Regional Operations
And Maintenance
Of Traffic Systems

Phase I: Feasibility Study
This report summarizes the results of several initiatives regarding the ongoing support of arterial management systems within the region, including a stakeholder survey, case studies that assess the experience of other regions, and a regional stakeholder forum, held August 14, 2001. It also contains findings and recommendations.

Arterial management systems can be an effective component in a regional strategy to reduce traffic congestion, improve air quality, and enhance safety. To facilitate the deployment of arterial management systems within the region, the Minnesota Department of Transportation Metro Division led the development of the Metropolitan Arterial ITS Deployment Plan, completed in August 2000. During plan development, it became apparent that success would depend not only on a sound deployment strategy but also on the ongoing support of arterial operations and system maintenance.

Agencies within the region regularly and successfully develop inter-jurisdictional agreements to conduct operations and maintenance. This study builds on these successful inter-jurisdictional agreements and investigates other strategies for addressing operations and maintenance issues as an entire region, including the feasibility of a regional operations and maintenance program. This report outlines the activities and findings of the efforts’ first phase.
Regional Operations And Maintenance Of Traffic Systems Phase I: Feasibility Study

Final Report

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Executive Summary

Reducing Congestion and Improving Safety on Arterials

Arterial management systems can be an effective component in a regional strategy to reduce traffic congestion, improve air quality and enhance safety. Arterial management systems are used to manage traffic by employing various detection and control devices along arterial roadways. Systems include traffic surveillance, traffic control, information display and public safety (enforcement). Although benefits will depend upon a number of operational variables, evaluations have shown that implementation of these systems can produce significant benefits in terms of reduction in travel times, less obstructed flow of traffic through signalized intersections, improved safety, and lower emissions. As an example, adaptive signal control, the most established arterial management application, has been shown to reduce delay by between 14 and 40 percent and to reduce stops by between 10 and 41 percent.  

To facilitate the deployment of arterial management systems within the region, the Minnesota Department of Transportation Metro Division led the development of “Metropolitan Arterial ITS Deployment Plan (August 2000)”. The plan calls for the deployment of advanced traffic signal control systems, transit priority systems, emergency vehicle preemption systems, dynamic message signs, and closed circuit television cameras. During the development of the plan, it became apparent that success would depend not only on a sound deployment strategy but also the ongoing support of arterial operations and system maintenance. Agencies within the region regularly and successfully develop inter-jurisdictional agreements to conduct operations and maintenance. The intent of this study is to build upon these successful inter-jurisdictional agreements and to investigate other strategies for addressing operations and maintenance issues as an entire region. One possibility that is being explored in detail is the feasibility of a regional operations and maintenance program. This report outlines the activities and findings of the first phase of this effort.

Stakeholder Survey

The first component of the study is a stakeholder survey. Transportation agencies throughout the Minneapolis-St. Paul eight county metropolitan area were surveyed to assess the current status of operations and maintenance in terms of jurisdictional arrangements and existing operations and maintenance agreements, to identify current staffing levels, and to determine interest areas for further discussion. Of the 109 survey forms that were distributed, responses were received from thirty-two agencies, including most of the larger cities, seven counties, and the Minnesota Department of Transportation.

Survey results indicate a wide variety of experiences and levels of involvement in the operations and maintenance of arterial signal systems, ITS components, and communication systems. Smaller agencies often procure operations and/or maintenance services from either larger

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agencies or private companies. Both large and small agencies are concerned about their ability to attract and retain experienced operations and maintenance staff as well as providing funding for spare parts and special equipment.

**Case Studies**

Case studies were conducted to learn more from the experiences of other regions involved in regional operations and maintenance. The initial conclusion in developing the case studies is that there are few truly regional programs for both operations and maintenance. Las Vegas, Nevada; Monroe County (Rochester), New York; Kansas City, Missouri; and Los Angeles County, California were included as case studies in this report. Each of these regions address operations and/or maintenance regionally.

The Las Vegas and Los Angeles County experiences are most relevant to this study. The Las Vegas Area Computerized Traffic System is a comprehensive regional operations and maintenance program for arterial traffic signals. Los Angeles County Traffic Signal Synchronization, Operation and Maintenance Program provides an example of a regional approach to the planning and programming of arterial ITS and traffic signals in a metropolitan region.

**Stakeholder Forum**

A regional stakeholder forum, held on August 14, 2001, brought together representatives from ten cities, four counties, the Minnesota Department of Transportation, and the FHWA. The objective of the forum was to present findings from the stakeholder survey and the case studies, and to solicit the representative’s input. After the presentations, participants were divided into discussion groups and asked to respond to a series of questions. A voting exercise was conducted at the end of the day, giving everyone the opportunity to record his or her reaction.

When the stakeholders were asked to prioritize their needs/issues during the voting exercise, the results reflected a consensus that “staffing” and “funding” were of highest priority. The stakeholders expressed support for regional operations and maintenance through both the voting exercise and their response to the breakout questions.

Stakeholders commented that a regional approach could potentially:
- Allow for specialization and greater expertise.
- Be more responsive to public complaints. Response time to complaints suffers from shared ownership/liability of traffic devices.
- Promote more efficient traffic management throughout the region.
- Reduce the complexity and cost of contract administration.
- Result in cost savings through regional equipment procurement and standardization.
- Address the lack of regional traffic information beyond the freeway system.

Challenges and issues were also discussed. The greatest challenge would be getting buy-in from all the stakeholders. Local agencies would have to agree to forfeit some degree of autonomy.
City council members, county commissioners, administrators and engineers may resist any program that diminishes their ability to respond directly to the requests of constituents, elected officials, or administrators.

A regional approach to operations and maintenance would also require substantive input from affected staff and their unions as well as strong support from Mn/DOT’s upper management and the state legislature.

Findings and Recommendations

While acknowledging that state and local agencies have been successful in addressing arterial system operations and maintenance, there remains a shared perception that operations and maintenance is an ongoing concern for a variety of reasons, most notably insufficient funding and staffing.

Analysis of the information gathered through the stakeholder survey, stakeholder forum, and the case studies has led to the following findings:

1. Staffing and funding are the two issues deemed to be of highest priority by stakeholder forum participants.
2. Due to budget constraints, preventative maintenance has not received adequate support throughout the region.
3. There is strong interest and support for a regional approach to operations and maintenance.
4. There are many current examples of successful inter-agency operations and maintenance, which would serve as models for future agreements.
5. Traffic signals are identified both in the forum and the survey as the system with the greatest potential for regional operations and maintenance.
6. A regional approach to operations and maintenance may allow smaller agencies to deploy more advanced systems.
7. Gaining the support and commitment from all stakeholders will be the greatest challenge to developing a regional operations and maintenance program.
8. Broad support will depend on a comprehensive regional agreement that is the product of negotiation among participating agencies.

Analysis of the information leads to the following recommendations:

1. **Develop regional standards.** Independent of the decision to go forward with a regional operations and maintenance program, agencies within the region should develop regional standards and processes for equipment, materials, specifications, installation, operations, maintenance and communications.

2. **Go forward with Phase II of this regional O&M study.** The results of the stakeholder survey and forum confirm that there is a strong interest and potential support for a regional operations and maintenance program. Phase II could;
a. Achieve concurrence on the geographical scope of a regional operations and maintenance program. It is recommended that the program include functional category “principal arterial” and “A minor arterial” roads, as defined by the Metropolitan Council (Met Council). Principal arterials include all interstate freeways, some major metropolitan highways and county roads that connect the region to other areas of the state and to other states. “A” minor arterials connect the urban service area to cities and towns inside and outside the region. They generally provide medium to short trips of two to six miles in length and emphasize mobility rather than access. Appendix I provides an overview of these arterials in the metropolitan area.

b. Expand upon the information gathered in the stakeholder survey to develop a GIS based inventory of traffic signals, controllers and other systems of interest. Information will be gathered on the location, type, and age of the equipment. Establish responsibilities and resources to develop and maintain this inventory.

c. Assess the cost effectiveness of alternate operations and maintenance organizational models. Use selected jurisdictions to perform a cost effectiveness study, comparing current costs to projected costs under various regional operations and maintenance scenarios.

d. Identify and assess successful inter-agency operations and maintenance activities within the region. Determine which funding mechanisms and formulas have worked well. Lay the groundwork for similar agreements regionally.

e. Based on the findings, develop a detailed scope and initiate a pilot program. Such a project could be operations only, maintenance only, or a combination of the two. The scope will include a specific organizational model, deployment strategy, roles and responsibilities, funding strategies, costs, schedules, etc. The pilot program would have an evaluation component, using performance measures drawn from ITE guidelines, and a cost analysis. If possible, the pilot project will address a need identified in the stakeholder forum such as the lack of regional traveler information beyond the freeway system and poor response time to public complaints due to shared ownership/liability of traffic devices.

f. Draft a proposal to the Federal Highway Administration (FHWA) in pursuit of federal support for the proposed pilot project.

3. **Begin a dialog with Met Council’s Transportation Advisory Board** regarding the eligibility and priority of regional arterial management system projects for surface transportation program and congestion mitigation and air quality improvement program funding. Although a regional approach to operations and maintenance would serve the objectives of the Met Council, the eligibility and priority criteria set forth in the Met Council’s 2001 Solicitation may not allow for the funding of projects with a regional scope. Existing criteria, particularly prioritizing criteria, focus on the characteristics of the specific segments of principal arterials and “A” minor arterials.
Initiate a regional operations and maintenance program (Phase III). Upon successful completion of Phase II and assuming that there is sufficient support from local agencies either directly or via the Met Council, go forward with the development of a regional operations and maintenance program.
1. Introduction

This report documents the findings of the Minnesota Department of Transportation (Mn/DOT) project entitled “Regional Operations and Maintenance of Traffic Systems, Phase I: Feasibility Study.” The objective of this phase of the study is to investigate the feasibility and regional interest in pursuing a regional operations and maintenance program for traffic control and management systems. Agencies within the region regularly and successfully develop inter-jurisdictional agreements to conduct operations and maintenance. The intent is to build upon these successful inter-jurisdictional agreements and to investigate other strategies for addressing operations and maintenance issues as an entire region. The findings and recommendations are based on the results of a stakeholder survey and input gathered through a stakeholder forum. Additional information was gathered through research, which included case studies that focused on the experiences of other regions. The results are presented as follows:

Stakeholder Survey- Chapter 2

Transportation agencies throughout the Minneapolis/St. Paul eight county metropolitan area were surveyed to assess the current status of operations and maintenance in terms of jurisdictional arrangements and existing operations and maintenance agreements, to identify current staffing levels, and to determine interest areas for further discussion. The survey findings are documented in Chapter 2. Complete survey results are included as Appendix A. The survey form is included as Appendix B.

Case Study Findings- Chapter 3

Case studies were conducted to learn more from the experiences of other regions involved in regional operations and maintenance. Las Vegas, Nevada; Monroe County (Rochester), New York; Kansas City, Missouri; and Los Angeles County, California were included as case studies in this report. These regions each address operations and/or maintenance regionally. Chapter 3 includes a description of each of the various approaches and an assessment of how these experiences are relevant to the Minneapolis/Saint Paul metropolitan area. A copy of the inter-jurisdictional agreement that serves as the basis of the Las Vegas Area Computerized Traffic Signal System (LVACTS) is included as Appendix H.

The Role of the Metropolitan Council- Chapter 4

As summarized in Chapter 4, the Metropolitan Council (Met Council) plays a central role in regional transportation planning. Although regional operations programs would not be directly eligible for funding under the federal programs administered by the council, traffic system deployment projects that enable a regional approach to operations and maintenance (e.g. deployment of standardized signal systems or build out of
communication infrastructure) would likely qualify. One of the recommendations of this study (see Chapter 7) is that a regional operations and/or maintenance program should include roadways with functional classifications principal arterial and “A” minor arterial, as defined by the Met Council. A functional class map is included as Appendix I.

Stakeholder Forum Summary- Chapter 5

The regional operations and maintenance stakeholder forum, held on August 14, 2001, brought together representatives from ten cities, four counties, Mn/DOT, and the FHWA. The objective of the forum was to present findings from the survey and the case studies, and to solicit input from these representatives. The results of the forum are summarized in Chapter 6. The forum agenda and breakout session questions are included are Appendix C. The forum presentations are summarized in Appendix D. The complete notes from the breakout session are included as Appendix E, and a Roster of Forum Participants is included as Appendix F.

Findings: Potential Benefits, Drawbacks and Issues -Chapter 6

Analysis of the information gathered through the stakeholder survey and forum, the case studies, and additional research has led to these findings included in Chapter 5.

Recommendations and Next Steps-Chapter 7

Based on the findings summarized in Chapter 6, Chapter 7 outlines the recommended action items for Phase II and beyond.

Process Lessons Learned-Appendix G

As a supplement to this report, the project management team discussed and documented the lessons learned. In short, the team identifies what went well and what could be improved with the approach and the process.
2. Stakeholder Survey

The stakeholder survey and the stakeholder forum were the two outreach tools used to gather stakeholder input. The stakeholder surveys were sent to 108 county and local agencies. Responses to the survey were received from thirty-two agencies, including:

- 7 counties
- 13 large cities (population > 20,000)
- 11 small cities (population < 20,000)
- Mn/DOT.

The survey results indicate a wide variety of experiences and levels of involvement in the operation and maintenance of arterial signal systems, ITS components, and communication systems. Twenty-six of the thirty-two responding agencies reported that they own traffic signals, making them the single most common component. In terms of the number of units, operations and maintenance of traffic signals are most commonly contracted out (156 for operations and 241 for maintenance). In terms of percentage of units, operations and maintenance of communication systems and end equipment is contracted out the most frequently. Time plus materials is the most common type of contract.

The city and county agencies reported having a total of nineteen staff members dedicated to system operations, twenty-four staff members dedicated to maintenance and forty-nine staff members involved in joint operations and maintenance activities. Larger cities are more apt to allow for specialization in either operations or maintenance (30.5 out of 48.5 full time employees [FTEs]). Smaller cities and the counties more often combine operations and maintenance functions (25 out of 26 FTEs).

When asked their preferred method for operations and maintenance of signal systems, ITS components and communication systems, more than 50% of the respondents indicated a preference for having a public agency, other than their own, conduct operations and maintenance. Traffic signals were deemed to have the greatest potential for a regional approach, followed by fiber optic cable systems. Eighteen of the thirty-two responding agencies also indicated an interest in further discussion of regional operations and maintenance of traffic signal systems. Message sign maintenance was a distant second with eight agencies indicating an interest in further discussions. Considering, however, that only seven of the thirty-two agencies currently own arterial dynamic message sign systems, this represents a strong interest.

Survey recipients were asked a series of questions on spare parts, training, and specialized equipment. Seventeen of the thirty-two respondents (53%) reported that they keep an inventory of spare parts. Smaller jurisdictions kept the most basic parts such as light emitting diodes (LEDs) or signal bulbs. Larger jurisdictions based their spare part inventories on anticipated need and experience with particular components. Many base their inventory directly on the number of components that are in the field. Hennepin
County, for example, maintains a spare parts inventory equal to 10% of the total number of components in the field.

Fourteen (44%) of the respondents indicated that their employees receive specialized training. Signal operations and maintenance training was the most frequently mentioned. Eleven (34%) of the respondents expressed an interest in additional training, most frequently mentioning training for fiber optic cable system operations and maintenance. Eleven (34%) of the respondents reported that they keep an inventory of specialized equipment to assist with operations and maintenance. Loop tester equipment was the most frequently mentioned.

Survey recipients were also asked to describe their current arrangement for operations and maintenance support of more traditional infrastructure, including signing, street lights, signal lights, and pavement markings. Painting was the task that was most frequently contracted out (20 of 32 agencies) and signing was the least frequently contracted out (3 of 32). When asked whether they would be interested in regional operations and maintenance programs for these tasks, painting received the most interest (15 of 32 said yes) followed by signal relamping and street light relamping (12 of 32 said yes for each).

Twenty-five of the thirty-two agencies reported having inter-jurisdictional operations and maintenance agreements in place. Mn/DOT was listed as a contracting partner the most often (17 of 32), followed by Hennepin County (5 of 32). This indicates that the agencies within the region are regularly developing inter-jurisdictional agreements to conduct operations and maintenance to the benefit of the traveling public.

A large majority of the agencies (23 of 32) indicated that they would be interested in attending the stakeholder forum. This reflects a high level of interest in discussing alternative approaches to operations and maintenance within the region.
3. Case Study Findings

3.1 Las Vegas, Nevada – Regional Operations and Maintenance

The Las Vegas Area Computerized Traffic System (LVACTS) is the most comprehensive regional operations and maintenance program for arterial traffic signals. Created in 1981, the LVACTS is an independent regional agency that operates and maintains more than 600 traffic signals and other traffic management tools in the cities of Las Vegas, North Las Vegas, and Henderson as well as Clark County. Their existing system software incorporates signals, closed circuit television, and other traffic management tools.

The Operations Management Committee (OMC), which consists of one representative from each of the local agencies, the Nevada DOT, and Regional Transportation Commission (a non-voting member), provides oversight and direction, makes policy decisions, and manages the financial aspects of the LVACTS. The jurisdictions are equally represented on the OMC, each given one vote in the decision making process, with the exception of the Regional Transportation Commission.

Each of the four participating jurisdictions fund LVACTS based on a formula that takes into account the number of signals and other traffic management components within their boundaries. A system inventory is conducted annually and contributions from the jurisdictions are adjusted accordingly.

The funding formula is as follows:  \( X+Y+Z \)

- Nevada DOT \( = X \)
- Regional Transportation Commission \( = Y \)
- Las Vegas \( = Z \times (\% \text{ of signals within Las Vegas}) \)
- North Las Vegas \( = Z \times (\% \text{ of signals within North Las Vegas}) \)
- Clark County \( = Z \times (\% \text{ of signals owned by Clark County}) \)
- Henderson \( = Z \times (\% \text{ of signals within Henderson}) \)

The contribution of the Nevada DOT (X) is limited to that portion, if any, which is reimbursable by the federal government and which the Nevada DOT elects to approve and appropriate.

The contributions of the Regional Transportation Commission (Y), if any, is to be determined by the members of the Regional Transportation Commission.

The remaining share (Z) of the funding formula will be an amount sufficient, when combined with X and Y contributions, to equal the total funding requirements for the operation and maintenance of the system.
The funding formula does not take the age or condition of equipment into consideration. Age and condition of the system would likely be an issue if it were a larger region or if there were considerable variation in equipment age or condition among the participating agencies. The Operations and Management Committee take an active role in maintaining regional standards for controllers, signal equipment, communications parameters, etc.

Maintenance of the traffic signal system is the combined responsibility of local agencies and LVACTS. Each local agency is responsible for the construction of new signals, lamp replacement, and basic functionality. LVACTS maintains the communications components.

LVACTS will soon be succeeded by FAST, which will combine the arterial management system with the Nevada DOT’s regional freeway management system. By having one management center and a single staff with responsibility for both arterials and the freeway, the FAST program will realize greater operational efficiency and monetary savings.

Figure 3-1 illustrates the organizational model for LVACTS.

Contact: Neal Rohleder, LVACTS (tel. 702.229.6611)

Figure 3-1: Regional Operations and Maintenance Model

- Operating Management Committee
- LVACTS (new organization)
  - O&M for Freeway and Arterials
  - Based on Multi-jurisdictional Agreement

- Each jurisdiction represented on OMC
- Each jurisdiction funds LVACTS annually based on an agreed-upon formula

3.2 Monroe County, New York - County Lead Signal Operations and Maintenance

Monroe County, New York, provides an example of a county lead operations and maintenance program. The Rochester metropolitan area is unique in that the city and all of the suburbs fall within one county. The county has agreements in place with all municipal governments to cover operations and maintenance of traffic signals. The county also operates and maintains 60 of the roughly 500 state-owned traffic signals within the county (those linked to the central system).
The Monroe County Department of Transportation is responsible for the design, installation, and maintenance of some 737 traffic signal devices located on county highways and City of Rochester streets. A computerized signal system, housed in the Traffic Control Center, continuously monitors 360 traffic signals located mostly on major City of Rochester streets and selected county and state highways in the towns of Greece, Henrietta, and Irondequoit. This computerized system monitors traffic flow and is capable of selecting varying signal timing patterns to meet traffic flow conditions.

The County-State agreement addresses:

- Equipment
- Operations and maintenance tasks
- Operations and maintenance standards
- Modifications to the system
- System timing patterns
- Reimbursement
- Records and audit
- Inspection
- Indemnification

Figure 3-2 illustrates the county-based organizational model for Monroe County.

Contact: James Pond, Monroe County Department of Transportation (tel. 716.274.7912)

Figure 3-2: Regional O&M – County Based

3.3 Los Angeles County, California – Regional Planning and Programming

The Los Angeles County provides an example of a regional approach to the planning and programming of ITS and traffic signals on urban arterials. In the late eighties, a countywide proposition was passed dedicating a portion of the sales tax to transportation projects, specifically congestion relief. With funding provided through the Los Angeles
County Metropolitan Transportation Authority (LACMTA), project planning and programming is lead by Los Angeles County’s Department of Public Works as directed by the Signal Support Group (SSG).

The SSG was formed in 1993 to develop the signal synchronization element of the LACMTA transportation system plan. The SSG continues to work with city traffic engineers, operations and maintenance personnel, and public works staff to evaluate sub-regions of the county and to select arterials to be synchronized across jurisdictional boundaries. Several agencies, including the Los Angeles County Department of Public Works and Caltrans, are involved in the analysis and implementation of the improvement projects. This is a relatively new approach to the planning and programming of arterial traffic signal systems within a metropolitan region. The efforts of the SSG ensure that signal operation and intelligent transportation system technologies and improvement policies are consistent throughout Los Angeles County.

Regions and sub-regions have been created over most of the county. The cities within each region make up what is referred to as Los Angeles County Regional Traffic Signal Forums. Through this program, the County has administered several regional traffic forum projects, such as:

- San Gabriel Valley Signal Synchronization Operation and Maintenance Pilot Project, I-210 Corridor.
- Gateway Cities Signal Synchronization Operations and Maintenance Pilot Project.
- South Bay Signal Synchronization and Bus Speed Improvement

Local jurisdictions are responsible for operations and maintenance of their signal systems, with the county assisting in signal timing as resources allow. The county is currently developing software to facilitate the sharing of signal and traveler information among jurisdictions. As these jurisdictions begin to share data electronically, the county anticipates that there will be a need for a regional role in operations and maintenance. The Los Angeles County Department of Public Works conducts an ongoing study to determine how other regions with integrated signal systems share costs.

Figure 3-3 illustrates the Los Angeles organizational model.

Contact: Jane White, Los Angeles County Department of Public Works (tel. 626.458.5905)
3.4 Kansas City Missouri, Mid-America Regional Council – Planning for Regional Operations

The Mid-America Regional Council (MARC) is the Metropolitan Planning Organization for the Kansas City area.

Having recently completed a feasibility study, MARC is currently shoring up funding to upgrade signal systems at 600 intersections. Phase I of the enhancements will include, replacement of signal controllers, development of signal timing plans, and addition of wireless communication for isolated traffic signals.

The feasibility study provided capital cost estimates and included a system inventory. The inventory found that 20 different agencies operate and maintain signals in the Kansas City metropolitan area, using three different types of controllers. The objective of Phase I is to replace all electromechanical controllers. Over the long term, the objective is to migrate towards 2070 Controllers. Where closed loop systems are in place, they will continue to be used. Where they do not exist, spread spectrum radio communication systems will be installed.

The Kansas DOT and the Missouri DOT are developing a freeway management system for the Kansas City metropolitan area. Future phases of the arterial signal upgrade effort might include the development and staffing of a regional arterial traffic management...
center and coordination with the freeway management system. Hardware is being selected that can accommodate ITS components such as closed circuit television cameras and message signs, although no decisions for future deployment, integration, or system operations and maintenance have been made.

As part of the feasibility study, a steering committee and a technical advisory committee were developed. The technical advisory committee consists of stakeholders from throughout the region. Several workshops were conducted during the feasibility study to gather input from the stakeholders. The committee structure will remain in place through Phase I and beyond.

MARC was the logical choice for leading this effort for two reasons. Kansas City is currently designated as a maintenance area for ozone and may soon be re-designated as a non-attainment area. Much of the early planning was done, in part, as an air quality mitigation effort. Also, because the Kansas City metropolitan area includes jurisdictions from two states, an MPO, with representation from both sides of the state line, is the common organization for multi jurisdictional coordination efforts.

Federal funding, which will be available in October of 2001, will cover 80% of phase one. MARC is currently working with the 20 agencies to come up with the 20% local match.

Contact: Ron Achelpol, MARC (tel. 816.474.4240)
4. The Role of the Metropolitan Council

The Metropolitan Council (Met Council) is the metropolitan planning organization for the Twin Cities seven-county metropolitan area. The Met Council selects projects for funding under three federal programs: STP Urban Guarantee, CMAQ and STP Transportation Enhancements. The regional Transportation Policy Plan sets the broad framework. Implementation plans are developed within this framework to address various problems. On the regional level, examples of implementation plans include transit sector studies. On the local level, comprehensive plans articulate problems and solutions unique to a particular community. Large-scale corridor studies bring together local and regional concerns.

Integral to the transportation planning process is the Transportation Advisory Board (TAB). The TAB consists of 33 members, including: 10 municipal elected officials, 7 elected county officials, 9 private citizens, and 4 modal representatives appointed by the council. Because the TAB consists, in part, of elected local officials, it enables the Met Council to satisfy federal MPO requirements. The TAB is responsible for assigning funding priorities and adopting programs.

The Technical Advisory Committee (TAC) provides technical assistance and the coordination necessary for the TAB to perform its responsibilities. The TAC membership is composed of 27 professional staff from the principal governmental units involved in transportation in the metropolitan area.

The TAB adopts and implements the regional process for solicitation, evaluation, prioritization, and selection of transportation projects. The solicitation uses a set of qualifying criteria to determine if a proposed project or program meets the broadest policy directions and follows regionally adopted procedures. Once it is determined that a proposed project qualifies, it is ranked against other qualified projects based on a set of prioritizing criteria. Ranking is done by the TAC and forwarded to the TAB Programming Committee.

The Met Council’s “Prospectus for the Transportation Planning Process” points out that in recent years the national and regional emphasis has shifted away from capital intensive development and toward more the preservation and management of existing infrastructure and low cost innovations supporting other public objectives. A regional approach to operations and maintenance of traffic systems would further these objectives. However, arterial operations and maintenance activities would not currently qualify for funding through the federal programs administered by Met Council. Arterial management system deployment projects that support a regional approach (e.g. deployment of standardized signal systems or build out of communication infrastructure) would likely qualify. It is recommended that Mn/DOT Metro Division begin a dialog with Met Council’s Transportation Advisory Board regarding the eligibility and priority of regional traffic system deployment as well as operations and maintenance projects for
surface transportation program and congestion mitigation and air quality improvement program funding.

Current Met Council criteria, particularly prioritizing criteria, focus on the characteristics of the specific segments of principal arterials and “A” minor arterials. Based on this, a regional operations and/or maintenance program should include roadways with functional classifications principal arterial and “A” minor arterial, as defined by the Met Council. Principal arterials include all interstate freeways, some major metropolitan highways and county roads that connect the region to other areas of the state and to other states. “A” minor arterials connect the urban service area to cities and towns inside and outside the region. They generally provide medium to short trips of two to six miles in length and emphasize mobility rather than access. (see Appendix I).
5. Stakeholder Forum Summary Findings

The regional stakeholder forum brought together representatives from ten cities, four counties, the Mn/DOT, and the FHWA. The objective of the forum was to introduce the concept of a regional program, present findings from the stakeholder survey and the case studies, and then to solicit input from the representatives. After the presentations, participants were divided into discussion groups and asked to respond to a series of questions. A voting exercise was conducted at the end of the day, giving everyone the opportunity to record his or her reaction. The following section summarizes the major points gleaned from both the group discussion notes and the voting exercise. Complete notes from the discussion groups and the voting results are included as Appendix E to this report.

5.1 Issues and Concerns

When the stakeholders were asked to prioritize their needs/issues during the voting exercise, the results reflected a consensus that “staffing” and “funding” were of highest priority.

- **Staffing.** Stakeholders indicated that attracting and retaining staff, particularly operations staff, is their greatest challenge. Staffing levels are not keeping pace with system expansion, making it increasingly difficult to meet operations and maintenance objectives. With the shortage and high turnover rate, developing expertise is also an issue, particularly for more specialized equipment.

- **Funding.** Funding levels for operations and maintenance have not kept pace with need in some jurisdictions and has been reduced in others. As a result, agencies are not able to keep adequate spare parts in stock or to fund preventative maintenance programs, forcing agencies to operate in a reactive, rather than a proactive, mode.

Other issues of note include:

- Lack of regional traffic information beyond the freeway system.
- Response time to complaints suffers from shared ownership/liability of traffic devices.
- Operations and maintenance concerns are not adequately factored into the planning process.
5.2 Support for a Regional Approach

The stakeholders expressed support for regional operations and maintenance through the voting exercise and in response to the breakout questions. Twenty-one of the twenty-two participants affirmed that regional operations and maintenance is worth pursuing in some manner. Several advantages to a regional program were identified in the breakout sessions. These include:

− **A regional program would allow for specialization and greater expertise.** All participating jurisdictions would have access to operations and maintenance staff with expertise in technologies such as fiber optic cable, variable message signs, and closed circuit television cameras. Access to this expertise will allow smaller agencies, who don’t have the resources to invest in specialized training, to take advantage of advanced technologies.

− **A regional maintenance program would be more responsive to public complaints.** Equipment within the region is often owned and maintained by different agencies. For a person attempting to report malfunctioning equipment, the responsible agency is not always obvious, and having to contact two or more agencies prior to getting a response can cause frustration. A regional program would allow for a single point of contact and a central dispatch.

− **Regional operations would promote more efficient traffic management throughout the region.** Signal timing plans are often developed by local agencies with little emphasis given to uniformity among jurisdictions. A regional approach would lead to a higher level of coordination among jurisdictions. Arterial systems could also be coordinated with the freeway systems to provide a regional response to congestion, incidents, and major events.

− **A regional operations and maintenance agreement would reduce the complexity and cost of contract administration.** A single umbrella agreement among agencies would supercede all of the individual interagency agreements currently in place.

− **Substantial cost savings could be realized through regional equipment procurement and standardization.** Together, the jurisdictions would be able to buy equipment and spare parts in larger volumes, potentially at lower unit costs.

5.3 Challenges to a Regional Operations and Maintenance Program

In addition to identifying the benefits of a regional approach to operations and maintenance, the stakeholders were also asked to identify the greatest challenges and barriers and to suggest strategies for overcoming these challenges.

− **Support.** The key to developing a program is to get support from all stakeholders, including:
Participating agencies. All participating agencies would have to agree to forfeit some degree of autonomy for a regional program to work. City council members, county commissioners, administrators, and engineers may resist any program that diminishes their ability to respond directly to the requests of constituents, elected officials, or administrators.

Staff. Operations and maintenance staff are represented by various unions throughout the region. Any plans to develop a regional operations and maintenance program will have to involve input from staff and their unions.

Mn/DOT and the State legislature. The concept of a regional operations and maintenance program must be given priority by Mn/DOT’s upper management and receive the support of the legislature.

Legal/Organizational. Stakeholders also discussed the prospects for developing a regional memorandum of understanding or umbrella agreement. It was pointed out that, because this region is so large and includes so many jurisdictions, negotiating a detailed agreement that is acceptable to all parties will be a challenge. Las Vegas, which has been used as the model for a regional program, consists of only four jurisdictions.

Strategies for Meeting the Challenges. The stakeholders also suggested strategies for meeting the challenges and moving forward. One approach would be to develop a master agreement that supersedes all others. The agreement would set the funding formula and establish the governance of a regional program. Using Las Vegas as a model, the agencies would negotiate a funding formula that factors in the number of components in each of the participating jurisdictions. The formula should also factor in the age and service history of components. One recommendation was to begin developing an agreement with the larger jurisdictions. Without the participation of Mn/DOT, the cities of Minneapolis and St. Paul, Hennepin and Ramsey Counties, and the Met Council, many of the potential benefits of a regional program could not be realized.

One discussion group recommended selling the regional approach to decision makers based on improved safety and efficiency, and return on investment. Such an approach will require a better understanding of current operations and maintenance costs by unit.

Another discussion group suggested focusing on improving coordination among jurisdictions rather than developing a formal regional structure/organization. Agencies regularly and successfully develop inter-jurisdictional agreements to meet operations and maintenance objectives. Rather than developing a single formal structure, the agencies within the region would benefit from meeting regularly to
discuss operations and maintenance, as well as other topics that affect multiple jurisdictions, such as access management.

5.4 Next Steps

During the breakout sessions, the participants were also asked to respond to the idea of a pilot project and to identify which technologies would be the best candidates for regional operations and maintenance.

The response of the four breakout groups to the idea of a pilot study varied greatly. Group 1 felt that a pilot study would be a good idea and suggested that it include more traditional maintenance tasks such as painting, pavement markings, or traffic signal maintenance for selected intersections. Group 2 suggested using the ICTM components, which are currently operated centrally but maintained separately by each of the jurisdictions, in an operations and maintenance pilot project. Group 3 recommended analyzing current examples of inter-jurisdictional agreements, reviewing payment methods and jurisdictional arrangements. Group 4 rejected the idea of a pilot project. They argued that a pilot project agreement that only included a few agencies would be too small in scale to be useful in developing a regional program.

Although there was strong interest in a pilot project, the varying perspectives of what such a project may entail make it clear that a careful and inclusive planning process is a requirement. To be of benefit, the objectives and scope of a pilot project must be clearly defined and agreed upon by participating agencies.

The following findings are based on the information gathered in this study.

1. **Staffing and funding are the two issues deemed to be of highest priority by stakeholder forum participants.**

When asked to list issues, each of the four discussion groups at the stakeholder forum were quick to include staffing and funding. Later, in the stakeholder forum voting exercise, staffing and funding were selected as the primary operations and maintenance issues facing the participating agencies. Staffing levels are not keeping pace with system expansion, making it increasingly difficult to meet operations and maintenance objectives. With the shortage and high turnover rate, developing expertise is also an issue, particularly for more specialized equipment.

There is general consensus that operations and maintenance of arterial systems are inadequately funded. Funding levels for operations and maintenance have not kept pace with need in some jurisdictions and have been reduced in others. As a result, agencies are not able to keep adequate spare parts in stock or to fund preventative maintenance programs, forcing agencies to operate in a reactive, rather than a proactive, mode.

2. **Due to budget constraints, preventative maintenance has not received adequate support throughout the region.**

ITE guidelines are in place for preventative maintenance procedures and personnel time for both traffic signal systems and intelligent transportation systems. As a general rule, it is recommended that 70% of the maintenance budget be dedicated to preventative maintenance, 25% to response maintenance, and 5% to design modification maintenance. Stakeholders indicated that budget constraints have forced their agencies to minimize their preventative maintenance programs. The majority of their time is dedicated to response maintenance.

This region is not unique in this regard. According to a national survey conducted by the Institute of Transportation Engineers, transportation agencies reported a shortfall of between 20 and 35 percent in funding and personnel needed to effectively operate and maintain current traffic control systems. Forty-four percent of responding agencies rated their ability to operate and maintain their existing systems as fair to poor.

3. **There is strong interest and support for a regional approach to operations and maintenance.**

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Both the stakeholder survey and the voting results at the conclusion of the stakeholder forum indicate that the participants have a strong interest in moving forward with a regional operations and maintenance program. This interest in the concept of a regional program was qualified by several comments in the stakeholder forum that indicated that success would depend on broad acceptance of a regional structure.

When asked, 21 of the 22 voting participants at the stakeholder forum indicated that regional operations and maintenance (in some manner) was worth pursuing. Survey recipients were asked their preferred method for operations and maintenance of signal systems, ITS components and communication systems. In each of the four subject areas, the majority of the respondents indicated a preference for having a public agency, other than their own, conduct operations and maintenance for each of the components that was listed.

4. **There are many current examples of inter-agency operations and maintenance activities that are successful and that would serve as models for future arrangements.**

Local agencies and Mn/DOT have formed successful interagency partnerships to conduct shared resource projects. In fact, twenty-five of the thirty-two agencies reported having inter-jurisdictional operations and maintenance agreements in place. Noteworthy examples include:

**The Integrated Corridor Traffic Management (ICTM) system** has evolved from a federally funded ITS operational test. The ICTM system consists of an adaptive traffic signal and dynamic trailblazer system deployed along parallel arterials in the Interstate 494 corridor through the cities of Edina, Richfield, and Bloomington within Hennepin County. The ICTM system allows local agencies to cooperatively divert traffic along arterials during incidents on the freeway. The ICTM roadside components are owned and maintained by the respective agencies.

**The DIVERT (During Incidents Vehicles Exit to Reduce Time) Program** was jointly developed and deployed by the Mn/DOT and the City of St. Paul to manage the effects of incidents on I-94 and I-35E. DIVERT links Mn/DOT’s Freeway Management System and St. Paul’s central based traffic signal control system, and, similar to ICTM, allows for the diversion of traffic off the freeway, along surface streets and back to the freeway during major incidents. The system consists of changeable message signs, static trailblazer signs, LED “blank-out” signs and special incident timing plans, which override local intersection signal timings during incidents.

There are numerous **county to city and city to city arterial system operations and maintenance agreements** in existence throughout the region. For example, the City of St. Paul provides signal maintenance to Washington County, Cottage Grove, Woodbury, Forest Lake, Oak Park Heights, and the University of Minnesota and provides street
lighting maintenance to Falcon Heights and Roseville. St. Paul successfully and routinely assists agencies that have limited operations and maintenance staff.

5. Traffic signals are identified both in the forum and the survey as the system with the greatest potential for regional operations and maintenance.

In the voting exercise, the stakeholders were asked to rank which systems held the greatest potential for regional operations and maintenance. Their top three choices were very similar to the survey results. This is illustrated in figure 5-1:

Figure 5-1: Top 3 Components - Greatest Potential for Regional Operations and Management

(Survey recipients were asked to rank the priority of various components from 1 to 5 with 1 representing the highest potential. Forum participants were asked to vote on which components have the greatest potential. Traffic signals received the most votes. Therefore, although the vertical axis values are counter to one another, the results actually reflect agreement.)

In the Survey, CCTV cameras and message signs tied for the third highest potential. In the Stakeholder Voting, CCTV cameras received the third most votes, while message signs received the seventh most. Otherwise, the potential ranking in the survey matched the voting at the stakeholder forum.

Of the systems listed in the survey and discussed in the stakeholder forum, traffic signals are the most common. A contributing factor to this interest may be that a majority of the agencies, traffic signals are the only arterial systems that are owned and operated by their jurisdictions. Operations and maintenance of signal systems is the preferred starting point for a regional approach.

6. A regional approach to operations and maintenance may allow smaller agencies to deploy more advanced systems.

This point was made at the stakeholder forum. Smaller agencies have smaller operations and maintenance budgets. Training staff to maintain or operate a small number of specialized devices would be difficult. A regional approach that pooled operations and
maintenance resources would allow for more specialization of maintenance duties and provide opportunities for shared operations.

The survey findings reinforced this point. When asked which technologies warrant further discussion in regard to developing a regional maintenance program, message sign maintenance was ranked highly. Currently, message signs are owned and operated by the state and a few of the larger local agencies. The survey results indicated that interest in regional operations and maintenance of message signs was strongest among smaller agencies that do not yet have these devices suggesting that they are thinking beyond their current levels of technology.

7. *Gaining the support and commitment from all stakeholders will be the greatest challenge to developing a regional operations and maintenance program.*

For a regional program to work, local agencies will have to agree to forfeit some degree of autonomy. City council members, county commissioners, administrators and engineers and staff may resist any program that diminishes their ability to respond directly to the requests of constituents, elected officials or administrators. A regional approach to operations and maintenance would also require substantive input from affected staff and their unions and strong support from city and county governing bodies, Mn/DOT’s upper management and the state legislature.

8. *Broad support will depend on a comprehensive regional agreement that is the product of negotiation among participating agencies.*

Identifying broad support for the concept of a regional operations and maintenance plan is only the first step in a very complex process. There are a multitude of factors to be considered/negotiated including governance of a regional program, the funding mechanism, the geographic scope, as well as the scope in terms of roles and responsibilities.
7. Recommendations/Outline of Next Steps

1. **Develop regional standards.** Independent of the decision to go forward with a regional operations and maintenance program, agencies within the region should develop regional standards and processes for equipment, materials, specifications, installation, operations, maintenance and communications.

2. **Go forward with Phase II of this regional O&M study.** The results of the stakeholder survey and forum confirm that there is a strong interest and potential support for a regional operations and maintenance program. Phase II could;

   a. Achieve concurrence on the geographical scope of a regional operations and maintenance program. It is recommended that the program include functional category “principal arterial” and “A minor arterial” roads, as defined by the Met Council. Principal arterials include all interstate freeways, some major metropolitan highways and county roads that connect the region to other areas of the state and to other states. “A” minor arterials connect the urban service area to cities and towns inside and outside the region. They generally provide medium to short trips of two to six miles in length and emphasize mobility rather than access. *Appendix I* provides an overview of these arterials in the metropolitan area.

   b. Expand upon the information gathered in the stakeholder survey to develop a GIS based inventory of traffic signals, controllers and other systems of interest. Information will be gathered on the location, type, and age of the equipment. Establish responsibilities and resources to develop and maintain this inventory.

   c. Assess the cost effectiveness of alternate operations and maintenance organizational models. Use selected jurisdictions to perform a cost effectiveness study, comparing current costs to projected costs under various regional operations and maintenance scenarios.

   d. Identify and assess successful inter-agency operations and maintenance activities within the region. Determine which funding mechanisms and formulas have worked well. Lay the groundwork for similar agreements regionally.

   e. Based on the findings, develop a detailed scope and initiate a pilot program. Such a project could be operations only, maintenance only, or a combination of the two. The scope will include a specific organizational model, deployment strategy, roles and responsibilities, funding strategies, costs, schedules, etc. The pilot program would have an evaluation component, using performance measures drawn from ITE guidelines, and a cost analysis. If possible, the pilot project will address a need identified in the stakeholder
forum such as the lack of regional traveler information beyond the freeway system and poor response time to public complaints due to shared ownership/liability of traffic devices.

f. Submit a proposal to the FHWA in pursuit of federal support for the proposed pilot project.

3. **Begin a dialog with Met Council’s Transportation Advisory Board** regarding the eligibility and priority of regional arterial management system projects for surface transportation program and congestion mitigation and air quality improvement program funding. Although a regional approach to operations and maintenance would serve the objectives of the Met Council, the eligibility and priority criteria set forth in the Met Council’s 2001 Solicitation may not allow for the funding of projects with a regional scope. Existing criteria, particularly prioritizing criteria, focus on the characteristics of the specific segments of principal arterials and “A” minor arterials.

4. **Initiate a regional operations and maintenance program (Phase III).** Upon successful completion of Phase II and assuming that there is sufficient support from local agencies either directly or via the Met Council, go forward with the development of a regional operations and maintenance program.
Appendices

Appendix A: Complete Survey Results
Appendix B: Survey Form
Appendix C: Stakeholder Agenda and Breakout Questions
Appendix D: Stakeholder Presentation Summary
Appendix E: Notes and Voting Results from the Stakeholder Forum
Appendix F: Roster of Stakeholder Forum Participants
Appendix G: Process Check
Appendix H: Las Vegas (LVACTS) Inter-jurisdictional Agreement
Appendix I: Functional Class Roads Map
Appendix A: Complete Survey Results
Overall Response

Of the 109 surveys that were distributed, thirty-three have been returned, which is a 30% return rate. Of the responses, 7 (21%) were from counties, 14 (42%) were from large cities (those with populations over 20,000), 11 (33%) were from small cities (those with populations under 20,000), and 1(3%) was from Mn/DOT. The following is a summary of the survey findings.

Please note that, because many of the survey forms were not filled out completely, the number of responses for any given question may or may not be thirty-three, the total number of survey responses.

1. Indicate the approximate number of arterial components your agency is responsible for operating and/or maintaining. Also indicate how you operate and maintain those components

Of the thirty-three agencies that responded, twenty-eight indicated that they are involved in operations and/or maintenance of traffic signals making it the single most common hardware component. The City of St. Paul and Mn/DOT were the only responding jurisdictions that reported owning fiber optic end equipment.

**ITS Activity**

<table>
<thead>
<tr>
<th>Activity Area</th>
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<tr>
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</tr>
<tr>
<td>Message Signs</td>
<td>8</td>
</tr>
<tr>
<td>CCTV Cameras</td>
<td>16</td>
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<tr>
<td>Fiber Optic Cable</td>
<td>5</td>
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<td>FOC End Equipment</td>
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</tr>
<tr>
<td>Other Communication Systems</td>
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</tr>
<tr>
<td>OCS End Equipment</td>
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</tr>
</tbody>
</table>

Survey Response Origin

- **Small City**: 33%
- **Large City**: 43%
- **County**: 21%
- **Mn/DOT**: 3%

Of the thirty-three agencies that responded, twenty-eight indicated that they are involved in operations and/or maintenance of traffic signals making it the single most common hardware component. The City of St. Paul and Mn/DOT were the only responding jurisdictions that reported owning fiber optic end equipment.
This graph provides an overview of operations and maintenance task designation by component type. As this graph indicates, operations and maintenance of communications systems and end equipment are the tasks that are most likely to be contracted out. The following tables provide more detail for each of these components.
Traffic Signals

Twenty-one agencies reported that they operated a total of 2,456 signal systems but maintained 2,842 signals. Public agencies identified as contractors for maintenance and/or operations include MN/DOT, Hennepin and Anoka Counties and the City of St. Paul. It should be noted that the number of units owned, operated and maintained are not equal. Through inter-jurisdictional agreements, many of the agencies operate and/or maintain units for other agencies.

<table>
<thead>
<tr>
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<tr>
<td>Totals</td>
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</tr>
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</table>

Message Signs

Seven agencies reported they owned a total of 73 arterial message signs. Agencies include Mn/DOT, the Cities of Bloomington, Minneapolis, and St. Paul and Hennepin, Ramsey, and Scott Counties. St. Paul has fifty of the seventy-four message signs.

<table>
<thead>
<tr>
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</table>

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
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<td>In-House</td>
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<td>85</td>
</tr>
<tr>
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<td>3</td>
</tr>
<tr>
<td>Other Public Agency</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>Other</td>
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<td>1</td>
</tr>
<tr>
<td>Totals</td>
<td>76</td>
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</tr>
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</table>

CCTV Cameras

Six agencies, the Cities of Bloomington, Minneapolis, Richfield and St. Paul, Hennepin County, and Mn/DOT, reported having a total of 71 CCTV cameras located on arterials.

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</tr>
<tr>
<td>Other</td>
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<th>%</th>
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<tr>
<td>Other</td>
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<td>0</td>
</tr>
<tr>
<td>Totals</td>
<td>67</td>
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</tr>
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</table>
**Communication System – Fiber Optic Cable**

Five agencies, the Cities of St. Paul and Woodbury, Hennepin and Ramsey Counties and Mn/DOT, reported that they own a total of 12 fiber optic cable communication systems. St. Paul and Woodbury reported that they contract out for the maintenance of their system.

### VII. Number of components agency operates

<table>
<thead>
<tr>
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<th>%</th>
</tr>
</thead>
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</tr>
<tr>
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<td>Other Public Agency</td>
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<td>0</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>12</strong></td>
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### VIII. Number of components agency maintains

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<th>Units</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-House</td>
<td>11</td>
<td>85</td>
</tr>
<tr>
<td>Independent Contractor</td>
<td>2</td>
<td>15</td>
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<td>Other Public Agency</td>
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<tr>
<td>Other</td>
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</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>13</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

**Communication System – Fiber Optic Cable End Equipment**

St. Paul and Mn/DOT reported that they owned fiber optic cable end equipment. St. Paul said that they owned 100 units of end equipment, while Mn/DOT has end equipment on two systems. Maintenance activities in St. Paul are done partially in house and partially through independent contractors. Specifically, cable splicing is contracted out.

**Communication System – Other**

This category includes all non-fiber optic systems. Eleven agencies, the Cities of Bloomington, Brooklyn Park, Fridley, Minneapolis, Richfield, and St. Paul, as well as Dakota, Hennepin, Ramsey and Washington Counties and Mn/DOT, reported that they owned a total of 1,073 other communication systems.

### IX. Number of components agency operates.

<table>
<thead>
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<th>Operations</th>
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<th>%</th>
</tr>
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<tr>
<td>Other</td>
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<tr>
<td><strong>Totals</strong></td>
<td><strong>1081</strong></td>
<td><strong>100</strong></td>
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### X. Number of components agency maintains.

<table>
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<th>Maintenance</th>
<th>Units</th>
<th>%</th>
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<tr>
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<td>90</td>
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<tr>
<td><strong>Totals</strong></td>
<td><strong>1081</strong></td>
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</table>

**Communication System – Other End Equipment**

The cities of Bloomington, Oakdale, Richfield and St. Paul and Ramsey and Dakota Counties, as well as Mn/DOT, reported that they owned a total of 1,013 pieces of other communication system end equipment.
XI. Number of components agency operates

<table>
<thead>
<tr>
<th>Operations</th>
<th>Units</th>
<th>%</th>
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XII. Number of components agency maintains

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<tr>
<td>Totals</td>
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</table>

*Mn/DOT listed their freeway system components separately. They use 441 ramp meters, fifty freeway message signs, thirteen CCTV cameras, thirty detector stations, and 230 miles of fiber optic cable. All these components are operated and maintained by in-house staff.*

2. If you checked ‘Communication System – Other’ in Question 1, indicate the other type of communication system your agency maintains.

Twelve of the thirty-three respondents (36%) listed the other communications systems they use. The systems they listed are as follows:

<table>
<thead>
<tr>
<th>Type</th>
<th>Responses Listed</th>
</tr>
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<tbody>
<tr>
<td>Pair/Twisted Pair</td>
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</tr>
<tr>
<td>Microwave</td>
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</tr>
<tr>
<td>Two-way Radio</td>
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<td>Phone Line</td>
<td>1</td>
</tr>
<tr>
<td>Cell Phone/Pager</td>
<td>1</td>
</tr>
</tbody>
</table>

3. If you indicated ‘in-house staffing’ for Question 1, indicate the type of staff you employ (technician, electrician, engineer, Gopher State One Call locator), the number of staff for each type (number or fraction of full-time person), and whether they are supervisors or non-supervisors.

The thirty-three responding agencies reported having a total of 28.2 staff dedicated to system operations, 36.95 staff dedicated to maintenance and 41.55 staff involved in joint operations and maintenance activities. For the most part larger cities and the state are more apt to allow for specialization in either operations or maintenance. Smaller cities and the counties were more apt to have joint operations and maintenance personnel assignments.
**Dedicated Operations Staff**

<table>
<thead>
<tr>
<th>Dedicated Operations Personnel</th>
<th>Small City</th>
<th>Large City</th>
<th>County</th>
<th>Mn/DOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technician Supervisor</td>
<td>0</td>
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<tr>
<td>Technician NS</td>
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<td>6</td>
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<td>5</td>
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<tr>
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<td>Electrician NS</td>
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</tr>
<tr>
<td>Engineer Supervisor</td>
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<td>0</td>
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</tr>
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<tr>
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<td>0</td>
<td>16</td>
<td>0.2</td>
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(NS indicates non-supervisor positions. GSOC indicates Gopher State One Call locator.)

**Dedicated Maintenance Personnel**

<table>
<thead>
<tr>
<th>Dedicated Maintenance Personnel</th>
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<th>County</th>
<th>Mn/DOT</th>
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<tbody>
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<td>1</td>
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<td>Engineer NS</td>
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Joint Operations & Maintenance Personnel

<table>
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<th>Large City</th>
<th>County</th>
<th>Mn/DOT</th>
</tr>
</thead>
<tbody>
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<td>Electronic Technician Supervisor</td>
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<td>0</td>
</tr>
<tr>
<td>Electronic Technician NS</td>
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<td>1.75</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Electrician Supervisor</td>
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<td>10</td>
<td>3</td>
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</tr>
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<td>1</td>
<td>2.3</td>
<td>0</td>
</tr>
<tr>
<td>Engineer NS</td>
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<tr>
<td>GSOC NS</td>
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<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Other Supervisor</td>
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<td>1</td>
<td>0.3</td>
<td>0</td>
</tr>
<tr>
<td>Other NS</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Totals</td>
<td>4.2</td>
<td>17.75</td>
<td>20.6</td>
<td>0</td>
</tr>
</tbody>
</table>

4. If you indicated a method other than ‘in-house staffing in Question 1 for any system/component, indicate the agency/contractor and the payment method. (Payment methods include cost-plus, fixed rate, time and materials (T&M), and other.)

The survey indicates that traffic signals are the most common system/components operated or maintained by an external agency and, for those that contract out for operations and/or maintenance, time plus material is the most common type of contract.
5. **Looking to the future, indicate the preferred method for operation and maintenance of signal systems, ITS components, and communication systems.**

For each of the components listed in the survey, 50 percent or greater of the respondents indicated a preference for having a public agency, other than themselves conduct the operations and maintenance. Having operations and maintenance conducted in-house was consistently the second choice.

**Traffic Signals**
Message Signs

Oak Grove indicated that they would prefer an independent contractor for the operations and maintenance of message signs.

CCTV Cameras

Bloomington indicated that they would prefer an independent contractor for CCTV operations and maintenance.
Communication System – Fiber Optic Cable

![Fiber Optic Cable Systems O&M](chart)

Communication System – Fiber Optic Cable End Equipment

![FOC End Equipment O&M](chart)

Communication System – Other

![FOC End Equipment O&M](chart)
6. Consider which components/systems hold the greatest potential for regional operation and maintenance, and indicate your priority for each component/system. (‘1’ indicates the highest priority and ‘7’ the lowest.)

Traffic signals, the most commonly held of the systems/components included in the survey, were deemed to have the greatest potential for a regional operations and maintenance approach. Fiber optic cable systems and end equipment were deemed to hold the second greatest potential.

Average Priority Ranking

Number of responses for each ITS System is given in parenthesis after the average ranking
7. Indicate the areas you would be interested in discussing further regarding regional operations & maintenance.

Nineteen of the thirty-three respondents indicated an interest in further discussion of regional operations and maintenance for traffic signal systems. Operations and maintenance of message signs was a distant second with ten respondents signifying that they would be interested in further discussion. Considering, however, that eight of the thirty-three respondents currently own arterial dynamic message sign systems, this represents a strong interest in further discussion.

**Interest In Further Discussion**

- Traffic Signal Maint: 20
- Traffic Signal Op: 19
- Message Sign Maint: 9
- Message Sign Op: 8
- FOC End Equipment Maint: 6
- FOC End Equipment Op: 6
- CCTV Camera Maint: 7
- CCTV Camera Op: 7
- Other Communication System Maint: 5
- Other Communication System Op: 5
- OCS End Equipment Maint: 5
- OCS End Equipment Op: 5
- Other Communication System Maint: 4
- Other Communication System Op: 4
- Fiber Optic Cable Maint: 5
- Fiber Optic Cable Op: 5
- Yes – 19 (58%)
- No – 12 (36%)
- No Response – 2 (6%)

8. Does your agency currently stock spare parts?

Yes – 19 (58%)
No – 12 (36%)
No Response – 2 (6%)
Below are all statements of philosophy on stocking spare parts.

**Mn/DOT** stock spare parts based on past experience and anticipated need.

**Washington County** keeps a higher percentage of the most problematic components but don’t have explicit target percentages for spare parts. They buy what they can afford.

**Dakota County** tries to anticipate approximately 1 year need when purchasing.

**Ramsey County** will try to maintain spares of most major components, and stock enough of other items to keep things going.

**Hennepin County** maintains a stock of 10% of the total components in the field, as a general rule.

**The City of Eden Prairie** stocks spare parts based on opportunity and need. They salvage heads, controllers, and cabinets. They need load switches, EVP detector boards, bulbs, and flash transfer relays.

**The City of Woodbury** stocks LED units based on percentage of units in the field.

**The City of Minneapolis** has very defined spare part inventory objectives. Inventories are replenished annually.

**The City of Oak Park Heights** stocks only minor maintenance items such as bulbs and fuses.

**The City of Fridley** stocks extra lamps for immediate repair of traffic signals.

**The City of St. Paul** bases its inventory levels on the ramifications if parts are not in stock and consider availability from other government agencies.

**The City of Crystal** reports that Hennepin County maintains traffic signals on their roads.

**The City of Golden Valley** reports that bulbs are the only spare parts that they keep in inventory.

**The City of Hopkins keeps** only parts for city owned traffic signals in stock.

**The City of Bloomington** reports that their spare parts inventory decisions are driven by cost and reliability. The more problematic a component proves to be, the higher the inventory.

**The City of Chanhassen** maintains spare parts as a percentage of their equipment in the field. 5% of LEDs, 5% of yellow bulbs, 1% of controllers, and 5% of load switches.
The City of Richfield stocks only those items they use for their limited maintenance of traffic signals. The complexity of the system dictates their role in maintenance.

9. Training

A. Describe any specialized training your staff has received in order to assist with the operation or maintenance of signal systems, ITS components and communication systems.

Fourteen of the thirty-three respondents (42%) indicated that their employees did have special training.
- Signal O/M – 6 responses
- Video Detection/CCTV – 3
- General Electronic technician training – 3
- SCOOT/SCAT signal controller software – 2
- The following were each listed once: licensed journeymen, NEMA Controller, TCS II, CMS, ICTM, ORION.

B. Please describe any operations and/or maintenance related training needs your agency may have

Eleven of the thirty-three responses (33%) said that they desired additional special training.
- Fiber optics – 4 responses
- Signal operations – 3
- Timing – 3
- Signal controller programming – 3
- Emergency vehicle preemption systems – 2
- Video Detection/Closed Circuit Television systems – 2
- The following were each listed once: synchro training, signal maintenance, LED signal maintenance, fiber optic splicing, work zone safety, and Autoscope.

10. Equipment

A. Describe any specialized equipment you have in-house to assist in the operations or maintenance of signal systems, ITS components and communication systems

Eleven of the thirty agencies indicated that they do keep special equipment
- Loop Tester – 7
- Conflict Monitor Tester – 3
- Cable Locator – 2
- Emergency vehicle preemption tester – 2
- Meggers – 2
- Oscilloscope – 2
The following were each listed once: voltage tester, ohmmeter, fiber optic/CCTV camera test equipment, PC software, environmental chamber, cable fault tester.

B. Describe any equipment needs you may have in order to perform current operations and maintenance activities efficiently.

Six of the thirty-three responses (18%) listed any special equipment. No equipment was listed more than once; answers are as follows:

- Conduit Steamer, tower truck, fiber optic equipment, personal computer system
- Fiber test equipment
- Bucket truck
- Load switch test equipment, conflict monitoring test equipment
- Boom truck
- Communications to monitor video from CCTV

11. Indicate how you support traditional pavement markings, signing, signal system/street light relamping, and painting. Also indicate your interest in regional maintenance of these activities.

Support of Traditional Systems

<table>
<thead>
<tr>
<th>Area</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Painting</td>
<td>22</td>
</tr>
<tr>
<td>Street Light Relamping</td>
<td>18</td>
</tr>
<tr>
<td>Signal Relamping</td>
<td>22</td>
</tr>
<tr>
<td>Signing</td>
<td>26</td>
</tr>
<tr>
<td>Pavement Markings</td>
<td>19</td>
</tr>
</tbody>
</table>

![Support of Traditional Systems Chart]

- **External Contract Service**: 22 responses
- **In-house Agency Support**: 19 responses
- **Other**: 3 responses
Current Level of Support

Pavement Marking

Sixteen agencies said they provide agency support, nineteen agencies said they provided contract support, and 5 agencies did not identify any support.

Interest in Regional O&M

Pavement Marking O&M Interest

- Yes: 11
- No: 9
- No Answer: 13

Signing

Twenty-six agencies said they provided agency support, four said they provided contract support, and six agencies did not identify any support.

Signing O&M Interest

- Yes: 6
- No: 10
- No Answer: 17

Signal Relamping

Twenty-two agencies said they provided agency support for signal relamping, nine said they provided contract service, and six did not indicate any support.

Signal Relamping O&M Interest

- Yes: 13
- No: 5
- No Answer: 15

Street Light Relamping

Twelve agencies listed that they provide agency support for street light relamping, nineteen agencies said that they provide contract service support, and six did not indicate any support.

Street Light Relamping O&M Interest

- Yes: 13
- No: 5
- No Answer: 15
**Current Level of Support**

**Painting**

Nine agencies indicated that they provide agency support for painting, twenty-two noted support through contract services, and six did not indicate any support.

**Interest in Regional O&M**

12. Does your agency have any written policies and procedures for operations, maintenance, or preventative maintenance activities? If yes, would you be willing to share them with Mn/DOT?

Four of the responding agencies indicated that they do have written policies in place, while twelve responded that they do not. All four who do have a written policy (Hennepin County, Scott County, the City of Richfield, and the City of St. Paul) would be willing to share. Bloomington replied that they are currently writing their policy and would appreciate any help from Mn/DOT.

13. What is your agency’s policy on “response time” for equipment failures, malfunctions, or citizen complaints?

![Response Time Chart](chart)
14. Please list any current inter-jurisdictional operations and maintenance agreements your agency may have in place with other agencies.

Twenty-three of the thirty agencies indicated that they do have interagency agreements. The following chart illustrates the agencies with which the respondents have inter-jurisdictional agreements. The cities referenced in the chart are listed below.

Cities Listed:
- St. Paul – 2
- Bloomington – 2
- Chanhassen
- Maple Grove
- Champlin
- New Hope
- Crystal
- White Bear Lake
- Woodbury
- Forest Lake
- Stillwater
- Lake Elmo
- Oakdale
- Mahtomedi
- Apple Valley
- Burnsville
- Eagan
- City not identified – 6
15. List any additional comments you would like to share with us or topics you would like addressed as we begin development of the agenda for the stakeholder forum.

- I am concerned for operations and maintenance of ITS devices. We need to provide for staff to accomplish program. All metro ITS O&M activities should be under one agency (Metro Traffic Control).
- We hire an independent contractor to splice fiber optic cables.
- Question 1 is unclear, because O/M is not clear-cut for each signal. We own 41 traffic signals, but do O/M for more. Also, we perform minor maintenance on signals, but we hire St. Paul for more involved maintenance on them.
- Training in basic signal trouble-shooting skills may be necessary due to possibly inexperienced Bloomington staff from new employees.
- Major city/county roads with freeway interchanges & continuity on either side of the freeway should run on city/county close loop system. We operate arterial ITS on TH 252.
- Hennepin County maintains lights on their roads, and Mn/DOT should too because small cities don’t have the equipment or safety devices to properly do so.
- Richfield will support regional cooperation that enhances operations, reduces costs, or strengthens training of support staff.

16. Would you be interested in attending the stakeholder forum?

Yes – 21 (63%)
No – 10 (30%)
No Response – 2 (6%)

The following agencies responded to the survey.

<table>
<thead>
<tr>
<th>Agency</th>
<th>Responder</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Apple Valley</td>
<td>Neal Heuer</td>
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<td>City of Blaine</td>
<td>Charles Lenthe</td>
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<td>City of Bloomington</td>
<td>Paul Zager</td>
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<td>City of Brooklyn Park</td>
<td>Jeff Holstein</td>
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<td>City of Chanhassen</td>
<td>Mike Wegler</td>
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<td>Chisago County</td>
<td>Emil “Mic” Dahlberg</td>
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<tr>
<td>Dakota County</td>
<td>Pete Sorenson</td>
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<td>City of Eden Prairie</td>
<td>Randy Newton</td>
<td>54,901</td>
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<td>City of Fridley</td>
<td>Jon Haukaas</td>
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<td>City of Golden Valley</td>
<td>Jeff Oliver</td>
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<td>City of Hampton</td>
<td>Karen Priebe</td>
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<td>Hennepin County</td>
<td>Jerry Smrcka</td>
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<td>City of Hopkins</td>
<td>Vern Pankratz</td>
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<td>Mike Spack</td>
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<td>Population</td>
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<tr>
<td>----------------------</td>
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<tr>
<td>City of Mendota Heights</td>
<td>Jim Danielson</td>
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<td>City of Minneapolis</td>
<td>Steve Mosing</td>
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<td>City of Newport</td>
<td>Bruce Hanson</td>
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<td>City of Oak Grove</td>
<td>Janice Olsen</td>
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<td>Jay Johnson</td>
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<td>Brian Bachmeier</td>
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<td>Ramsey County</td>
<td>Daniel Soler</td>
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<td>City of Richfield</td>
<td>Tom Foley</td>
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<td>City of St. Paul</td>
<td>John Marzko</td>
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<td>City of St. Paul Park</td>
<td>Lee Flandrich</td>
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<td>Scott County</td>
<td>Brad Larson/ Brian Sorenson</td>
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<td>City of Spring Lake Park</td>
<td>Terry Randall</td>
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<td>Wayne Sandberg</td>
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<td>David Jessup</td>
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<tr>
<td>Mn/DOT</td>
<td>Beverly Farraher</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B: Survey Form
April 30, 2001

RE: Metro Area Operations and Maintenance Assessment Survey

Dear Transportation Professional:

The Minnesota Department of Transportation (Mn/DOT), Metro Division is continuing their planning efforts for signal systems and intelligent transportation systems (ITS), specifically related to long term operation and maintenance of systems on arterial roadways. The first phase of this effort will involve an assessment (see attached survey). The survey will assess jurisdictional arrangements, summarize the existing operation and maintenance agreements, document staffing levels, and define interest areas for further discussion. The discussions will be focused on regional operation and maintenance activities for traffic signals, closed-circuit television cameras, message signs, and communication systems. Upon completion of the survey, an open forum will be held for all interested stakeholders to present findings and explore opportunities for possible regional operation and maintenance activities.

BRW is currently under contract with Mn/DOT. They will be providing assistance in gathering data, facilitating the forum, and preparing a final report that summarizes the discussions. It is anticipated that the final report will be completed this summer and will be sent to all forum attendees. The report will also be posted on a Mn/DOT web site.

Please review and complete the attached survey and return it to me no later than May 18, 2001 via facsimile machine at 651-634-2085 or by mail using the enclosed address label. If you are interested in any additional information, please contact me at 651-634-2152 or e-mail me at beverly.farraher@dot.state.mn.us. Mn/DOT appreciates your effort to participate in the survey and looks forward to future discussions at the upcoming forum.

Sincerely,

Beverly A. B. Farraher, P.E.
Mn/DOT Metro Division Traffic Engineer

Attachment: Operation and Maintenance Survey
List of Survey Recipients
Address Label
The purpose of this survey is to document the current jurisdictional arrangements and staffing levels for operation and maintenance of traffic signals, closed-circuit television cameras (CCTV), message signs (CMS, VMS, DMS), and communication systems (fiber optic cable, twisted pair, telephone lines, wireless, etc.) It will also assess any potential opportunities for regional long-term operation and maintenance in these same areas. The information collected will be used as the basis for further discussions at an upcoming stakeholder forum.

1. Indicate the approximate number of arterial components your agency is responsible for operating (defined as timing signals, viewing images, initiating messages) and/or maintaining (defined as replacing knockdowns, relamping, troubleshooting). Also indicate how you operate and maintain those components.

<table>
<thead>
<tr>
<th>Total Number Own</th>
<th>Number of Components Agency Operates</th>
<th>Number of Components Agency Maintains</th>
</tr>
</thead>
<tbody>
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<td>Traffic Signals</td>
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<td>Independent Contractor</td>
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<tr>
<td></td>
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<td>Independent Contractor</td>
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<tr>
<td>Message Signs</td>
<td>In-house Staffing</td>
<td>Independent Contractor</td>
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</table>

<table>
<thead>
<tr>
<th>Total Number Own</th>
<th>Number of Components Agency Operates</th>
<th>Number of Components Agency Maintains</th>
</tr>
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<tr>
<td>----------</td>
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<tr>
<td>CCTV Cameras</td>
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<tr>
<td></td>
<td>Other</td>
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</tr>
<tr>
<td>Communication System – Fiber Optic Cable</td>
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</tr>
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<td></td>
<td>Independent Contractor</td>
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<td>Communication System – Fiber Optic Cable End Equipment</td>
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<tr>
<td></td>
<td>Independent Contractor</td>
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<td>Contract with Public Agency</td>
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<td>Other</td>
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<tr>
<td>Communication System - Other</td>
<td>In-house Staffing</td>
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<td>Independent Contractor</td>
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<td>Other</td>
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<tr>
<td>Communication System – Other End Equipment</td>
<td>In-house Staffing</td>
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<td></td>
<td>Independent Contractor</td>
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<td>Contract with Public Agency</td>
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<td></td>
<td>Other</td>
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</tbody>
</table>

2. If you checked 'communication system - other' in Question 1, indicate below the other type of communication system your agency maintains. (i.e. twisted pair, wireless, microwave).
3. If you indicated 'in-house staffing' for Question 1, indicate what type of staff you employ (technician, electrician, engineer, Gopher State One Call locator) and indicate the number of staff for each type (number or fraction of full-time person) and whether they are supervisors or non-supervisors.

<table>
<thead>
<tr>
<th>Total Number of Staff</th>
<th>Type of Staff</th>
<th>No. of Each Type</th>
<th>Supervisor (S) or Non-Supervisor (NS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dedicated Operations Personnel</td>
<td>Technician</td>
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<td></td>
<td>Electrician</td>
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<td></td>
<td>Engineer</td>
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<td>Other ______</td>
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<tr>
<td>Dedicated Maintenance Personnel</td>
<td>Electronic Technician</td>
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<tr>
<td></td>
<td>Electrician</td>
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<td></td>
<td>Engineer</td>
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<td></td>
<td>GSOC Locator</td>
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<tr>
<td>Joint Operations and Maintenance Personnel</td>
<td>Electronic Technician</td>
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<td>Electrician</td>
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<td>GSOC Locator</td>
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<td></td>
<td>Other ______</td>
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</table>

4. If you indicated a method other than 'in-house staffing' in Question 1 for any system/component, indicate below the agency/contractor and payment method. (Payment methods include cost-plus, fixed rate, time and materials, and other.)
<table>
<thead>
<tr>
<th>Component Supported</th>
<th>Agency/ Contractor</th>
<th>Payment Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Signals</td>
<td></td>
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<tr>
<td>Message Signs</td>
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<tr>
<td>CCTV Cameras</td>
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<tr>
<td>Comm System - Fiber Optic Cable</td>
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<tr>
<td>Comm System - Fiber Optic Cable End Equipment</td>
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<tr>
<td>Comm System – Other</td>
<td></td>
<td></td>
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<tr>
<td>Comm System – Other End Equipment</td>
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</tbody>
</table>

5. Looking to the future, indicate below the preferred method for operation and maintenance of signal systems, ITS components, and communication systems. (Check appropriate boxes for each component/system.)

<table>
<thead>
<tr>
<th>Component Supported</th>
<th>In-house Staff</th>
<th>Independent Contractor</th>
<th>Contract with Public Agency</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Signals</td>
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<tr>
<td>Message Signs</td>
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<td>CCTV Cameras</td>
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<td>Comm System - Fiber Optic Cable</td>
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<td>Comm System - Fiber Optic Cable End Equipment</td>
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<td>Comm System – Other</td>
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<tr>
<td>Comm System – Other End Equipment</td>
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</tbody>
</table>

6. Considering which components/systems hold the greatest potential for regional operation and maintenance, indicate below your priority for each component/system. (Use 1,2,3,4 to indicate priority order. Each number can be used more than once.)
### Priority Order for Regional Operations

<table>
<thead>
<tr>
<th></th>
<th>Priority Order for Regional Operations</th>
<th>Priority Order for Regional Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Signals</td>
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<tr>
<td>Message Signs</td>
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<tr>
<td>CCTV Cameras</td>
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<td>Comm System - Fiber Optic Cable</td>
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<td>Comm System - Fiber Optic Cable End Equipment</td>
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<tr>
<td>Comm System - Other</td>
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<tr>
<td>Comm System - Other End Equipment</td>
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</tbody>
</table>

7. Indicate the areas you would be **interested in discussing further** regarding regional operations and maintenance. (Check appropriate boxes)

<table>
<thead>
<tr>
<th></th>
<th>Regional Operations</th>
<th>Regional Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic Signals</td>
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<tr>
<td>Message Signs</td>
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<tr>
<td>CCTV Cameras</td>
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<tr>
<td>Communication System – Fiber Optic Cable</td>
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<tr>
<td>Communication System – Fiber Optic Cable End Equipment</td>
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<tr>
<td>Communication System – Other</td>
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<td></td>
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<tr>
<td>Communication System - Other End Equipment</td>
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</tbody>
</table>

8. Does your agency currently stock spare parts?

Stock spare parts___________  Do not stock spare parts___________
If you stock spare parts, please state your philosophy for stocking spare parts. (i.e., % of each component, % of most problematic components) How do size, cost, and availability affect your decisions? How does your philosophy vary by the type of system?

________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
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________________________________________________________________________________________________________

9. Training

A. Describe any specialized training (i.e., electronics, fiber optics, signal operation) your staff has received in order to assist with the operation or maintenance of signal systems, ITS components, and communication systems.

________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________

B. Please describe any operations and/or maintenance related training needs your agency may have.

________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
________________________________________________________________________________________________________
10. Equipment

A. Describe any specialized equipment (i.e., loop testers, meggers, fiber optic testers) you have in-house to assist in the operation or maintenance of signal systems, ITS components, and communication systems.

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B. Describe any equipment needs you may have in order to perform current operations and maintenance activities efficiently.

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11. Indicate how you support traditional pavement markings, signing, signal system/street light relamping, and painting. (Check appropriate boxes) Also, indicate your interest in regional maintenance of these activities.

<table>
<thead>
<tr>
<th></th>
<th>Agency Support</th>
<th>Contract Service</th>
<th>Interest in Regional Maintenance - Yes(Y) /No(N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavement Markings</td>
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<tr>
<td>Signing</td>
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<tr>
<td>Signal Relamping</td>
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<td></td>
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<tr>
<td>Street Light Relamping</td>
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<td></td>
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<tr>
<td>Painting</td>
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</tbody>
</table>
12. Does your agency have any written policies and procedures for operations, maintenance, or preventive maintenance activities? If yes, would you be willing to share them with Mn/DOT?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

13. What is your agency’s policy on “response time” for equipment failures, malfunctions or citizen complaints?

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14. Please list any current inter-jurisdictional operations or maintenance agreements your agency may have in place with other agencies.

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________________________________________________________________________
15. List any additional comments you would like to share with us or topics you would like addressed as we begin development of the agenda for the stakeholder forum.
________________________________________________________________________
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16. I would be interested in attending the stakeholder forum.  
Yes_______  No_______

17. Please provide information on your availability to attend the stakeholder forum, which will be scheduled between mid-June and mid-August. (i.e., unavailable to attend second and fourth Monday of the month, unavailable June 18 – 22, etc.)
________________________________________________________________________
________________________________________________________________________
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18. Would you like future contacts regarding this initiative to be via e-mail or hard copy?  
E-mail _______  Hard Copy _______
19. Identify below which jurisdiction you represent, your title, mailing address, telephone, fax, and e-mail address.

NAME:________________________________TITLE:________________________________

JURISDICTION:_____________________________TELEPHONE:________________

ADDRESS:______________________________________________________________

FAX:___________________________E-MAIL:________________________________

Please return this survey to Beverly Farraher by fax at 651-634-2085 or by mail using the enclosed address label.

If you have any questions, please contact:

Beverly A. B. Farraher, P.E.
Mn/DOT
Metro Division
(651) 634-2512

or e-mail me at beverly.farraher@dot.state.mn.us.

THANK YOU FOR YOUR ASSISTANCE WITH THIS SURVEY!
Appendix C: Stakeholder Agenda and Breakout Questions
Metro Area Regional Operations & Maintenance
Stakeholder Forum
AGENDA
Tuesday, August 14, 2001
Arden Hills Training Center
1900 West County Road I, Room 4, Shoreview, MN
Time: 10:00 a.m. – 3:30 p.m.
Dress: Business Casual (No Ties)

10:00 a.m. Background
- Why are we here? (Mn/DOT)
- Regional Perspective (Mn/DOT)
- National Perspective (FHWA)
- Potential Funding Sources (FHWA)

10:30 a.m. Survey Results (URS)

10:45 a.m. Case Studies (URS)

11:00 a.m. Breakout Sessions – Part 1 (All)
Topics to Discuss:
- O&M Needs/Issues/Concerns
- Possible Solutions
- Regional Program Benefits/Barriers
- Funding/Agreements

Noon Lunch/Networking

1:00 p.m. Breakout Sessions – Part 2 (All)
Topics to Discuss:
- Regional O&M Stakeholders, Project Area, Components & Priorities
- Organizational Model
- Strategy for Next Steps
- Other

2:00 p.m. Breakout Group Summaries (All)

2:30 p.m. Voting Exercise (All)

3:00 p.m. Summary of Day/Next Steps/Wrap-up (Mn/DOT & URS)

3:30 p.m. Adjourn
Metro Area Regional Operations & Maintenance Stakeholder Forum

Breakout Session Questions

Part 1

1. What are your agencies’ greatest needs/issues/concerns in the area of operations and maintenance?

2. What suggestions/ideas do you have to address any identified needs, issues and/or concerns?

3. Could any of these needs/issues/concerns be addressed more effectively through a regional operations and maintenance program? If yes, which ones.

4. What would you anticipate to be the benefits of a regional operations and maintenance program?

5. What do you see as the greatest barriers to developing a regional operations and maintenance program? What strategies would you suggest for overcoming these barriers?

6. What suggestions or strategies do you have for funding a possible regional operations and maintenance program?

7. What suggestions or strategies do you have for staffing a possible regional operations and maintenance program?

8. Would existing inter-jurisdictional agreements adequately cover a regional operations and maintenance program? If not, what suggestions do you have for establishing a new agreement or Memorandum of Understanding?

Part 2

9. Is a regional operations and maintenance program worth further consideration? If no, why not, and under what circumstances would a regional program make sense? If yes, please answer the following questions:
a. From whom would we need buy-in?

b. What arterial classifications should be included in a regional program? (i.e. all roadways, primary arterials, other.)

c. Of the following list, which 3 components/systems hold the greatest potential for regional operations and maintenance and why? Which 3 hold the least potential and why? (O&M Component Categories: Traffic Signals, Message Signs, CCTV Cameras, Fiber Optic Cable, Fiber Optic Cable End Equipment, Other Communication Systems, Street Light Relamping, Signal Relamping, Signing, Pavement Markings, Painting, Other)

d. Would a pilot study be an effective way to initiate a regional operations and maintenance program? If so, do you have any suggested locations for a pilot and what technology components should it include?

10. Based on the information gathered through the case studies and taking into account funding, political and staffing considerations;

   a. What scope of responsibility would be most appropriate for a Twin Cities regional program? (e.g. operations and maintenance, operations only, maintenance only, planning and programming)

   b. What agency/organization/jurisdiction would be the most appropriate lead for developing and overseeing a regional operations and maintenance program?

   c. Please describe a strategy on how to move forward with the concept of a regional operations and maintenance program (i.e., please describe the next steps).

11. Please provide any other comments you may have.
Appendix D: Stakeholder Presentation
Summary
Background:

Why Are We Here? A Regional Perspective
Bev Farraher of Mn/DOT's Metro Division

Bev began the meeting with a brief description of the background and purpose of the forum. She explained that in the process of developing the Mn/DOT Metropolitan Arterial ITS Deployment Plan, it became apparent that successful deployment would depend on effective arterial operations. A primary objective of this stakeholder forum is to determine if there are any fundamental improvements that can be made to existing engineering and/or organizational systems.

One possibility to be considered is the formation of a regional operations and maintenance program. A regional approach to operations and maintenance has the potential to: improve coordination and communication among agencies; promote common standards; allow for greater system integration and optimization; allow for shared staffing and expertise; and leverage funding opportunities.

As experts, the stakeholders in attendance are being asked to share their ideas and concerns in regard to operations and maintenance. The stakeholders’ input will define the scope and direction of this effort. Success will require: a common vision and mission; technical, management, and political support; and a well-developed implementation plan.

The product of this phase of the project will be a report that summarizes the vision, thoughts, concerns, and ideas expressed through the survey and at this stakeholder forum.

A National Perspective on Operations
Jim McCarthy, Federal Highway Administration

Historically, the focus of the Federal Highway Administration has been on the development of the national highway system. Over the past ten years, however, the FHWA is shifting its emphasis away from development and toward operations and maintenance. Traffic congestion has become a major public policy issue. The FHWA is supporting innovative regional traffic operations programs that focus on improving the efficiency of existing regional transportation systems and that address the issue of congestion.

With the passage of the last two transportation authorization bills, operations and maintenance activities have gone from being almost entirely ineligible for federal funds to almost entirely eligible. Eligible operations activities include: labor, facility operations, system maintenance, and software and hardware procurement (when the software/hardware is used to maintain peak system performance.)
In addition to the more flexible funding, the FHWA has entered into a national dialogue on operations in conjunction with the Institute of Transportation Engineers (ITE), the American Association of State Highway and Transportation Officials (AASHTO), the Federal Transit Administration, ITS America, and the American Public Transportation Association (APTA).

The national dialogue on operations is ongoing. The 2000 and 2001 ITE spring conferences have been dedicated to operations. The next summit on operations is scheduled for October of 2001. Jim mentioned that additional information is available on FHWA’s website http://ops.fhwa.dot.gov.

Case Studies
Daryl Taavola, URS
(also see Chapter 3: Case Study Findings, p. 9)

Daryl presented information on regional traffic operations initiatives in Las Vegas, Nevada; Los Angeles County, California; Rochester, New York; and Kansas City, Missouri.

The Las Vegas Area Computerized Traffic System is the most comprehensive regional operations and maintenance program for arterial traffic signals. Created in 1981, the LVACTS is an independent regional agency that operates and maintains more than 600 traffic signals and other traffic management tools in the cities of Las Vegas, North Las Vegas, and Henderson, as well as Clark County. Each agency funds the system based on a formula that takes into account the number of signals within their respective boundaries.

Monroe County, New York, has a county lead operations and maintenance program. The Rochester metropolitan area is unique in that the city and all of the suburbs fall within one county. The county has agreements in place with all municipal governments to cover operations and maintenance of traffic signals. The county also operates and maintains 60 of the roughly 500 state owned traffic signals within the county (those linked to the central system).

The Los Angeles County provides an example of a regional approach to the planning and programming of ITS and traffic signals on urban arterials. With funding provided through the Los Angeles County Metropolitan Transportation Authority (LACMTA), project planning and programming is lead by Los Angeles County’s Department of Public Works as directed by the Signal Support Group (SSG). Operation and maintenance responsibilities remain with the participating jurisdictions.

The Kansas City area is of interest because it is similar in size to the Minneapolis/St. Paul area and, as a region, is moving toward regional traffic operations. The Mid-America Regional Council, the Kansas City metropolitan planning organization, has recently completed a feasibility study for a regional integrated signal system and is in the process
of shoring up funding to upgrade signal systems at 600 intersections. Phase I of the enhancements will include replacement of signal controllers, development of signal timing plans, and addition of wireless communication for isolated traffic signals. The feasibility study provided capital cost estimates and included a system inventory. The inventory found that 20 different agencies operate and maintain signals in the Kansas City metropolitan area, using three different types of controllers.

**Stakeholder Survey Findings**

**Mark Nelson URS**

(also see Chapter 2: Stakeholder Survey p. 10, and Appendix A: Complete Survey Results)

Transportation agencies from throughout the Minneapolis/St. Paul eight county metropolitan area were surveyed to assess the current status of operations and maintenance in terms of jurisdictional arrangements and existing operations and maintenance agreements as well as to identify current staffing levels and interest areas for further discussions. Of the 109 surveys that were distributed, responses were received from thirty-two agencies, including 7 of the 8 counties and most of the larger cities within the metropolitan area.

Each of the forum participants was given a comprehensive summary of the survey results. The presentation highlighted some of the findings including: types of equipment owned/operated/maintained by the responding agencies, staffing, source of external operations and maintenance contracts, potential for a regional program, and interest in further discussion.

The survey results indicate a wide variety of experiences and levels of involvement in the operation and maintenance of arterial signal systems, ITS components, and communication systems. There is a strong interest in further discussion of a regional operations and maintenance program, with traffic signals deemed to be the component that best lends itself to such a program.
Appendix E: Notes and Voting Results from The Stakeholder Forum
What are your agencies’ greatest needs/issues/concerns in the area of operations and maintenance?

Group 1

1.) Budgets for operations and maintenance have been reduced or have not kept pace with need.
2.) Staffing levels are not keeping pace with system expansion.
3.) It is difficult to develop expertise for increasingly specialized equipment.
4.) There was a question as to whether it would be possible to have a regional operations and maintenance program in a metropolitan area as large as the Minneapolis/St. Paul area.
5.) Scarce resources have resulted in a lack of preventative maintenance. Agencies have taken the approach, “If its not broken don’t fix it”
6.) Statewide contracts for purchase of equipment and statewide standardization would be beneficial.
7.) There is a lack of regional traffic information beyond the freeway system.
8.) There is a need for specialized training.
9.) A regional operations and maintenance programs would have to address participating agencies’ expectations in terms of quality of service, costs, and priorities.

Group 2

1.) Staffing. There is inadequate budget for staffing operations and maintenance. It is difficult to recruit and retain staff.
2.) Liability. More than one agency is often responsible for a single system. For example, in Hopkins, the city owns signals that are maintained by the state and operated by the county.
3.) Training. There is insufficient training to operate and maintain new systems and equipment.
4.) Equipment Standardization. Without standardization, there are too many different types of equipment in the field to be operated and maintained by a single organization.
5.) Response Time. When there is a malfunction or a complaint, the public is often being bounced around from agency to agency, which is detrimental to response time.
6.) Installation of Unwarranted Signals. Installation that is done at the request of an elected official can be counter-productive. Unwarranted signals can decrease the efficiency of the overall system.
7.) Lack of Spare Parts/Equipment. There is no funding to purchase parts/equipment to fix or maintain equipment, particularly specialty equipment such as CCTV systems and message boards.

Group 3
1.) It would be difficult to determine the appropriate size of an operations and maintenance staff for a regional program.
2.) Attracting and retaining staff, specifically operations staff is an issue. Agencies are forced to be reactive rather than proactive.
3.) Agencies don’t have the resources to invest in developing staff competence in specialized technologies such as CCTV, Fiber optic, and variable message signs.
4.) Pavement Markings. Trying to meet FHWA’s Retroreflectivity Standards & DOT 365 DAP is difficult within paint budgets.
5.) Developing and maintaining adequate street lighting along major corridors.
6.) There is limited time available to work on major arterials. Work zones are being set up more and more at night.
7.) Operations and maintenance concerns should be addressed throughout the planning process.

Group 4

1.) Lack of staffing to meet operations and maintenance objectives.
2.) Upgrading and keeping equipment current is a challenge for smaller agencies.
3.) Inventory levels are kept at a bare minimum.
4.) It is difficult to develop or obtain the expertise needed. No qualified applicants and the low wage scale do not attract experienced workers.

2. What suggestions/ideas do you have for addressing these needs?

Group 1

- Develop a regional maintenance program to realize economies of scale.
- Work as a grout to contract for operations and maintenance tasks.

Group 2

- Create a centralized telephone number for the reporting of equipment malfunctions.
- Combine resources.
- Improve specialization through multi-agency team formation.
- Do a better job of coordinating emergency vehicle priority systems among agencies.
- Improve maintenance planning, project management, and training.
- Improve coordination among municipalities.

Group 3

- Planning for infrastructure maintenance should be formalized. Have to think about operations and maintenance issues “out of the box”.
• Regional coordination. Agencies should sit down regularly to discuss not only operations and maintenance but also access management and to achieve greater regional uniformity.
• Regional coordination versus formal regional structure. Agencies could work together to address maintenance timing issues, to coordinate roadwork with adjacent jurisdictions.
• Lighting issues get very political. Agencies must do a better job of communicating with the public and one another.

Group 4

• Increase operations and maintenance budgets
• Develop different pay scales for specialized staff.
• Develop additional training opportunities for new staff or work with the IMSA to develop a training program.
• Work with colleges in the region to improve opportunities for traffic engineering and specialization within traffic engineering.

3. **Could any of these needs/issues/concerns be addressed more effectively through a regional operations and maintenance program?**

Group 1

• Specialized items such as variable message signs, cameras and fiber optic cable
• Training
• Sub regions may be a better scale for maintenance support and loop replacement.
• It would be better if one telephone call got the work done.

Group 2

• A centralized public telephone number for reporting equipment malfunctions/problems.
• A regional approach could provide easier access to experts on specialized equipment.
• With a regional program, it would be possible to maintain a regional traffic center
• Expanding operations and maintenance staff.

Group 3

• Regional coordination of signals. Consultants are often doing timing plans for local agencies. There is little emphasis given to uniformity among jurisdictions.
• Coordinating arterial and freeway traffic to respond regionally to congestion or incidents.
• Better coordination/cooperation for major events.
• Develop expertise in fiber optic cable, CCTV, Message sign.
• Sharing of maintenance equipment.

Group 4

• Smaller cities could benefit from a regional approach.
• A regional approach would reduce administration costs.
• A regional umbrella agreement would replace the large number of interagency agreements needed to conduct shared operations and maintenance of signal systems.

4. What would you anticipate to be the benefits of a regional operations and maintenance agreement?

Group 1

• One-stop shopping for reporting problems. One phone call to a “central dispatch”.
• Improved level of expertise.
• Potential to reduce overall costs.
• Opportunity to address many of the needs listed.

Group 2

• Improved service to the public.
• Improved use and efficiency of resources.

Group 4

• Increase smaller agencies’ access to ITS.
• Develop a regional priority for operations and maintenance of signal systems.
• Provide for more operational consistency/coordination particularly along corridors.
• Standardization of practices.
• Address staffing needs.

5. What do you see as the greatest barriers to developing a regional operations and maintenance program? What strategies do you suggest to overcoming these barriers?

Group 1
• Lack of funding.
• Getting political support.
• The contracting process
• Getting buy-in from the unions that would be affected.
• Not seen as a high priority.
• Building infrastructure (staff, equipment, physical plant.)
• Staffing, recruiting and training would be a challenge.

Group 2

• Jurisdictional and political barriers. There would be a need to increase the level of cooperation among agencies/jurisdictions.
• Resistance to change. Would have to show projections of greater efficiency.
• Funding. Would need contributions from all participating agencies.

Group 4

• Getting buy-in from the many trade unions (often competing unions) that are involved in operations and maintenance.
• Loss of autonomy. Agencies may not be willing to give up their ability to respond directly to the requests of their administrator/city hall.

6. What suggestions or strategies do you have for funding a possible regional operations and maintenance program?

Group 1

• Each jurisdiction should calculate their unit costs for operating and maintaining components.
• Las Vegas offers a good model.

Group 2

• Present safety, efficiency and investment return information based on research and statistics.

Group 4

• Every agency would have to contribute based on a formula that took into account the number of components owned by the jurisdiction and the number of service calls these components generate.
• Have to address the equity issue. Smaller communities with few signals must see the benefit of participating.
• Must also address the issue of equipment condition. There is a great variation in the age and quality of equipment among jurisdictions.
• Could funding be based on performance measures?

7. What suggestions do you have for staffing a possible regional operations and maintenance program?

Group 2

• Look to other large regions such as Kansas City.
• Inventory the personnel that are currently providing operations and maintenance support throughout the region.

Group 4

• Use the same expertise that is currently available. Only the organizational structure would change.

8. Would existing inter-jurisdictional agreements adequately cover a regional operations and maintenance program? If not, what suggestions do you have for establishing a new agreement or Memorandum of Understanding?

Group 2

1.) Create a master agreement and an agreement to cover the certification of service personnel.
2.) Look to follow other model agreements.

Group 4

1.) Existing agreement would not be adequate.
2.) There would need to be a master agreement that supersedes all others. The agreement would have to be negotiated with each of the participating agencies, to set the funding formula and the governance of the regional program.

9a. From whom would we need buy-in?

Group 1

• city councils
• county boards
• state legislature
• Met Council
  employees and upper management of agencies.

Group 2

• High level policy makers
• state legislature.

Group 3

Yes ( to 9. Is regional operations and maintenance worthwhile?) it is worth consideration, but there is no commitment. Maintenance in the region is currently considered very good. ITS components are the challenge. ( no answer to 9a.)

Group 4

• Union
• Agency policy makers
• Agency technical staff.
• The Big 5, Mn/DOT, Minneapolis, St. Paul, Hennepin County, and the Met Council.

9b. Which roadway classifications should be included?

Group 1

All

Group 2

All

Group 4

Primary arterials although customer service must be the driving factor.

9c. Which three components hold the greatest potential?

Group 1

• Cameras
• Signal Systems
• Painting and pavement markers.

Group 2
• Signals
• Signal relamping
• Cameras

Group 3

Maintenance
• Relamping
• Pavement Markings
• CCTV/Fiber Optic/CMS
• Work on joint standards and joint bidding on equipment.

Operations
• Ramp meters
• Develop a traffic management czar to monitor systems, share information with other TMC’s, coordinate use of local roads when diverting traffic from the interstate.

Group 4

• Traffic signals.
• CCTV
• Fiber Optic Cable

(Minneapolis would be interested in group relamping, but it was agreed that there would be more regional value in the high technology devices.)

9d. Would a pilot study be an effective way to initiate a regional operations and maintenance program?

Group 1

Yes to pilot study. Pavement markings and painting or traffic signals by intersection.

Group 2

Reference ICTM corridor and all components included.

Group 3

There are plenty of examples of inter-jurisdictional agreements in place. Document what is happening. Review payment methods and other aspects of these agreements.

Group 4

A pilot study would be a waste of time. This has to be accomplished on a large scale.
10a. What scope of responsibility would be most appropriate for a Twin Cities regional program?

Group 1

Depends on application and customer base. It may be different for each category.

Group 2

Start with operations and maintenance and planning and programming. It may be difficult but it would be best in the long run.

Group 4

The simplest would be just operations although operations and maintenance may provide the most bang for the buck.

10b. Which agency/organization/jurisdiction would be the most appropriate lead for developing and overseeing a regional operations and maintenance program?

Group 1

We would need a regional committee similar to Las Vegas.

Group 2

Create an organization with sub regional managers under one director, overseen by a committee with regional representation.

Group 4

A regional committee

10c. Describe a strategy for on how to move forward with the concept.

Group 1

- Scanning tour to Las Vegas
- Pilot project
- Address Barriers and issues.
- Proposal request for funding.

Group 2
Create a map of existing operations and service stations to see where service and maintenance facilities are for all agencies in the region.

Group 3

- Keep striving for best practices.
- Build upon the good work that has already been done.

Group 4

- Define representation structure, how would each jurisdiction be represented?
- Define the boundaries of the region.
- Try to get cities, counties and the state to buy-in.
- This may all be an iterative process.
Stakeholder Voting Summary

The stakeholders were asked to prioritize the following issues:

- Staffing
- Funding
- Expertise
- Preventative Maintenance
- Response Time
- Regional Traffic Information Availability
- Installation of Unwarranted Signals
- Training
- Pavement Markings
- Size/Magnitude
- Liability
- Street Lighting
- Equipment
- Spare Parts Inventory
- Availability

Staffing received the most total votes (17.3), with Funding coming in second (12.1) and Expertise a distant third (5). The votes from Mn/DOT representatives were divided by 11, the number of representatives who attended the forum, to normalize the voting.

The following graphs show the total number of votes for all the issue areas and the breakdown by agency of the voting of the top 5 issue areas. Spare Parts Inventory, Equipment, and Availability received no or negligible votes, so they do not appear in the Total Voting chart.
Overall Priority Needs Ranking

Score

Issues

Staffing
Funding
Expertise
Preventative Maintenance
Response Time
Regional Traffic Information Activity
Installation of Unwanted Signs
Training
Pavement Markings
Size/Magnitude
Liability
Street Lighting

17.3
12.1
5
4.4
4.4
3.6
3.2
2.3
2
1.3
1
1
Following are charts of the top voting scores for each type of agency.
The stakeholders were then asked to rank which systems/tasks have the greatest potential for regional operations and maintenance from the following list, followed by the total points received:

- Traffic Signals – 12.3
- Fiber Optic Cable and End Equipment - 10
- CCTV Cameras – 7.7
- Traveler Information – 5.7
- Signal Relamping – 5.4
- Pavement Markings - 5
- Message Signs – 3.3
- Street Light Relamping - 2
- Other Communications Systems – 1.4
- Painting - 1
- Signing - 0

Again, The number of Mn/DOT votes in each area was divided by 11 to normalize the Mn/DOT input.
Following are charts of the top voting scores for each type of agency.
The stakeholders were asked the following questions:

**Are regional operations worth pursuing in some manner for this region?**

Yes – 21  
No – 1

![Regional Operations Breakdown](image)

**Is regional maintenance worth pursuing in some manner for this region?**

Yes - 21  
No – 1

![Regional Maintenance Breakdown](image)
On a scale of 1 to 5, how important is it that the operations and maintenance of a system be the responsibility of the same agency/organization?

1- Not important at all
2- Not very important
3- Important
4- Very Important
5- Absolutely Essential

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<th>Agency Type</th>
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<th>Not Very Important</th>
<th>Important</th>
<th>Very Important</th>
<th>Essential</th>
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<tr>
<td>Mn/DOT</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
Which of the following business models would hold the greatest potential in the Twin Cities?
- Regional Operations and Management
- Regional O&M and Regional Planning and Programming
- Regional Planning and Programming

### Breakdown of Voting on Regional Business Models

<table>
<thead>
<tr>
<th>Agency Type</th>
<th>Regional O&amp;M</th>
<th>Regional O&amp;M and P&amp;P</th>
<th>Regional P&amp;P</th>
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<tr>
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<tr>
<td>Counties</td>
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<td>0</td>
</tr>
<tr>
<td>Mn/DOT</td>
<td>5</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>
Appendix F: Roster of Stakeholder Forum Participants
Breakout Groups

Group 1
1) Steve Misgen, Mn/DOT
2) Jon Weller, Carver County
3) Willie Meadow, Hopkins
4) Scott Tacheny, Minneapolis
5) Sheila Johnson, Mn/DOT
6) Linda Taylor, Mn/DOT
7) Rick Terway, Vadnais Heights
8) Curt Gobeli, Mn/DOT

Group 2
1) Randy Newton, Eden Prairie
2) Jerry Smrcka, Hennepin County
3) Mark Karnowski, Lindstrom
4) Paul Kurtz, St. Paul
5) Glen Carlson, Mn/DOT
6) Allan Espinoza, Mn/DOT
7) Brad Belair, Ham Lake
8) Craig Hoecherl, Mn/DOT

Group 3
1) John Maczko, St. Paul
2) Dan Soler, Ramsey County
3) Paul Zager, Bloomington
4) Boyd Bailey, Victoria
5) Nick Thompson, Mn/DOT
6) Marlin Reinardy, Mn/DOT
7) Beverly Farraher, Mn/DOT

Group 4
1) Wayne Sandberg, Washington County
2) Paul Lawrence, Fridley
3) Steve Mosing, Minneapolis
4) Adane Teferi, Mn/DOT
5) Amr Jabr, Mn DOT (PM only)
6) Jim McCarthy, FHWA
7) Ron Stallman, Hopkins
8) Ed Andrajack, Mn/DOT
Appendix G: Lessons Learned
The study team documented the lessons learned in the study process, summarizing both what worked well and what could be improved.

**Stakeholder Forum**

The stakeholder forum was a success. The participants were engaged in the topic and willing to candidly discuss the issues. Many participants indicated that the forum was worthwhile.

- The pace was good. The agenda prompted a high level of interaction among the participants. Changes back and forth from presentation to small group exercise to large group exercise made for a fast paced day.
- There was some redundancy in the breakout group questions. Less questions would have been better. Many of the later questions were discussed early in the process.
- The facilities were excellent.
- The voting exercise worked out well. It gave everyone the opportunity to express themselves individually.
- Recording the forum proved to be very helpful in documenting and double-checking the discussion points.

**Stakeholder Survey**

In terms of return rate, the stakeholder survey was quite successful. All but one of the larger cities and counties responded.

- A better definition of terms would have been helpful. In the future, we would use more standardized definitions with more detail. The ITE document, “Traffic Control System Operations: Installation, Management, and Maintenance” defines staff positions by responsibilities and signalized intersections by complexity of systems. Using these definitions would have improved our ability to compare and quantify responses.
- Questions regarding communications systems were somewhat difficult to interpret. We would simplify these questions and clarify the definitions.

**Case Studies**

The information gathered was helpful. However, with the exception of Las Vegas, there are not many examples of regional operations and maintenance programs for arterials. Las Vegas provided good insight, but their region is much smaller and simpler (4 agencies).

**General**

This feasibility study was successful. We were able to effectively:

- Gauge the interest and priorities of local stakeholders.
- Identify resources.
- Develop a strategy for moving forward.
Appendix H: Las Vegas (LVACTS) Inter-Jurisdictional Agreement
Highway Agreement No. PXXX-XX-XXX

Cooperative Agreement for the
Las Vegas Freeway and Arterial System of Transportation

This Agreement, made and entered into on the_______ day of __________,2001,
by and between the STATE OF NEVADA, acting by and through its DEPARTMENT OF
TRANSPORTATION, CLARK COUNTY, the CITY OF HENDERSON, CITY OF LAS
VEGAS, CITY OF NORTH LAS VEGAS, and the REGIONAL TRANSPORTATION
COMMISSION OF SOUTHERN NEVADA, hereinafter referred to as the MEMBER
AGENCIES.

WITNESSETH:

WHEREAS, an Interlocal Agreement is defined as an agreement by public agencies
to “obtain a service” from another public agency; and

WHEREAS, pursuant to the provisions contained in Chapter 408 of the Nevada
Revised Statutes, the Director of the Nevada Department of Transportation (NDOT) may
enter into agreements necessary to carry out the provisions of the Chapter; and

WHEREAS, NRS 277.180 authorizes any one or more public, agencies to enter into
agreements with any one or more other public agencies to perform any governmental service,
activity or undertaking which any of the public agencies entering into the agreement is
authorized by law to perform; and

WHEREAS, the purpose of this Agreement is to supplant the existing Las Vegas
Area Traffic Control System Agreement, Hwy. Agreement No. P547-80-012, and all
Amendments, whereby Agreement No. P547-80-012 and Amendments 1-3 are deleted in
their entirety and is replaced by this Agreement; and

WHEREAS, Clark County, the City of Henderson, City of Las Vegas, City of North
Las Vegas, Regional Transportation Commission (RTC) of Southern Nevada, and NDOT
each own and operate transportation infrastructure within the boundary of Clark County,
Nevada, and the NDOT District 1; and

WHEREAS, the purpose of this Agreement is to combine the Las Vegas
metropolitan area arterial traffic management system, referred to as the "Las Vegas Area
Computer Traffic System" (LVACTS), and the NDOT freeway management system (FMS)
to a single integrated organization, hereinafter referred to as the "Freeway and Arterial
System of Transportation" (FAST); and

WHEREAS, by agreement the FAST Member Agencies have determined that
through combining the arterial and freeway management systems, the Member Agencies will
achieve transportation management coordination and operational efficiency, and reduce
financial costs through joint funding and organizational consolidation; and
WHEREAS, the FAST System will be of benefit to the Member Agencies and to the people of the State of Nevada; and

WHEREAS, the FAST Member Agencies are each willing and able to perform the requirements described herein; and

NOW, THEREFORE, in consideration of the premises of the mutual covenants herein contained, it is agreed as follows:

SECTION I-, DEFINITIONS

Administrator - The Administrator is responsible for the Human Resource, administrative, and financial functions necessary for the operation and management of FAST, as more specifically described in Section III. D, below.

Appeals Board - A three-member board whose function is to hear and rule on Operations and Management Committee (OMC) decisions or actions contested by Members Agencies, as more described in Section IH. C, below.

Arterial Management System (AMS) - The AMS manages the movement of traffic on the local street network. An AMS includes a combination of ITS Field Devices, communication networks, computer hardware and software platforms to manage and control traffic.

Executive Director - The Executive Director reports to the OMC and is responsible for the daily operation of FAST, the Transportation Management Center, and implementation of the Transportation Management Strategies, as more specifically described in Section III. E, below.

FAST Organization - The institutional organization of FAST consisting of; the management structure, the OMC and Appeals Board and; the staff organization, including the Executive Director, the freeway and arterial system managers, and other professional, technical, and administrative staff.

FAST System - The operational functions and features of the freeway and arterial management systems. This would include the system, software and hardware platform, operator work stations, video wall, the communication system including the fiber optic and microwave network, and the ITS field devices and traffic signals.

Freeway Management System (FMS) - The FMS manages the movement of traffic onto and on the controlled access road-way-facilities. An FMS includes a combination of ITS Field Devices, communications networks, computer hardware and software platforms to manage and control traffic.

Incidents - An incident is an unscheduled event generally characterized as non-recurrent congestion or a traffic accident.

Intelligent Transportation System (ITS) - ITS is the collective term for using technology to implement measures targeting the efficient operations and management of transportation facilities and services.
**ITS Field Devices** - Field equipment located along existing roadways, such as, but not limited to traffic signals, Closed Circuit Television (CCTV), Dynamic Message Signs (DMS), trailblazer signs, ramp meters, detection stations, and Highway Advisory Radio (HAR).

**Jurisdictional Management Centers** (JMCs) - The site or location designated by agencies containing various equipment capable of controlling and monitoring those freeway and arterial FAST ITS Field Devices authorized through this Agreement.

**Member Agency** - Is a public agency as defined by Nevada Revised Statutes and a party to this Agreement. Further defined in Section 111, B, below.

**Operations and Maintenance (O & M)** - The Operating and Maintenance activities associated with the Transportation Management Infrastructure. O & M costs may include, but are not limited to, such items as staff salaries and benefits, utility costs, purchase of equipment and supplies, rental and leasing of equipment or facilities, purchase and repair of vehicles, consultant/contractors costs, and the upgrade and repair costs of equipment.

**Operations Management Committee (OMC)** - The OMC shall set policy and oversee the operations of FAST, as more specifically described in Section III. A, below.

**Priority Times** - The period of time, as determined by the OMC, during which all Transportation Management Infrastructure is operated and controlled according to the FAST OMC approved Transportation Management Strategies. Typically, this would include the time of day during peak periods of traffic, such as morning and afternoon rush hours, the time before, during and after special events, scheduled construction and maintenance activities, and incidents.

**Transportation Management Center (TMC)** - Site at which the FAST operational staff and equipment capable of controlling and coordinating the arterial, freeway and other Transportation Management System elements are located.

**Transportation Management Infrastructure** - The various telecommunications and field components, such as, but not limited to, conduit, fiber optic cable, traffic signals, closed circuit television, ramp meters, dynamic message signs and Trailblazer signs that are part of the Transportation Management System.

**Transportation Management Strategies** - Traffic control and other transportation measures that are approved by the OMC and used to manage the transportation infrastructure, including but not limited to freeways, arterials and transit for maximum safety and efficiency during priority times.

**Transportation Management System** - All of the various components, such as the Transportation Management Center, Transportation Management Infrastructure, central systems hardware and software, and Transportation Management Strategies that are combined to provide a system to safely and efficiently manage the transportation infrastructure.

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SECTION II: FAST ORGANIZATION

FAST is organized as shown below.

FAST ORGANIZATIONAL STRUCTURE

Appeals Board  

Operations Management Committee

Member Agencies

Administrator

Executive Director

Staff
A. Operations Management Committee (OMC)

1) Committee Structure

The OMC membership consist of one (1) representative from each Member Agency represented by the Director, or Assistant, Deputy Director(s) of Public Works, the Director of NDOT, and the General Manager of the Regional Transportation Commission. Each representative shall have a designated first and second alternate with full authority to act in the absence of the representative.

Designation of the OMC Chairperson and Vice-Chairperson shall rotate alphabetically by Member Agency. The Chairperson shall serve a one-year term starting with the July OMC meeting. Upon completion of the term, the Vice-Chairperson shall become the Chairperson and the new Vice-Chairperson shall assume his/her office.

A majority of the Member Agencies of the OMC shall constitute a quorum necessary to convene the meeting of the Committee. Unless stated elsewhere in this Agreement, all decisions of the OMC shall be determined by a majority vote of the quorum present.

The OMC shall meet on a monthly basis. Additional meetings may be held at the discretion of the Chairperson should such a need arise. All meetings shall comply with the notice requirements of the Open Meeting Law (NRS 241).

The OMC may be expanded to include additional Member Agencies. Additional Member Agencies must be approved by a unanimous vote of the OMC and become signatories to this Agreement and any subsequent amendment then in effect. The OMC may place conditions on new Member Agencies.

2) Roles and Responsibilities

The primary role of the OMC is, to provide instructions and direction to the Executive Director, to formulate policy, establish operational procedures and principals (Transportation Management Strategies), and monitor the various aspects of the Transportation Management System.

The OMC shall develop a funding policy that achieves the funding requirements for the Operation and Maintenance of FAST. The policy shall determine the funding formula/share for each Member Agency. The funding policy shall be unanimously approved by the OMC before the policy is implemented. If the proposed funding policy is not approved by the Member Agencies, the previous year's formula/share, including any increases required to cover salary and benefit increases shall be implemented.

The OMC shall be responsible for providing direction to the Executive Director for the development, review and approval of the annual budget. Approval of the annual budget requires a unanimous vote of the Member Agencies. The approved budget shall be submitted to each Member Agency as required to meet each agency's budget development schedule. Funding for the Operation and Maintenance is further discussed in Section 111.

The OMC shall have the authority to appoint sub-committees to carryout the purpose and duties of this Agreement. These sub-committees shall make recommendations to the OMC for action.
The OMC shall approve all Transportation Management Strategies prior to their implementation in the FAST System, **exempted are non-regional special events and non-priority times.**

Transportation Management Strategies selected by the OMC may be implemented during Priority Time.

If a Member Agency desires to delete any Transportation Management Infrastructure or ITS Field Device within its jurisdiction from control of FAST, notice of such intent shall be conveyed in writing to the OMC at a minimum of seven (7) months prior to the close of the current fiscal year and that in no event shall the proposed number of transportation management or ITS devices exceed ten percent (10%) of the total number of transportation management or ITS devices within the members jurisdiction. The OMC shall have the authority to approve or disapprove the recommended deletion of any Transportation Management Infrastructure or ITS Field Device from FAST.

The OMC shall select the Executive Director from a list of qualified applicants provided by the Administrator. The list of candidates shall be selected in accordance with the guidelines provided by the OMC and the policy and procedures of the Administrator.

The OMC shall determine the salary and job responsibilities of the Executive Director, which shall be referred to the Administrator for placement into the appropriate job classification of the Administrator’s personnel classification system.

The Chairperson of the OMC shall prepare an annual review of the Executive Director's job performance, and establish annual goals and objectives, considering input from other Agency Members. The evaluation will be forwarded to the Public Works Director of the Administrator for inclusion into the Administrator's job performance evaluation process.

The OMC shall approve/disapprove job classifications, job descriptions, job status (appointive or classified), salaries and other related matters as recommended by the Executive Director. Such approved job classifications, shall be filled in accordance with the personnel policies and procedures of the Administrator.

Majority vote of the OMC is required in the hiring and termination of the Executive Director except as otherwise provided in Section II. D.

The OMC shall review and approve monthly the budgetary needs and expenditures of the FAST System.

B. **Members**

1) **Member Agency**

Each Member Agency shall have one (1) vote on actions taken by the OMC.

The Member Agencies, in alphabetical order, are Clark County, City of Henderson, City of Las Vegas, Nevada Department of Transportation, City of North Las Vegas and the RTC of Southern Nevada.

2) **Roles and Responsibilities**
Member Agencies have identical roles and responsibilities as to the management of FAST except as may be defined within this Agreement.

Member Agencies provide the operating funds for the FAST System. The funding level is determined by the Operation and Maintenance needs. A Member Agency funding share shall be, based on the formula and budget approved by the OMC and Member Agencies.

Member Agencies shall incorporate the proposed budget and funding share within each agency’s budget approval process. If a Member Agency disapproves the proposed budget, then the basis of the disapproval shall be stated in writing to the Executive Director for consideration by the OMC. The budget, if revised, shall be resubmitted to the Member Agencies for incorporation into the agency budget.

Member Agencies shall within thirty (30) days from receipt of the notice from the Administrator remit their funding share in the cost of operating and maintaining FAST for the quarter.

Member Agencies shall make the final determination regarding which traffic control and/or ITS Field Devices will be operated and/or maintained by FAST.

Member Agencies are responsible for the funding of upgrades and expansions to the FAST infrastructure that are within their jurisdictional responsibility. FAST system upgrades such as central system equipment, software and other like things that are of a mutual benefit to the Member Agencies may be funded jointly or individually through FAST.

Member Agencies may have a Jurisdictional Management Center located within their jurisdiction that will allow them to operate and obtain information from or through the FAST system.

Member Agencies may elect to implement Transportation Management Strategies within their jurisdictional responsibility during special events of non-regional significance and during non-priority times.

C. Appeals Board

1) Organization Structure

The three-member Appeals Board shall be made up of the Director of NDOT, General Manager of the Regional Transportation Commission of Southern Nevada, and the Public Works Director for the Member Agency represented by the current OMC Chairperson. If a representative of NDOT or the RTC is the current OMC Chairperson, then the Chairperson membership on the Appeals Board will be replaced by the Public Works Director for the Member Agency of the current Vice-Chairperson. Representatives to the Board may appoint a designee, the designee may not have been involved in the decision under appeal.

2) Roles and Responsibilities

The Appeals Board shall meet when requested by a Member Agency to resolve a member’s disagreement with a majority action of the OMC. The Member Agency shall submit to the FAST Executive Director within sixty days of the action taken by the OMC their request for a bearing by the Appeals Board. The submittal shall present their disagreement with the OMC action. The Appeals Board shall bear the matter and make a determination. The decision will
be submitted to the OMC for action. The decision by the Appeals Board requires a majority vote which is final.

3) Open Meeting Law

The Appeals Board shall conform to the Open Meeting Law (NRS 241).

D. Administrator

1) Designated Administrator

The City of Las Vegas shall serve as the FAST Administrator.

2) Administrator Roles and Responsibilities

The Administrator is responsible for collecting from each Member Agency their proportionate share of the operating funds as determined by the approved budget.

At the beginning of each quarter of the fiscal year the Administrator shall invoice the Member Agencies for the amount of their quarterly funding share in the cost of Operations and Maintenance of FAST.

The Administrator shall deposit funds received from Member Agencies into an account established solely for the purpose of paying operation and maintenance expenses of the FAST System. The Administrator shall issue bank drafts against said account for expenses approved by the OMC. Any interest which may accrue to the funds shall be credited by the Administrator to said account for the benefit of the FAST System.

The Administrator shall maintain under generally acceptable accounting principles full, true and complete records and documents pertaining to this Agreement and present, at any reasonable time, such information for inspection, examination, review, audit and copying at any office where such records and documentation is maintained.

The Administrator shall implement the FAST organizational structure, job classifications, job descriptions, job status, and salary scale as determined by the OMC unless the determined organizational structure, job classifications, job descriptions, job status, and salary scale does not conform to existing Human Resource policies and procedures. Any actions must be approved by the Administrator before they become effective.

The Administrator agrees to hire the Executive Director approved by the OMC.

The Administrator shall be responsible for implementing the hiring and termination decisions of the Executive Director.

The Administrator agrees to discipline or terminate the Executive Director if so requested by the OMC provided, however, the Administrator reserves the right to separately and independently discipline or terminate the Executive Director for violations of the policies and procedures of the Administrator. Prior to any action by the Administrator, the Administrator shall suspend the Executive Director and shall meet with the OMC for the purpose of achieving concurrence on the discipline or termination action; the Administrator retains the final decision.
E. Executive Director

1) Executive Director Position

The FAST Executive Director shall be an appointive employee of the Administrator assigned to FAST who shall serve at the pleasure of the OMC.

2) Roles and Responsibilities

The Executive Director is responsible for the daily operations of FAST: to include the day to day supervision of the FAST staff, system Operation and Maintenance activities, approval of additions to the Transportation Management Infrastructure or ITS Field Devices, development of the Transportation Management Strategies, mid preparation of the annual budget.

The Executive Director shall meet annually, or more frequently as required, with the Director of Public Works of each agency, the General Manager of the RTC and the Director of the NTDOT to discuss the operation of FAST.

The Executive Director shall prepare a FAST Strategic Plan and submit for approval to the OMC. The Strategic Plan shall be revised at minimum of every five (5) years or as required.

The Executive Director shall maintain detailed expenditure records for the Operation and Maintenance of the FAST System. These records will be used to establish the annual FAST budget, providing the OMC with adequate information to determine the cost for each type of equipment, function and location (freeways or arterials).

The Executive Director shall notify each Member Agency of the approved annual budget and their proportionate share within thirty (30) days of OMC approval.

The Executive Director shall prepare an annual report detailing the performance of the freeway and arterial management systems and recommending any improvements to FAST.

The Executive Director shall maintain a record of all adopted policies according to the Open Meeting Law, NRS Chapter 241. All OMC records shall be maintained in accordance with NRS 23 9.0 10 on public records and retained at the FAST TMC.

The Executive Director shall recommend to the OMC the number of employees needed to carry out the day to day operations of FAST including without limitation, the job classifications, job descriptions, job status (appointive or classified), salaries and other related matters, based upon the Administrator’s personnel classification system.

The Executive Director shall have the right to terminate, or to recommend termination of, any employee pursuant to the personnel policies and procedures of the Administrator. The OMC shall be informed of such terminations prior to its implementation.

The Executive Director shall provide those administrative functions required by the Appeals Board.
F. FAST Staff

1) Staff Positions

The professional, technical and administrative staff shall be employees of the Administrator assigned to the operations of FAST with all of the same rights and benefits of other employees of the Administrator (including the benefits and rights under any collective bargaining agreement, which may vary by employee’s job classification).

SECTION III: FUNDING

A. First Three Years of FAST

Starting with the LVACTS fiscal year occurring after the execution of this Agreement and extending for a period of three (3) years after the FAST System operational acceptance by NDQT, the total Member Agencies (excluding NDOT) contribution to the Operation and Maintenance budget of the Arterial Management System component of FAST shall be equivalent to the previous years' approved budget plus no more than a fifteen percent (15%) annual increase. The Operation and Maintenance of the Freeway Management System component shall be funded by NDOT.

The OMC shall determine the contributions of each Member Agency, excluding NDOT, based on the fair share formula as approved by the OMC, considering the number of its traffic signals and/or ITS Field Devices within each member’s jurisdiction.

B. After Year Three of FAST

After approximately three years of FAST operations and continuing through the duration of this Agreement, the funding of the FAST System Operation and Maintenance shall be allocated based on historical Operation and Maintenance records as developed by the Executive Director.

The total Member Agencies' (excluding NDOT) contribution to the Operation and Maintenance of FAST shall be equivalent to the previous year's expenditure for the Arterial Management System component plus an increase to allow for expansion of the system as determined by the Executive Director and approved by the OMC and each Member Agency’s approval of its budget share. NDOT's contribution to the Operation and Maintenance of the Freeway Management System component of FAST shall be equivalent to the previous year's expenditure plus an increase to allow for expansion of the system as determined by the Executive Director and approved by the OMC and NDOT.

The OMC shall determine the contributions of each Member Agency (excluding NDOT) based on a fair share formula as approved by the OMC, considering the number of traffic signals and/or ITS Field Devices within each member’s jurisdiction and the budget for the Arterial Management System component of FAST.

C. Jurisdictional Management Center

Funding associated with the Operation and Maintenance of the JMC shall be the responsibility of the jurisdiction in which the JMC is located. Such costs may include, but are not limited to, computer and communication equipment, staffing, utilities, capital improvements, and
consultant/contractor. Funding for the implementation of software and hardware changes at each JMC caused by the central operations of FAST shall be the responsibility of FAST.

SECTION IV: INSURANCE AND INDEMNITY

A. The FAST Member Agencies mutually agree to indemnify and defend the Administrator for actions arising out of the Operation and/or Maintenance of FAST in the following manner:

(1) For suits regarding FAST Operation and/or Maintenance within NDOT’s controlled access highway Right of Way, NDOT will indemnify and defend the Administrator being responsible for all claims, demands, actions, damages, decrees, judgments, attorney fees, costs, and expenses resulting from injuries or damages to persons or properties and will hold harmless the other parties hereto, or any of its officers or employees from any and all claims, demands, actions, damages, decrees, judgments, attorney fees, costs and expenses which said party, its officers or employees may suffer, or which may be sought against, recovered from, or obtainable against said party, its officers or employees;

(2) For suits regarding FAST Operation and/or Maintenance within a FAST Member Agency’s Jurisdictional boundary, not subject to the above provision, each FAST Member Agency will indemnify and defend the Administrator for suits regarding FAST Operation and/or Maintenance within its jurisdictional boundary being responsible for all claims, demands, actions, damages, decrees, judgments, attorney fees, costs, and expenses resulting from injuries or damages to persons or properties and will hold harmless the other parties hereto, or any of its officers or employees for any and all claims, demands, actions, damages, decrees, judgments, attorney fees, costs and expenses which said party, its officers or employees may suffer, or which maybe sought against, recovered from, or obtainable against said party, its officers or employees;

B. The FAST Member Agencies mutually agree to indemnify and defend the Administrator for actions against the Administrator arising out of the employment of the PAST Executive Director or FAST staff unless the action is based on a unilateral decision of the Administrator, in which case, the Administrator shall be solely responsible for the cost of defense and any and all liability (such as, without limitation, monetary judgments or arbitration awards).

In cases where the FAST Member Agencies indemnify and defend the Administrator, the cost for indemnification and defense shall be considered an expense of FAST to be paid in accordance with the funding formula approved by the OMC.

Nothing in this Agreement shall be construed to be a waiver of the governmental immunities contained in Chapter 41 of the NRS.

SECTION V: DURATION OF AGREEMENT

This Agreement shall terminate in 20 years unless otherwise five (5) of the six (6) Member Agencies agree to an earlier date of termination.

SECTION VI: TITLE TO FASTSYSTEM PROPERTY

A. Acquisition of Property other than with Funds Appropriated by NDOT
Title and ownership of all property which is acquired with funds appropriated by the Member Agencies other than NDOT under this Agreement shall be determined in the following manner:

(1) Any and all property installed at the site of a traffic signal or ITS Field Device shall vest in title and ownership in the name of the party in whose jurisdiction the property is located;

(2) Any and all property installed at a Jurisdictional Management Center shall vest in title and ownership in the name of the jurisdictional operator.

(3) Any and all property installed in the FAST System with funds appropriated by the Member Agencies shall vest jointly in title and ownership in the name of the funding agency hereto according to the percentage of their contribution to the overall funding of the Transportation Management System during the fiscal year of acquisition. However, any joint owner or NDOT may offer to acquire said property under terms agreed to by all the joint owners taking into account depreciation and other factors effecting value.

B. Acquisition of Property with Funds Appropriated by NDOT

Title and ownership of all property which is acquired with funds appropriated by NDOT shall vest in the name of NDOT.

C. Traffic Management Center

NDOT agrees to provide the building in which the FAST organization and system will be located.

SECTION VII: SEVERABILITY

It is understood and agreed by the Member Agencies hereto that if any part, term or provision of this Agreement is declared by a court of competent jurisdiction to be illegal or in conflict with any laws of this State, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the Member Agencies shall be construed and enforced as if the Agreement did not contain the particular part, term or provision held to be invalid.

SECTION VIII: AMENDMENTS

All notices or other communications required or permitted to be given under this Agreement shall be in writing and shall be deemed to have been duly given if delivered by hand, telephone facsimile transmission with simultaneous regular mail or mailed certified return receipt requested, postage prepaid on the date postmarked and addressed to the Member Agencies at the following addresses:

SECTION IX: NOTIFICATION

FOR COUNTY of CLARK: Public Works Director
500 S. Grand Central Parkway
Las Vegas, NV 89155
(702) 455-6020
SECTION X: NO THIRD PARTY BENEFICIARY

It is specifically agreed between the parties executing this Agreement that it is not intended by any of the provisions of any part of the Agreement to create in the public or any member thereof a third party beneficiary status, hereunder, or to authorize anyone not a party to this Agreement to maintain a suit for personal injuries of property damage pursuant to the terms or provisions of this Agreement.

SECTION XI: OPEN MEETING LAW

Pursuant to NRS 241, information or documents may be open to the public for inspection and copying. The parties will have the duty to disclose unless a particular record is confidential by law or a common law balancing of interest.

SECTION XII: ENTIRE AGREEMENT

This Agreement constitutes the entire agreement of the Member Agencies and is intended as a complete and exclusive statement of the promises, representations, negotiations, discussions, and other agreements that may have been made in connection with the subject matter.
hereof. Unless an integrated attachment to this Agreement specifically displays a mutual intent to amend a particular part of this Agreement, general conflicts in language between any such attachment and this Agreement shall be construed consistent with the terms of this Agreement. Unless otherwise expressly authorized by the terms, of this Agreement, no modification or amendment to this Agreement shall be binding upon the Member Agencies unless the same is in writing and signed by the respective parties hereto and approved by the Attorney General.

This Agreement may be executed in multiple counterparts, each of which shall be deemed to be an original document.

SECTION XIII: AUTHORIZATION

The parties hereto represent and warrant that the person executing the Agreement on behalf of each Member Agency has full power and authority to enter into this Agreement and that the parties are authorized by law to perform the services set forth herein.

IN WITNESS WHEREOF, the Member Agencies have executed this Agreement on the day and year first above written.

ATTEST DEPARTMENT OF TRANSPORTATION, STATE OF NEVADA

______________________________
Chief, Safety & Traffic Division

Approved as to the legality and form:

______________________________
Deputy Attorney General

ATTEST COUNTY OF CLARK

______________________________
County Clerk

Approved as to the legality and form:

______________________________
District Attorney’s Office
County of Clark
ATTEST

City Clerk

Approved as to the legality and form:

City Attorney, City of Henderson

ATTEST

City Clerk

Approved as to the legality and form:

City Attorney, City of Las Vegas

ATTEST

City Clerk

Approved as to the legality and form:

City Attorney, City of North Las Vegas

ATTEST

City Clerk

Approved as to the legality and form:

City Attorney, City of Henderson

ATTEST

City Clerk

Approved as to the legality and form:

City Attorney, City of Las Vegas

ATTEST

City Clerk

Approved as to the legality and form:

City Attorney, City of North Las Vegas

ATTEST

Executive Assistant

Approved as to the legality and form:

General Counsel

CITY OF HENDERSON

Mayor

CITY OF LAS VEGAS

Mayor

CITY OF NORTH LAS VEGAS

Mayor

REGIONAL TRANSPORTATION COMMISSION

Chairman, Regional Transportation Commission
Appendix I: Functional Class Roads Map
Functional Class Roads
- Principal Arterial
- A Minor Augmentor
- A Minor Reliever
- A Minor Expander
- A Minor Connector
- B Minor
- Major Collector
- Minor Collector

Note: County boundaries are shown for reference but are not included in this layer.