

**Should Twinsburg, Solon and Reminderville
Create an Automatic Mutual Aid Territory?**

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CERTIFICATION STATEMENT

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ABSTRACT

The problem this study addressed is the lack of an organized response to calls between communities that have fire stations close together but not working together. The City of Twinsburg, the City of Solon and the Village of Reminderville currently only work together on calls when specifically called.

The purpose of this study was to determine if an AMA territory can be a satisfactory solution that would meet or improve the response requirements or if it would be better to continue the current system of operating independently.

Evaluative research was used to answer these questions: One: "If the AMA territory were to be created, is technology needed to facilitate each dispatch center to monitor and alert the other department(s) to a call?" Two: "How would unavailable units be replaced in the call response?" Three: "What kind of equipment and protocol conflicts are there between the departments?" Four: "Will current bargaining unit contracts be violated if the AMA territory is created?"

The author looked at the communities, staffing, distances between stations, the number of calls per department, communications, hydrant threads and medical protocols. All of these items were looked at to find out what possible problems might be encountered and if the territory should be limited to fire calls or include EMS calls.

The results of the research indicates that an Automatic Mutual Aid Territory is a good solution to the unorganized response to calls in the northeast part of Twinsburg, the southeast part of Solon and all of Reminderville. There is a potential for all three communities to arrive in short order to what sounds like a working fire so that the outcome of the incident would be much improved over having just one of the communities arriving alone.

The chief officers from the Twinsburg Fire Department, Solon Fire Department and Reminderville Fire Department should meet to review the results and decide if the communities should move forward with an AMA territory. If the chiefs agree with this recommendation, then they should create a committee to decide on the exact territory to be covered, come up with a communications plan, any backup assignments, what would be the chain of command and anything else that comes up.

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INTRODUCTION

Statement of the Problem

The problem this study addressed is the lack of an organized response to calls between communities that have fire stations close together but not working together. The area encompasses part of three communities that have fire stations close to each other when all three fire departments operate differently and two of the departments have one or more other stations.

The City of Solon has three fire stations, the City of Twinsburg has two fire stations and the Village of Reminderville has one fire station. Solon and Twinsburg have stations that are close together and Reminderville's is not too far away.

Purpose of the Study

The purpose of this study was to determine if an AMA territory can be a satisfactory solution that would meet or improve the response requirements or if it would be better to continue the current system of operating independently. The plan was to find out what operational benefits each department would get for creating this territory and what kind of problems they may run into from the creation.

The idea of creating this territory would be to have each department respond to this area for fire alarm drops from their closest station and arrive faster than the home department's (department the call is located in) second station would have. With this happening, the home department would leave the other equipment in-service (available) for other calls. If the call sounds like a working fire, the home department would also send additional units. Another benefit would be faster response to emergency medical service calls when the home department's closest station is not available.

The research method chosen for this study was evaluative. This method was picked as the best option because the researcher must evaluate the call data and the community maps for all three fire departments to see what benefits and possible problems would result in the AMA territory being created.

The research questions this study investigated were:

1. If the AMA territory were to be created, is technology needed to facilitate each dispatch center to monitor and alert the other department(s) to a call?
2. How would unavailable units be replaced in the call response?
3. What kind of equipment and protocol conflicts are there between the departments?
4. Will current bargaining unit contracts be violated if the AMA territory is created?

BACKGROUND AND SIGNIFICANCE

The City of Solon had two fire stations that were located in the northwest and central part of its community. After investigating the best options, Solon decided to build a third station in the southeast end of its community.

While Solon was building station number three, Twinsburg City Council requested its Mayor contact the Mayor of Solon to see if they would provide fire and EMS protection to the northeast part of Twinsburg from the new fire station. Twinsburg was looking to fix a response issue to the area but had nothing to give Solon in return. Solon said they would provide regular mutual aid to Twinsburg when Twinsburg was unavailable because of other calls, but would not cover the area on a regular basis as it was spending the money to protect its own area.

With the City of Solon not providing coverage to Twinsburg, Twinsburg City Council decided to build a station on the best available property in the northeast end of its community.

At the same time the new station was being designed and built, there was a new connector road in the works that would shorten the distance between Twinsburg station one and the Solon border.

Table 1 presents the mileage from the individual stations to the Solon / Twinsburg border. A visualization of the area is shown on the map in Appendix 8

Table 1

Mileage to Solon / Twinsburg Border

	Solon / Twinsburg Border
Solon Station Two	2.7
Solon Station Three	0.6
Twinsburg Station One Before New Road	3.0
Twinsburg Station One After New Road	2.5
Twinsburg Station Two	0.6

The Village of Reminderville is Twinsburg's northeast border community. They opened a new fire station in 2005.

Table 2 shows the mileage from Reminderville's fire station.

Table 2

Mileage from Reminderville fire station

	Reminderville Fire Station
Reminderville / Twinsburg Border	0.9
Twinsburg Station Two	1.9
Solon / Twinsburg Border	2.5

Table 3 presents the census data that indicate the population increases in the three communities of Reminderville, Solon and Twinsburg. All three communities have grown since 1990, with Twinsburg having the biggest percentage increase of almost 81% in population. Solon increased by a little over 20% and Reminderville increased by 16%.

Table 3

Census

	Reminderville	Solon	Twinsburg
1990	2,163	18,548	9,606
2000	2,347	21,802	17,006
2005	2,512	22,335	17,380

There has been an agreement in place since October 1, 2001 between Solon and Twinsburg where both departments would respond automatically to fire calls in multi-tenant buildings in a small area in Solon and Twinsburg, with the originating department responding with multiple units and the other department sending one unit. This arrangement has worked sporadically since the inception with the underlying problem possibly being either human or computer or both. Since neither fire department oversees the dispatchers, it has been extremely difficult in correcting the problem.

Prior to Twinsburg opening station two, Reminderville was being used as a first responder in the areas of Twinsburg that Reminderville could get to faster than Twinsburg could. This arrangement worked OK as long as the Twinsburg dispatchers remembered to alert Reminderville at the same time Twinsburg was alerted. Since Twinsburg Fire has no authority over the Twinsburg dispatchers, the only thing that could be done was to remind the dispatchers

to page Reminderville immediately and complain to the police chief of the problem. Once Twinsburg station two opened, the AMA with Reminderville ended as Twinsburg was able to arrive in a timely manner.

Table 4 below shows the total number of calls for each community, but does not break-out the calls that the stations in the AMA area covered. Table 5 shows how many calls the stations in the AMA area covered.

Table 4

Total Calls

	Reminderville	Solon	Twinsburg
2004	243	2,361	2,192
2005	236	2,536	2,289
2006	205	2,444	2,168
2007	236	2,677	2,234

Table 5

Calls the AMA area stations covered

	Reminderville	Solon	Twinsburg
2004	243	461	514
2005	236	614	518
2006	205	589	441

Currently the Twinsburg Fire Department responds to fire alarms with a shift commander in his vehicle, an engine or aerial and a medic unit out of station one and an aerial out of station two. If the call sounds like it is a working fire, a chief officer responds and the shift commander

requests a mutual aid box alarm assignment (MABAS) for the appropriate zone and a recall of off-duty personnel. For the area that is being discussed, Solon is requested for an engine or aerial depending on the hazard level, Reminderville is requested for an engine company and Hudson EMS is requested for a medic unit.

Reminderville responds to fire alarms with an engine and if it sounds real would also call Aurora for an engine and Twinsburg for a ladder.

Solon responds to a fire alarm with an engine and medic unit out of the closest station, the shift commander from station two and an engine from the next closest station. If the call is a working fire, dispatch notifies the chief and assistant chief of this and one of them will also respond. The third station will also respond when it is a working fire to be used as a rapid intervention team (RIT) with mutual aid called for additional resources. If both stations will be committed to a call for longer than an hour that is not a working fire, the station furthest from the scene moves up to the middle station to cover the city.

The above information indicating how the departments currently respond to fire calls is to help the reader understand how much equipment responds to fire alarms.

One of the questions that need's to be asked is, should this agreement involve all types of emergencies or just fire calls? In other words, if the medic unit at Solon station three is out of the district, would it be better if the medic unit at Twinsburg station two handled the call? Other departments such as communities around Dallas have looked at dropping the community border in favor of sending the closest unit. By having Twinsburg station two handle the call, the patient would receive medical care faster than if another medic unit from Solon responds.

The item that will have to be closely evaluated for the proposal of the closest unit responding will be if the dispatchers can monitor the activity of the other department's units by computer and notifying them in a timely fashion.

An AMA territory could result in the same number of units arriving at scenes for alarm drops while leaving more units in each community in service, and more units arriving quicker for real fires.

The potential impact this study could have on all three fire departments is a few more mutual aid calls, but would have a better response to the scene.

LITERATURE REVIEW

Clet and Larson (1998) investigated the problem of response time to the scene and patient. They first had to define response time to include the phone call, dispatching the units, turnout-time, and travel-time. They looked at using automatic aid from a department that had a closer station but discovered that the only way for this to work was to use technology to speed up the transfer of information. They now have the dispatch centers connected so that both departments can receive information almost simultaneously.

Cooley (2003) explained the on-again off-again AMA between the City of Roseburg Fire Department and the Douglas County Fire Department in Oregon. The agreement started in 1975 and worked until the Douglas County Fire District No. Two built a new fire station headquarters in July 1979. When the new stations were built and old ones closed the agreements would change because the response times for the area were changing. The new station was farther away from the city line which meant that the city ended up covering not only all of its territory

but more of the county's with less help from the county. So in September of 1979 the automatic aid ended.

Cooper (1999) evaluated improving response times by not looking at jurisdictional boundaries but by looking at the fire station locations in the area. He discovered that by doing this the departments could improve response times, save some departments from actually responding when the call was minor and reduce duplicated equipment between departments. So he made the recommendation that the Cities of Balch Springs and Dallas and Dallas County in Texas, drop jurisdictional boundaries for responding to calls.

Ellis (2000) looked at consolidating fire protection services in fourteen communities in central Penobscot County, Maine to just one department. Two of the main reasons to look at consolidating are cost savings and increased service levels. Other studies had been done to consolidate the departments but there were too many turf wars at the time. During his study he discovered that some of the turf wars had ended and members of the different departments would work with each other, but not everyone was in agreement that one department was the way to go. Mr. Ellis came to the conclusion that as long as the departments started working together in such areas as training and AMA and eliminating political boundaries so the closest available units could handle the emergency, then improvements in service would be seen.

Hoback (2001) investigated the possibility of having automatic aid in the Roanoke Valley of Virginia. Several communities were in the position of stagnate income with increased calls for service. The area consisted of full-time and volunteer fire departments. Some fire departments would respond past other fire stations to get to calls in their own territory before calling for help because calling for help was a sign of weakness. Chief Hoback recommended regionalization of the area and create a task force to manage the transition.

Marentette (1999) studied the potential for consolidating fire departments in Muskegon County, Michigan. The county consists of ten fire departments that have different types of equipment, different hydrant threads, different size hose and different policies. The study pointed out that the consolidation would save money and allows all the departments in the county to have similar equipment and reduce duplication of equipment. It also showed that AMA agreements allowed better response in areas that would normally only have one department respond to an incident.

Roe (2001) looked at the community growth in the cities of Clive, Urbandale and West Des Moines, Iowa along with the fire stations to determine the most efficient way to deliver the best possible customer service in the area. He looked at station locations, radio communications, operating procedures and joint purchases to name a few. When he was done, he made some recommendations with the ultimate recommendation that the communities should work together. The city of Clive ended up making agreements with different communities for different services to help their problem.

Simkins (2004) studied the feasibility of automatic aid in the Knox County area of Illinois. The study involved a full-time department and five volunteer departments. There were some concerns that the full-time department would be giving the majority of the aid but it was felt that overall it would be a good idea. He felt that the agreements would work well to help resolve emergencies quicker, save more lives and give the departments a good public relations atmosphere.

Yang, Baiyu; Viswanathan, Krishnan; Lertworawanich, Ponlathep; Kumar, Sendil (2000) used math and computer simulations to study the fire station districting in the Centre Region of Pennsylvania. They tried six different scenarios to figure out what would be the best response to

calls for service using three different stations. They discovered that there were times that it would be better to have units from a different district respond to calls because they could arrive faster than the originally assigned station. Another result that came out of this study was that the number of calls per station would actually even out by following the recommendations of this study.

To summarize the literature, AMA can work if the parties work together to create a territory with policies and needed equipment that will provide the best service to the public and to the employees. A good AMA program will provide the same amount of personnel, or more personnel depending on the call, to the scene and reduce response time. There is also a possibility of reduced costs because of not duplicating equipment.

PROCEDURES

The information was compiled by reviewing literature from the National Fire Academy's Learning Resource Center, the Twinsburg Fire Department, Solon Fire Department, the U.S. Census Bureau, Reminderville Fire Department MABAS book, Official Street Atlas of Akron, Summit and Portage Counties, Official Street Atlas of Cleveland and Cuyahoga County.

Solon Assistant Fire Chief (A/C) Steve Shebeck responded to e-mails regarding the on-duty staff levels, what the response procedures they use for fire calls, hose information and call totals for 2007. This information was used to help compare all three departments.

The author met with Twinsburg Dispatcher Ron Good and asked these questions: One) What software is used for monitoring FD units in dispatch? Two) Can another agency (Solon Dispatch) be able to monitor FD units? Three) Can Twinsburg Dispatch monitor Solon Dispatch? And Four) How does dispatch track units out of service? This information was needed to see how compatible the two dispatch centers were and how easy it would be for the dispatchers to see what units were available in the other communities.

The author also met with Solon Battalion (B/C) Chief Mark Vedder: One) What software is used for monitoring FD units in dispatch? Two) Can another agency (Twinsburg Dispatch) be able to monitor FD units? Three) Can Solon Dispatch monitor Twinsburg Dispatch? and Four) How does dispatch track units out of service? This information was needed to see how compatible the two dispatch centers were and how easy it would be for the dispatchers to see what units were available in the other communities.

Thomas A. Craven, owner and programmer of the Twinsburg dispatch software responded to an e-mail about what his software could do. Specific questions were: One) Can we continually send Solon the status of our vehicles from the dispatch console? Two) Can our

dispatch consoles accept input from Solon on the status or their equipment? Three) Is there a way that our dispatch can easily enter & monitor our vehicles when they are on the road & available somewhere in the community? Four) Is there a way that the color of the status screen can change based on the status of the vehicle? And Five) Can the vehicles be arranged on the monitor based on the fire station they are assigned too? I had to make this contact as the Twinsburg dispatcher did not have all the answers.

A questioner was sent to the Fire Chiefs of Reminderville and Solon to get additional information on their respective departments to compare with Twinsburg. The author answered the questions for Twinsburg.

The questioner for Reminderville asked these questions: One) What is the number of calls per year since 2003? Two) What is the number of fire calls per year since 2003? Three) What is the number of EMS calls per year since 2003? Four) What is the number of out of town mutual aid calls per year since 2003? Five) What is your current response to a fire alarm in the area? Six) What is your current response to a reported structure fire in the area? Seven) What is your current MABAS for a structure fire in the area? Eight) What hospital is your medical protocol under? And Nine) What hose threads are your fire hydrants?

The questioner for Solon asked these questions: One) What is the number of calls per year since 2003? Two) What is the number of calls per year since 2003 from station number three? Three) What is the number of fire calls per year since 2003? Four) What is the number of fire calls per year since 2003 from station number three? Five) What is the number of EMS calls per year since 2003? Six) What is the number of EMS calls per year since 2003 from station number three? Seven) What is your current response to a fire alarm in the area? Eight) What is your current response to a reported structure fire in the area? Nine) What is your current

MABAS for a structure fire in the area? Ten) What hospital is you medical protocol under? and Eleven) What hose threads are your fire hydrants?

The author answered these questions: One) What is the number of calls per year since 2003? Two) What is the number of calls per year since 2003 that station number two would have handled? Three) What is the number of fire calls per year since 2003? Four) What is the number of fire calls per year since 2003 that station number two would have handled? Five) What is the number of EMS calls per year since 2003? Six) What is the number of EMS calls per year since 2003 that station number two would have handled? Seven) What is your current response to a fire alarm in the area? Eight) What is your current response to a reported structure fire in the area? Nine) What is your current MABAS for a structure fire in the area? Ten) What hospital is you medical protocol under? and Eleven) What hose threads are your fire hydrants?

The information collected allowed the author to look at how busy the departments were and figure out if they would have enough time to respond to additional calls. Staffing levels were looked at to see how many members would be responding on the AMA calls and how many, if any, would still be available for the remainder of the communities. The other information was used to see if there would be any compatibility issues with equipment, protocols and procedures. Solon and Twinsburg were asked a couple of additional questions because they have more than one station.

During normal mutual aid, compatibility of equipment isn't always a problem because help is usually called for after the home department is on-scene and their equipment is already in place when the mutual aid department arrives. The mutual aid department simply pulls more hose from the initial truck or trucks and goes to work. With AMA, there is a possibility that the mutual aid department would arrive first which means their equipment would get used. If their

hose threads are not the same, there could be a problem unless planning was done beforehand to make sure adapters were in place. Protocols and procedures were looked at for similar reasons because no one would want to start treating a patient or start something else to find out that there was incompatibility between the departments.

Definition of Terms

MABAS. Mutual Aid Box Alarm System is a list of preset instructions for the dispatcher to follow.

On-duty. Amount of personnel currently working.

Un-Official Fire District. An area between two or more communities that will have fire protection from more than one fire department that does not have to follow Ohio Revised Code 505.371.

Official Fire District. An area between two or more communities that must follow Ohio Revised Code 505.371.

EMS. Emergency Medical Service.

Zone. A designated area of a community.

Automatic mutual aid (AMA). A prearranged response of one fire department's resources to another fire department.

Mutual aid. An agreement between fire departments to assist another department when called.

National Standard Thread (NST). Nationally accepted design of hose threads.

Cleveland Hose Thread. Hose thread Cleveland Water specifies.

Working fire. Any time fire is damaging property.

Quint. A fire truck with pump, water tank and aerial device.

Speed dial. Phone systems that have phone numbers programmed into it so that very few buttons would have to be touched to dial the number.

Limitations of the Study

The limitations included not having the financial information for each department and how they calculate the cost of a call. Other issues not included are what radio frequency would work best, how far into the other community should the AMA territory go and how long does dispatch have to inform the other community that they are not available to respond. The biggest issue is being able to look for computer software that would allow the dispatcher of one community to monitor the activity of the other community's fire department when the dispatch centers do not use the same software.

RESULTS

Answers to Research Questions

Question one asked, "If the AMA territory were to be created, is technology needed to facilitate each dispatch center to monitor and alert the other department(s) to a call?" By talking to Solon B/C Vedder and reading the e-mail from Thomas Craven, the technology is available.

Question two asked, "How would unavailable units be replaced in the call response?" The author talked to Solon Chief Shaw and Twinsburg Chief Racine to get their input on this. Any unavailable unit would be replaced by the home department responding another station to the scene or calling the next unit in the MABAS, whichever is closer.

Question three asked, "What kind of equipment and protocol conflicts are there between the departments?" Twinsburg and Reminderville both have NST connections on their 2 ½" hose hand lines and can connect without a problem. Solon uses Cleveland connections on their 2 ½"

hose hand lines which would require an adapter to connect to the NST hose. Twinsburg and Reminderville both have medical protocols from Bedford Hospital, with Solon using the protocol from South Pointe Hospital. There are some differences between the two protocols, but South Pointe is currently revising theirs to be very similar to Bedford's. Regardless of what protocol is being used, there is no restriction on what hospital the patient can be transported to.

The Twinsburg Fire Department is dispatched by the Twinsburg Police Department Dispatch Center. The author's interview with Twinsburg Dispatcher Ron Good provided the following information. The police department uses the Thomas A. Craven (TAC) Computer software for its reports, with the majority of the reports starting off in dispatch creating the event number. Dispatch also uses this system for all calls associated with the fire department. Some of the fields that the system has are the event number, date, location, caller and the times for all the fire department vehicles and any police officers that respond to call. Dispatcher Good was not sure if TAC could be monitored by Solon dispatchers or if Twinsburg would be able to monitor Solon's dispatch program. Twinsburg dispatch currently can listen to Solon Police on a separate radio, but can not hear Solon Fire. Twinsburg dispatch currently does not track Twinsburg Fire units that are out of service or on special details, but are working on it. Twinsburg dispatch also dispatches the Reminderville Fire Department on the same frequency.

The author's interview with Solon B/C Mark Vedder provided the following information. Solon Fire is dispatched by the Solon Police Department Dispatch Center. Solon uses Emergitech Inc. (Emergitech) software for dispatching units, and all the fire and police reports. Emergitech has a web based section called Intershare that would allow another dispatch center to monitor Solon Fire's vehicle status. Currently Solon Dispatch does not monitor Twinsburg Fire radio traffic, but they may have the frequency on a separate radio.

Solon's dispatchers are able to keep track of their vehicles fairly easy as Emergitech assigns vehicles by call type and location. The program even will take certain vehicles out of service based on the call, or the dispatcher can manually change vehicle status based on what they are told over the radio. Per B/C Vedder, if Ladder one is assigned to the call but Engine one is on the road from something else Engine one will respond and have the dispatcher change the assignment in the computer for that particular call.

One of the problems Solon has is that they can not tell exactly where a unit is when it is going from one location to another. For example, if Engine three was at station one for training and calls dispatch that they are leaving station one and going back to station three, dispatch does not know where the engine is until it calls out at station three.

Interoperable communications is available as all three departments are on the same radio band of 420 and they have each other's frequency in the mobile and portable radios.

All three communities have hydrants throughout the area; however there is a difference in hydrant threads. Twinsburg and Reminderville both have NST with Solon having Cleveland. This could slow down a department in hooking up a supply line from a fire hydrant, especially if they do not have an adapter on the truck to fit the hydrant.

The author also looked to see what medical facility is their medical control in case there was a big difference in medical treatment. Twinsburg and Reminderville use Bedford Hospital that has a progressive protocol in place for the EMS units to use. Solon uses the protocol from South Pointe Hospital that is currently being upgraded to be very similar to what Bedford Hospital's is. Regardless of what protocol is being used, there is no restriction on what hospital the patient can be transported to.

The type of staff and the number of on-duty members is different for each department. Twinsburg is a combination department with both full-time and part-time members with everyone but three being certified paramedics. Twinsburg has nine members per shift with a minimum of five full-time on duty at a time. The overall minimum manning is seven. Currently there is always three members' on-duty at station two with the remaining at station one.

Solon is an all full-time department with 18 members per shift and a minimum of 13 members' on-duty with four-six at station one and five-seven at station two and four-five at station three. All members of Solon are certified paramedics with the exception of six members.

Reminderville is an all part-time department with three members on-duty at a time. All of the members are certified paramedics. The chief will also respond to calls when he is available.

The primary response vehicles at Twinsburg station one are two medic units, an aerial platform, an engine along with some reserve and special units. Twinsburg station two has a medic unit and a quint.

The primary response vehicles at Solon station one are one medic unit, an engine and an aerial platform along with some reserve and special units. Solon station two has two medic units, an engine, heavy rescue and the shift commander. Solon station three has a medic unit and a quint.

Reminderville's response vehicles are two medic units, an engine and a reserve engine / heavy rescue. They also have a utility vehicle they use to run errands.

Twinsburg has Mobile Data Terminals (MDT's) in their primary response vehicles to cut down on some of the radio traffic. They are not used to replace all the radio traffic, just some of it. For example when the MDT's are operating, the unit makes a general announcement over the

radio as to what they are doing (en route to the scene, at the scene, en route to the hospital and which hospital, at the hospital, returning from the hospital, back in quarters) but the dispatcher does not have to answer them. If the MDT is down, then all radio traffic must be directed to dispatch and the dispatcher must answer and enter the information into TAC. With the MDT's working, the dispatcher knows what the units are doing while at the same time they can be doing other things such as medical dispatching or calling for additional help from a mutual aid department. A mapping program is being looked at to assist the units in finding the location of the call.

Currently Solon has MDT's that has the mapping program in some of their vehicles and is looking at adding a dispatch feature, but it also will not replace all the radio traffic.

Reminderville has not done anything with vehicle mounted computers.

Question four asked, "Will current bargaining unit contracts be violated if the AMA territory is created?" Both Twinsburg and Solon have union contracts while Reminderville does not. Twinsburg has an article that does not allow contracting out work, while Solon has an article that does not allow volunteer or part-time personnel to do full-time employee work. Neither of the contracts would be violated with the creation of the AMA territory because Twinsburg would not be contracting Solon or Reminderville to do the work and Solon would not be contracting with Twinsburg or Reminderville employees.

DISCUSSION

Research on creating an automatic mutual aid territory between Twinsburg, Solon and Reminderville resulted in similar findings as to what others found. The idea for this is that the three departments have stations that are fairly close, and there are areas in Twinsburg that

Solon's and Reminderville's stations are closer than Twinsburg's main station. The same can be said for areas in Solon.

Clet and Larson (1998) looked at AMA, but discovered that it would only help with improving response time if the dispatch centers could be connected. The technology is available that Twinsburg and Solon could view what the other department is doing so the closest department could be dispatched. At this time the fastest way to find out if the other department is available and have them alerted is to speed dial the dispatch center by phone and verbally give the information to the dispatcher so the department can be dispatched.

With Twinsburg dispatching Reminderville, this actually would make it easier for Twinsburg and Reminderville to create an AMA territory between the two departments. Both Twinsburg and Solon would have to purchase software and hardware to monitor the other's units. Twinsburg dispatch and Solon dispatch could make room for the required computer monitors.

Cooper (1999) looked at removing jurisdictional lines to improve response times by having the closest station respond to emergencies. Twinsburg and Solon have areas that the other department's station is closer than their own second station is. Cooley (2003) discovered that when stations are moved departments must re-evaluate AMA territories to make sure they are still fair so that one department isn't providing all the aid. Twinsburg and Solon did not move stations but added stations which meet the same criteria that AMA territories should be re-evaluated.

Hoback (2001) explored four departments that operate differently, two full-time and two volunteer, but have similar problems in that some areas of their territories were hard to get to in a timely manner but one of the other departments could get there quickly. The recommendation

was to regionalize so that the closest department would be the one dispatched. Twinsburg, Solon and Reminderville all operate differently. Twinsburg has full-time personnel as the primary members, but use part-time members to keep the on-duty staffing level at full strength the majority of the time. Solon is a totally full-time department that is rarely at full strength because of people being off. Reminderville is a totally part-time department that depends on its members to work the shifts they sign up for.

Ellis (2000) and Marentette (1999) looked at consolidating fire department services in their areas. They discovered that consolidating would reduce costs for some areas, but each community would lose control of operations. Both felt that instead of actually consolidating the departments that each department should work together in creating AMA responses to resolve the overall problem of not having the staff on scene in a timely fashion. Issues such as county lines with different tax rates; full-time, full-time/part-time, all part-time departments; pay scales; consolidation would not work between Twinsburg, Solon and Reminderville, but an AMA territory is definitely something that could be looked at.

Roe (2001) evaluated and recommend having the closest unit respond to calls between three departments, provided communication, operating procedures and member buy-in was accomplished. Simkins (2004) discovered there were definite benefits to having the closest unit's respond to emergencies as lives and property could be saved and would result in better relations with the public. Twinsburg, Solon and Reminderville would not necessarily be the primary unit to the majority of the AMA calls because the home department station in the AMA territory has the closest units, but they could be a good secondary unit or backup unit.

Yang, Viswanathan, Lertworawanich and Kumar (2000) used math and simulation to look at what would be the best response plan to calls. By using maps and programs that can look

at speed limits, simulations can be done to find the best AMA territory. Twinsburg and Solon both have access to review maps to see what would be the best areas to be in the AMA territory.

By creating an AMA territory, for alarm drops the host department could keep their second station in-service for another call. For calls that sound like they are actually working fires, additional resources would be immediately sent from the host department along with the AMA department so that enough resources are on scene in a timely fashion which would provide a safer environment for the public and firefighters. For EMS calls when the primary station is not available for whatever reason, the AMA department that was in quarters could arrive faster than the host department, which could give the patient a better outcome.

The AMA territory would create additional calls for all the departments involved, but the benefits of having closer units responding and other units available for other calls would overcome the drawbacks.

RECOMMENDATIONS

The result of the research indicates that an AMA territory is a good solution to the unorganized response to calls in the northeast part of Twinsburg, the southeast part of Solon and all of Reminderville. There is a potential for all three communities to arrive in short order to what sounds like a working fire so that the outcome of the incident would be much improved over having just one of the communities arriving alone.

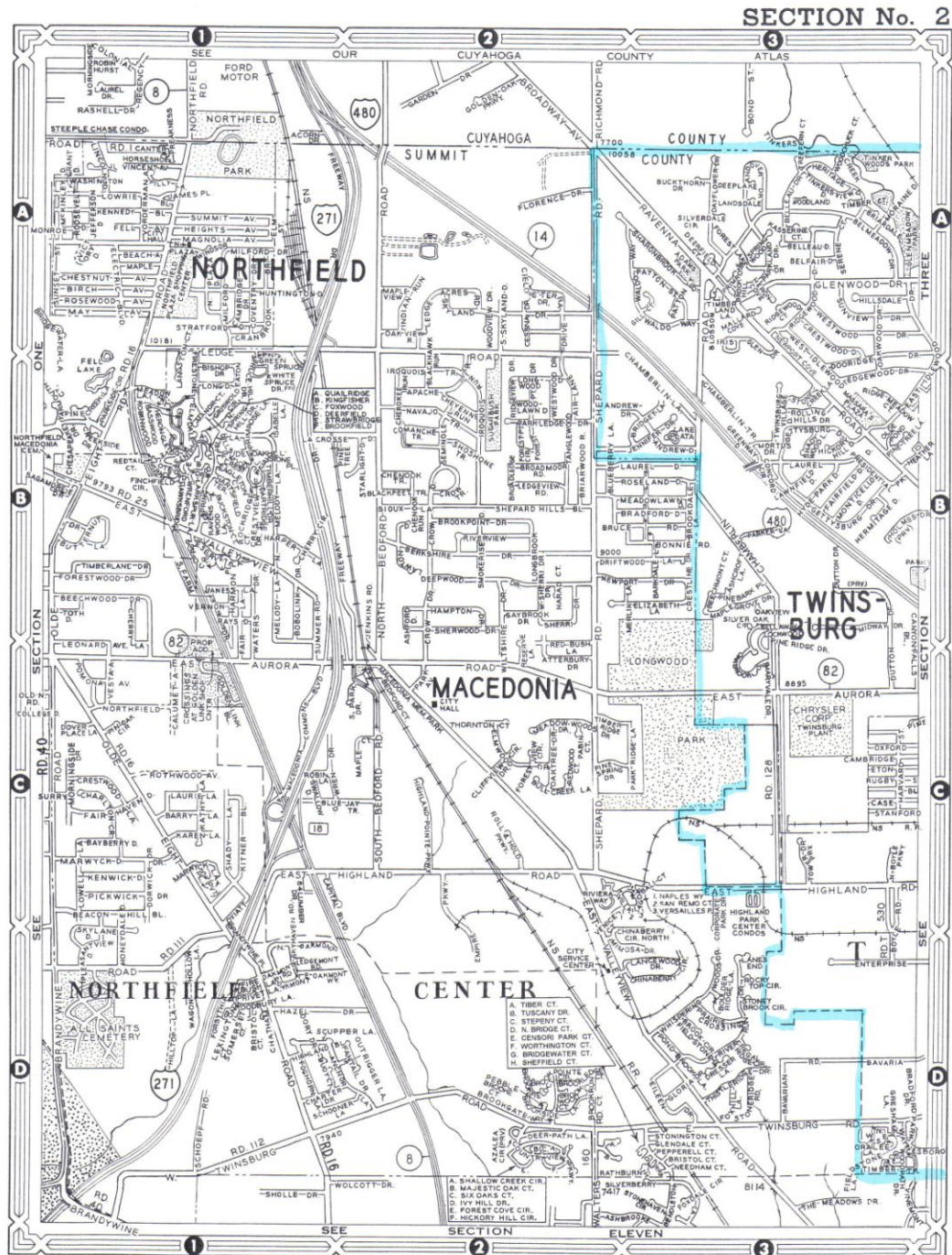
The chief officers from the Twinsburg Fire Department, Solon Fire Department and Reminderville Fire Department should meet to review the results and decide if the communities should move forward with an AMA territory. If the chiefs agree with this recommendation, then they should create a committee to decide on the exact territory to be covered, come up with a communications plan, any backup assignments, what would be the chain of command and anything else that comes up.

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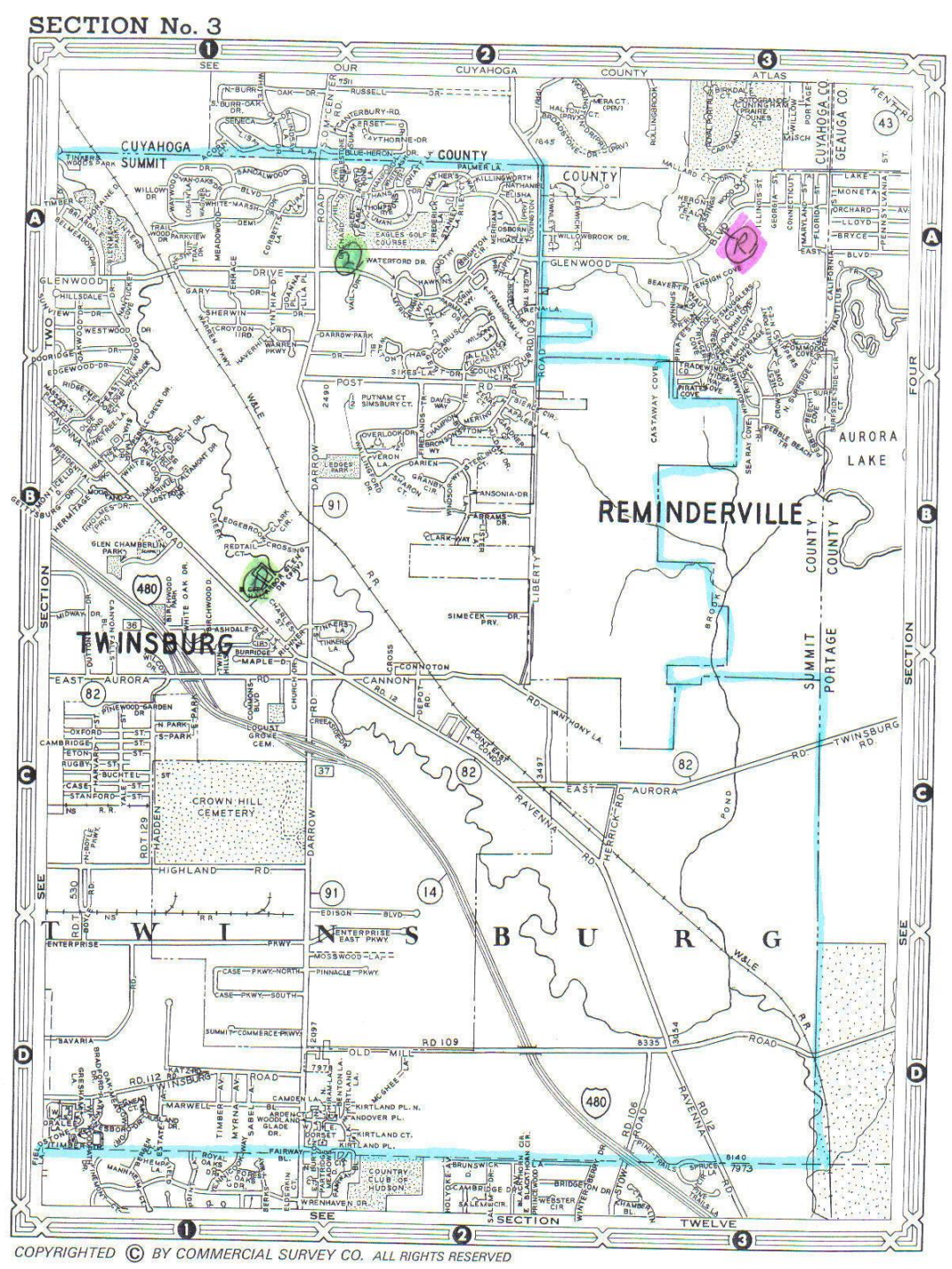
APPENDIX 1 – MAP 1 OF TWINSBURG



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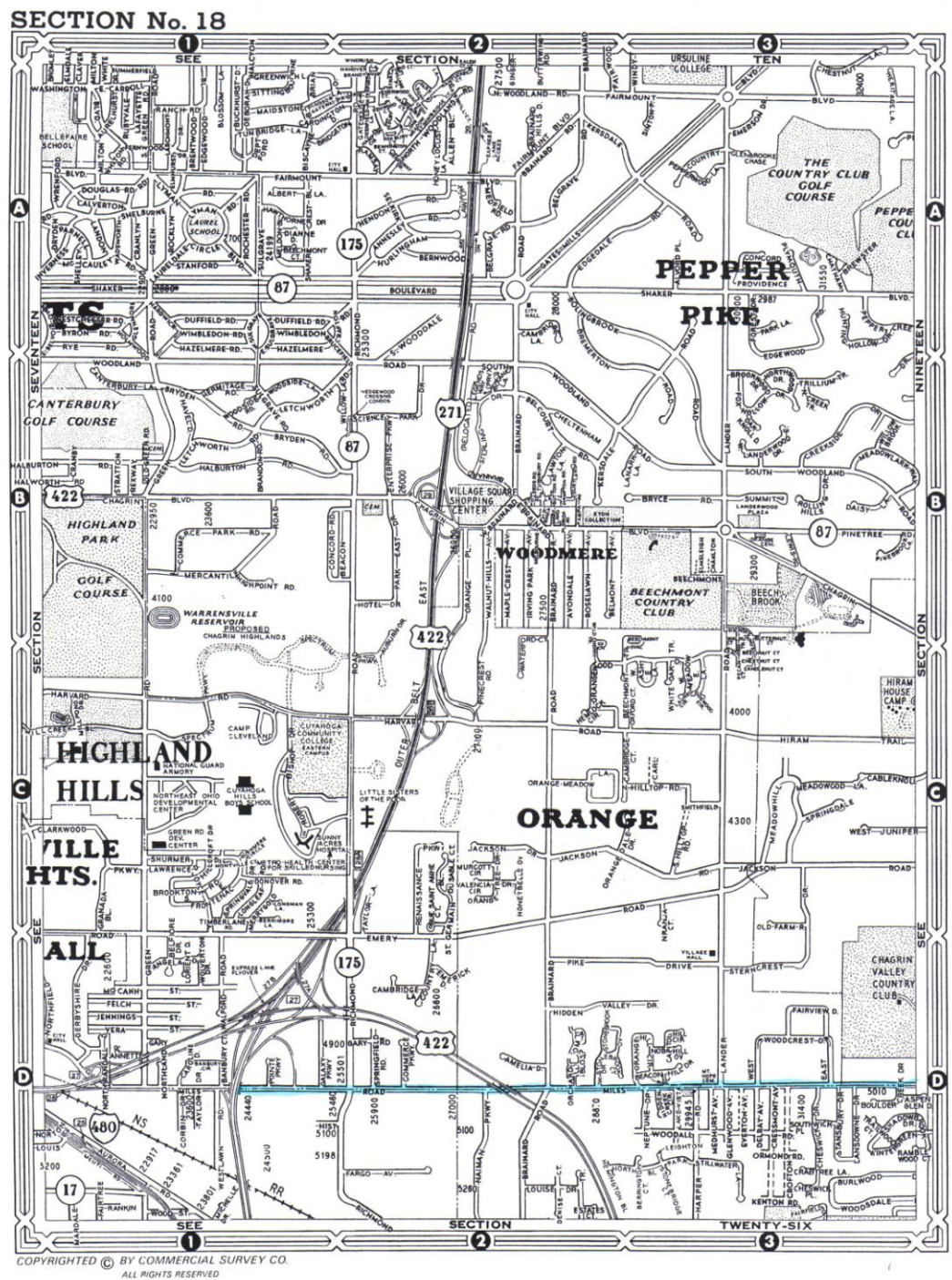
APPENDIX 2 – MAP 2 OF TWINSBURG

Fire stations 1 and 2 are marked along with the Reminderville fire station.



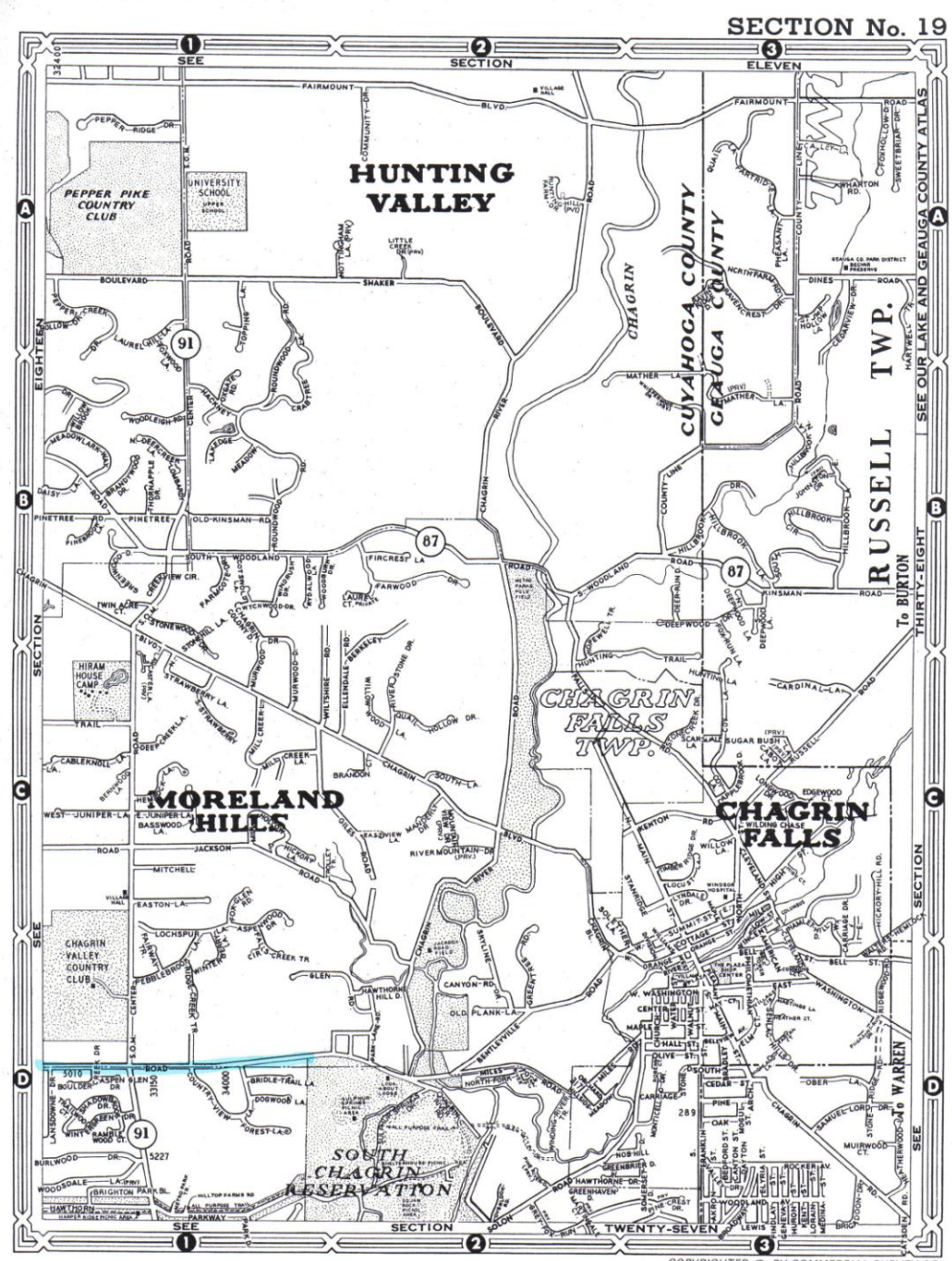
APPENDIX 3 – MAP 1 OF SOLON

Northern part of Solon.



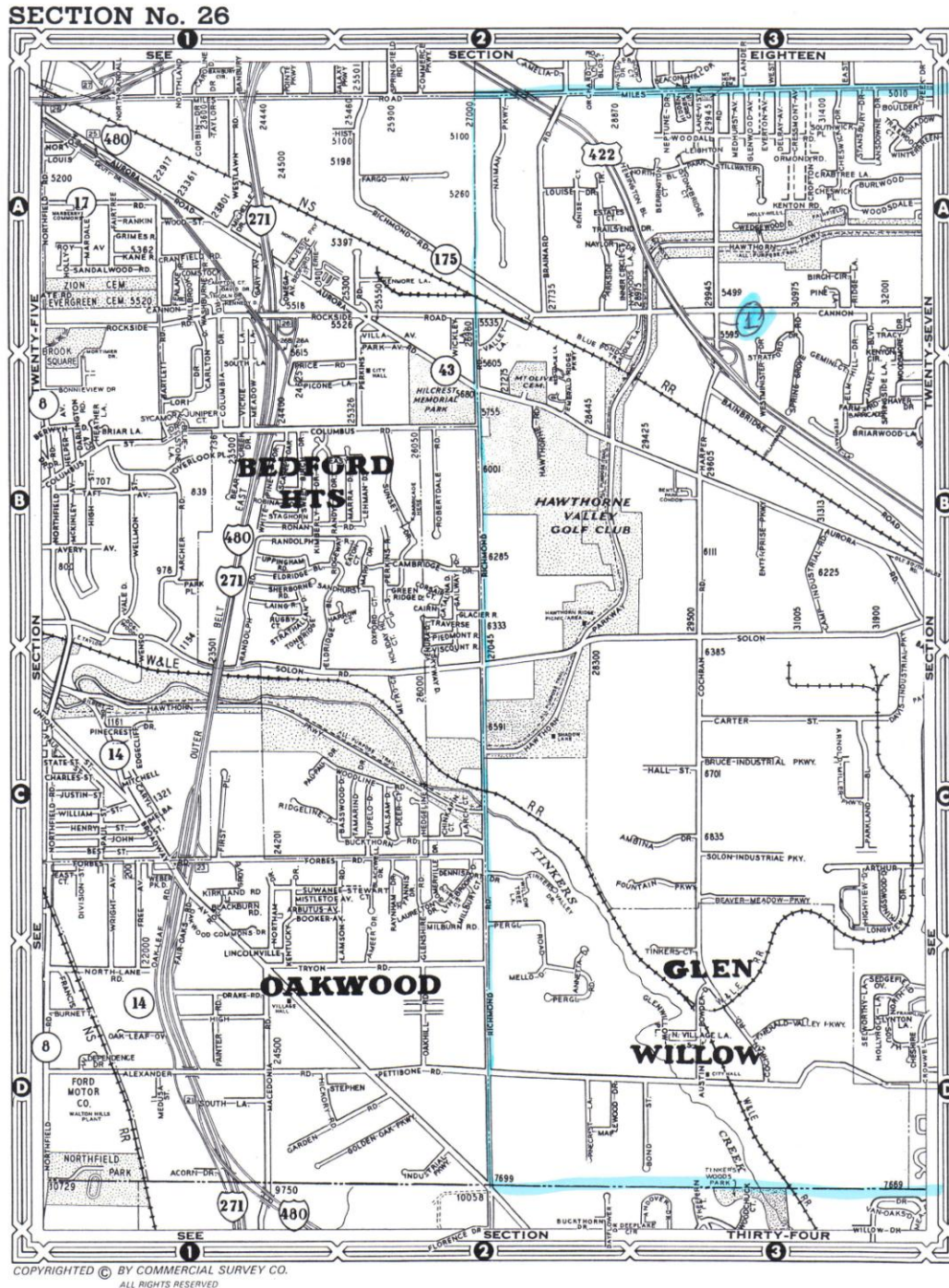
APPENDIX 4 – MAP 2 OF SOLON

Northern part of Solon.



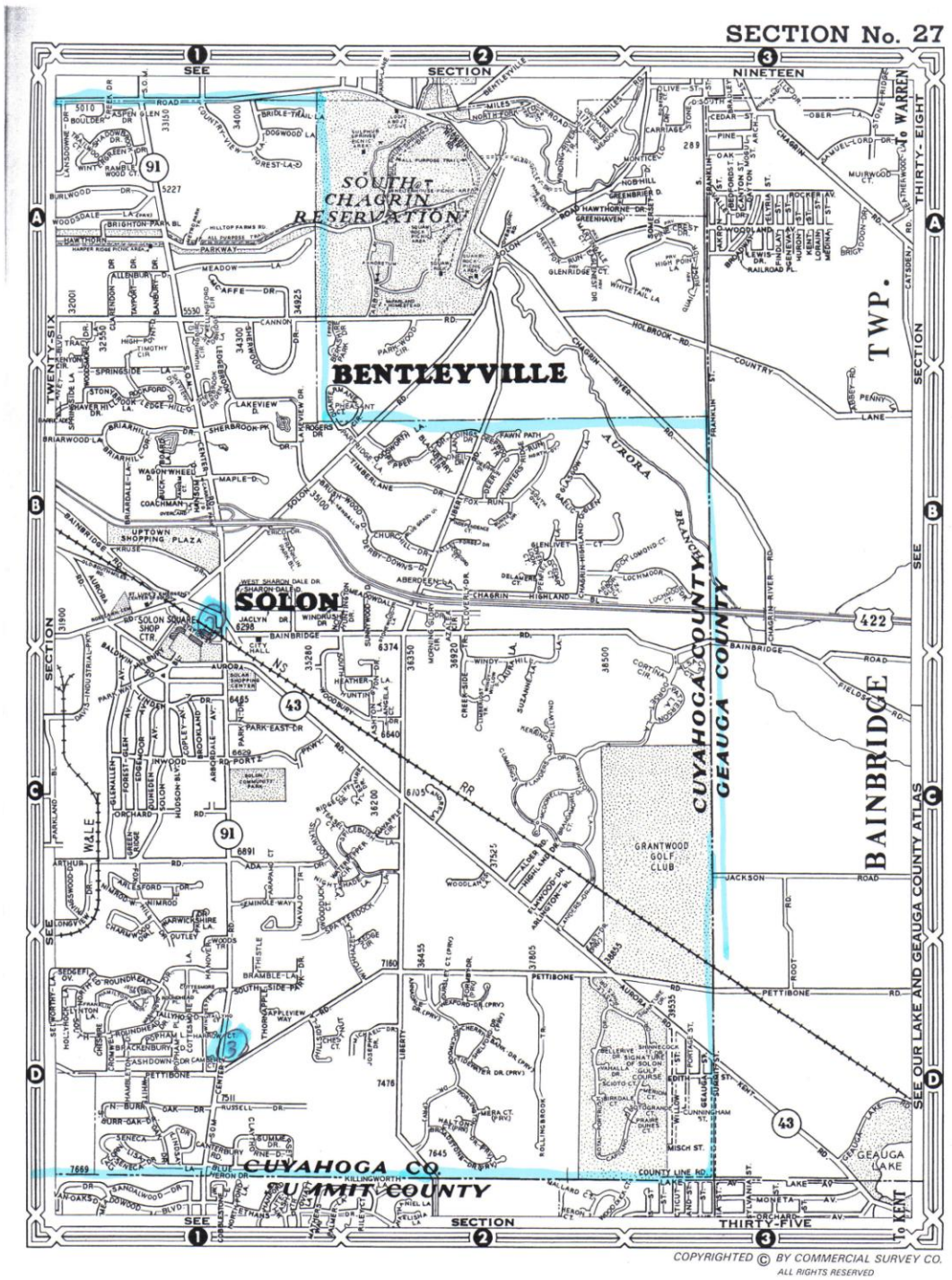
APPENDIX 5 – MAP 3 OF SOLON

Solon fire station 1 is marked.



APPENDIX 6 – MAP 4 OF SOLON

Solon fire stations 2 and 3 are marked.



APPENDIX 7 – SOLON RESPONSE ZONES



APPENDIX 8 – COMBINED MAP

Twinsburg fire stations marked in red, Solon in blue and Reminderville in orange.

