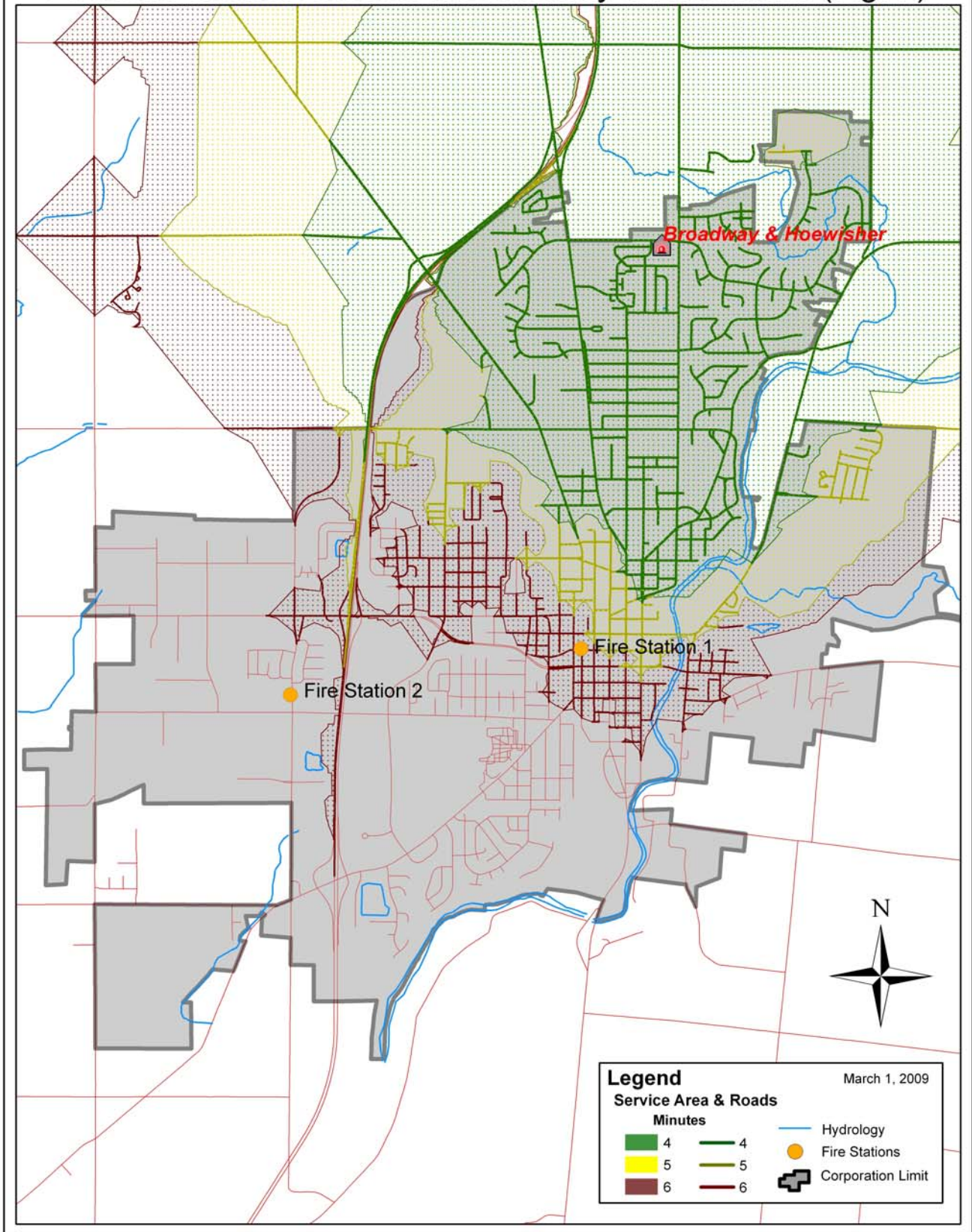
Potential Station Located at Broadway & Russell (Fig. 5)



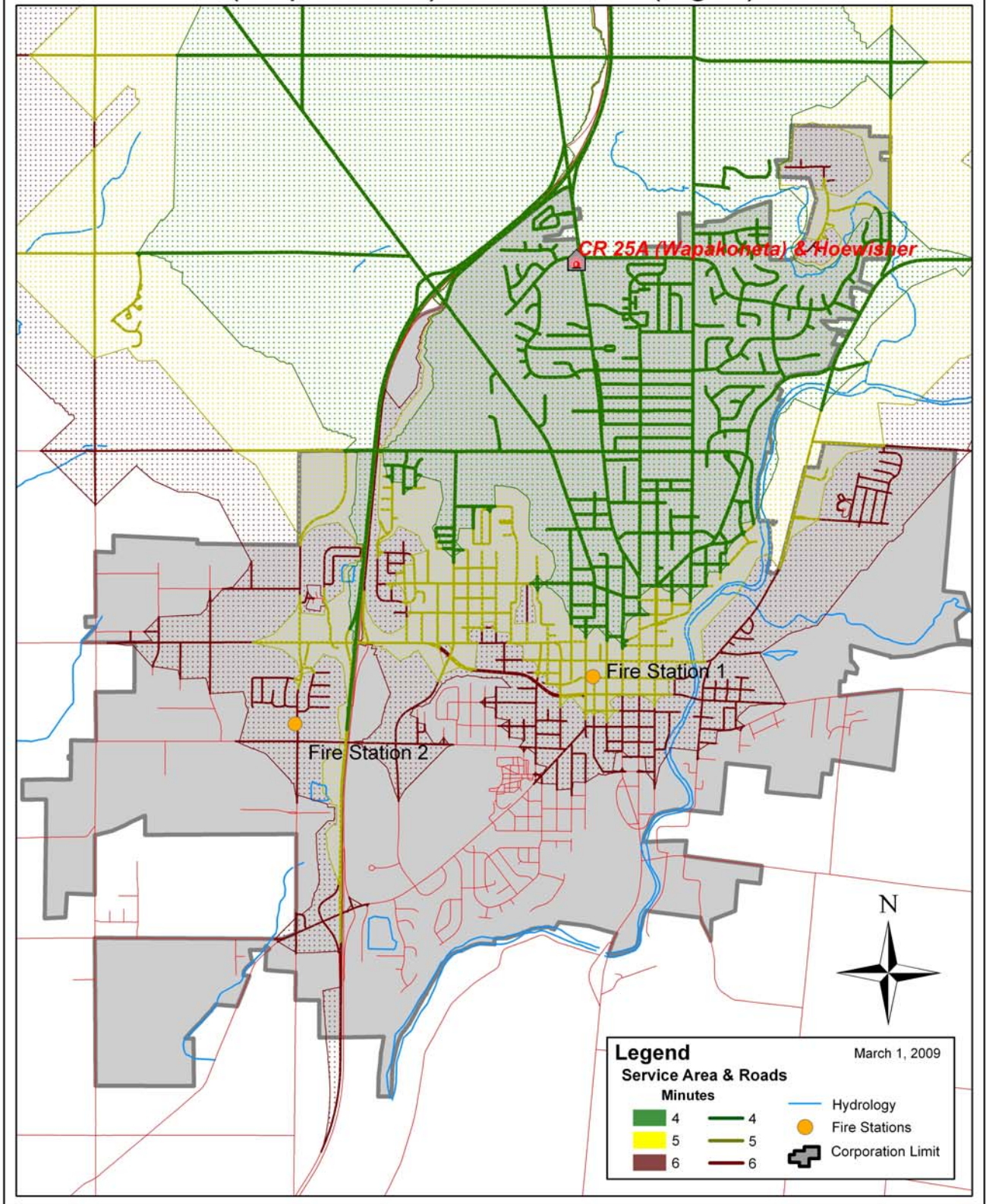
Potential Station Located at Broadway & Parkwood (Fig. 6)



Potential Station Located at Broadway & Hoewisher (Fig. 7)



Potential Station Located at CR25A (Wapakoneta) & Hoewisher (Fig. 8)



Potential Station Located at Hoewisher & Parkwood (Fig. 9)

