Portage County and City of Stevens Point

Emergency Medical Services

Master Plan

July 2006

Emergency Services Consulting inc.

Portage County
City of Stevens Point

Emergency Medical Services

Master Plan 2006

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Executive Summary

Purpose of This Report

This Emergency Medical Services Master Plan for Portage County, Wisconsin is offered in response to a joint request by Portage County and the City of Stevens Point Fire Department. The purpose of this master plan was to review and analyze current deployment of emergency medical resources within Portage County and to assess future needs specific to resource deployment, staffing, and operational policies.

ESCi would like to thank the staff and elected officials of Portage County and the City of Stevens Point for the excellent cooperation in the preparation of this report. All involved were candid in their comments and provided a large amount of information in a short period of time.

Each report objective provides the reader with general information about that element, as well as specific observations and analysis of any significant issues or conditions that are pertinent to the topic discussed. Observations are supported by data collected during the information gathering process, through analysis of the collected data, and from the collective emergency services experience of the ESCi consultants. Finally, specific findings and conclusions are included to resolve identified issues and to take advantage of any opportunities that may exist.

Section I

Section 1 includes a detailed review of the resource deployment and staffing systems in place by the Stevens Point Fire Department in its provision of emergency medical services (EMS) with Portage County. Ancillary supports systems within EMS systems have been reviewed as well to understand in totality, the system in place for emergency medical incidents.

The criteria used to evaluate the department have been developed over many years. These criteria include relevant guidelines from national accreditation criteria, the National Fire Protection Association, federal and state mandates for EMS systems, recommendations by various medical communities (AMA, FACEP), and generally accepted practices within the EMS industry.

From the standpoint of general policy, ESCi recommends that Portage County and the Stevens Point Fire Department formally adopt a set of performance objective to guide the EMS resource deployment and provide a measurement of service quality. As suggested within this study, an assessment of customer expectations should be surveyed prior to the finalizations of these performance objectives.

There are areas within Portage County which benefit from the current deployment scheme and many other areas that do not. Although the current deployment is located in the area with the highest service demand, residents further away from the city, face increasing response times due to this deployment. In order to achieve a more balanced response time performance countywide, changes in the deployment of resources which include additional apparatus, facilities, and staffing must be considered.

Through analysis of current system deployment and system performance, ESCi is able to identify several issues where improvement can be achieved. These issues are summarized in the following paragraphs.

- **Unbalanced response time performance within the County**
  It can be stated that an acceptable six-minute average response time and 90 percent of calls are reached within 15 minutes of dispatch in the County. However, this is disputed by the fact that the majority of the time, travel times to many of peripheral areas in the County have taken in excess of twenty minutes. This unbalanced response time performance has been supported by the establishment of concentric response time objective zones with unrealistic expectations. Efforts to shore up this imbalance through the implementation of the rapid response unit and first responder financial assistance has had limited effect on the improvement of the system.

- **Financial support for an effective EMS system is inadequate**
  Inadequate financial support for existing system deployment has been found in the budget analysis, as it does not fund for contingency planning or growth development within the system. The method by which expenditures, revenue generation, and the disbursement of these funds is practiced creates a conundrum in which an atmosphere of mistrust is often created.

- **Organizational structure of the EMS system hinders effectiveness**
  The system oversight structure is so multifaceted and layered, that the system's ability to rapidly adjust to community needs has been hindered. The use of firefighter/paramedics has forced into question the fire protective needs of the City of Stevens Point, rather than the use of more cost-effective civilian EMS personnel.

- **System assets are not adequate for current deployment**
  The most important assets, the human resources, are trained to the highest level, but have challenges to meet in order to maintain this level. Facilities are rapidly becoming outdated, and the need for more space and more efficient design will become increasingly necessary. Although current in-service apparatus are in excellent condition, back-up apparatus are in fair to poor condition.

Section II

This section develops population and service demand projections necessary for the creation of future deployment strategies. It does so by examining current and future risk factors for the County which includes population projections, and socioeconomic and demographic compositions.

All of these factors translate into a community risk assessment of countywide variables that affect current and projected impacts on service demand.

Section III

This section provides the foundation to implement a long-term strategic approach to the balanced provision of EMS within Portage County. Several deployment strategies are offered which detail station location and modeled response performance. The effect on the area, road miles, and population of each deployment option is also explained. These options will support deployment strategies necessary to improve the provision of EMS in the County.

Organizational strategies are offered in which several types of structure and oversight are debated as to the feasibility of implementation and the advantages or disadvantages of each. Staffing options pertaining to provider capabilities, status, and scheduling are considered, as

well as cost estimates of the deployment strategies and staffing options in order to place a cost/benefit estimate in the hands of decision-makers.

Section IV

The report concludes with a series of short and mid-term strategies designed to improve the system with solutions that can, and in some cases should, be implemented prior to the recommended deployment strategy.

A recommended long-term strategy is offered which details changes in resource deployment, organizational structure, and financial oversight. An alternate strategy of resource deployment in the short-term is offered in light of expected fiscal concerns.

In response to community expectations, and in respect to fiscal concerns, ESCi recommends the implementation of deployment Strategy 3. This strategy is summarized below.

- Six deployed units throughout Portage County
- 24 civilian staff members
- Five additional facility arrangements
- Three additional apparatus procurements

An organizational structure which streamlines the financial, reporting, and decision-making process for the inter-governmental arrangement within Portage County is suggested in order to create a more responsive process when situations of operational relevance warrant. Highlights include:

- The Medical Director focusing on clinical issues rather than operational aspects
- An inter-governmental joint board of authority
- Streamlined chain of command for the operational chief; in this case, the fire chief
- Suggestions for a linear fiscal process which eliminates cross-governmental transfers

Section I - Current System Analysis

Objective One - System Overview

The emergency medical services (EMS) system within Portage County (County) is currently a multiple layer approach administered through a combination of providers. Under Wisconsin legislative authority, the provision of EMS is primarily a home rule responsibility of local government. In Portage County, the County government has, historically, assumed the coordination and financing of EMS services. According to the 1979-1980 Portage County EMS Task Force report, the arrangement of the County contracting with the City of Stevens Point (City) to provide EMS service within Portage County, dates back to 1974; a handshake agreement between the City and County. It is interesting to note that many of the same themes which existed in that report are still at issue, and are discussed within the context of this report.

Portage County contracts for EMS services at the advanced life support (ALS) level for medical transportation for the majority of Portage County. The County has had a long standing contract relationship with the Stevens Point Fire Department (SPFD) to provide these ALS transport services to most of the County. The system is also comprised of a number of first responder squads that provide a network of local response prior to the arrival of ALS units. The County has assigned its full-time emergency manager to oversee the contract with SPFD. The department has a traditional reporting structure of fire chief and municipal elected officials, and has designated a deputy chief as *service director* to interact with the County on contract/EMS issues.

Organizational Structure

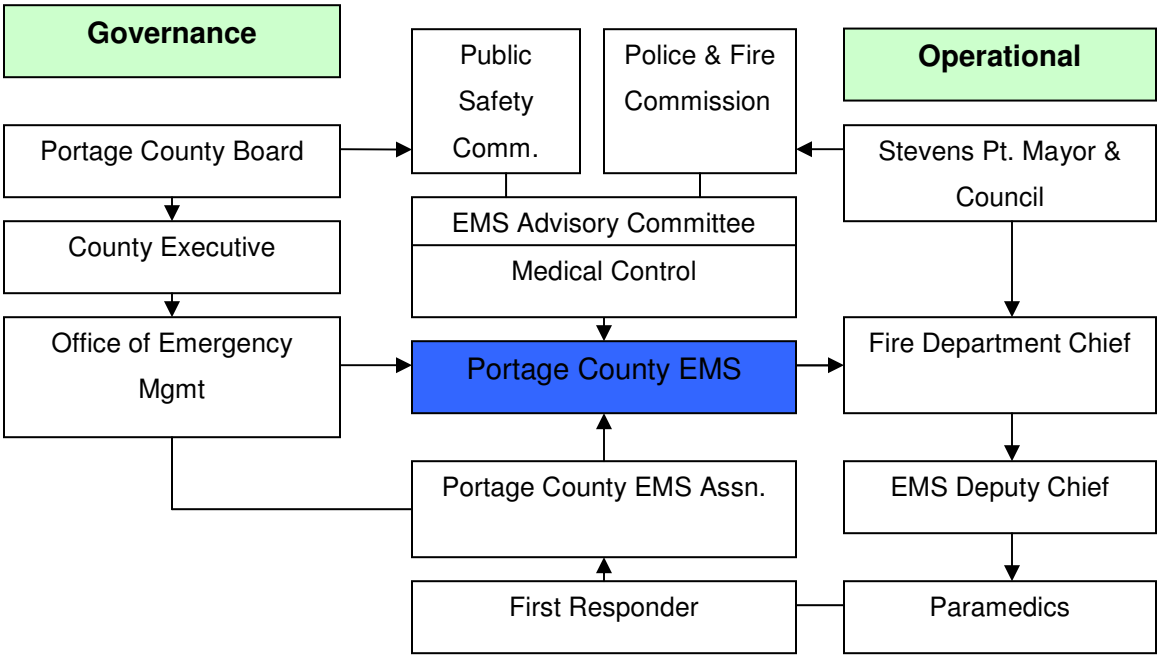
The County government is structured with an elected board, and recently amended its charter to establish an elected county executive to oversee daily County operations. The City organizational structure is that of its mayor and board along with the Stevens Point fire chief. The SPFD deputy chief who oversees the EMS program ultimately reports and is accountable to the fire chief. Each of the volunteer EMS agencies has their own board and administration.

In addition, several committees have input and decision-making authority over the provision of EMS in the County. A City authorized Commission of Police and Fire Services provides

operational oversight to the fire department, and a County Public Safety Committee provides system recommendations and guidance to an EMS advisory group, which includes the EMS Medical Director. The Portage County EMS Association, representing the multitude of first responder groups, also provides input to these committees on issues that concern them.

The figure below illustrates the organizational structure which currently provides governance and operational aspects of Portage County EMS.

Figure 1: Portage County EMS Organizational Structure



Finance

This section will examine the FY 2005 Stevens Point Fire Department – EMS budget compared to budget information received from the Portage County Finance Department. ESCi's goal in this section is to determine how it compares to projected costs of operating EMS for all of Portage County, and to determine if funding received by SPFD is sufficient to provide the services contracted. Each line item in the budget submitted to ESCi was examined individually, and differences detailed in paragraph form. All information for this section was obtained either from the FY 2005 Stevens Point EMS Budget, Portage County Budget Status Reports, or the Stevens Point Fire Department "Report to the Comptroller" published in 2004.

There are several noted differences between the information provided to us by Portage County and Stevens Point Fire Department. Most notably are the total FY 2005 budget appropriations. According to the budget submitted by SPFD, the total appropriated budget for FY 2005 was $1,093,777.00, with an actual expenditure of $985,460.00; results in a net surplus of $108,317.00. According to the information provided by Portage County in the form of their Budget Status Reports, the contract funds appropriated for SPFD totaled $1,120,838.00 with an actual disbursement to Stevens Point of $1,009,248.00. Additionally, an allocation from the ambulance reserve fund of $65,000.00 was disbursed for a total of $1,074,248.00, resulting in a net difference of $46,590.00.

If the contract amount indicated by the Portage County information is correct, and the actual expenditure amount indicated on the Stevens Point budget summary is correct, this results in a net difference of $70,378.00 which, by contract, Stevens Point is to retain. According to the Portage County Ambulance Contract Reconciliation Report for 2005, the contract requires Portage County to “reimburse” Stevens Point for ambulance services, based on prior year call volumes, at a rate of $300.00 per call for 3,338 calls for a total of $1,001,400. Based on this “reimbursement” agreement and the actual expenditure noted on the Portage County Budget Status Report of $1,009,248.00 (not including the $65,000.00 from the ambulance reserve fund), Portage County overpaid Stevens Point $7,848.00 for FY 2005. This amount corresponds to the Reconciliation Report for 2005.

The budgetary analysis becomes overly complex due to the fact that two governmental entities budgets are combining to pay for the operation of a single system. It would better serve both Portage County and Stevens Point to enter into an agreement for one entity to financially support all associated system costs, thereby removing much of the budgetary intricacies which can lead to appropriation questioning.

There are a number of line items detailed on the Portage County Budget Status Report that are not included in the Stevens Point contract price. Those items are listed below.

Additional Portage County Costs Not Covered By Contract		
	FY 2005 Budgeted	**FY 2005 Actual**
Vehicle Maintenance	$34,675.00	$27,395.37
Radio Maintenance	$1,020.00	$1,985.65
Towing Charges	$204.00	$218.00
Defibrillator Maintenance	$3,800.00	$3,822.00
Medical Supplies	$53,400.00	$64,347.84
FR Medical Supplies	$30,000.00	$38,119.36
Accreditation	$10,000.00	$0.00
Vehicle Replacement	$65,000.00	$65,000.00
Gas and Oil	$15,300.00	$20,316.69
Total Additional	**$213,399.00**	**$221,204.91**

The difference between budgeted funds and actual expenses ($7,805.91) is due in part to the equipping of the new rapid response unit which was put into operation in January 2006. The equipment necessary to put this unit into operation was purchased from the FY 2005 budget, even though this equipment was not originally a budgeted expense. In addition, rising oil and fuel costs added to the difference. The fact that vehicle maintenance was less than budgeted could be due to the replacement of one of the older ambulances in 2004, thereby reducing the need for extensive repairs. Beyond the additional costs listed above, the Portage County Budget Status Report indicates other expenses as well relating to the administration of the service and collection of revenues. Those expenses are as follows.

Additional Portage County Administrative Costs Not Covered By Contract		
	FY 2005 Budgeted	**FY 2005 Actual**
Telephone	$360.00	$147.72
EMS Billing	$80,000.00	$75,478.42
Office Supplies	$1,400.00	$802.48
Photocopying	$400.00	$200.00
Miscellaneous	$1,000.00	$14,933.65
Legal Notices	$0.00	$50.46
Vehicle Insurance	$5,000.00	$7,551.00
Total Additional	**$88,160.00**	**$99,163.73**

As with the non-administrative expenses, these items were under-budgeted with the exception of the "Miscellaneous" line item. Much of the cause of this overage is due to placing the rapid response unit into operation according to Portage County Emergency Management. Using the budgeted totals of the Stevens Point contract and additional Portage County administrative and non-administrative expenses, the total to fund the system equated to $1,422,037.00 with an actual expenditure of $1,265,532.34. When the $65,000 from the ambulance reserve fund is added into that figure, the total becomes $1,330,532.34. When $1,009,248.00 is subtracted for the Stevens Point contract, the result is a net additional cost to Portage County of $321,284.34 for FY 2005.

According to the Report to the Office of the Comptroller for Stevens Point, SPFD has requested an additional $497,427.36 to fund five additional firefighter/paramedic positions, one deputy chief position, one confidential secretary position, and additional funds to cover the cost of housing those staff. This report was published in July 2004, but budget figures were obtained from FY 2005. According to information provided by Portage County, the amount appropriated for the Stevens Point contract in FY 2004 was $1,058,715.00, indicating a decrease for FY 2005 to $1,009,248.00. This indicates that no additional personnel or other expenses were funded in the FY 2005 budget. If the budget figures remained unchanged, and the additional $497,427.36 was added to the FY 2005 appropriation of $1,009,248.00, the total new budget would have equated to $1,506,675.36.

Additional information provided to ESCi indicates, however, that two additional firefighter/paramedics have been funded for FY 2006, but for one year only and no guarantee has been given to the continued funding of these positions.

As for the budget provided by SPFD, an analysis is included below.

1. Deputy Chief's Salary

At present, SPFD has directed one deputy chief to oversee operations of the EMS section of the department, in addition to the normal activities associated with department operations such as personnel, response, suppression, and training for that particular shift. Discrepancies noted were benefits calculated at 47 percent and longevity calculated at 9.5 percent.

2. Captain's Salary

It was difficult to determine the exact amount of involvement the captain position has with the EMS section. Although the position was listed in the budget provided to ESCi, the July 2004 Report to the Office of the Comptroller for Stevens Point, published by SPFD, makes no mention of this position. This position was not included in the FY 2006 budget.

3. Lead Emergency Medical Technician (EMT) Wages

Based on the budgeted amount of $153,150.00, and salary information obtained, the amount listed within the budget is extremely close to the salary requirements of three lead personnel at the median salary. Based on calculations, three lead personnel, at starting salary, would require $144,409.32 and require $150,823.30 at a median salary.

4. Firefighter/EMT Wages

For this line, the budget indicates a total of $223,521.00 to staff two ambulances per shift. Based on the assumption that one ambulance will have one lead and one firefighter/paramedic, and one ambulance would have two firefighter/paramedics, a total of three firefighter/paramedics would be required to staff the two units. Based on salary calculations, three firefighter/paramedics, at starting salary, would require $118,346.40 per shift for a total of $355,039.20 to cover all three shifts. If those same personnel were at median salary, the cost would increase to $384,690.06 annually.

It is understood that the contract between Portage County and SPFD for FY 2005 provided funds for ten personnel to staff two ambulances to cover the entire County. This funding, in addition to the other line items discussed above and below, does not account for all personnel required to staff the system as it is now operated. It is clear that the necessary funding to provide contractually required coverage is inadequate.

5. Longevity

Longevity is to be paid to personnel who have remained employed with the department for an extended period of time. At the time of this report, 27 SFPD personnel qualified for longevity pay. The calculation was based on the assumption that personnel qualify for one percent longevity pay at their five-year anniversary date.

6. General Overtime Wages

The intent of this budget line is to pay for personnel used on additional ambulance transports above the operational two ambulances. After-hours transports such as those that require personnel to work past their normal off-duty time and other additional ambulance uses are examples of additional duty. The original budgeted amount of $106,000.00 resulted in an actual expenditure of $163,881.58, a deficit of $57,880.58. This deficit, however, was offset by surpluses of $74,052.15 and $28,340.51 in the Lead FF/EMT and FF/EMT lines respectively for a net overtime wage surplus of $44,512.08. The comparison uses an amount of $80,000.00 for overtime wages, due to the potential to move unused portions of regular wages to other lines when positions are vacated. With the net surplus in overtime wages indicated above, this reduction should be absorbed as absences occur without budgeting additional funds at the beginning of the fiscal year. To see a reduction in this particular line, the jurisdiction should consider part-time personnel to staff units during absences and limit those personnel to 40 hours per week instead of paying full-time personnel double time to fulfill those same responsibilities. This may not be permissible under union contractual agreement however.

7. FLSA Pay

According to our information, all SPFD personnel are subject to Fair Labor Standards Act (FLSA) overtime. The challenge with this line item is determining the amount of total overtime attributed to EMS activities, rather than fire suppression or other fire related activities. Based on the information provided, ESCi cannot make that determination, but Stevens Point personnel have assured that overtime attributed to the EMS budget is tracked.

8. Holiday Pay

Stevens Point Fire Department budgeted $40,397.00 for holiday pay for FY 2005. Of that amount, $32,526.72 was actually disbursed to personnel. This difference can be attributed to the assumption that some personnel choose to take the time off, rather than to be paid for the accrued time.

9. Off-Duty Ambulance Trips

This line is intended to pay for those times when off-duty personnel are called in to either staff additional units for inter-facility transfers or to staff units while the original two ambulances are involved in other calls.

10. Off-Duty Training Pay

The original budget was $15,000.00, but only $6,748.62 was expended. There are several different possible explanations for this divergence. The first possibility is that the line was simply over budgeted. Another possible explanation is required EMS training was not completed throughout the fiscal year. ESCi did not have the appropriate information to make this determination. According to calculations, training costs per individual equate to $1,494.72 for firefighter/paramedic and $1,758.72 for a lead firefighter/paramedic. Additional costs include the annual fee of $96.53 per person for continuing education through the community college plus a $500.00 annual allowance per employee to pursue professional education.

With a total of 21 staff certified at EMT-Paramedic, the total training budget should be closer to $44,708.25 annually, which is a combination of wages and associated costs of providing the educational opportunities. This calculation also includes “General Seminars/Education Expense” as a combined total for training and education. This line could be significantly reduced if the department did not have to meet the annual re-certification requirements for EMT-Paramedics by the State of Wisconsin. This could be accomplished by dedicating EMS personnel within the department, and thereby reduce the dependency on cross-trained personnel.

11. Clothing Pay

Clothing and uniforms are important to any public safety organization that is constantly under the watchful eye of the community. The budgeted amount for this line to provide uniforms to the staff was $6,750.00. Based on calculation of $300.00 annually per person for uniforms, the total

equated to $4,200.00. An additional $1,000.00 could be included for replacement of uniform items damaged or contaminated while on-duty. Safety equipment and protective clothing should not be purchased from this line but, rather, should be considered a capital item as needed.

12. Employer Contribution Retirement

The amount budgeted in the FY 2005 budget equaled just over 24 percent of the budgeted wages indicated, while the actual expenditures indicated a contribution of 17 percent.

13. Employer Contribution/S.S. Tax

This line item calculates to one percent of the total wages; this percentage was used in the projections as well.

14. Employer Contribution/Life Insurance

Uncontrollable expense

15. Worker's Compensation Premium

Worker's Compensation premiums are determined by the agency risk management provider and are calculated at a rate of approximately 6.5 percent of total wages.

16. I.C. Insurance Premium

Uncontrollable expense

17. Medical Insurance Premium

Uncontrollable expense

18. General Utility Charges

Utilities are necessary and expected for the operation of any agency which houses personnel and equipment. These charges include electricity, gas, water, and garbage. Telephone service is budgeted separately, and cable television is paid by the union. $16,719.00 was budgeted with an actual expenditure of $14,148.94. The calculation indicated that general utilities per structure should not exceed $11,000 per facility total. Since SPFD owns the facilities which house the Portage County EMS units and the EMS unit only occupies one space in each facility (plus off-duty units that can be used for additional transports as necessary), the total utility costs should

be divided more equally based on the amount of personnel and square-footage occupied by the vehicle along with an equitable amount for personnel using the facility.

19. Telephone Utility Charges

ESCi's calculations indicate a total of $1,200.00 annually for phone service per facility. The current budget allows $2,112.00. Based on the information above, this service should also be divided more equally between SPFD and Portage County.

20. General Travel Expenses

The $1,700.00 allowed in this line, and the actual expenditure of $521.30 should be consolidated into the training and education lines. If the line is to remain, there should be a process in place to ensure that Portage County is funding travel associated with the EMS section of the fire department only.

21. Other General Miscellaneous Supplies

This line is intended to cover all "other" none line item expenses associated with the operation of the EMS section. The total expenditures were actually a deficit of $133.21 for FY 2005, but considering that no line is in place for the replacement of non-disposable equipment such as splints, backboards, blood pressure cuffs, and no allowance had been made for the re-supply of disposable supplies such as dressings, IV equipment, and oxygen supplies, this is to be expected. According to best practice, there should be separate lines for General Office Supplies, Copy Services, Janitorial Supplies, Medical Supplies, Fuel, Public Education Supplies, Miscellaneous Expenditures, Service Contracts, Building Repair, Equipment Repair, Vehicle Repair, Postage, Vehicle Insurance and Equipment Rental such as oxygen tanks totaling $95,500.00 per facility and/or vehicle staffed. In this case, with two facilities housing two full-time transport units, these lines should total $191,000.00.

According to information provided by Portage County, a majority of these additional funding areas are supported by the County and, therefore, do not factor in to Stevens Points' budget. These items do, however, affect the overall cost of operating the system and should be considered as an integral part of any funding mechanism.

22. General Laundry Supplies

This is budgeted at $800.00 for laundry supplies and should be eliminated to be absorbed within a newly created Janitorial Supplies line.

23. EMT Malpractice Insurance

This line is essential to the function of the system at the ALS level. The State of Wisconsin licenses EMT-Paramedics to function; allowing them to work without direct oversight from a physician. This places an enormous liability on the agency; the liability is amplified without some type of malpractice insurance. Even with governmental immunity, the actions of pre-hospital providers can be called into question, especially after the injury or death of a patient. EMT Malpractice Insurance gives the agency at least a limited shield of protection against negligence claims. ESCi has calculated $1,300.00 per provider which corresponds to that budgeted by the department.

24. General Seminar/Education Expenses

Discussed above in Item 10

25. Regulated Mandated Expenditures

This line is to maintain National Registry credentials for all EMT-Paramedic staff and is utilized every other year in cycle with the National Registry of Emergency Medical Technicians at a rate of $35.00 per year per individual.

26. Meal Allowance

Since this line was not originally budgeted, there is no need to address it extensively. Suffice it to say that any meals incurred by agency staff, while on duty or off, should be borne by the employee. The only exception to this policy should be those meals incurred while at training seminars or other educational offerings and those meals should be included in the $500.00 annual training allowance offered to each employee.

27. Booked Comp Time

Given that personnel are paid a salary and paid double time for events leading to hours over and above the normally scheduled hours, there should be no need for compensatory time. The only potential reason for the inclusion of this line is the possibility of a policy change and

subsequent departure of an individual who previously earned compensatory time. This line is not included in our projections.

28. Unemployment Compensation Expense Reimbursement

The agency already pays for Unemployment Insurance premiums which should prevent this as an unexpected expense within the budget. This line is not included in our projections.

29. Back Pay 2005 Union Contract 1.5 percent

ESCi has no information regarding this line.

#	Line Item	FY 2005 Budget	Actual
1	Deputy Chief or Equivalent	$54,660.00	$54,395.06
2	Captain or Equivalent	$53,989.00	$50,918.60
3	Lead Firefighter/Paramedic	$153,150.00	$79,097.85
4	Firefighter/Paramedic	$223,521.00	$195,180.49
5	Longevity	$2,480.00	$1,607.88
6	General Overtime Wages	$106,000.00	$163,881.58
7	FLSA Pay	$8,000.00	$4,504.21
8	Holiday	$40,397.00	$32,523.72
9	Off-Duty Ambulance Trips	$73,000.00	$70,956.70
10	Off-Duty Training Pay	$15,000.00	$6,748.62
11	Clothing Pay	$6,750.00	$6,344.69
12	Emp. Cont/Retirement	$144,442.00	$93,920.08
13	Emp. Cont/S.S. Insurance	$7,323.00	$5,947.53
14	Emp. Cont/Life Insurance	$391.00	$272.93
15	Worker's Comp	$39,277.00	$34,537.22
16	I.C. Insurance	$1,180.00	$1,130.39
17	Medical Insurance	$102,886.00	$101,399.40
18	General Utilities	$16,719.00	$14,148.94
19	Telephone	$2,112.00	$2,220.24
20	General Travel	$1,700.00	$521.30
21	Other General	$2,000.00	$2,133.21
22	Laundry Supplies	$800.00	$319.49
23	Malpractice Insurance	$15,000.00	$24,990.89
24	General Seminar/Education	$22,000.00	$12,309.31
25	Regulated Mandated Expenditures	$1,000.00	$308.60
Total		**$1,093,777.00**	**$985,460.00[#]**

[#] Includes $80.00 Meal Allowance, $11,292.79 Booked Compensatory Time, $1,765.08 Unemp Comp Exp, Reimbursement, and $12,000.00 Back Pay 2005 Union Contract 1.5% as indicated on the FY 2005, but not budgeted items.

In the analysis of budgets and other information presented during the review, with the exception of partial utilities charges, it appears that Portage County is simply reimbursing SPFD to provide personnel to utilize and operate equipment owned, insured, and serviced by additional Portage County funds. In addition, Portage County is providing funding to replace medical supplies not only on the transport ambulances, but also for first responder agencies throughout Portage County. Although it is true that funding an EMS system is funding personnel to be ready to respond should the need arise, in this case, with an average call volume of just over nine calls per day between two ambulances, there is a significant amount of time spent on non-EMS activities. While it is also true that, were this system operated by Portage County, there would also be significant "down time," that time would not be devoted to other activities with another agency and costs could be more closely monitored.

Another challenging aspect of this arrangement is that there does not appear to be any checks or balances for the funds appropriated to Stevens Point from Portage County. The contract price is driven by a base dollar amount per call without any attachment of performance criteria. While Stevens Point is responding to most calls within their municipal limits within an acceptable time, the remainder of Portage County is vastly uncovered and, therefore, in jeopardy of extended response times possibly leading to negative patient outcomes.

At the end of FY 2005, the total Portage County cost of operating the EMS system including two on-duty ambulances, three back-up ambulances, and equipment and first responder costs were $1,330,532.34. $1,120,838.00 covers personnel costs for SPFD, leaving $209,694.34 to cover one ambulance replacement ($65,000) and other non-personnel related costs borne by the County. To offset these expenditures, Portage County collected $1,091,764.12 in FY 2005 through billing, plus another $15,690.65 from fees and bad debt collection. This leaves net deficit of $223,077.57 for the County. This equates to an 83 percent collection rate (system cost to collections) which is phenomenal in today's EMS systems. The total amount billed during FY 2005 was $1,788,005.00 on 3,338 calls, for an average of $535.65 per call. Of this total, the amount collected was $1,107,454.77 or 62 percent *billables* to actual collections. This is on par with most providers throughout the nation.

Cost Recovery Efforts

Several cost recovery methods are utilized to finance the system. Financing sources include EMS transport revenues, County general fund tax subsidy, as well Stevens Point tax subsidy. The Higgins Ambulance Service, which operates in a small area on the southwestern border, is funded via a separate municipal-funded contract which will be detailed later. Each of the respective volunteer first responders provides their own funding support (detailed in Section 4) with the exception of the recent grant provided from County ad valorem tax dollars. An additional County investment of $100,000 was authorized to staff a Rapid Response Unit (RRU) to operate between 50-55 hours weekly as a pilot program beginning in 2006. The RRU will be discussed in more detail in Section 4.

According to the information contained in the Portage County Budget Status Report, EMS collections for FY 2005 totaled $1,107,454.77 which included $1,091,764.12 from the billing company, $12,331.82 from fees, and $3,358.83 from bad debt collections. The current ambulance fee structure is as follows.

	Resident Fee	Non-Resident Fee
BLS Emergency	$ 400.00	$510.00
ALS	$ 590.00	$700.00
Aid Call/No Transports	$ 175.00	
Mileage Rate	$ 11.00 per mile	

Basic Life Support (BLS) Emergency

This term, defined by the Center for Medicare/Medicaid Services (CMS), includes services rendered to patients at the EMT-Basic level, up to and including the initiation of an intravenous (IV) line.

Advanced Life Support (ALS)

This designation applies to calls in which patients received one or more ALS interventions as defined by CMS. An ALS intervention is defined as skills above and beyond the scope of practice for an EMT-Basic. These skills are defined in a later section.

Aid Calls/No Transport

This particular charge is not a billable charge to Medicare/Medicaid or most private insurance carriers. This is primarily a self-pay category and is usually due to treatment rendered on scene without the need for a transport. An example of this type of call would be a diabetic patient whose blood glucose had fallen too low. EMS providers could treat this problem with the administration of glucose which, in most cases, returns the patient to their normal state and no transport is necessary.

Mileage

Mileage is calculated only on loaded miles (patient must be in the ambulance). Response miles do not count toward this total. All of Portage County is considered to be "rural" under CMS rules and is allowed to bill mileage at the rural rate of $9.17. Portage County currently charges $11.00 per mile and this amount should be revisited based on the drastic increase in fuel prices.

National EMS Billing serves Portage County as its collection agent and, given the figures from FY 2005, are performing at an exceptional level collecting 83 percent of the actual expended budget (cost to collections) while only charging seven percent for their services. With only minor modifications in rates, Portage County could see a nearly 100 percent collection rate compared to actual expended budget.

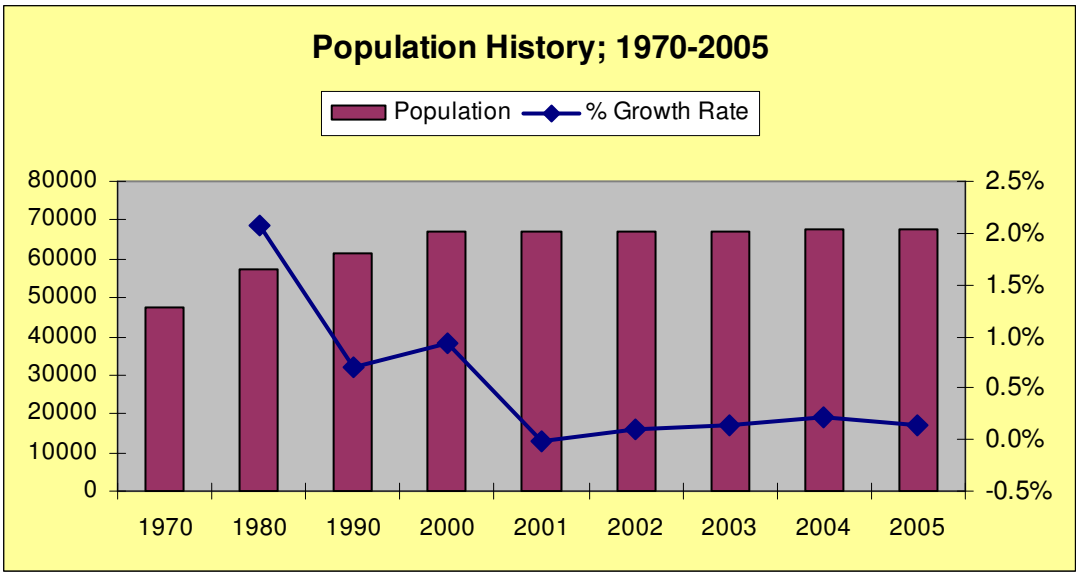
Population

The following examines Portage County's current population and its composition. Analysis of individual towns and villages, along with changes in demography will be discussed in later sections. County population was 67,182 in the 2000 U.S. Census[1]. However, the Census Bureau has estimated some increase since the 2000 Census, and the County's population was estimated at 67,585 in 2005. For the County, this population figure represents a modest 10 percent increase over the 1990 Census, when the population of Portage County was 61,405. The most significant growth has clearly occurred through additional housing development, since over 16 percent of the total housing in the County has been built since 1990.

The following chart provides historical Portage County population information.

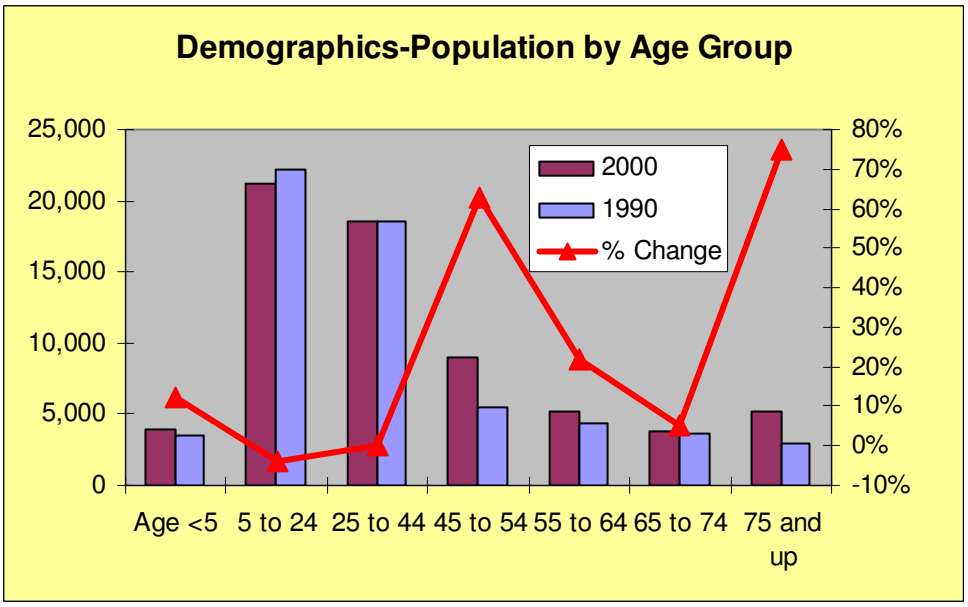
[1] 2000 U.S. Census Table SF-1 and SF-3.

Figure 2: Portage County Population Growth History



The following figures provide general demographic information on population and housing for Portage County[1].

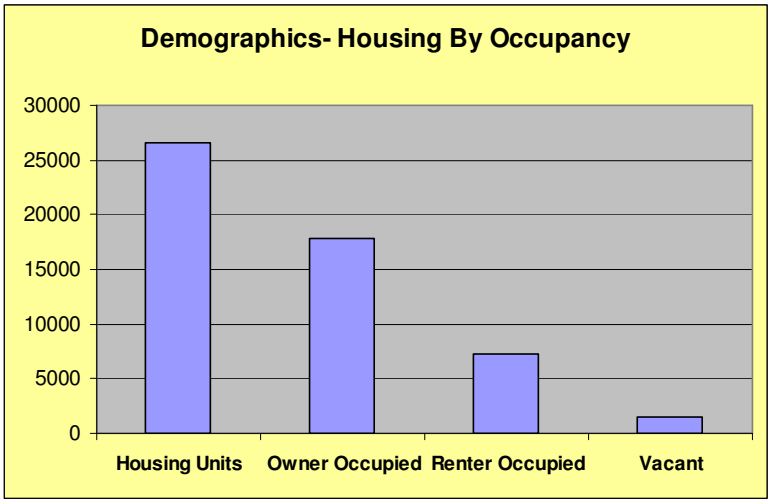
Figure 3: Portage County Population by Age



Selected Demographic Information- 1990 to 2000								
	Total Pop	Age <5	5 to 24	25 to 44	45 to 54	55 to 64	65 to 74	75 and up
2000	67,182	3,964	21,276	18,583	8,945	5,235	3,791	5,232
1990	61,405	3,528	22,161	18,587	5,489	4,299	3,610	2,993
change	9%	12%	-4%	0%	63%	22%	5%	75%

Although the bulk of the population is made of relatively young age groups, it is worth noting that nearly two-thirds of the 8,000 students the University of Wisconsin-Stevens Point are current residents of Portage County. As seen from the figure, 13 percent of the population is 65 years of age or older, and six percent of the population is under five years of age, placing a total of 19 percent of the area's population within the significant target age groups that poses the highest risk for mortality in medical and trauma related emergencies. It is also worth noting that the number of residents over the age of 75 has increased by 75 percent since 1990, a change that can be expected to create a significant increase in service demand for emergency medical incidents. In looking forward, the age group of 45- 54 years (also a fast growing segment) will enter their senior years within the next 10- 20 years.

Figure 4: Portage County Housing by Occupancy



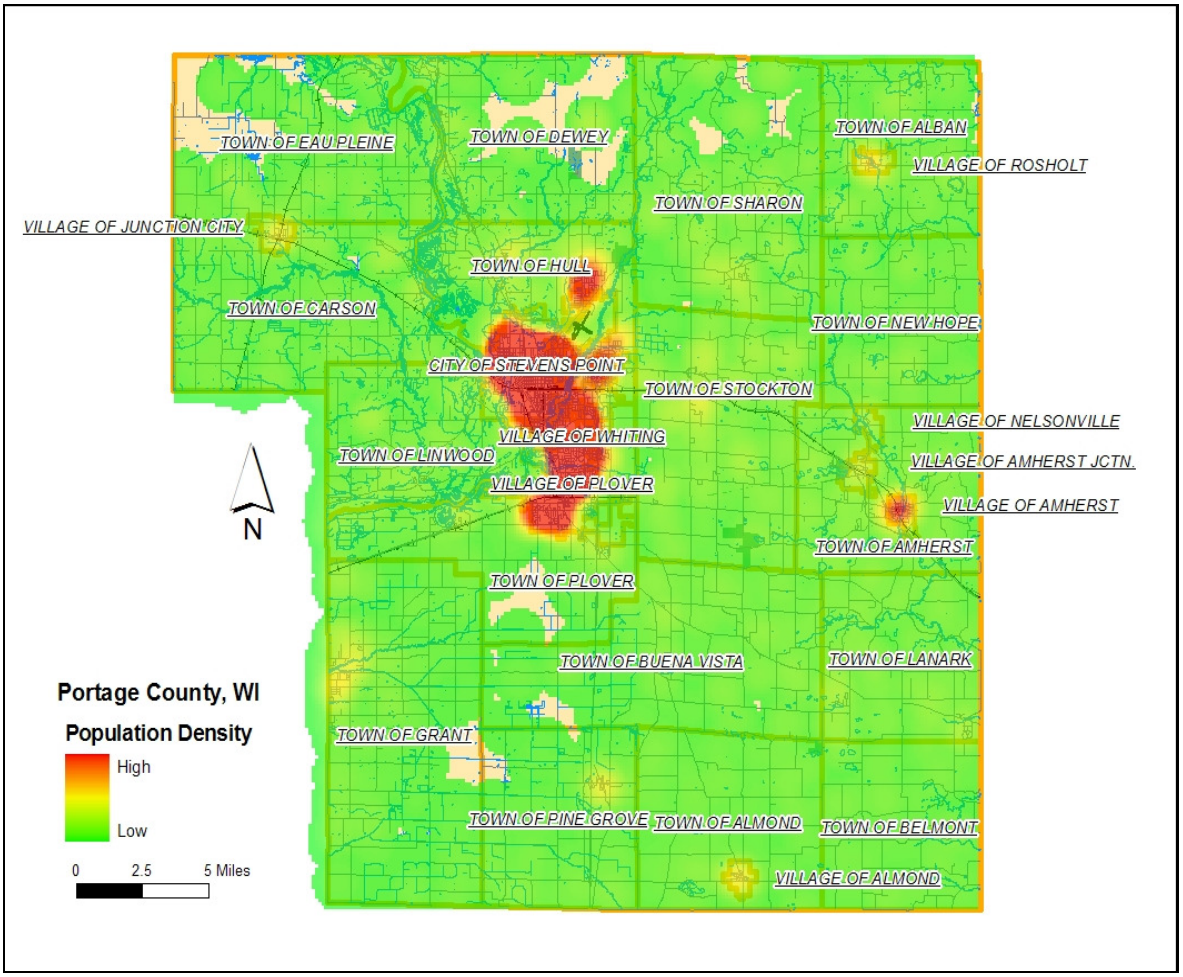
Selected Housing Information- 1990 to 2000				
	Housing Units	Owner Occupied	Renter Occupied	Vacant
2000	26589	17750	7290	1549
1990	22910	14984	6322	1604
change	16%	18%	15%	-3%

In 2000, one-third of the housing units were either rental properties or vacant. Although all communities have similar properties, it is important to examine the economic health and stability of an area that plays a role in EMS service demand. Nationwide, EMS systems are predominately utilized by the elderly and people of lower socioeconomic means. Rental property can reflect this trend, as some seniors are relegated to a fixed pension or social security

income, and the working poor are unable to afford to own a home. Socioeconomic effects on EMS and specifically within Portage County will be explored in more detail in Section 2 of this document.

It is useful to assess population distribution within the County, since there is a direct correlation between population density and service demand. The following map displays population density, based on information from the 2000 U.S. Census.

Figure 5: Portage County Population Density



Population density is located in the center which includes the City of Stevens Point, the Village of Whiting, and the Village of Plover. Pockets of population concentration exist in other areas as well, most notably the Town of Hull and the Village of Amherst. Although this reflects recent conditions, projections for population growth will alter this map into the future. Population projections will be discussed in Section 2.

Objective Two - Call Processing and Dispatching

Portage County

Portage County maintains and operates its own communications center through its Sheriff's Department. This center functions as the dispatch point for County law enforcement, as well as fire departments and first responders outside of Stevens Point. The dispatch center is staffed with three dispatchers from 9am to 4pm, one dispatcher from 3am to 7am, and two dispatchers during all other times.

The communications center handles about 69,000 telephone calls annually, including both administrative and emergency calls, and monitors three incoming 9-1-1 lines and six incoming cellular emergency lines[2]. This dispatch center is the primary Public Safety Answering Point for the communities it serves.

This dispatch center is not currently equipped with computer-aided dispatch (CAD) system. Call processing and dispatch is mostly done manually by the dispatchers, with no automated processes to identify the correct unit or stations to dispatch. Dispatchers rely on telephone-company programming of automatic number and location information (ANI/ALI) to help identify the correct jurisdiction.

No formal call processing time standards have been established, and there is currently no formal system for quality control. Staff members report that they do analyze call processing times manually on certain occasions.

Dispatch takes place by general station announcement, with no programmed assignment of specific apparatus quantities and types. Due to the absence of CAD, apparatus availability for the communities is not tracked and no back-up assignments or multiple alarms have been designated. These must be done manually on a per incident basis by incident commanders and/or dispatchers. Time stamps such as dispatch, arrival, and control are entered manually and are not retrievable in a computer database for analysis.

[2] Four Phase II wireless emergency lines are shared between Sheriff and Stevens Point Police.

Dispatch of apparatus within the fire stations and on-call responders takes place by tone-encoded radio receivers. Medical priority dispatching is not utilized, reportedly due to lack of sufficient staffing to permit effective implementation.

The Portage County Sheriff Department's (PCSD) radio system operates on conventional VHF frequencies from sixteen primary tower sites. Dispatchers report that system *queuing* only happens occasionally. Queuing is when requests for services are stacked either by order in which they were received or based upon priority waiting for a response unit to become available.

The dispatch center has reasonable contingency plans for system failure. Back-up power is in place and the County can transfer operations into Stevens Point's police dispatch facility, if necessary. Dispatchers have been trained on this procedure.

Stevens Point

The City of Stevens Point maintains and operates its own communications center through its police department. This center functions as the dispatch point for City law enforcement and SPFD. The dispatch center is staffed with two dispatchers from 10am to 6pm Monday through Friday, and one dispatcher during all other times. Staffing is also permitted to drop to one on weekdays when leave time is used.

The communications center handles about 70,000 telephone calls annually, including both administrative and emergency calls, and monitors four incoming 9-1-1 lines and six incoming cellular emergency lines[2]. This dispatch center is the primary Public Safety Answering Point for the City of Stevens Point.

Currently, this dispatch center is also not equipped with a CAD system. As with PCSD, call processing and dispatch is done manually by dispatchers, with no automated processes to identify the correct unit or stations to dispatch. Dispatchers rely on telephone-company programming of automatic number and location information (ANI/ALI) to help identify the correct ambulance to send from Station #1 or #2.

No formal call processing time standards have been established, and there is currently no formal system for quality control.

Dispatch takes place by general announcement to the fire department, with no programmed assignment of specific apparatus quantities and types. Due to the absence of CAD, apparatus availability for the City is not tracked and no back-up assignments or multiple alarms have been designated. These are manually done on a per incident basis by incident commanders and/or dispatchers. Time stamps such as dispatch, arrival, and control are entered manually using a punch card machine and are not retrievable in a computer database for analysis.

Dispatch of apparatus within the fire stations takes place by radio receivers. There are no in-station printers or direct line audio links. Medical priority dispatching is utilized to some extent when possible, but full implementation is compromised due to lack of sufficient staffing.

Like Portage County, this dispatch center has reasonable contingency plans for system failure. Back-up power is in place and the City can transfer operations into Portage County Sheriff's dispatch facility if necessary. Dispatchers have been trained on this procedure.

Observations

Both the City and the County are in need of significant modernization of their emergency communications centers. The centers are not modernized, and have not implemented the necessary automation, software, staffing, or procedures to accommodate a fully effective and integrated fire, first responder, and emergency medical services system. The development of an improved EMS system will be continually compromised, if changes to the initial notification and dispatch systems are not made.

The process of a modern emergency response system begins with the initial call to the emergency dispatcher. This initial contact is the first link in the response chain. It is followed by timely notification of appropriate resources to handle the call. These resources, be they engines, ladder trucks, first responders, or paramedics, need to be selected on the basis of both the need of the specific incident and its geography in relation to those resources.

These processes simply cannot be effective when they rely on the individual memory or intuition of a human dispatcher. The procedures for selecting, coordinating, and multiplying resources to meet the need must be automated and pre-programmed in an effective CAD system. Failure to do so, will limit the ability of the County to modernize its fire or EMS system to include any tiered

response levels, any effective use of priority medical dispatch, and the immediate dispatch of specified apparatus to specified risks. Automatic aid will challenging and, most likely, inconsistent, and multiple alarms will be slow and cumbersome, directing the attention of the incident commander away from the tactical needs of the emergency.

The inability to track turnout, travel, and commit times of apparatus dispatched to various calls was a major roadblock in the performance of this study, because of the lack of automated time stamping provided through a CAD system. It prohibited the effective study of individual unit performance and significantly reduced the quality of the geographic analysis of system performance. Without consistent and proper tracking of resource times through automated CAD systems, the agencies will never be able to fully track performance improvements or degradation.

In some EMS systems, the use of specifically trained emergency medical dispatchers (EMD) is utilized. These dispatchers perform, in addition to regular dispatch duties, the ability to deliver to the caller a formatted set of instructions for initial care of the patient, such as CPR procedures and Heimlich maneuvers. These dispatchers have been credited with saving lives and reducing mortality due to their advice to the callers of 9-1-1. The cost of training and implementation can be offset either by medical community grant funding, or when an EMS system can benefit from their training to efficiently deploy units based upon the call.

They are most useful for the system when designed on a multi-tiered response methodology. In these systems with varying types of emergency medical apparatus and responder skill levels, the emergency medical dispatcher can send the most appropriate units based on the information received. For instance, although most medical calls are presumed to require an ambulance, only the calls which would require a paramedic level of skill would be sent a paramedic (usually in a non-transportable vehicle, but not always). In this way, numerous ambulances can be staffed with less costly EMT-Basics, while more costly paramedics can be less in number, and available to only respond to certain high risk calls. In a single-tiered system of paramedic ambulance provision, this benefit of emergency medical dispatchers is not realized.

Another way EMD can be utilized is to assign a response mode to the units based on set medical criteria of criticality and the information received on the phone. Though the assumption

is that all requests should be responded to in an emergency mode (i.e. lights & siren), this in reality is not the case. Many calls that may require medical attention do not necessarily require an emergent response that disturbs the public and endangers the crew in its response. Calls such as toothaches, back pain, and headaches do not necessarily require this type of response. The emergency medical dispatchers can either upgrade or reduce the level of response of the ambulance after initial dispatch, by gaining further information from the caller. An ambulance can even be diverted to a higher priority call while responding to a low priority call. This lower priority call can safely be assigned to a unit that is farther away, while the higher priority call receives the attention it deserves. Cost savings can be realized with reduced ambulance involved/caused accidents, reduced wear and tear on vehicles, worker's compensation, and reduced mortality and injury by utilizing medical units more effectively.

Another useful tool for communication centers is to install global positioning systems (GPS) within response units. The units actual locations can be recognized by the CAD system to designate the closest unit for response to a call. This system can be utilized to manage the deployment of units within a geographic area based upon service demand frequency.

A decision to implement such a program should be based upon system design, medical community commitment to the emergency medical service, and availability of funds for additional training in the communications divisions of Portage County and Stevens Point.

While the intent of this study was not to be a full and complete evaluation of the emergency communications system of the Portage County agencies, observations suggest that such a study would be advisable. The County and City should fully study the individual and collective needs of their communications centers, the need to continue independent operations of those centers, the potential advantages of a merged communications center, and the cost projections for both independent and cooperative improvements, modernization, and adequate staffing.

Objective Three - Law Enforcement in EMS

As with many emergency medical systems, Portage County finds that law enforcement patrol services may provide expedient first responder service to certain types of calls. This is typical, as most law enforcement agencies have mobile units that patrol within specified patrol districts, often able to arrival prior to fire, rescue, and EMS units responding from a fixed station deployment model. Portage County is served by the Portage County Sheriff's Department, and several of the individual municipalities maintain city police departments. These law enforcement departments respond to medical calls, however with no specified response criteria or reliability of response as reported to our study group through interviews.

The sheriff's department indicated their patrol officers respond to significant medical calls (as determined by the officer), but not through specific dispatch protocol. The decision to respond is usually made by the officer based on their location relative to the incident, and their current workload. There was strong indication that the patrol officers, particularly when in remote areas of the County, realize that they may be able to arrive far ahead of other trained personnel, and attempt to do so whenever it is felt their service could be of value and they are not committed to another function.

Stevens Point Police Department indicated their patrol officers also respond to significant medical calls, but admit it is much more infrequent due to the fact that the ambulance units usually arrive within only a few minutes. When patrol officers do respond, they often arrive simultaneously with fire-rescue personnel. Thus, the hands-on practice of medical skills is rarer because of the geographical proximity of paramedics.

Other municipal police departments had similar response experience as the sheriff's department. Again, officers respond when not committed to other functions, and when it is felt that the service they could render might be of significant value.

Interviewed police officials indicated most officers have received initial first aid training, many at the first responder level, during their initial law enforcement academy training. However, all admit that, given the massive amounts of mandated criminal justice training required annually, little time is left to review or refresh their medical skills. As such, the level of emergency medical care each individual officer may feel *comfortable* providing, can vary. Most of those interviewed

indicated that officers do try to respond, particularly to life-threatening medical calls, when they are available and within a response distance where it is felt they could be of value. Portage County EMS should consider funding the continuing medical training for police officers.

Particular value has been demonstrated when law enforcement officers, equipped with automated external defibrillators (AEDs), respond rapidly to victims of sudden cardiac arrest. For example, in Rochester, Minnesota law enforcement reported over a fifty percent survival rate from automated external defibrillation administered by first-arriving law enforcement. This survival rate, published in the Annals of Emergency Medicine, compares with a national average survival rate of approximately five percent, according to the American Heart Association.

Continued support of law enforcement AED in Portage County may assist in reducing response times to initial deployment of critical first responder services. Law enforcement can also provide critical first responder services such as obstructed airway assistance, cardiopulmonary resuscitation, bleeding control, and initial scene size-up. The Portage County system should continue to enhance law enforcement response, particularly the identification or initial triage[3] of high priority calls, and work to consistently dispatch AED-equipped law enforcement officers to the scene of cardiac-related incidents.

Common training between EMS and law enforcement would also enhance a working relationship, and develop mutual trust and expectations for system performance. Whenever possible, law enforcement officers, particularly those in routine patrol positions, should be rotated through some level of refresher training for medical response where they can train and practice with other emergency medical response personnel in their own response system.

Working with law enforcement agencies, EMS should encourage the establishment of automatic response protocols by the sheriff patrol units for high priority medical cases. Many of the trauma cases presumably already involve law enforcement such as traffic accidents, assaults, and traumatic falls.

[3] Under protocols established by a Medical Director.

Objective Four - EMS First Responders in Portage County

In this section of the report, ESCi will discuss the various first responder agencies within Portage County. These are non-transporting emergency medical units operating at least the first responder level of care. The majority of these agencies operate as a division within the local fire department; however, some are independent organizations. Each agency is discussed which includes a map of coverage areas, analysis from the first responder data provided, and information regarding each agency's membership and training/certification levels. It should be noted that not all first responders are cross trained as firefighters and vice versa.

It is known that this is an incomplete record of incidents for first responders as they are not required or given incentive to complete a data record. As such, the omission of data will negatively affect reliability and response time analysis[4]. The use of whole minute formatting of incident times within the database, in addition to the manual means by which they are entered, affects analysis. Following are subsections for each first responder group.

Almond EMS

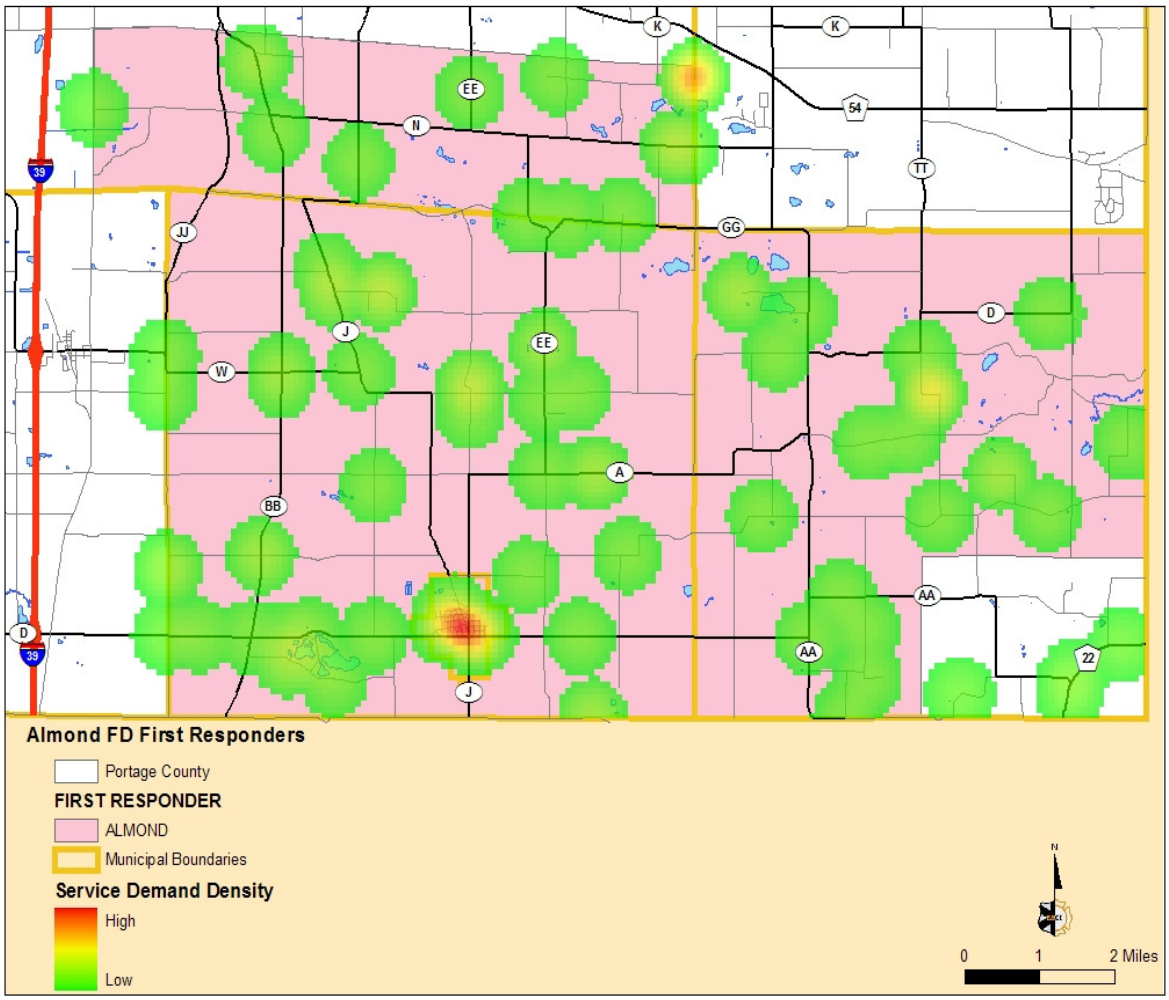
Almond is located at the southeastern border of Portage County. The Almond Fire Department provides first responder service through volunteer personnel (Almond EMS). The fire department operates a fire station at 114 Main St., but many times the members respond to incidents from their homes and elsewhere in their own vehicles. The 2000 Census information for their service area included 1,986 persons within 868 housing units.

Service Area

Almond EMS serves the Village and Town of Almond, along with portions of the Towns of Buena Vista, and Belmont. The area of coverage is 90.6 square miles with 178 miles of roadway. The following figure details the Almond EMS service area and the located calls within the area.

[4] For a brief description of the statistical measures used, refer to same title in the appendix

Figure 6: Almond EMS Service Area



Staff and Certifications

Thirty-seven citizens are members of the Almond Fire Department, with 11 EMS members trained to the first responder level. The administrative staff includes the fire chief, two assistant chiefs, two captains, two lieutenants, and two first responder officers. All serve on a volunteer basis along with the line personnel.

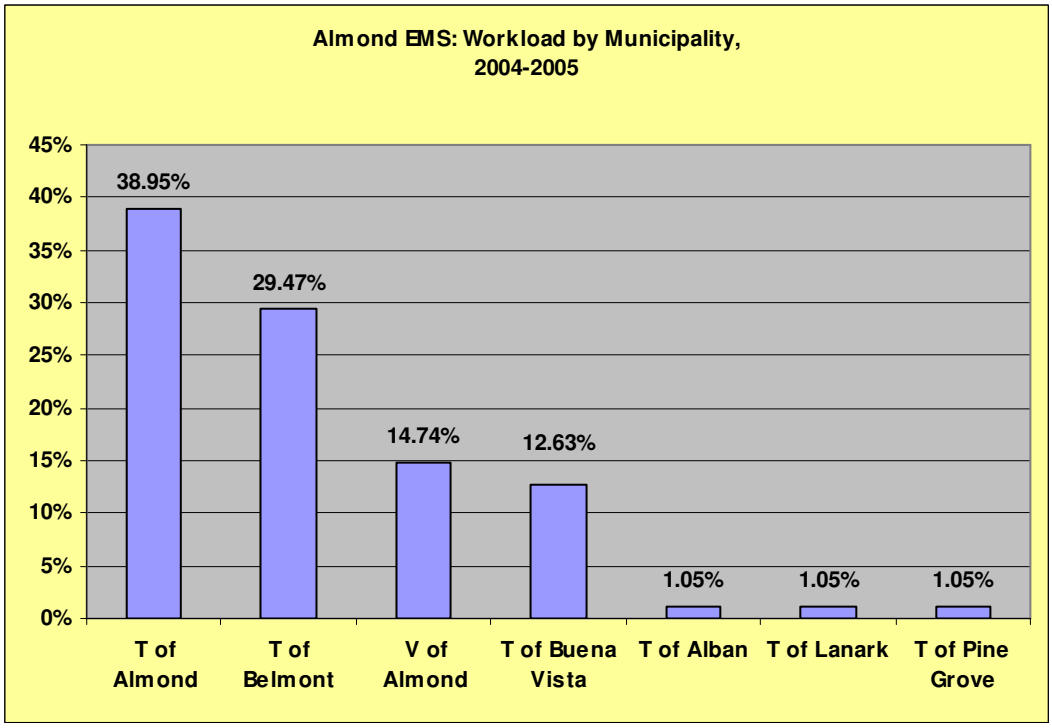
Finance

The Almond Fire Department budgeted $39,015 in expenses for 2005, including $800 for first responder supplies. Reimbursement for these expenses was expected from the towns and villages served, as well as bank interest on reserve funds.

Performance

According to the first responder database, Almond EMS reported 95 calls for the years 2004-2005. As seen in the following figure, the majority of those calls are within the Towns of Almond, and Belmont. This compares to 91 EMS calls located in their primary area which indicates a reliable response performance.

Figure 7: Almond EMS Workload



The average turnout time for the Almond EMS is **one minute and 24 seconds,** while the average response time from dispatch is **10 minutes and 15 seconds**. Almond EMS responds to 90 percent of calls within **19 minutes**.

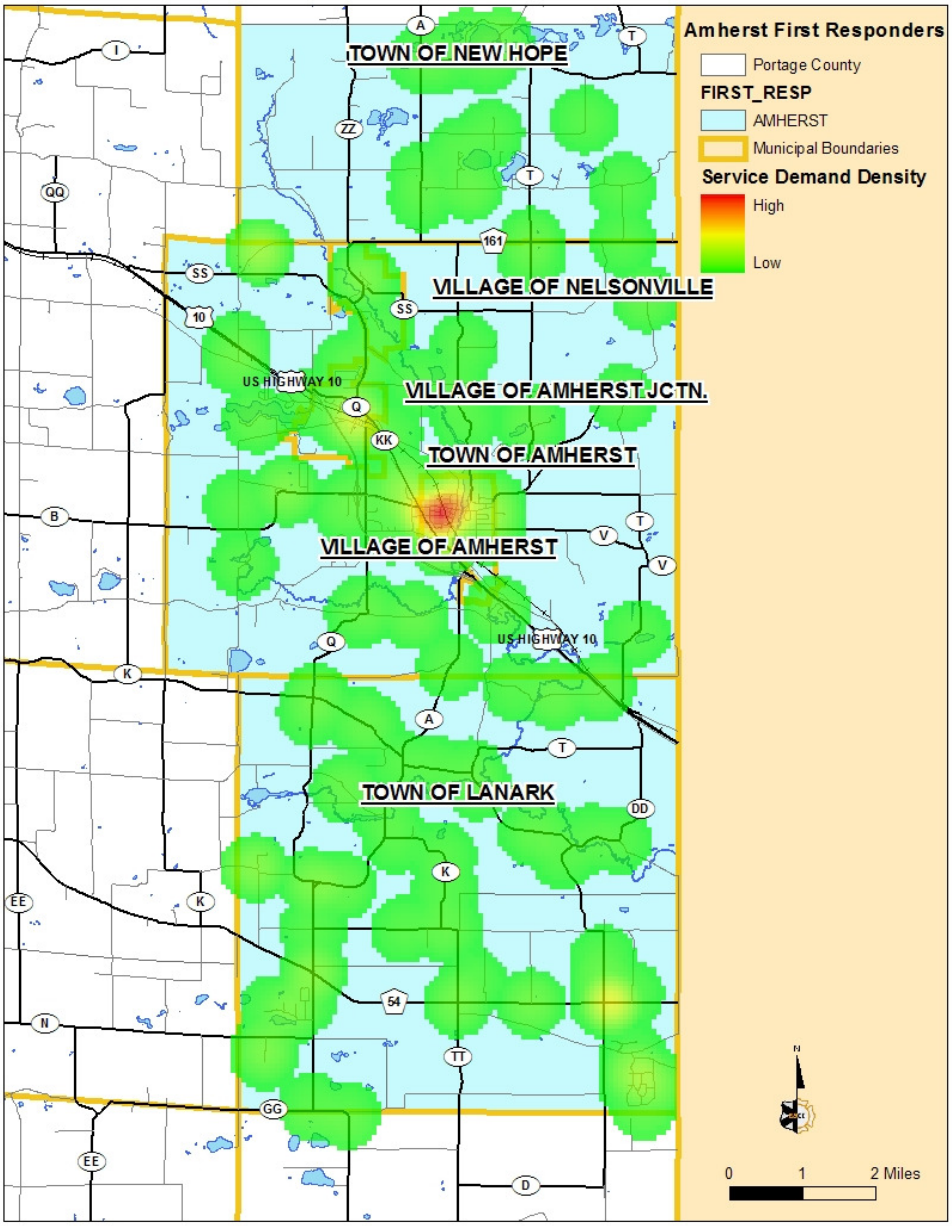
Amherst EMS

The Amherst Fire District provides first responder service through paid on-call personnel (Amherst EMS). The fire district operates a fire station at 4585 Fairground Rd in Amherst. The 2000 Census information for their service area included 4,758 persons within 2,037 housing units.

Service Area

Amherst EMS serves the Villages of Amherst, Amherst Junction, and Nelsonville. In addition to these villages, the service area includes the Towns of Amherst and Lanark, along with a portion of the Town of New Hope. The area of coverage is 96 square miles with 240.3 miles of roadway located on the eastern edge of the County. The following figure details the Amherst EMS service area and the located calls within the area.

Figure 8: Amherst EMS Service Area



Staff and Certifications

Thirty-eight citizens are members of the Amherst Fire District, with 21 EMS members trained to at least the first responder level. Seventeen of the 21 EMS members are trained to the EMT-B level. The administrative staff includes the fire chief and three assistant chiefs.

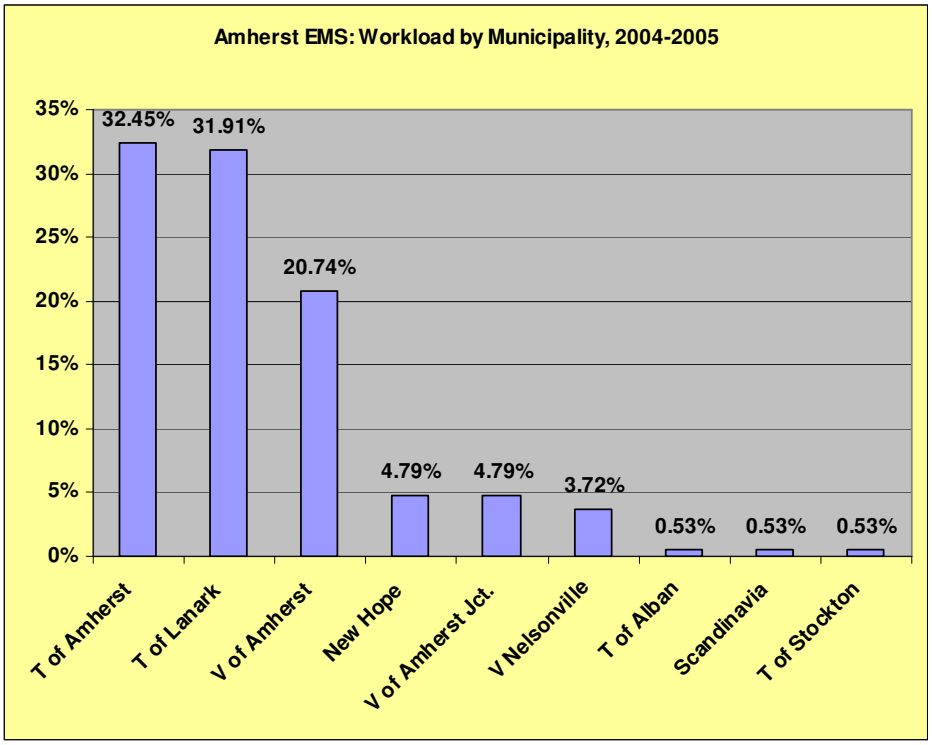
Finance

The Amherst Fire District budgeted for $18,150 in first responder expenses for 2005, including $2000 for medical supplies. Revenue information was not provided.

Performance

According to the first responder database, the Amherst Fire District reported 189 calls for the years 2004-2005, with nearly twice as many calls reported in 2004 versus 2005. As seen in the following figure, the majority of those calls are within the Towns of Lanark and Amherst. This compares to 256 EMS calls located in their primary area which indicates 73.8 percent response reliability.

Figure 9: Amherst EMS Workload



The average turnout time for the Amherst EMS is **three minutes,** while the average response time from dispatch is **12 minutes and 43 seconds**. Amherst EMS responds to 90 percent of calls within **20 minutes**.

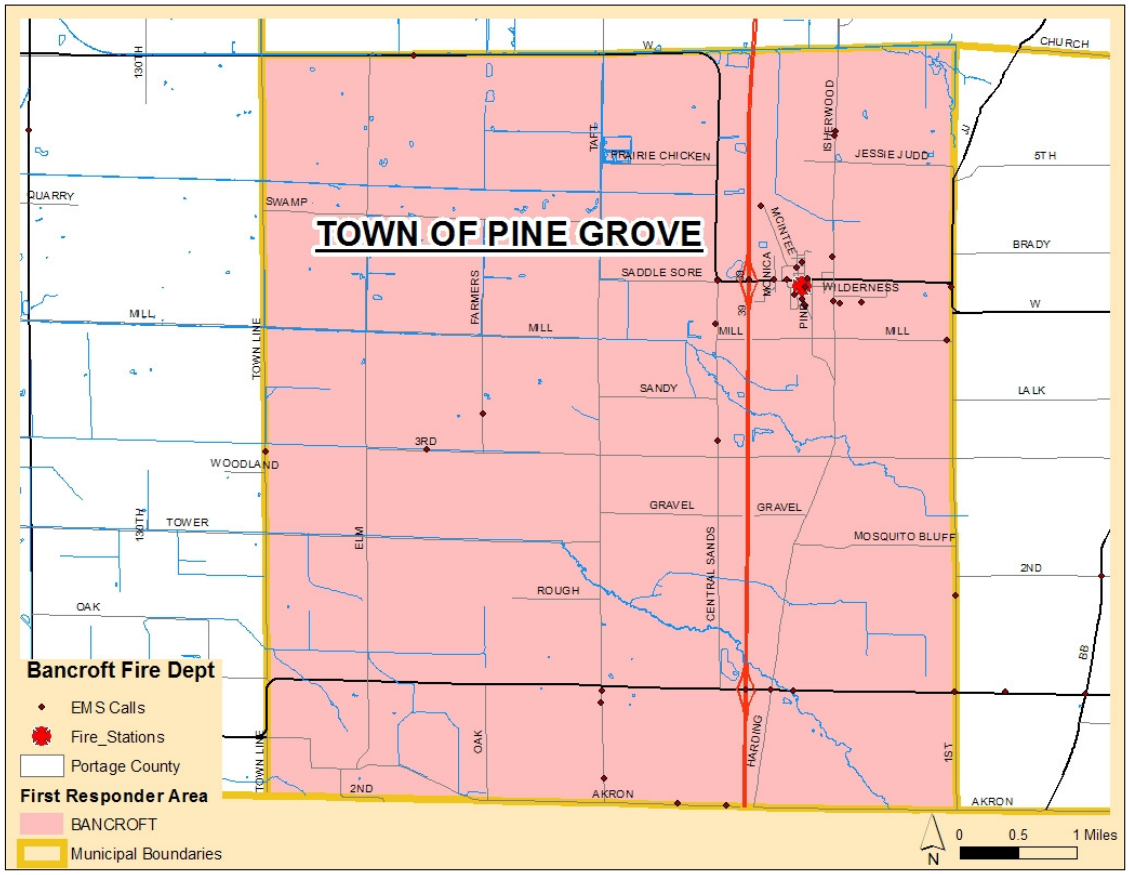
Bancroft EMS

The Bancroft Fire Department provides first responder service (Bancroft EMS) through paid on-call personnel. The fire district operates a fire station in Bancroft within the Town of Pine Grove. The 2000 Census information for their service area included 904 persons within 372 housing units. The Town of Pine Grove is located on the southern border of Portage County.

Service Area

Bancroft EMS serves only the Town of Pine Grove. The area of coverage is 37.8 square miles with 120 miles of roadway. The following figure details the Bancroft EMS service area and located calls within the area.

Figure 10: Bancroft EMS Service Area



Staff and Certifications

Twenty-two citizens are members of the Bancroft Fire Department, with eight EMS members trained to the first responder level. The administrative staff includes the fire chief, two assistant chiefs, and one captain.

Finance

Financial information regarding the Bancroft Fire Department was not provided.

Performance

According to the first responder database, Bancroft EMS reported 20 calls for the years 2004-2005, all within Pine Grove. This compares to 52 EMS calls located in their primary area which indicates 38.5 percent response reliability.

The average turnout time for the Bancroft EMS is **four minutes and 11 seconds,** while the average response time from dispatch is **eight minutes and 11 seconds**. Bancroft EMS responds to 90 percent of calls within **13 minutes**.

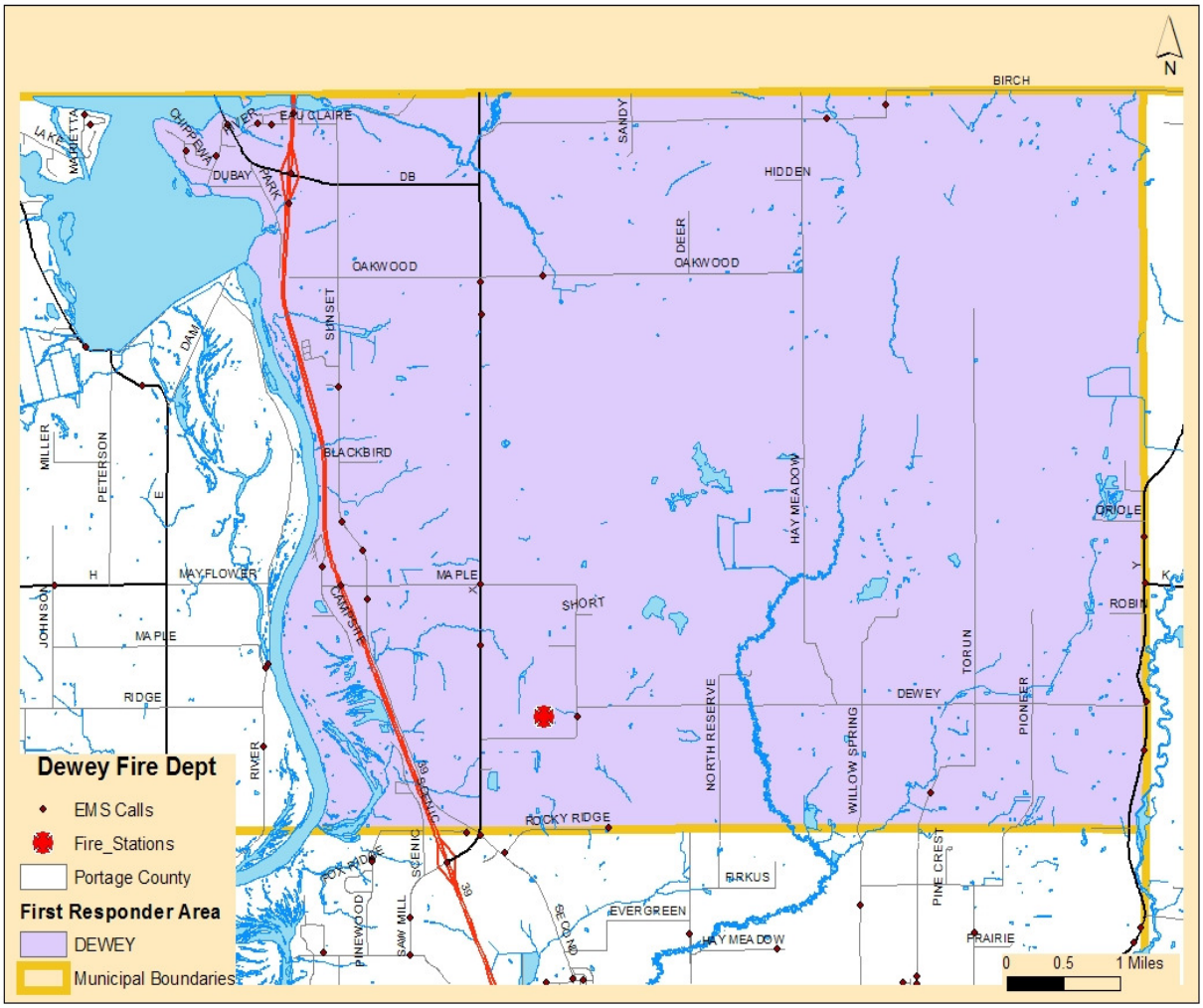
Dewey EMS

The Dewey Fire Department provides first responder service (Dewey EMS) through volunteer personnel. The fire department operates a fire station at 430 Dewey Rd. The 2000 Census information for their service area included 975 persons within 407 housing units.

Service Area

Dewey EMS serves the Town of Dewey on the northern border of Portage County. The area of coverage is 47 square miles with approximately 85 miles of roadway. The following figure details the Dewey EMS service area and the located calls within the area.

Figure 11: Dewey EMS Service Area



Staff and Certifications

Twenty-one citizens are members of the Dewey Fire Department, with 11 EMS members trained to the first responder level. The administrative staff includes the fire chief, the assistant chief, two captains, and two lieutenants. They serve on a volunteer basis along with the line personnel.

Finance

The Dewey Fire Department budgeted $9,700 in total expenses for 2005. This is an increase of $5,960 over 2004, which included $200.00 for medical supplies. Most of the budget is set aside to equip and train three new members. Partial reimbursement of $8,385 was expected from the Town of Dewey, with rest from reserve funds held by the department.

Performance

According to the first responder database, Dewey EMS reported 25 calls for the years 2004-2005, with nearly three times as many calls were reported in 2005 versus 2004. Ninety-six percent of those calls were within the Town of Dewey, with the remainder in neighboring Town of Sharon. This compares to 31 EMS calls located in their primary area which indicates 77.4 percent response reliability.

The average turnout time for the Dewey EMS is **three minutes and nine seconds,** while the average response time from dispatch is **nine minutes and 41 seconds**. Dewey EMS responds to 90 percent of calls within **12 minutes**.

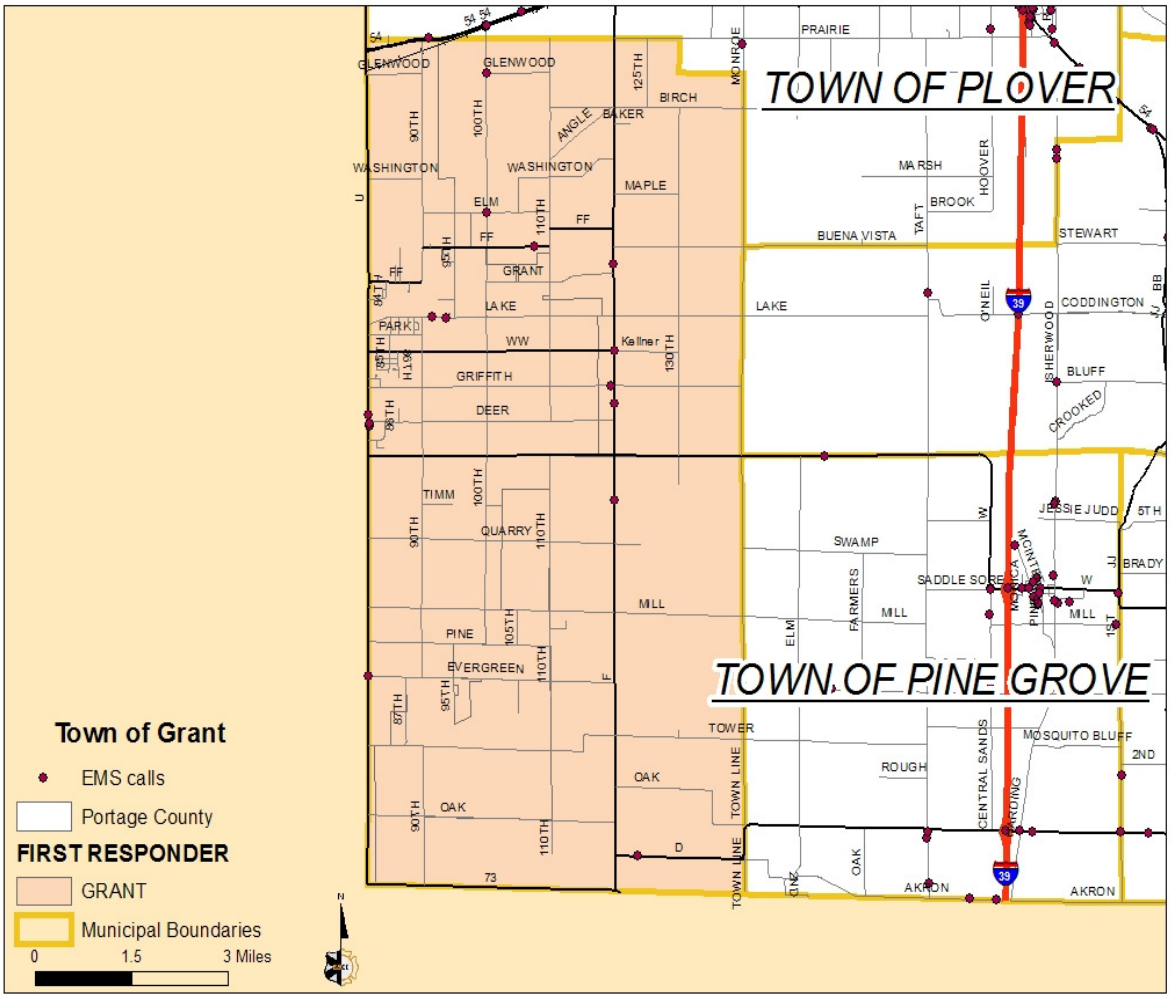
Grant EMS

Grant is located in the southwestern corner of Portage County. Grant EMS is an independent volunteer organization which provides first responder service in the Town of Grant exclusively. There is no station at this time, the members respond to incidents from their homes, and elsewhere, in their own vehicles. The 2000 Census information for their service area included 2,020 persons within 753 housing units.

Service Area

The Town of Grant has an area of coverage of 71.6 square miles with 180 miles of roadway. The following figure details Grant EMS service area and located calls within the area. These are calls reported by SPFD as a part of Portage County EMS. As will be detailed later, an area on the eastside of Grant, known as Kellner, is served under contract by Higgins Ambulance Service in neighboring Wisconsin Rapids. Higgins did not provide response records for their role in the Town of Grant.

Figure 12: Grant EMS Service Area



Staff and Certifications

Exact staffing information was not provided, but it appears from the budget report, that there are at least six members trained at the first responder level. These members respond to incidents from their homes, or elsewhere, with their private vehicles to initiate patient care until either Higgins or SPFD arrive.

Finance

The Town of Grant budgeted for $9,900.00 in expenses for 2005, including $2,045.00 for first responder supplies. Reimbursement for these expenses was not detailed, but presumably this was covered by the town budget.

Performance

According to the first responder database, Grant EMS has not reported calls for the years 2004-2005, however SPFD reports 12 calls in the Town of Grant. In a meeting with officials from Grant, it was stated that Grant EMS handled 44 calls in 2005, Higgins Ambulance service reports 41 calls answered within town limits in 2005.

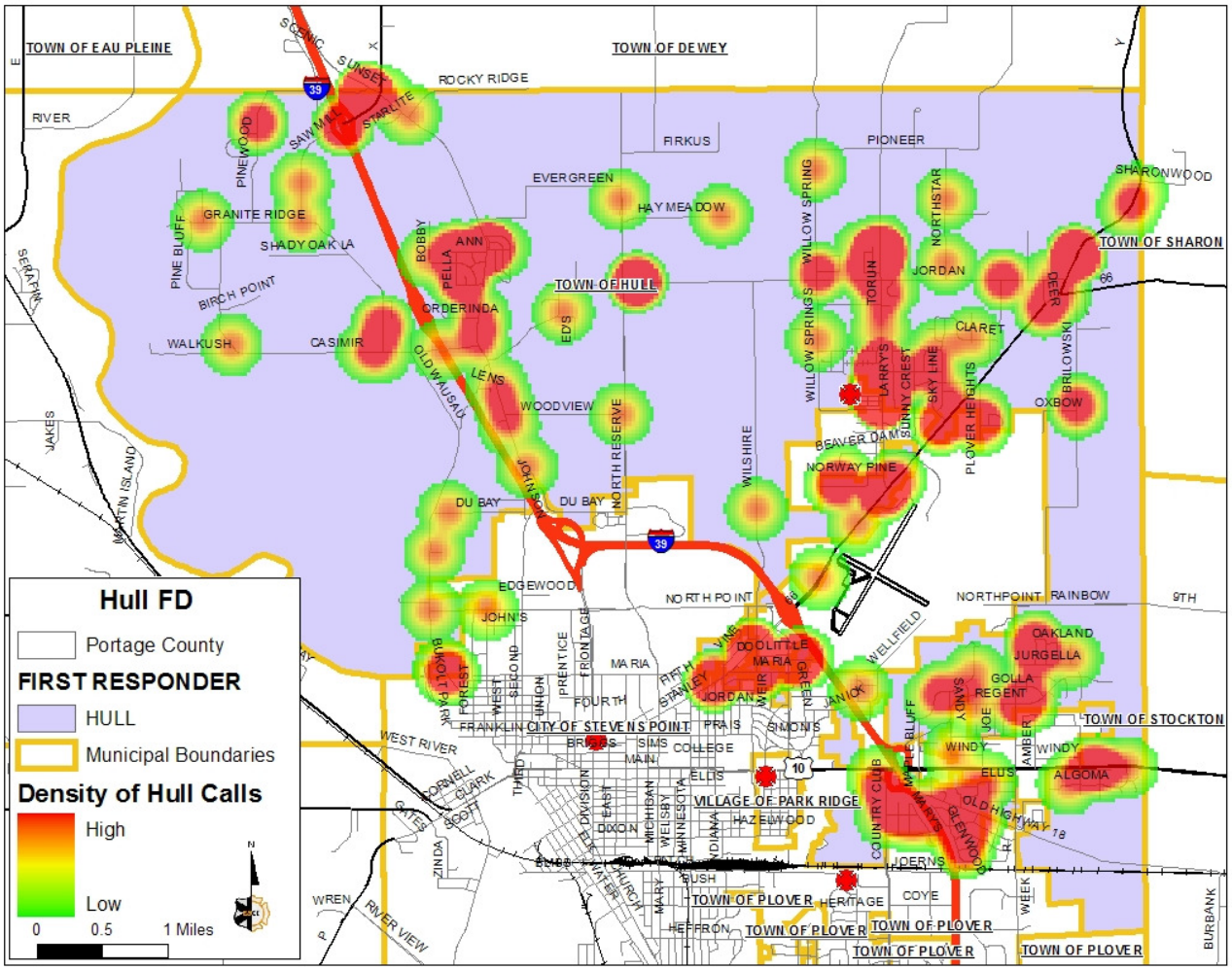
Hull EMS

The Town of Hull lies just north and east of the City of Stevens Point. It has major arterial routes of Interstate 39 and US Highway 10 traversing through it. The Hull Fire Department provides first responder service (Hull EMS) through volunteer personnel. The fire department operates a fire station at 4818 Wojcik Memorial Drive in Hull, but many times the members respond to incidents from their homes, and elsewhere, in their own vehicles. The 2000 Census information for their service area included 5,493 persons within 2,026 housing units.

Service Area

Hull EMS serves within the town limits of Hull exclusively. The area of coverage is 32 square miles with 147 miles of roadway. The following figure details the Hull EMS service area and the located calls within the area.

Figure 13: Hull EMS Area



Staff and Certifications

Twenty-seven citizens are members of the Hull Fire Dept, with 8 EMS members trained to the first responder level and four at the EMT-B level. The administrative staff includes the chief, two assistant chiefs, two captains, and one lieutenant. All serve on a volunteer basis along with the line personnel.

Finance

The Town of Hull budgeted for $3,050 in first responder expenses for 2004. Further detail was not provided.

Performance

According to the first responder database, Hull EMS has reported 88 calls for the year of 2005, all within the Town of Hull. This compares to 162 EMS calls located in their primary area which indicates a 54 percent reliability performance.

The average turnout time for the Hull EMS is **one minute and 50 seconds,** while the average response time from dispatch is **seven minutes and 23 seconds**. Hull EMS responds to 90 percent of calls within **11 minutes**.

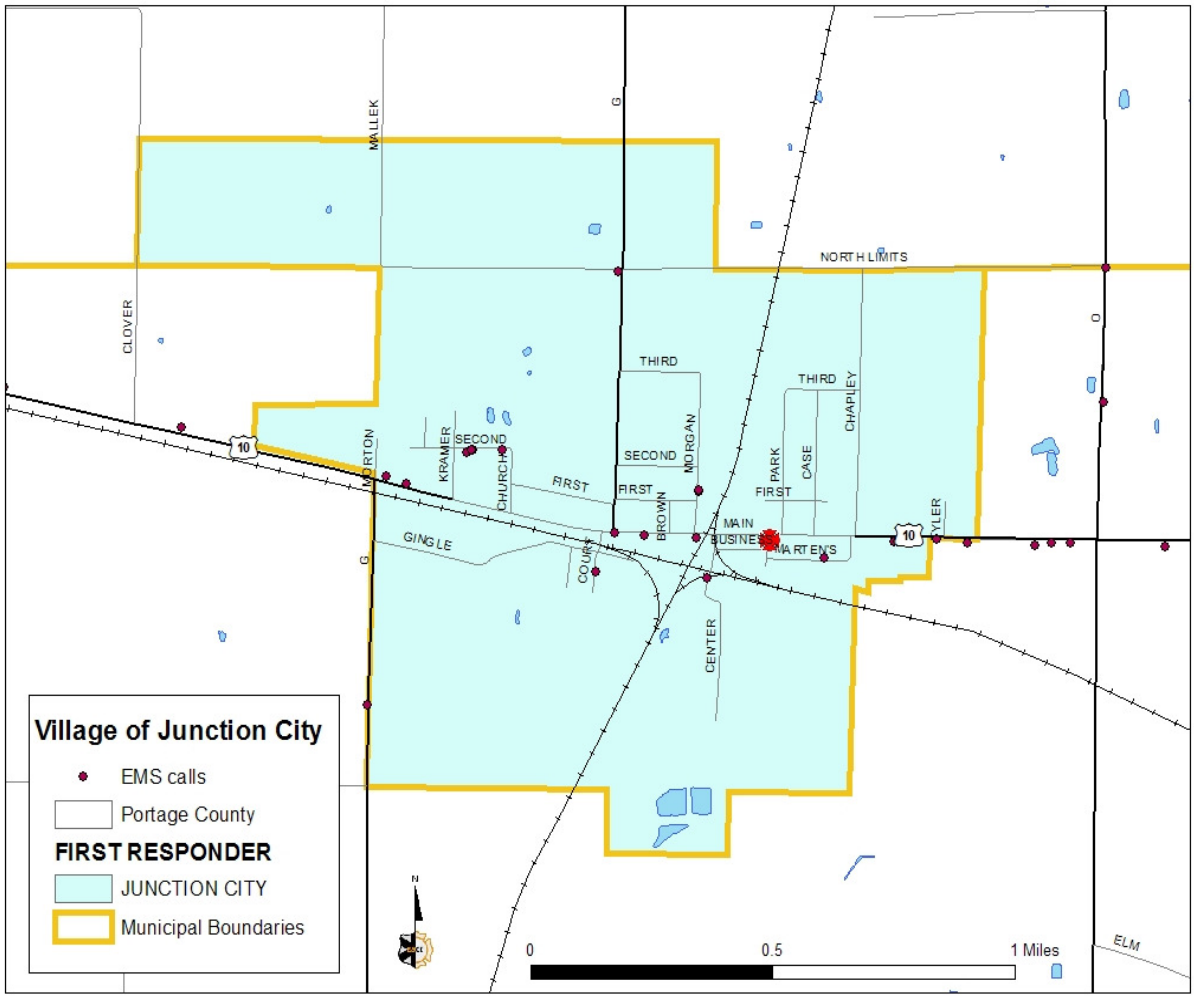
Junction City EMS

Junction City is located at the junction of railways on the northern border of the Town of Carson and adjoins the Town of Eau Pleine. The Junction City Fire Department provides first responder service (Junction City EMS) through paid on-call personnel. The fire department operates a fire station at 1001 Main St. in Junction City, but many times the members respond to incidents in their own vehicles. The 2000 Census information for their service area included 440 persons within 193 housing units.

Service Area

Junction City EMS primarily serves only the Village of Junction City. The area of coverage is two square miles with 7.3 miles of roadway. The following figure details the Junction City EMS service area and located calls within the area.

Figure 14: Junction City EMS Service Area



Staff and Certifications

Twenty-three citizens are members of the Junction City Fire Department, with five EMS members trained to the first responder level and four at the EMT level. The administrative staff includes the fire chief, one deputy chief, one lieutenant, and one first responder training officer.

Finance

The Village of Junction City Fire Department budgeted for $2,200 in expenses for 2005 as detailed below.

Line Item	Amount Budgeted
Equipment	$500
Clothing/Gear	$100
Wages	$500
Certifications	$400
Training	$500
Previous Medicine	$200

Performance

According to the first responder database, Junction City EMS reported 17 calls during 2005. All of the calls were within city limits. This compares to 53 EMS calls located in their primary area, indicating 32 percent response reliability performance.

The average turnout time for the Junction City EMS is **two minutes,** while the average response time from dispatch is **13 minutes and 18 seconds**. Junction City EMS responds to 90 percent of calls within **19 minutes**.

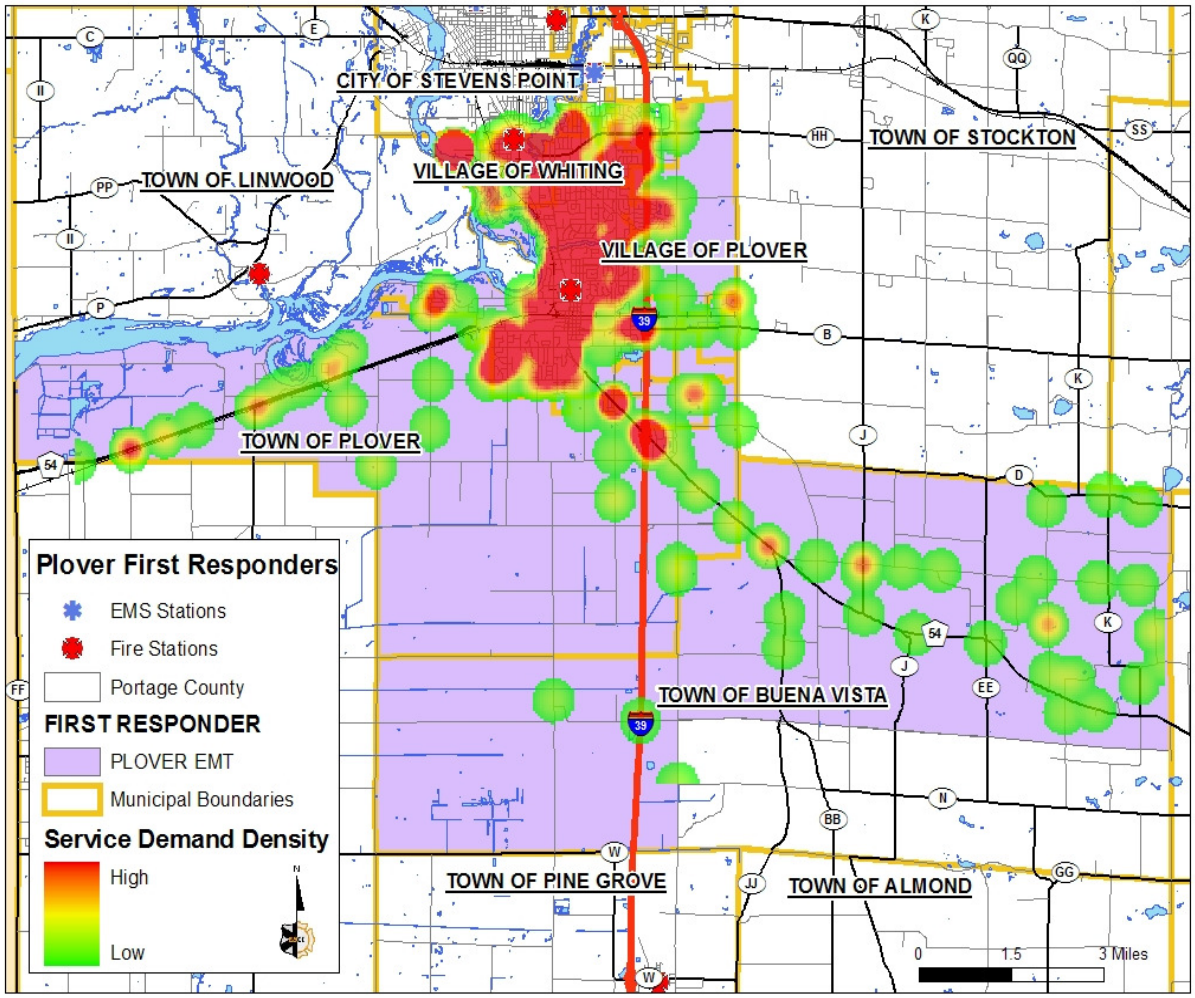
Plover EMS

The Plover Fire Department provides first responder service through mostly paid on-call personnel (Plover EMS). The fire department operates a fire station at 2400 Post Rd. in Plover, but many times the members respond to incidents in their own vehicles. The 2000 Census information for their service area included 15,662 persons within 6,107 housing units.

Service Area

Plover EMS serves the Village and Town of Plover, the Village of Whiting, along with a portion of the Town of Buena Vista. The area of coverage is 99 square miles with 366.65 miles of roadway. The following figure details the Plover EMS service area and the located EMS calls within the area.

Figure 15: Plover EMS Service Area



Staff and Certifications

Forty-four citizens are members of the Plover Fire Department, with 18 EMT members trained to EMT-Basic level. There are two full-time department employees; their training level is unknown. The administrative staff includes the fire chief, two assistant chiefs, three captains, and six lieutenants.

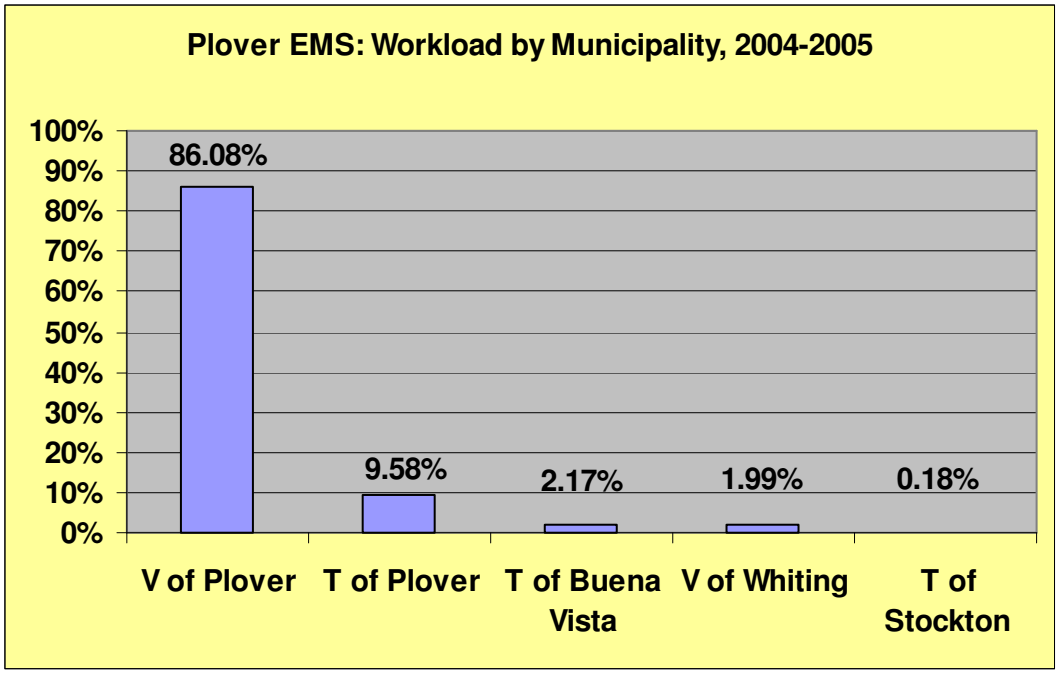
Finance

The Plover Fire Department budgeted $60,329 for first responder expenses for 2002, of which $47,700 was allocated for wages. Revenue for these expenses was not detailed.

Performance

According to the first responder database, Plover EMS reported 556 calls for the years 2004-2005. As seen in the following figure, the majority of those calls are within the Village of Plover. This compares to 1,191 EMS calls located in their primary area which indicates 47 percent reliability performance.

Figure 16: Plover EMS Workload



The average turnout time for the Plover EMS is **one minute and 41 seconds,** while the average response time from dispatch is **six minutes and 15 seconds**. Plover EMS responds to 90 percent of calls within **10 minutes**.

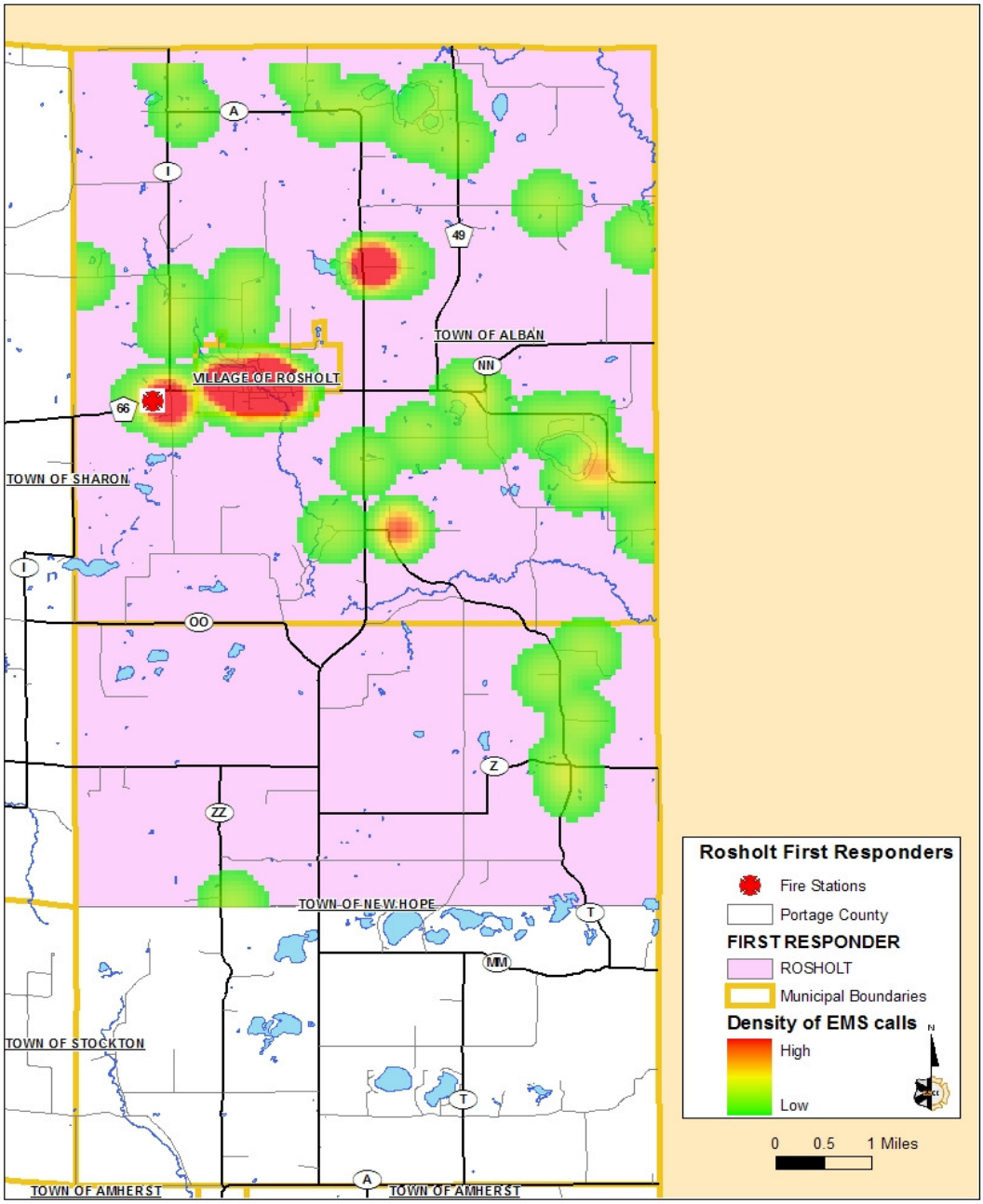
Rosholt EMS

Rosholt EMS provides first responder service through paid on-call personnel (Rosholt EMS). The fire district operates a fire station at 9075 STHY 66 in Rosholt, but many times the members respond to incidents from their homes and elsewhere in their own vehicles. The 2000 Census information for their service area included 1,713 persons within 747 housing units.

Service Area

Rosholt EMS serves the Village of Rosholt and Town of Alban, along with a portion of the Town of New Hope. In the northeast corner of Portage County, the area of coverage is 55 square miles with 105.5 miles of roadway. The following figure details the Rosholt EMS service area and located calls within the area.

Figure 17: Rosholt EMS Area



Staff and Certifications

Thirty-five citizens are members of the Rosholt Fire District, with 13 of those members trained to the first responder level and two members trained to the EMT level. The administrative staff includes the fire chief, two assistant chiefs, and three captains.

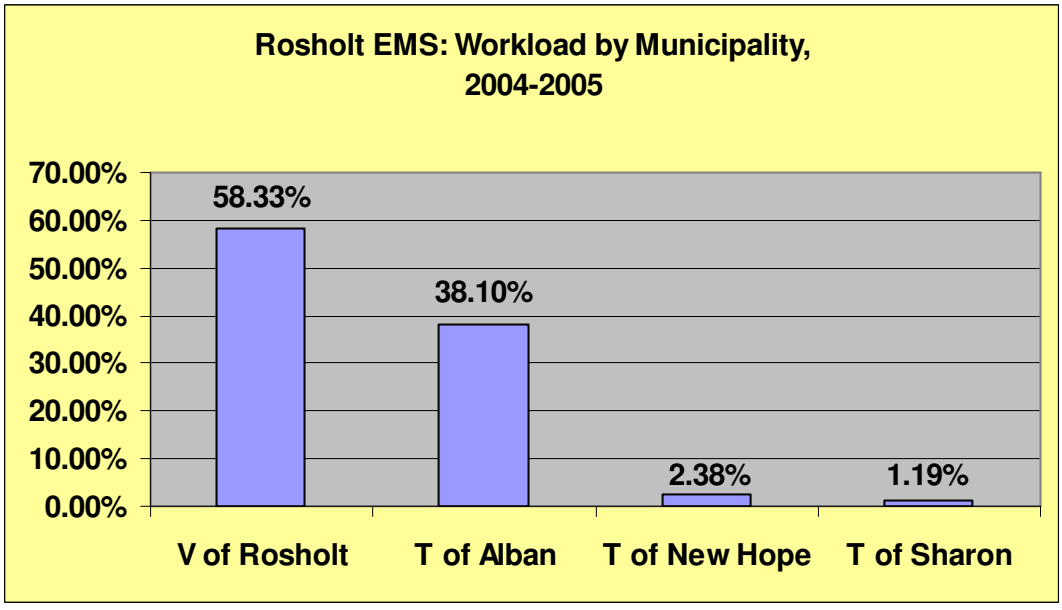
Finance

The Rosholt Fire District budgeted $16,980 in expenses for 2005, including $6,330 for wages which includes $3.00/shift and $30/call. The district budget is based on an expectation of 65 calls a year. Reimbursement for these expenses was expected from the towns and village, based on population served assessed at $9.48 per person.

Performance

According to the first responder database, Rosholt EMS reported 87 calls for 2004-2005. As seen in the following figure, the majority of those calls were within the Town of Alban and the Village of Rosholt. This compares to 99 EMS calls located in their primary area which indicates a reliable 88 percent response performance.

Figure 18: Rosholt EMS Workload



The average turnout time for the Rosholt EMS is **three minute and eight seconds,** while the average response time from dispatch is **11 minutes and 16 seconds**. Rosholt EMS responds to 90 percent of calls within **14 minutes**.

Rudolph EMS

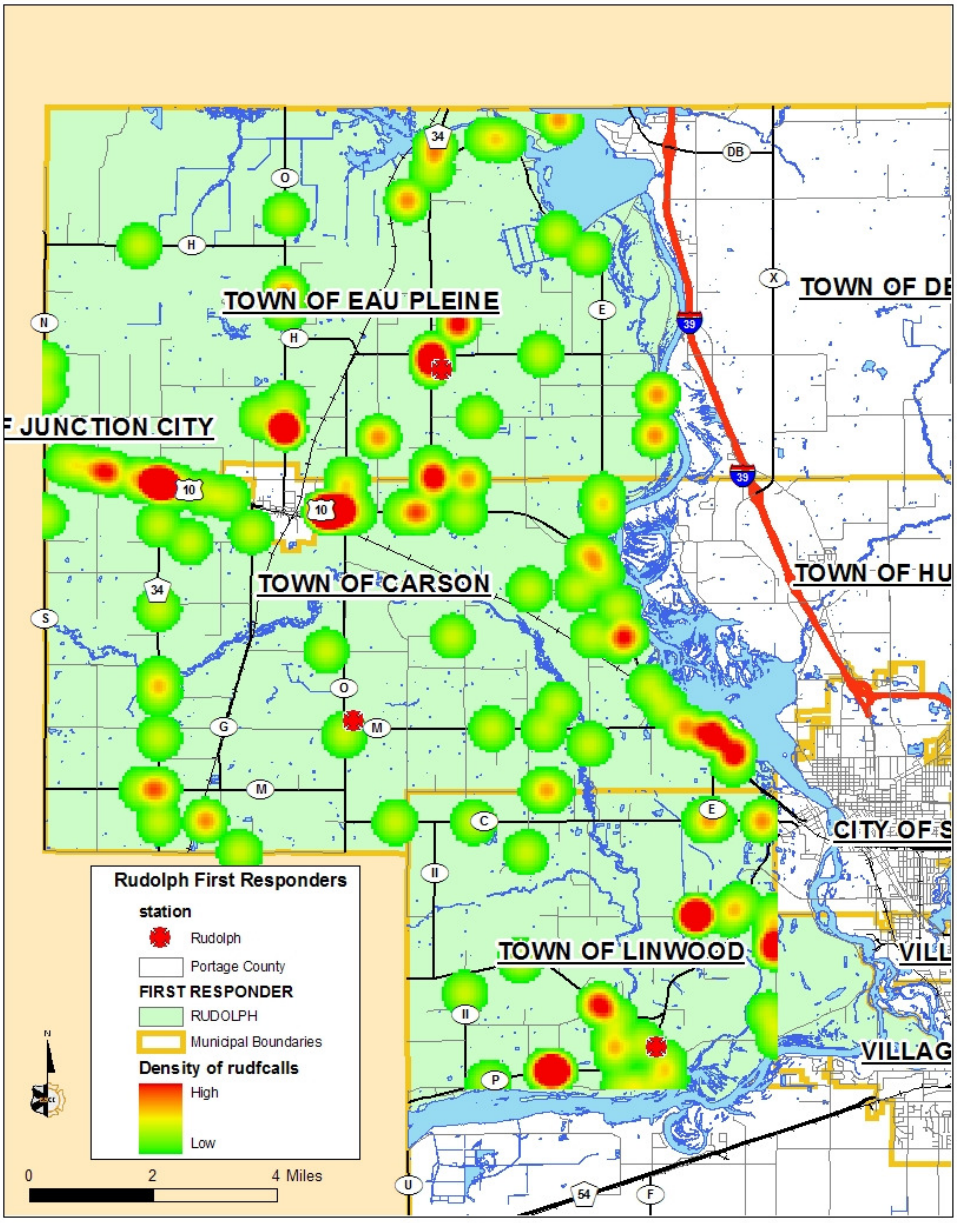
The Rudolph Fire Department provides first responder service (Rudolph EMS) through a combination of paid and volunteer personnel. The fire department operates four stations as listed below, but many times, the members respond to incidents in their own vehicles. The 2000 Census information for the service area included 3,341 persons within 1,313 housing units.

Station	Address
1/HQ	Village of Rudolph in Wood County
2	1785 West River Drive, Linwood
3	Hwy 34 & Co Rd H, Eau Pleine
4	Co Rd O & Co Rd M, Carson

Service Area

Rudolph EMS serves the Towns of Eau Pleine, Carson, and Linwood on the northwestern side of Portage County. The area of coverage is 145 square miles with 271.85 miles of roadway. The following figure details the Rudolph EMS service area and located calls within the area.

Figure 19: Rudolph EMS Service Area



Staff and Certifications

Seventy-seven citizens are members of the Rudolph Fire Department, with 15 EMS members trained to the first responder level and 14 at the EMT-B level. The administrative staff includes the fire chief and two assistant chiefs. There are two full-time employees of the department; it is unknown what level of training they hold.

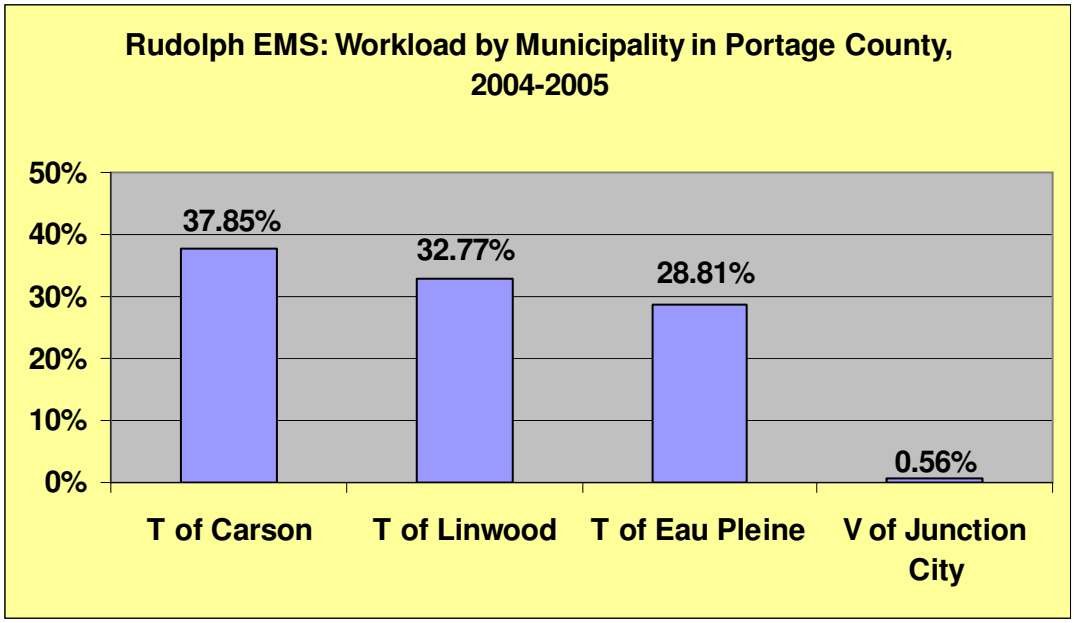
Finance

The Rudolph Fire Department budgeted $368,642 in expenses for 2005, including $12,500 for first responder equipment and supplies. Revenue figures for these expenses was not specified.

Performance

According to the first responder database, Rudolph EMS has reported 177 calls in 2004-2005. As seen in the following figure, the workload distribution is relatively equal across the three towns in Portage County where they have primary response coverage. This compares to 189 EMS calls located in their primary area, which indicates 93.6 percent reliable response performance.

Figure 20: Rudolph EMS Workload



The average turnout time for the Rudolph EMS is **eight seconds** while the average response time from dispatch is **seven minutes and five seconds**. Rudolph EMS responds to 90 percent of calls within **11 minutes**.

Sharon EMS

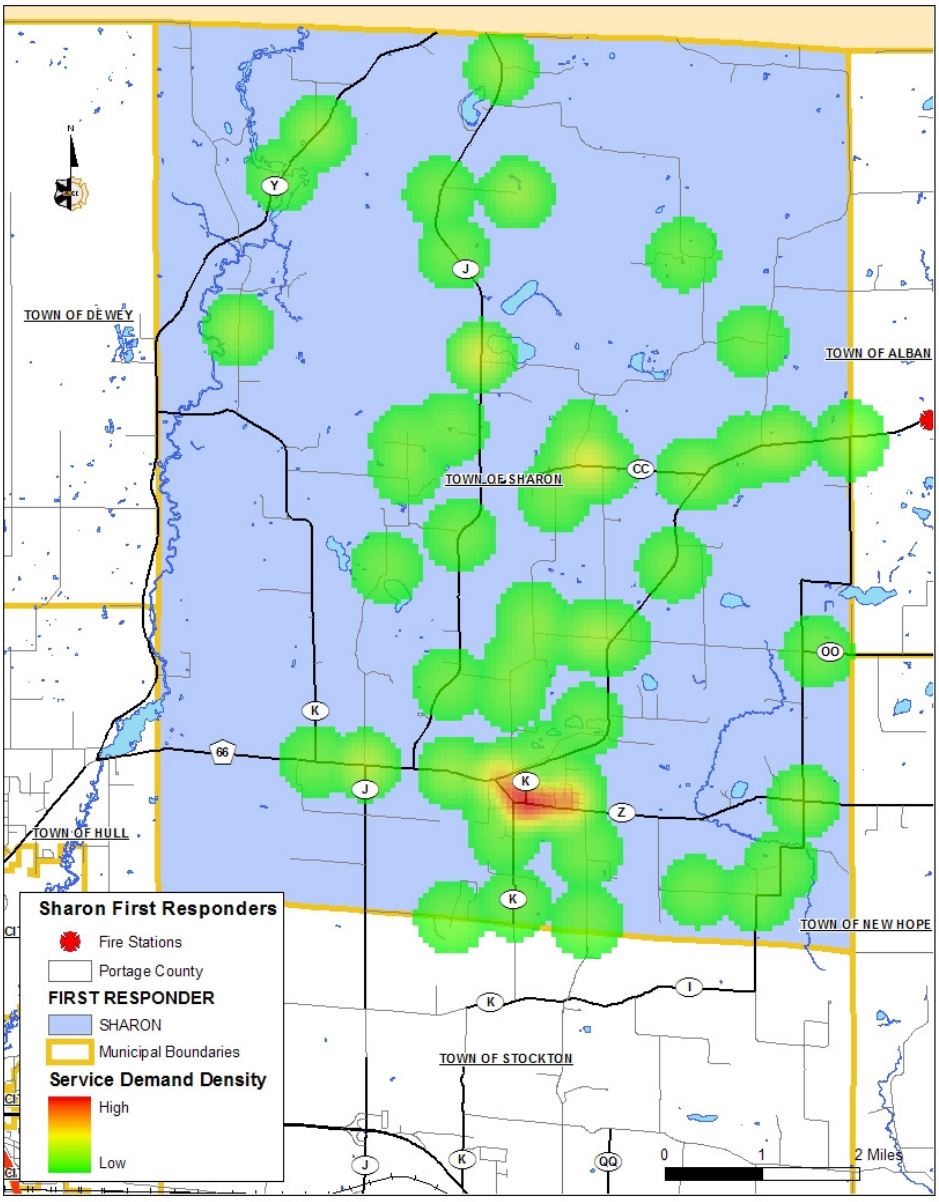
The Town of Sharon is located on the northern border of Portage County. Sharon EMS is an independent organization that provides first responder service through volunteer personnel.

Currently, there is no station in Sharon, but one may be built by the Rosholt Fire District within town limits in the near future. As such, the members respond to incidents from their homes and elsewhere in their own vehicles. The 2000 Census information included 1,936 persons within 754 housing units.

Service Area

The first responders primarily serve the Town of Sharon, in an area of 65 square miles with 118 miles of roadway. The following figure details the Sharon EMS service area and the located calls within the area.

Figure 21: Sharon EMS Service Area



Staff and Certifications

A staff of 11 members is listed on the roster for Sharon EMS. No further staffing information was provided.

Finance

Sharon EMS submitted a budget of $7,849 in expenses for 2005. Revenue for these expenses was not specified.

Performance

According to the first responder database, Sharon EMS unit reported 55 calls within Town limits for the years 2004-2005. This compares to 86 EMS calls located in their primary area which indicates a 64 percent response reliability performance.

Call times were not reported completely in the first responder database; response performance data could not be analyzed.

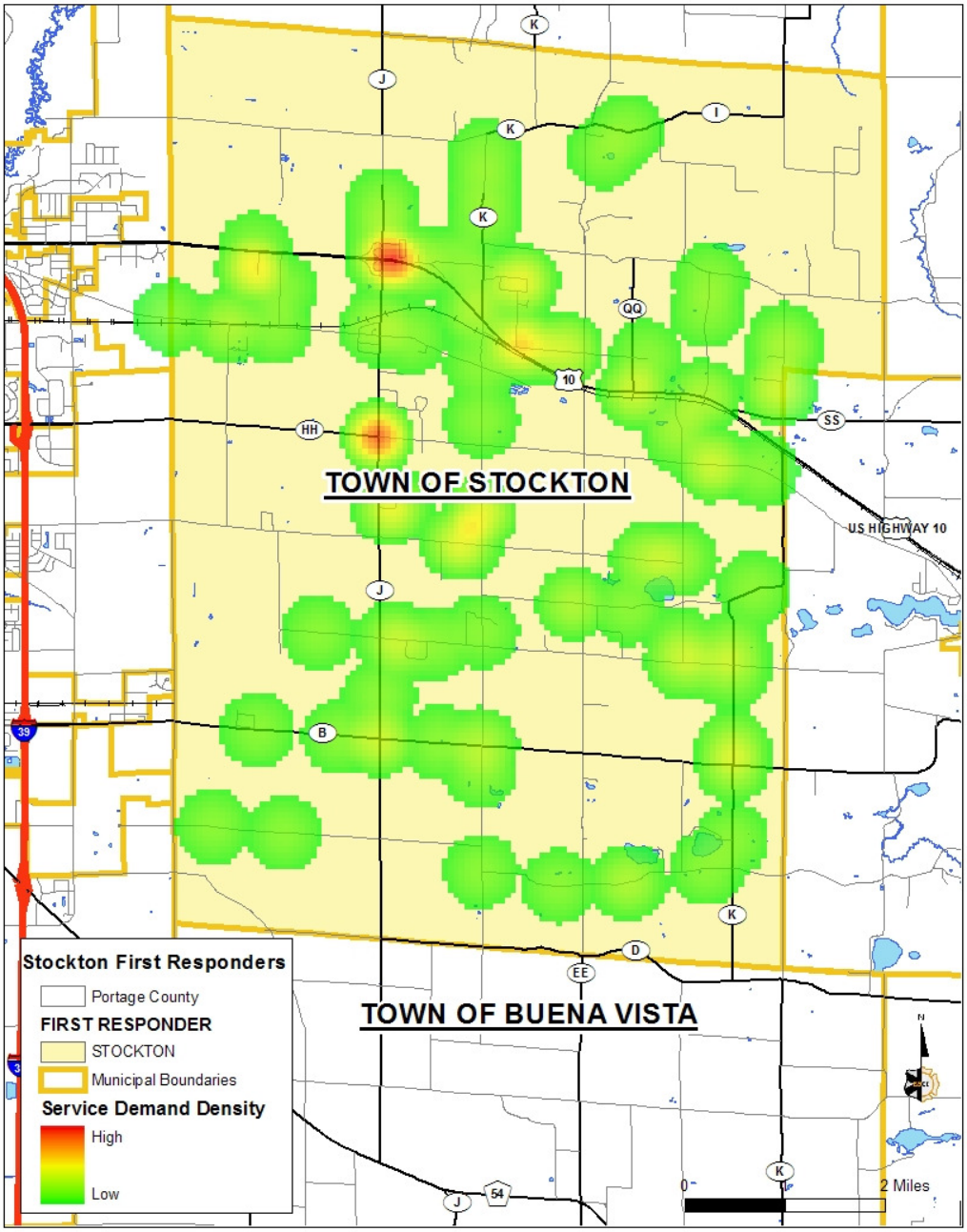
Stockton EMS

Stockton EMS is an independent organization that provides first responder service through paid on-call personnel. A station exists at 6th and Custer Streets, but most times the members respond to incidents from their homes and elsewhere in their own vehicles. The 2000 Census information included 2,896 persons within 1,024 housing units.

Service Area

Stockton EMS serves primarily the Town of Stockton, within an area of 11 square miles with 118.22 miles of roadway. The following figure details the Stockton EMS service area and the located calls within the area.

Figure 22: Stockton EMS Service Area



Staff and Certifications

Twelve members are on the roster for Stockton EMS. Further staffing information was not provided.

Finance

Stockton EMS budgeted $9,000 in expenses for 2005, including $2,780 for on-call wages based on an expectation of 60 calls. Reimbursement for these expenses was not specified.

Performance

According to the first responder database, Stockton EMS has reported 142 calls within the Town of Stockton for 2004-2005. This compares to 157 EMS calls located in their primary area which indicates a 90.4 percent response reliability performance.

The average turnout time for Stockton EMS is **two minutes and 50 seconds,** while the average response time from dispatch is **seven minutes and 52 seconds**. They respond to 90 percent of EMS calls within **11 minutes**.

Summary

The following table provides a pertinent informational summary for the first responder units within Portage County.

Figure 23: Portage County First Responder Unit Summary

Portage County First Responder Unit Summary								
Unit	**Service Area**	**Population served**	**Members Trained**	**2004-2005 Responses**	**Calls in District**	**Avg Turnout**	**Avg. Response**	**90th Perc Response**
Almond	90.6	1,986	11	95	91	1:24	10:15	19:00
Amherst	96.0	4,758	21	189	256	3:00	12:44	20:00
Bancroft/Pine Grove	37.8	904	8	20	52	4:11	08:11	13:00
Dewey	47.0	975	11	25	31	3:09	09:41	12:00
Hull	32.0	5,493	12	88	162	1:50	07:23	11:00
Junction City	2.0	440	9	18	53	2:00	13:18	19:00
Plover	99.0	15,662	18	556	1191	1:41	06:15	10:00
Rosholt	55.0	1,713	15	87	99	3:08	11:16	14:00
Rudolph	145.0	3,341	31	177	189	0:08	07:05	11:00
Sharon	65.0	1,936	11	55	86	*No Data*	*No Data*	*No Data*
Stockton	11.0	2,896	12	142	157	2:50	07:52	11:00
Grant	71.6	2,020	6	44	53	*No Data*	*No Data*	*No Data*
Totals	752	42,124	165	1496	2420			

Source: Useable data from the Portage County First Responder database, Stevens Point Fire Dept and Higgins EMS Response Data, & geocoded incident data.

Note: Times are in minute:second format

Portage County should develop a system which routinely records the first responder response data in an accurate manner. As stated elsewhere in this report, this could be accomplished by a modern computer-aided dispatch system. In the case of the data analyzed here, 17 percent of recorded calls did not have a response time, 13 percent had enroute to scene time missing, and 12 percent did not have an arrival time. It is unknown how many calls are completely omitted.

First responder financial support by the towns and villages in which they serve should continue. Countywide financial support of first responder groups should also be continued to assist these units with education and recruitment needs. Requiring an accounting of funds for these purposes, as well as requiring complete activity reporting into the County's first responder database should be considered. One option is to provide funding based upon service-demand. However, these groups need to recruit more members, resulting in higher training and supply costs. The loss of financial support in areas with lower volumes could be detrimental. Since areas with higher service-demand correlates with higher populations, donation/fund drives may be more successful than in the more rural areas of the County. County financial support, training requirements, and data management should be managed by the Office of Emergency Management. The first responder organizations should maintain a liaison between with the Office of Emergency Management to ensure compliance with required elements to assure continued funding.

Because many of these organizations are volunteer, it would be extremely difficult to require specific equipment or staff. County subsidy can be dependant on requiring training levels and equipment availability for first responders. In discussions with these agencies, the majority of these groups had no desire to assume the mantel of EMS transport services in their service areas. The necessity to raise local property taxes to establish, equip, staff, and train to at least the EMT level for these services, is not currently feasible. Overwhelmingly, these groups expressed a desire for a regional solution, over a local one.

The purpose of the subsidy would be to help build and maintain a countywide system, rather than aiding one or two organizations who obtain funding through methods not available in rural communities.

Portage County Rapid Response Unit (RRU)

The clamor of complaints about long response times to the more remote sections of the County by the public, elected officials, and first responder groups led to the addition of a rapid response unit (RRU) to the EMS community in Portage County.

Like other County EMS services, the RRU is governed by Portage County. The RRU differs in that it operates directly under the Office of Emergency Management, rather than being contracted out (such as with SPFD). It is staffed by a single paramedic hired by the County, and operates under the same medical care protocols established for all Portage County paramedics.

Planning

It has been reported that the RRU has quieted some of the long-response time concerns within Portage County for the time-being. From interviews held with many stakeholders, this program is viewed as a stop-gap measure until a permanent strategy for EMS in the County can be determined. It was felt that if other alternatives for EMS delivery were recommended, this may include the use of a resource such as the RRU. The RRU is also used for EMS presence at large events.

Equipment and Facilities

The RRU was recently deployed utilizing a sport utility vehicle donated by a local car dealership (Figure 24). It is equipped with the same medical supplies normally carried by SPFD paramedics and utilizes the same existing communications system. It is housed at Plover Fire Station, but is not typically deployed for calls from that location.

Figure 24: Portage County EMS Rapid Response Unit

Service Delivery

The RRU has an ambiguous strategy of roaming the County, outside of the urban area, in an effort to *catch* calls in the area they happen to be in. They are given a guideline roughly based upon a two-year historical pattern of service demand. However, where the RRU happens to be at any particular time is ultimately decided upon by the paramedic. Such a vague deployment strategy encumbers the staff with a difficult task of intuitively predicting where a call may occur at any given time.

The RRU is funded to operate on a 50-55 hour per week schedule, which is less than a third of the total amount of time available to answer calls within the County. The RRU has been deployed for an average of 45 hours per week not including special events.

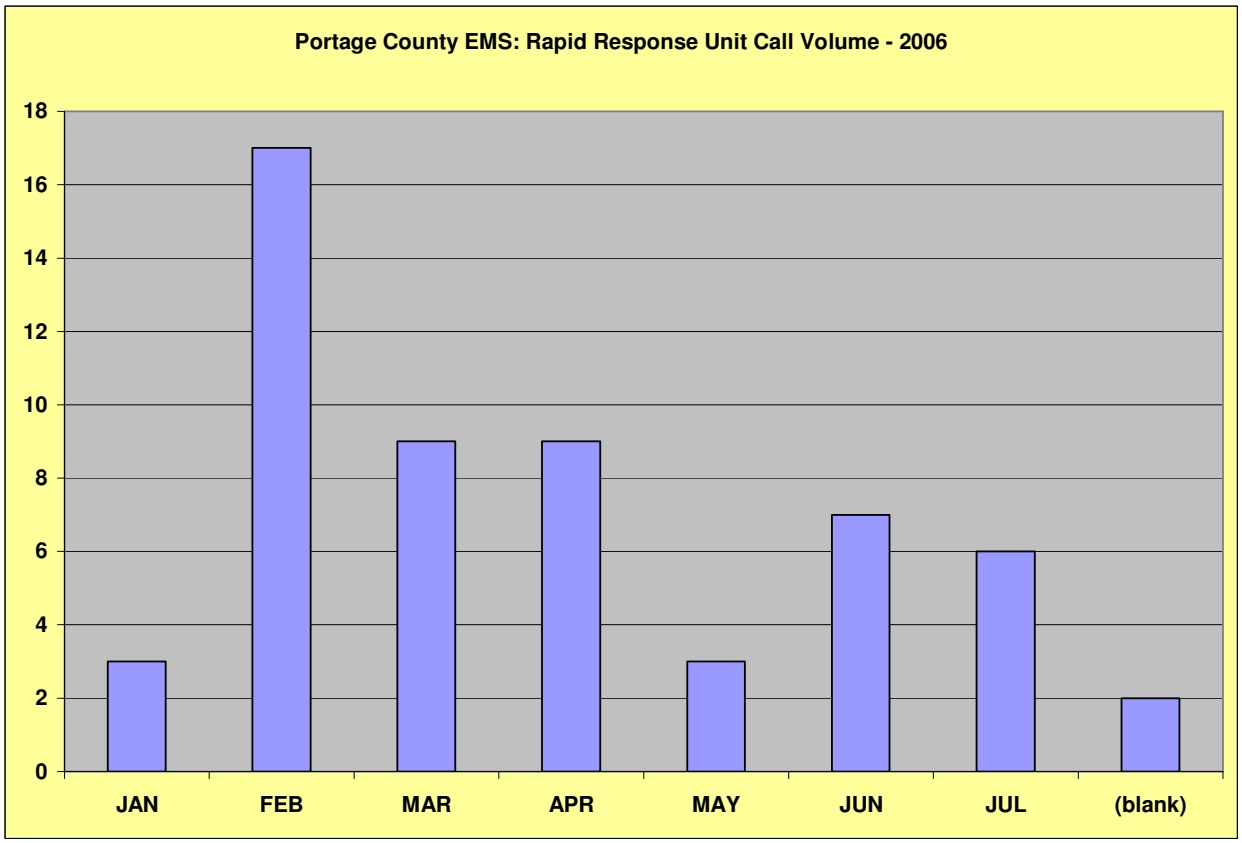
Finance

This is a pilot program by the County; hence it has no additional funding planned for its continuation until the results of this EMS Master Plan study are released. The County had provided $100,000 as a funding grant for the RRU.

Reporting and Records

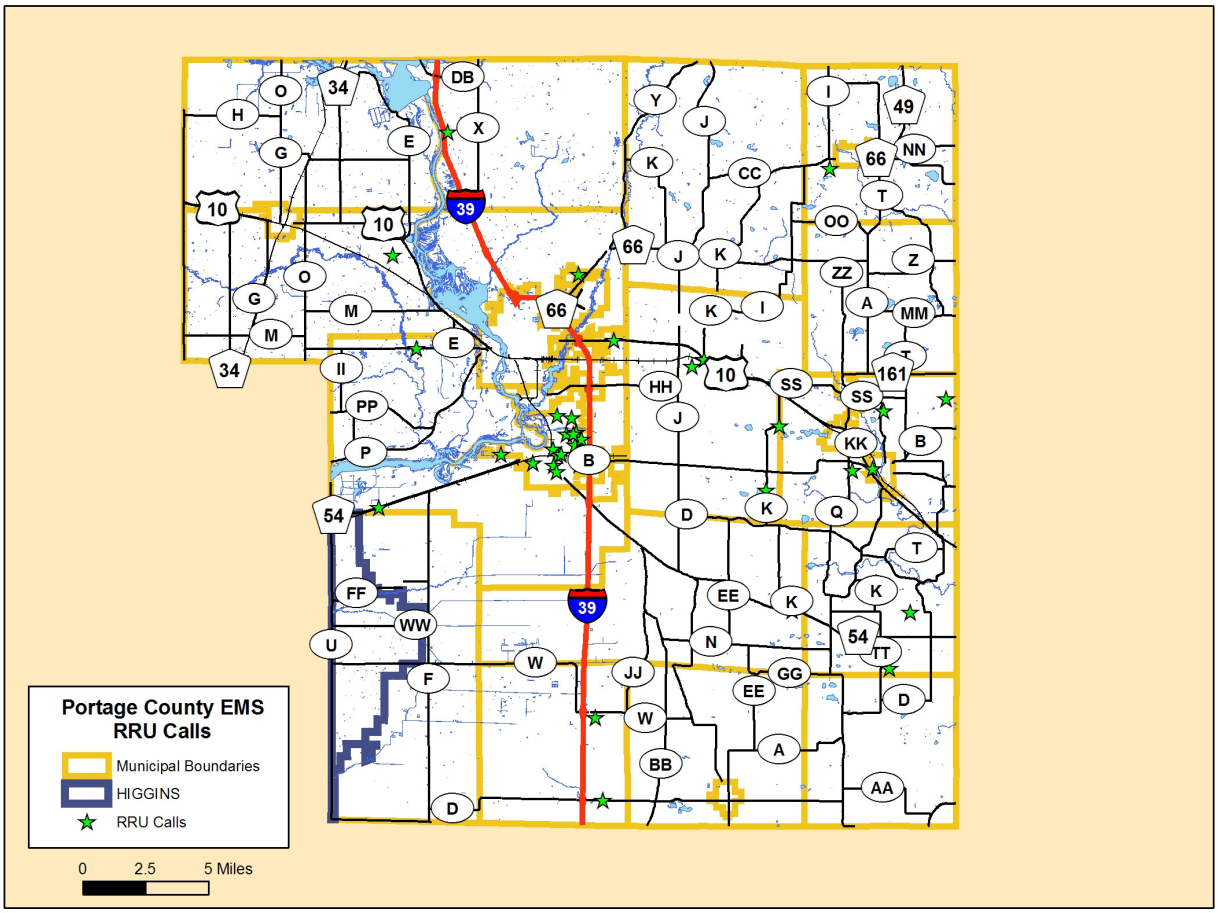
The provided call record for the RRU included 57 responses from 1/21/06 through 7/11/06. The following figure illustrates this call volume based on a monthly basis.

Figure 25: Rapid Response Unit Call Volume



As seen in the chart, the amount of calls that the RRU was able to reach has generally decreased since inception of the program. The following map illustrates the location of these incidents with most of the responses within the Village of Plover, which is already nearby SPFD Station 2.

Figure 26: RRU Call Locations



The paramedic is required to complete a patient care record which includes incident time reporting from the dispatch center, however only 59.6 percent of the call record included time stamps sufficient for a response time analysis. The average of the recorded response times for the RRU was **eleven minutes and five seconds**. The RRU was able to answer 90 percent of the calls within a **twenty minute and twenty-four second** time frame according to the data provided. 64.7 percent of the these calls indicated a response time of the SPFD ambulance which indicates that the RRU arrived at a scene 2.86 minutes faster on the average. 13.6 percent of the calls in which SPFD arrival were recorded; the ambulance arrived first on the scene by an average of 3.6 minutes.

Observations

If the goal of the RRU was to reduce response times to calls outside the County urban core, it probably hasn't been successful due to program design. If the goal was a stop-gap measure to

reduce public attention of extended EMS response times, or to display the ability of the County to initiate ALS-level services without a contracted entity, then perhaps it was.

One part-time rapid response unit covering an excess of 700 square miles based on a loose guideline of deployment is challenged to be in the right place at the right time. It has not done so often enough to make a significant statistical difference. Deploying the unit from an area that is already near existing resources, rather than an area farther from it, requires travel time in order for the RRU to be in position to effectively answer calls. This can be seen in the response time analysis.

Rapid response type units are used in other parts of the Country under various naming conventions and staffing configurations. Some areas call these units *stat* trucks, quick response vehicles (QRVs), medic cars, and Mobile Intensive Care Units (MICUs). In some areas, they are used by first responders to arrive ahead of the ambulance to render aid, sometimes assisting the ambulance on the trip to the hospital. Some communities simply use fire apparatus equipped with medical supplies for such a purpose and the ambulance service is designed to provide second-arriving paramedic level care. Other areas use these vehicles to provide first-arriving paramedic level care; as in Portage County. The difference however, is that they are supplemental to an existing and sufficient base of BLS-capable ambulance units rather than a replacement.

It appears the issue in Portage County is not first responder response times, but whether they are police officers, EMTs, or paramedics. Although it is recognized that the skill set possessed by a paramedic is advantageous in the field, the real issue is the amount of time it takes for the ambulance to arrive and begin to deliver the patient to a definitive, higher level of care.

The RRU, in its current environment, is ineffective in solving the basic issue at hand, and it is recommended that the County discontinue its use, unless a program in which it supplements additional basic ambulance units is offered and adopted by Portage County EMS. Various strategies of deployment will be offered later in this report, including one that utilizes an RRU, although it may not be the option ultimately recommended.

Objective Five - EMS Transport: Stevens Point Fire Department

The Stevens Point Fire Department is the only agency contracted for ALS transport services in Portage County. This is accomplished by the Ambulance Service Agreement between the County and the City of Stevens Point. This relationship has been one that has existed since 1974, and is currently operating on a previous contract extension.

System Regulation and Policy

The Stevens Point Fire Department operates a fire-based EMS system. It provides traditional fire protection services within the City of Stevens Point and by contract, provides ALS transport for the entire County. The system is regulated by Wisconsin State EMS statues as established by the Wisconsin Department of Health and Family Services. Chapter HFS 110 "Licensing of Ambulance Service Providers and Emergency Medical Technicians" as well as Chapters HFS 111 and 112 of State Statues which speaks directly to governance and regulation of EMS services and personnel. The system is further organized and governed by the contract for services between Portage County and SPFD. The department also operates under the authority of an EMS system medical director, provided at no cost by the local hospital system.

The Ambulance Service Addendum requires a joint meeting of the Police and Fire Commission and the Portage County Public Safety Committee. EMS delivery policies and procedures are the joint responsibility of the Police and Fire Commission and the Public Safety Committee, with the Police and Fire Commission having final approval. A statistical monthly report is required to be submitted, along with a comprehensive annual report. The County is obligated to produce billing revenue and vehicle maintenance expenditure reports on a quarterly basis. While the addendum requires performance standards be developed to continuously measure the effectiveness of the program, there appears to be insufficient, actual performance standard reporting. The contract calls for cooperative development of these standards, and specifically, discusses establishment and measurement of clinical standards, customer standards, response time reliability, and economic efficiency.

It is uncommon in contractually-provided service, particularly in such an important community service such as public safety, that more stringent system performance requirements are not clearly established within the contract. Many communities provide specific system performance standards and achievement benchmarks directly in the contract. Failure to meet system

performance parameters typically has contractually-identified penalties. ESCi strongly recommends that future contract negotiations, with any provider providing critical emergency medical services, include specific performance expectations.

Planning

The contract calls for the operation of two ALS ambulances on a 24-hour a day basis to service any area of Portage County, where ever the call for assistance originates. Additionally, Stevens Point is obligated to provide an ALS ambulance on call for a third, and if necessary, fourth ambulance. The contract also requires non-emergency calls and transports as necessary. Financial reimbursement for 10 staff-paramedic wages, benefits, overtime, travel costs, training, malpractice insurance, accreditation expenses, on-call pay, and other mandated expenses are borne by Portage County.

The County had one ambulance on duty until 1981, when financing was increased from providing three staff members to ten, which allowed for the second unit. In 1984, a provision in the contract referenced a third ambulance be staffed on an on-call basis, followed by the fourth ambulance in 1988. These were to be staffed by off-duty personnel, at overtime rates when needed. No additional full-time staff, or additional unit deployment, has been agreed on since 1981. As will be detailed later in this report, service demand has steadily increased annually. Current service demand, as well as projected demand, will be analyzed to help determine whether additional units are advisable.

There does not appear to be workload, response time, or geographic coverage parameters which guide the decision to add additional units when appropriate, nor is there a funding mechanism in place, should the parameters not be met. Response time parameters will guide the necessity for more units, if necessary. Increased workload will cause response times to fall short, and more units to alleviate this shortfall would be needed. If response times are not met because of geographic reach, additional units, strategically deployed, would bring response time performance in line with goals.

Human Resources

The County provides human resource services for SPFD through the ALS contract. Labor is represented by the International Association of Fire Fighters (IAFF), Local 484, which has a collective bargaining agreement with SPFD.

SPFD utilizes cross trained personnel to provided EMS services. Department members may engage in fire suppression activities within the City, however, it was reported that EMS units are kept in a position such that they are able to be freed from a fire-related incident to respond to an EMS alarm.

The costs associated with funding the personnel aspects of an EMS system are dependent upon a wide array of variables; most are related to the methods in which staff are scheduled. Total cost for an individual employee is a combination of base annual salary (without regard for overtime wages), scheduled overtime (dependent upon the method used to calculate overtime), benefits such as retirement, social security tax, life/medical insurance, worker's compensation insurance, unemployment insurance, unscheduled overtime or *call-back* pay, training pay, and holiday pay (dependent upon the method used to calculate the hourly rate).

Basic Facts:

1. Base salary for Firefighter/Paramedic - $41,856.24.
2. Base salary for Lead Firefighter/Paramedic - $51,074.16.
3. Schedule: 24 hours on, 24 hours off, 24 hours on, 24 hours off, 24 hours on and then four days off with all hours on duty considered *paid* time. Average 56-hour workweek.
4. No use of "Kelly" time for sleep or other down times.
5. Hours worked over 56 per week considered overtime and paid at double-time.
6. Hours worked during call-back paid at double-time.
7. Ten paid holidays per year.
8. Holidays paid at 24-hours or personnel are allowed to bank the time and use it for time off.
9. Employees work all scheduled hours resulting in full annual pay.

Personnel Costs

The City of Stevens Point Fire Department, through a collective bargaining agreement with the International Association of Fire Fighters Local 484, has set the beginning annual salary for a Nationally Registered EMT-Paramedic/firefighter at $41,856.24 with a maximum annual salary of $48,847.44 resulting in a median annual salary of $45,351.84.

Benefits, stated in paragraph one, are calculated at twenty-five percent (25%) of the base annual salary which results in an additional cost of $10,464.06, $11,337.96 and $12,211.86 for starting, median and maximum salaried employees respectively, however, information received indicated that benefits were calculated at 60 percent which is well above the national average.

Holiday pay has been calculated using the standard average for a 56 hour workweek shift pattern to obtain average annual hours worked of 2,912. The base annual salary was then divided by 2,912 to determine an hourly rate and that rate was multiplied times twenty-four (24) hours per holiday for ten (10) holidays per year which resulted in $3,449.69, $3,737.79 and $4,025.89 annually for starting, median and maximum salaried employees respectively.

Firefighter/EMT-Paramedic 56-hour Workweek						
	Hourly Rate	**Base Salary**	**Benefits**	**Overtime**	**Holiday**	**Total**
Starting	$14.37	$41,856.24	$10,464.06	Variable	$3,449.69	$55,789.99
Median	$15.57	$45,351.84	$11,337.96	Variable	$3,737.79	$60,427.59
Maximum	$16.77	$48,847.44	$12,211.86	Variable	$4,025.89	$65,085.19

The beginning lead firefighter/paramedic is set at $51,074.16, with a maximum annual salary of $55,614.60 resulting in a median annual salary of $53,334.30. Benefits are calculated at 25 percent of the base annual salary resulting in an additional cost for beginning, median, and maximum salaried employees of $12,768.54, $13,333.58, and $13,903.65 respectively. Holiday pay for lead personnel was calculated using the same methods indicated above, and results in an additional cost per beginning, median, and maximum salaried employee of $4,209.60, $4,396.80 and $4,584.00 respectively.

Lead Firefighter/EMT-Paramedic 56-hour Workweek						
	Hourly Rate	**Base Salary**	**Benefits**	**Overtime**	**Holiday**	**Total**
Starting	$17.54	$51,074.16	$12,768.54	Variable	$4,209.60	$68,052.30
Median	$18.32	$53,334.30	$13,333.58	Variable	$4,396.80	$71,064.68
Maximum	$19.10	$55,614.60	$13,903.65	Variable	$4,584.00	$74,102.25

Additional salaried personnel identified in the FY 2005 budget were those of one deputy chief ($54,394.88) and one captain ($52,690.31). The benefits for those positions would be calculated the same as for line personnel. The captain position would receive holiday pay at a rate of $18.09 per hour for ten holidays resulting in an additional cost of $4,341.60. The deputy chief position is subject to the 56-hour workweek, and therefore, is paid in the same manner as all other field positions resulting in an hourly rate of $18.68 and holiday pat in the amount of $4,483.20.

Personnel with more than five years of service are granted longevity pay in addition to the regular annual salary. The budgeted amount for these payments for FY 2005 was $2,480.00, but only $1,607.88 was expended from the budget. This could be due in part to the unexpected departure of tenured personnel.

Training and education is an important aspect of any EMS system and will often determine the overall quality of service delivered. Based on the FY 2005 budget, there is $22,000.00 allotted for educational seminars and training courses plus $15,000.00 for “Off-duty Training Pay.” The State of Wisconsin requires EMT-Paramedics to obtain 48 hours of continuing education every two years (24 hours per year) in order to maintain their certification. There are currently 21 personnel within SPFD certified at the EMT-Paramedic level which are regulated by state statute regarding re-certification. Based on the budgeted amounts, an additional expense of $1,850.00 per employee could be incurred; however, actual expenditures for FY 2005 indicated only $952.90 per employee was incurred. Mid-State Technical College currently has an agreement with SPFD to provide 48 hours of continuing education each year for a cost of $96.53 per person, a significant savings to the agency. This does not, however, cover the cost of paying the employee for their time.

Using the salary calculations indicated earlier for the median salary individual, the total annual pay for state mandated EMS training would result in an additional salary cost per employee of $1,494.72 for a firefighter/paramedic, and $1,758.72 for a lead firefighter/paramedic. Training seminars and/or educational offerings that are not required for personnel should be allowed and the expense of registration, travel, lodging, and meals should be paid as the budget allows. It is recommended that personnel receive an annual allowance of $500.00 for discretionary use on non-mandatory educational offerings. This would bring the total per employee cost of training and education to $2,091.25 for a firefighter/paramedic and $2,355.25 for a lead firefighter/paramedic.

One additional personnel expenditure to be expected within any EMS system relates to the safety and well-being of the staff. The Occupational Safety and Health Administration (OSHA) requires each healthcare worker involved directly in patient care receive testing for possible exposure to tuberculosis at least annually. Those individuals in *high risk* geographical areas should receive testing twice per year. This testing can usually be accomplished through the local Department of Public Health for minimal cost to the agency. In addition, healthcare workers are required to receive inoculation against Hepatitis B Virus (HBV). This vaccine can also typically be acquired through the local Department of Public Health. The estimated cost per employee for these medical services is $150.00 annually.

Total Estimated Cost for Median Firefighter/Paramedic		
	Firefighter/Paramedic	Lead Firefighter/Paramedic
Base Salary	$45,351.84	$53,334.30
Benefits	$11,337.96	$13,333.58
Holiday Pay	$3,737.79	$4,396.80
Longevity	$453.53	$533.34
Training/Education	$2,091.25	$2,355.25
Uniforms/Clothing	$300.00	$300.00
Medical Services	$150.00	$150.00
Malpractice Insurance	$1,300.00	$1,300.00
Total	**$64,722.37**	**$75,703.27**

In addition to personnel cost associated with operating an EMS system, there are varying numbers of other expenditures that must be addressed. These expenditures depend greatly on what methods are employed to operate the system. Rather than summarize these additional expenses in paragraph form, they are listed in the following table with a brief explanation of each. Some of these items are already listed within either Portage County or Stevens Points' budget summaries, however, areas not identified within those existing budgets have been included to show estimated total system cost. Each item is shown as a per facility/vehicle annual expense.

Additional Non-Personnel Expenses	
General Utilities	$11,000.00
Telephone Charges	$1,200.00
General Office Supplies	$2,000.00
Copy Services	$500.00
Janitorial Supplies	$1,500.00
Medical Supplies	*$30,000.00
Fuel	**$35,000.00
Public Education Supplies	$2,000.00
Miscellaneous Expenditures	$1,000.00
Service Contracts	***$4,000.00
Building Repair	$3000.00
Equipment Repair	$2000.00
Vehicle Repair	$7,000.00
Postage	#$2,000.00
Vehicle Insurance	$1,500.00
Equipment Rental – Oxygen	$4,000.00
Total	**$107,700.00**

*Replacement of equipment and supplies that are non-disposable or that are disposable and not replaceable at receiving facilities.
**Per Vehicle - Based on a price per gallon of $3.50, traveling 150 miles per day per unit and averaging six miles per gallon.
***Service agreements for specialized equipment such as cardiac monitors, cots or other electronic equipment.
#Only if billing is completed in-house.

Equipment and Facilities

The Stevens Point Fire Department operates from two fire stations located in the City. Both stations are used in the deployment of emergency medical transport ambulances. A review of these facilities was made during the site visit to Portage County in winter of 2006. The following tables provide general information and condition of the facilities at that time.

SPFD Station #1
1701 Franklin Street
Built in 1967, this large 16,099 square foot headquarters facility consists of three drive-through apparatus bays. The facility is an older building, but with adequate capacity for its use, and blends well with the surrounding area. Any specific problems with this facility can be classified into the following seven categories.

• **Design:**	*The apparatus bay size was not planned large enough for current apparatus. There is no space for expansion. Parking is tight during classes or when apparatus from the other station is present. Some areas are quite dated, and renovation or remodeling might be beneficial.*
• **Construction:**	*Masonry construction with flat membrane roof. Some leaking reported, likely needs repair or replacement over living areas. Hot water heat, natural gas. Central air conditioning.*
• **Safety:**	*Building is not sprinklered. Local fire detection only. Automatic door stops operating. Diesel generator supplies back-up power.*
• **Environment:**	*Partial exhaust removal only. No underground storage tanks. No floor drain oil separator (not required at time of construction).*
• **Code Compliance:**	*Fire separation between bay and offices not one-hour rated (may not have been required at time of construction). Entrance and bathrooms ADA compliant. Hardware and 2nd floor do not appear to be ADA compliant.*
• **Staff Facilities:**	*Inadequate space for working around apparatus. Movement to apparatus for response is compromised by tight space. Some compromise necessary for two-gender staffing; women must use downstairs bathroom only.*
• **Efficiency:**	*Office space is somewhat limited. Many staff members share common office spaces. Should be addressed through remodeling and better space utilization.*

SPFD Station #2
4401 Industrial Park Drive
Built in 1983, this small 4,033 square foot substation facility consists of one drive-through and one back-in apparatus bays. This is a relatively modern, but very small facility in a mixed-use area of mostly commercial occupancies.
Any specific problems with this facility can be classified into the following seven categories.

• **Design:**	*This facility was designed too small for its current or intended use. Apparatus must back in directly off of street due to small apron. Trees and lack of traffic signal make apparatus exit perilous. No room for additional staffing or apparatus.*
• **Construction:**	*Masonry with shed-style asphalt shingle roof. Building was constructed with special energy-efficient features, some no longer functioning as intended.Windows leak. Boiler converted to forced air system. Central air conditioning.*
• **Safety:**	*Building is not sprinklered. Local fire detection only. Automatic door stops operating. Diesel generator supplies back-up power.*
• **Environment:**	*Exhaust removal system in place and used regularly. No underground storage tanks. No floor drain oil separator.*
• **Code Compliance:**	*Bathroom does not appear to be ADA compliant. Hardware does not appear to be ADA compliant.*
• **Staff Facilities:**	*Inadequate spaces for personal hygiene. Very small four-person dorm, building provides virtually no privacy. Small single shower stall. Compromises necessary for two-gender staffing. Dayroom and kitchen are combined, exteremely small and cramped with equipment, furnishings, storage, etc.*
• **Efficiency:**	*Extremely small space compromises building efficiency.*

The ambulances used by Stevens Point were also reviewed for general condition at the time of the site visit. The following summary provides general information regarding the apparatus used in EMS transport.

Medic 1 (A822)

2003 MedTec International Type I Ambulance

Seating Capacity: **2**
Condition: **Excellent**

Additional Comments or Observations: No problems noted. Mileage 59,198

Medic 2 (A965)

2004 Horton International Type I Ambulance

Seating Capacity: **2**
Condition: **Excellent**

Additional Comments or Observations: No problems noted. Mileage 37,008

Medic 3 (A518)

2000 Horton International Type I Ambulance

Seating Capacity: **2**
Condition: **Good**

Additional Comments or Observations: No problems noted. Mileage 86,549

Medic 4 (A531)

1995 Horton Ford Type III Ambulance

Seating Capacity: **2**
Condition: **Fair to Poor**

Additional Comments or Observations: Surface rust all over. Mileage 150,851

Medic 5 (A968)

1993 Horton Ford Type III Ambulance

Seating Capacity: **2**
Condition: **Poor**

Additional Comments or Observations: Structural rust-through in door jambs. Surface rust all over. Mileage 150,901

Public Information and Education

The department participates, according to annual reports, in ongoing community outreach activities. An example cited was a mock motor vehicle crash which was simulated at the Amherst Fairgrounds. Such activities, aimed at educating community youth are an excellent example of public education and prevention outreach. Additionally, during EMS Week, SPFD provides community CPR outreach opportunities.

Medical Direction

Medical direction is provided to the County, and de facto the City by the local health care system's commitment to providing pre-hospital medical direction at no direct cost. In fact, Saint Michael's Hospital/Ministry Health Systems assumes the responsibility of financially supporting a system medical director to provided clinical oversight to the Portage County EMS system and the SPFD, specifically. The medical director provides regular written annual reports of his activities and system improvements, as well as areas of opportunities for improvement/enhancement. The medical director's annual report is submitted to the Portage County Law Enforcement/Emergency Management Committee and the Stevens Point Fire and Police Commission.

Through ESCi's review, it is obvious that the system medical director is a dedicated physician, knowledgeable in out-of-hospital emergency care, as well as emergency medicine. The medical director has oversight and involvement in educational training programs appropriately to assure consistent delivery of appropriate clinical topics. The medical director initiated a ride along program during 2003, and is involved in quarterly dispatch run reviews with both communications centers within the County.

An EMS Strategic Planning committee was undertaken and has developed a work product looking at current, as well as future, service delivery options for the County with regards to the provision of EMS.

The medical director has taken a proactive role in the development of a quality improvement initiative to measure outcomes and system performance. Items in this arena included response mode and pain management study reviews. Key performance areas selected by the medical director for review provide meaningful feedback to system providers and regulators with regards to clinical performance.

The medical director is also active in assisting first responder units throughout Portage County in enhancing their current level of service and knowledge, as well as upgrading or enhancing their level of service delivery. The medical director noted in his 2005 Annual Report that all first responder groups will be upgraded skill level-wise to utilize three new skills: epinephrine auto-injectors for anaphylactic reactions, non-visualized airway adjuncts, and spinal immobilization.

The medical director has also developed contemporary, ALS-based clinical protocols in the provision of EMS. Specific system clinical enhancements include, but are not limited to, aggressive pain management pathways, ventilators, intravenous infusion pumps, bone IO gun, Quick Trache emergency airway access, rapid sequence induction, continuous positive airway pressure or CPAP , Zoll data reporting system, as well as 12-lead ECG capabilities.

It was obvious through numerous interviews with stakeholders that there has or is a perceived divergence between the department and its medical director. While the perceived causation is speculative, ESCi believes that it is important for fire department administration and the medical director to continue to build a strong relationship that will ultimately enhance service delivery and patient care.

Service Delivery

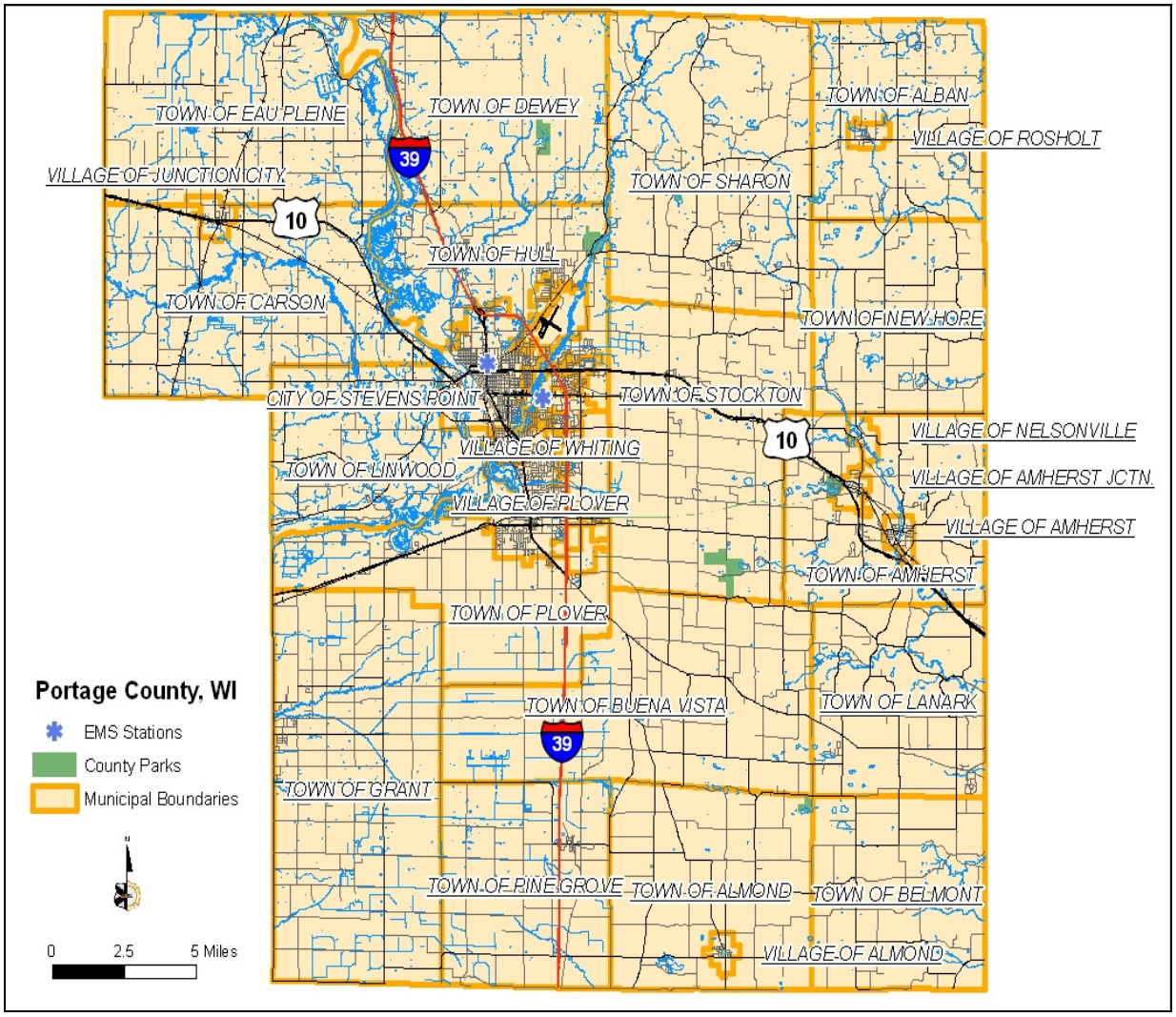
This section evaluates various components and provides observations of the elements that make up the delivery of the most critical core services provided by the Stevens Point Fire Department for Portage County EMS.

Facility deployment

The Stevens Point Fire Department deploys EMS units primarily from two locations within the City. Current service area coverage is considered *good* for urban areas of the County, but as the nature of the community expands with more suburban development, it has not meet expected response coverage standards for those areas of the County with increasing population densities. SPFD may need to consider deployment changes to improve coverage and response time performance as development continues in the future.

The following map displays current deployment of EMS units by SPFD.

Figure 27: Current Facility Deployment

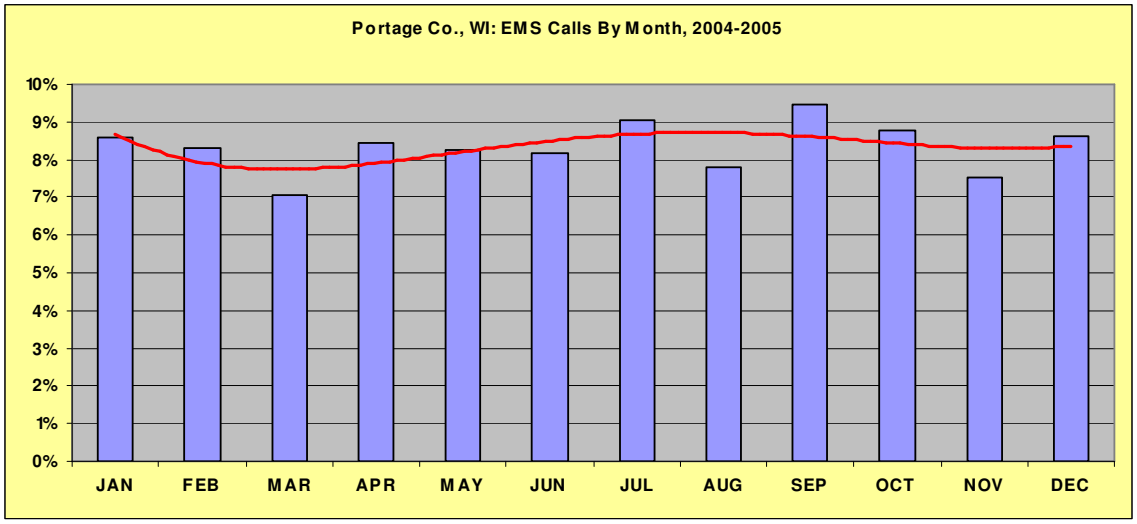


Workload

Temporal analysis of workload across geographic space and variants of time are useful in determining whether current deployment is sufficiently staffed, positioned, and managed to effectively respond to the demands for EMS service within the County. Yearly call volumes have increased according to the records, except recently with the loss of non-emergent transport volume. ESCi examined the last two years of data, revising it for emergency calls only. The practice of using multiple entries for multiple patients was filtered out of the data, when it could be determined that the same crew was treating both patients, on the same call, at the same time.

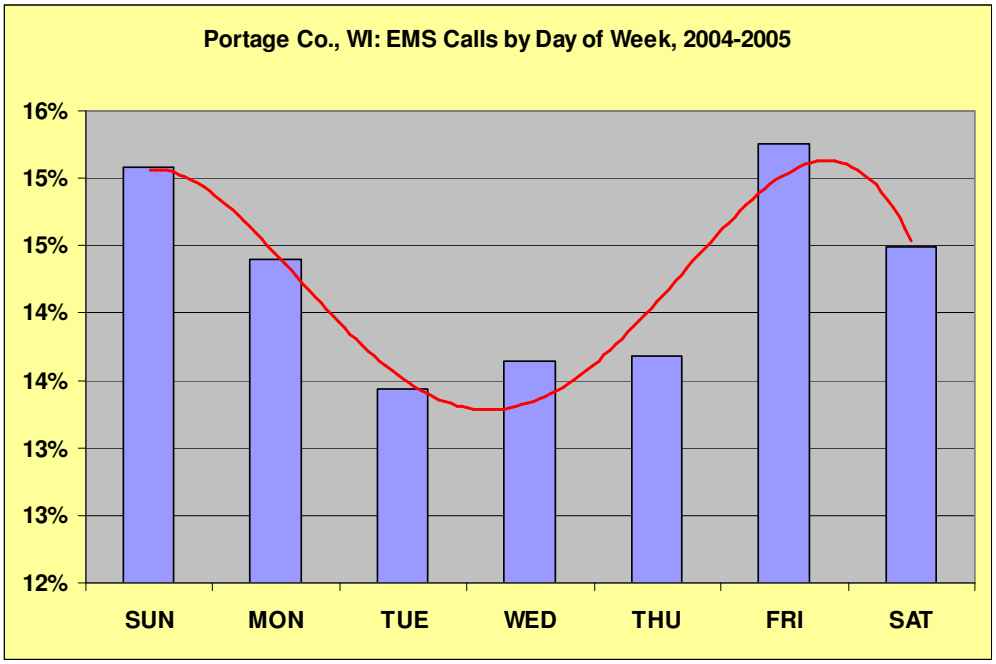
Monthly workload variation can be seen in the following figure. Wide variations at certain times of the year indicate seasonal workload aspects and can call for peak deployment options during the busiest months. SPFD workload from month to month is fairly stable ranging from seven to just over nine percent per month. September has been the busiest month, with March historically, being the lowest.

Figure 28: Workload by Month of Year



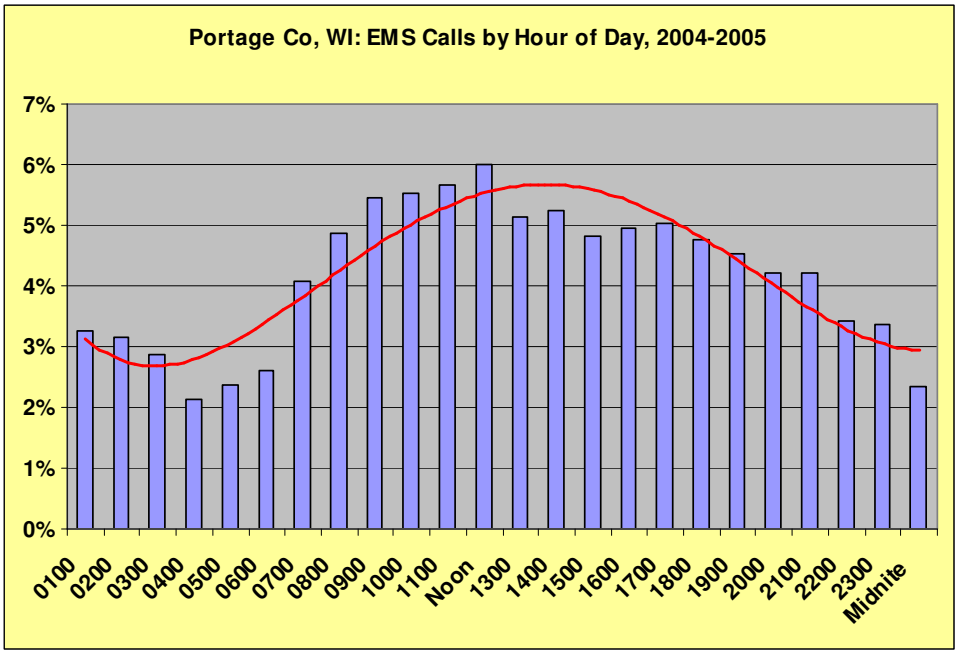
Workload is not as stable when plotted by day of the week. In Portage County, most call volume occurs on the weekends, beginning on Fridays and extending into Mondays. The following figure illustrates this weekly trend over the last two years.

Figure 29: Workload by Day of Week



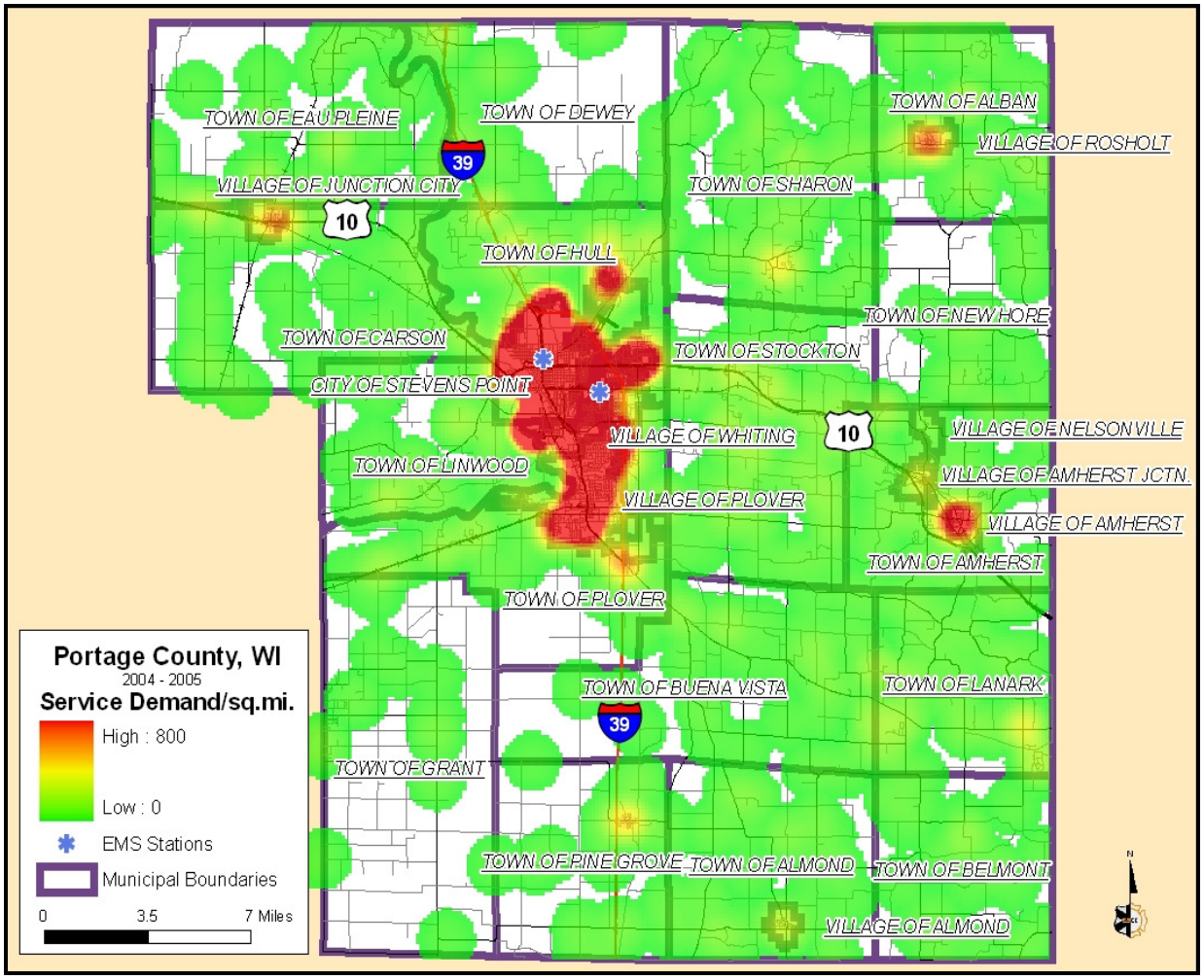
Taking a step further in the temporal analysis, the workload is displayed by the hour of day in which they occur. Similar to most communities, service demand increases during the day as most people's activities and traffic volume begin the day. Late morning appears to be the busiest time of day for Portage County EMS units. Service demand wanes into the evening hours as activities and traffic volume lightens.

Figure 30: Workload by Hour Of Day



As important as analyzing *when* the service demand occurs, is *where* the service demand occurs within the County. In the report's first responder section, each area's service demand was illustrated for their coverage area. As SPFD EMS units provide coverage to the majority of the County, service demand is from a countywide perspective, rather than a close-up local perspective. The following figure displays service demand on a countywide perspective.

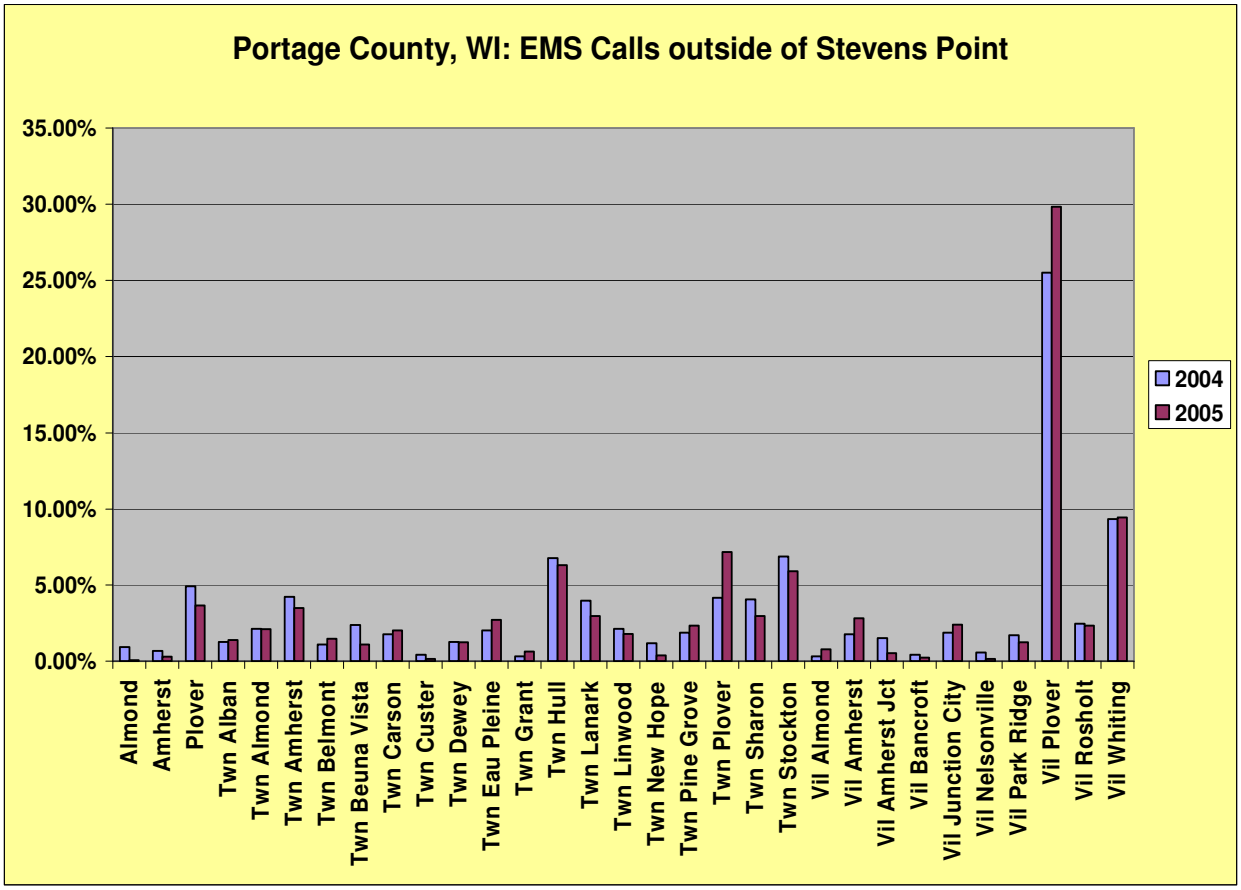
Figure 31: Portage County EMS Service Demand Density



It can be seen that the majority of the County has light service demand. The highest service demand is located in the Stevens Point and Village of Plover area, with pockets of high demand in the Village of Amherst, Junction City, and the village of Rosholt. Areas of moderate demand include portions of the Town of Lanark, Stockton, Sharon, and Hull. Moderate demand can also be found in the Villages of Almond and Bancroft.

The City generates nearly 60 percent of service demand within Portage County. The following table details workload within the towns and villages outside of Stevens Point, as a percentage of the remainder of service demand.

Figure 32: EMS Service Demand Excluding Stevens Point



Collectively, approximately 40 percent of service demand outside the City is unevenly divided among the municipalities. The majority of service demand outside of Stevens Point is being generated by the nearby Villages of Plover and Whiting, and the Towns of Hull, Stockton, and Plover. The area which includes the villages of Amherst, Amherst Junction, and the Town of Amherst also generates moderate service demand. These pockets of higher demand outside of the urban core of Portage County necessitate consideration of a deployment configuration that can meet these needs effectively. In the next subsection, ESCi examines how well current deployment has been able to meet these needs.

Response Capability

The ultimate goal of any emergency service delivery system is to provide sufficient resources (personnel, apparatus, and equipment) to the scene of an emergency in time to take effective action to minimize the impacts of the emergency. This need applies to fires, medical emergencies, and any other emergency situation to which the fire department responds.

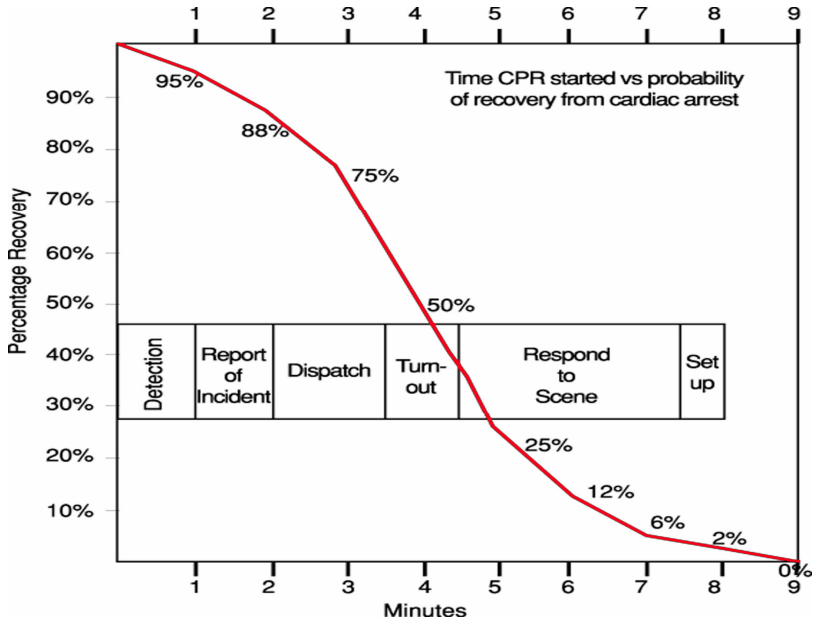
Cardiac arrest is one of the most significant life threatening medical events. A victim of cardiac arrest has mere minutes in which to receive definitive lifesaving care if there is to be any hope for resuscitation.

Recently, the American Heart Association (AHA) issued a set of cardiopulmonary resuscitation guidelines designed to streamline emergency procedures for heart attack victims, and to increase the likelihood of survival. The AHA guidelines include new goals for the application of cardiac defibrillation to cardiac arrest victims.

Heart attack survival chances fall by seven to ten percent for every minute between collapse and defibrillation. Consequently, the AHA now recommends cardiac defibrillation within five minutes of cardiac arrest.

As with fires, the sequence of events that lead to emergency cardiac care can be visually shown, as in the following figure.

Figure 33: Cardiac Arrest Event Sequence



The percentage of opportunity for recovery from cardiac arrest drops quickly as time progresses. Recent research stresses the importance of rapid cardiac defibrillation and administration of certain drugs as a means of improving the opportunity for successful

resuscitation and survival. An Oregon fire department recently studied the effect of time on cardiac arrest resuscitation, and found that nearly all of their *saves* were within one and one-half miles of a fire station, underscoring the importance of quick response.

Time matters a great deal in the achievement of an effective outcome to an emergency event. Time, however, isn't the only factor. Delivering sufficient numbers of properly trained, appropriately equipped, personnel within the critical time period completes the equation.

For medical emergencies this can vary based on the nature of the emergency. Many medical emergencies are not time critical. However, for serious trauma, cardiac arrest, or conditions that may lead to cardiac arrest, response time is very critical.

Equally critical is delivering enough personnel to the scene to perform all of the concurrent tasks required to deliver quality emergency care. For a cardiac arrest, this can be up to six personnel; two to perform CPR, two to set up and operate advanced medical equipment, one to record the actions taken by emergency care workers, and one to direct patient care.

Thus, for a medical emergency the real test of performance is the time it takes to provide the personnel and equipment needed to deal effectively with the patient's condition, not necessarily the time it takes for the first person to arrive.

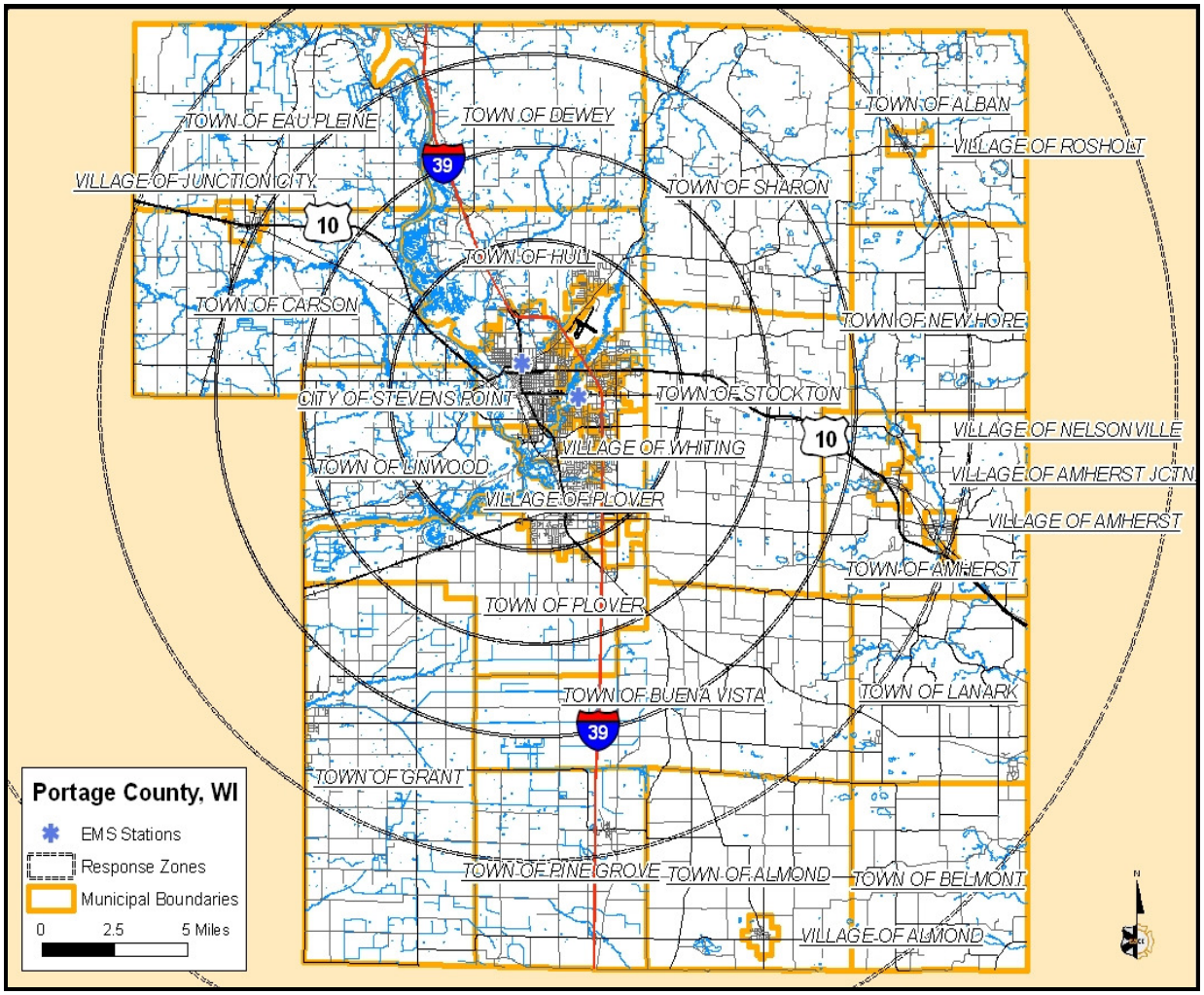
In 2000, a draft strategy of response time objectives from the Portage County EMS Advisory Council proposed that the ALS unit to be on scene within 10 minutes, 90 percent of the time in an area defined as 7.5 miles from the geographic center of the Stevens Point- Plover corridor (later defined as Patch and Michigan). Outside this area, the council proposed an objective response time performance of 20 minutes, 90 percent of the time. These response times were to be achieved by 2005, according to the document.

However, since 2003, SPFD has been reporting response time reliability within five concentric zone areas. These five concentric zones were reportedly established by the EMS Advisory Council following the 2000 document. The table below illustrates zone response objectives followed by a map of the zone areas.

Figure 34: Portage County Response Zone Objectives

Zone	Miles	Time	Reliability
1	8	7:59 or less	90%
2	11	10:59 or less	90%
3	15	14:59 or less	90%
4	22	21:59 or less	90%
5	30	29:59 or less	Not established

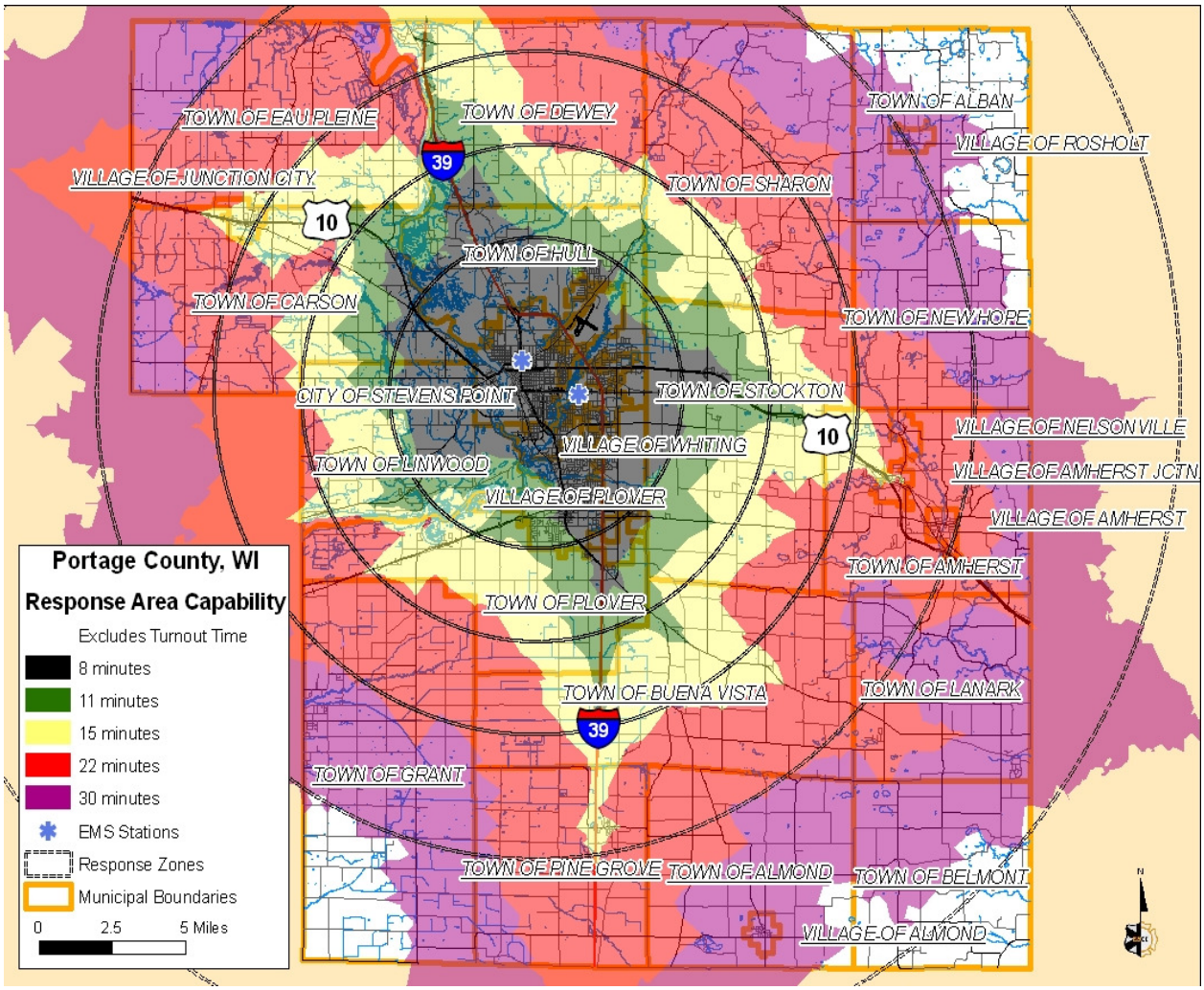
Figure 35: Portage County Response Zones



In replicating the hard copy map of response zones provided for this study, inconsistencies were discovered. Although the map above closely replicates the hard copy map, they both do not correlate with the response time objective table. The inner circle of the map which replicates Zone 1, measures five miles not eight as represented in the material provided for this study. It is followed by concentric Zones at 11, 15, and 22 mile radii in order to follow the objective in the table.

Utilizing computer-modeling techniques, a response capability map of the travel time of an EMS unit deployed at the current stations was developed. Using techniques which evaluate time traveled in relation to various safe speeds that can be achieved, in addition to consideration of acceleration, deceleration, and turning time, a model was created. The following figure displays the modeled travel distance an EMS unit could reach, based upon the time objectives in the previous table, and compares it to the response zones established by the EMS Advisory Council.

Figure 36: Stevens Point Fire Department EMS Response Area Capability

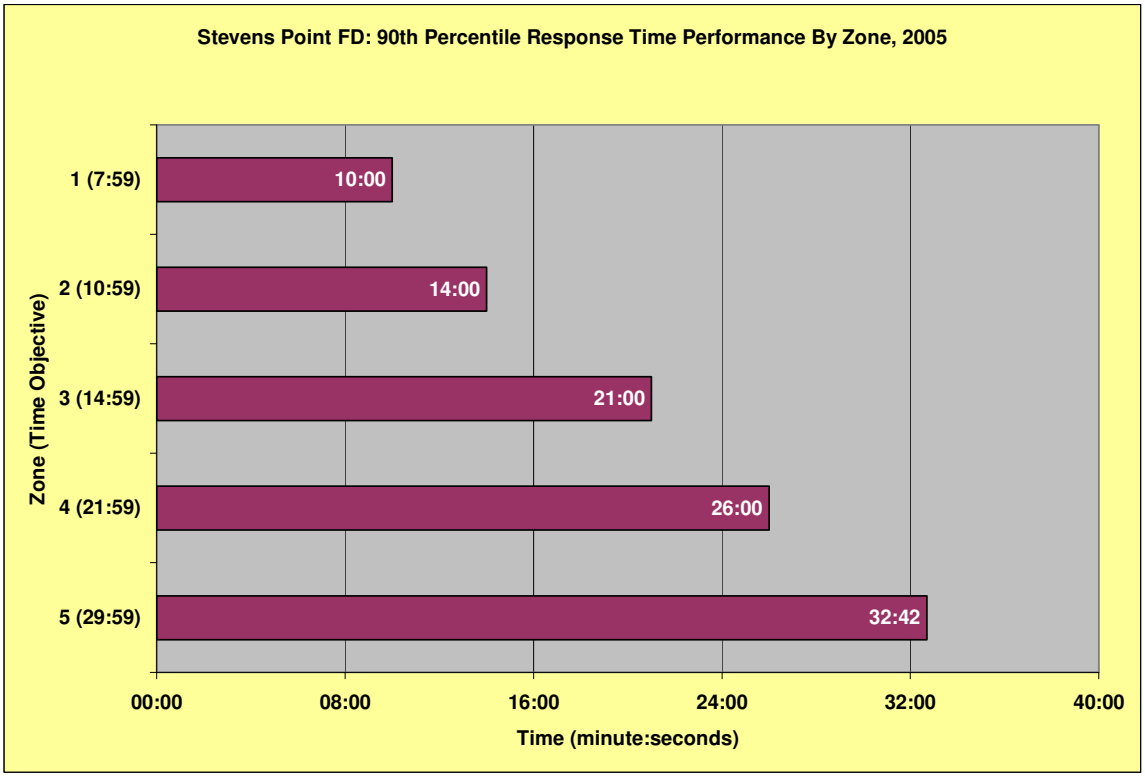


The modeled travel time falls well short of response zone circles. This is travel time only, and does not include turnout time (the time from dispatch to the unit beginning travel). This is a modeled environment illustration, and actual results can vary due to such obstacles as weather, road construction, traffic volume, and connectivity of the street network.

An examination of the most recent data reveals a shortfall by the department in reaching the response time objective. The dataset has been filtered to remove duplicate responses and non-emergency calls. The following figure details the 90th percentile response time[5] performance by zone area. The zone area designation is based upon the dataset input rather than the geographic representation above.

[5] For a brief description of the statistical measures used, refer to same title in the appendix

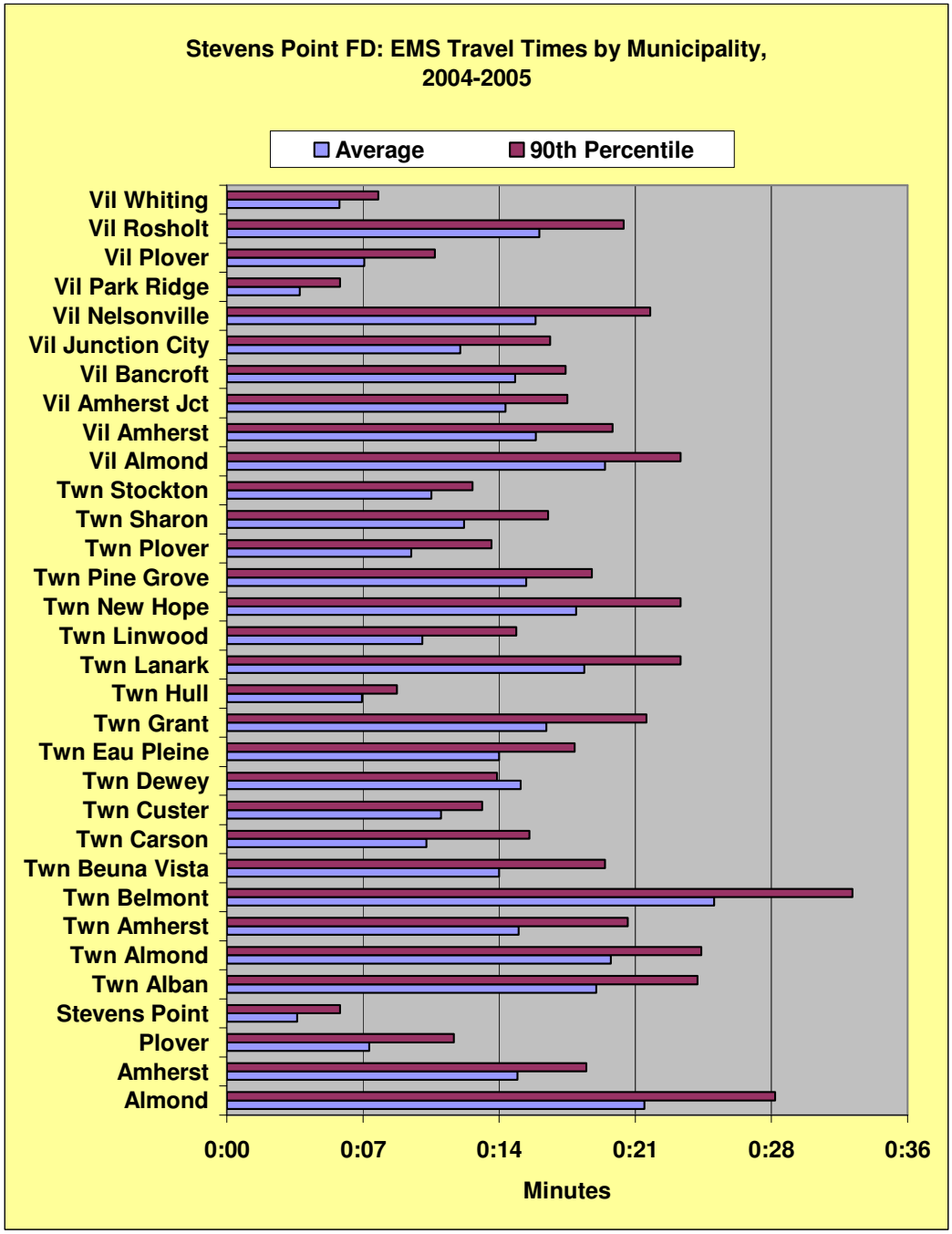
Figure 37: 90th Percentile Response Time Performance by Zone



The results would be expected if the zones were indeed established based upon the earlier figure that begins with the eight-mile circle. Even so, response time goals previously set appear to be physically unachievable, based on the map provided and according to the dataset of actual performance. If this *response time objective by zone* were to be maintained, either redeployment of units or redrawing of the zones in relation to the computerized model would need to be accomplished. Discussion as to public expectations and future deployment strategies will occur in later sections.

Looking at response times in a different way, ESCi examined actual travel times recorded by the EMS units to the various towns and villages within the County. Travel times do not include turnout time which will be discussed later in this section. The following chart details the average and 90th percentile travel times to municipalities of Portage County.

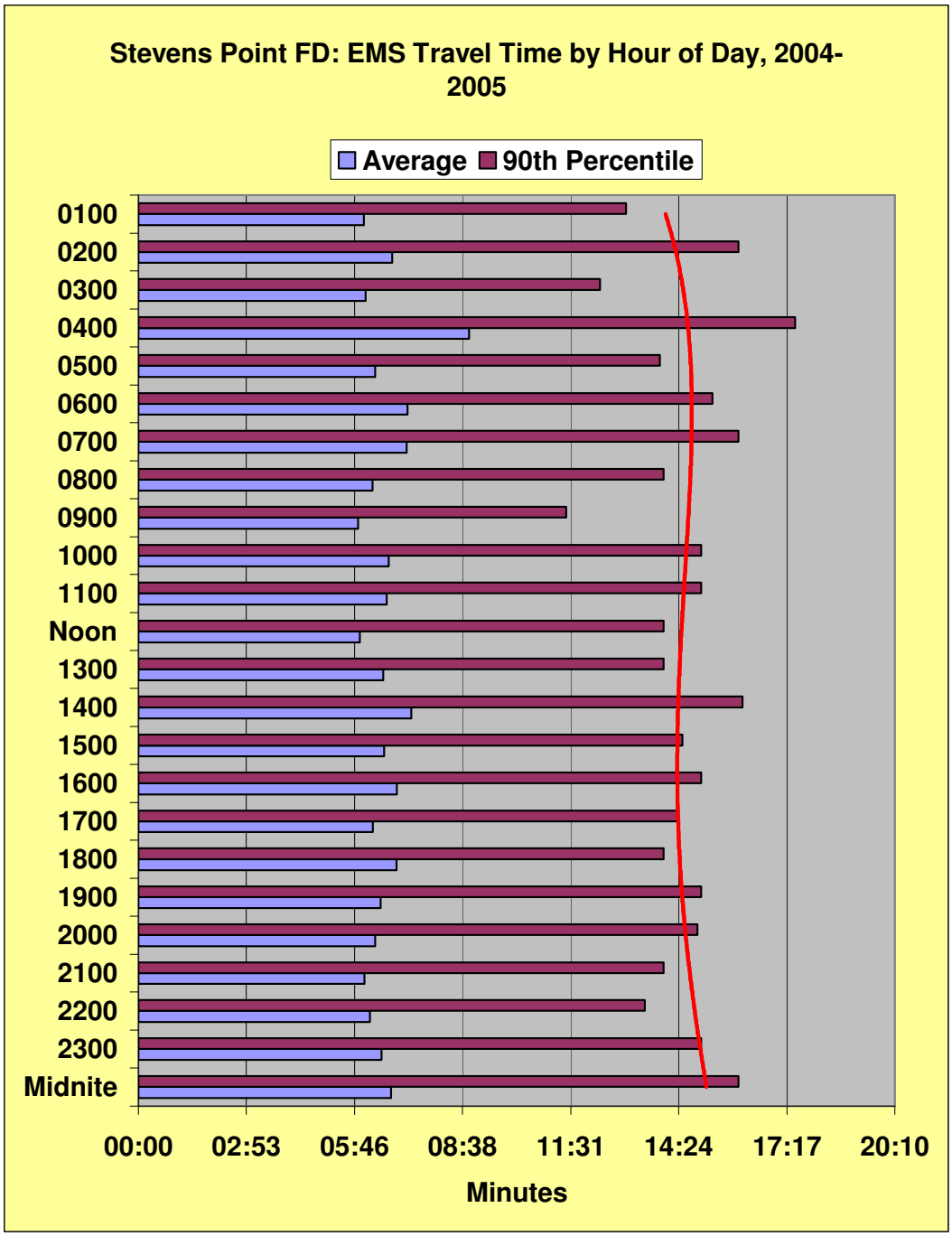
Figure 38: Travel Time by Municipality



As expected, the towns that are closest to where the units are deployed enjoy the lower travel time. Unfortunately, areas on the periphery of the County wait over 15, or even 20 minutes for the unit to travel to their towns.

In examining travel times by hour of day, the consistency indicates that long travel times are occurring during all hours of the day, and are not sufficiently concentrated during any particular time period of the day to permit consideration of peak period deployment to those areas.

Figure 39: Travel Times by Hour of Day

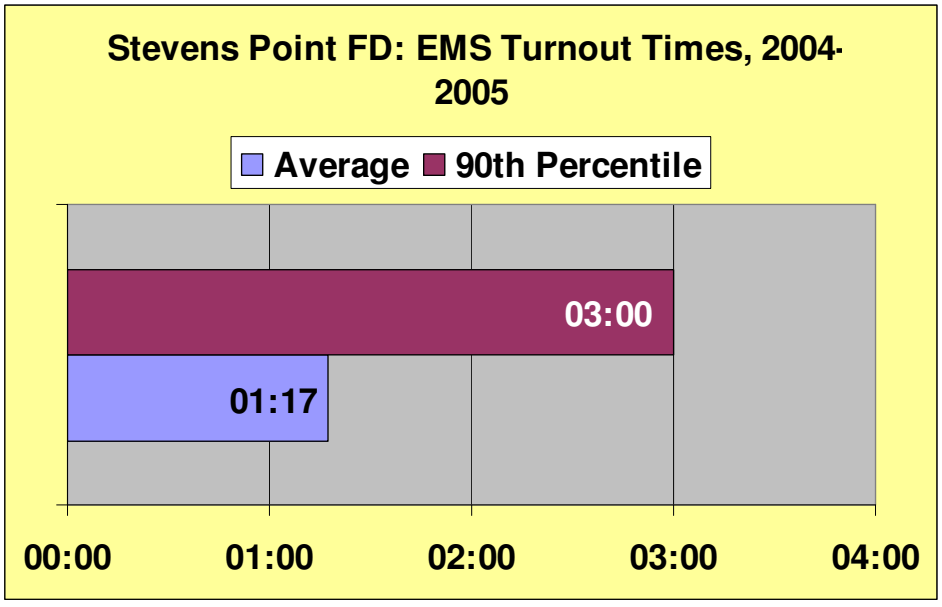


Response time is measured from point of dispatch to the arrival on scene by the first apparatus. It is made up of two components - turnout time and travel time. Many variables can affect travel time, which are not controllable by the fire department, such as weather, traffic, and speed limitations. Turnout time, however, is very much in control of the firefighters who are assigned to an apparatus or station. Turnout time is the interval from notification to apparatus response.

For firefighter turnout times, the *National Fire Protection Association (NFPA) 1710: Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments* provides a benchmark for firefighter turnout time (from notification to apparatus response) of 60 seconds or less. The standard calls for this performance to be met at least 90 percent of the time.

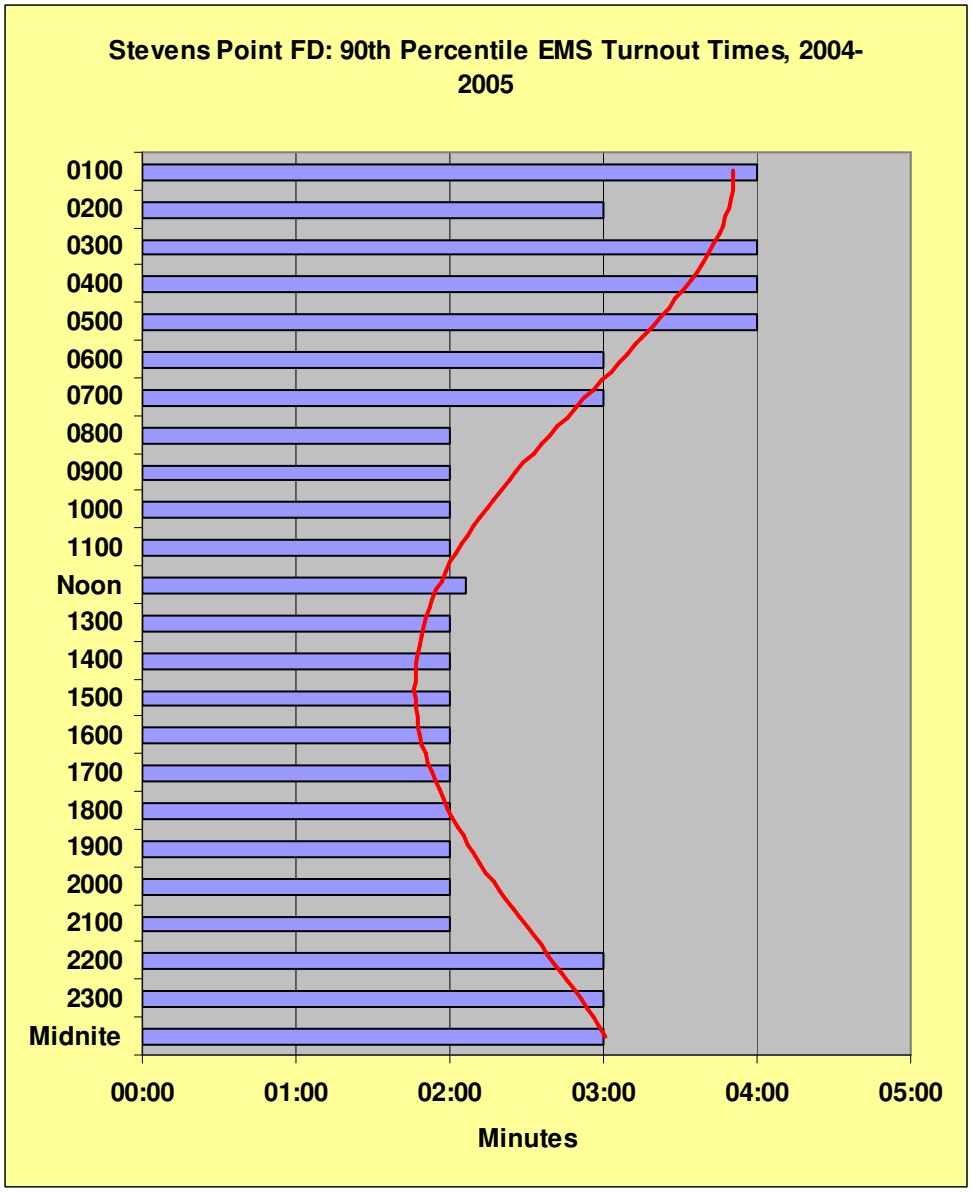
For the year 2005, turnout time performance of SPFD on EMS calls was three minutes at the 90th percentile. The following figure displays both the average and 90th percentile turnout time for EMS calls.

Figure 40: SPFD EMS Turnout Time



Turnout times can vary by time of day. The following figures details the 90th percentile turnout times by the hour of the day.

Figure 41: SPFD 90th Percentile EMS Turnout Times



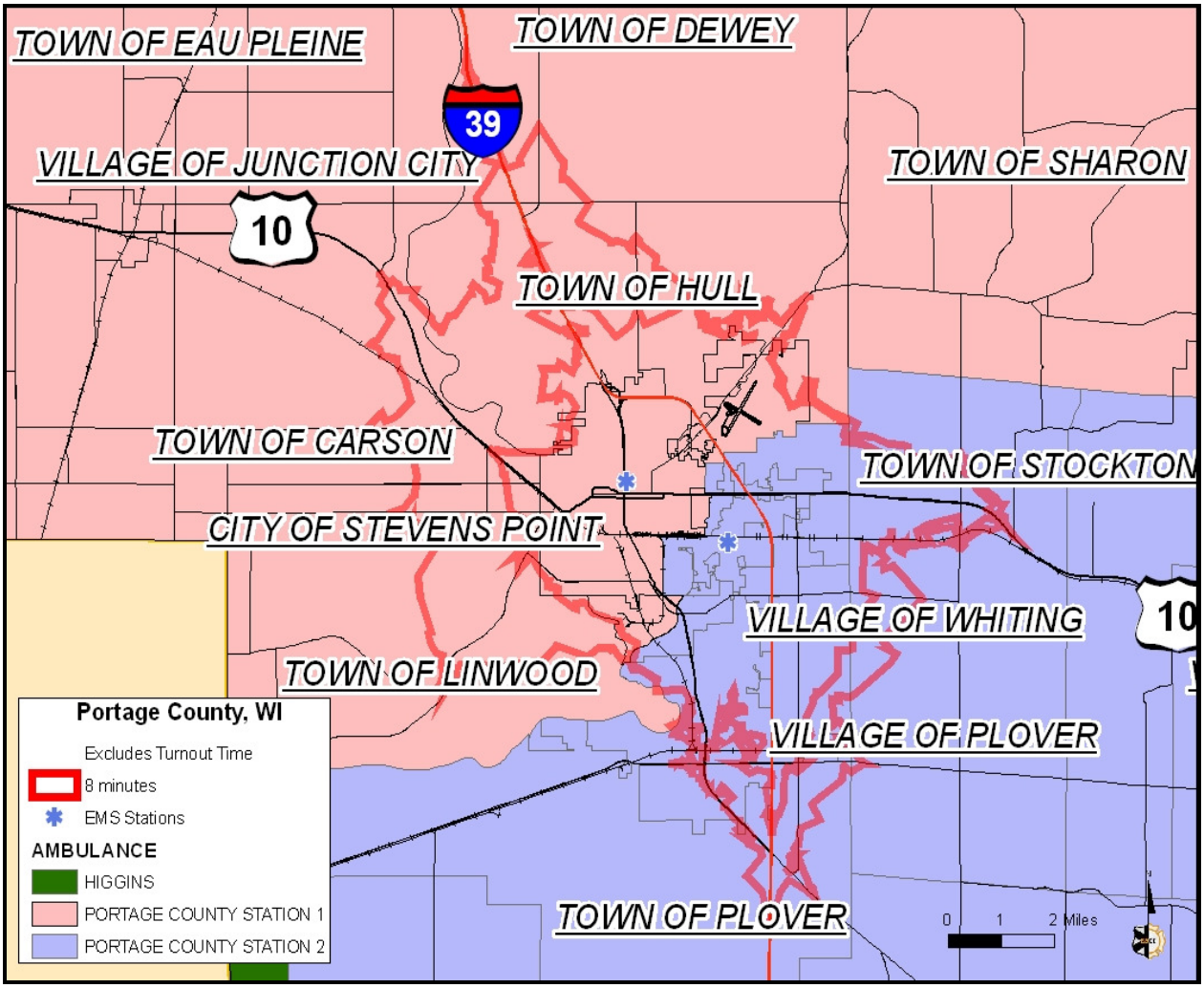
Turnout times are longer in the evening and early morning hours as responders rest on their 24 hour shift.

In order to achieve the performance objective found in *NFPA 1710*, the SPFD would need to reduce its 90th percentile firefighter turnout time by two minutes. While some reduction may be able to be accomplished through changes in procedure, a two-minute reduction may be difficult to achieve without at least some changes in certain station's layout, design, or hygiene facilities.

Resource Concentration

As shown previously, two ambulances are deployed from within Stevens Point, which has been demonstrated as the area of highest service demand. Because of the proximity of these units to each other, the response capability of each unit overlaps significant with the other as seen in the following figure.

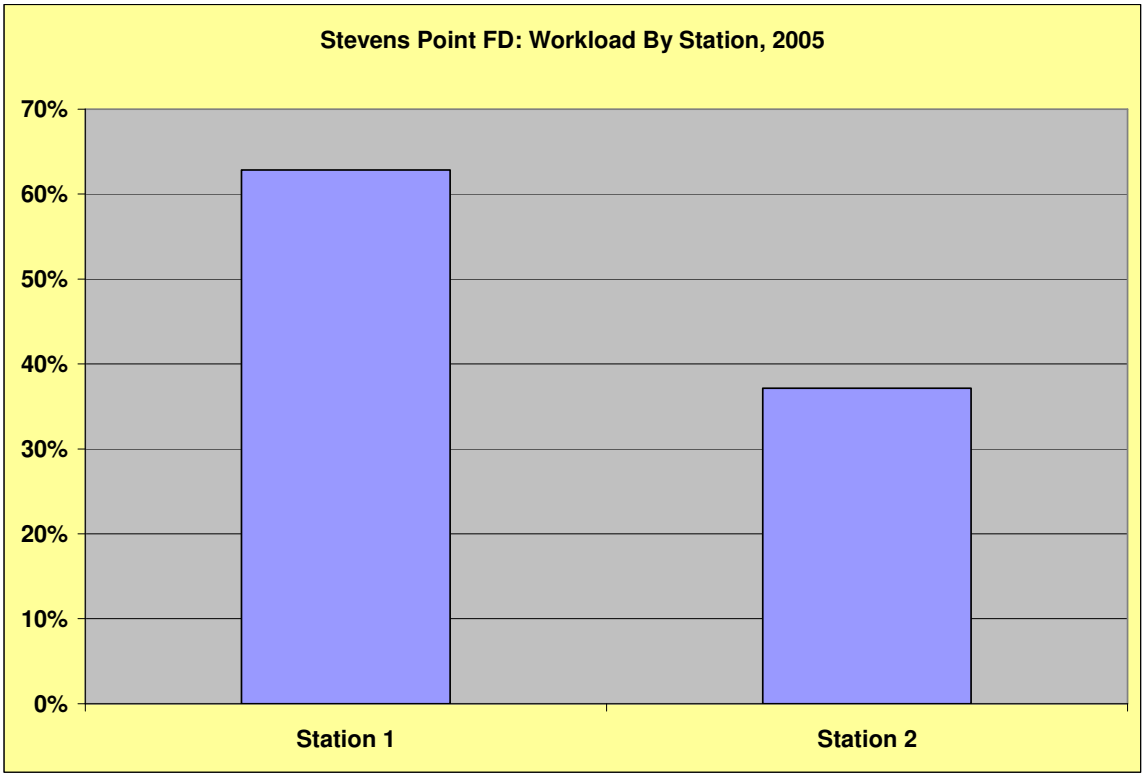
Figure 42: SPFD EMS Response Capability Overlap



This area of overlap is not necessarily a disconcerting issue. In an area of high service demand, there is a higher probability that more than one call would occur concurrently.

The workload of each station is not divided equally as can be seen in the following figure. Station 1 handles the bulk of the EMS calls for the County.

Figure 43: Workload by Station



The workload of emergency response units can be a factor in response time performance. The busier a given unit, the less available it is for the next emergency; thus, the higher its *failure rate*[6]. If a response unit is unavailable, an alternate unit and/or a unit from a more distant station must respond, increasing overall response times. A cushion of surplus response capacity above average values must be maintained due to less frequent, but very critical times, when atypical demand patterns appear in the system. Multiple medical calls, simultaneous fires, multi-casualty events, or multiple alarm fires are all examples, and are not at all uncommon.

Recommended unit hour utilization (UHU) targets for fire department units are around 0.20, with some studies indicating that significant employee burnout can occur with fire-based EMS units at around 0.30 unit hour utilization. UHU for each station for EMS calls is reported in the figure below and accounts for emergent responses only, and filtered to remove times when multiple patients transported within the same ambulances. The department's UHU for non-emergency transports is .05.

[6] *Failure rate* is the term that refers to the percentage of calls for which a unit is unavailable when it would normally be the closest and most appropriate unit. When an alternate unit must be dispatched, this is considered a *call failure* for the normally assigned unit.

Figure 44: Ambulance Unit Hour Utilization

2005 Unit Hour Utilization			
Station	Time (mins)	Calls	UHU
1	81540.08	1939	0.16
2	48120.60	1146	0.09

The amount of time a given unit is committed to an incident is also an important workload factor. Analyzing last year's data reveals that SPFD spends an average of 42 minutes and 36 seconds per EMS call, or one hour and 15 minutes at the 90th percentile. Considering travel time figures, on scene care, and hospital turnaround activities, this is not unreasonable. Hospital turnaround time begins after arriving at a hospital, and extends through transferring the patient to the hospital staff, report writing, and unit clean-up on a normal basis. It ends as the unit declares they are available for service. SPFD hospital turnaround times average 16 minutes (35 minute 90th percentile).

However, service demand is not the only factor that can affect unit workload, particularly for the transport ambulances. As stated, the current UHU calculations are based on historical data, indicating out-of-service time for EMS calls, including transportation of the patient to the receiving hospital, and report writing.

When multiple calls are generated concurrently, more than two calls may put SPFD into a call-back status and affect the fire protection within the City. This depends on whether the officer in charge feels a unit can clear before resorting to overtime. In the following figure, SPFD reports the following concurrency statistics.

Figure 45: EMS Call Concurrency

Concurrency	2005		2004		2003		2002		2001	
1	2495	74.79%	2226	67.01%	2115	67.59%	2437	70.90%	2486	68.47%
2	686	20.56%	891	26.82%	827	26.43%	859	24.99%	974	26.82%
3	138	4.14%	175	5.27%	165	5.27%	126	3.67%	153	4.21%
4	15	0.45%	27	0.81%	21	0.67%	14	0.41%	18	0.50%
5	2	0.06%	3	0.09%	1	0.03%	1	0.03%	0	0.00%

Approximately five percent of the time, more than two calls have occurred concurrently. This combined with UHU figures, indicates the level of workload on the staff. Concurrency workloads for just emergent responses (removing non-emergent transports and multiple patient incidents transported in one unit) were lower than those reported above. Two concurrent calls were 17

percent, while three concurrent calls were three percent; the remainder amounted to less than one percent.

Reporting and Records

The Stevens Point Fire Department/ Portage EMS utilizes an electronic charting system in order to complete its patient care reports, as well as to collect call data. This can provide consistent quality and completeness to the reports given to the hospital staff, and aid in collection of data. Over two full years of data, as well as the patient log was provided for analysis in this study.

Several issues with data collection need to be addressed. Although the ambulance log provides times when a unit went on a call and when it was available again, the electronic dataset times were not as complete. Though theses lapses were not numerous enough to erode confidence in the results of the previous analyses, if left unresolved, could led to a greater margins of error in future analyses. This may be due to issues related to the communication centers' recording practices, rather than Stevens Point personnel. The times were recorded in whole minute units which can either aid or hinder the data results. An effort should be made to record times completely, automatically through technological aids, and within a minute-second format. Such technological aids include CAD systems and automatic status technology. The practice of assigning each patient an incident number, when multiple patients are transported in the same ambulance, should be revised or flagged in the dataset in such a way as not to mistakenly be included in incident totals, unit, workload, temporal, and response analyses in the future.

Objective Six - EMS Transport: Higgins Ambulance Service

Higgins Ambulance Service is included in this report as the are the primary ambulance service provider to portions of the Town of Grant. Years ago, many of the nation's ambulance providers were funeral home operators, because they not only were used to lifting people in the field, but because they had the most appropriate transportation available, especially in rural areas. Higgins is a link to that tradition, being jointly located with Higgins Funeral Home in Wisconsin Rapids.

System Regulation and Policy

Higgins Ambulance is regulated under the laws and statutes for ambulance providers within the State of Wisconsin. It currently operates under the Enhanced Intermediate/Intermediate 99 level of care. With many certified paramedics on staff, Higgins is anticipating an upgrade in service level, with State of Wisconsin approval. Since state law provides that it is the responsibility of a municipality to ensure the provision of emergency medical care to the public, many towns in the area of Wisconsin Rapids have contracted with Higgins to provide primary ambulance service.

Planning

In the Town of Grant, 84 percent of the population resides near the hamlet of Kellner, according to town officials. In 1975, Higgins was contracted to provide services to property owners near and around Kellner, which is on the western border of the town adjoining Wood County. This amounted to 24 square miles of the town's 72 square mile total. This decision was reportedly based on the concern of ambulance response time from Stevens Point, compared to one from Wisconsin Rapids which is within closer proximity.

As Higgins covers other areas within Wood County, including an area covered by the Rudolph Fire Department first responders, they are willing to expand. Rudolph Fire Department also covers areas of Portage County west of Stevens Point. Higgins has expressed a willingness to provide ambulance service in this area, if so desired, and contracted by the governing EMS entity in Portage County.

An ambulance board, which is comprised of Higgins Ambulance and a representative of each contracted town or village, meets semiannually (or as needed) to provide oversight for the service. Besides invoicing insurance and patients for services (see table), a subsidy from each

contracted area has been established by the board. The formula for the subsidy based on population (70 percent), the area of coverage (20 percent), and the service demand (five percent).

Figure 46: Table of Fees for Higgins Ambulance

Bill Type	Amount
BLS Non-Emergent	$ 195
ALS Non-Emergent	$240
Emergency BLS	$300
Emergency ALS 1	$370
Emergency ALS 2	$500
Aid Call/No Transport	Variable
Mileage rate (per mile)	0-17: $10 18-50: $8 >50: $7

A new five-year contract was signed for all towns on January 1, 2005; any change in area of coverage would need board approval.

A first responder-like plan was recently established which allows an off-duty Higgins provider to respond directly to a call for aid and render care, with equipment and supplies covered under the auspices of Higgins Ambulance Service. Higgins reports that with this program, response times of a provider on-scene have reduced to an average of nine minutes.

Human Resources

Higgins is awaiting approval for paramedic level delivery status from the State. The issue is that Higgins' paid, on-call staff includes 14 enhanced intermediate EMTs or paramedics, six IV technicians, and 10 Basic EMTs. The staff is paid $2/hour for a shift, $17/hour during a transport, $30/hour for an emergency run. A full-time on-duty paramedic staff would preclude this as an issue according to state law.

Equipment and Facilities

The Higgins Ambulance Service operates from one facility located in the City of Wisconsin Rapids. Though the building houses the administrative office for the ambulance service, the ambulances themselves are deployed from various locations. During time periods where the

full-time staff is manning the units, they are typically located in the main facility. At other times, however, the primary call ambulance will be deployed with the responder, and can be taken to that individual's residence or within a defined area in and around Wisconsin Rapids. This process ensures that initial unit response is dependably quick, though travel time to primary service demand may vary, based on the unit's location.

A review of the facility was made during the site visit to Portage County in winter of 2006. The following table provides general information and condition of the facility at that time.

Higgins Ambulance Service
631 E. Grand Avenue
Built 1949, this 1,000 square foot (for ambulance service) facility consists of two back-in apparatus bays.
Any specific problems with this facility can be classified into the following seven categories.

• **Design:**	*This is an older, well-maintained building whose primary use is as a funeral home. The building has a secondary use as the headquarters for the ambulance service, which operates out of a two-bay garage and downstairs office spaces.The building has been remodeled and updated since its original size and construction. It is well-designed for its primary use, but space is limited for the ambulance service. Downstairs location is less than desirable for public access and quick movement to apparatus.*
• **Construction:**	*Wood frame, older building. Ambulance service occupies small offices in basement and two-bay garage.*
• **Safety:**	*Building is not sprinklered. Local detection only. Lacks back-up power generator.*
• **Environment:**	*No exhaust removal, but garage area not immediately adjacent to other uses. No underground storage tanks.*
• **Code Compliance:**	*Accessibility issues associate with downstairs office. No other concerns noted.*
• **Staff Facilities:**	*No staff facilities present. Office space only.*
• **Efficiency:**	*Limited space for ambulance service office. Ambulance garage is somewhat cramped due to limited size. Little room for working around apparatus.*

Higgins Ambulance Service ambulances were also reviewed for general condition at the time of the site visit. The following summary provides general information regarding the apparatus used in EMS transport.

Unit 350

2004 Road Rescue Ford Type III Ambulance

Seating Capacity: **2**
Condition: **Excellent**

Additional Comments or Observations: Shore lines and compartment heating installed. Mileage 11,730

Unit 351

1999 Wheeled Coach Ford Type III Ambulance

Seating Capacity: **2**
Condition: **Fair**

Additional Comments or Observations: Surface rust and some corrosion on box. Mileage 107,741

Unit 352

1996 Wheeled Coach Ford Type III Ambulance

Seating Capacity: **2**
Condition: **Fair**

Additional Comments or Observations: Very minor surface rust. Mileage 130,343

Medical Direction

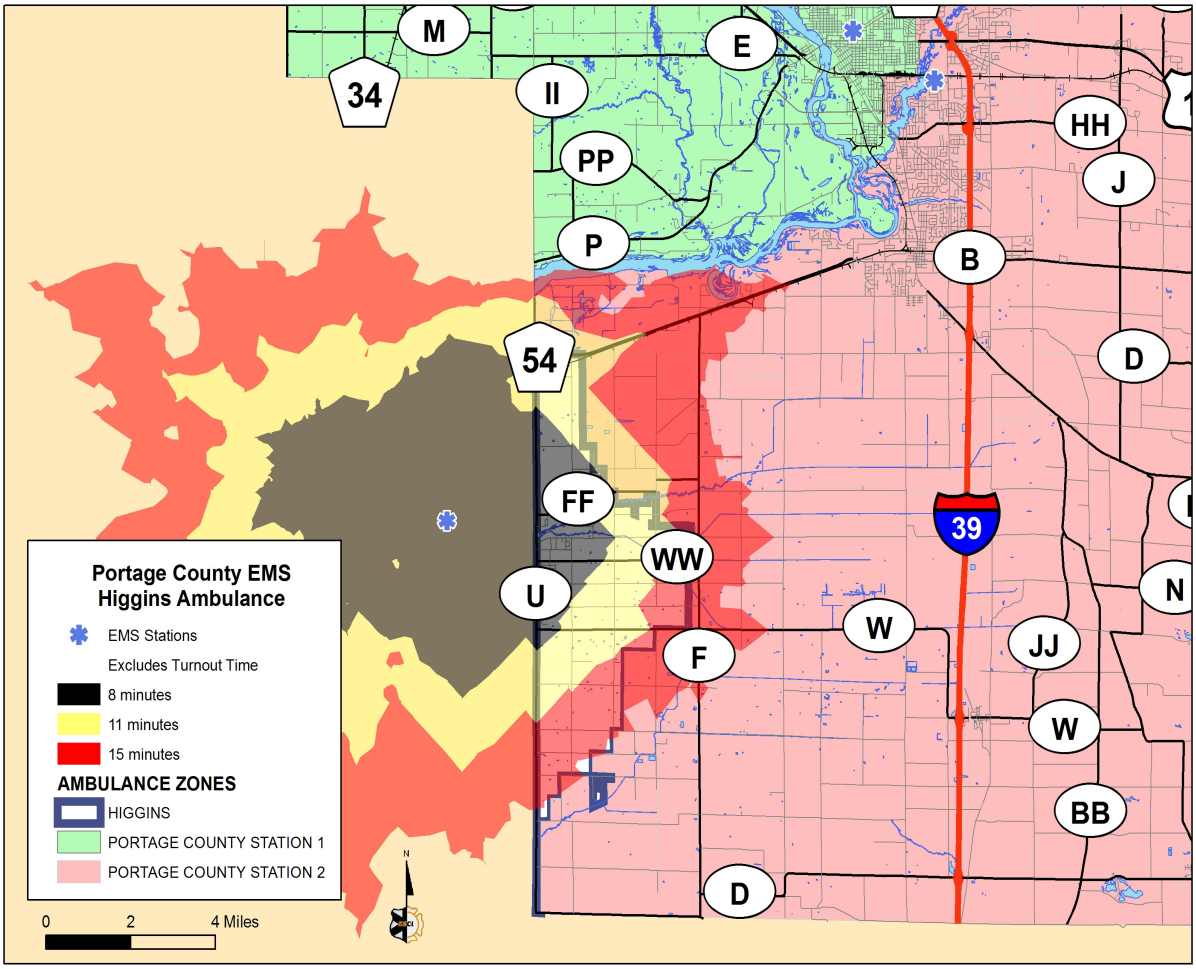
State permitted practices for an intermediate EMT level service require medical oversight by a physician. Medical delivery protocols and quality oversight has been contracted through a physician with Riverview Hospital to assure compliance with standards of practice for ambulance providers within the State of Wisconsin.

Service Delivery

Using modern equipment and training, Higgins provides services to the townships of Sigel, Seneca, Grand Rapids, the Village and Town of Rudolph, as well as the portion of Grant. One of the on-call staff keeps the ambulance with them (at home, on errands, etc.) during the shift; a turnout objective is set for 90 seconds and they must meet their partnered staff member within

two to three minutes before responding to the call. In most cases, Higgins' crews are within two miles of each other. Two ambulances are staffed on-call routinely 24-hours, one of which is always with at least one provider. Since most of the providers live within a two mile range of the Grand Rapids Fire Station just west of Kellner, Higgins agreed it would be a reasonable point to which to model response for the primary ambulance, as opposed to the headquarters since it normally does not respond from there. The following figure details the response capability of a Higgins Ambulance responding from that location and the service area within the Town of Grant. Town officials in Grant anecdotally estimate Higgins response time average to be seven to eight minutes.

Figure 47: Higgins Service Area



Reporting and Records

Higgins reports 851 calls for 2004, and "slightly more than" 300 calls through the 9-1-1 system. They report that most of their transported patients are delivered to Riverview Hospital in Grand Rapids (350), St. Joseph's (31), and occasionally to St. Michaels in Stevens Point (2). It is reported that Higgins responded to 41 calls within the Town of Grant in 2005. Higgins also provides inter-facility, private non-emergency transportation, and event stand-by services which will account for the remainder of the call volume.

Objective Seven - Critical Issues

In this section, ESCi will identify and address critical issues found within the Portage County EMS system and provide implementation strategies to address these issues.

Critical Issue One: Resources

Are there enough resources, i.e.: staffing and apparatus, to adequately handle the service demand now and into the future?

Apparatus and facilities were reviewed; please refer to this section for a detailed examination. Sufficiency of apparatus implies that there is well-functioning equipment in service as well as useable vehicles in reserve in case of mechanical failure for the staffing level provided. The current on-duty and call-back staffing arrangement needs to be evaluated against workload demand, as well as future projections.

Critical Issue Two: Unit Locations

Are current resources located to ensure equitable delivery of EMS to Portage County citizens?

There are 810 square miles of land in Portage County serving nearly 70,000 residents, in addition to visitors. Currently, EMS units are deployed from Stevens Point within the center of the County, and as seen previously in Figure 34, these units cannot reach outlying areas within an acceptable period of time. Determining how many units it takes to cover the County, within an acceptable and standard response time objective, needs to be accomplished.

Evaluating different response time objectives, based on the emergency described to dispatch so it can be elevated or decreased based on the first responder report, as well as the use of outside agencies, should be investigated.

Critical Issue Three: Service Demand

How are these resources to be located in relationship to current and future service demand?

Since it may require far more units than financially feasible to provide service at a certain response objective, where should units be located given the current and projected service demands? Factors that influence service demand for emergency medical units include age and

socioeconomic indicators. Future demand will be shaped by population projections including immigration, emigration, death rates, fertility, and aging. Future service demand will also be affected by planned changes in land use, which may be in response to market demand, or in other cases, demand is created by construction, such as an amusement park.

Critical Issue Four: EMS Delivery Method

Is the current method of EMS delivery (ALS transport) the most effective and efficient way?

Currently, the delivery method for Portage County EMS is a fire department-based ALS transport service employing paramedics. Other options are available such as:

- EMT and Paramedic combination transport, whereby the EMT assists the paramedic on critical cases, but can provide care in routine ones. This can be beneficial financially, but reduces the level of care in the most critical cases.
- Two-tiered level of service whereby BLS ambulances respond to all calls initially. They are dispatched with, or met by, a paramedic intercept in the most critical cases. This requires three to four people on critical cases, but has the advantage of fewer ALS units vs. BLS, which accounts for the majority of calls. Also, if warranted, the ALS unit can be cancelled from a call that is deemed BLS, and become readily available for the next call.
- A combination of ALS and BLS transport units, relying on medical priority dispatch protocols to send the appropriate unit.

Critical Issue Five: Governance

What agency should have the responsibility for ensuring adequate EMS delivery within Portage County?

According to state law, it is the municipality's responsibility to ensure EMS delivery. In Portage County, the County government has assumed the mantle of governance for EMS. Municipalities certainly have the right to their own governance of this issue, as can be seen with the Town of Grant's arrangement with Higgins Ambulance. While not obligated to do so, the advantages of regional oversight in coordination of resources (apparatus, staffing, protocols, etc.) outweigh local control in EMS. In other areas, this authority has been contracted to the local hospital system, as they are the medical experts within a community.

Critical Issue Six: Operations

What agency should operate EMS services within Portage County?

Currently, the Stevens Point Fire Department delivers EMS care countywide, but there are issues which are not insurmountable. They include firefighter-only status, and the desire for location of EMS units within Stevens Point.

The advantages of SPFD to continue EMS delivery include, but are not limited to:

- ALS level care
- Established procedures and protocols
- Experience level of clinicians

Other options include:

- First responders properly trained, financed, and equipped to become full BLS or ALS squads
- Private provider ambulance service
- County EMS authority
- A combination of the above

These critical issues will be taken into consideration, along with the details of the next section to provide recommended strategies in Section 3 for the provision of EMS services within Portage County.

Section II - System Demand Projections

This section will detail the effect of demographics and projections for community growth on emergency medical service demand.

Demographic Risk Analysis

Although there is always some probability for each citizen to require the use of emergency medical services, age and socioeconomic factors play an important role in the frequency of use. A review of available academic literature yielded many related studies; the majority of which are found in medical journals, and focus on the many facets of emergency services such as hospitals and police services.

The high utilization rate of the emergency department by the elderly has been discussed, and it has been found that inadequacies in the access to primary care physicians by the elderly,, at home and in nursing homes is the cause of an inappropriate reliance on emergency rooms and emergency transportation services (Wofford, Schwartz, and Byrum 1993)[7]. Clark and Fitzgerald (1999)[8] found that although the elderly comprise 12 percent of the population, they utilize approximately one-third of emergency ambulance use and two thirds of non-urgent use in their study area.

Another study examined the demand on emergency departments and public emergency units when a patient, whose condition is beyond the resources of current medical science, is sent home to live their final days with the family. The study emphasized the need for physician counseling for family members for 'expected' deaths at home, so the patient does not needlessly end up in the hospital again (Grant 1993)[9].

Several studies have been conducted relating to the use of emergency services by the population at large. The British Health Department, in a response to an over-reliance on emergency services, proposed alternatives to be given to those patients or callers who summon

[7] Wofford, James L., Earl Schwartz, and JE Byrum. 1993. "The Role of Emergency Services in Health Care for the Elderly: A Review" *Journal of Emergency Medicine,* 11(3): 317-26.
[8] Clark, MJ and G. Fitzgerald. 1999. "Older People's Use of Ambulance Services: A Population Based Study" *Journal of Accident & Emergency Medicine,* 16(2): 108-11.
[9] Grant, Dorothy. 1997. "MDs Must Help Eliminate 911 Calls After 'Expected' Home Deaths, Medical Examiner Advises" *Canadian Medical Association Journal*, 156(7): 1035-1038.

emergency help for non-emergent situations (Beecham 1997)[10]. In Milwaukee, as with many U.S. cities, ambulance diversion from overloaded hospitals has generated its own quest for solutions to the growing problem. Usually, protective hospital systems are cooperatively providing bed-status data to the emergency service that is accessible and updated, via the internet in an effort to reduce the strain on hospital services (Barthell et.al. 2003)[11].

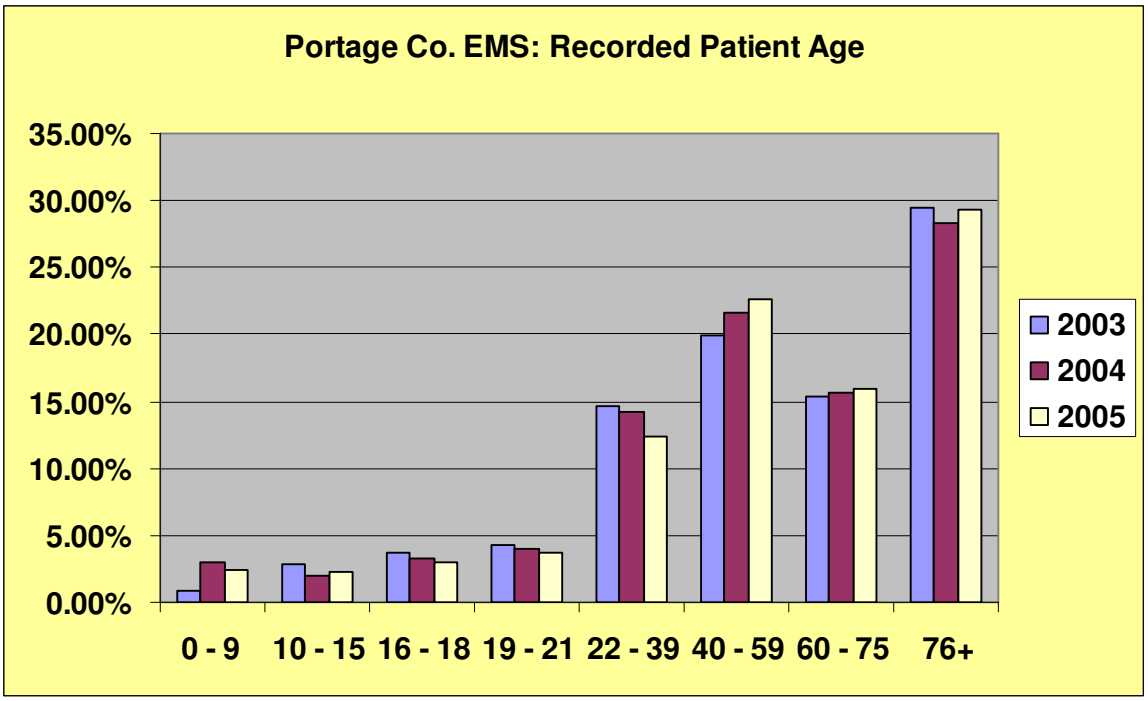
Cadigan and Burgarin (1989)[12] studied a larger population and found a correlation between the use of emergency services, and age and income. The elderly and poor are more likely to use emergency services. Both Svenson (2000)[13] and Rucker et. al. (1997)[14] found elderly use of emergency services higher than the general population. Rucker et. al (1997) and Dickinson et. al. (1996)[15] correlated the type of insurance as a factor in emergency services use and time of day services used.

The *Baby-Boom* generation includes those individuals born between 1946 and 1964. In 2006, the oldest member is 50 years of age and the youngest 42 years of age; this is the largest segment of the population in the United States. The growth of the elderly (65 years and older) is expected to increase dramatically over the next 30 years across the country. In Portage County in the year 2000, 13 percent of the population was elderly[16]. This is expected to increase to 21.7 percent in the year 2030[17]. As this group ages, medical conditions such as heart disease, cancer, neurological conditions, and cognitive maladies are likely to be present within this group. Potentially, this will significantly increase emergency services call volume

[10] Beecham, Linda. 1997. "Review Proposes More Emergency Care in the Community" *British Medical Journal* , 314(7076): 251.
[11] Barthell, Edward, Seth Foldy, Kim Pemble, Christopher Felton, Ronald Greischar, William Pirrallo, and William Bazan. 2003. "Assuring Community Emergency Care Capacity with Collaborative Internet Tools: The Milwaukee Experience" *Journal of Public Health Management and Practice,* 9(1): 35-42.
[12] Cadigan, RT and CE Burgarin. 1989. "Predicting Demand in Emergency Ambulance Service" *Annals of Emergency Medicine,* 18(6): 618-21.
[13] Svenson, James E. 2000."Patterns of Use of Emergency Medical Transport: A Population-Based Study" *American Journal of Emergency Medicine,* 18(2): 130-4.
[14] Rucker, Donald, Roger Edwards, Helen Burstin, Anne O'Neil, and Troyen Breenan. 1997. "Patient –Specific Predictors of Ambulance Use" *Annals of Emergency Medicine.* 29(4): 484-491.
[15] Dickinson, Edward, Vincent Verdile, Christopher Kostyun, and Richard Salluzzo. 1996. "Geriatric Use of Emergency Medical Services" *Annals of Emergency Medicine*, 27(2): 199-203.
[16] US Census Bureau.
[17] Department of Administration, State of Wisconsin.

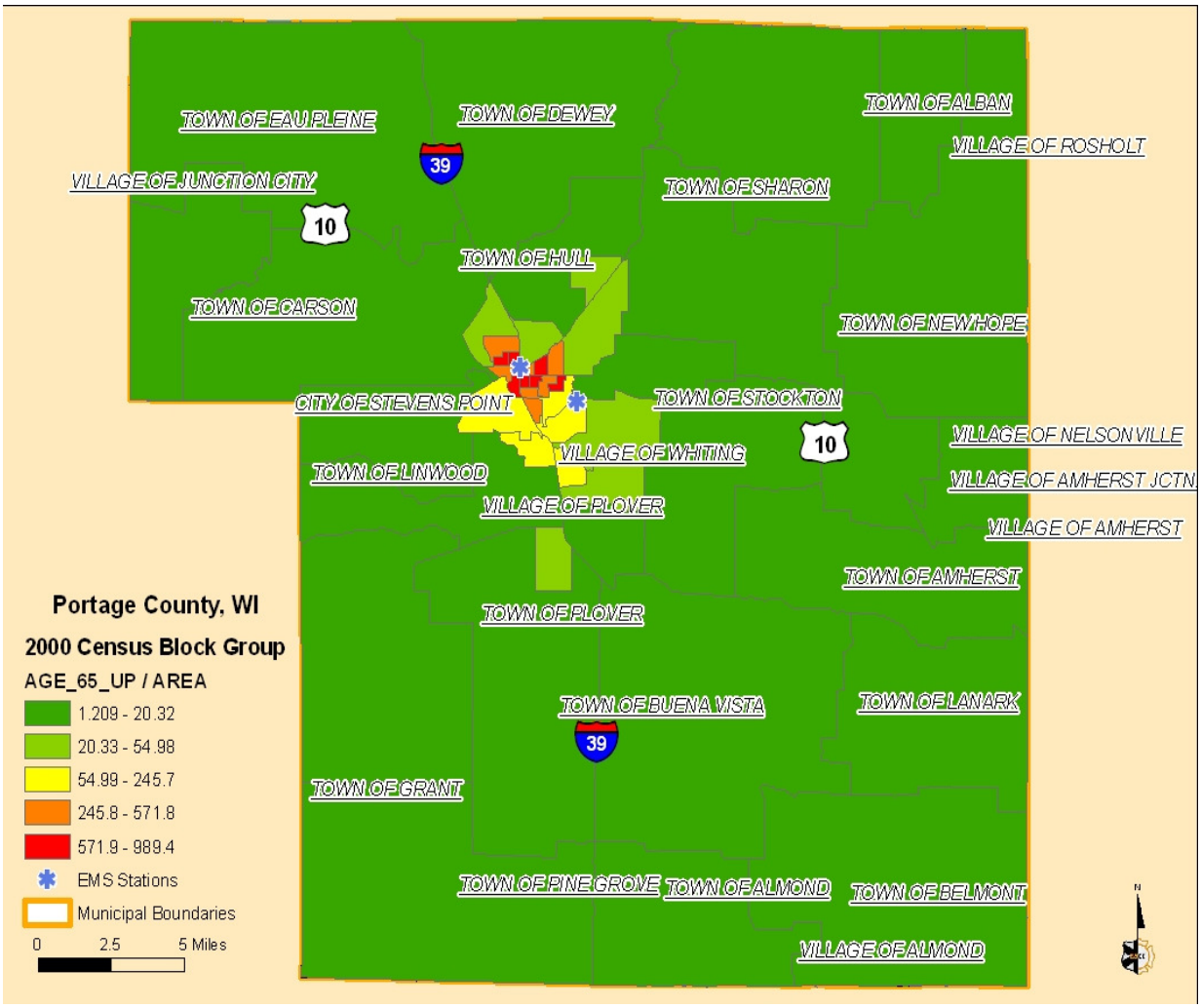
SPFD provided hard-copy data of patients transported, by age, which indicated a higher propensity for transportation by the aged population. The following figure details recorded patient ages for the past three years.

Figure 48: Recorded Age of Patients



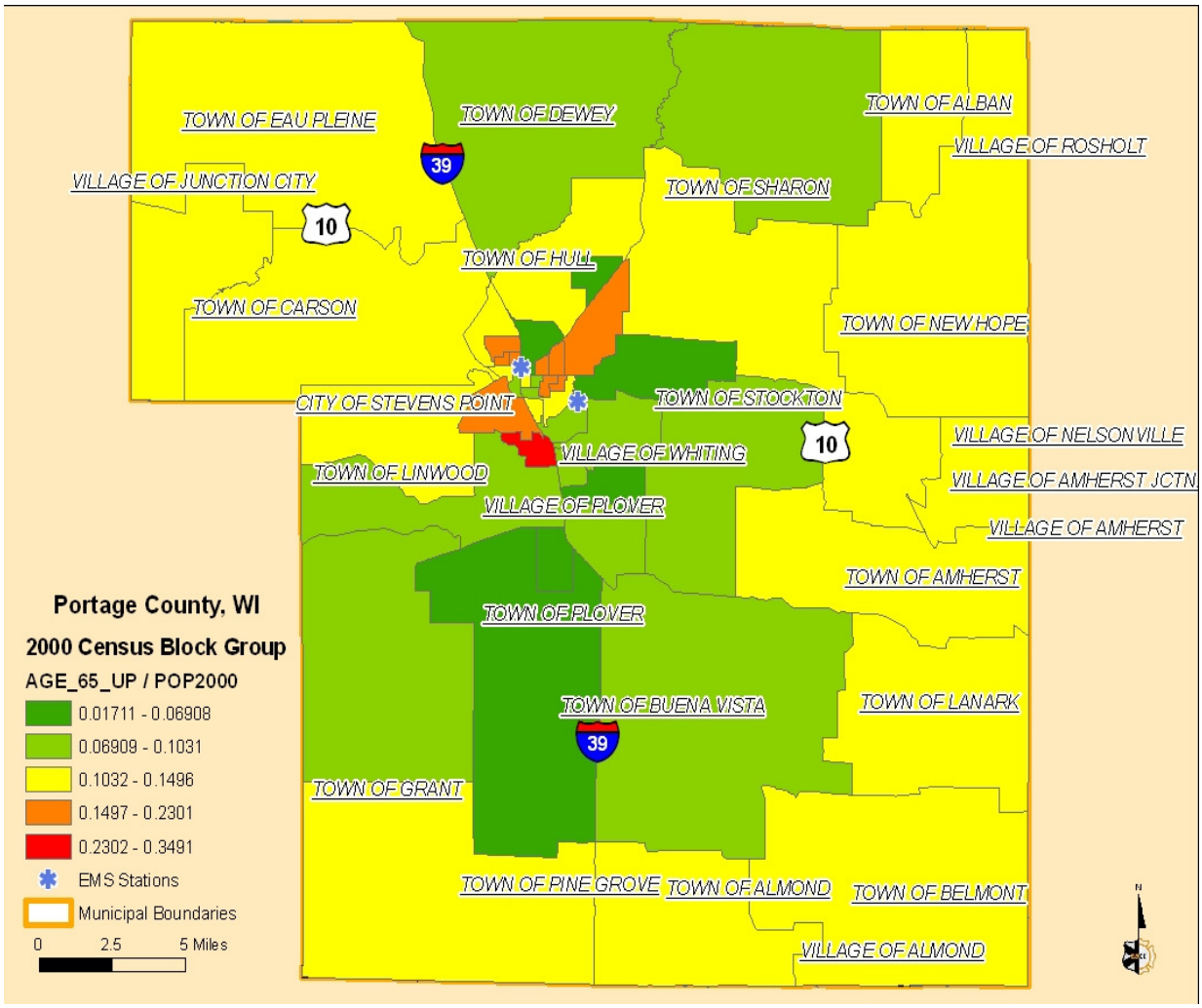
Emergency medical services use by citizens over the age of 60 is seen as a dominant profile in Portage County. Although this confirms the high use of EMS by the elderly population, it doesn't tell us where they are when they request the ambulance. ESCi begin by examining where the highest concentration of senior citizens are located within the County. The following map illustrates Portage County's senior population density divided by Census blocks.

Figure 49: Portage County Senior Citizen Population Density



The previous figure illustrates that the population of seniors is most concentrated in the core area of Stevens Point and the Villages of Whiting and Plover. This area of high senior citizen concentration correlates very well with the area of high service demand density. This is not to say, however, that senior citizen population is not a locally, intensive issue. When the senior citizen population is viewed on a per capita basis by Census block group, as in the following figure, a new perspective is drawn.

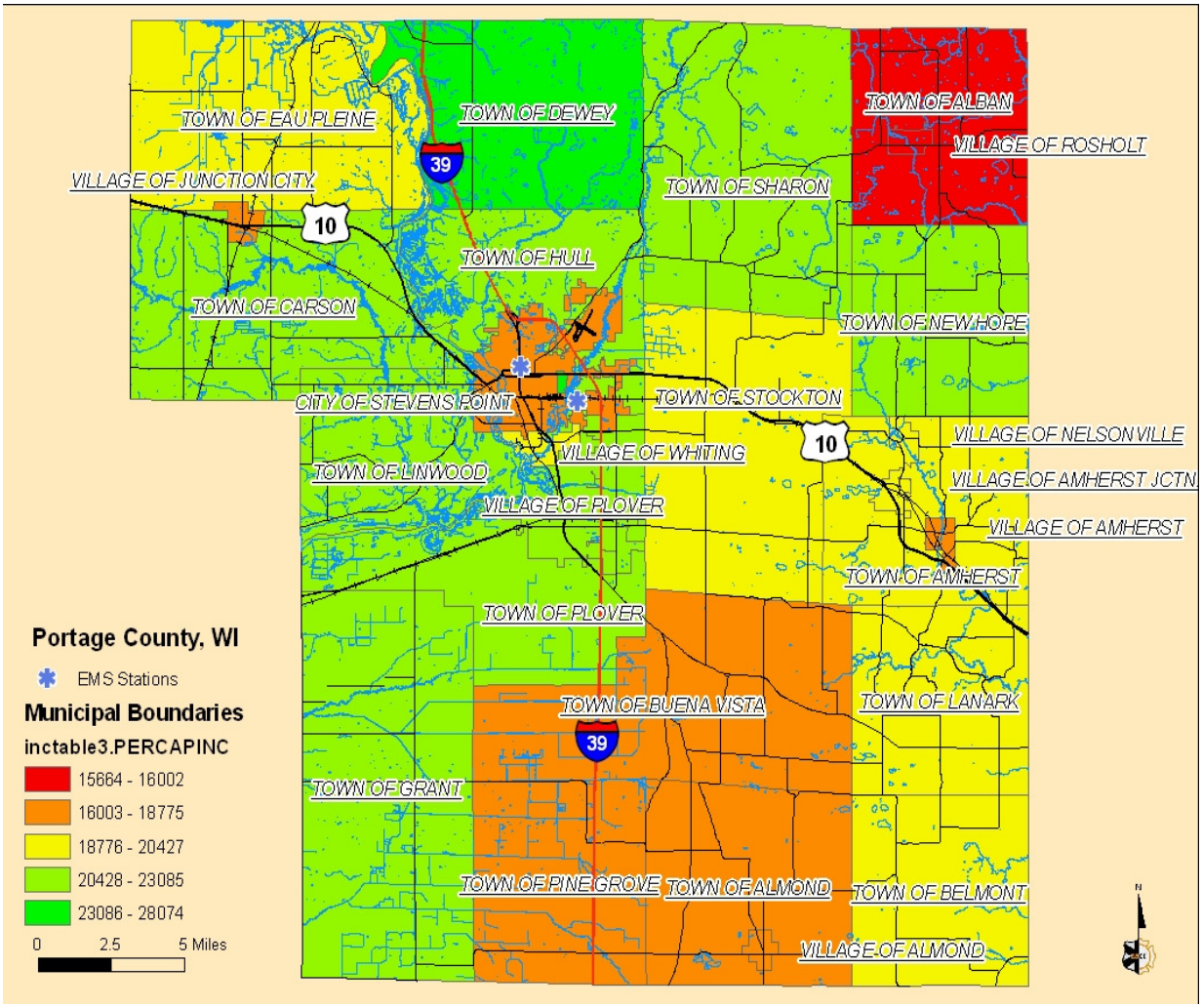
Figure 50: Senior Population Per Capita



Locally, senior citizen population reveals most of the County is in the national range of *senior population*, between 10 – 15 percent of the Census block group's population. However, higher per capita rates are located near the central core of the County.

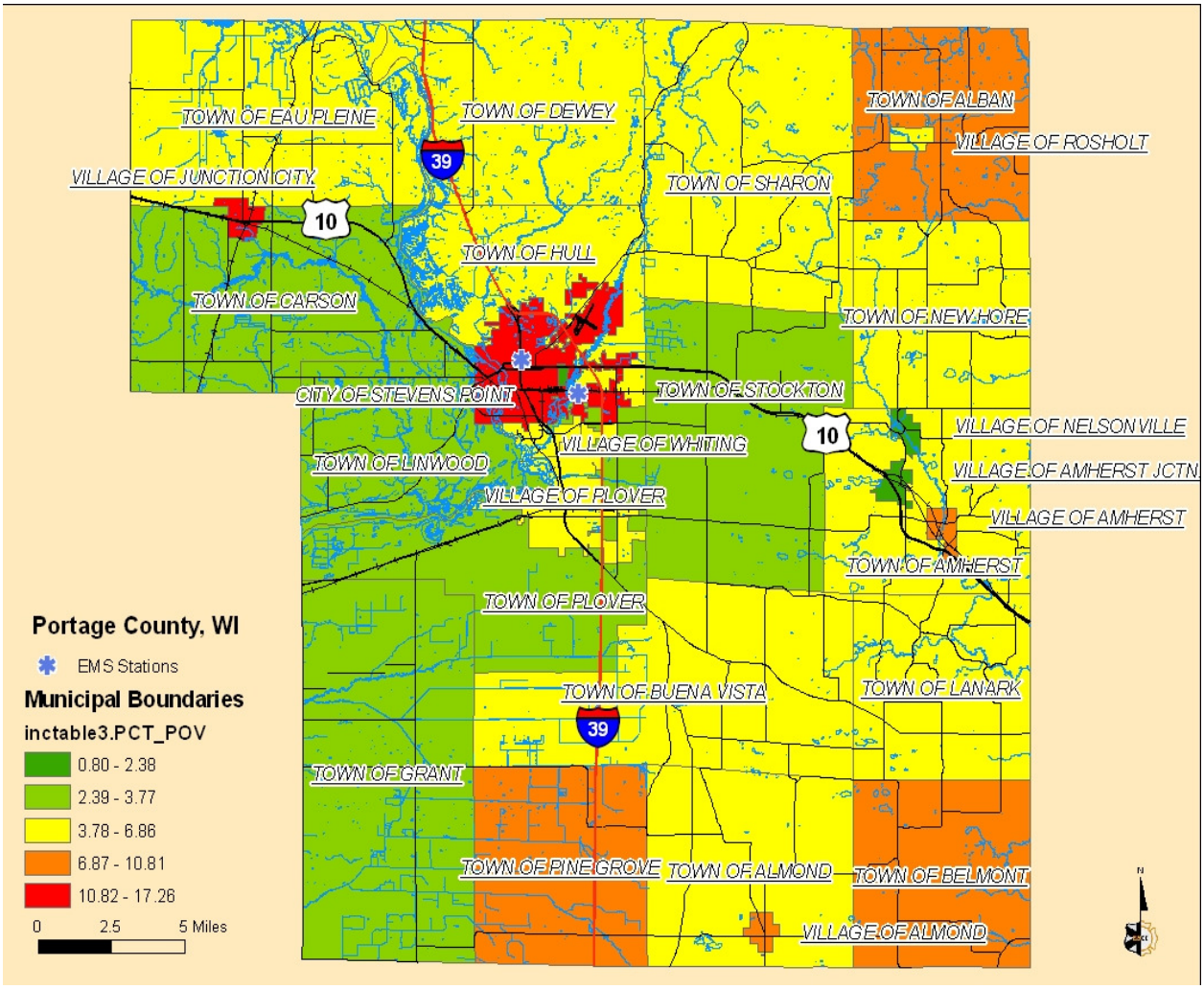
Another element that influences emergency service frequency-of-use is that of a lower socioeconomic profile among a population. Determining where this population segment is located can help develop deployment strategies, if it correlates with service demand density. The following figure depicts the per capita income by municipality.

Figure 51: Portage County Income per Capita by Municipality



Higher service demand can be seen in areas with lower income. In areas such as Pine Grove and Almond in the south, and Alban in the northeast, service demand is not high due to population levels; this can be reviewed in the population density map in figure 5 (pg. 23). In order to analyze income further, the figure below details poverty rate per municipality.

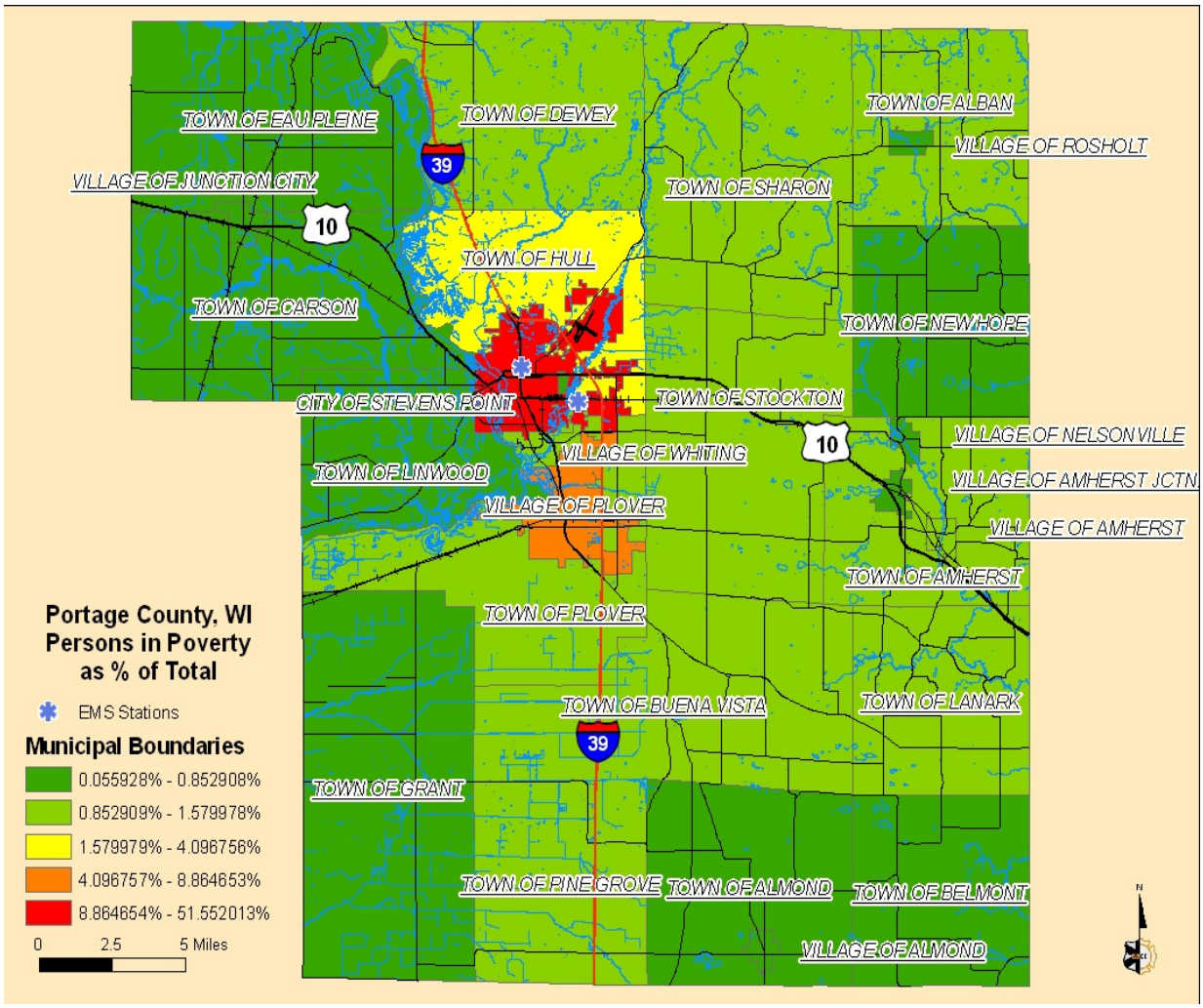
Figure 52: Portage County Poverty Rate by Municipality



Although this figure illustrates the level of poverty within each municipality, some of these municipalities do not have a relatively large population base. Nonetheless, it is useful in examining potential service demand when compared to each other.

Looking at poverty rates on a countywide level, it is clear the density of persons at or below the poverty level reside in the central core of the County. This correlates with the service demand density map in Figure 31 (pg. 81).

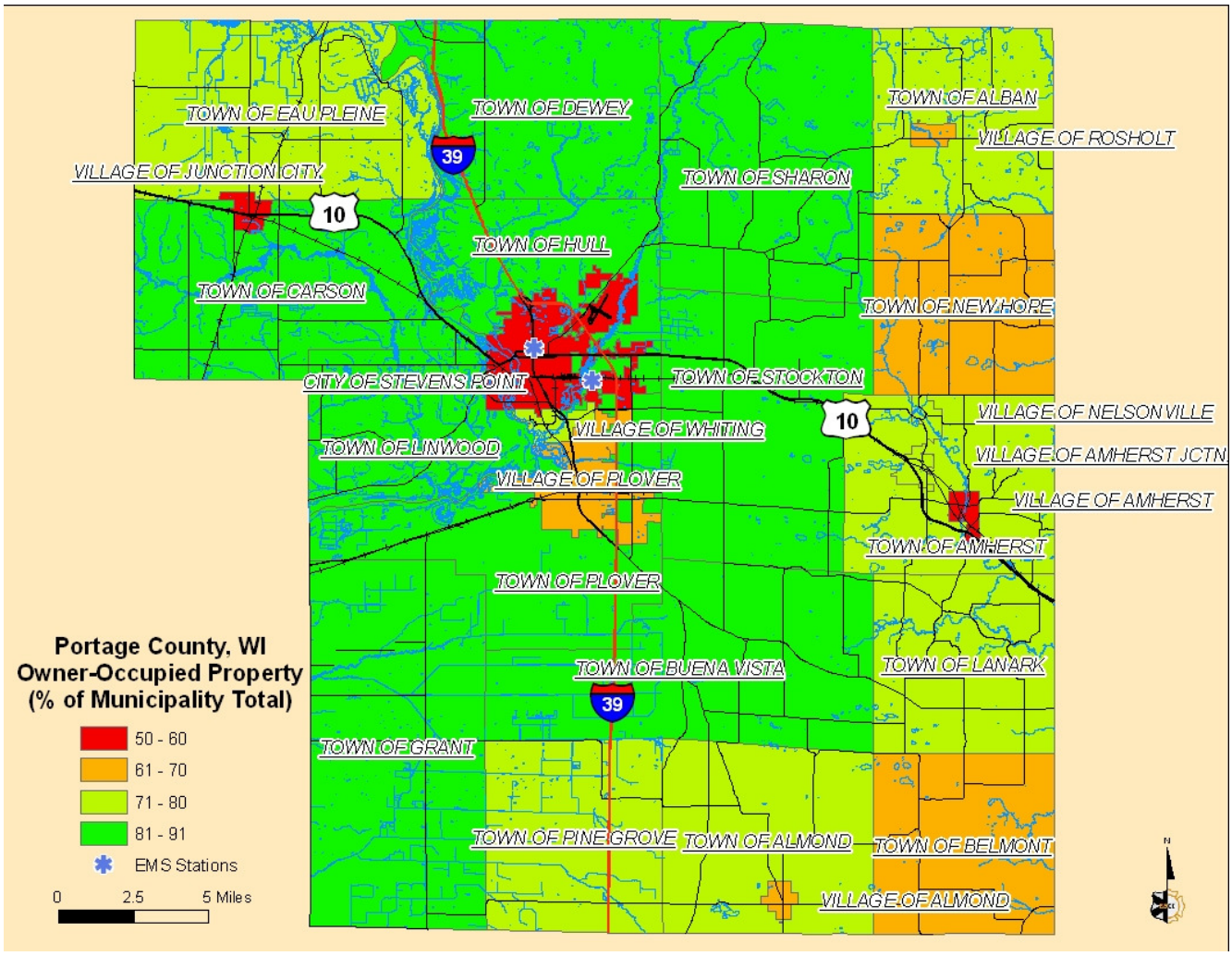
Figure 53: Portage County Density of Persons in Poverty



Housing is another area which indicates socioeconomic health within an area. Areas with a higher owner-occupancy usually coincide with higher incomes, while areas with high rental and vacancy units can coincide with lower socioeconomic areas. Exceptions to this assumption include resort areas, or areas with universities, such as Stevens Point.

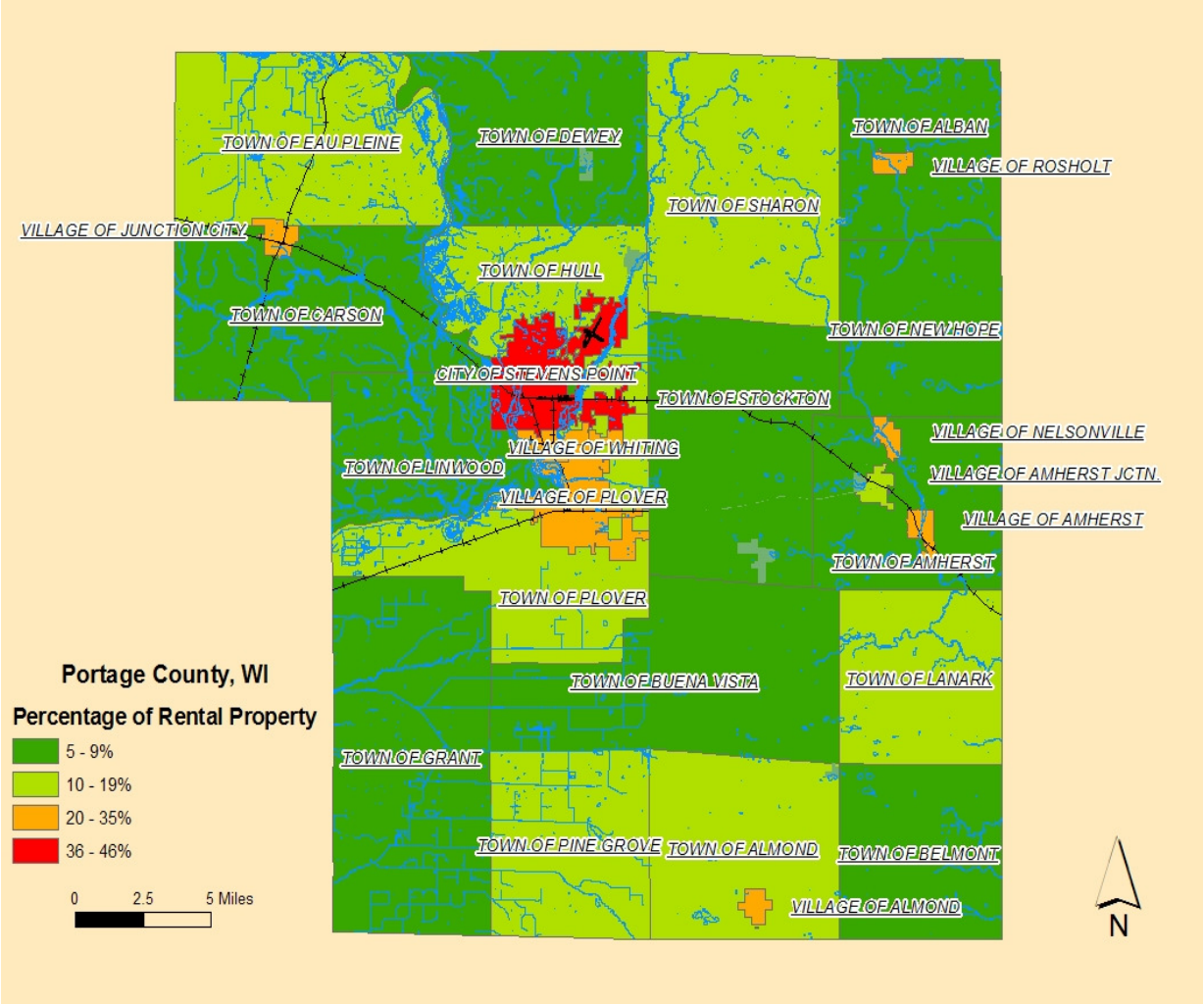
ESCi examined current housing information as it relates geographically in the following figures; beginning by examining owner-occupancy rate by municipality.

Figure 54: Portage County Percentage of Owner-Occupied Housing by Municipality



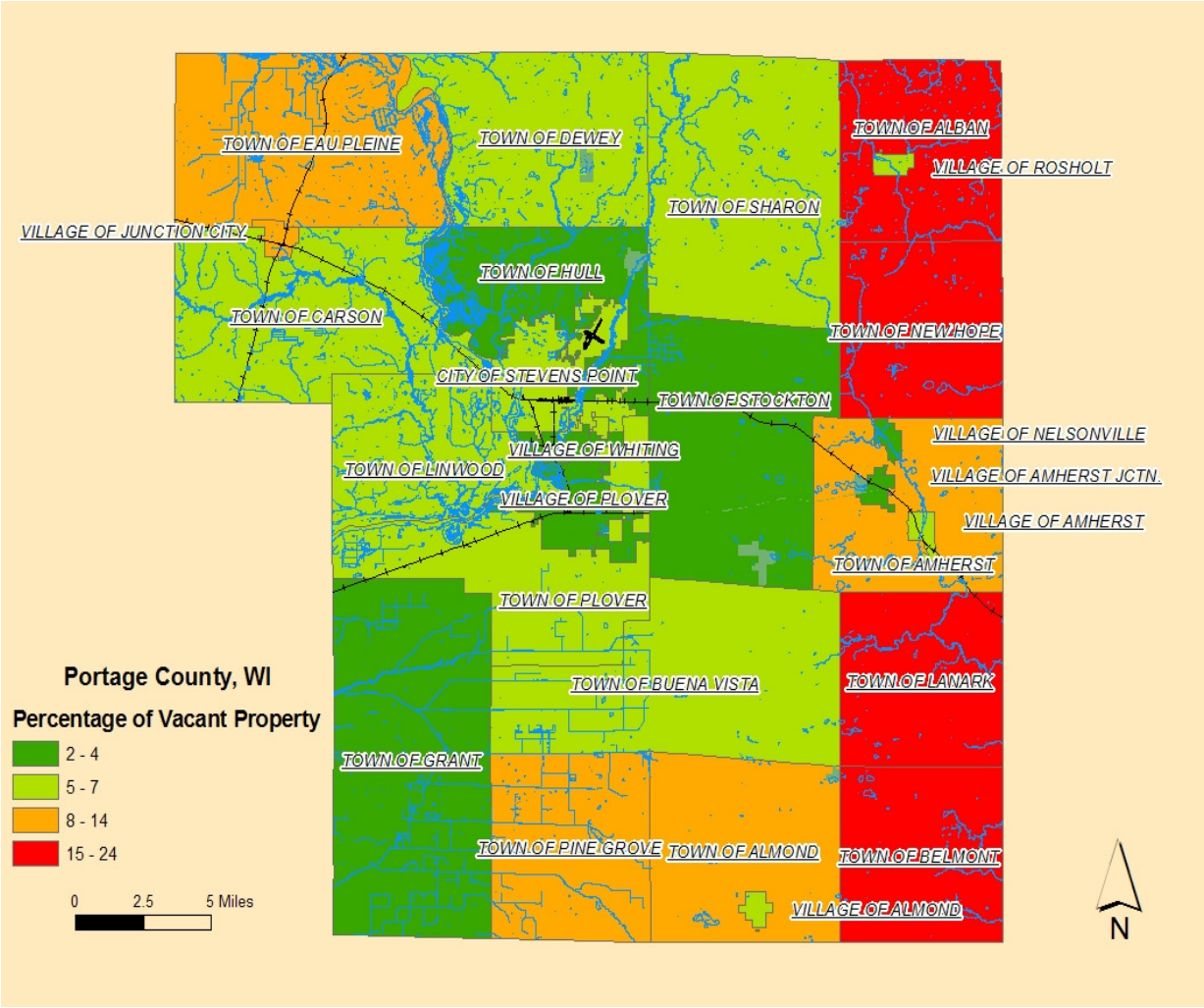
Many of the areas which have fewer owner-occupied housing correlate with higher service demand, especially in the more densely populated areas of Stevens Point, the Village of Amherst, and the Village of Junction City. In other less populated areas, there are indications of demand potential given by the lower ownership rates. In the following figure, percentage of rental property is illustrated by municipality.

Figure 55: Portage County Percentage of Rental Property by Municipality



Higher rental property areas closely correspond to both the population density map, as well as the service demand density map. These areas, as expected, experience a greater frequency of EMS calls. Lastly, a look at vacancy rate per municipality is shown in the following figure.

Figure 56: Portage County Percentage of Vacant Property by Municipality

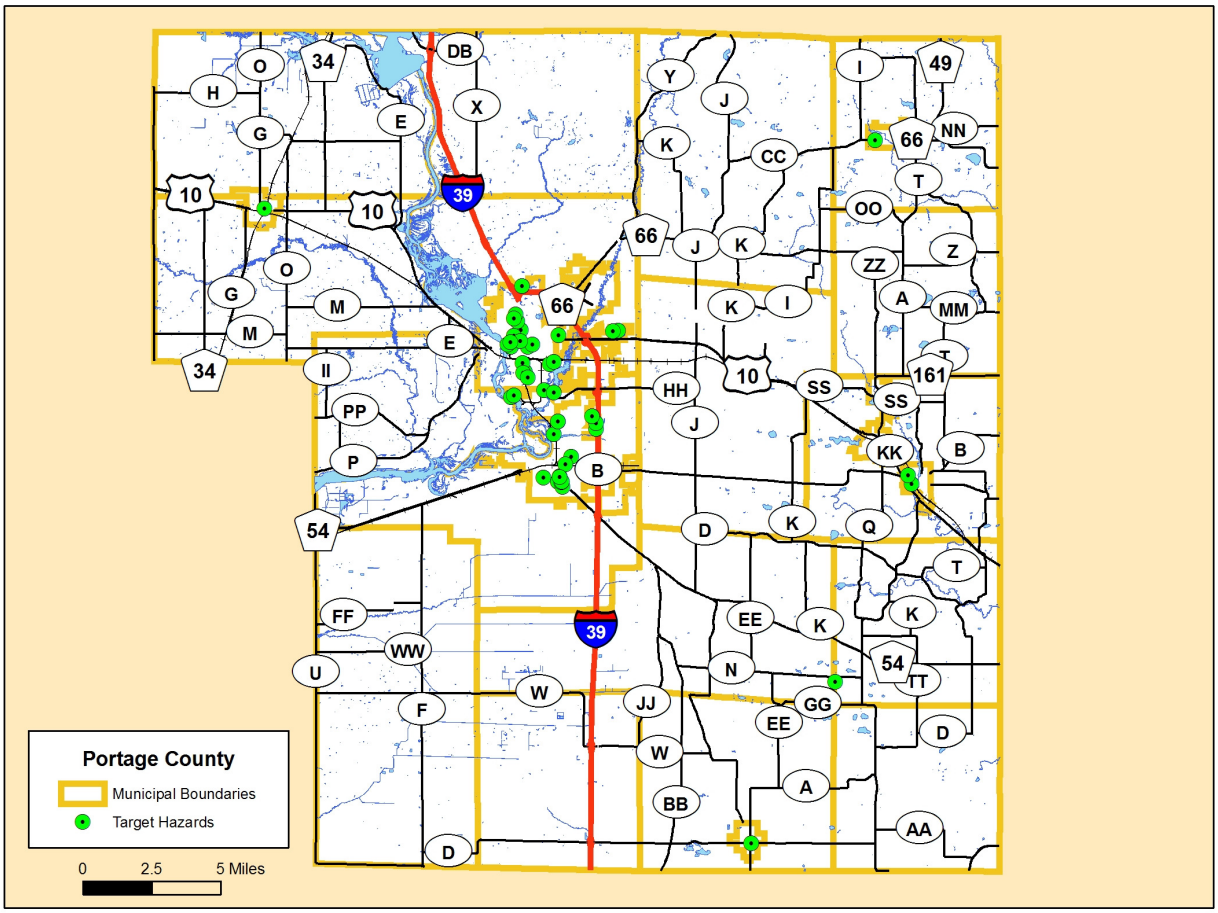


Higher rates of vacant property lie on the eastern and southern end of the County, and additionally Eau Pleine to the north. Theoretically, no potential patients would arise from vacant properties; however it does indicate a degree of economic health within the community. As with all of these maps, the density of housing units is highest within the central core of the County. In this case, the degree of vacant property points to decreased socioeconomic indicator and a potential for increased service demand outside of this core area.

EMS demand in Portage County is influenced in similar fashion to nationwide norms, in that senior citizen population and lower socioeconomic groups correlate strongly with service demand patterns. ESCi has explored these factors on a countywide and municipal level basis. In the following figure, we searched for specific properties, which typify these influencing factors, to plot locations and evaluate against current service demand. ESCi refers to these properties

as target hazards - such locations would include skilled nursing homes, assisted living facilities, senior housing complexes, and HUD Section 8 public assistance housing.

Figure 57: Target Hazards



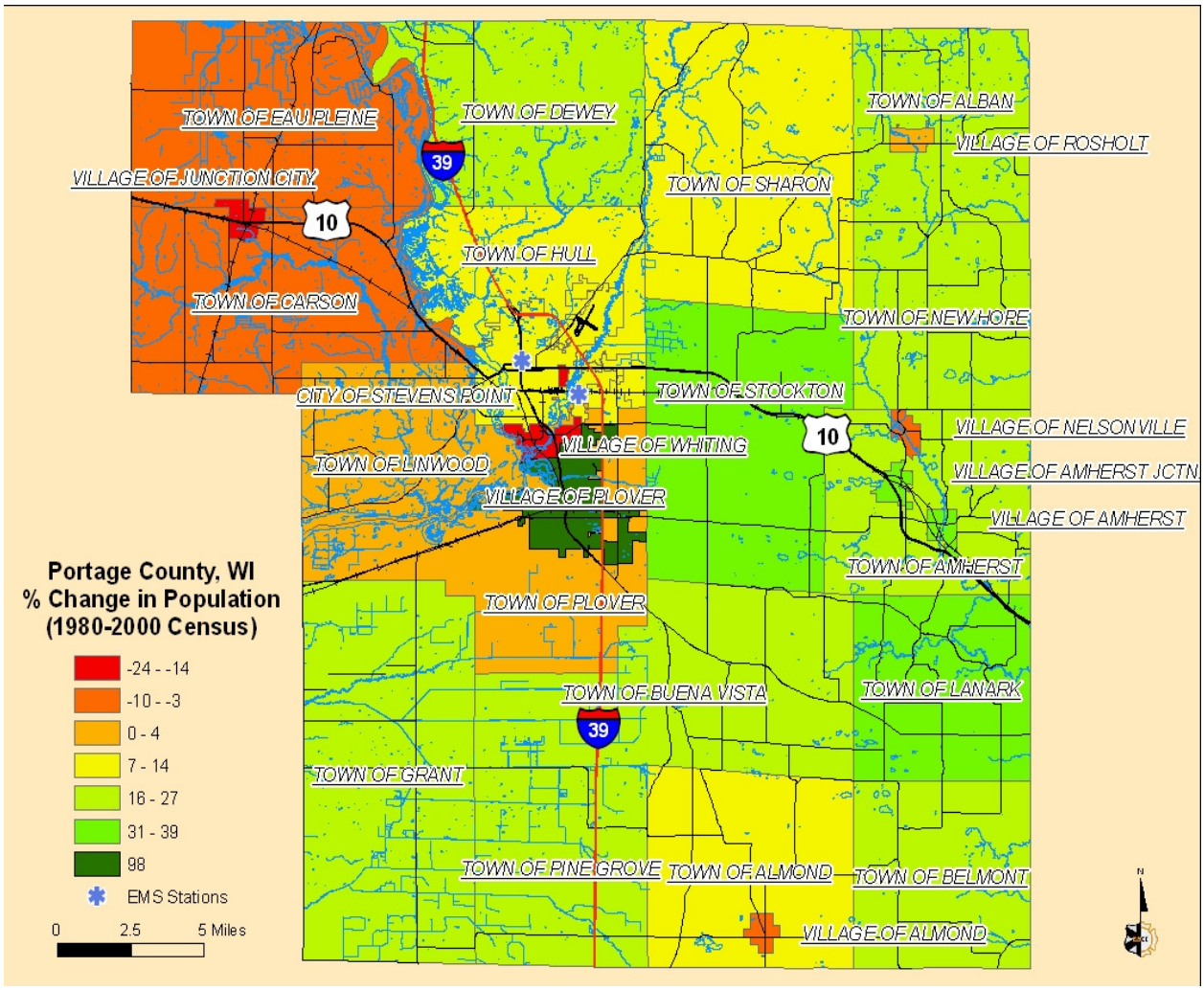
A list of these facilities was provided and their locations were mapped (above). The majority of these facilities were located within the central core of the County, which gives further validation to the assumption of influences for EMS service demand. While all of this points toward current risk analysis and leads to the evaluation of current deployment, the fact is that all of these communities will pose a different pattern of potential future risk.

Community Growth Potential

In this section, ESCi will begin to analyze plans for potential growth, within the various communities of Portage County. An analysis of these future plans and projections of population growth, within these municipalities, guide the development of future service demand projections.

A glimpse into the past would be prudent in any look toward the future. There are areas of Portage County which have benefited from population growth and economic fruits of business development. Other areas have remained mostly agricultural; others have lost population and businesses. The following map details historical growth rates, by municipality, within Portage County from the 1980 to 2000 Census.

Figure 58: Portage County Historical Growth Rate by Municipality, 1980-2000



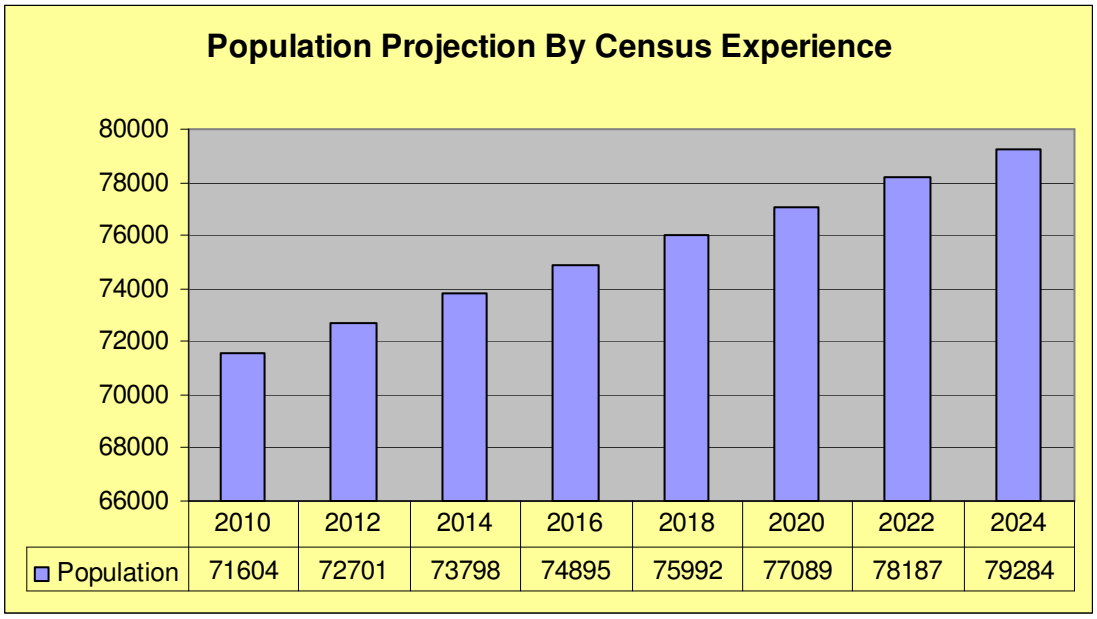
By far the most explosive growth has occurred in the Village of Plover, nearly doubling its population over the 20 year span to average annual growth of five percent per year, growing 54 percent in the 1980 decade. Other faster growth areas include the Towns of Stockton and Lanark, along with the Villages of Amherst and Amherst Junction. These suburban areas with rapid growth have, and will, certainly impact the need for EMS. This population tends to increase motor vehicle-related injuries and, depending on age, medically related calls as well.

Census-based Growth Projections

As indicated earlier in this section, the population of Portage County has grown modestly in the last decade; with anticipated additional growth in the future.

In developing forecasts for population growth, ESCi typically develops a forecast based on several decades of Census experience. In the case of Portage County, decennial Census figures from 1970 through 2000 were used. A mathematical forecast is created through the year 2024. The resulting population forecast appears as follows.

Figure 59: Census-based Population Forecast

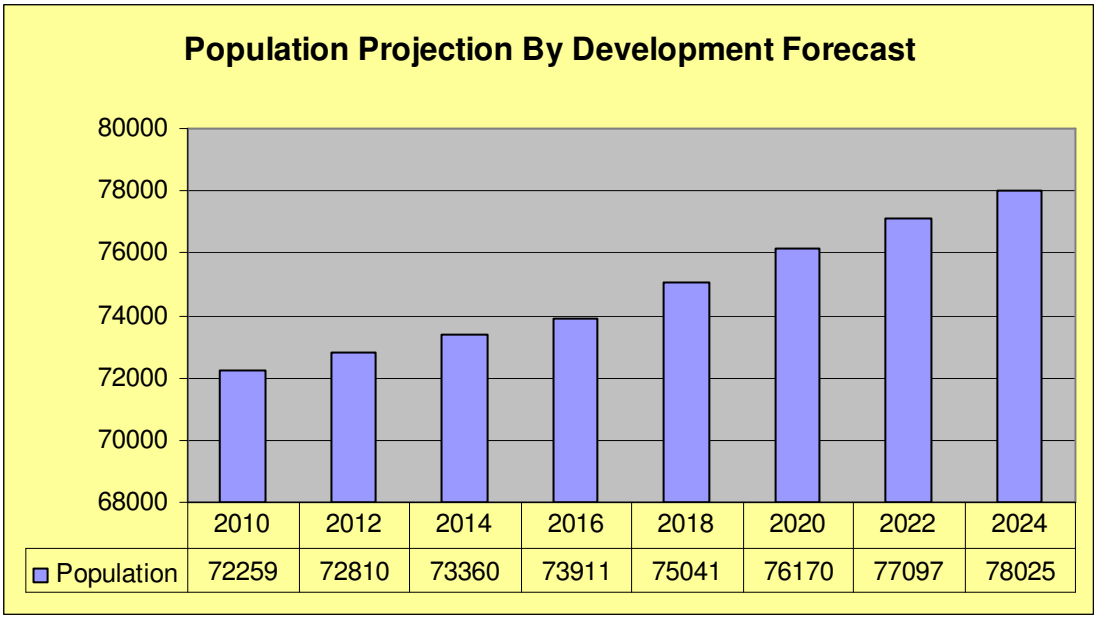


Development-based Growth Projections

While census-based population projections provide a mathematically based estimate of future population based on historical data, they often fail to account for expected trends in the growth rate of an area. These changes often result from redevelopment, annexation, changes in employment capacity, or other socio-economic factors not reviewed in a census-based projection. For this reason, ESCi also offers population projections based on a review of available local development and business information.

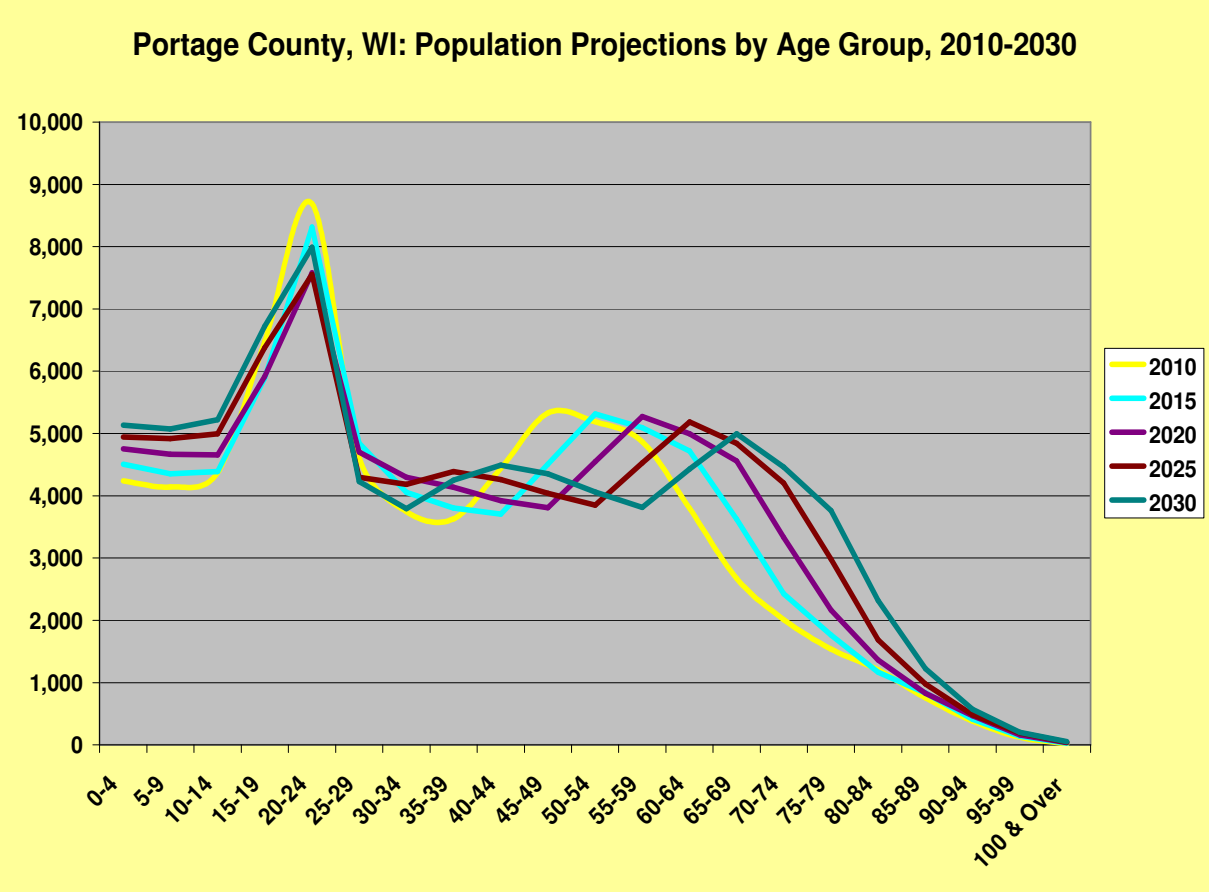
In this case, ESCi reviewed information available from the comprehensive plans of the villages and towns within the County, along with information from the State of Wisconsin Department of Administration. The resulting population forecast appears as follows.

Figure 60: Development-based Population Forecast



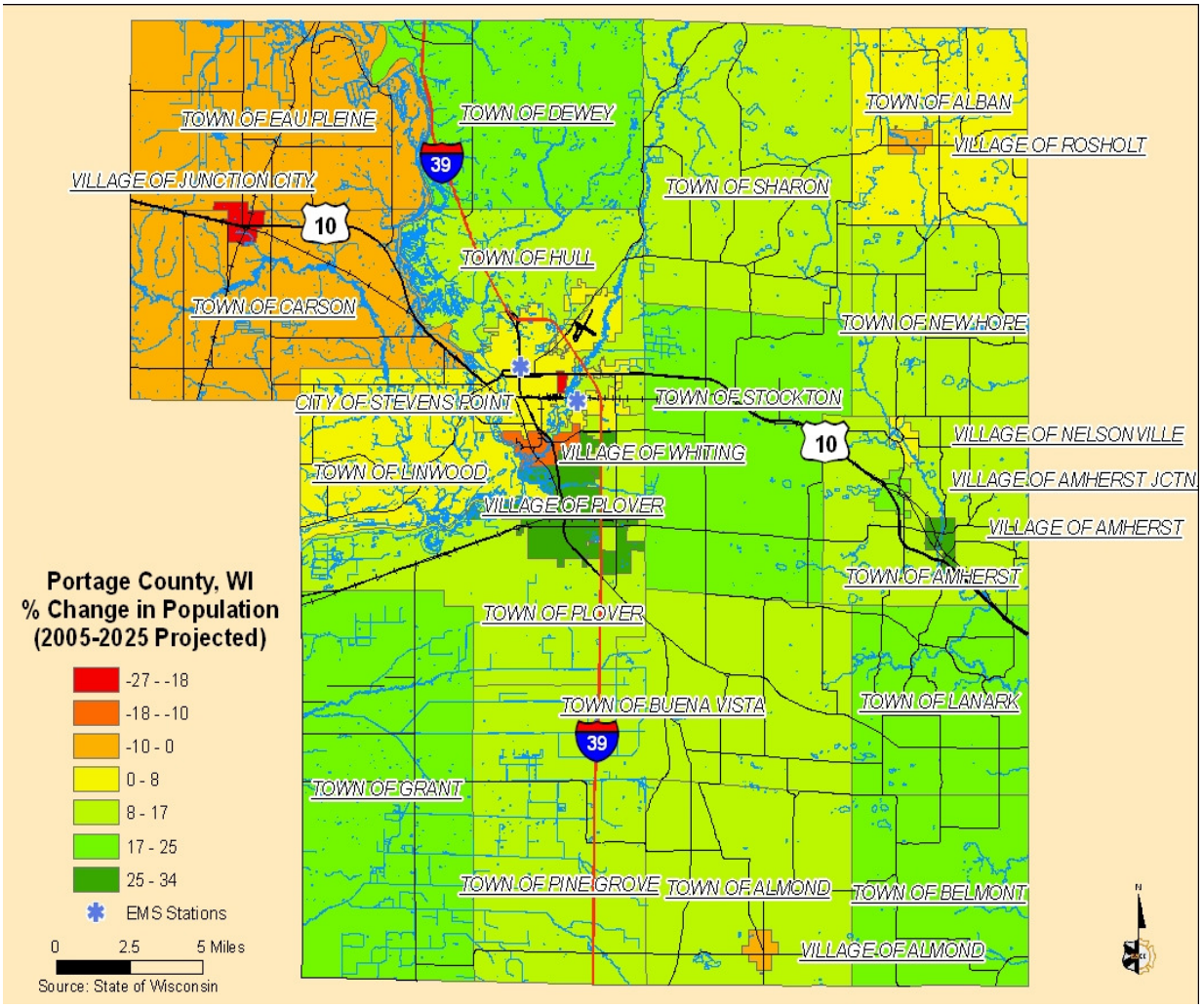
The State Of Wisconsin has projected populations by age for the County and by municipalities as a whole, until 2030. The figure provides insight into the future population projections for Portage County. The following graph details population projection by age for Portage County.

Figure 61: Portage County Population Projection by Age, 2010 - 2030



Noteworthy are the increases forecasted for each year in the pediatric age group. While the college age group remains high due in part to the university presence, an interesting trend begins to take place. The age group of the late forties and early fifties, age in progression as the baby-boomers progress into their senior years. This increase in senior citizen population will have a great demand upon EMS services into the future.

Unfortunately, the State hasn't projected these age groups by municipality, but ESCi can extrapolate the effect of age groups by the shifting patterns of population growth and regression by municipality. The following figure illustrates population growth by municipality. Each one of these areas will be impacted by the changes in population patterns.



Areas with more affordable housing, unskilled or limited skilled job opportunities, and government assistance offices tend to result in a congregation of lower income residents. Although these amenities attract seniors on a fixed pension or social security, the proximity to hospitals, doctor's offices, and public transportation is also attractive. These benefits can be found most prevalently within the Stevens Point area. As the senior population grows, the necessity for nursing care or assisted living quarters will also be in demand. These facilities prefer to also locate near hospitals and other medical facilities. They also require transportation for non-ambulatory patients which increases the demand for non-emergent ambulance transport.

It is not the intent of this study to be a definitive authority for the projection of future population in the service area, but rather to base our recommendations for future EMS needs on a

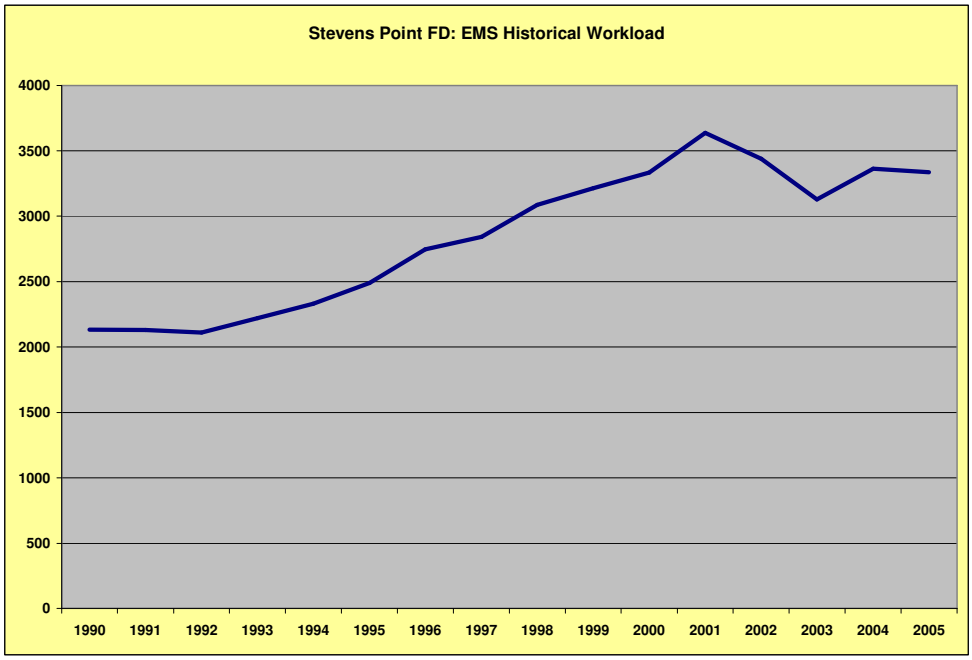
reasonable association with projected service demand. Since it is known that service demand for emergency agencies is based almost entirely on human activity, it is important to have a population-based projection of the future size of the community. While we can see variation in the population projections discussed here, one thing that can be certain, is that EMS services will increasingly be a need to a growing population, likely reaching over 75,000 by 2025. Planning should begin now to maintain the resources needed to meet the continuing demand for services.

Service Demand Projections

In evaluating the deployment of facilities, resources, and staffing, it is imperative that consideration be given to potential changes in workload that could directly affect such deployment. Any changes in service demand can require changes and adjustments in the deployment of staff and resources in order to maintain acceptable levels of performance.

The following chart details the historical workload for the SPFD for EMS calls within Portage County, including non-emergency transports.

Figure 62: Fifteen-year Workload History



This chart indicates a steady increase in workload since 1990, decreasing in 2001, and most recently remaining stable. The decrease has been attributed to the advent of a private non-emergency medical transportation service within Portage County. A concern has been voiced as to whether this service will continue long-term.

Land use within an area influences the frequency in which EMS is requested. For example, from the previous discussion regarding age, it can be seen that a nursing home would influence the number of EMS calls to that area. Staffing and deployment decisions should be made with consideration of the level of risk within geographic sub-areas of a community.

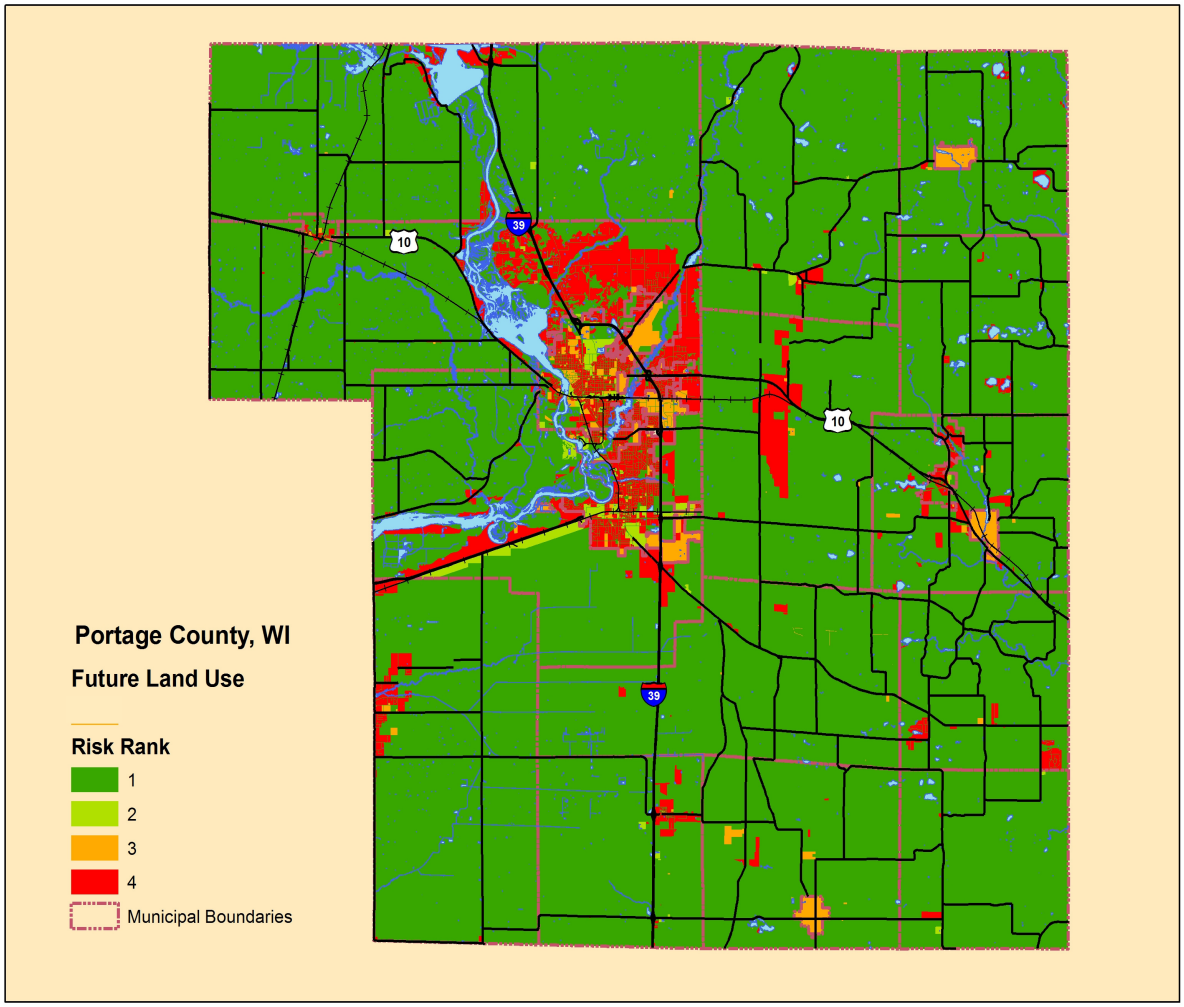
In examining the relationship between EMS calls and the land use designation near the call, it was found that most calls occur in residential areas. This is not to say that they occur necessarily within a residence, but that the area itself is residential. The following table illustrates Portage County EMS use based upon land use designation.

Figure 63: EMS Frequency Level for Land Use Types

Land Use	% of Calls	Risk Level
Medium Density Residential	46%	4
Low Density Residential	18%	4
Commercial	10%	4
High Density Residential	8%	4
Office	5%	3
Institutional	4%	3
Vacant	3%	2
UWSP	1%	2
Industrial	1%	2
Parks/Open Space	1%	1
Farm	1%	1
Park	0%	1
Road	0%	1
Right of Way	0%	1
Quarry	0%	1

The community's risk assessment has been developed based on potential land use. These potential uses are found in municipal development plans and zoning designations. The following map translates land use (potential scale and type of development within geographic sub-areas) to categories of relative risk of frequent EMS use.

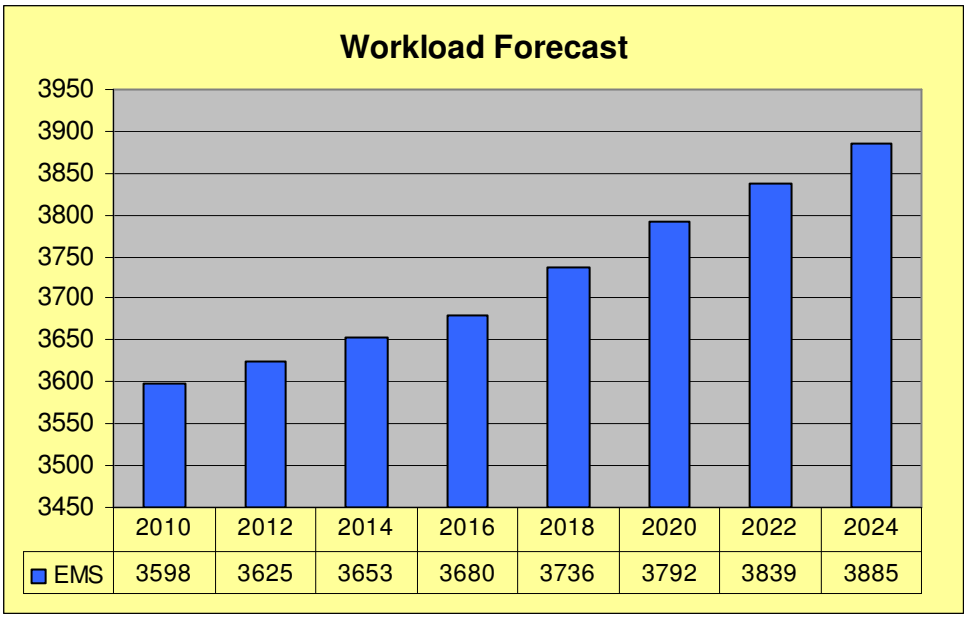
Figure 64: Community Risk Assessment



Future land use plans call for expanded residential and commercial land use outside the City of Stevens Point, especially points east and southeast of the city. These areas, if developed, will increase the service demand upon Portage County EMS. The question then is: what are the projections for workload and population within the borders of Portage County?

For purposes of this study, ESCi utilized population projections obtained through community development research and multiplied these by a forecasted incident rate derived from a five-year history of incident per capita rates to identify workload potential through the year 2025. The results of the analysis are shown by year in the following chart and table.

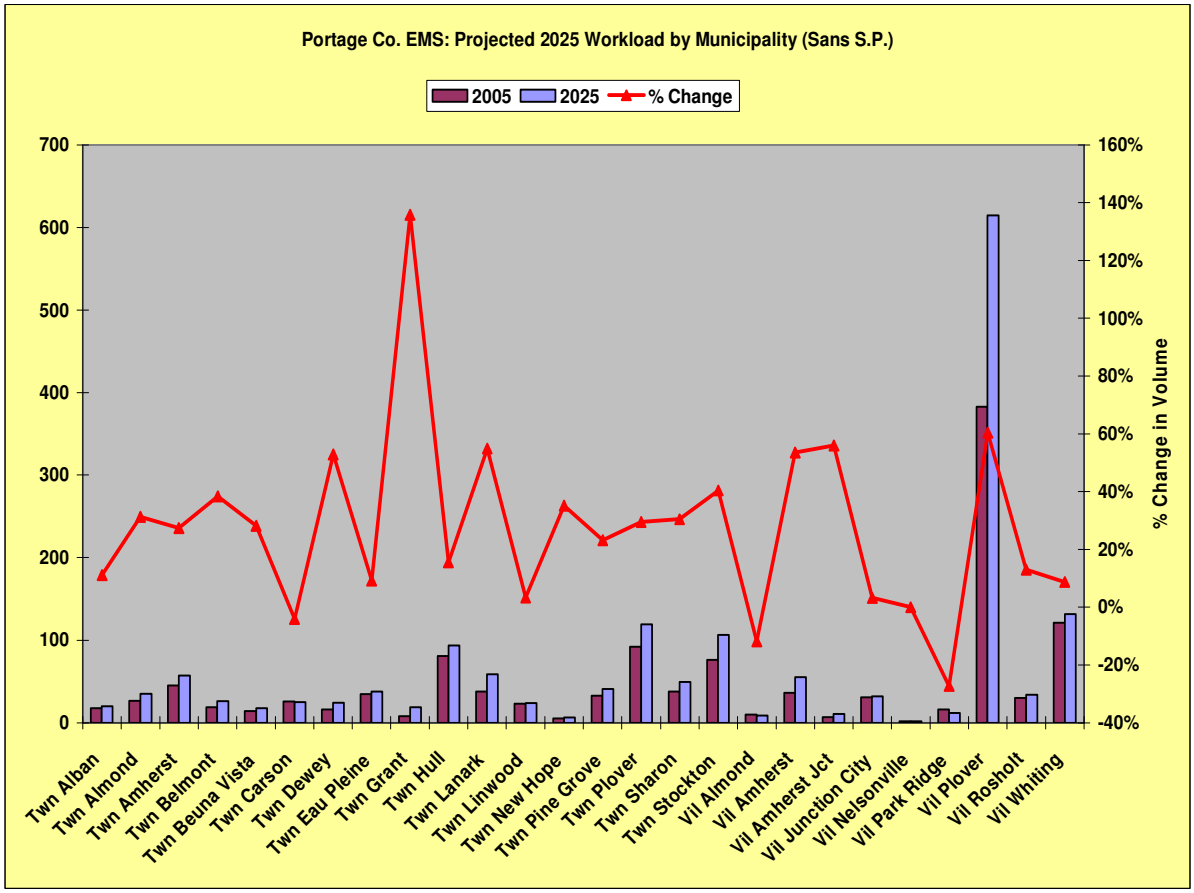
Figure 65: Workload Projection



As the chart indicates, EMS service demand is expected to increase slightly over the coming decades which may require an increase in staff and resources to be able to meet the demand.

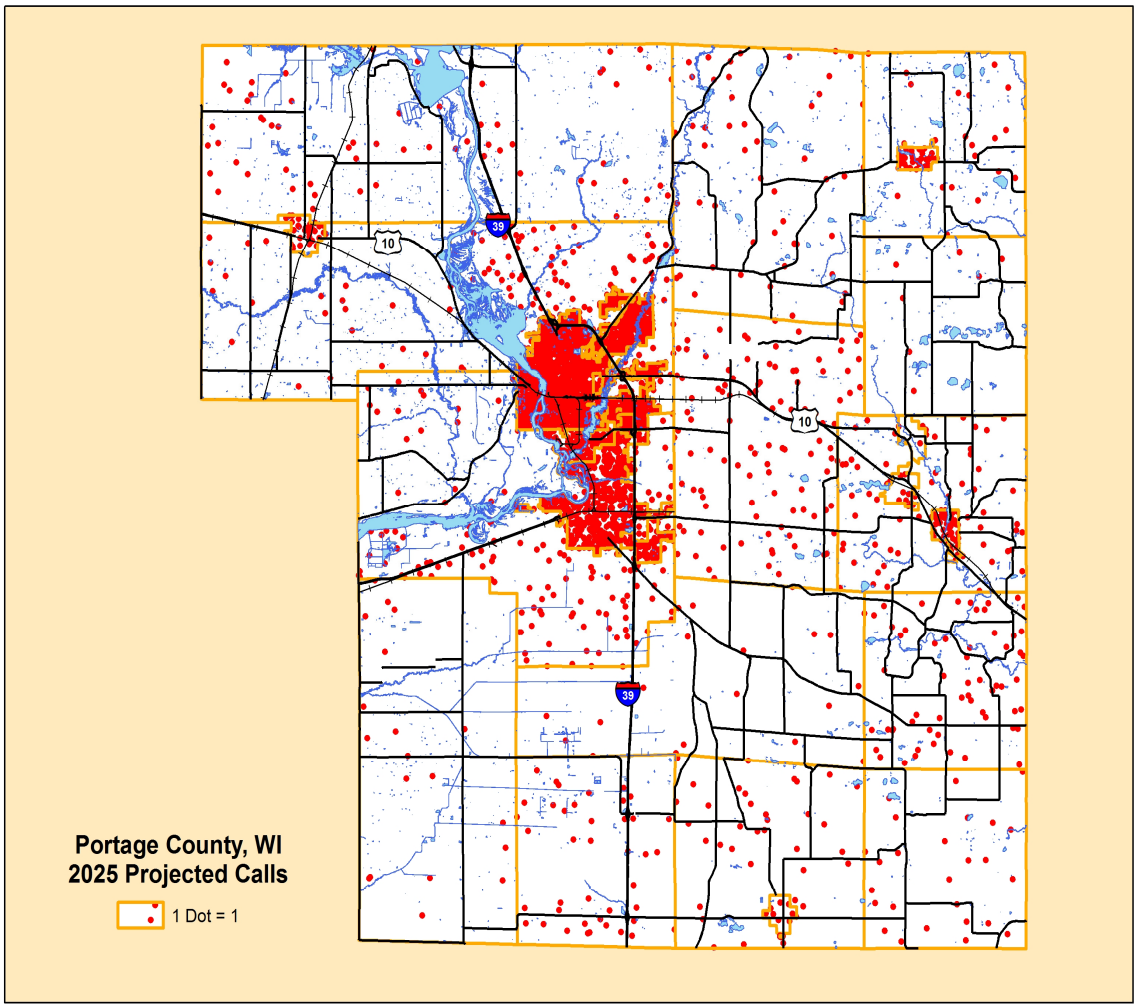
Just as important as the level of expected workload is the location of expected highest service demand. As towns and villages within Portage County grow in population; percentages can be staggering. This will certainly have a similar effect upon the service demand within the municipalities. The following figure details the projected percentage of change in workload for each of the municipalities outside the City, considering population projections, aging populous, and future land use changes.

Figure 66: Projected 2025 Workload by Municipality



The percentage change of the projected increase in call volume within the municipalities is impressive. When viewed in a countywide perspective, it reveals that most of the villages and towns will continue to be lower service demand producers than the Village of Plover, which will continue to demand nearly 16 percent of the workload. The share of service demand generated within Stevens Point is expected to decrease from 59 to 57 percent, but obviously will still be the area with the most significant demand. Outside of the Village of Plover and Stevens Point, the service demand equals 27 percent of volume over a larger expanse of land. Plotted geographically, this projected workload is displayed in the following figure.

Figure 67: Portage County 2025 Projected Calls



The result of workload projection analysis is similar to the current service demand due to a modest increase in population projections countywide, although at a municipal level it is quite high. Changes in residential housing land use were strongest to the east of Stevens Point.

Although, there may not be much change in the service demand density within Portage County, there still exists the need for EMS services in all areas of the County. A need for EMS services has demanded better response time performance than current deployment. Several strategies for the provision, governance, and deployment of EMS within Portage County are discussed in the following section.

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Section III - Future Delivery System Models

In this section, ESCi explores various strategies intended to improve the quality and the effectiveness of EMS delivery in Portage County. We begin by exploring unit deployment options, which are based solely on geography, service demand, and response time.

Unit Deployment Options

The current performance of units being deployed from Stevens Point has been detailed in previous sections. It is apparent that, although located in the area of highest service demand, the response times to the rest of the County are not acceptable to many of the citizens and public officials.

If only two units are staffed on a full-time basis, placing them in the area of highest service demand may make the most sense. Even as noted in previous sections of the report, the unit coverage overlap is advantageous, as the likelihood of concurrent calls in the area of Stevens Point area is relatively high. However, it is not the recommendation of this report to maintain the status quo deployment pattern, since it results in travel time to other areas of the County that are unacceptably long. It seems clear that, due to response time performance to outer reaches of the County and the expansion of higher service demand areas outside of Stevens Point, additional apparatus and staffing are warranted.

Several public and stakeholder sessions were held during the information gathering process from which remarks regarding the state of the current system as well as the ideas for improvement were forwarded. Although a unified, ALS-level EMS system was celebrated; response times in excess of 20 minutes have been deemed unacceptable by the outlying residents of Portage County. The question was posed during these public input sessions, “What is an acceptable response time?”

Nationally, there is no required or accepted standard of response time for EMS units. Departments can choose to adhere to recommended standards for response time found within the National Fire Protection Association’s Standards, but this may not be economically feasible in all cases. Response time in EMS has been widely studied for cardiac arrest victims, but the

vast majority of calls are less critical, and the debate in medical literature as to what level of response is appropriate, for which type of call continues.

The standard response time for urban EMS systems is less than nine minutes, at the 90th percentile, within suburban settings response time increases to less than 13 minutes, and rural settings increases to less than 15 minutes. Despite this, what is acceptable to the citizens of Portage County is a range between eight and 15 minutes, according to feedback received in public hearings and administrative meetings with officials.

Certain factors that influence overall response time, such as call processing and turnout time, can be reduced to less than a total of two minutes with significant effort by the providing agencies. Performance objectives for call processing of 30 seconds or less from call pick-up to unit dispatch are being achieved in several model communications centers around the country. More and more fire departments are successfully holding personnel accountable for meeting the *NFPA 1710* standard for turnout time of 60 seconds or less.

Travel time, however, is a factor of overall response time that is nearly impossible to impact without changes in deployment. The amount of units necessary to achieve a given response time objective has a direct correlation to length of that response time objective. Simply put, shorter response times require more units, longer response time require less. Smaller factors do come into play such as traffic volume, weather, road network connectivity, and speed when evaluating travel time, but basic geography is the overriding issue.

To begin the analysis of deployment, a ten-minute travel time objective was used. This would typically result in a maximum response time of 11 to 13 minutes, or about mid-range in the span of acceptable response times expressed in the public and stakeholder input meetings. Keep in mind, that the maximum of travel is 10 minutes, but areas closer to where units are stationed would naturally enjoy shorter response times.

At this response level, the current deployment (including Higgins) covers 117 square miles, which translates into only 17.5 percent of the County area. Yet, because of unit location within the area of highest service demand, 71.5 percent of the call volume can be covered. This is still well below a 90 percent performance rate, and does not address extended response times in the periphery of the County. In order to address this, several new deployment options have been developed.

The following deployment options are derived without regard to what agency is operating the EMS system and from a regional perspective, not limited to intra-county resources. They are intended to adequately cover the areas of highest service demand while also providing reasonable response time performance to areas of the county with more infrequent demand.

In each strategy, specific locations are described for future station construction or relocation. It should be noted that these specific locations provide the point at which the performance projection data was achieved and represent ESCi's recommended *best case* location. It is understood that additional factors such as land availability, zoning, traffic patterns, etc.; will also impact any decision on a specific station site. An effort was made to utilize existing facilities such as fire stations, since many of the first responder units are within them. Facility use agreements are also less costly than acquiring a site and constructing a station. For these reasons, ESCi suggests that variations to the listed locations are acceptable within a range of the equivalent of two or three city blocks. Any such variations will impact the performance projection of the strategy, but not significantly to render it inaccurate.

Base Change Options: Ten-Minute Travel Time

Units can respond into Stevens Point from outside the City, staying within the acceptable travel time objective, just as well as they can from inside the City limits. The added benefit is that they can reach farther out into the County, without compromising shorter response times to Stevens Point.

While ESCi recommends keeping at least one EMS unit located within city limits, one option for existing resources would be to move one of the units farther out into the County, but within range of the high demand area. For example, moving Station 2's ambulance southward to the Plover Fire Station increased the ten-minute travel time coverage area by 48 square miles and increased service demand coverage by 1.1 percent. Another option would be to move a unit farther east to the new County building off Highway 10, but this would yield essentially the same result.

Though these options for relocating existing resources do provide some small amount of improvement to about one percent of EMS calls, such a move would be of little significant

impact to the problem of long response times. This analysis simply adds validity to the subsequent recommendations of additional units in an alternate deployment option.

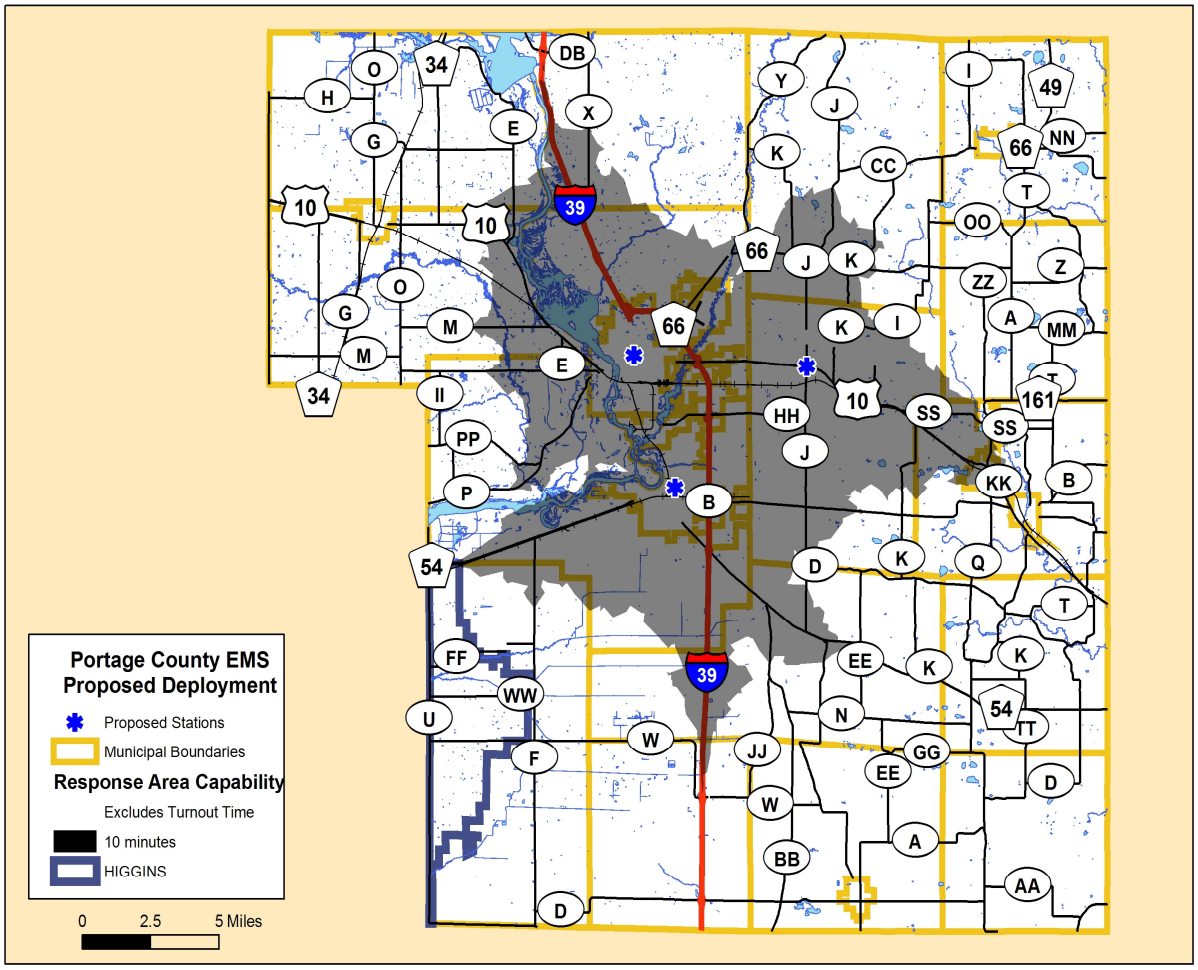
These additional deployment options are offered in the following sections and would require additional apparatus, resources, and staffing in order to implement.

Deployment Strategy 1: Ten-Minute Travel Time

As the need to add units to the deployment became clear, the necessity for two on-duty, staffed units within such close proximity became less important. In this deployment strategy, one unit would remain positioned within the Stevens Point Fire Headquarters**,** supplemented by two units positioned just outside the City. Collectively, these units overlap coverage within the City, which will be necessary during times of call concurrency and service demand generated by the area.

In this case, one unit is recommended to be relocated to the Plover Fire Station to the south, and a new unit would be deployed from the vicinity of Hwy 10 and County Road J. Alternatively, a collaborative effort with the Stockton EMS station at 6th Street and Custer could be utilized without significant change in deployment coverage.

Figure 68: Deployment Strategy 1

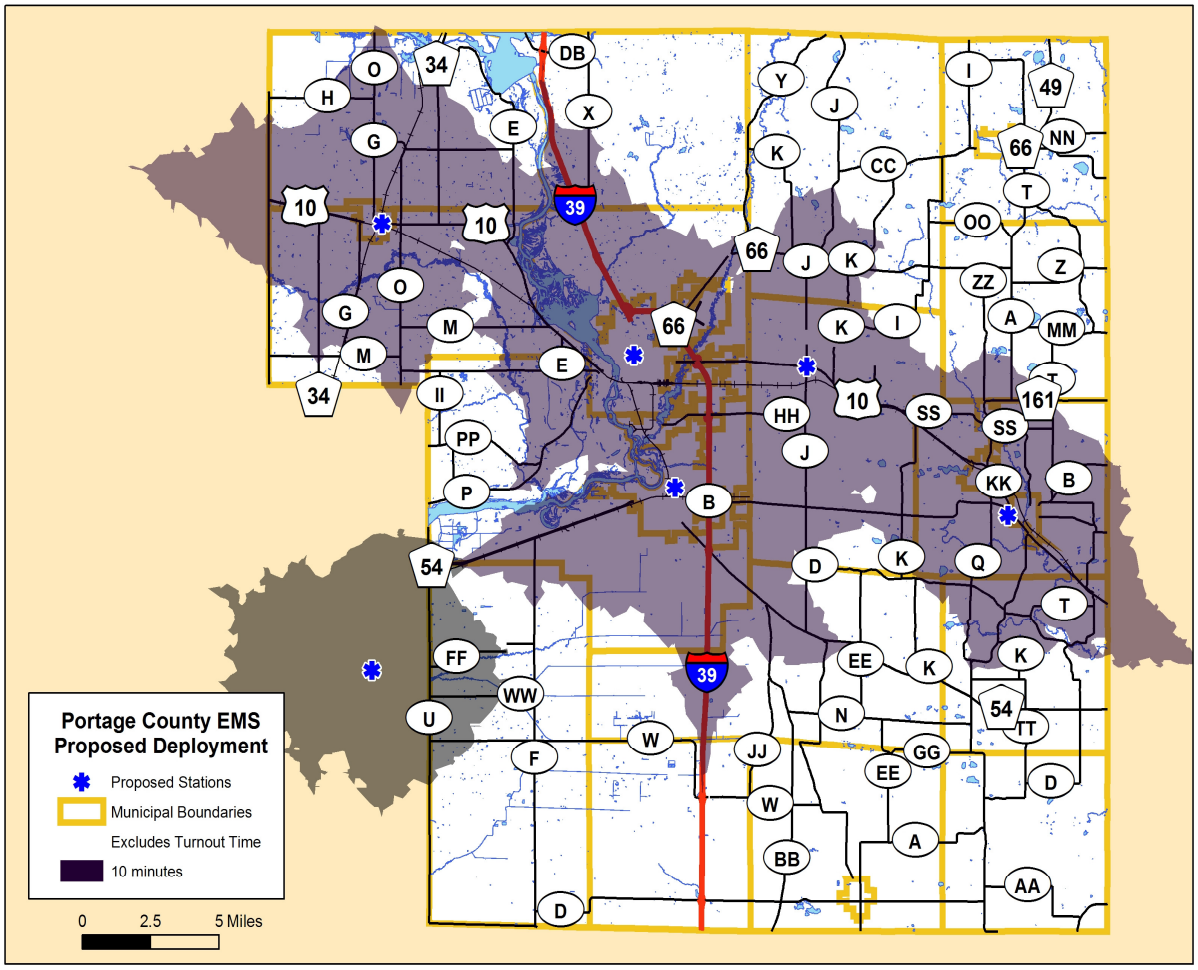


This strategy increases the geographic area that can be reached within 10-minute travel time to 228 square miles or 28 percent of the County's land area, an improvement of 94 percent over current coverage. A slight increase is also projected in the percentage of call volume that can be reached within 10-minute travel time, improving to a total of 75 percent.

Deployment Strategy 2: Ten-Minute Travel Time

In order to increase the percentage of call volume to near 80 percent, additional units would need to be deployed in the Village of Amherst and the Village of Junction City, as well as the locations and relocations already discussed in Strategy 1.

Figure 69: Deployment Strategy 2



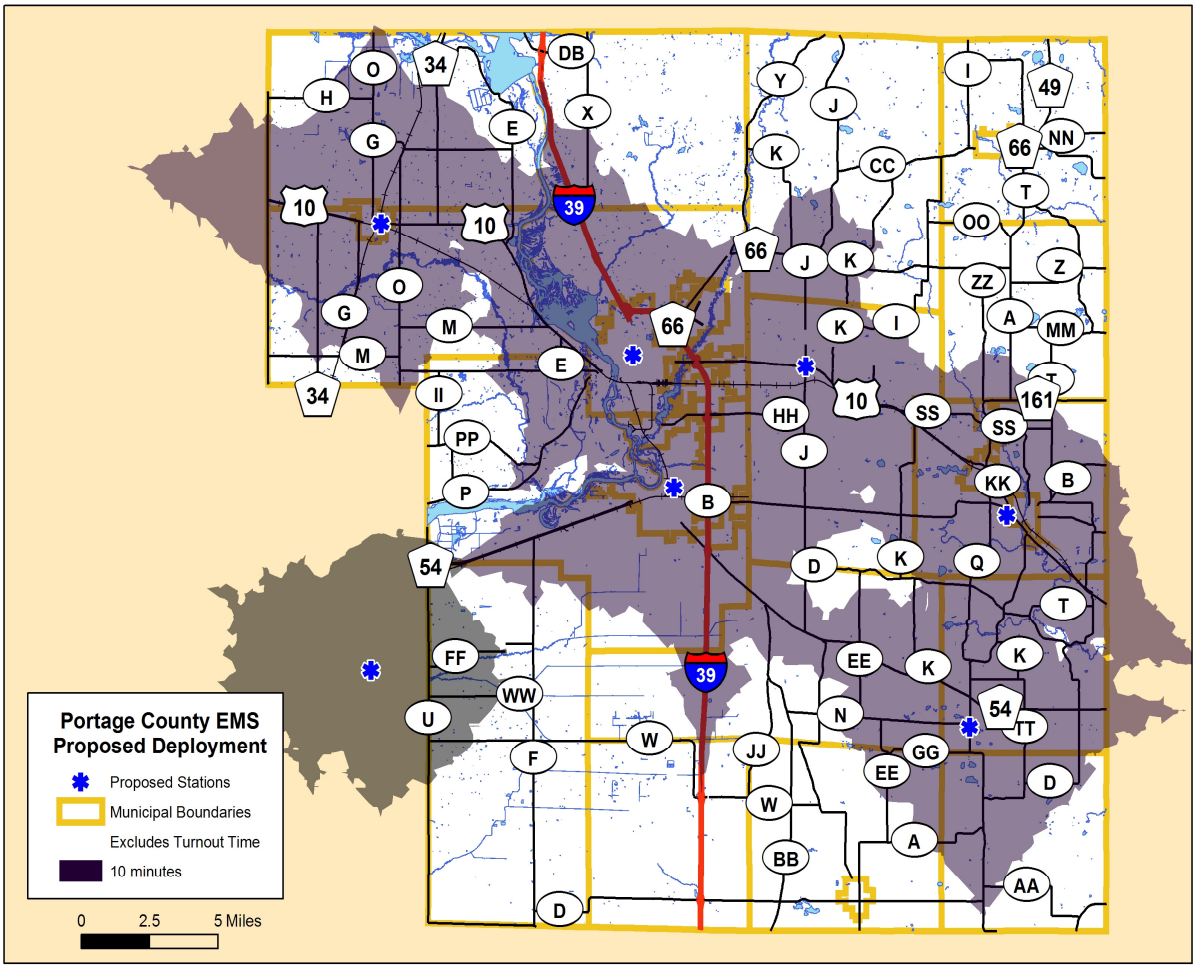
This strategy increases the geographic area that can be reached within 10-minute travel time to 385 square miles or 47 percent of the County's land area, an improvement of 229 percent over current coverage. A slight increase is also projected in the percentage of call volume that can be reached within 10-minute travel time, improving to a total of 79 percent.

It is noted that Higgins Ambulance expressed willingness to explore options with the Rudolph Fire Department to provide ambulance service into its area. When considering the Junction City unit shown in this strategy, an alternate location in either the RFD station in Eau Pleine or Carson will slightly reduce the potential improvement of this configuration as the model best deploys from Junction City. However, the possibility of the Higgins' deployment would be worth considering.

Deployment Strategy 3: Ten-Minute Travel Time

To achieve a ten-minute travel time coverage of at least 90 percent of the service demand, an additional station located at the crossroads of County Road N and County Road A in Lanark will be necessary, in addition to the locations and relocations in Strategies 1 and 2. This would require the construction of an EMS facility because a fire department location is not sufficiently close to the best deployment location. The following figure depicts this configuration for the region.

Figure 70: Deployment Strategy 3

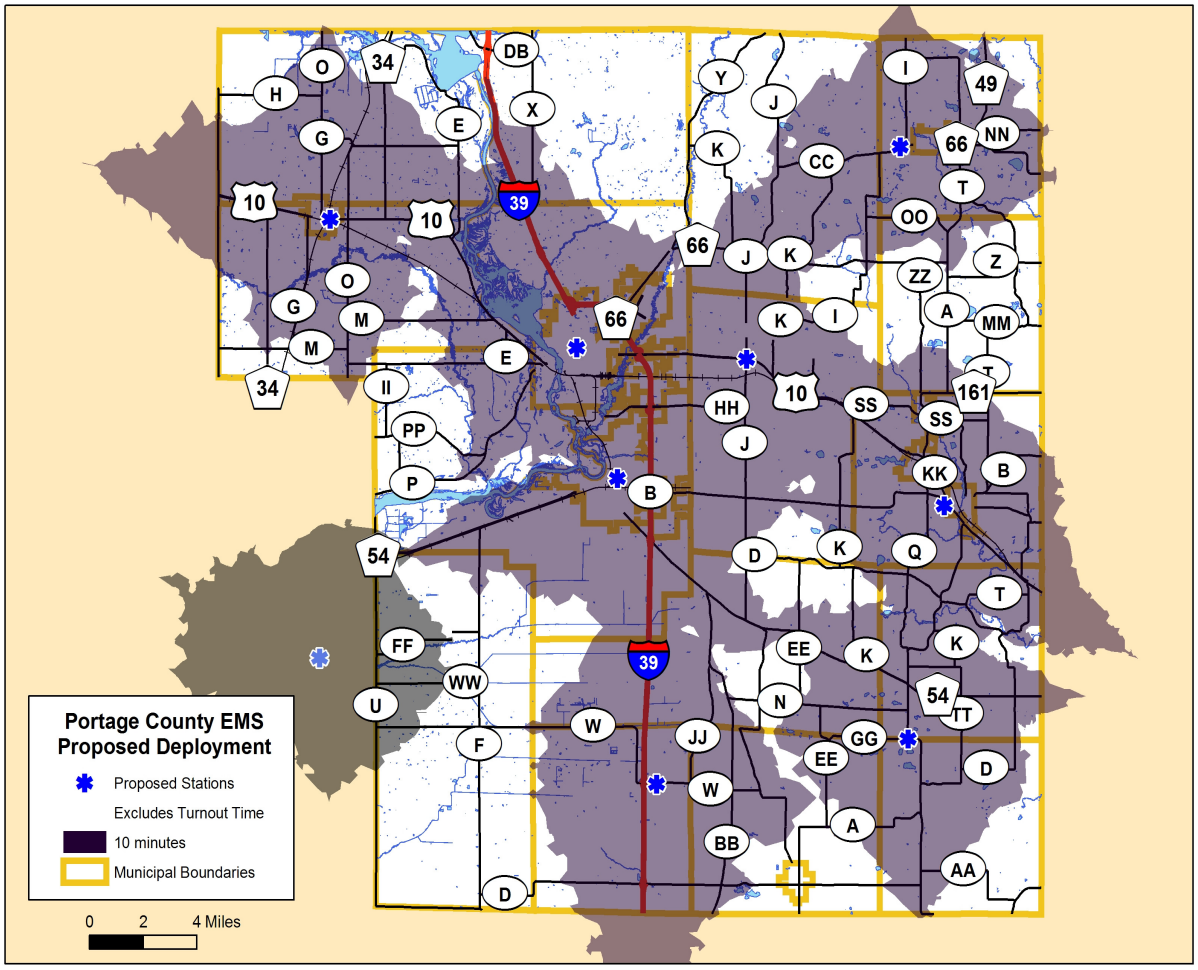


This strategy increases the geographic area that can be reached within 10-minute travel time to 454 square miles or 56 percent of the County's land area, an improvement of 288 percent over current coverage. A significant increase is projected for the call volume percentage that can be reached within 10-minute travel time, improving to a total of 94 percent.

Deployment Strategy 4: Ten-Minute Travel Time

This optimum strategy deploys units to cover geographic service area and call volume at a very high level. This strategy requires adding a unit in the Rosholt Fire District station, as well as the Bancroft Fire Station; in addition to locations and relocations in Strategies 1, 2, and 3. The station in Lanark is adjusted to County Road A and County Road GG. The following figure illustrates proposed unit deployment and their response capability.

Figure 71: Deployment Strategy 4



This strategy increases the geographic area that can be reached within 10-minute travel time to 590 square miles or 73 percent of the County's land area, an improvement of more than 400 percent over current coverage. A major increase is also projected in the percentage of call volume that can be reached within 10-minute travel time, improving to a total of 97 percent.

Although this is perhaps the most desirable deployment from the standpoint of projected response time performance, economic constraints may limit this from becoming reality and one of the previous configurations may have to be pursued. In light of this, as well as other operational strategies, further options are offered for consideration. However, before these additional options are discussed, a summary table of deployment options is presented in the following figure.

Figure 72: Summary Table of Ten-Minute Deployment Strategies

Unit Deployment Strategy Summary					
Deployment Strategy	**Travel Minutes**	**Area (sqmi)**	**Area %**	**% Demand Covered**	**No. Stations**
Current	10	117.44	18%	72%	2
Base Change (P)	10	165.53	20%	73%	2
Base Change (S)	10	162.97	20%	73%	2
1	10	228.00	28%	75%	3
2	10	385.30	47%	79%	5
3	10	454.40	56%	94%	6
4	10	590.50	73%	97%	8

(P)=Plover
(S)=Stockton **(S**

Extended Response Time Deployment Strategies

Exploring options using a 15-minute travel time model rather than a 10-minute model may provide means to reduce overall cost of the system, but it should be recognized that the system would be designed only to achieve response time performance that is at the maximum end of the range most often cited as *acceptable* during public and stakeholder input.

From a medical perspective, such options should primarily be considered when planning a two-tiered system for response. In other words, a 15-minute travel time for an ALS ambulance may be acceptable, provided there is reliable and consistent early response from a basic life support first responder. Based on current performance data, response time ranges from ten to twenty minutes at the 90th percentile for first responder agencies in the County. Four agencies had response times in excess of fifteen minutes at the 90th percentile.

Additional effort by initial first responders would be necessary to achieve lower response times in many areas of the County in order to be satisfactory to the citizens.

Base Change Options: Fifteen-Minute Travel Time

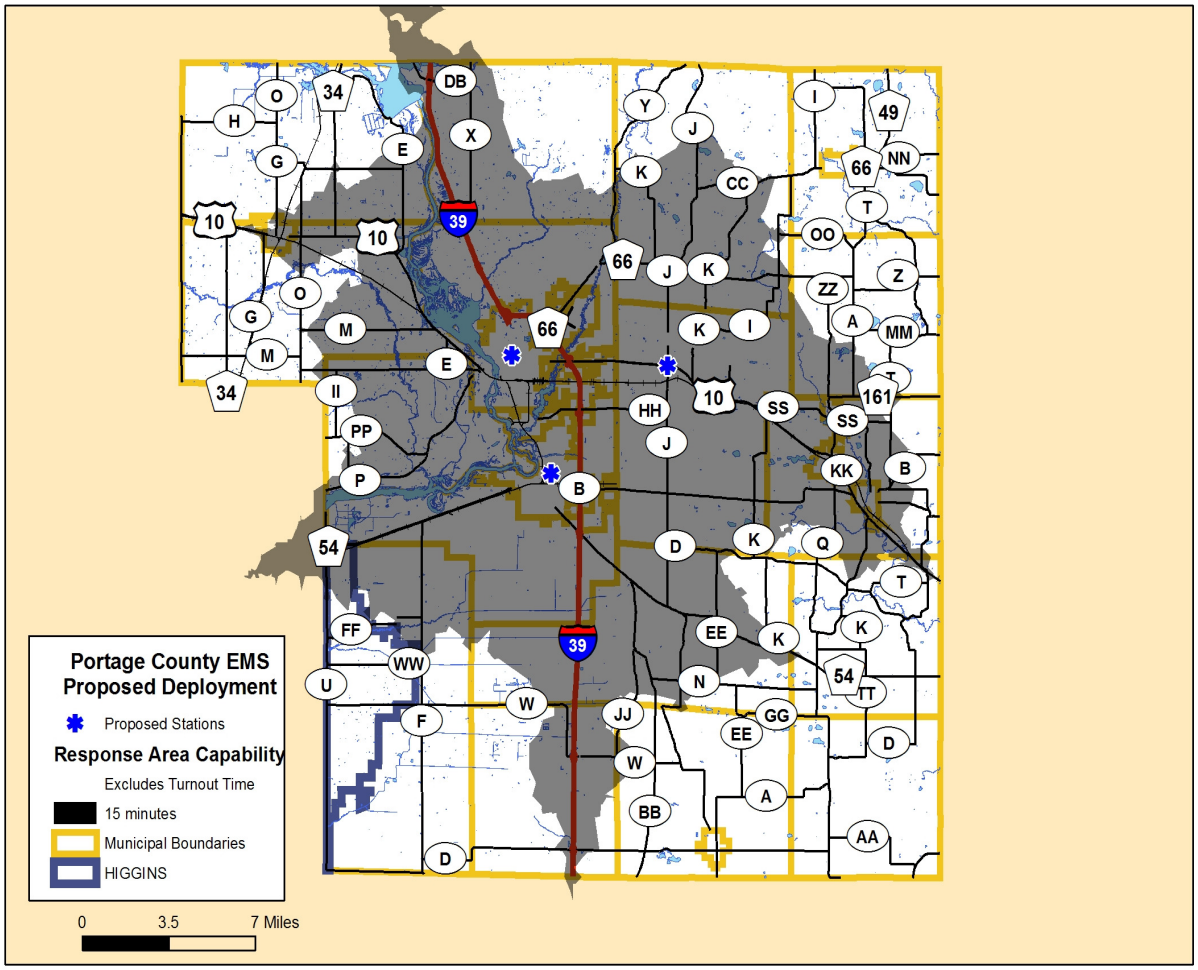
Under the existing deployment strategy, modeling response coverage with 15-minute travel time, rather than 10-minute, covers almost twice the geographic area, but still shows an increase of only four percent in call volume coverage. It appears that an alternate deployment strategy involving more units will be required to cover 90 percent of service demand, even at a 15-minute travel time.

Again, the option of keeping one unit in SPFD Headquarters and moving the second unit to either Plover or Stockton could improve service demand coverage to near 80 percent, a gain of about four percent. In order to achieve 90 percent service demand coverage at 15-minute travel time, however, a strategy involving additional resources will need to be considered.

Deployment Strategy 5: Fifteen-Minute Travel Time

The unit locations in this strategy are identical to those of deployment Strategy 1, but this time the analysis is performed with a 15-minute travel time. One unit would remain positioned within SPFD Headquarters, supplemented by two units positioned just outside the City.

Figure 73: Deployment Strategy 5

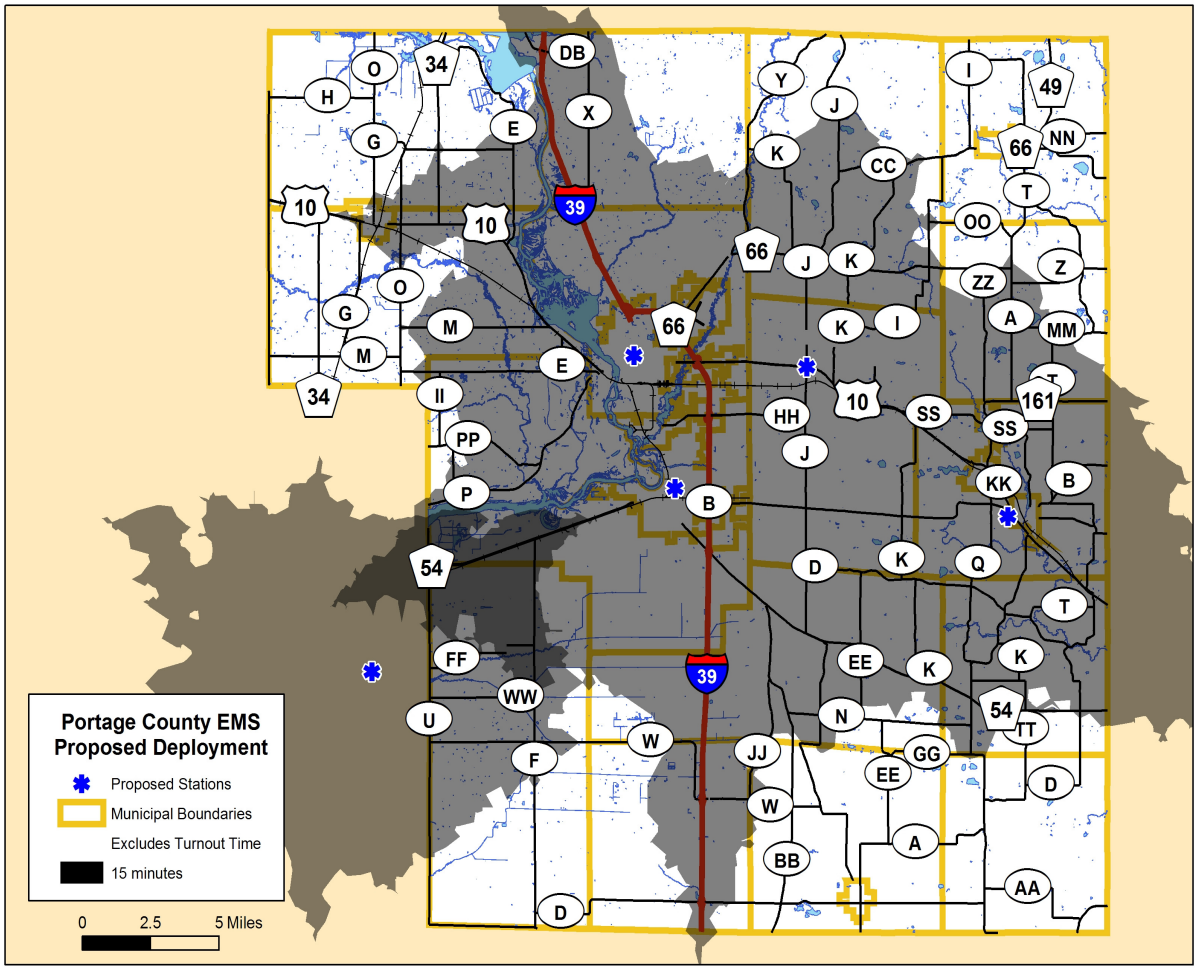


This three unit deployment scheme increases the geographic area that can be reached within 15-minute travel time to 427 square miles or 53 percent of the County's land area. Little increase is projected in the percentage of call volume that can be reached within 15-minute travel time, improving only to 81 percent.

Deployment Strategy 6: Fifteen-Minute Travel Time

This strategy adds a unit to the Village of Amherst, in addition to the locations and relocations in Strategy 5. Keep in mind that the area not shaded will have modeled response time in excess of 15-minutes. The following figure displays this deployment strategy and the response area of coverage.

Figure 74: Deployment Strategy 6

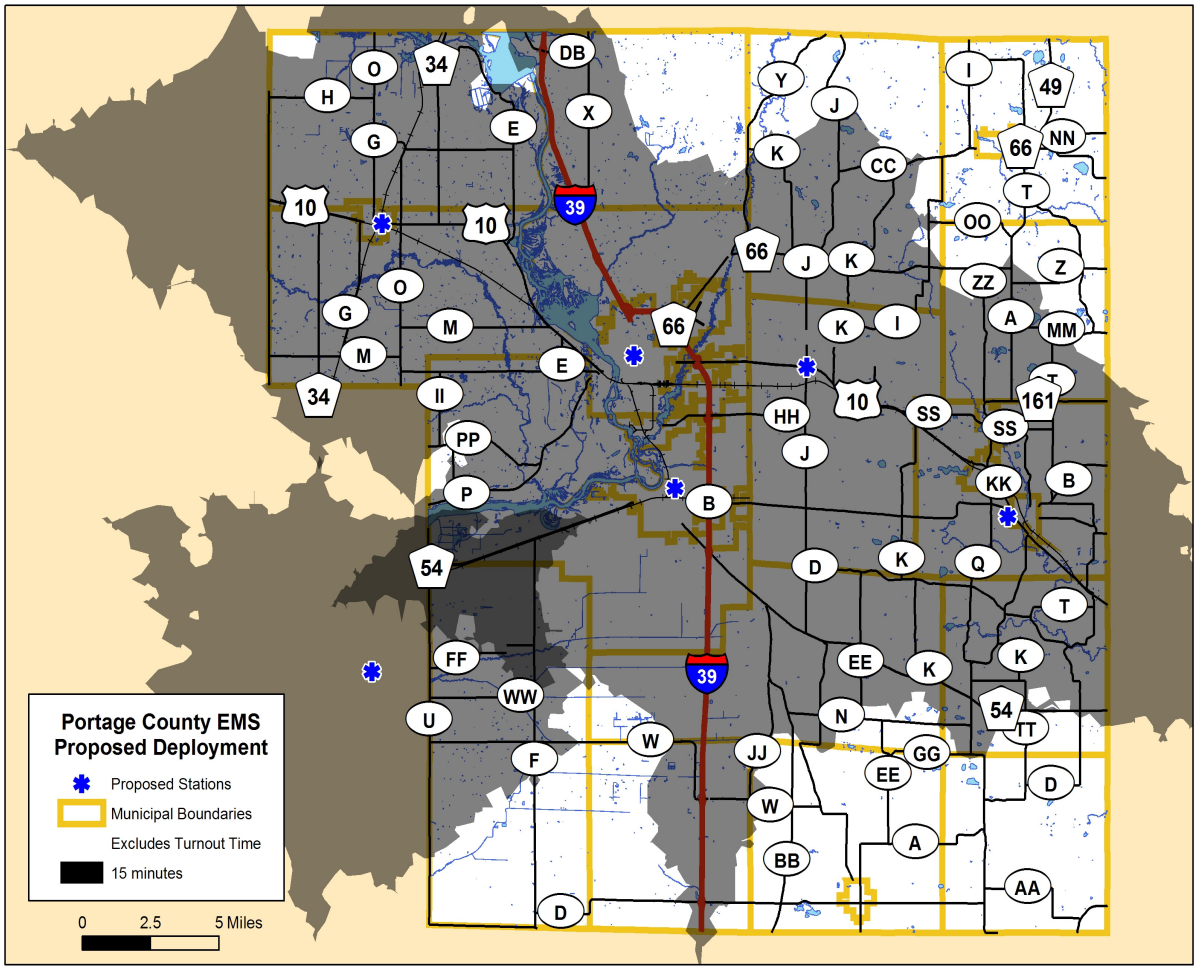


This four unit deployment scheme increases the geographic area that can be reached within 15-minute travel time to 553 square miles or 68 percent of the County's land area. Some increase is projected in call volume percentage that can be reached within 15-minute travel time, improving to a total of 83 percent.

Deployment Strategy 7: Fifteen-Minute Travel Time

The unit locations in this strategy are identical to those of deployment Strategy 2, but this time the analysis is performed with a 15-minute travel time. The deployment includes locations and relocations described in Strategies 5 and 6, along with a unit added in the Village of Junction City. The following figure demonstrates this deployment pattern and response area.

Figure 75: Deployment Strategy 7



This five unit deployment scheme increases the geographic area that can be reached within 15-minute travel time to 706 square miles or 87 percent of the County's land area. Some increase is projected in call volume percentage that can be reached within 15-minute travel time, improving to a total of 96 percent.

These various extended response time deployment strategies are summarized in the table below. Decisions on which deployment strategy to follow should include discussion of the operational format to be implemented. A decision to use extended response time of ambulance units should be made in combination with an accepted commitment by all involved parties to pursue improvements in the reliability and consistency of early intervention by BLS first responders.

Regardless of the configuration, in order to provide improved response times to more area of the County, as well as handle an increase in service demand, additional units would be necessary.

Figure 76: Summary Table of Fifteen-Minute Deployment Strategies

Unit Deployment Strategy Summary					
Deployment Strategy	**Travel Minutes**	**Area (sqmi)**	**Area %**	**% Demand Covered**	**No. Stations**
Current	15	275.14	34%	76%	2
Base Change (P)	15	357.66	44%	78%	2
Base Change (S)	15	338.91	42%	80%	2
5	15	426.90	53%	81%	3
6	15	552.60	68%	83%	4
7	15	706.84	87%	96%	5

(P)=Plover
(S)=Stockton

ESCi does not recommend alternate strategies that would spread resources too thin in the highest service demand area. Although these options can be explored, the burden of long response times would simply be transferred to urban residents, instead of providing a solution. The likelihood of call frequency and concurrency in this area is too great to consider such options which would jeopardize the majority of the population to alleviate an essentially geographic issue.

Organizational Strategy Options

Future Organizational Strategy A – Enhanced Status Quo

This report has described future system unit deployment strategy options which are based upon response time reliability and performance. Based on performance levels to which the system can be expected to perform, under these strategies, the community's expectations will typically dictate what level of funding will be made available to accomplish any improvements.

This section will examine future organizational configurations to achieve the discussed deployment strategies. The system has made efforts financially and with training to assist first responder groups in upgrading skill levels and response capabilities. All recommendations for organizational strategy and deployment configuration assume that the system will continue to nurture and grow this critical first link in the EMS system response.

Organizational Structure - Strategy A

The current arrangement between the County and SPFD to provide countywide ALS transport has its roots in longstanding partnership agreements that were designed to provide a public-public partnership to provide a high level of EMS service to all residents and visitors of the County. It became obvious during the study and interviews that SPFD provides excellent, clinical care with the driving sentiment being the need for appropriate unit deployment and adequate resources to serve current and future service demand within the County.

To provide more consistent coverage, additional resources are required to enhance response time reliability, coverage area, and service demand. The Stevens Point Fire Department currently provides two ALS ambulances staffed with firefighter/paramedics as part of the contract for service. This report supports enhanced service deployment by relocating current units to a new deployment strategy.

Strategy A assumes the County and the City would renegotiate their current service agreement for provision of EMS services, and adopt unit deployment recommendations as determined by community policymakers and available funding. Utilizing this strategy, ESCi believes Stevens Point would need to adopt a *customer centered philosophy*, realizing they are a contracted provider of service, and provide for flexible staffing configurations. This would include staffing units that are deployed outside City boundaries with civilian EMS personnel, as opposed to the

current configuration of units inside City limits only and cross-trained as firefighter/paramedics. While this would be a compromise from the current fire-based perspective, the staffing of additional units, who's sole purpose is EMS, would be more appropriately staffed with civilian paramedics. In addition, the cost efficiency of civilian-staffed units makes implementation financially feasible.

This would require a dialogue between the City and its' labor union to allow for civilian hiring. During discussions with labor, there appeared a receptiveness to adapt to customer and system needs, given the deployment analysis and recommendations, such flexibility will be required if Scenario A is to be viable.

This scenario utilizes the value of a single command of EMS services providing regional continuity of care. Strategy A, to some extent, also addresses concerns that Portage County is subsidizing City fire suppression staffing. Based on ESCi's analysis, the County and its' municipalities would determine unit deployments based on system performance expectations and costs as outlined. The County and City would need to negotiate a performance-based contract, utilizing civilian personnel at unit/station locations identified for coverage based on area and service demand. The SPFD would continue to provide these services under a single command, by contract, with Portage County.

Cost Projections- Strategy A

The cost projections in Strategy A remain status quo for the current service to Portage County. However, this strategy assumes additional resources and service unit deployment would be added, by Stevens Point, in the form of civilian personnel staffing transport units. This will result in significant cost reduction in labor costs, which in turn make this option of maintaining a single contracted provider, SPFD, more viable.

The current IAFF labor contract requires entry level positions to be cross-trained. However, as the Portage EMS system grows and expands, SPFD as the contracted provider must be flexible and adapt to meet evolving customer requirements. Civilian personnel would be under a single command and would leverage off an infrastructure already in place, such as administrative support, training, medical direction, records management, and communications.

Strengths and Weaknesses- Strategy A

There is much strength with this strategy - the provision of EMS expands with the reconfiguration of current EMS resources and additional resources are added to better enhance system performance and reliability. The County maintains a regional system with all of its EMS assets via the unified command structure of SPFD. This is of particular importance, not only in day-to-day oversight and administration, but becomes magnified in importance in times of mass casualty incidents (MCI) or catastrophic disaster such as a Homeland Security issue or natural disaster.

Furthermore, most stakeholders reported they were happy with their current service. The ability of the County and Stevens Point to successfully negotiate an agreement allowing for EMS staffed units outside the municipal boundaries, as needed, would provide cost efficient and effective service.

A weakness of Strategy A includes the perceived or actual concern, that Stevens Point does not see itself as a contract service provider, or of being flexible and agile in changing to meet the needs of the customer. While this notion was expressed during discussions on alternative deployment strategies and future needs, ESCi believes this exploration of a new paradigm is not necessarily a weakness, but one that will occur either via mutual consent or be driven by customer demands. Stevens Point, as a provider of contract services, must be willing to listen to the customer and adapt accordingly. Given that Stevens Point has an organized bargaining unit, representing its workforce, a weakness of Strategy A may be limited flexibility for changing staffing configurations, deployment strategy, and cost efficiency.

Future Organizational Strategy B – County Operated EMS Delivery Organization

ESCi emphasizes that all future organizational strategies have a synergistic effect by continuing the vision of enhancing first responder organizations through continuation and expansion of County grants, additional training, and support throughout the County EMS system.

Organizational Structure - Strategy B

Organizational Strategy B assumes that Portage County would create its own, third service entity of EMS care and transport. The County's rapid response unit pilot program, utilizing part-time County employees, is an example of this strategy. However in this scenario, Portage County would organize an EMS Division under County government and begin providing direct

services, as opposed to doing so through its current contract with SPFD. The City would be entitled to receive this service from the County as well, as the service would be paid for by the general ad valorem property tax levy. Of course, Stevens Point may well elect to continue their own service in such a scenario, or dispute the appropriate funding methodology with the County.

This strategy allows for Portage County to establish their own system deployment design, guided by this system performance analysis and deployment configuration recommendations, and implement these entirely under their own control. There would significant start up issues such as program management, administration, and support staff, inclusive of 24/7 supervisory and command presence for system oversight.

Currently, in large part, the SPFD provides this at a contractually agreed upon fee. This strategy would require Portage County to hire administrative oversight and management staff, as well as personnel to effectively staff two units, and the additional resources this master plan has outlined as necessary to meet community response time expectations. The County Emergency Management Office coordinates contract oversight at this time. However, the office does not have the administration and emergency operations support staff necessary to provide oversight of an expanded EMS system.

This strategy would provide the County with the greatest amount of control over its resources, as they would have day-to-day operational and planning responsibility. However, the trade-off is significant start-up program costs and the need to assume employee liability risks for additional employee-employer disputes or human resources risks.

Cost Projections - Strategy B

This strategy requires administrative start-up cost inclusive of a full-time program manager; administrative support staff, on-shift command presence, as well as paramedic personnel to staff current units, as well as expansion into the additional projected resources. While many third service operations may be more cost effective than fire-based service, this is often due to less robust benefit packages and long-term incentives, as well as a well-defined career ladder. As such, retention and employee satisfaction may be side issues in this scenario. Thus, employee wages and benefits, while perhaps initially less than the status quo, may not be a guarantee for the mid to long-range future.

According to budget calculations based on the current system and budget information provide by Portage County and Stevens Point, the system could be operated as a third-party civilian service under complete County control and operation. This would eliminate the need for cost sharing; the system would provide service to all municipalities within Portage County, including Stevens Point. This would also eliminate the situation in Stevens Point, where EMS calls are reportedly decreasing the department's ability to provide fire protection services within their jurisdiction. For FY 2005, Portage County expended $1,265,532.34, including the Stevens Point contract. Based on ESCi calculations, Portage County could provide the same level of service now in effect for approximately $1,166,360.77.

Strengths and Weaknesses - Strategy B

Clearly the strongest element of this strategy is that the County would be able to exert direct control over its resources, personnel, and system. This would give direct accountability for any tax levies, which they are currently contributing to the system, in addition to revenues. There would not be a need to rely upon a contractual arrangement for services. The County would be directly responsible for personnel issues, and hiring, training, and supervision which could be viewed as strength, and at the same time, a challenge. The County would also have more direct control over its costs, as they would be negotiating all of their direct costs. Currently, this is completed through multiple parties (the County, Stevens Point, and Labor).

Weaknesses of this strategy include program start up costs and administrative/support service personnel costs. The County would need to establish processes for expanded hiring, screening, and administration of a larger work force. The County's current administrative oversight of the EMS system does not lend itself to the experience and depth needed for establishing and maintaining the EMS service without further administrative, operational, and support processes and personnel. The unknown is Stevens Point's position if the contract between the two is canceled. This could result in a splitting of services, and the argument of double taxation depending on the County's funding structure. In short, unforeseen political discord between Stevens Point and Portage County may result.

A further weakness is that unless Portage County could draw upon trained and experienced personnel from elsewhere, presumably by offering more competitive wages and benefits, there may be an experience drain, and ultimately an issue with system service quality, due to

inexperience of personnel. This would be both a recruiting issue from a human resource perspective, as well as a pay and benefits' issue to attract experienced and qualified personnel.

In many systems, it is believed that it takes several years to develop an experienced paramedic clinician. In a start up operation, it would be essential to attract experienced providers, particularly in key mentoring positions such as operational supervisors and trainers that are responsible for the level of care and personnel readiness.

Future Organizational Strategy C – Public/Private Partnership

Strategy C involves a contract between Portage County and a private sector EMS provider to provide ALS transport services within the County under a new service contract.

Organizational Structure- Strategy C

Strategy C assumes that Portage County would negotiate a contract for service with a private provider for providing EMS services to either all of Portage County as it currently does today, or for areas outside of Stevens Point, if Stevens Point continued serving its own residents with or without County tax subsidy. This strategy will result in lower labor costs and lower overall cost from tax subsidy. Given that private-for-profit entities are in business to turn a profit, they carefully manage overhead, and direct and indirect costs assuring profit margins are sustainable for future growth.

Portage County would establish the service level it wishes to purchase from this private entity and enter into a contract. Given that the majority of service demand calls are within Stevens Point city limits, there may be reluctance by the entity to contract for areas outside of the greatest demand, unless of course it was guaranteed, through tax subsidy, an attractive profit in addition to transport revenue. Much of ESCi's analysis of unit deployment strategies was not by highest demand areas, but by land area covered as well as service demand areas. The private sector entity may be willing to cover areas of high demand based on revenue alone, however areas of low demand may require a negotiated tax contribution to the private provider or payment.

Cost Projections - Strategy C

Personnel services and operating costs may be lower in this scenario due to non-public sector pay and benefits. However, as discussed earlier, whether this strategy is applied as a countywide contract or only for areas outside of Stevens Point, the County may need to re-evaluate its provider options given ESCi's deployment strategy recommends models outside of Stevens Point city limits. The cost for this model, to the tax payer, would most likely vary widely depending on whether the provider was to service the City of Stevens Point, as well as the rest of the County.

Strengths and Weaknesses - Strategy C

Strengths of this system could be lower costs, driven predominantly by lower labor costs. The County would have an arrangement where it contracts for certain level of service, and oversees the contract. An additional strength is that the private sector is typically very accustomed to performance-based contracts and would likely be willing to entertain a contract with specific performance requirements.

Weaknesses would be the unknown variable with regards to how the City of Stevens Point would be served. In this scenario, the County could offer the private provider the ability to serve all areas of the County. Should Stevens Point, politically, not wish such service they could continue to service the City through SPFD. Of course, the notion of whether the County would continue a subsidy to Stevens Point would be in contention as it may raise a legal issue surrounding double taxation and service delivery. However, this has not been the case with the County Sheriff and Stevens Point police.

Another potential weakness may be depending on a private sector entity to provide critical public sector services. Notwithstanding, the County currently owns much of the infrastructure, (i.e.: ambulances). Still, reliance on a for-profit company to ensure high value public safety services without interruption, despite contractual assurances, has inherent risks.

Future Organizational Strategy D – Request For Proposal

Strategy D is common in many communities, identifying responsive bidders at competitive prices. Requests for proposals allows the requester to establish service levels and system performance and establishes, through market competitive forces, what the market will bear. Theoretically, there may be an advantage to stimulating competitive forces in areas where multiple agents are willing to compete.

Organizational Structure - Strategy D

This scenario would require the County to establish what level(s) of service and resources they are willing to purchase through contract. Much of this service level has already been suggested in this report through current system deployment and performance analysis, identification of current service gaps, and identification of system deployment options to enhance current performance and reliability.

This approach would enable the County to examine available options for providing service and enable the market to drive competitive pricing and value-added service. Currently, single providers (with the exception of Grant and Higgins) provide the County with service through contractual relationships that has been devoid of competitive forces, until recently with the addition of the rapid response unit. Recent customer feedback has driven a re-examination as to how the current system is working, and a review of what system modifications are required.

Cost Projections - Strategy D

Strategy D costs would be driven by competitive pricing. This scenario of interjecting competition requires organizations to compete. With the advent of private sector competition, such a process may have a desirable effect on other public sector agencies, with bidding being more competitive and creative, with service provision or cost strategies.

Strengths and Weaknesses - Strategy D

The obvious weaknesses of Strategy D are two fold. First, that there is limited or worse, no competition to the current market. In such a scenario, the County would be in a poor negotiating place and have only two options - continue with its' current provider or create a new provider, most likely itself as a governmental EMS agency. If the market held limited competition, the current provider would have little incentive to offer anything, but full freight costs as determined

via contract labor negotiations, and may have no incentive to make current system deployment and or staffing configuration modifications.

Strengths for this strategy includes allowing all providers, who may be interested in competing, to be the provider of choice for Portage County and also allows the County flexibility through competitive market forces. This also provides a better negotiating platform for a performance-based contract with the chosen provider. The competitive process may in fact motivate existing providers to consider alternative staffing, deployment, and other system elements to be better able to compete.

EMS Staffing Options

There are various options to staffing EMS units. Many times this staffing configuration depends on the system design itself. To begin ESCi will briefly describe the capabilities of each field medical provider and discuss various staffing strategies that can be utilized.

Provider Levels

There are several levels of field emergency medical provider within the State of Wisconsin, which range from the first responder level up to the paramedic level.

The following is a brief description of each. More detailed information can be obtained from the State Office Department of Health and Family Services (DHFS).

First Responder

Basic medical training is provided under the certification of first responder. Intended for providers who primarily, or as a part of their duties, render emergency medical aid. These groups include police officers, firefighters, and first aid units specifically designed to render basic medical care and assist responding ambulance units. Basic aid such as CPR, Heimlich maneuver, vital sign assessment, splinting, oxygen delivery, and automatic external defibrillation are a part of the skill set possessed by the first responder. In addition, they are able to assist patients with their auto-inject epinephrine, oral glucose administration, and assist during childbirth training.

Emergency Medical Technician - Basic (EMT)

The minimum requirement for ambulance personnel in the State of Wisconsin, the EMT-Basic can perform skills in addition to the first responder that includes:

- Removal of foreign objects from a patient's airway under direct visualization with the use of forceps
- MAST Trousers
- Assisting a patient with an albuterol inhaler
- Blood glucose monitoring
- Pain management techniques
- Traction splint
- Physical restraint application

Several medications are in the EMT-Basic formulary that may be administered under protocol and can be referenced under HFS 110.05 (04) (d) of the administrative codes with Wisconsin DHFS.

Additional training for the EMT-Basic is required for such skills as:

- ECG monitoring
- 12 lead ECG acquisition
- Use of a mechanical CPR device
- Manual defibrillation
- CPAP
- Capnometry
- Spinal triage
- Assisting a patient with an atrovent inhaler.

Some of these skills require state approval before being permitted to perform.

Emergency Medical Technician - Intermediate (EMT-I)

Building upon the EMT-Basic skill set, EMT-I are trained to provide a higher level of care with more advanced skills and medication administration. These include:

- Endotracheal intubation
- Blood draw sampling
- Needle thorocostomy
- Tracheobroncial suctioning
- Valsalva maneuvers
- Cardioversion/ transcuteaneous pacing
- IV initiation
- Medications as listed in HFS 111.04 (4) (b) 2

Paramedic

The highest level of field medical provider in the State of Wisconsin, the paramedic is licensed to provide several skills in addition to all the skills afforded to the previous levels of providers. They include:

- Cricothyrotomy, either surgically or utilizing a needle catheter
- Insertion of an NG tube for gastric decompression
- Intubation assisted by paralytic agents as well as assisted by non-paralyic medications
- Nasotracheal intubation
- Mechanical ventilation systems
- Piggyback IV techniques

The following require additional training and in some cases, state approval to perform in the field.

- Administration of blood/ blood by products and colloidal solutions
- Central Line IV access
- Monitoring of thrombolytic therapy

Staffing Strategies

In Wisconsin, several configurations of the above licensed levels are allowed under state statute. Currently, Portage County enjoys a dual paramedic ambulance system which is the highest level that can be configured utilizing field medical providers. Although this level of service is appreciated by the community, due to the skill set involved, it is more expensive than other options. Several questions arose during the public sessions.

- *Is a paramedic needed on every EMS call?*
  The easy answer is no. There are many calls in which a paramedic level of care is not required based upon the patient's condition. EMT-Basics or Intermediates could be sent instead. The reduction in skill sets, typically, results in wage savings by the department. However, the difficulty lies in cases which sound benign due to vague symptoms being reported, but in actuality, a serious condition is at hand. For example, some heart attacks present themselves with little or no pain as described by the patient. Without the aid of emergency medical dispatchers trained to ask pertinent questions, determining if a paramedic is needed or not is very difficult. This would place a communication center in a position of liability if a mistake is made.

- *How much more expensive are paramedics versus other providers?*
  In most areas of the country, the cost difference for a paramedic versus an EMT is not significant. In cases of large department deploying in excess of 15 units, the cost is multiplied over larger number would require a serious analysis of potential savings.

- *Do paramedics need to be firefighters as well?*
  In cities that provide EMS services through their fire departments, it is advantageous to have these employees able to provide a dual role. The firefighter/paramedic can provide multiple services for the department within the same salary, and less staffing is required to perform essential department functions. Typically, firefighter pay scales are usually higher than that of a civilian paramedic, and in fact, firefighter paramedics are sometimes paid a premium for their EMS training. However, dual benefits of the firefighter/paramedic outweigh increased salary costs. In areas outside Stevens Point, these additional benefits of firefighter services by the staff is not realized.

- *Is there a way to have the best of both worlds?*
  Although ESCi does not recommend degradation of service level that exists in Portage County, there are options that can be considered to utilize the higher skills of a paramedic, with the cost efficiencies of less skilled medical practitioners or civilians. Utilizing the two-tier system, a BLS ambulance staffed by EMT basics or intermediates provides the ambulance service with the supplemental paramedic support in the form of a RRU. Although EMTs are more wage cost efficient, that savings in lost with the additional paramedic staff member and the apparatus cost. For this reason, this is not a feasible alternative in the case of Portage County.

It is also doubtful that the state would allow this to occur, as the EMS statutes stipulate that if a service was licensed to operate before the year 2000 under the *paramedic operational plan*, two paramedics must accompany the patient during transport. Any additional or subsequent EMS services in a primary area, which operated under this plan, must continue at this level of service. Legal advice regarding this statute should be consulted regarding this issue, if necessary, before any potential staffing changes are made.

ESCi's cost estimates for deployment strategies are based on a dual paramedic system in light of State of Wisconsin statutes.

Cost Estimates

An estimation of the capital equipment costs required for each deployment option is offered. Subsequently, ESCi examines the cost estimates for firefighter paramedics versus civilian paramedics on deployment options levels. Finally, estimated costs of station construction or co-location rental estimates based upon the locations in the model are provided.

There are two schools of thought as to vehicles used in EMS. Historically, agencies have used smaller vehicles that are somewhat more maneuverable, lighter and can fit into smaller spaces. These vehicles, such as Ford F-350, F-450, E-450, or Chevrolet 3500 series trucks are considered medium-duty vehicles and, therefore, the strain of serving as an emergency vehicle taxes the designed abilities of the vehicle. In recent years, agencies have opted to purchase larger, heavier duty vehicles to use as ambulances. These vehicles, such as Freightliner M2 and Chevrolet 4500 series, are considered medium-heavy to heavy-duty vehicles and,

therefore, should last much longer under the heavy strain as an emergency vehicle. In addition, the number of warranty miles is usually much higher with the heavier duty vehicles.

In addition to the base cost of any vehicle, options above and beyond the base vehicle price are necessary for the vehicle to operate as an emergency vehicle. These options can include power supplies being adjusted to carry the electrical load of agency specific equipment, appearance options matching existing agency designs, optional equipment for hazardous road condition, patient compartment shelving requirements to match agency specific equipment, security options, weatherproofing chassis, and additional wiring. Agency specific medical equipment also adds a significant expense to making a vehicle operational. Operational equipment includes, but is not limited to, radio equipment, cardiac monitor/defibrillators, oxygen equipment, splints, bandaging, pediatric equipment, storage boxes and equipment bags, airway equipment, burn supplies, and suction units.

Below is a cost comparison of several types of vehicles. Although the number of warranty miles on the heavy-duty vehicles is higher, maintenance costs tend to be in line with that of the smaller vehicles due to the cost of labor associated with heavy-duty vehicles.

Estimated Capital Equipment Costs			
	Vehicle Base Price	Vehicle Price with Typical Options	Total Vehicle Price with Operational Equipment*
Ford F-350 Type I	$82,000.00	$90,000.00	$140,600.00
Ford F-450 Type I	$90,000.00	$98,000.00	$148,600.00
Ford E-450 Type III	$87,000.00	$95,000.00	$145,600.00
Chevrolet C4500	$108,000.00	$120,000.00	$170,600.00
Freightliner M2	$126,000.00	$135,000.00	$185,600.00

* Operational equipment includes all equipment necessary to function as an advanced life support transport ambulance including, but not limited to:

1. Radio Equipment, front and rear of unit. $ 8,000.00
2. Radio Equipment, portable. $ 2,000.00
3. Communications Equipment, voice pager. $ 600.00
4. Cardiac Monitor/Defibrillator $25,000.00
5. Miscellaneous Medical Equipment $15,000.00

Using the average price for vehicles, along with equipment listed above included ($158,200), an estimate for equipment costs for each strategy is offered in the following table.

Figure 77: Estimate of Equipment Costs

Strategy Reference	Total units deployed	additional units needed	additional unit cost
Base Change	2	0	$0.00
1,5	3	0	$0.00
6	4	1	$158,200.00
2,7	5	2	$316,400.00
3	6	3	$474,600.00
4	8	4	$632,800.00

Total Cost to Staff One Ambulance

Several factors must be considered when estimating the total cost of making one ambulance operational within any jurisdiction. The following information assumes that personnel staffing the unit are paid at median salary with associated benefits, the vehicle purchased is an average of those listed, personnel continue to work a 56-hour workweek, and no change is made to an alternative schedule. The projections shown below do not take into account shifts vacated for illness, vacation, or otherwise which must be filled either with other full-time staff (which would require overtime pay) or part-time staff (which is not addressed in the current system). The projections also do not include supervision, management oversight, or additional responsibilities indicated on the FY 2005 SPFD EMS budget such as off-duty call-backs, payment of compensatory time, or other ancillary expenditures.

FF Personnel Costs – Total individual personnel costs x 2 personnel x 3 shifts	$388,334.22
Non-Personnel Costs – Total of operational cost for one vehicle	$107,700.00
Capital Equipment Costs – Vehicle and all Operational Equipment	$158,200.00
Total Cost of placing one fully staffed ambulance into operation	**$654,234.22**

The above estimation also assumes that no change is made to the type of service delivery; Dual firefighter/paramedic operated through SPFD. One option to reduce expenditures is to staff operational units with non-cross trained civilian EMT-paramedics rather than City firefighter/paramedics. This shift in personnel deployment would reduce the annual salary of the

personnel due to their decreased responsibility (no longer required to train and respond as firefighters as well as EMS personnel).

The following is the cost estimates for staffing with the various deployment strategies using firefighter paramedics.

Figure 78: Staffing Cost Estimates using Firefighter/Paramedics

Strategy Reference	Total units deployed	minimum additional staff	Additional FFstaff cost
Base Change	2	0	$0.00
1,5	3	6	$388,334.22
6	4	12	$776,668.44
2,7	5	18	$1,165,002.66
3	6	24	$1,553,336.88
4	8	36	$2,330,005.32

According to a report issued by the *Center for the Study of Jobs and Education in Wisconsin and the United States,* published in 2005 by the Wisconsin Technical College System, the median salary for an individual graduating from their EMT-paramedic program was $31,223.00. Since this data was published in 2005 for the 2003-2004 academic year, ESCi has used an elevated salary of $33,000.00 to calculate potential costs of a civilian EMT-Paramedic service.

Civilian EMT-Paramedic 56-hour Workweek						
	Hourly Rate	**Base Salary**	**Benefits**	**Overtime**	**Holiday**	**Total**
Starting	$11.33	$33,000.00	$8,250.00	Variable	$997.04	$42,247.04
Median	$12.30	$35,805.00	$8,951.25	Variable	$1,082.40	$45,838.65
Maximum	$13.26	$38,610.00	$9,652.50	Variable	$1,166.88	$49,429.38

It should be noted, however, that should EMS be provided by Portage County rather than through a contract with SPFD, the “7K” exemption to the Fair Labor Standards Act (FLSA), which only covers firefighters and law enforcement officers, would not apply, and paying according to the 56-hour workweek, instead of compensating for normal overtime, could be determined to be illegal.

The FLSA fluctuating workweek provision allows employers whose employees work rotating (fluctuating) workweeks (12-hour schedules), to pay a *half-time* rate for hours worked over 40 hours in a normal workweek. The alternative is to pay those employees hourly, and compensate hours over 40 at time and one-half. The tables below indicates the difference in the total cost, per employee, for both scenarios mentioned above and uses the same calculations to determine benefits and holiday pay as discussed earlier. The maximum salary was determined based on a 17 percent difference between the beginning and maximum of the current firefighter/paramedic salary steps.

Civilian EMT - Paramedic at Half-Time						
	Hourly Rate	**Base Salary**	**Benefits**	**Overtime**	**Holiday**	**Total**
Starting	$11.33	$33,000.00	$8,250.00	$1,374.88	$997.04	$43,621.92
Median	$12.30	$35,805.00	$8,951.25	$1,491.38	$1,082.40	$47,330.03
Maximum	$13.26	$38,610.00	$9,652.50	$1,608.88	$1,166.88	$51,038.26

Civilian EMT - Paramedic at Time and One-Half						
	Hourly Rate	**Base Salary**	**Benefits**	**Overtime**	**Holiday**	**Total**
Starting	$11.33	$33,000.00	$8,250.00	$4,714.32	$997.04	$46,961.36
Median	$12.30	$35,805.00	$8,951.25	$5,114.98	$1,082.40	$50,953.53
Maximum	$13.26	$38,610.00	$9,652.50	$5,516.64	$1,166.88	$54,946.02

Total Estimated Cost for Median Civilian EMT - Paramedic			
	56-Hour Workweek	**Half-Time**	**Time and One-Half**
Base Salary	$35,805.00	$35,805.00	$35,805.00
Overtime	$0	$1,491.38	$5,114.98
Benefits	$8,951.25	$8,951.25	$8,951.25
Holiday Pay	$1,082.40	$1,082.40	$1,082.40
Longevity	$350.85	$350.85	$350.85
Training/Education	$1,777.33	$1,777.33	$1,777.33
Uniforms/Clothing	$300.00	$300.00	$300.00
Medical Services	$150.00	$150.00	$150.00
Malpractice Ins.	$1,300.00	$1,300.00	$1,300.00
Total	**$49,716.83**	**$51,208.21**	**$54,831.81**

Work Schedules

The tables above were generated using different methods to calculate overtime for employees working a 12-hour fluctuating workweek schedule. This schedule varies from that currently used by SPFD in that the current staff works a California schedule which consists of 24-hours on, 24-hours off, 24-hours on, 24-hours off, 24-hours on and four days off resulting in a 56-hour workweek average. Emergency services schedules are varied from agency to agency, and each variant of a schedule is called by as many different names. Some of these schedules are commonly known as California, DuPont, or Modified DuPont. In any case, personnel must be on duty 24-hours a day, seven days a week to provide the necessary coverage to meet an ever fluid service demand. The intent of this section is to sort out some of the major differences in some of the more common schedules utilized by emergency services agencies throughout the country.

Typical (24/48)

The schedule currently in use by SPFD is the most common in use today. Personnel report to work at 0700 hours (7:00 a.m.) and remain on duty until 0700 hours the next day. At the end of their shift, they will be *off duty* for a total of 48 hours, and the cycle starts again. Within this schedule, personnel work on a three week cycle for overtime purposes. For example, if the pay week begins on Sunday, and an individual's shift is on Sunday, that particular week the

individual will work 24-hours on Sunday, be off-duty Monday and Tuesday, work 24-hours on Wednesday, be off-duty Thursday and Friday, and work 24-hours again on Saturday, resulting in a 72-hour workweek. Continuing with that schedule pattern, the same individual would be off-duty Sunday and Monday, work 24-hours on Tuesday, be off-duty Wednesday and Thursday, and work 24-hours on Friday, resulting in a 48-hour workweek. The schedule would continue with the individual being off-duty Saturday and Sunday, work 24-hours on Monday, be off-duty Tuesday and Wednesday and work another 24-hours on Thursday, resulting in another 48-hour workweek. This cycle continues producing two 48-hour workweeks and one 72-hour workweek every three weeks. This equate to an average 56-hour workweek.

Recent studies on sleep deprivation have indicated that working 24-hour shifts is not conducive to safe and effective patient care or operation of a motor vehicle. While some of the information is inconclusive, call volume, night incidents, outside employment, and on-duty stress should all be taken into consideration before making a change away from a 24-hour shift pattern. In some cases, on-duty time is of less concern than that of how much actual rest personnel receive during their days off-duty.

The typical 24/48 schedule requires the staffing of three shifts of personnel to operate the system 24-hours a day, seven days a week. For this schedule, it requires six full-time personnel to staff one on-duty ambulance 24-hours a day.

Figure 79: 24/48 Schedule Calendar

24/48 Hour Schedule for August 2006
Three Shifts – A, B, and C

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
		A	B	C	A	B
6	7	8	9	10	11	12
C	A	B	C	A	B	C
13	14	15	16	17	18	19
A	B	C	A	B	C	A
20	21	22	23	24	25	26
B	C	A	B	C	A	B
27	28	29	30	31		
C	A	B	C	A		

Alternative #1 – 24/72

A somewhat more conducive schedule, and one that is highly sought after by many in EMS and the fire service, is the 24/72 schedule. This particular schedule still retains the 24-hour on-duty shift, but gives an additional day of down-time for the personnel to prepare for their next shift. Beginning on Sunday, as above, an individual would report for duty at 0700 hours on Sunday and remain on duty until 0700 hours on Monday. The individual would be off-duty Monday, Tuesday, and Wednesday, return to work on Thursday and be off-duty Friday, Saturday, and Sunday, resulting in a 48-hour workweek. The same individual would work 24-hours on Monday, be off-duty Tuesday, Wednesday, and Thursday, and work 24-hours on Friday, resulting in another 48-hour workweek. The individual would return to work for another 24-hour shift on Tuesday, be off Wednesday, Thursday, and Friday, and work 24-hours on Saturday, resulting in another 48-hour workweek. The following week, the individual would be off-duty Sunday, Monday, and Tuesday, work 24-hours on Wednesday and be off-duty Thursday, Friday, and Saturday, resulting in a 24-hour workweek. This equates to an average 42-hour workweek as will be seen in the remaining example schedules. Sleep deprivation during busy periods is still a concern under this particular schedule, but it is thought that the added down-time between on-duty shifts allows the staff more time to rest and prepare for the 24-hour on-duty period.

One negative aspect of this particular schedule is that it requires more personnel to staff the units, and therefore, adds significant personnel costs to the system. This is true of the following alternatives as well. Although the number of units is not increased, the typical 24/72 schedule requires the staffing of four shifts of personnel to operate the system 24-hours a day, seven days a week. For this schedule, it requires eight full-time personnel to staff one on-duty ambulance 24-hours a day.

Figure 80: 24/72 Schedule Calendar

24/72 Hour Schedule for August 2006
Four Shifts – A, B, C, and D

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
		A	B	C	D	A
6	7	8	9	10	11	12
B	C	D	A	B	C	D
13	14	15	16	17	18	19
A	B	C	D	A	B	C
20	21	22	23	24	25	26
D	A	B	C	D	A	B
27	28	29	30	31		
C	D	A	B	C		

Alternative #2 – 12-Hour Rotating

The 12-hour rotating schedule was developed by the DuPont® Chemical Corporation and is commonly referred to as the Modified DuPont® schedule. This particular schedule works on a 28-day cycle, usually beginning on Wednesday, but can vary depending on the day the normal pay period begins. An individual working this schedule, would begin their shift at 1900 hours (7:00 p.m.) on Wednesday (or alternate day to produce the same hours per workweek) and be off duty at 0700 hours on Thursday. They would repeat this process for Thursday, Friday, and Saturday, after which time the individual would be off-duty Sunday, Monday, and Tuesday. The individual would report for duty at 0700 on Wednesday, get off at 1900 Wednesday, and repeat this process on Thursday and Friday. The individual would be off-duty on Saturday, only to return to duty at 1900 on Sunday. The individual would get off duty Monday at 0700 and repeat this process Monday and Tuesday being off-duty Wednesday, Thursday, and Friday. The individual would return to duty Saturday at 0700, get off at 1900 Saturday, and repeat this process Sunday, Monday, and Tuesday. This completes the three weeks of work, after which the individual would be off for seven consecutive days, and begin the 28-day cycle again.

This results in work weeks of 36-hours, 48-hours, 36-hours and 48-hours. This type of schedule eliminates the issue of 24 consecutive hours, but adds the element of rotating between day-shift and night-shift, which some studies indicate equates to a schedule worse than 24 consecutive hours due to the body's inability to adjust to the alternating schedule.

The typical 12-hour rotating schedule requires the staffing of four shifts of personnel to operate the system 24-hours a day, seven days a week. For this schedule, it requires eight full-time personnel to staff one on-duty ambulance 24-hours a day.

Figure 81: 12-Hour Rotating Schedule Calendar

12- Hour Rotating Schedule for August 2006 Four Shifts – A, B, C, and D						
Sunday	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**
		1	2	3	4	5
		B	D	D	D	C
		C	A	A	A	A
6	7	8	9	10	11	12
C	C	C	A	A	A	D
D	D	D	B	B	B	B
13	14	15	16	17	18	19
D	D	D	B	B	B	A
A	A	A	C	C	C	C
20	21	22	23	24	25	26
A	A	A	C	C	C	B
B	B	B	D	D	D	D
27	28	29	30	31		
B	B	B	D	D		

Alternative #3 – 12-Hour Fixed

This schedule is a modification of the DuPont® schedule in that the rotation between day-shift and night-shift is removed, and personnel are assigned to one or the other. Alternation can occur on an as-needed basis, but the schedule is primarily stable. In order to remove the rotation between days and nights, the seven day break was removed from this schedule. In lieu of the seven consecutive day break, every other weekend is a three-day weekend off-duty. This particular schedule typically begins its cycle on the last day of any given pay period. For example, if a pay period begins on Tuesday, the following schedule would apply. An individual working this schedule would report for duty on Monday for 12-hours. This would be repeated on Tuesday, with Wednesday and Thursday off-duty. The individual would work 12-hours each on Friday, Saturday, and Sunday resulting in a 48-hour workweek. The next week would be the opposite of the previous. The individual would be off-duty Monday and Tuesday, work 12-hours on Wednesday and Thursday, and be off-duty Friday, Saturday, and Sunday, returning to duty on Monday resulting in a 36-hour workweek.

With the exception of the seven-day break, this schedule is preferable to many due to the ability to schedule weekend activities and choose between either a day or night shift schedule. In addition, remaining on the same schedule allows for more reliable and routine rest patterns for staff members.

The typical 12-hour fixed schedule requires the staffing of four shifts of personnel to operate the system 24-hours a day, seven days a week. For this schedule, it requires eight full-time personnel to staff one on-duty ambulance 24-hours a day.

Figure 82: 12-Hour Fixed Schedule Calendar

12- Hour Fixed Schedule for August 2006 Four Shifts – A, B, C, and D						
Sunday	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**
		1	2	3	4	5
		C	A	A	C	C
		D	B	B	D	D
6	7	8	9	10	11	12
C	A	A	C	C	A	A
D	B	B	D	D	B	B
13	14	15	16	17	18	19
A	C	C	A	A	C	C
B	D	D	B	B	D	D
20	21	22	23	24	25	26
C	A	A	C	C	A	A
D	B	B	D	D	B	B
27	28	29	30	31		
A	C	C	A	A		

Alternative #4 – 10-Hour

The 10-hour shift schedule is intended primarily for *prime-time* or *peak demand* units, and is extremely difficult to staff on a continuous schedule. The scheduling patterns vary from agency to agency and are primarily determined by service demand during particular times of the day or on particular days of the week with more units on-duty when service demand is higher and fewer units when service demand is lower. The number of staff required to staff a 10-hour

schedule also varies greatly based on the information previously mentioned. A 10-hour shift schedule is not recommended for use as a primary means of staffing an entire system.

Alternative #5 – 8-Hour

An 8-hour shift schedule operates much the same as the 10-hour schedule in that it is used primarily to staff peak demand units or dedicated convalescent units for the sole purpose of operating interfacility transfers. Many services that utilize an 8-hour schedule employ limited personnel assigned as an adjunct to the primary system; their primary function is to remove the burden of interfacility transfers from the front-line ALS transport units during daylight hours. It is possible to operate an 8-hour schedule for an entire system, but the additional personnel required would be cost prohibitive. To operate an entire system under a schedule of this type, the system would need to function much like a manufacturing facility which would also involve mandatory breaks and meal periods.

The typical 8-hour schedule would begin at 0700 (7:00 a.m.) and end at 1500 (3:00 p.m.) for first shift, 1500 to 2300 (11:00 p.m.) for second shift, and 2300 to 0700 for third shift. One benefit to a system of this type is that overtime is kept to a minimum. That is, if personnel go off-duty at their scheduled time. In a system as fluid and dynamic as EMS, it would be difficult to predict where particular units would be at their designated off-duty time. If units were on calls and involved in patient care and transport, it could generate a significant amount of unexpected overtime for the system. As with the 10-hour schedule, an 8-hour schedule is not recommended for use as a viable alternative schedule for an entire system.

Other shift patterns are available, but those mentioned are primarily used within emergency services departments. Larger agencies with many more personnel, more fluid population shifts (such as commuter influx into a jurisdiction), higher call volumes, and high turnover rates may dictate alternative shift patterns, but given the demographics of Portage County and its municipalities, the 24/48 schedule should continue to serve the jurisdiction well. Below is a table illustrating the main differences between the different shift patterns highlighting average hours worked, number of shifts required and the total number of personnel required per ambulance for normal

Shift	Average Weekly Hours	# of Shifts	# of Personnel per Ambulance
24/48	56	3	6
24/72	42	4	8
12-Hour Rotating	42	4	8
12-Hour Fixed	42	4	8
10-Hour	40	Variable	Variable
8-Hour	40	Variable	Variable

Using figures calculated for civilian paramedic working the 56-hour work week plus time and one-half overtime, the following cost estimates for civilian paramedic use is offered.

Figure 83: Cost Estimate using Civilian Staff

Strategy Reference	Total units deployed	minimum additional staff	Additional FFstaff cost	Additional civilian staff cost	Cost Difference
Base Change	2	0	$0.00	$0.00	$0.00
1,5	3	6	$388,334.22	$328,990.86	$59,343.36
6	4	12	$776,668.44	$657,981.72	$118,686.72
2,7	5	18	$1,165,002.66	$986,972.58	$178,030.08
3	6	24	$1,553,336.88	$1,315,963.44	$237,373.44
4	8	36	$2,330,005.32	$1,973,945.16	$356,060.16

Cost estimate for additional facilities

While the units are purchased and the staff is hired, station facilities need to be procured in order to provide proper quarters. These quarters are necessary for storage of the unit, supplies, and living quarters for the crew during downtime. While the deployment strategies call for the continued use of SPFD Headquarters to deploy one of the EMS units, the other locations used in the model require additional expenditure for facilities.

As stated previously, the deployment strategies utilized, where possible, existing public safety facilities. Co-location agreements can be less costly than traditional brick and mortar stations, but can be fraught with relational discords as time wears on. They can be used permanently in some cases, or temporarily until a permanent site can be obtained and construction completed. Since ESCi did not examine some of the facilities suggested in the deployment strategies, admittedly some may be inadequate for these needs. In addition, these departments may be

unwilling to accept a co-location agreement, leaving the EMS system no other option than station construction.

Co-location agreements should be based on market rate for inside square footage of use, along with an estimated increase in utility costs, such as electricity, telephone, etc. An estimate of $1,000/month/station, considering yearly facility costs can be expected. Such as any rental arrangement, this will be more costly in the long term.

Therefore, the following table details the estimated cost for a station construction within Portage County.

- Each estimate is based on a lot size of two acres
- The average station size is calculated at 5,576 square feet minimum
- Includes two bays for primary vehicles and reserve units. It also allows for growth of secondary units if necessary past the study's timeline
- Includes sleeping quarters for four crew members

Figure 84: Estimated Cost of Station Construction

Space Description	Size	Square
Administration		
Entry Vestibule	5x8	40
Communications/watch room	10x10	100
Storage	6x8	48
Living Quarters		
Dayroom/classroom	20x20	400
Kitchen	12x15	180
Dining area	12x15	180
Sleeping rooms	2 @ 10x12	240
Washroom – men's	12x15	225
Washroom – women's	12x12	144
Locker room – men's	10x15	150
Locker room – women's	10x15	150
Utility storage	8x12	96
Supply storage	8x8	64
Laundry room	10x10	100
Physical fitness room	15x20	300
Apparatus Room		
Apparatus bays (2)	40x60	2,400
Tools and parts storage	8x10	80
Equipment decontamination room	8x12	96
Site maintenance storage	10x10	100
Subtotal of room/space sizes		**5,093**
Plus 20% of office/quarters for circulation		**483**
Total Recommended Square Feet of Space		**5,576**

Square footage cost from Saylor	$	162
Location multiplier from Saylor		0.84
Construction Cost Estimate	$	758,837
Design Cost Estimate at 7%	$	53,119
Land Cost Estimate		$60,000
Total Cost Estimate	$	871,955

As different deployment strategies require varying number of additional fire stations, the table below illustrates the costs of construction as well as the non-personnel ongoing costs for each station.

Figure 85: Estimates of Facilities and Non-Operational Costs

Strategy Reference	Total units deployed	additional facilites	additional facilities cost	additional non operational cost/year
Base Change	2	1	$871,955.00	$107,700.00
1,5	3	2	$1,743,910.00	$215,400.00
6	4	3	$2,615,865.00	$323,100.00
2,7	5	4	$3,487,820.00	$430,800.00
3	6	5	$4,359,775.00	$538,500.00
4	8	7	$6,103,685.00	$753,900.00

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Section IV - Recommended Strategies

In this section, a best choice recommendation of unit deployment is offered. The decision is based upon necessary elements to efficiently and effectively respond to the service demand patterns as they exist now and are projected to be. Estimated total cost is illustrated along with a timeline for implementation. ESCi starts with a set of short and mid-term strategies which in essence summarize the suggestions in the various sections of this report.

It is ESCi's belief that the central core services of government include the establishment of order, ensuring justice under the law, and the protection of life and property. We further believe that this is paramount, above many other activities that government may engage in and should not be compromised.

Recommended Short and Mid-Term Strategies

General Policy

- Formally adopt a set of performance objective that guide EMS unit deployment and as a measurement of service delivery quality.
- Strive to maintain the organizational delivery system.
- Included in the performance parameters, the following areas should be emphasized:
    - Call process and data collection
    - EMS unit performance
    - Support systems

Call Processing and Data Collection

- Encourage the use of computer-aided dispatch (CAD) for accurate time stamping, data collection, and appropriate unit dispatch as the multiple unit deployment strategy is implemented.
- Implement automated status monitor devices in which the EMS units can communicate to the CAD changes in response processes without the aid of the dispatcher.
- Implement global positioning systems in the EMS units linked to the CAD to coordinate the location of units with the address of a request for EMS to be able to send the closest

unit. Preferred method is to utilize road network distances rather than line-of-sight models.

- Consider emergency medical dispatcher training to enhance the assistance of patients prior to the arrival of emergency units. This would also be necessary for the implementation of a prioritized dispatch system to assign response modalities to the EMS units.
- Set a goal for call processing and dispatch time for EMS calls to be less than one-minute 90 percent of the time. Revise call handling procedures and use technological aids in an effort to streamline this process.
- Collect time data in minute and second format rather than whole minutes.

EMS Unit Performance

- Provide incentives for EMS units to achieve a turnout time less than one minute 90 percent of the time, and a hospital turnaround time less than 20 minutes. Friendly, competitive policies, with tangible reward for producing results, should be instituted.
- Revise processes which are obstacles to these standards such as station design and navigation processes. Work with hospital officials to streamline EMS patient acceptance procedures in an effort to aid crews in reaching these goals.
- Eliminate unnecessary reporting procedures which cause the crew to delay availability for service.
- The circular response zones will not be necessary as multiple unit strategies are employed. Consider abandonment at the end of the reporting year.
- Consider the procurement of mobile mapping technology which determines quickest route calculations for the unit and provides turn by turn prompting. This would also need to be linked to a CAD system in order to effectively be implemented. Manually imputed address systems may delay enroute times, but probably no more than manual map navigation.
- Allow a 20-minute, 90th percentile response time for calls determined to be non-emergent, based on medical dispatch criteria.

Support Systems

- Continue to financially support first responder units with the requirement that funds be used for recruitment and training purposes only. Estimated cost based on 165 providers at $63.63 per student (Mid-State Tech) equals $10,498.95. Although, some are at higher level than first responder, ESCi believes this to be the maximum County subsidy for training, and can reduce the burden if one wants to use it for their EMT refresher.
- Mandate that the first responder database information and training be completed to continue funding. The use of CAD to capture this information should also be implemented.
- Implement automatic response program with law enforcement agencies to respond to high priority medical calls.
- Implement cross agency training with law enforcement, first responders, and fire departments.

Recommended Long-Term Strategy

The long-term recommendation from this study is the adoption of Unit Deployment Strategy 3, a six-unit configuration, supported by Organizational Strategy A that is an enhancement of the status quo with SPFD as the primary provider.

The concentration of the current service demand is in and around Stevens Point. The projected models indicate a similar pattern into the future. However, 20 to 30 percent of service demand is outside of this area, and suffers from unacceptable response times according to the public and elected officials in the region. Current deployment cannot geographically service this area in equivalent time frames that the urban area enjoys. With over 750 square miles to cover, it has not been possible for an ambulance to reach many calls from Stevens Point, without extended travel time. Regardless, these areas are part of the total service area, pay their fair share in taxes to support a county-wide EMS system, and deserve service in an acceptable time frame. The deployment strategies do not try to blanket the entire County with shorter response time shadows. This would require a significant amount of units deployed in excess of those strategies already offered. The strategies are a blend of geographic reach and service demand areas of moderate demand.

ESCi does not support the deployment options at the 15-minute travel time model. Although some strategies call for additional units, and we realize additional units require capital expenditure, it is felt that these models do not effectively provide a solution to the problem of long response times. They were a starting point to evaluate the need for additional units at the maximum acceptable time frame for geographic coverage.

In evaluating the deployment strategies at the 10-minute travel model, several factors were considered. ESCi recommends strategies which are modeled to cover at least 90 percent of service demand, because this estimates that 10 percent of the projected service demand will be in excess of this time. This does not include factors such as weather events, closed streets, construction, or excess traffic volume delays which cannot be predicted for this model. ESCi's preferred recommendation is for Deployment Strategy 4, because it covers the most geography and the most service demand. However, it requires two more stations to capture three percent more service demand than Deployment Strategy 3. Considering the additional expenditures required for this strategy for the modest gain in service demand coverage, ESCi strongly recommends no less than Deployment Strategy 3.

To provide adequate response times to 90 percent of the service demand, will require at least five new stations and equivalent staff and resources from the vicinity of the following locations:

- Stevens Point (fire headquarters)
- Village of Plover (vicinity of fire headquarters)
- Village of Amherst
- Town of Stockton (Hwy 10 and County Road J)
- Village of Junction City
- Town of Lanark (County Road N and A)

Deployment Strategy 3 provides near optimum service demand coverage superior to the other 10-minute deployment option strategies. Compared to the current deployment coverage, this is an increase of 22 percent service demand coverage and 38 percent more geographic coverage. The other strategies provide less coverage in relation to the estimated costs to implement. Simply put, Strategy Option 3 provides the most bang for the buck.

ESCi did not develop new district lines for each unit for several reasons. The units should be on a closest unit methodology, with the aid of geographic positioning systems (GPS) within the

units. The GPS information should be coordinated with a computer-aided dispatch to determine which unit to dispatch. As one unit gets a call, it causes the surrounding unit's *district* or *area of responsibility* to increase. This may, at times of higher concurrent calls, require dispatchers to relocate units temporarily between stations to provide coverage. In addition, ambulances return to their stations from hospitals in Stevens Point and elsewhere in which they may be closer to certain calls than an another unit who normally responds to this area.

Therefore, a performance goal of reaching at least 85 percent of countywide calls within 11 minutes of dispatch should be required by contract. Some contracted agencies are assessed a per call penalty for non-compliance with the performance objective.

A recommendation of quarterly staff rotation is suggested in order to provide respite from the busier units. It also aids staff in becoming familiar with the road network in a smaller area on a concentrated basis before moving to the next area. Interpersonal relationships between first responder groups and the paramedics can be strengthened by frequent contact by working together. Quarterly rotations into the busier units help keep the clinical skills of the paramedic sharper through repetition.

Just as the staff is suggested to be rotated, ESCi suggests that that as routine, permanent ambulance assignment to staff be accomplished. Not only does it provide a sense of ownership to the staff to maintain their vehicles, but it increases the vehicles longevity by being in less busy areas at times.

Although ESCi recommends the enhanced status quo organizational option, the use of civilian employees would create some savings, if agreed upon by SPFD. The net savings for using civilian employees versus firefighters is approximately $98,000 per year including overtime. ESCi recommends utilizing the same schedule as this allows the fire department to utilize less personnel per unit.

The following table illustrates the cost estimation summary for the recommended deployment strategy.

Figure 86: Recommended Deployment Strategy Total Cost Estimation

Strategy	Total units deployed	minimum additional staff	Additional civilian staff cost/yr	Additional units needed	Additional non operational cost/yr	Additional unit cost	Additional facilites	Additional facilities cost
3	6	24	$1,315,963.44	3	$538,500.00	$474,600.00	5	$4,359,775.00

Timeline

It is estimated that it will take at least two years for funding and acquisition of equipment and staff and additional year for station construction. Currently, Portage County has three units in sufficient condition for on-line service, two others deemed in fair to poor should remain in reserve status once the deployment strategy is fully implemented.

Year 1:

After obtaining authorization and funding from elected officials:

- Establish co-location agreements in areas specified.
- Order additional supplies and units.
- Relocate Station 2 ambulance to Plover or to Stockton whichever is feasible first. Since the County already has an agreement with Plover for the RRU, it would seem that arrangements for an ambulance in this location would be negotiated without much difficulty.

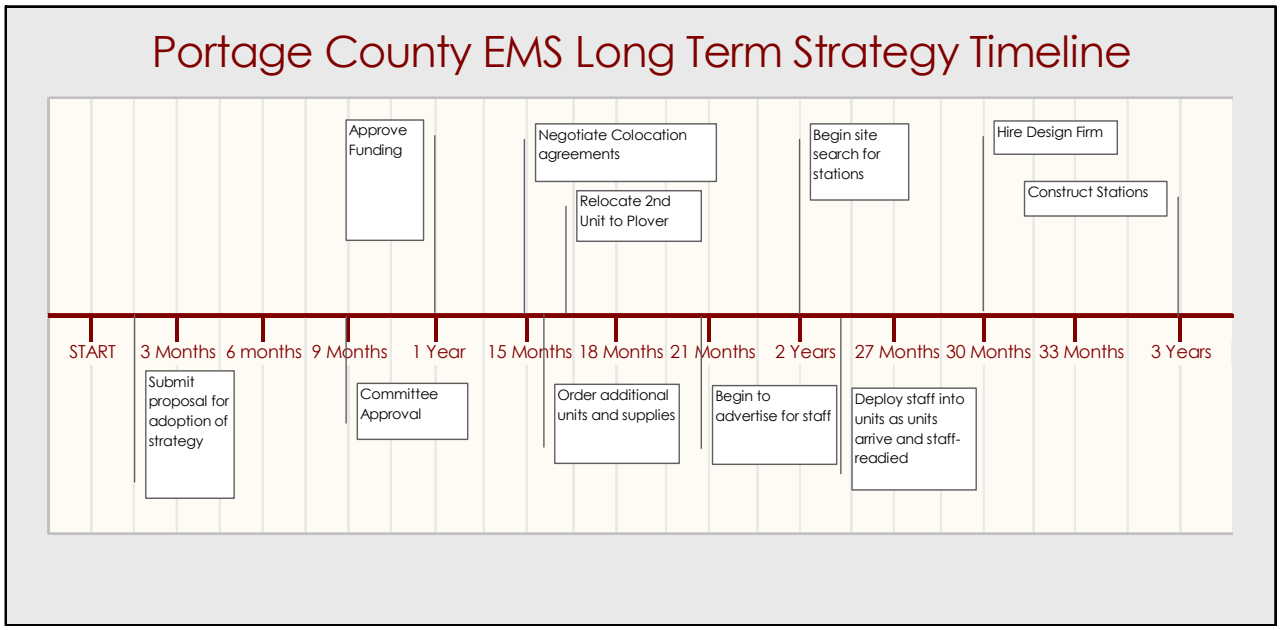
Year 2:

- Begin site search for station construction, purchase property.
- Begin hiring staff to fulfill the six-unit deployment strategy.
- After staff is properly oriented to the service and *road-ready*, deploy ambulances in order listed above as staffing permits.
- Utilize the reserve ambulances outside of Stevens Point area until the three new units arrive, are stocked, and inspected. Begin vehicle rotation strategy between stations.

Year 3:

- Obtain land and hire design and construction firms.
- Construct stations and relocate units into them as occupancy permits are obtained.

Figure 87: Strategy Timeline



Alternate Strategy

In recommending a deployment strategy that requires a significant investment of capital, many times this is an obstacle which has the ability to derail a recommended strategy from implementation to the proverbial shelf. Recognizing this reality, ESCi is offering an alternate, operational strategy to consider in the short-term if economic or political obstacles require its consideration. This alternate, operational plan is based on the recommended long-term strategy above for the same reasons previously stated. It is not our firmest recommendation, but it is an improvement from the status quo. It, like all strategies, has advantages and disadvantage which need to be carefully debated if adoption is considered.

Using the RRU type of vehicle, the minimally suggested alternate strategy is to utilize three ambulances as in Deployment Strategy 1, and the remainder of the unit deployments with RRU's in locations that complete the Strategy 3 configuration. As more ambulance units are affordable, currently and into the future, the objective should be to work toward the full implementation of Strategy 3 deployment as suggested in a time-line which is as short as funding can accommodate.

This alternate strategy will satisfy those with immediate and subsequent economic concerns related to implementation of Deployment Strategy 3. The cost advantages are realized by using

single paramedic staffed units which are less costly. The equipment, non-operational costs, and facility costs would be very near to those estimated in Deployment Strategy 3.

As an example for cost estimates, ESCi is assuming that a Ford Expedition (or equivalent) is used as an RRU. If purchased from state contract through the State of Wisconsin, Bureau of Procurement, a base vehicle can be purchased for approximately $23,000.00. Adding markings and emergency warning devices to the vehicle could add another $8,000.00 to $10,000.00 to the cost of the vehicle. Normal equipment costs apply as the only difference in equipment carried on a RRU compared to that of a transport unit is the cot. That cost would be approximately $50,600. Personnel costs would range from $149,150.49 for three civilian EMT-paramedics working a 56-hour workweek to $388,334.22 for three lead firefighter/paramedics working a 56-hour workweek to $219,327.24 for four civilian EMT-paramedics working a 42-hour workweek.

The table below shows the total cost of operating a transport unit compared to that of operating a Rapid Response Unit.

	Conventional Transport Unit	Rapid Response Unit
Personnel Costs	$388,334.22	$149,150.49 - $219,327.24
Non-Personnel Costs	$107,700.00	$107,700.00
Capital Equipment Costs	$158,200.00	$83,600.00
Total Cost	**$654,234.22**	**$340,450.49 - $410,627.24**

Another advantage is that areas of the County, which are subjected to long travel times of advanced emergency medical care from the ambulances responding from Stevens Point, will have better access to those paramedic providers in less time. However, this has not done much to solve this issue of emergent transportation, as the patient must still await the arrival of an ambulance to begin to initiate a return trip to the hospital. Therefore, three staff members are engaged on each call in these areas, along with two vehicles and their associated costs. Over the long-term, this will become a more expensive option than an ambulance with a staff of two. This additional expense of RRU deployment may not be recoverable through billing in all cases.

Future Funding

According to the information provide by Portage County, the SFFD contract to provide EMS services to the entire County has increased nearly 62 percent from 1995 to 2005, while the call volume has increased just over 25 percent. The table below shows the incremental increases by year.

Year	Call Volume	Percent Call Volume Increase	Actual Allotment to SPFD	Percent Increase (Decrease)
1995	2,491	-	$626,206.00	-
1996	2,749	10.3%	$685,869.00	9.5%
1997	2,543	(0.7%)	$680,303.00	(0.1%)
1998	3,087	21.4%	$704,206.00	3.5%
1999	3,227	4.5%	$728,826.00	3.5%
2000	3,333	3.2%	$750,691.00	3.0%
2001	3,361	0.8%	$873,212.00	16.3%
2002	3,426	1.9%	$1,141,198.00	30.6%
2003	3,125	(8.8%)	$1,012,468.00	(11.3%)
2004	3,361	7.5%	$1,058,715.00	4.6%
2005	3,338	(0.7%)	$1,009,248.00	(4.7%)
Total Change		25.4%		61.2%

Other areas of this report cover the actual costs of the current system as well as revenue generated from annual EMS billing operations, as well as bad-debt collection. As stated in those sections, National EMS Billing is performing at a high level; to pursue increasing collections above the current 87 percent of actual expenses would be extremely difficult to do. It should be noted that without a significant increase in call volume or an increase in charges, the addition of personnel and/or equipment which increases the annual budget would not be a recoverable expense.

As for cost sharing between Portage County and Stevens Point, there are several alternatives to consider regarding continued funding of a countywide operation.

Scenario #1

According to ESCi budget calculation based on a review of the current system and budget information provide by Portage County and Stevens Point, the system could be operated as a third-party civilian service under complete control and operation of Portage County or the fire department. This would eliminate the need for cost sharing and the system could provide services to all of the municipalities within Portage County including Stevens Point. This would also eliminate the current draw from fire suppression activities within Stevens Point that are reportedly decreasing their ability to provide fire protection services within their jurisdiction. For FY 2005, Portage County expended $1,265,532.34, including the Stevens Point contract. Based on ESCi calculations, Portage County could provide the same level of service now in effect for approximately $1,166,360.77.

Scenario #2

This scenario is based on the assumption that service will remain unchanged without the addition of personnel and/or equipment. Currently, the amount appropriated to fund the EMS system (both Portage County expenses and Stevens Point contract amount - $1,144,037.00) comes entirely from Portage County. Stevens Point Fire Department makes the argument that the contract amount is not adequate to staff two ambulances 24 hours per day, in addition to providing the necessary administrative and clerical support for the system. ESCi agrees with this argument, however, we also recognize that Portage County is funding the EMS system according to a contract which SPFD agreed to.

Although it is not recommended that the current level of service remain unchanged, if that were the case, the SPFD contract should be renegotiated to cover all necessary personnel, administrative, and clerical positions. According to ESCi calculations, if the entire required personnel were funded through the contract, SPFD should receive approximately $1,204,876.91. This figure assumes that Portage County will continue to fund non-personnel items related to the operation of the system and that Stevens Point would incorporate part-time personnel into their ranks to cover vacation, illness, injury, military deployment, or other non-budget absences. By incorporating part-time personnel and using them to cover vacancies rather than full-time personnel subject to call-back, the expenditures for overtime and off-duty ambulance trips would be significantly reduced.

Scenario #3

If Portage County wishes to continue contracting EMS services with SPFD, and to improve the level of service to citizens outside of Stevens Point jurisdiction, funding must increase to cover the additional costs of personnel and equipment. Any contract entered into by the parties should clearly indicate what expenses are to be covered be each agency. If the current cost sharing is to continue, Portage County will continue to cover the costs of personnel expenses incurred by SPFD through the contract process. The contract should clearly indicate the desired level of service, through performance criteria, as well as the required staff to accomplish that level of service. ESCi cost estimates for additional staff should be used to calculate additional personnel expenses and should correspond to the contract amount based on the total number of personnel required to operate at the desired level. With this in mind, Portage County would continue to fund the non-personnel expenses outside the contractual agreement with Stevens Point.

Future Governance

Emergency medical service, within Wisconsin, remains a local governmental responsibility; however, the Portage County government provides strong leadership to coordinate the provision of emergency medical services for all residents by providing for a uniformed system of care and transport.

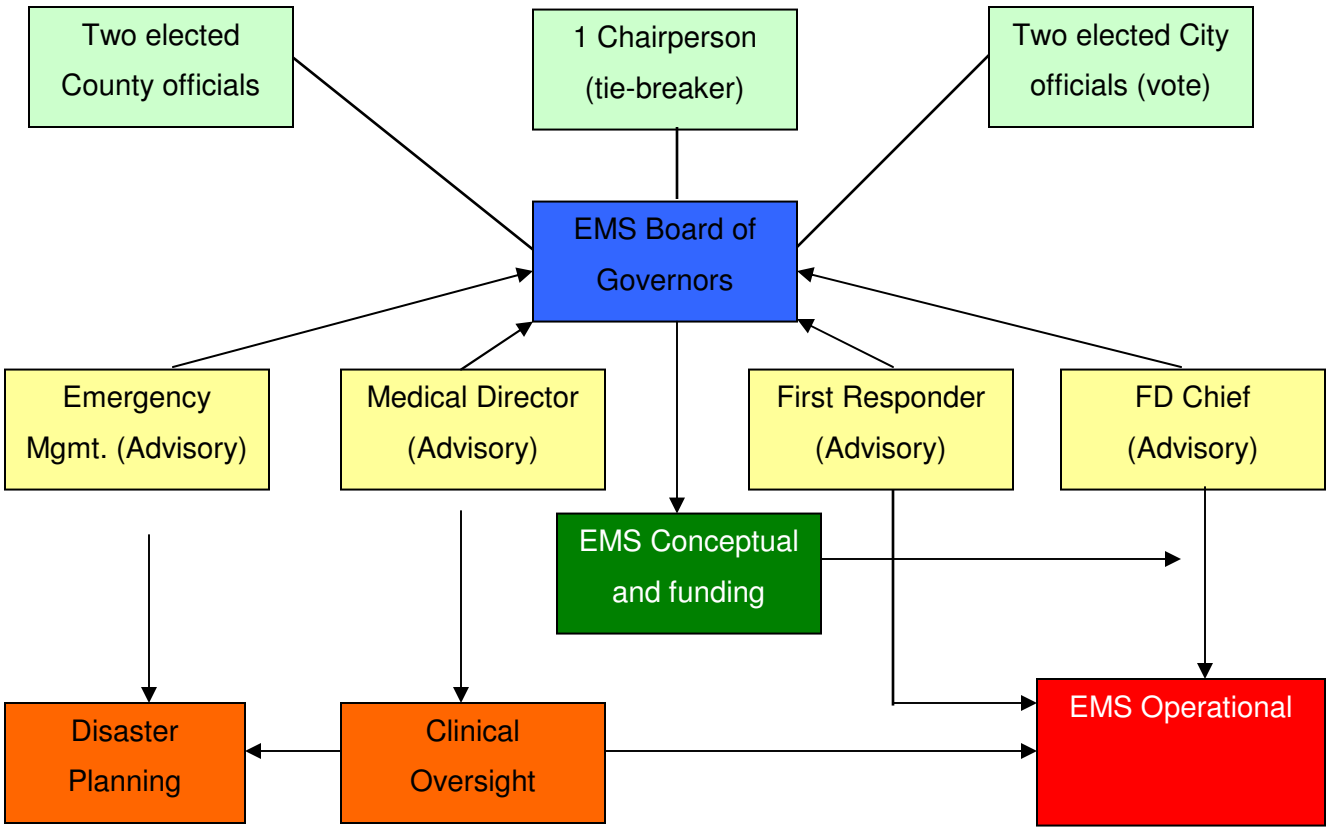
Portage County accomplished this broad vision by providing for an intergovernmental agreement with its most populated municipality which operates the EMS system in the County. By such an arrangement, the County acts as contractor and the City of Stevens Point Fire Department as the sub-contracting agent. Portage County retains the identity as the system name is branded *Portage County EMS*. However, structurally, such an arrangement inherently utilizes multiple layers of oversight and administration which may make system accountability more cumbersome and less agile than systems with a more streamlined oversight process. The inherent nature of having the County contract with the City for countywide services provides by definition, two governmental entities with oversight interest and responsibility. Both entities have an electorate to answer to within Portage County and the City of Stevens Point.

It is important from a policy development and planning standpoint that a direct line of oversight be established which provides direct accountability between end users (tax payers) and the service provider. As such, typical models have focused around the public policy of joint

governance, or joint powers authorities. An intergovernmental board, that is small enough to be manageable with key stakeholders that have policy setting authority, may provide a more stream-lined oversight. This board should be established by County Charter and responsible to the County Executive, and Portage County which has ultimately taken lead responsibility for this essential public safety service.

It is recommended that two members representing elected officials from the County, two members representing the City, and one chairperson sit on the board. It is suggested that they may be members of the respective public safety or police & fire commissions that currently exist. The council chair would transfer annually between the groups to conduct the meetings and in the event of an impasse, cast the deciding vote. Ad-hoc or non-voting members should include emergency management, City fire representative, medical director, the presiding officer of the first responder organization, and would have advisory-only capacity to the board. The board will have contracting authority and budget appropriation powers which will be administered by the County Executive. The operating subcontractor (SPFD) must report expenditures, future needs, and system statistical analysis to this board. Medical control has authority limited to clinical oversight and quality assurance. Operational policy decisions are not within medical control purview, and must be approved by the board. The board will establish performance parameters, but leave daily operations to the fire chief.

Figure 88: Future Organizational Strategy



Given the intergovernmental nature of the EMS system, this is a solution which prevents impasses, allows for shared control, encourages consensus, and reduces lines of authority for the EMS operational aspects of the fire department.

Cost Sharing

By choice, Portage County has accepted responsibility of providing EMS for the citizens and visitors of the County. Rather than the County providing this service directly, Portage County has contracted with SPFD to operate the EMS system with units owned and serviced by Portage County and personnel provided by Stevens Point to staff two ambulances around the clock. According to the contract entered into between these two agencies, Portage County has

continued to pay Stevens Point an agreed upon amount based on the total number of calls calculated on the premise that Portage County was funding ten EMS positions. It has already determined that this number is inadequate to fully staff two full-time ambulances to cover all of Portage County. Further, the amount agreed upon in the contract does not take into consideration the clerical or administrative costs associated with operating a countywide system.

Based on the amount Portage County has historically paid Stevens Point, it is evident that Stevens Point is already bearing at least a portion of the total system expense. The portion Stevens Point is currently contributing is in the form of administrative oversight, clerical support, and the additional field staff needed to fully staff the two ambulances over and above the ten positions agreed upon in the contract.

To further complicate this issue, Portage County is utilizing the services of National EMS Billing to collect a significant portion of the total funds expended, whereas, Stevens Point has no mechanism in place to recoup their portion of the expenses. Our analysis indicates that approximately 50 percent of the total call volume occurs within the municipal limits of Stevens Point. Based solely on that number, it could be surmised that Stevens Point should be responsible for a similar share of the expenses to operate the system but, again, Stevens Point has no method to recoup those costs whereas Portage County does.

It could also be presumed that each municipality within Portage County contribute a representative share in the cost of the system, but Portage County already levies a tax to each property owner, including residents of Stevens Point, which assists with the funding of the system. While it is true that a significant portion of the call volume occurs with the municipal limits of Stevens Point, the responsibility for providing the service has been assumed by Portage County. As long as Portage County continues to bill for EMS services, whether provided through SPFD or another agency, Portage County should refine its fee structure to more accurately reflect its true cost of operation and should continue to fund the system from both collections and tax levies as necessary.

Summary

If Portage County wishes to continue contracting with Stevens Point to provide emergency medical services to the County, any new contract should include:

- performance indicators for response times
- accurate billing information
- timely report submission
- personnel training

The goal should be toward enhancing the County's ability to increase collections in an attempt to bring the system to a revenue neutral status, totally independent of tax levies and able to operate solely on collections of billings. Performance indicators should be reviewed monthly and any new contract should include penalties for failure to meet the desired performance criteria. This is the only viable method of ensuring that all parts of Portage County are receiving the same level of service and response time standards as those living within the municipal limits of Stevens Point.

ESCi cost estimates for additional staff should be used to calculate additional personnel expenses and should correspond to the contract amount based on the total number of personnel required to operate at the desired level. With this in mind, Portage County would continue to fund the non-personnel expenses outside the contractual agreement with Stevens Point.

Emergency Services Consulting inc. believes that good long-term planning decisions are best made by informed local elected officials. We have endeavored to provide adequate data and analysis to support the decision-making process. The officials of Portage County and the City of Stevens Point can use the information and performance projections to confidently select an appropriate future deployment strategy. They can do this knowing that their decision is based on sound principles of data analysis.

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Appendices

Statistical Measures

Throughout this document, certain descriptive statistical measures are utilized which may not be familiar to all readers. In an effort to reduce confusion or the drawing of inaccurate conclusions, this section seeks to provide a brief explanation of these measures. The measures most often used which require clarification are the use of *average* and *percentile* measures.

Average

The average measure is a commonly used descriptive statistic also called the mean of a data set. It is a measure which is a way to describe the central tendency, or the center of a data set. The average is the sum of all the points of data in a set divided by the total number of data points. In this measurement, each data point is counted and the value of each data point has an impact on the overall performance. Averages should be viewed with a certain amount of caution because the average measure can be skewed if an unusual data point, known as an outlier, is present within the data set. Depending on the sample size of the data set, the skewness can be either very large or very small.

As an example, assume that a particular fire station with a response time objective of six minutes or less had five calls on a particular day. If four of the calls had a response time of eight minutes, while the other call was across the street and only a few seconds away, the average would indicate the station was achieving its performance goal. However, four of the five calls, or 80 percent, were beyond the stated response time performance objective.

The opposite can also be true, where one call with an unusually long response time can make otherwise satisfactory performance appear unacceptable. These calls with unusually short or long response time have a direct impact on the total performance measurements and the farther they are from the desired performance, the greater the impact.

One reason to compute average is because of its common use and the ease of understanding that is associated with it. The most important reason for not using averages, for performance standards, is that it does not accurately reflect the performance for the entire data set. As

illustrated above, one extremely good or bad call skewed the entire average. While it does reflect all values, it does not really speak to the level of accomplishment in a strong manner.

Percentile

With average measure, it is recognized that some data points are below the average and some are above the average. The same is true for a median measure, which simply arranges the data set in order and finds the value in which 50 percent of the data points are below the median and the other half are above the median value. This is also called the 50th percentile.

When you deal with fractiles or percentages, the actual value of the individual data does not have the same impact as it did in the average. The reason for this is that the fractile is nothing more than the ranking of the data set. The 90th percentile means that 10 percent of the data is greater than the value stated and all other data is at or below this level.

Higher fractile measurements are normally used for performance objectives and performance measurement because they show that the large majority of the data set has achieved a particular level of performance. This can then be compared to the desired performance objective to determine the degree of success in achieving the goal.

Report Maps

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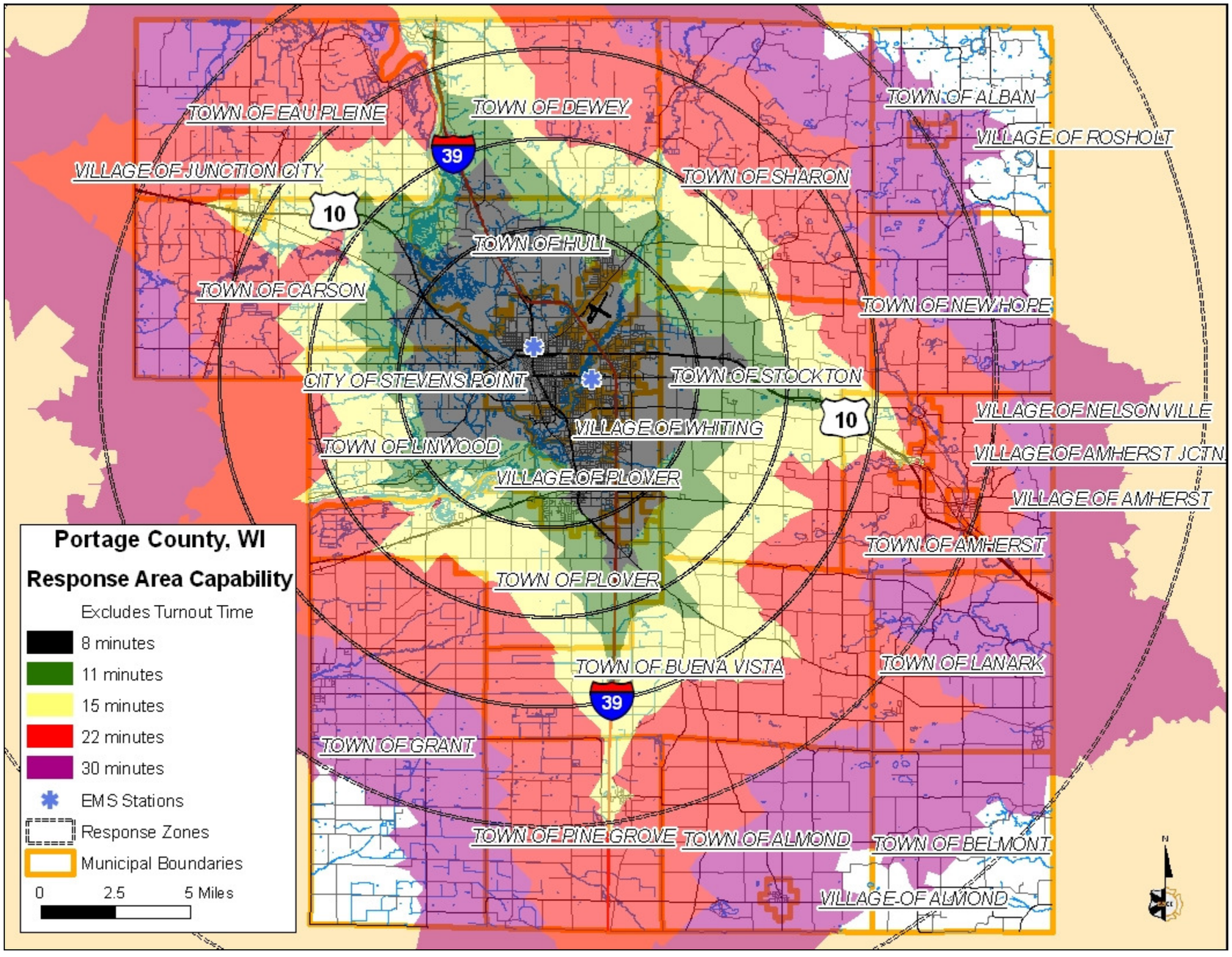
TOWN OF EAU PLEINE
TOWN OF DEWEY
TOWN OF ALBAN
VILLAGE OF ROSHOLT
VILLAGE OF JUNCTION CITY
39
TOWN OF SHARON
10
TOWN OF HULL
TOWN OF CARSON
TOWN OF NEW HOPE
CITY OF STEVENS POINT
TOWN OF STOCKTON
VILLAGE OF NELSONVILLE
10
VILLAGE OF WHITING
TOWN OF LINWOOD
VILLAGE OF AMHERST JCTN
VILLAGE OF PLOVER
VILLAGE OF AMHERST
TOWN OF AMHERST
TOWN OF PLOVER
Portage County, WI
Response Area Capability
Excludes Turnout Time
8 minutes
11 minutes
15 minutes
22 minutes
30 minutes
EMS Stations
Response Zones
Municipal Boundaries
0
2.5
5 Miles
TOWN OF BUENA VISTA
TOWN OF LANARK
39
TOWN OF GRANT
TOWN OF PINE GROVE
TOWN OF ALMOND
TOWN OF BELMONT
VILLAGE OF ALMOND
N

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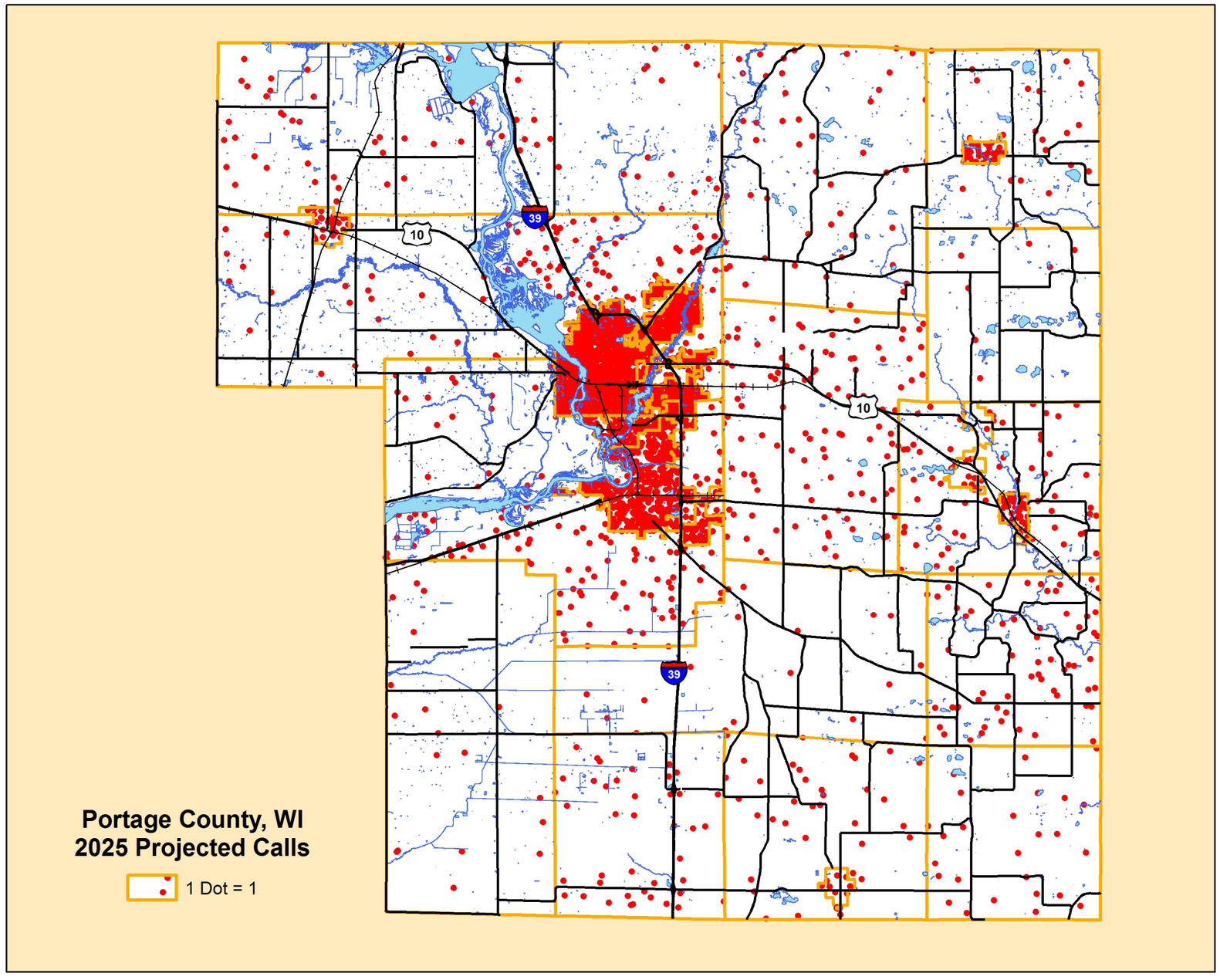
39
10
10
39
Portage County, WI
2025 Projected Calls
1 Dot = 1

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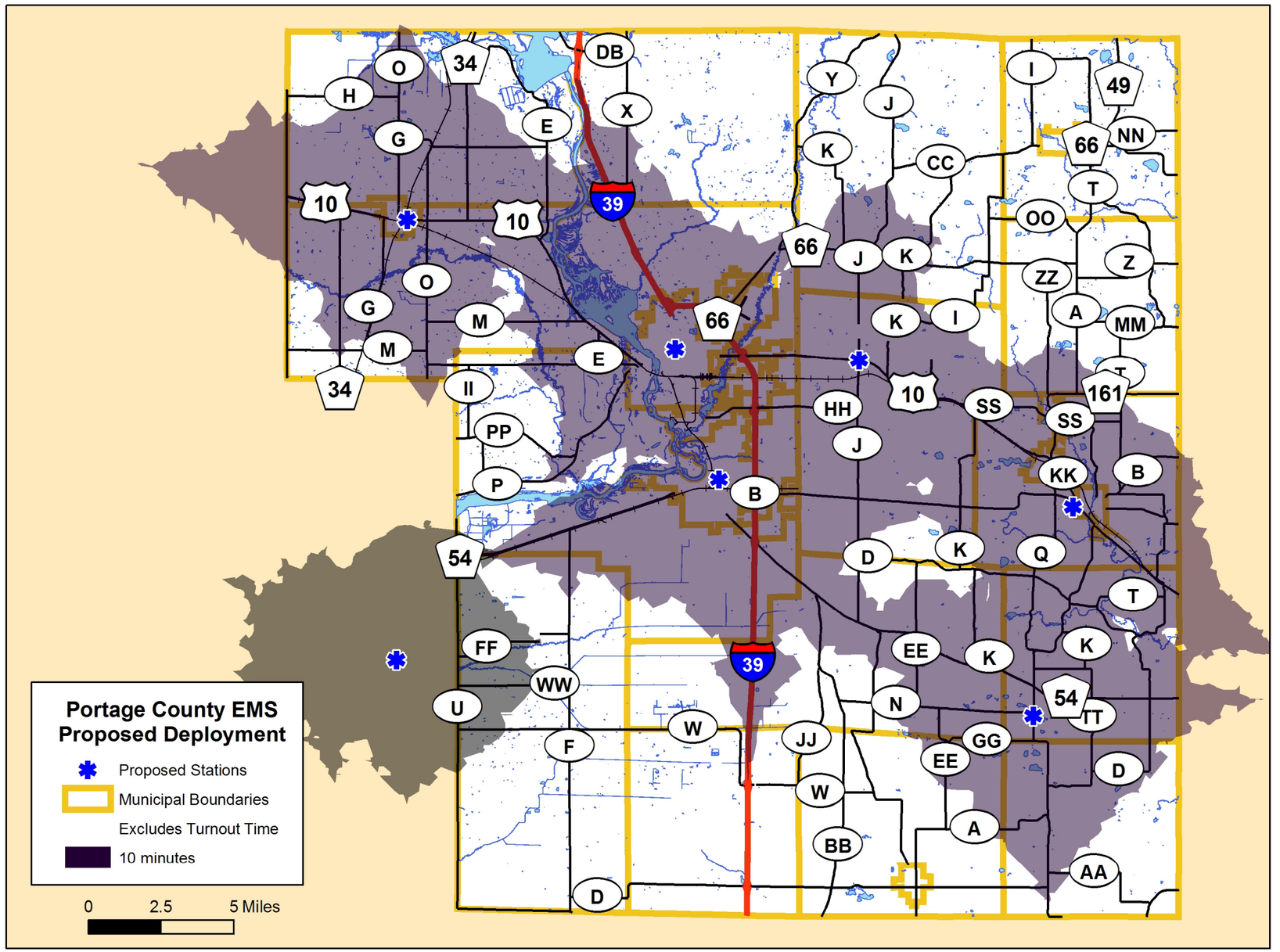
Portage County EMS
Proposed Deployment
Proposed Stations
Municipal Boundaries
Excludes Turnout Time
10 minutes
0
2.5
5 Miles
DB
X
E
O
H
34
G
10
39
M
II
PP
P
54
FF
WW
U
F
D
W
JJ
B
HH
J
66
Y
K
CC
I
49
NN
T
OO
Z
ZZ
A
MM
161
SS
KK
Q
D
EE
N
GG
BB
AA