Kane County
Intelligent Transportation Systems (ITS)/
Traffic Management Center (TMC)
Feasibility Study

ITS STRATEGIC PLAN

September 2007
## DOCUMENT REVISION HISTORY

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Executive Summary

Introduction

As Kane County continues to grow in population and economic opportunity, a greater stress is being placed on its transportation infrastructure. To address this concern, the Kane County Division of Transportation (KDOT) has initiated a feasibility study to identify intelligent transportation system (ITS) projects that will address the unique transportation needs of Kane County, including a potential traffic management center (TMC).

This project is directed at four focus areas:
- Arterial Operations
- Traffic Incident Management
- Maintenance and Construction Management
- Rural ITS Applications

Intelligent transportation systems can be defined as “the integrated application of sensor, computer, electronics, and communications technologies and management strategies to provide traveler information to increase the safety and efficiency of the surface transportation system.” Or, simply put,

People using technology in transportation to save time, lives, and money

Before intelligent transportation systems can be effectively deployed, ITS stakeholders should come together to develop a common vision for ITS. The vision statement is a key component of the Kane County ITS Strategic Plan because it provides overall direction for the identification of stakeholder needs, operational concepts, potential ITS strategies and technologies, and ultimately the final recommendations:

“Deploy advanced transportation technology and operational strategies to maximize the safety and efficiency of the countywide transportation system through enhanced traveler information, interagency cooperation and regional coordination”

The ITS projects identified through this Strategic Plan process should also meet the following operational goals:
- Increase traveler safety
- Limit congestion and the effects of incidents
- Expand data collection
- Improve traveler information
- Enhance tools available to maintenance personnel

Intelligent transportation systems provide a number of tools for meeting these goals. This study is intended to identify those ITS applications that are best suited for addressing the unique transportation needs in Kane County.
Needs Assessment

To help develop Kane County ITS/TMC Feasibility Study recommendations, research into past studies and related efforts and extensive stakeholder outreach was conducted to define the existing roadway network, identify planned projects, and determine the key transportation issues in Kane County.

Findings from recent transportation studies in Kane County identified system deficiencies that will be addressed in the final recommendations. These include intersections and corridors with growing congestion, high crash locations and roadway segments with the highest delay.

Stakeholder outreach consisted of two stakeholder workshop and one-on-one stakeholder interviews. The following key agencies were interviewed as part of this process:

- KDOT Geographic Information Systems Department
- KDOT Maintenance and Operations Department
- KDOT Planning and Programming Department
- KDOT Project Implementation
- Kane County Office of Emergency Management
- Kane County Sheriff Department
- Rutland Dundee Fire Protection Department (Kane County Fire Chiefs’ Association)
- St. Charles Police Department (Kane County Police Chiefs’ Association)
- Village of Montgomery Department of Public Works
- Kane-Kendall Council of Mayors
- City of Aurora Department of Public Works
- City of Elgin Department of Public Works
- Pace Suburban Bus
- Metra Commuter Rail
- Regional Transportation Authority (RTA)
- IDOT District 1 Bureau of Traffic
- Illinois State Toll Highway Authority

Through this outreach process, the following needs categories were defined for further consideration:

- Arterial Operations – provide ITS solutions to reduce the traffic congestion and increase traveler safety at key locations
- Data Collection – enhance the surveillance capabilities of roadway infrastructure for improved maintenance and construction activities
- Data Management – develop resources for effective data collection and storage and create methods and protocols for agencies to exchange pertinent, useful data across jurisdictional boundaries
• **Operational Coordination** – improve coordination between various agencies for effective utilization of resources – especially between transportation agencies, emergency services, and construction and maintenance agencies for incident response

• **Promotion of Transit Use** – improve the viability of transit use through the application of ITS technologies and improved transit parking facilities

• **Traveler Information** – increase the prevalence, attractiveness, and awareness of traveler information in Kane County

**Concept of Operations**

The Kane County ITS Concept of Operations describes 1) the various stakeholders involved in ITS in Kane County; 2) partner agency roles and responsibilities; 3) ITS services or “market packages” that transportation agencies in the county currently provide or may provide through the deployment of ITS tools; and 4) potential ITS benefits and performance measures. This Concept of Operations builds upon the project vision statement to describe how key ITS stakeholders in Kane County will come together to provide ITS services in the four project focus areas.

**Arterial Operations**

Arterial operations include systems that monitor and regulate arterial traffic flow, mitigate congestion, manage parking facilities, support transit operations, coordinate expressway-arterial operations, and disseminate traveler information. Examples include dynamic signal timing measures to provide coordinated traffic flow, parking lot detection to measure availability, multimodal coordination that increases the efficiency of transit operations, coordinated traffic control between ramps and arterial corridors, and alerts to motorists and emergency responders. In concert with a central traffic management functionality, these systems seek to optimize the flow of traffic on arterial routes.

Examples of existing and planned arterial operations ITS services in Kane County include signalized intersection control and coordination, vehicle detection systems (including video monitoring), emergency vehicle preemption (EVP), transit signal priority (planned), red light running enforcement (planned), dynamic message signs (DMS), traffic forecasting using traffic models, signal preemption at highway-rail intersections, traveler information websites (e.g., KDOT’s Project Management Development website), and traffic and crash data sharing.

**Traffic Incident Management**

Traffic incident management (TIM) is the process of coordinating the resources of a number of different partner agencies and private sector companies to detect, respond to, and clear traffic incidents as quickly as possible while protecting the safety of on-scene responders and the traveling public. TIM emphasizes the need for improved incident management tools and techniques and better coordination between incident managers to speed emergency detection, assessment, response, and clearance.
Examples of existing and planned traffic incident management ITS services in Kane County include the KCART crash investigation team, emergency call-taking and dispatch centers, electronic mapping systems for emergency response, EVP, and emergency alert systems (e.g., Emergency Alert Radio System).

Maintenance and Construction Management
Maintenance and construction management (MCM) comprises the monitoring, managing, and coordination of roadway infrastructure construction and maintenance activities. Representing both public agencies and private contractors that provide these functions, this focus area also includes the management of maintenance, construction, or special service vehicles (e.g., snow and ice control equipment).

Examples of existing and planned maintenance and construction management ITS services in Kane County include maintenance vehicle tracking systems, KDOT’s Computerized Fleet Analysis system, weather monitoring systems (including on-board instrumentation on maintenance vehicles), automated roadway treatment devices to remediate icy conditions, KDOT’s “Snow Plow Command Center,” maintenance scheduling software, and work zone DMS.

Rural Operations
While initially developed to address urban congestion issues, intelligent transportation systems provide a multitude of tools to increase rural transportation safety, mobility, and efficiency. This concept overlaps the arterial operations, traffic incident management, and maintenance and construction focus areas discussed above, but does so in a manner that is tailored for rural areas.

Examples of existing and planned rural operations ITS services in Kane County include many of those listed above under the other project focus areas. Additional ITS services specific to rural operations include speed monitoring systems that relay current travel speeds to motorists at roadway curves, bridge decks, and other infrastructure can become dangerous at high speeds or during inclement weather.

Technology/Strategy Assessment
Taking into consideration transportation planning efforts in Kane County (e.g., 2030 Kane County Transportation Plan), as well as numerous regional ITS studies (e.g., Northeastern Illinois ITS Deployment Plan), the consultant team identified a series of candidate strategies and technologies for potential deployment in the county.

Candidate Strategies and Technologies
With the identified transportation needs in Kane County as a starting point, candidate operational strategies and transportation technologies, essentially potential ITS solutions, were identified which might be applied to address those needs. Those solutions will relate to the four focus areas of the ITS/TMC Feasibility Study: arterial operations, traffic incident management, maintenance and construction management, and rural operations.
For the purposes of this analysis, “strategies” can be defined as a plan or method for obtaining a specific goal or result which may or may not be dependant upon a specific technology. A “technologies” are electronic or digital products and systems considered as a group which can be employed for obtaining a goal or result.

**Prioritization**
While each of the potential technologies and strategies intended bring about improvements on the Kane County transportation system, budgetary and staffing limits require that these potential solutions be prioritized for deployment. To identify top-priority ITS technologies/strategies for Kane County, a two-step evaluation process was applied. The first “objective” analysis was conducted to determine how well each technology or strategy would achieve the identified stakeholder goals and how much effort (e.g., cost, personnel requirements) it would take to successfully implement them. Different sets of criteria, listed below, were used by the consultant team to evaluate the technologies and strategies with a consistent, 100-point scoring system.

| Technology Functionality Matrix | Initial Operations | - Financing  
- Transition Issues  
- Staff  
- Training  
- Integration Issues  
- Coordination |
|---------------------------------|--------------------|
| Maintenance                     | - Life Cycle Costs  
- Staffing  
- Training |
| Technology Maturity             | - Proven Technology  
- Enabling Technologies  
- Competitive Procurement  
- Technology Will not be Outdated Soon  
- Industry Standards |
| Potential Benefits              | - Customer Satisfaction  
- Efficiency  
- Energy and Environment  
- Mobility  
- Productivity  
- Safety |
| Human Resource                  | - Staff Availability  
- Staff Skills  
- Time Commitment |
| Supporting Costs                | - Meeting Costs  
- Deliverable Costs |
| Strategy Functionality Matrix   | Coordination Issues | - Agreements  
- Legal and Policy Issues |
|                                 | Potential Benefits | - Customer Satisfaction  
- Efficiency  
- Energy and Environment  
- Mobility  
- Productivity  
- Safety |
To compliment this evaluation, a second “subjective” assessment was conducted. This process applied input from the Steering Committee based on its members’ unique perspectives.

The objective evaluation conducted by the consultant team and the subjective vote by the Steering Committee helped to identify the top tier of candidate ITS technologies and strategies for deployment in Kane County. These lists provided a pool from which an overall top priority list could be developed. By combining the results of the evaluation steps, the following top ten project concepts have been selected:

**Overall Listing of Top Ten Technologies/Strategies**

- Arterial Operations Center
- Traffic Signal Timing Upgrades along Priority Corridors
- Instrumentation on Priority Corridors
- Countywide Construction/Maintenance Database
- Emergency Responder Communications Integration
- Expanded Emergency Vehicle Preemption (EVP)
- DMS/HAR on Priority Corridors
- Detour/Alternate Route Maps
- Motorist Warning Systems
- Work Zone Traffic Management

**Implementation Plan**

**Priority Corridors**

To help in the identification of deployment locations for ITS devices, ITS priority corridors have been developed. Deployment of ITS technologies on these corridors is intended to address the identified stakeholder needs while also providing the greatest benefits.

Based on criteria developed to identify priority corridors (e.g., congestion levels, crash rate), the following is a list of potential corridors for ITS implementation (in no particular order):

- IL Route 47 (from McHenry County Line to Kendall County Line)
- Randall Road/Orchard Road (from McHenry County Line to Kendall County Line)
- IL Route 31 (from McHenry County Line to Kendall County Line)
- IL Route 25 (from IL Route 62 to I-90 and from Stearns Road to Kendall County Line)
- Kirk Road/Farnsworth Road (from IL 64 to New York Street)
- Huntley Road/(future) Longmeadow Parkway (from McHenry County Line to IL 62)
- IL Route 72 (from IL Route 47 to DuPage County Line)
- US 20 (from McHenry County Line to DuPage County Line)
- (future) Stearns Road/McDonald Road (from Randall Road to Dunham Road)
- IL Route 64 (from IL Route 47 to DuPage County Line)
- IL Route 38 (from IL Route 47 to DuPage County Line)
- Fabayan Parkway (from Randall Road to DuPage County Line)
- IL 56 (from IL 47 to Interstate 88 and from Farnsworth Avenue to DuPage County Line)
**Proposed Projects**

Building upon the top-priority ITS solutions developed in the Technology/Strategy Assessment, ten proposed ITS projects have been identified. A brief description of each follows.

- **Arterial Operations Center** - A Kane County Arterial Operations Center (AOC) would allow KDOT staff to monitor traffic along major/priority arterial corridors in Kane County and remotely operate ITS devices along those corridors to improve traffic flow and better respond to traffic incidents.

- **Traffic Signal Timing and Coordination** - This project would entail optimization of traffic signal timing plans, expansion of signal-control systems along all major signalized arterials in the county, and interconnecting signals across jurisdictions.

- **Traffic Incident Management Work Group** - This project would establish an informal stakeholder work group to collaborate on ways to prevent, respond, and recover from transportation incidents.

- **Emergency Responder Communications Integration** - This project would build off existing efforts to provide a common frequency for responders to communicate directly with each other and address any gaps in existing coverage or procedures.

- **Instrumentation of Priority Corridors** - This project would entail installation of vehicular detection, CCTV cameras, road weather information systems (RWIS), and associated communications infrastructure to support real-time monitoring of the transportation network.

- **DMS/HAR on Priority Corridors** - This project would implement portable and permanent dynamic message signs at key decision points on the identified priority corridors; HAR could be considered for deployment in the future.

- **Work Zone Traffic Management** - This project would procure and deploy traffic monitoring and traveler information devices for use specifically within work zones across the county.

- **Countywide Construction/Main tenance Database System** - This project would be deployed to periodically collect roadway construction and maintenance information from various agencies in the county (including directly from contractors), assimilate and process the information, and broadcast this processed information to various agencies and public through a user-friendly interface (e.g., a web-based interactive map).

- **Countywide Dynamic Alternate Route Maps** - This project would be a regional initiative for developing alternate route information, which can be accessed by various agencies through a secure Internet website using a graphical user interface (GUI).

- **Performance-Based Crash Prevention System** - This project would establish a systematic methodology for preventing crashes at signalized intersections by focusing on the most critical sites that have demonstrated crash patterns first.
Implementation Strategy

While all of the proposed ITS projects are designed to meet the goals of the ITS/TMC Feasibility Study, additional factors must be addressed before they can be deployed to realize these goals. These considerations include implementation issues, operational issues, project sequencing, available procurement methods, potential funding sources, legal issues, and any interagency agreements that may be necessary for successful project deployment and operation.

To support deployment of the ten top-priority ITS projects, a suggested implementation sequence has been provided. This sequence is based on conceptual project costs (both design/deployment and operations/maintenance), anticipated benefits, identified “early winner” projects, interdependencies between projects, and balancing overall costs between the short-, medium-, and long-term. This project sequence, along with associated project costs for implementation and ongoing operations and maintenance, can be found in the tables that follow.
Proposed Project Deployment Sequence with Estimated Deployment Costs

<table>
<thead>
<tr>
<th>Project</th>
<th>Estimated Deployment Costs*</th>
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<tr>
<td></td>
<td>Short-Term</td>
</tr>
<tr>
<td>Arterial Operations Center</td>
<td>$</td>
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<tr>
<td>Traffic Signal Timing and Coordination</td>
<td>$ 401,000</td>
</tr>
<tr>
<td>Traffic Incident Management Work Group</td>
<td>$</td>
</tr>
<tr>
<td>Emergency Responder Communication Integration</td>
<td>$</td>
</tr>
<tr>
<td>Instrumentation of Priority Corridors</td>
<td>$ 470,000</td>
</tr>
<tr>
<td>DMS on Priority Corridors</td>
<td>$ 88,000</td>
</tr>
<tr>
<td>Work Zone Traffic Management</td>
<td>$ 130,000</td>
</tr>
<tr>
<td>Countywide Construction/Maintenance Database</td>
<td>$</td>
</tr>
<tr>
<td>Countywide Dynamic Alternate Route Maps</td>
<td>$ 150,000</td>
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<tr>
<td>Performance Based Crash Prevention System</td>
<td>$ 50,000</td>
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Totals: $ 1,289,000 | $ 3,965,000 | $ 2,410,000 | $ 7,670,000

* 2007 dollars
## Proposed Annual Operations and Maintenance Costs

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<tr>
<th>Project</th>
<th>Estimated O &amp; M Costs*</th>
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<tr>
<td></td>
<td>Short-Term**</td>
</tr>
<tr>
<td>Arterial Operations Center</td>
<td>$ -</td>
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<tr>
<td>Traffic Signal Timing and Coordination</td>
<td>$ 45,000</td>
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<td>Traffic Incident Management Work Group</td>
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<td>Emergency Responder Communication Integration</td>
<td>$ -</td>
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<tr>
<td>Instrumentation of Priority Corridors</td>
<td>$ 87,000</td>
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<tr>
<td>DMS on Priority Corridors</td>
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<tr>
<td>Work Zone Traffic Management</td>
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<td>Countywide Construction/Maintenance Database</td>
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<td>Countywide Dynamic Alternate Route Maps</td>
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<td>Performance Based Crash Prevention System</td>
<td>$ 25,000</td>
</tr>
<tr>
<td><strong>Totals:</strong></td>
<td><strong>$ 218,000</strong></td>
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* 2007 dollars

** Amounts shown reflect total annual O&M costs at the completion of each deployment timeframe (including salaries)
1. Introduction

As Kane County continues to grow in population and economic opportunity, a greater stress is being placed on its transportation infrastructure. To address this concern, the Kane County Division of Transportation (KDOT) has initiated a feasibility study to identify intelligent transportation system (ITS) projects that will address the unique transportation needs of Kane County, including a potential traffic management center (TMC). To help develop recommendations, extensive stakeholder outreach and research into past studies has been conducted to identify transportation issues in Kane County.

The ITS/TMC Feasibility Study is led by a Steering Committee that consists of the following organizations/agencies:

- Kane County Division of Transportation
- Rutland-Dundee Fire Protection District
- Kane County Sheriff’s Department
- Kane County Office of Emergency Management
- Chicago Metropolitan Agency for Planning (CMAP)
- Illinois State Toll Highway Authority
- City of Aurora
- City of Elgin
- City of St. Charles Police Department
- Village of Burlington
- Village of Montgomery
- Federal Highway Administration
- IDOT District 1 – Bureau of Traffic
- IDOT ITS Program Office

These agencies and many others have played key roles in the development of this ITS Strategic Plan, including meeting participation and document review.

This project is directed at four focus areas:

- **Arterial Operations** – improved system performance driven by traffic signal integration, coordinated “smart” corridors, and increased traveler information
- **Traffic Incident Management** – countywide coordination for traffic incident detection and response
- **Maintenance and Construction Management** – tools for routine maintenance operations, coordinating road construction projects, improving work zone operations, and collecting weather data
- **Rural ITS Applications** – application of ITS technologies for specific rural transportation issues, such as severe weather, high crash locations, and rural transit
1.1 Definition of Intelligent Transportation Systems (ITS)

Intelligent transportation systems can be defined as “the integrated application of sensor, computer, electronics, and communications technologies and management strategies to provide traveler information to increase the safety and efficiency of the surface transportation system.” Or, simply put, the definition of ITS is:

*People using technology in transportation to save time, lives, and money*

The USDOT ITS Joint Program Office defines sixteen different types of technology applications that encompass ITS deployments. These applications include Intelligent Infrastructure systems, such as arterial management systems, incident management systems, roadway operations and maintenance, and crash prevention and safety; and Intelligent Vehicle systems, such as collision avoidance systems and driver assistance systems.

In order for these intelligent transportation systems to be most effective, they must work together in an integrated manner by sharing a common framework. This less visible integration component requires various communications systems to support the exchange of data between management centers, personnel, vehicles, field devices, and the traveling public.

Acknowledging the need for this framework before deploying ITS, in 2001 the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) developed a rule/policy that requires regions that plan to deploy ITS to develop a regional ITS architecture in order to receive Federal funding for such projects. As a result, various ITS architectures have been developed across the state and the region to provide a framework for the planning, deployment, and operation of ITS in Illinois. For Kane County, the Northeastern Illinois Regional ITS Architecture serves as the framework for ITS planning and deployment. As depicted below in Figure 1-1, development and use of the regional architecture is the first step in the systems engineering process for developing ITS projects. As identified in the diagram, this Kane County ITS/TMC Feasibility Study follows the systems engineering process through project concept exploration and the development of a countywide ITS Concept of Operations.

1.2 Vision

The vision statement is a key component of the Kane County ITS Strategic Plan because it provides overall direction for the identification of stakeholder needs, operational concepts, potential ITS strategies and technologies, and ultimately the final recommendations.

During the project kickoff meeting held on October 25, 2006, key transportation and public safety representatives worked together to develop a common vision for ITS in Kane County. The resulting vision statement is:

*“Deploy advanced transportation technology and operational strategies to maximize the safety and efficiency of the countywide transportation system through enhanced traveler information, interagency cooperation and regional coordination”*

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1 USDOT ITS Joint Program Office website – Technology Overview
The vision statement is intended to serve as guidance for the planning and deployment of ITS in Kane County for the long-term, and should be continually reevaluated to ensure that it accurately captures the needs and goals of travelers and transportation stakeholders in the county.

1.3 Project Purpose and Goals

Due to growing population and congestion in the region, the physical infrastructure is rapidly reaching its threshold capacity. As such, this study is intended to provide recommendations for the deployment of ITS technologies and operational strategies in Kane County that can maximize the capacity of the network. This process begins with the identification of major stakeholder issues to determine most appropriate traffic management alternatives and concludes with the identification of potential funding sources, deployment timeframes, and costs for potential projects.

These deployments should address the goals and objectives set forth in the Kane County 2030 Transportation Plan:

- Cooperative Planning Goal: Coordinate local and regional transportation planning to provide a transportation system that accommodates both existing and future travel demands and supports local and regional land use plans and policies.
- System Efficiency Goal: Reduce congestion while preserving the County’s transportation system and its carrying efficiency.

---

- Personal Mobility Goal: Develop a balanced intermodal transportation system that adds to the available travel options, and increases personal mobility and offers alternatives to the Single Occupancy Vehicle (SOV).
- Quality of the Environment Goal: Maintain and improve the quality of the environment while providing transportation services to growing areas.³

The proposed ITS projects should also meet the following operational goals:
- Increase traveler safety
- Limit congestion and the effects of incidents
- Expand data collection
- Improve traveler information
- Enhance tools available to maintenance personnel

Intelligent transportation systems provide a number of tools for meeting these goals. This study is intended to identify those ITS applications that are best suited for addressing the unique transportation needs in Kane County.

³ Kane County 2030 Transportation Plan, 2004.
2. Needs Assessment

Before ITS recommendations can be developed, a needs assessment must be conducted to determine deficiencies and problem areas on the Kane County transportation network. This section describes existing conditions in the county, details the results of the project stakeholder outreach process, and identifies issues raised in past studies and related efforts. These critical needs will serve as the basis for the Kane County ITS recommendations.

2.1 Kane County Transportation Network

The transportation network in Kane County consists of the highway system transit services, paths for non-motorized travel, and some specially designated rural roads.

Highway Network

Highway functional classifications in Kane County (Table 2-1) include Interstates (Ronald Reagan Memorial Tollway/I-88 and Northwest Tollway/I-90), U.S. Highways (e.g., US 20), county freeways/expressways (e.g., parts of IL 56) and Strategic Regional Arterials (SRA) (e.g., Orchard/Randall Road), principal arterials (e.g., IL 31), minor arterials (e.g., Bowes Road), and collectors. Figure 2-1 depicts the Kane County highway network functional classifications in graphical format.

<table>
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<tr>
<th>Functional Class</th>
<th>Route Miles</th>
<th>Lane Miles</th>
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<tbody>
<tr>
<td>Freeways and Ramps</td>
<td>61</td>
<td>256</td>
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<tr>
<td>County Freeways and SRA</td>
<td>142</td>
<td>413</td>
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<tr>
<td>Principal Arterials</td>
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<td>Minor Arterials</td>
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<td>453</td>
</tr>
<tr>
<td>Collector</td>
<td>511</td>
<td>1,065</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,133</strong></td>
<td><strong>2,660</strong></td>
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</table>

*Note: Excludes local streets.*

Table 2-1 – Mileage of All Highways in Kane County by Functional Classification

Numerous agencies are responsible for construction and maintenance of highways in Kane County. More than half of the highway system in the county consists of local roads (arterials and collector streets) that are owned by local townships and municipal highway departments. Kane County highways account for roughly one quarter of the total highway route mileage in the county. This includes the key SRA routes of Orchard Road/Randall Road, Fabayan Parkway, and Kirk/Dunham Road, as well as the planned Stearns Road corridor. The two Interstates that cross through the county fall under Illinois State Toll Highway Authority (ISTHA) jurisdiction. Table 2-2 provides a breakdown of the roadway jurisdictions and class.

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4 Kane County 2030 Transportation Plan, 2004.
Figure 2-1 – Functional Classifications of the Kane County Roadway Network

5 Kane County 2030 Transportation Plan, 2004.
<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Route Miles</th>
<th>Lane Miles</th>
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<tr>
<td>Interstates</td>
<td>47</td>
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<tr>
<td>U.S. Highways</td>
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</tr>
<tr>
<td>County Highways</td>
<td>311</td>
<td>702</td>
</tr>
<tr>
<td>Total</td>
<td>553</td>
<td>1,413</td>
</tr>
</tbody>
</table>

Table 2-2 – Kane County Roadway System Mileage by Jurisdiction<sup>6</sup>

The transportation model for Kane County developed by Chicago Area Transportation Study (CATS) and updated in 2003 was used in developing the Comprehensive Road Improvement Plan (CRIP) for impact fees in the county. According to 2003 ADT values, the higher volume highways are located in the easternmost portion of the County. The heaviest traveled routes include the I-90 and I-88, the Orchard/Randall Road corridor, the Kirk Road Corridor, US 20 in Elgin, IL 64 in St. Charles, and IL 25 in Carpentersville. The tollways carry a large percentage of commercial traffic, but truck traffic is also heavy on portions of IL 47 and IL 64.

The travel demand is largest in the north/south directions along the Fox River with a slight decrease in demand between St. Charles and Elgin. The north-south travel desires appear to be a combination of trips originating in and destined to locations in the urban corridor, as well as regional trips traveling through the county.

Transit Infrastructure

At present there are three primary transit services in the region: general public bus service provided by Pace, paratransit and vanpool services provided by Pace and other local providers, and commuter rail provided by Metra.

Pace Suburban Bus, a division of Regional Transportation Authority (RTA), provides fixed bus routes service, express bus service, dial-a-ride paratransit, and vanpool bus service in the Kane County region. The 33 fixed Pace routes operate on major streets in the Greater Elgin Transit Area, the Upper Fox Transit Area, and the Greater Aurora Transit Area, as well as the Orchard/Randall Road corridor throughout Kane County. These routes connect areas of major activity centers to other parts of the county and the link Metra stations to park-and-ride lots.

Pace, Kane County, and other municipalities provide a total of eighteen subsidized dial-a-ride services in the county for elderly residents, people with disabilities, and low-income persons.<sup>7</sup> For a reduced fee, registered patrons can use these paratransit programs for travel anywhere in Kane County, most trips are for medical appointments or to government offices. These services are available in Aurora Township, the City of Batavia, Batavia Township, Dundee Township, the City of Elgin, St. Charles Township, Geneva Township, Burlington Township, Hampshire Township, Plato Township, Rutland Township, and the Village of Algonquin. Pace ADA

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<sup>6</sup> Kane County 2030 Transportation Plan, 2004.

<sup>7</sup> Kane County Paratransit Coordination Study, 2003.
Paratransit Service operates in portions of Aurora, Batavia, Dundee, Elgin, Geneva, St. Charles and Sugar Grove Township. In an effort to promote coordination between these paratransit services, KDOT conducted a Paratransit Coordination Study in 2003.

In order to encourage higher vehicle occupancy ridership, Pace also has extensive vanpool programs like Metra Feeder, ADVantage, Non-Emergency Medical Shuttle, and Employer Shuttle.

There are three Metra commuter rail lines in Kane County: the Burlington Northern Santa Fe (BNSF) Line which runs from Aurora to Chicago’s Union Station, the Union Pacific West (UP-W) Line which links Elburn and the Ogilvie Transportation Center, and the Milwaukee District West (MD-W) Line between Big Timber and Union Station. These three Metra lines carry over 100,000 passengers per day during the work week, with the BNSF Line carrying approximately half of those passengers. There are seven Metra Stations in located along these lines in Kane County, one in Aurora (BNSF), one in Elburn (UP-W), one in La Fox (UP-W), one in Geneva (UP-W), one in Big Timber (MD-W) and two in Elgin (MD-W). The Geneva Station is served by Pace Route 921 which connects it to the Metra park-n-ride lot located at Geneva First Baptist Church. This service runs of weekdays during am and pm peak period.

**Rustic Roads**

The Rustic Road Program was adopted by Kane County in 2000 to protect rural roads and scenic vistas while subtly incorporating transportation improvements and new developments. These enhancements are deployed in a way not to conflict with the character of these rural roads, including both natural and existing man-made features. The program is designed to promote a sense of place, preservation of resources, recreation, and economic development through tourism. Only a couple of roadways have been designated in this new program, but the County anticipates continued implementation in the future.

**Non-Motorized Travel**

Kane County has 223 miles of bicycle and pedestrian paths, mostly located in the eastern third of the county. In addition to providing users with a safe route for recreation, many of these paths connect with rail stations and bus stops to provide bicyclists and pedestrians links to a transit network that extends throughout Kane County as well as beyond it. In addition to these paths, some county-maintained roads provide paved shoulders or wide curb lanes for bicyclists and pedestrians to use.

**Existing Conditions**

According to 2003 data, even though County highways account for only one quarter of the total lane miles in the county, those routes carry roughly 70% of the total traffic and see nearly 90% of the travel delay. However, based on the ratio of traffic volumes to roadway capacity, less than 20% of the county’s roads are considered congested (v/c ratio above 0.79). These congested routes are focused in the more densely populated areas of the county (i.e., Carpentersvsille/Dundee/Elgin, St. Charles/Geneva, Aurora). Figure 2-2 shows current congested roadways in the county.
To analyze traffic safety in the county, KDOT conducts regular studies to identify those intersections that are demonstrating safety issues. These analyses consider 1) crash rates; 2) total crashes; 3) traffic volumes; and 4) the severity indices of the crashes that occur. Based on these factors, from 2003-2005, the following intersections are considered the highest priority for safety improvements in Kane County:

- Randall Road and IL 72 (Sleepy Hollow)
- Randall Road and IL 64 (St. Charles)
- Fabyan Parkway and Kirk Road (Batavia)
- Huntley Road and Randall Road (Carpentersville)
- Randall Road and IL 38 (St. Charles)
- Kirk Road and IL 38 (Geneva)
- Randall Road and Weld Road (Elgin)
- Randall Road and Big Timber Road (Elgin)
- Randall Road and Foothill Road (Elgin)
- Orchard Road and Galena Boulevard (Aurora)
- Orchard Road and Bowes Road (Elgin)

Although the overall portion of transit trips vs. total trips has decreased in recent years, transit ridership in Kane County has increased, especially the use of Metra trains. In many cases, Metra use has been limited primarily by the number of car or bicycle parking spaces at Metra stations in the county. Pace and paratransit routes see moderate ridership volumes, with the highest number of trips taken in Aurora and Elgin.

**Projected Conditions**

According to the Kane County 2030 Transportation Plan, population in the county is expected to increase by over 70% by 2030. As projected population growth in the county continues to be realized, past traffic volumes and congestion levels will transform from moderate to severe.

Total vehicle miles traveled will continue to see their current dispersion between state, county, and municipal routes. However, even with a future roadway network that includes current and committed routes, congestion is expected to increase to the point where over 50% of the County roads would experience congestion by 2030 (Figure 2-3). This would result in a 13 fold increase in vehicle hours of delay, and a 28 fold increase on County routes.

As noted in the 2030 Transportation Plan, these results emphasize that current and planned highways will not adequately support projected traffic volumes and traveler desires. As a result, the Transportation Plan and other past studies propose a number of improvements to address these congestion issues. Intelligent transportation systems are perhaps the most cost-effective tool available to meet this challenge.

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Figure 2-2 – 2003 Congested Roadway Segments\textsuperscript{10}

\textsuperscript{10} Kane County 2030 Transportation Plan, 2004.
Figure 2-3 – 2030 Congested Roadway Segments\textsuperscript{11}

\textsuperscript{11} Kane County 2030 Transportation Plan, 2004.
Planned Projects

A number of transportation planning studies are currently underway for Kane County. These include documents produced by the Kane County Division of Transportation and the Kane-Kendall Council of Mayors.

The following is a listing of projects as defined in the Kane County FY2007 Transportation Improvement Program (TIP):

- Stearns Road Bridge Corridor Bridge Construction and Road Alignment
- Anderson Road Extension over the UP Railroad Roadway Expansion
- Longmeadow Parkway Bridge Corridor Bridge Construction and Road Alignment
- Randall Road at IL 64 Intersection Improvements
- IL 38 and Kirk Road Intersection Improvements
- Orchard Road at Jericho Intersection Improvements
- McLean Boulevard - Hopps Road to Bowes Road Widening
- County Bridge Rehabilitation and Replacement Program
- Resurfacing and Annual Pavement Maintenance12

The KKCOM Annual Report identifies the Surface Transportation Program (STP) for the county. In 2006, the STP includes the following ITS projects:

- Signal interconnect project on Randall Road from Silver Glen to Red Haw (KDOT)
- Signal interconnect project on Randall Road from Binnie to IL 72 (KDOT)13

Additional signal interconnect projects are planned for deployment in the future. Some of these projects, listed below, also include the deployment of ITS devices (e.g., PTZ cameras – now standard for new KDOT signals) and associated communications infrastructure.

- Kirk Road – IL 64 to Pine Street
- Fabyan Parkway – County Line to Western Avenue
- Huntley Road – various locations

Some other projects planned in Kane County include:

- Reagan Tollway/I-88 Rebuild and Widen at the Aurora Toll Plaza
- Pace Bus Transit Signal Priority (TSP) on Randall Road
- Automatic Vehicle Location (AVL) technology on the City of Elgin vehicle fleet
- Red light running cameras in Aurora, Elgin, and other municipalities
- Fiber optic linkages in the City of Aurora
- Alternative/Backup 911 Center in the City of Aurora
- Signal Timing and Interconnects along IL 31 in the City of Aurora
- Kirk Road at IL 38 intersection improvements
- Randall Road and Fabyan Parkway intersection improvements
- IL 47 Expansion at I-90, IL 88, Big Timber Road

In addition to these current projects, the following is a listing of proposed projects in the 2030 Transportation Plan:

**Highway Projects**
- **Interstate Projects:** I-90 widening at the Elgin Toll Plaza, I-88 widening from Orchard road to the east county line, complete interchanges along I-90 and I-88 at IL 47
- **Additional Freeway/Expressway Projects:** US 20 widening through Elgin, US 20 and Randall Road interchange improvements
- **Prairie Parkway:** new corridor linking I-80 and I-88
- **Strategic Regional Arterials:** various improvements on Orchard/Randall Road, Fabyan Parkway, Dunham/Kirk Road, IL 47
- **Regional Fox River Bridge Corridors:** new crossings of the Fox River at Longmeadow Parkway/Bolz Road, Stearns Road, and Oak Street/IL 56
- **Existing Arterials:** various improvements to regional arterials

**Transit Projects**
- **Proposed Metra Commuter Rail Service:** UP-W Line extension to Elburn, MD-W extension to Huntley or Marengo, BNSF extension to Kendall County
- **Transit Area Improvements:** various transit system improvements in the five defined Kane County Transit Areas
- **Bus Rapid Transit (BRT):** operational improvements along Randall Road, Kirk Road, IL 25, I-90, and I-88
- **Transportation Hubs and Centers:** full-service multi-modal transportation hubs are planned for Geneva, and smaller transportation centers are planned for LaFox, Sugar Grove, Montgomery, Hampshire, South Elgin, St. Charles, and the Upper Fox Transit Area
- **Park-n-Ride Lots:** various locations throughout the county
- **Paratransit:** continued improvement and coordination of paratransit services (detailed further in the Kane County Paratransit Coordination Study)

**2.2 Stakeholder Outreach Process**
A project stakeholder can be defined as a member of any agency or organization in or around Kane County that has resources on or linked to the transportation network. Input from project stakeholders is critical to the success of this ITS/TMC feasibility study. To fully engage the different agencies and organizations that have a stake in the project, the Project Team conducted a project kickoff meeting, stakeholder workshop, and a series of interviews with key stakeholders. The results of these outreach activities are described in the subsections below.
Kickoff Meeting

Project outreach activities began with a kickoff meeting on October 25, 2006. During this meeting, key project stakeholders were given an introduction to the key concepts of ITS followed by the goals and purpose of the ITS/TMC Feasibility Study project. This meeting also provided an opportunity to develop the project vision statement described above in Section 1.2. This vision was developed through a brainstorming exercise that sought to highlight the issues that key project stakeholders wanted to address through the study. These issues were:

- Improved mobility
- Conveniently and easily accessible data
- Use of current and future technology
- Enhanced communication – internal and external
- Public informed
- Improve safety
- Information sharing
- Efficient and timely maintenance
- Cost effective
- Reduce incident response duration
- Interagency coordination/integration
- Regional data sharing
- Informed decision making
- Maximized capacity
- Education and enforcement
- Special events
- Bridge institutional barriers
- Interoperability Plan for predicted & prepare response for unpredicted
- Consider urban/rural driver expectations/behavior
- Influence appropriate driver response
- Commercial vehicles
- Performance measures to evaluate success
- Dynamic detour routing
- Preserve and enhance environment
- Modal options
- Reduced travel times
- Rail crossing safety

Stakeholder Workshop

A stakeholder workshop was held on November, 29, 2006. This workshop was conducted to bring the larger group of project stakeholder together to discuss the project concepts, introduce ITS, and collect valuable information about the current state of the Kane County transportation network. The workshop started with a brief overview of the project for the benefit of the attendees who were not present for the kickoff meeting. This was followed by a discussion of the existing and planned ITS-related projects in the county. Next, the stakeholders collectively identified the key transportation challenges facing their agencies. These findings were aggregated and prioritized by the stakeholders in a group exercise. The issues that emerged from the stakeholder workshop are listed in Table 2-3 in order of their relative importance.
Table 2-3 – Summary of Needs from Stakeholder Workshop

<table>
<thead>
<tr>
<th>Need Category</th>
<th>Total Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data sharing</td>
<td>42</td>
</tr>
<tr>
<td>Promote transit</td>
<td>35</td>
</tr>
<tr>
<td>Standardization</td>
<td>22</td>
</tr>
<tr>
<td>Communications infrastructure</td>
<td>18</td>
</tr>
<tr>
<td>Data management</td>
<td>14</td>
</tr>
<tr>
<td>Inter-jurisdictional Coordination</td>
<td>10</td>
</tr>
<tr>
<td>Rural driver safety</td>
<td>10</td>
</tr>
<tr>
<td>Pedestrian access</td>
<td>8</td>
</tr>
<tr>
<td>Information to the public</td>
<td>7</td>
</tr>
<tr>
<td>Data pipe for expansion</td>
<td>7</td>
</tr>
<tr>
<td>Evacuation planning</td>
<td>1</td>
</tr>
<tr>
<td>Data collection</td>
<td>0</td>
</tr>
</tbody>
</table>

Stakeholder Interviews

Individual interviews were conducted with representatives of key stakeholder agencies to collect information about their current resources and planned projects, operational roles and responsibilities, and particular transportation needs. In addition to the interview synopses below, notes from these interviews are found in Appendix B.

The following paragraphs describe the transportation issues that were raised by the individual agencies interviewed as part of the project outreach.

**KDOT GIS Department**

The KCDOT GIS Department’s main concern was the lack of available spatial data (with appropriate metadata), such as municipal roadwork planning activities, average daily traffic (ADT) volumes for township and municipal routes, geo-coded crash data for GIS mapping, and transportation infrastructure locations. They also expressed an interest in developing a central GIS database which could enable inter-agency data sharing, especially crash data.

**KDOT Maintenance and Operations Department**

The KCDOT Maintenance and Operations (M&O) Department seeks additional infrastructure monitoring tools that would enable the Department to remotely monitor road conditions and help it to effectively plan its construction and maintenance operations. Specifically, the Department would like access to bridge deck video cameras and additional cameras at road weather information stations (RWIS); automated deicing systems on certain bridges; and single command center with DTN, camera feeds, radio, television, digital maps, automated vehicle location (AVL) monitoring systems, etc. The M&O Department also noted that dangerous geometry and animal collisions pose a problem in some rural parts of the county.

**KDOT Planning and Programming Department**

The Permitting Department has a number of ongoing projects and sees a need for a user friendly mapping tool to visualize and track these projects.
KDOT Project Implementation
KDOT Project Implementation cited traffic congestion as a major concern. Specifically, high truck traffic volumes are adversely affecting traffic flow. Incident management operations also disrupt traffic operations on a regular basis. KDOT Project Implementation emphasized the need for different transportation agencies to coordinate their efforts, leverage funding, and share in the cost of implementing ITS elements. Like the KDOT GIS Department, Project Implementation also noted the importance of collecting useful traffic data for planning purposes.

Kane County Office of Emergency Management
The Kane County Office of Emergency Management (OEM) would like access to improved technologies for effective traffic information dissemination for rerouting traffic, e.g., dynamic message signs (DMS). The OEM would also like to implement traffic signal plans to help reroute traffic away from the incident.

Kane County Sheriff Department
For more efficient incident response, the Kane County Sheriff would like access to emergency vehicle pre-emption (EVP) system on major intersections and information about crash rates at these EVP locations. To improve incident management, they would also like access to video camera feeds where the cameras are deployed. A dynamic alternate route mapping system would be helpful in effective incident management. Clear jurisdictional delineation and improved communications with municipal and highway commissioners would also aid incident response.

The Sheriff Department stressed the need for greater coordination, especially in regard to crash reporting and crash data management. The Department is also open to the idea of a ‘Traffic Incident Management Work Group’ to coordinate transportation and emergency operations.

Rutland Dundee Fire Protection Department (Kane County Fire Chiefs’ Association)
A chief concern of the Rutland Dundee Fire Protection Department (representing the Kane County Fire Chiefs’ Association) is the upgrading of infrastructure for effective emergency response management. This includes the following:

- Installation of emergency vehicle pre-emption (EVP) systems and signal retiming on traffic signals for addressing safety issues;
- Investing in communication systems for coordinating activities with other agencies (e.g., police departments, KDOT) in areas of poor coverage;
- Implementing a dynamic traffic routing system (esp. on major roads) for redirecting traffic around incident sites; and
- Integrating various emergency management computer-aided dispatch (CAD) systems countywide, possibly through a low-end solution (e.g., automatic email updates) for incident information alerts.

The Department also expressed a need for regularly updated route, road closure, construction information (esp. in regions outside one’s own jurisdiction) and real time incident status information. This information can play a critical role in emergency response planning and dispatching), thus saving critical response time.
St. Charles Police Department (Kane County Police Chiefs’ Association)
The two primary concerns of St. Charles Police Department (representing Kane County Police Chiefs’ Association) are providing updated and timely incident information to the drivers and improvement of roadway surveillance systems, specifically providing roadway camera video access to police departments.

Village of Montgomery Department of Public Works and Kane-Kendall Council of Mayors
The Village of Montgomery Department of Public Works (DPW), also speaking on behalf of the Kane-Kendall Council of Mayors (KKCOM), stated its main interest is in mitigating the growing traffic congestion in the region. This might be achieved by interconnecting traffic signals in key corridors to increase traveler mobility and providing wider pavement infrastructure for increasing traffic capacity. Increased traveler information was also cited as a way to reduce congestion. The Village noted that rail operations at some of the highway rail intersections (HRI) in the county adversely affect traffic flow. This might be addressed by coordinating the rail and traffic operations.

The Department also raised the issue of emergency response management and expressed a need for alternate route planning and information sharing between various agencies through the 911 center.

City of Aurora Department of Public Works
The main concern for the Aurora DPW is arterial operations within the area. Traffic queues backup at a few HRI locations, there is inadequate capacity at Metra parking lots, limited pre-trip traveler information in certain corridors, and an underutilized transit system were identified as some of the key issues in Aurora. The City also noted that reliable, updated crash data and construction data was lacking in the county.

City of Elgin Department of Public Works
Like Aurora, the City of Elgin DPW noted that traffic congestion, much of it caused by the high level of development in the county and the disruption of traffic flow by rail operations, are key transportation issues in Kane County. The City also stressed the importance of access for pedestrians.

The following regional transportation agencies were interviewed as part of a related study. During these interviews, a number of regional issues were raised that pertain to transportation operations in Kane County.

Pace Suburban Bus
Pace is concerned with transit rider mobility, and as a result is currently deploying, testing, or developing a number of initiatives to address this need, including: active transit station signs, transit signal priority, bus rapid transit routes, and queue jumping. In addition, Pace would like to centralize its transit management functions, which could involve co-location with a county or municipal management center.
Metra Commuter Rail
In response to overloaded Metra station parking lots, Metra has deployed its Parking Management Guidance System (PGMS), which provides motorists with real-time Metra parking lot occupancy information. Metra is also in the process of deploying a real-time train tracking system that will assist with train operations.

Regional Transportation Authority (RTA)
The RTA is focused on providing useful, timely, and accurate traveler information to its ridership. While the RTA service boards (Metra and Pace) are able to track their vehicles in real-time, there is a shortfall in the availability of arterial traffic conditions that have direct impact on transit operations.

IDOT District 1 Bureau of Traffic
The IDOT District 1 Bureau of Traffic is in a unique position to link expressway and arterial traffic management functions. As more and more real-time arterial system data becomes available and as interagency communication is improved (e.g., Lake County PASSAGE and the Schaumburg corridor in Cook County), IDOT and partner agencies will have the capability to significantly improve arterial operations, traffic incident management, transit operations, and traveler information. For instance, IDOT is considering deployment of centralized traffic signal control, which it is now using in Lake County as part of the PASSAGE program. Also in place as part of PASSAGE, pan-tilt-zoom (PTZ) cameras are installed along state routes to provide video images to IDOT, Bureau of Traffic (plans are in place to share this video with the IDOT ComCenter and Traffic Systems Center). This video could be shared with other local traffic management agencies to improve coordination of arterial and expressway traffic operations. Lastly, IDOT is deploying arterial DMS to provide motorists with real-time travel information.

Illinois State Toll Highway Authority
As with KDOT and IDOT, the Illinois Tollway is interested in improving the flow of traffic between arterials and expressways. In particular, Tollway ramps experience significant queues, with ramp traffic often backing up onto the mainline. Video image sharing was also cited as a way to improve traffic flow near expressways.

The Tollway noted that, because the agency does not have limited liability, it is apprehensive to lead any effort to develop expressway alternate routes. However, the Tollway noted the importance of alternate routes during incidents, and agreed to participate in the development of alternate routes if led by another agency.

The Tollway noted that communication and coordination are the keys to interagency operations. When lines of communication are in place, information sharing and coordinated operations can commence. This should be considered before implementing any technology-based systems.

2.3 Conclusion
As the previous sections demonstrate, there are a number of cross-cutting transportation issues that numerous stakeholders and past studies have identified. These needs can be classified into the following needs categories:
• **Arterial Operations** – provide ITS solutions to reduce the traffic congestion and increase traveler safety at key locations
• **Data Collection** – enhance the surveillance capabilities of roadway infrastructure for improved maintenance and construction activities
• **Data Management** – develop resources for effective data collection and storage and create methods and protocols for agencies to exchange pertinent, useful data across jurisdictional boundaries
• **Operational Coordination** – improve coordination between various agencies for effective utilization of resources – especially between transportation agencies, emergency services, and construction and maintenance agencies for incident response
• **Promotion of Transit Use** – improve the viability of transit use through the application of ITS technologies and improved transit parking facilities
• **Traveler Information** – increase the prevalence, attractiveness, and awareness of traveler information in Kane County

Some of these needs areas have a direct correlation to one of the four focus areas for the project, while others fall under multiple focus areas. The needs categories correspond to the focus categories as described in the following matrix:

<table>
<thead>
<tr>
<th>Needs Categories</th>
<th>Arterial Operations</th>
<th>Traffic Incident Management</th>
<th>Maintenance &amp; Construction</th>
<th>Rural ITS Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arterial Operations</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Data Collection</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Data Management</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Operational Coordination</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Promotion of Transit Use</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Traveler Information</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>

**Table 2-4 – Relation between Project Focus Area and Needs Category**

Specific issues identified through this needs assessment are contained in Table 2-5. The table also includes notes about each identified need and the affected stakeholder(s) that would provide resources to address each listed issue. This list will serve as the basis for the technology and strategy assessment, as well as the final project recommendations.
Table 2-5 – Summary of Identified Kane County ITS/TMC Feasibility Study Needs

<table>
<thead>
<tr>
<th>Needs Category</th>
<th>Identified Needs</th>
<th>Affected Stakeholder(s)</th>
<th>Comments, Critical Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arterial Operations</td>
<td>Alleviate congestion and improve coordination along key arterial corridors</td>
<td>KDOT Implementation, City of Elgin DPW, Village of Montgomery DPW, IDOT</td>
<td>Randall Road (esp. McLean and IL Rte. 20)</td>
</tr>
<tr>
<td></td>
<td>Mitigate truck traffic issues</td>
<td>KDOT Implementation</td>
<td>Stearns Road corridor</td>
</tr>
<tr>
<td></td>
<td>Reduce traffic queues at HRI locations (esp. during peak periods)</td>
<td>City of Aurora DPW, City of Elgin DPW, Village of Montgomery DPW</td>
<td>Indian Trail and Highland Ave., IL 25 and Indian Trail Road</td>
</tr>
<tr>
<td></td>
<td>Increase access points on major arterials</td>
<td>City of Elgin DPW</td>
<td>Randall Road</td>
</tr>
<tr>
<td></td>
<td>Address conflicts to pedestrian traffic</td>
<td>City of Elgin DPW</td>
<td>Randall Road</td>
</tr>
<tr>
<td></td>
<td>Reduce crash rates at key intersections, including rural locations (e.g., animal collisions, icy conditions)</td>
<td>KDOT M&amp;O, KC Fire Chief Assoc, IDOT</td>
<td>Provide left turn arrow at IL Rte. 72 and Randall Road</td>
</tr>
<tr>
<td></td>
<td>Provide method for emergency services to operate traffic control devices</td>
<td>KC OEM</td>
<td></td>
</tr>
<tr>
<td>Data Collection</td>
<td>Increase video monitoring and weather sensors (especially at bridge decks)</td>
<td>KDOT M&amp;O</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Need more spatial data including GIS crash data maps, inventory of equipment</td>
<td>KDOT- GIS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Need more traffic related data (e.g., traffic volumes, crash data)</td>
<td>KDOT GIS, KDOT Implementation, IDOT, City of Aurora DPW, KC Sheriff</td>
<td></td>
</tr>
<tr>
<td>Data Management</td>
<td>Need a centralized countywide GIS database</td>
<td>KDOT- GIS</td>
<td>Build on County database, sharing arrangement between St. Charles, Aurora, and Geneva</td>
</tr>
<tr>
<td></td>
<td>Improve crash reporting, data storage, sharing</td>
<td>KDOT GIS, City of Aurora DPW, KC Sheriff</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide central repository and mapping tool to visualize and track construction projects</td>
<td>KDOT Permitting, City of Aurora DPW, IDOT, KC Fire Chief Assoc</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide interagency video data sharing</td>
<td>KDOT M&amp;O, KC Police Assoc, KC Sheriff, IDOT, ISTHA</td>
<td></td>
</tr>
<tr>
<td>Needs Category</td>
<td>Identified Needs</td>
<td>Affected Stakeholder(s)</td>
<td>Comments, Critical Locations</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Operational Coordination</td>
<td>Need a single command center with DTN, camera feeds, radio etc.</td>
<td>KDOT M&amp;O, KDOT Implementation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improve communications links, especially between dispatch centers (e.g., emergency dispatch centers, traffic management centers, hospitals)</td>
<td>KC Fire Chief Assoc, IDOT, ISTHA, Pace</td>
<td>Address weak communication signals on the west side of the county</td>
</tr>
<tr>
<td></td>
<td>Improve operational coordination between arterials and expressways</td>
<td>KDOT Implementation, IDOT, ISTHA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improve coordination between agencies, especially between emergency and transportation agencies</td>
<td>KC Fire Chief Assoc, Village of Montgomery DPW, KC Sheriff, IDOT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improve incident response routing and coordination</td>
<td>KC Fire Chief Assoc, Village of Montgomery DPW, KC Sheriff, ISOT, ISTHA</td>
<td>Increase EVP locations, routing information, (dynamic) alternate routes</td>
</tr>
<tr>
<td></td>
<td>Provide interoperability between different CAD systems</td>
<td>KC Fire Chief Assoc</td>
<td></td>
</tr>
<tr>
<td>Promotion of Transit</td>
<td>Improve Metra parking capacity</td>
<td>City of Aurora DPW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improve transit operational efficiency</td>
<td>Pace</td>
<td>Transit signal priority (e.g., Randall Road), bus rapid transit</td>
</tr>
<tr>
<td></td>
<td>Emphasize usage of bus transit system</td>
<td>City of Aurora DPW</td>
<td></td>
</tr>
<tr>
<td>Traveler Information</td>
<td>Enhance pre-trip and en-route traveler information sources (including incident information)</td>
<td>City of Aurora DPW, KC Fire Chief Assoc, KC Police Assoc, Village of Montgomery DPW, KC OEM, KC Sheriff, IDOT</td>
<td>Websites, dynamic message signs</td>
</tr>
</tbody>
</table>
3. Operations and Technology Concepts

This technical memorandum represents a critical step in the development of intelligent transportation systems (ITS) in Kane County. This document is intended to describe the current state of transportation operations in the county, as well as how the introduction of ITS tools might improve operations.

3.1 Concept of Operations

Following the systems engineering process, this Concept of Operations describes 1) the various stakeholders involved in ITS in Kane County; 2) partner agency roles and responsibilities; 3) ITS services or “market packages” that transportation agencies in the county currently provide or may provide through the deployment of ITS tools; and 4) potential ITS benefits and performance measures.

This Concept of Operations builds upon the project vision statement to describe how key ITS stakeholders in Kane County will come together to provide ITS services. The vision statement, as developed by the project Steering Committee, is

“Deploy advanced transportation technology and operational strategies to maximize the safety and efficiency of the countywide transportation system through enhanced traveler information, interagency cooperation and regional coordination”

The following subsections address these issues for the four focus areas of the project, namely:

- Arterial Operations
- Traffic Incident Management
- Maintenance and Construction Management
- Rural Operations

Arterial Operations

Arterial operations include systems that monitor and regulate arterial traffic flow, mitigate congestion, manage parking facilities, support transit operations, coordinate expressway-arterial operations, and disseminate traveler information. Examples include dynamic signal timing measures to provide coordinated traffic flow, parking lot detection to measure availability, multi-modal coordination that increases the efficiency of transit operations, coordinated traffic control between ramps and arterial corridors, and alerts to motorists and emergency responders. In concert with a central traffic management functionality, these systems seek to optimize the flow of traffic on arterial routes.

Stakeholders

Systems associated with arterial operations are managed by numerous agencies at the local, county, and regional level. Below is a listing of those organizations that play a role in arterial operations in Kane County:

- Kane County Division of Transportation (Traffic Department)
- Illinois Department of Transportation District 1 Bureau of Traffic
- Illinois Department of Transportation ITS Program Office
Roles and Responsibilities
Deployment of the market packages listed in the previous subsection requires that multi-agency roles and responsibilities be established. To identify the level of participation different transportation agencies play in the county, a series of operational scenarios were discussed during the first project workshop. These scenarios describe how the proposed system should operate and how different operators, managers, and service providers should interact under a particular set of circumstances. Thus, the scenarios were applied to help ITS stakeholders to understand how all the pieces interact to provide operational capability.

During the workshop, four scenarios were presented: 1) an incident scenario within a work zone on Randall Road; 2) a severe winter weather storm in the southern part of Kane County; 3) traffic impacts after the Kane County Cougars game; and 4) an emergency evacuation of the City of Chicago. During the ensuing breakout discussions, agency roles and responsibilities, as well as required information flows between agencies, resources used, and potential areas for response improvement, were identified.

Table 3-1 provides a listing of pertinent ITS operational roles and responsibilities for arterial operations. The status of role/responsibility is also provided, as follows: ‘existing’ denotes a role/responsibility that is currently in place, ‘planned’ that a particular ITS service will soon be deployed, and ‘potential’ for ITS services that may be deployed as part of this study.

Table 3-1 – Arterial Operations Roles and Responsibilities

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Roles and Responsibilities</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kane County Division of Transportation</td>
<td>Install and operate traffic signals and ITS surface street devices to collect and disseminate data (County routes)</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Monitor surface street system (County routes)</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Support transit signal priority</td>
<td>Planned</td>
</tr>
<tr>
<td></td>
<td>Coordinate resources for regional traffic control</td>
<td>Potential</td>
</tr>
<tr>
<td></td>
<td>Collect traveler and traffic information</td>
<td>Potential</td>
</tr>
<tr>
<td></td>
<td>Disseminate traffic, incident, and maintenance information to travelers</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Maintain countywide standardized electronic crash reporting system</td>
<td>Potential</td>
</tr>
<tr>
<td></td>
<td>Administer access improvements on all County roads and other related improvements (e.g., sidewalk upgrades, utilities, signals)</td>
<td>Existing</td>
</tr>
<tr>
<td>Illinois Department of Transportation District 1</td>
<td>Install and operate traffic signals and ITS surface street devices to collect and disseminate data (State routes)</td>
<td>Existing</td>
</tr>
</tbody>
</table>
### Stakeholder Roles and Responsibilities

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Roles and Responsibilities</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bureau of Traffic</td>
<td>Monitor surface street system (State routes)</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Coordinate resources for regional traffic control</td>
<td>Potential</td>
</tr>
<tr>
<td>Illinois Department of Transportation ITS Program Office</td>
<td>Disseminate traffic, incident, and maintenance information to travelers</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illinois State Toll Highway Authority</td>
<td>Disseminate traffic, incident, and maintenance information to travelers</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Monitor surface street system</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Coordinate resources for regional traffic control</td>
<td>Potential</td>
</tr>
<tr>
<td>Municipalities/Townships</td>
<td>Install and operate traffic signals (local routes)</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Monitor surface street system (local routes)</td>
<td>Potential</td>
</tr>
<tr>
<td></td>
<td>Provide parking related information to assist drivers</td>
<td>Planned</td>
</tr>
<tr>
<td></td>
<td>Coordinate resources for regional traffic control</td>
<td>Potential</td>
</tr>
<tr>
<td></td>
<td>Collect traveler and traffic information</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Disseminate traffic, incident, and maintenance information to travelers</td>
<td>Existing</td>
</tr>
<tr>
<td>Private Weather Information Providers</td>
<td>Provide road weather information to maintenance agencies</td>
<td>Existing</td>
</tr>
<tr>
<td>Pace Suburban Bus</td>
<td>Provide fixed route and paratransit service for the region</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Install and operate ITS transit devices</td>
<td>Existing</td>
</tr>
<tr>
<td>Private Sector Maintenance Contractor</td>
<td>Maintain traffic signals and ITS devices</td>
<td>Existing</td>
</tr>
<tr>
<td>Metra</td>
<td>Provide commuter rail service for the region</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Install and operate ITS transit devices</td>
<td>Existing</td>
</tr>
<tr>
<td>Regional Transportation Authority</td>
<td>Provide regional transit traveler information</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Support deployment of transit ITS technologies</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Disseminate transit incident, schedules, routes, fare and maintenance information to travelers</td>
<td>Existing</td>
</tr>
</tbody>
</table>

### ITS Services

The National ITS Architecture provides a common framework for planning, defining, and integrating intelligent transportation systems. It is a mature product that reflects the contributions of a broad cross-section of the ITS community (transportation practitioners, systems engineers, system developers, technology specialists, consultants, etc.). The architecture defines:

- The functions that are required for ITS
- The physical entities or ‘subsystems’ where these functions reside
- The information flows that connect these physical subsystems together into an integrated system to provide ITS functions

To describe the numerous services provided by transportation stakeholders, the National ITS Architecture (http://www.iteris.com/itsarch/html/mp/mpindex.htm) has defined 85 “market packages.” These market packages group together the related functions, physical entities, and information flows that coincide to provide ITS services. As an example, Figure 3-1 identifies the ITS elements involved in performing surveillance of the transportation network. These include physical entities on the roadway (e.g., CCTV cameras) and at a centralized traffic management...
location (e.g., TMC), surveillance functionality (e.g., collecting surveillance data), and the information flows between systems (e.g., traffic images).

Figure 3-1 – Network Surveillance (ATMS01) Market Package Diagram

Market packages are grouped into seven categories to address the numerous ITS services: advanced transportation management systems (ATMS), advanced public transportation systems (APTS), advanced traveler information systems (ATIS), advanced vehicle safety systems (AVSS), commercial vehicle operations (CVO), emergency management (EM), and maintenance and construction (MC) management. The following is a list of ITS market packages related to arterial operations in Kane County (more detailed descriptions of these market packages and their specific application in Kane County can be found in Appendix C). 14

- Network Surveillance (ATMS01)
- Probe Surveillance (ATMS02)
- Surface Street Control (ATMS03)
- Freeway Control (ATMS04)
- High-Occupancy Vehicle (HOV) Lane Management (ATMS05)
- Traffic Information Dissemination (ATMS06)
- Regional Traffic Control (ATMS07)
- Traffic Forecast and Demand Management (ATMS09)
- Electronic Toll Collection (ATMS10)
- Standard Rail Grade Crossing (ATMS13)
- Advanced Railroad Grade Crossing (ATMS14)
- Railroad Operations Coordination (ATMS15)
- Parking Facility Management (ATMS16)
- Transit Vehicle Tracking (APTS1)
- Transit Fixed-Route Operations (APTS2)

14 Market package descriptions include text from the National ITS Architecture website, www.iteris.com/itsarch
• Demand Response Transit Operations (APTS3)
• Transit Passenger and Fare Management (APTS4)
• Transit Security (APTS5)
• Multi-modal Coordination (APTS7)
• Transit Traveler Information (APTS8)
• Broadcast Traveler Information (ATIS1)
• Interactive Traveler Information (ATIS2)
• ISP Based Trip Planning and Route Guidance (ATIS5)
• Dynamic Ridesharing (ATIS8)
• ITS Data Mart (AD1)
• ITS Data Warehouse (AD2)

Performance Measures and Potential Benefits
Before deploying ITS, it is important to define the expectations for success. This is done by documenting performance measures which can be used to evaluate the effectiveness of ITS strategies that are deployed. In some cases, these performance measures are universal to different types of ITS deployments; in other cases they are unique to a particular application. To assist in this process, the USDOT has defined six goal areas for the deployment of ITS that can be used to develop performance measures for ITS projects:

- Customer satisfaction – positive difference between users' expectations and experiences in relation to a service or product
- Efficiency – increase in the capacity (the maximum rate at which vehicles can pass through a roadway segment) and throughput (the actual traffic rate) of the transportation network
- Energy & environment – lessening of air quality and energy impacts caused by the movement of goods and people
- Mobility – reductions in motorist delay and travel times
- Productivity – decrease in transportation operating costs
- Safety – reductions in the number, severity, and response time to crashes

The sample performance measures listed in Table 3-2 can be used to measure the effectiveness of ITS arterial operations projects. For effective performance measurement, it is important to carefully document these performance measures both before and after deploying ITS to truly determine the effects of the project on the transportation network.

Table 3-2 – Sample Arterial Operations Performance Measures\textsuperscript{16}

<table>
<thead>
<tr>
<th>USDOT Goal Area</th>
<th>Performance Measures</th>
<th>Unit of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Satisfaction</td>
<td>Positive driver survey responses for arterial operations improvements</td>
<td>Percentage of responses</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Intersection/roadway segment traffic capacity/throughput</td>
<td>Vehicles/hour crossing an intersection/roadway segment</td>
</tr>
<tr>
<td>Energy &amp; Environment</td>
<td>Reduction in emissions</td>
<td>Mobile source emission parts per million (ppm)</td>
</tr>
<tr>
<td></td>
<td>Reduction in fuel consumption</td>
<td>Gallons/year</td>
</tr>
<tr>
<td>Mobility</td>
<td>Average peak hour delay per vehicle at an intersection</td>
<td>Minutes/vehicle</td>
</tr>
<tr>
<td></td>
<td>Average travel time variability</td>
<td>Minutes/trip</td>
</tr>
<tr>
<td></td>
<td>Average peak hour travel speed</td>
<td>Miles/hour</td>
</tr>
<tr>
<td>Productivity</td>
<td>Cost savings</td>
<td>Operating expenses/year</td>
</tr>
<tr>
<td>Safety</td>
<td>Crash rate</td>
<td>Crashes/year by location</td>
</tr>
<tr>
<td></td>
<td>Traffic accident severity</td>
<td>Fatal, injury crashes/year by location</td>
</tr>
<tr>
<td></td>
<td>Response time for emergency vehicles</td>
<td>Minutes/incident</td>
</tr>
</tbody>
</table>

ITS strategies for improved operations have a proven track record of success, often realizing benefit cost ratios of 20-to-1 and higher. The USDOT ITS Joint Program Office (JPO) continually collects and publishes documented benefits of ITS deployments across the country. Benefits are organized by the particular application (e.g., arterial management systems, incident management systems) and by defined goal area. The following are sample benefits for arterial operations ITS deployments as documented by the USDOT ITS JPO\textsuperscript{17}:

- Field studies in several cities have shown that adaptive signal control systems can reduce delay up to 42%.
- **Automated enforcement of traffic signals** has reduced red-light violations by 75% in Charlotte, NC.
- **Emergency vehicle preemption systems** reduced average emergency vehicle travel time by 16-23%.
- Customer surveys in Wisconsin indicated that approximately 70% of drivers adjust their travel plans based on travel time information provided on dynamic message signs.
- Model estimates in San Antonio show that highway rail crossing notification systems can reduce delay by 6% and crash rates by 8%.
- **Truck preemption systems** in Texas were seen to reduce truck stops by nearly 100 per week, resulting in significant savings in fuel consumption and emissions.

**Traffic Incident Management**

Traffic incident management (TIM) is the process of coordinating the resources of a number of different partner agencies and private sector companies to detect, respond to, and clear traffic incidents as quickly as possible while protecting the safety of on-scene responders and the traveling public. TIM emphasizes the need for improved incident management tools and

\textsuperscript{16} USDOT, ITS Evaluation Guidelines – ITS Evaluation Resource Guide

\textsuperscript{17} http://www.benefitcost.its.dot.gov/its/benecost.nsf
techniques and better coordination between incident managers to speed emergency detection, assessment, response, and clearance.

**Stakeholders**
Below is a listing of those organizations that play a role in traffic incident management in Kane County:

- Kane County Division of Transportation
- Kane County Sheriff
- Kane County Office of Emergency Management
- Other County Highway Departments
- Other County Sheriff Departments
- Illinois Department of Transportation District 1 Bureau of Maintenance
- Illinois Department of Transportation District 1 Bureau of Traffic
- Illinois Department of Transportation ITS Program Office
- Illinois State Police
- Illinois State Toll Highway Authority
- Fire Districts
- Municipalities/Townships
- Private Towing Companies
- Regional Event Organizations
- Regional Transportation Authority

**Roles and Responsibilities**
As with arterial operations, the operational scenarios discussed during the first stakeholder workshop provide the basis for the listing of pertinent ITS operational roles and responsibilities for traffic incident management contained in Table 3-3.

**Table 3-3 – Traffic Incident Management Roles and Responsibilities**

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Roles and Responsibilities</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kane County Division of Transportation</td>
<td>Monitor traffic to detect incidents</td>
<td>Potential</td>
</tr>
<tr>
<td></td>
<td>Coordinate resources for incident management</td>
<td>Potential</td>
</tr>
<tr>
<td></td>
<td>Provide video feed to emergency agencies</td>
<td>Potential</td>
</tr>
<tr>
<td>Kane County Sheriff</td>
<td>Receive and process emergency calls</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Respond to incidents</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Establish incident command (County routes)</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Create incident reports</td>
<td>Existing</td>
</tr>
<tr>
<td>Other County Highway Departments</td>
<td>Respond to incidents</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Coordinate resources for incident response</td>
<td>Existing</td>
</tr>
<tr>
<td>Other County Sheriff Departments</td>
<td>Receive and process emergency calls</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Respond to incidents</td>
<td>Existing</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Roles and Responsibilities</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois Department of Transportation District 1 Bureau of Maintenance</td>
<td>Coordinate incident site cleanup (State routes)</td>
<td>Existing</td>
</tr>
<tr>
<td>Illinois Department of Transportation District 1 Bureau of Traffic</td>
<td>Provide video feed to emergency agencies</td>
<td>Potential</td>
</tr>
<tr>
<td></td>
<td>Monitor traffic to detect incidents (State routes)</td>
<td>Potential</td>
</tr>
<tr>
<td>Illinois Department of Transportation ITS Program Office</td>
<td>Implement signal timing modifications during incidents</td>
<td>Potential</td>
</tr>
<tr>
<td>Illinois State Police</td>
<td>Collect regional incident information</td>
<td>Existing</td>
</tr>
<tr>
<td>Illinois State Police</td>
<td>Receive and process emergency calls</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Respond to incidents (Tollway routes)</td>
<td>Existing</td>
</tr>
<tr>
<td>Illinois State Toll Highway Authority</td>
<td>Establish incident command (Tollway routes)</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Create incident reports</td>
<td>Existing</td>
</tr>
<tr>
<td>Illinois State Toll Highway Authority</td>
<td>Monitor traffic to detect incidents (Tollway routes)</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Respond to incidents</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Provide traffic control at incident sites (Tollway routes)</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Coordinate incident site cleanup (Tollway routes)</td>
<td>Existing</td>
</tr>
<tr>
<td>Municipalities/Townships</td>
<td>Receive and process emergency calls</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Respond to incidents</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Provide traffic control at incident sites (local routes)</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Coordinate incident site cleanup (local routes)</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Create incident reports</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Provide emergency medical services at incidents (local routes)</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Establish incident command (local routes)</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Close travel lanes at incident site</td>
<td>Existing</td>
</tr>
<tr>
<td>Private Towing Companies</td>
<td>Respond to incidents</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Coordinate incident site cleanup</td>
<td>Existing</td>
</tr>
<tr>
<td>Regional Event Organizations</td>
<td>Provide event information to emergency service agencies</td>
<td>Existing</td>
</tr>
<tr>
<td>Regional Transportation Authority</td>
<td>Detect incidents</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Provide incident information to emergency services</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Distribute incident information to travelers</td>
<td>Existing</td>
</tr>
</tbody>
</table>
**ITS Services**
The following is a list of ITS market packages related to traffic incident management in Kane County (more detailed descriptions of these market packages and their specific application in Kane County can be found in Appendix C).
- Traffic Incident Management System (ATMS08)
- Emergency Call-Taking and Dispatch (EM01)
- Emergency Routing (EM02)
- Roadway Service Patrols (EM04)
- Wide Area Alert (EM06)
- Disaster Response and Recovery (EM08)
- Evacuation and Reentry Management (EM09)

**Performance Measures and Potential Benefits**
There are a number of performance measures that can be used to measure how effective traffic incident management ITS strategies are and what level of benefit is being provided. These measures should be carefully defined so that both those gathering the information and reading the results are aware of what is being measured. Sample TIM performance measures are listed in Table 3-4.

### Table 3-4 – Sample Traffic Incident Management Performance Measures

<table>
<thead>
<tr>
<th>USDOT Goal Area</th>
<th>Performance Measures</th>
<th>Unit of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Satisfaction</td>
<td>Positive driver survey responses for TIM improvements</td>
<td>Percentage of responses</td>
</tr>
<tr>
<td>Mobility</td>
<td>Incident delay per vehicle</td>
<td>Minutes/vehicle</td>
</tr>
<tr>
<td></td>
<td>Work zone queue length</td>
<td>Distance</td>
</tr>
<tr>
<td>Productivity</td>
<td>Cost savings</td>
<td>Operating expenses/year</td>
</tr>
<tr>
<td>Safety</td>
<td>Crash rate (primary incident)</td>
<td>Crashes/year by location</td>
</tr>
<tr>
<td></td>
<td>Crash rate (secondary incident)</td>
<td>Crashes/year</td>
</tr>
<tr>
<td></td>
<td>Traffic accident severity</td>
<td>Fatal, injury crashes/year by location</td>
</tr>
<tr>
<td></td>
<td>Response time for emergency vehicles</td>
<td>Minutes/incident</td>
</tr>
<tr>
<td></td>
<td>Incident clearance time</td>
<td>Minutes/incident</td>
</tr>
</tbody>
</table>

The USDOT ITS JPO provides the following sample benefits of using ITS to enhance traffic incident management18:
- Deployment of traffic incident management systems in Pennsylvania have been seen to reduce secondary crashes by 40% and closure times by 55%.
- In New Mexico, the deployment of computer-aided dispatching (CAD) and automatic vehicle location (AVL) systems has reduced incident response by 15%.
- Motorist assist programs in Minnesota have decreased the average incident response time by eight minutes on average, saving $1.4 million per year in delay costs.
- Service patrols often receive numerous ‘thank you’ letters from motorists, enhancing the public’s opinion of the DOT.

Maintenance and Construction Management

Maintenance and construction management (MCM) comprises the monitoring, managing, and coordination of roadway infrastructure construction and maintenance activities. Representing both public agencies and private contractors that provide these functions, this focus area also includes the management of maintenance, construction, or special service vehicles (e.g., snow and ice control equipment).

An important stakeholder in maintenance and construction management are weather detection systems and weather information providers (the National Weather Service and commercial surface transportation weather service providers) that provide current and forecast weather information to various transportation agencies. This weather information can be fused with other data sources and used to support advanced decision support systems that increase the efficiency and effectiveness of maintenance and construction operations.

Stakeholders

Below is a listing of those organizations that play a role in maintenance and construction management in Kane County:

- Kane County Division of Transportation
- Illinois Department of Transportation District 1 Bureau of Construction
- Illinois Department of Transportation District 1 Bureau of Maintenance
- Illinois State Toll Highway Authority
- Municipalities/Townships
- Private Sector Maintenance Contractor
- Private Sector Project Administration (Engineering Consultant)
- Private Weather Information Providers
- Utility Companies

Roles and Responsibilities

Table 3-5 provides a listing of pertinent ITS operational roles and responsibilities for maintenance and construction management.

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Roles and Responsibilities</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kane County Division of Transportation</td>
<td>Maintain County routes including snow and ice control, pavement maintenance, and ITS devices</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Coordinate construction activities with other maintenance and construction agencies through construction, permitting and traffic departments</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Regularly alert Sheriff, police, fire, and schools about road closures, with updates within 48-72 hours</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Assist police departments at traffic incidents when asked (traffic control, cleanup)</td>
<td>Existing</td>
</tr>
<tr>
<td>Illinois Department of Transportation District 1 Bureau of Construction</td>
<td>Coordinate construction activities with other maintenance and construction agencies</td>
<td>Existing</td>
</tr>
</tbody>
</table>
### Stakeholder, Roles and Responsibilities

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Roles and Responsibilities</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois Department of Transportation District 1</td>
<td>Maintain State routes including snow and ice control, pavement maintenance, and ITS devices</td>
<td>Existing</td>
</tr>
<tr>
<td>Bureau of Maintenance</td>
<td>Coordinate construction activities with other maintenance and construction agencies</td>
<td>Existing</td>
</tr>
<tr>
<td>Illinois State Toll Highway Authority</td>
<td>Maintain Tollway routes including snow and ice control, pavement maintenance, and ITS devices</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Coordinate construction activities with other maintenance and construction agencies</td>
<td>Existing</td>
</tr>
<tr>
<td>Municipalities/Townships</td>
<td>Maintain local routes including snow and ice control, pavement maintenance, and ITS devices</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Coordinate construction activities with other maintenance and construction agencies</td>
<td>Existing</td>
</tr>
<tr>
<td>Private Sector Maintenance Contractor</td>
<td>Maintain traffic signals and ITS devices</td>
<td>Existing</td>
</tr>
<tr>
<td>Private Weather Information Providers</td>
<td>Provide road weather information to maintenance agencies</td>
<td>Existing</td>
</tr>
<tr>
<td>Utility Companies</td>
<td>Coordinate construction activities with other maintenance and construction agencies</td>
<td>Existing</td>
</tr>
</tbody>
</table>

### ITS Services

The following is a list of ITS market packages related to maintenance and construction management in Kane County (more detailed descriptions of these market packages and their specific application in Kane County can be found in Appendix C).

- Maintenance and Construction Vehicle and Equipment Tracking (MC01)
- Maintenance and Construction Vehicle Maintenance (MC02)
- Road Weather Data Collection (MC03)
- Weather Information Processing and Distribution (MC04)
- Roadway Automated Treatment (MC05)
- Winter Maintenance (MC06)
- Roadway Maintenance and Construction (MC07)
- Work Zone Management (MC08)
- Maintenance and Construction Coordination (MC09)

### Performance Measures and Potential Benefits

Whether the maintenance activities are conducted by in-house personnel or contracted out, there are several measures of performance that can be used to determine the effectiveness of maintenance and construction operations (Table 3-6).
**Table 3-6 – Sample Construction and Maintenance Management Performance Measures**

<table>
<thead>
<tr>
<th>USDOT Goal Area</th>
<th>Performance Measures</th>
<th>Unit of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Satisfaction</td>
<td>Positive driver survey responses for MCM improvements</td>
<td>Percentage of responses</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Work zone traffic capacity/throughput</td>
<td>Vehicles/hour passing through a work zone</td>
</tr>
<tr>
<td>Mobility</td>
<td>Work zone delay per vehicle</td>
<td>Minutes/vehicle</td>
</tr>
<tr>
<td></td>
<td>Work zone queue length</td>
<td>Distance</td>
</tr>
<tr>
<td>Productivity</td>
<td>Cost savings</td>
<td>Operating expenses/year</td>
</tr>
<tr>
<td></td>
<td>System availability (not including downtime due to maintenance)</td>
<td>Percentage of time operational</td>
</tr>
<tr>
<td></td>
<td>Mean time between equipment failures</td>
<td>Days</td>
</tr>
<tr>
<td></td>
<td>Mean time to repair equipment</td>
<td>Hours</td>
</tr>
<tr>
<td>Safety</td>
<td>Incident clearance time</td>
<td>Minutes/incident</td>
</tr>
</tbody>
</table>

The USDOT ITS JPO provides the following sample benefits of using ITS to enhance maintenance and construction management¹⁹:

- Deployment of an **automated work zone information system** in California resulted in a reduction in ADT on freeways by 15-19%.
- The application of **work zone dynamic message signs** in Kentucky led to reductions in speed violations by 50%.
- Nearly 97% of responding motorists indicated that a **work zone travel time prediction system** applied in Ohio was helpful to their travel.

**Rural Operations**

While initially developed to address urban congestion issues, intelligent transportation systems provide a multitude of tools to increase rural transportation safety, mobility, and efficiency. This concept overlaps the arterial operations, traffic incident management, and maintenance and construction focus areas discussed above, but does so in a manner that is tailored for rural areas.

To emphasize rural ITS applications, the United States Department of Transportation developed the “Rural ITS Toolbox” that identifies numerous ITS applications for seven specific rural transportation tracks:

- Emergency services
- Tourism and travel information
- Traffic management
- Rural transit and mobility
- Crash prevention and security
- Operations and maintenance
- Surface transportation and weather²⁰

These tools apply many of the ITS services described above for the other project focus areas to address issues specific to the rural transportation network.

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²⁰ “Rural ITS Toolbox,” USDOT
Stakeholders
Below is a listing of those organizations that play a role in rural operations in Kane County:
- Kane County Division of Transportation
- Municipalities/Townships
- Emergency Responders and Law Enforcement Agencies
- Private Sector Maintenance Contractor
- Weather Information Providers

Roles and Responsibilities
Table 3-7 provides a listing of pertinent ITS operational roles and responsibilities for rural operations.

Table 3-7 – Rural Operations ITS Roles and Responsibilities

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Roles and Responsibilities</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kane County Division of Transportation</td>
<td>Maintain rural routes including snow and ice control, pavement maintenance, and ITS devices</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Monitor rural routes</td>
<td>Potential</td>
</tr>
<tr>
<td></td>
<td>Provide traveler information</td>
<td>Potential</td>
</tr>
<tr>
<td>Municipalities/Townships</td>
<td>Maintain rural routes including snow and ice control, pavement maintenance, and ITS devices</td>
<td>Existing</td>
</tr>
<tr>
<td></td>
<td>Monitor rural routes</td>
<td>Potential</td>
</tr>
<tr>
<td></td>
<td>Provide traveler information</td>
<td>Potential</td>
</tr>
<tr>
<td>Private Sector Maintenance Contractor</td>
<td>Maintain traffic signals and ITS devices</td>
<td>Existing</td>
</tr>
<tr>
<td>Weather Information Providers</td>
<td>Provide road weather information to maintenance agencies</td>
<td>Existing</td>
</tr>
</tbody>
</table>

ITS Services
The following is a list of ITS market packages related to rural operations in Kane County (more detailed descriptions of these market packages and their specific application in Kane County can be found in Appendix C).
- Emergency Routing (EM02)
- Mayday and Alarm Support (EM03)
- Traffic Information Dissemination (ATMS06)
- Broadcast Traveler Information (ATIS1)
- Network Surveillance (ATMS01)
- Traffic Incident Management System (ATMS08)
- Work Zone Management (MC08)
- Transit Vehicle Tracking (APTS1)
- Demand Response Transit Operations (APTS3)
- Speed Monitoring (ATMS19)
- Standard Rail Grade Crossing (ATMS13)
- Advanced Railroad Grade Crossing (ATMS14)
- Maintenance and Construction Vehicle and Equipment Tracking (MC01)
- Roadway Automated Treatment (MC05)
- Road Weather Data Collection (MC03)
**Performance Measures and Potential Benefits**

There are a number of performance measures that can be used to measure the effectiveness of Rural ITS applications and the level of benefit that is being provided. These measures should be carefully defined so that both those gathering the information and reading the results are aware of what is being measured. Rural ITS performance measures are listed in Table 3-8.

**Table 3-8 – Sample Construction and Maintenance Management Performance Measures**

<table>
<thead>
<tr>
<th>USDOT Goal Area</th>
<th>Performance Measures</th>
<th>Unit of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer Satisfaction</td>
<td>Positive driver survey responses for rural operations improvements</td>
<td>Percentage of responses</td>
</tr>
<tr>
<td>Mobility</td>
<td>Average peak hour delay per vehicle at an intersection</td>
<td>Minutes/vehicle</td>
</tr>
<tr>
<td></td>
<td>Average travel time variability</td>
<td>Minutes/trip</td>
</tr>
<tr>
<td></td>
<td>Average peak hour travel speed</td>
<td>Miles/hour</td>
</tr>
<tr>
<td>Productivity</td>
<td>Cost savings</td>
<td>Operating expenses/year</td>
</tr>
<tr>
<td>Safety</td>
<td>Crash rate</td>
<td>Crashes/year by location</td>
</tr>
<tr>
<td></td>
<td>Traffic accident severity</td>
<td>Fatal, injury crashes/year by location</td>
</tr>
<tr>
<td></td>
<td>Response time for emergency vehicles</td>
<td>Minutes/incident</td>
</tr>
</tbody>
</table>

The USDOT ITS JPO provides the following sample benefits of using ITS to enhance rural operations:

- In a user survey, over 90% of motorists indicated that rural road weather information provided by the Washington State DOT made them better prepared for travel.
- Over 70% of surveyed travelers indicated that a dynamic curve warning system in California was perceived to be useful and that over 60% of them altered their speed based on its warning.
- A snow and ice forecasting model in Wisconsin improved work schedules and reduced labor costs by four hours per worker during winter storms.

### 3.2 Technology / Strategy Assessment

**Potential Influencing Factors**

A number of resources in Northeastern Illinois are already available that might affect the planning and deployment of ITS solutions in Kane County. Described in the subsections below, these initiatives represent significant ITS planning efforts over the last decade.

**2007 Kane County Transportation Improvement Plan (TIP)**

The TIP identifies transportation projects that will be conducted each year. To properly allocate funding, ITS technologies and strategies should be included in the annual TIP. Often times ITS projects can be combined into a larger engineering/construction project that would be identified in the TIP.

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The TIP for Fiscal Year 2007 identified engineering, right-of-way, and construction work for roads and bridges throughout the county, including on Plank Road, Randall Road, Kirk Road, Longmeadow Parkway, and Fabyan Parkway, among others. ITS elements, including those discussed further in this document, should be considered for application in these and future projects.

2030 Kane County Transportation Plan
This long-range transportation plan guides transportation decisions, identifies major transportation projects, and identifies resources to implement these projects. Among other goals and strategies, this plan considers several strategies to advance cooperative planning, improve system efficiency, enhance mobility, and improve the quality of the environment. The plan identifies improvement strategies for streets and highways, public transportation, transportation demand management, transportation system management (TSM), and non-motorized transportation. ITS efforts generally fall under the TSM category, which promotes more efficient use of the existing transportation system apart from major construction. Categories identified under TSM include traffic control and surveillance devices, and preferential facilities for transit and/or high-occupancy vehicles (HOV). The plan also recommends consideration of implementing “a county-wide, coordinated Intelligent Transportation System” to provide information for evaluation and management of traffic operations.

Some public transportation solutions, such as Bus Rapid Transit, are also applicable to this strategic plan. The transportation plan identifies Randall Road, Kirk Road, IL-25, I-90, and I-88 as potential routes for bus rapid transit.

Northeastern Illinois Regional ITS Architecture
Developed in 2003, the Northeastern Illinois Regional ITS Architecture provides a framework for integrating ITS in the Chicagoland area. The architecture provides a shared vision of how each participating agency’s systems will be integrated and work together provide an efficient regional transportation system. The architecture addresses all modes and routes operated and maintained by transportation agencies in the Counties of McHenry, Lake, Kane, DuPage, Cook, and Will, with Kendall County and part of Grundy County soon to be added.

This regional architecture complies with an FHWA Rule and FTA Policy requiring that federally funded ITS projects conform to the National ITS Architecture and approved USDOT standards. Any ITS systems that are deployed in Kane County will need to be incorporated into the Northeastern Illinois Regional ITS Architecture.

The Chicago Metropolitan Agency for Planning (CMAP) is currently leading an effort to update the Northeastern Illinois Regional ITS Architecture. The update will add recent ITS developments to the architecture, including those now underway in Kane County. The architecture currently shows the following elements for Kane County:

- Kane County 911 Center
- Kane County Emergency Operations Center
- Kane County TMC
- Kane County Roadside Equipment
- Kane County Maintenance
**Northeastern Illinois ITS Deployment Plan**
This plan identifies existing and planned ITS projects in Northeastern Illinois that advance the quality of transportation services in a regional context. This plan complements the Regional ITS Architecture by recommending strategies and priorities on how ITS projects will be deployed. Originally developed in 1999, the plan was updated by the Chicago Area Transportation Study (now CMAP) in 2005. The update identifies accomplishments in deploying and integrating ITS, lists and prioritizes projects, identifies roles and responsibilities in a greater regional context, and lays out an action plan for regional deployment to advance ITS in the six-county area.

Planned projects for Kane County listed in the ITS Deployment Plan include the following:

- Traffic Management Center
- Field Devices (road-weather information systems, emergency vehicle preemption, dynamic message signs, CCTV cameras)
- Traffic Signal Interconnects

**Gary-Chicago-Milwaukee (GCM) ITS Priority Corridor**
The GCM ITS Priority Corridor covers sixteen counties in Indiana, Wisconsin, and Illinois, including Kane County. Originally formed as a corridor to foster the deployment of ITS technology to enhance transportation, new ITS deployment managed by the corridor coalition has declined as federal funding for the corridor was not renewed. A GCM Corridor ITS Architecture was developed in 2001 to provide a framework for integrating systems across state lines. The corridor coalition is currently focusing on improving traffic operations (especially freight movements) on interstate highways near state borders through information sharing and coordination.

**National Transportation Communications for ITS Protocol (NTCIP)**
NTCIP is a group of standards designed to allow ITS equipment to communicate and operate together in an integrated manner. These standards describe open, consensus-based communications protocols. NTCIP is part of a larger effort to develop ITS standards to make equipment interoperable. NTCIP standards enable integration by encouraging vendors to develop equipment that complies with common standards.

Technology solutions in Kane County should comply with NTCIP standards when possible. Compliance with these standards will reduce the time and money spent for integration. Current NTCIP standards do not cover all ITS equipment and not all standards have been finalized, so standards development should be periodically monitored as ITS devices are procured and installed in Kane County.
Candidate Strategies/Technologies

Below are a series of strategies and technologies that were identified as potentially effective ways to address the stakeholder needs identified in Section 2. The strategies and technologies discussed here are concepts – not complete project ideas with specific locations, costs, and schedules. Specific projects based on the prioritized strategies and technologies are found in the Implementation Plan (Section 4).

**Arterial Operations**

**Arterial Operations Center** - Deploy an arterial operations center to monitor and manage traffic and coordinate traffic signal operations and ITS systems on major arterial routes in Kane County. This center could be an upgraded room at KDOT headquarters, a new (joint) facility, or a “virtual” TMC that is accessible through a secure Internet connection.

**Traffic Signal Timing Upgrades along Priority Corridors** - Develop a comprehensive program to update traffic signal timing plans (possibly across jurisdictions) to reduce delay and backups along major routes. This concept could include the deployment of traffic signal interconnections (e.g., fiber optic or wireless) to promote traffic flow and coordination.

**Queue Detection on Tollway Ramps** - Deploy systems to detect traffic queues on ramps and trigger signal timing changes at downstream traffic signals that will “flush the queues” to accommodate increased traffic volumes.

**Truck Signal Priority System** - Equip key intersections to enable automated traffic signal timing changes that will eliminate truck “dilemma zones” to allow an approaching truck to proceed through the intersection instead of having it become the head of the next queue.

**Integrated Corridor Management** - Coordinate operations between ITS elements on arterials and tollways. This includes CCTV cameras, vehicle detectors, and traveler information systems. This concept would also include center-to-center communications to coordinate operations across jurisdictions.

**Red Light Running Strategies** - Utilize one of two strategies available for red light running: 1) automated enforcement, in which tickets are issued through the mail when sensors and cameras detect a violation; or 2) monitoring systems that record hour of the week violation rates and then use that information to develop engineering countermeasures or schedule selective enforcement to improve the violation rates.

**De-icing Systems** - Deploy automated de-icing systems that would spray chemical solutions on bridges or roadways that have a
history of ice-related crashes. These systems would be triggered by nearby environmental/weather detection systems.

**Intersection Occupancy Measurement** - Deploy detectors to log the occupancy of the center of a signalized intersection when demand is present to assess efficiency. Modifications to signal phasing and timing can then be applied to optimize the signal operation.

**Roadway Service Patrols** - Implement roving service patrol vehicles along key arterial corridors (e.g., Randall Road) to speed incident detection and response. This concept would build on the highly successful Illinois Emergency Traffic Patrol (ETP) and Tollway Highway Emergency Lane Patrol (HELP) programs. This concept could involve public and/or private entities.

**Data Collection**

**Instrumentation on Priority Corridors** - Provide traffic detectors, CCTV cameras, road weather information systems (RWIS), or possibly sonic crash detectors to more effectively monitor critical corridors.

**Performance Measures** - Develop a variety of techniques for measuring the effectiveness of ITS initiatives, including customer satisfaction and gathering comments from the public.

**IPASS Readers along Priority Corridors** - Deploy IPASS toll tag readers to produce arterial travel time and origin/destination data that can be used for a variety of incident response, planning, and performance measurement purposes.

**Digital Image Measurement System** - Utilize calibrated digital camera images to make multiple measurements of complex 3D images. This is useful for making drawings used in crash investigation and preliminary engineering work.

**Speed Detection Systems** - Deploy speed recorders (permanent, portable, or a combination) that produce hour of the week violation rates per site. These can then be used to schedule selective enforcement to control excessive speeding on a long-term basis.

**Data Management**

**Performance Measurement Website** - Deploy a public website enabling access to historical performance measures such as crash statistics, travel time index, intersection capacity, red light running data, etc. Secure areas on the site could be used by member agencies to input their information.

**Transportation Data Warehousing** - Integrate the large amount of useful transportation information is being collected by all agencies into a shared databases to enable more effective performance, research, and operational measurement and to lower costs of managing data. This warehouse would include a common repository of GIS information and tools, allowing multiple...
agencies to easily access the same GIS information and use common coordinates for different projects, making them easier to coordinate and integrate.

**Equipment Inventory and Tracking Geographic Information Systems (GIS) Database** - Update infrastructure and ITS equipment inventories and track them using a GIS database. This would support a comprehensive configuration management program, and would be very useful for making important decisions about equipment lifecycles, inventory needs, equipment budgets and infrastructure planning. This effort would promote multi-agency data sharing.

**Countywide Crash Database** - Develop a common database/repository for crash information in the county enabling multiple agencies to enter data more easily and view data more quickly.

**Performance-Based Crash Prevention System** - Apply a systematic approach that sorts annual crash records to identify and analyze the most critical sites (as identified by the crash database). Crashes are sorted by type and frequency to enable specific countermeasures and performance measures to be applied. This process routinely identifies the most severe sites and uses various performance measures for monitoring results when improvements have been made.

**Operational Coordination**

**System Monitoring Data Sharing** - Enable emergency response and local transportation operations agencies access to video images, weather data, and other information collected by system monitoring devices.

**Countywide Construction/Maintenance Database** - Develop a multi-agency database where participating agencies contribute timely information regarding their activities that restrict roadway and intersection capacities. Distribution of this information over a public website would enable these agencies, the media, and the public access to reliable trip planning information.

**Communications Lines along Priority Corridors and Between Centers** - Deploy fiber optic cables or other communications infrastructure along key corridors to support high volume data transfer to and from ITS equipment, between operations centers, and to support security systems. This concept could be facilitated through a public/private partnership.

**Multi-agency Incident Management Work Group or Training** - Create an informal work group that meets periodically to identify problems and develop effective solutions for traffic incident management. This group would act as a catalyst for affecting positive changes in coordinated incident response, multi-agency training, shared deployment of tools and resources, and sharing of lessons learned.
Emergency Responder Communications Integration - Implement better communications systems and processes between public safety answering points (PSAPs), dispatch centers, and between responders in the field for improved incident management.

Emergency Control of Traffic Signals - Develop agreements between traffic agencies and law enforcement to allow public safety control of traffic signals during incidents (either directly or through improved institutional processes).

Computer Aided Dispatch (CAD) - Deploy CAD in emergency response fleets that do not already have such systems.

Integrate Emergency/Maintenance Computer Aided Dispatch - Coordinate CAD systems between emergency response agencies and agency maintenance divisions to allow a more coordinated response to emergencies in and around the county.

Highway-Rail Intersection (HRI) Status Information Integration - Provide HRI detection data to emergency dispatchers and/or response vehicles so they can make more informed decisions about paths to take on emergency runs.

Expanded Emergency Vehicle Preemption (EVP) - Implement EVP in areas or along corridors that do not already have such systems, making them interoperable with current systems and future deployments (e.g., transit signal priority).

Promotion of Transit Use

Transit Promotional Campaign - Work with Pace/Metra/RTA to promote transit/park-and-ride lot use to promote greater transit ridership in Kane County.

Metra Parking Management Guidance System (PMGS) - Expand Metra’s pilot test project to deploy signs for Kane County Metra parking lots to inform travelers about the availability of parking stalls as they approach a station or park-n-ride lot.

Transit Signal Priority (TSP) - Coordinate with Pace to deploy TSP on major bus routes in Kane County (e.g., Randall Road) to improve travel time reliability and better transit service.

Traveler Information

Highway Rail Intersection (HRI) Status Alerts Prior to Decision Points - Where alternate routes are available, provide active message signs near HRIs alerting drivers before a decision point if a highway-rail crossing is occupied by a train.
Arterial Operations Center Link to Gary-Chicago-Milwaukee (GCM) Gateway - Link the Kane County arterial operations center to the GCM Gateway to enable the sharing of information with other agencies and provide information on the GCM Travel website.

Dynamic Message Signs (DMS)/Highway Advisory Radio (HAR) on Priority Corridors - Deploy DMS and/or HAR to provide real-time, en-route traveler information.

Detour/Alternate Route Maps - Through interagency participation, develop alternate routes for application during incidents. Route maps could be made available on websites and eventually through in-vehicle applications.

Motorist Warning Systems - Deploy detectors and static signs with flashing beacons to alert travelers of dangerous situations, such as icy/foggy conditions, truck entrances, pedestrian crossings, or impending collisions (e.g., crossing animal, oncoming vehicle) to reduce crashes at intersections and other roadway segments with a history of crashes.

Work Zone Traffic Management - Deploy DMS, CCTV cameras, and other work zone monitoring and traveler information devices to provide motorists and transportation agencies with more information about conditions in and around work zones. This information could include travel times, lane closures, or work schedules.

Evaluation Matrixes
While each of the technologies and strategies discussed in Section 3.2 are intended bring about improvements on the Kane County transportation system, budgetary and staffing limits require that these potential solutions be prioritized for deployment. This section describes the evaluation methods that were used to identify top-priority ITS technologies/strategies for Kane County. The first “objective” analysis was conducted to determine how well each technology or strategy would achieve the identified stakeholder goals and how much effort (e.g., cost, personnel requirements) it would take to successfully implement them. Different sets of criteria, described below, were used by the consultant team to evaluate the technologies and strategies with a consistent, 100-point scoring system.

To compliment this evaluation, a second “subjective” assessment was conducted. This process applied input from the Steering Committee based on its members’ unique perspectives.

Technology Functionality Matrix
The technology functionality criteria focused on issues regarding initial operations, maintenance, technological maturity, and potential benefits. The following criteria were examined by the consultant team for each technology solution, with higher scores given for criteria that were favorable for implementation. These criteria were applied to all candidate solutions listed in Section 3.2, except for Performance Measures, Performance-Based Crash Prevention System, Multi-agency Incident Management Work Group or Training, and Transit Promotional Campaign, which are considered ITS strategies.
Initial Operations
- **Financing** – whether funding is available for the initial deployment of the technology (maximum 5 points)
- **Transition Issues** – whether institutional issues in adopting the new technology and procedures are major or minor (maximum 4 points)
- **Staff** – whether staff will be available for initial deployment and operations (maximum 4 points)
- **Training** – availability of training for operations staff (maximum 4 points)
- **Integration Issues** – whether technical issues regarding transitioning to the new technology are manageable (maximum 4 points)
- **Coordination** – how likely agencies are to modify their procedures to incorporate the new technology/approach (maximum 4 points)

Maintenance
- **Life Cycle Costs** – whether funding is available for on-going operations and maintenance (maximum 10 points)
- **Staffing** – availability of staff for on-going operations and maintenance (maximum 10 points)
- **Training** – availability of on-going training for maintenance and operations staff (maximum 5 points)

Technological Maturity
- **Proven Technology** – whether the technology or application has been successfully used elsewhere (maximum 4 points)
- **Enabling Technologies** – whether systems necessary to support and fully utilize the technology are already in place (maximum 4 points)
- **Competitive Procurement** – whether more than one company offers this technology or application, so competitive prices and services are available (maximum 4 points)
- **Technology Will Not Become Outdated Soon** – whether the technology is accepted and expected to be used, supported, and upgraded for the foreseeable future, as opposed to another technology that could replace it (maximum 4 points)
- **Industry Standard** – an adopted standard is in place for the technology, such as from the NTCIP family, allowing for easier integration (maximum 4 points)

Potential Benefits
- **Customer Satisfaction** – how much the end user, either operators or travelers, will appreciate the technology (maximum 5 points)
- **Efficiency** – how much the technology would reduce costs, reduce delivery time, or reduce labor requirements (maximum 5 points)
- **Energy and Environment** – how much of an impact the application would have on reducing emissions and fuel consumption (maximum 5 points)
- **Mobility** – how much the technology would reduce delays or enhance the ability of travelers to get to their destination in a timely manner (maximum 5 points)
- **Productivity** – how well the technology would enable the agency to enhance its existing services or provide new services (maximum 5 points)
• **Safety** – how well the technology will increase traveler and staff safety (maximum 5 points)

**Strategy Functionality Matrix**

Strategies required a different set of evaluation criteria to assess the feasibility of implementation and maintenance. For example, questions about technology maturity were not applicable. The four candidate strategies were analyzed by criteria relating to human resource commitments, supporting costs, coordination issues, and benefits. Criteria that were favorable for implementation were given high scores.

**Human Resources**
- **Staff Availability** – whether staff is available to implement the strategy (maximum 10 points)
- **Staff Skills** – how well the available staff members have skills necessary to adopt the strategy (maximum 5 points)
- **Time Commitment** – whether the expected time commitment to adequately conduct the strategy fits within available staff members’ schedules and does not conflict with their existing duties (maximum 10 points)

**Supporting Costs**
- **Meeting Costs** – whether venue, travel, and clerical/assistant labor costs are affordable (maximum 10 points)
- **Deliverable Costs** – whether the cost of producing the final work products are affordable (maximum 15 points)

**Coordination Issues**
- **Agreements** – the likelihood that needed agreements or MOUs can be signed in a timely manner (maximum 10 points)
- **Legal and Policy Issues** – whether there are any legal or agency policy conflicts that would hinder the implementation of the strategy (maximum 10 points)

**Potential Benefits**
- **Customer Satisfaction** – how much the end user, either operators or travelers, will appreciate the strategy (maximum 5 points)
- **Efficiency** – how much the strategy would reduce costs, reduce delivery time, or reduce labor requirements (maximum 5 points)
- **Energy and Environment** – how much of an impact the strategy would have on reducing emissions and fuel consumption (maximum 5 points)
- **Mobility** – how much the strategy would reduce delays or enhance the ability of travelers to get to their destination in a timely manner (maximum 5 points)
- **Productivity** – how well the strategy would enable the agency to enhance its existing services or provide new services (maximum 5 points)
- **Safety** – how well the strategy will increase traveler and staff safety (maximum 5 points)
Through this objective evaluation process, the technologies and strategies listed below received the highest ratings (in no particular order). Detailed functionality matrices can be found in the appendices.

Listing of Top Tier Technologies/Strategies – Objective Evaluation Process

- Traffic Signal Timing Upgrades Along Priority Corridors
- Instrumentation on Priority Corridors
- Digital Image Measurement
- Emergency Control of Traffic Signals
- Computer Aided Dispatch (CAD)
- Expanded Emergency Vehicle Preemption (EVP)
- Link to Gary-Chicago-Milwaukee (GCM) Gateway
- Detour/Alternate Route Maps
- Work Zone Traffic Management
- Performance Measures
- Performance Based Crash Prevention System
- Multi-agency Incident Management Work Group/Training

Steering Committee Voting Process

During a meeting held on March 29th, 2007, and subsequent correspondence, the project Steering Committee was introduced to the 38 candidate ITS technologies and strategies contained in Section 3.2. Each committee member was then asked to identify the top ten items from the list that they felt were of greatest benefit to Kane County. The voting process involved stakeholders from all four project focus areas (Arterial Operations, Traffic Incident Management, Maintenance and Construction Management, and Rural Operations). The following candidate ITS solutions (in no particular order) received the highest number of votes:

Listing of Top Tier Technologies/Strategies – Subjective Evaluation Process

- Arterial Operations Center
- Traffic Signal Timing Upgrades Along Priority Corridors
- Integrated Corridor Management
- Instrumentation of Priority Corridors
- Performance-Based Crash Prevention System
- Countywide Construction/Maintenance Database
- Emergency Responder Communications Integration
- Expanded Emergency Vehicle Preemption (EVP)
- Dynamic Message Signs/Highway Advisory Radio on Priority Corridors
- Detour/Alternate Route Maps
- Work Zone Traffic Management

Prioritization

The objective evaluation conducted by the consultant team and the subjective vote by the Steering Committee helped to identify the top tier of candidate ITS technologies and strategies for deployment in Kane County. These lists provided a pool from which an overall top priority list could be developed. To create this list, any candidate ITS solutions contained in both the
objective and subjective lists were selected. Next, the remaining technologies/strategies were independently reviewed against the stakeholder needs identified during project outreach. Those that significantly address the identified needs were selected for the final list.

Due to budgetary and staff limits, only the top ten candidate ITS solutions will be pursued further in this Strategic Plan. Other potentially effective solutions not contained in this list are Integrated Corridor Management, Performance Measures, Emergency Control of Traffic Signals, Computer Aided Dispatch, Digital Image Measurement System, Motorist Warning Systems, and Communications Lines along Priority Corridors and Between Centers. These applications should be considered for deployment once the top ten ITS solutions have been implemented.

In addition, several other candidate ITS technologies/strategies described in Section 3.2 are being planned or are underway in Kane County. These include Transit Signal Priority, Red-Light Running Strategies, the Metra Parking Management Guidance System, and an Arterial Operations Center Link to Gary-Chicago-Milwaukee (GCM) Gateway. These initiatives should be pursued for Kane County as outside funding sources and teaming opportunities arise.

By combining the results of the evaluation steps described in Section 3.2, the following top ten project concepts have been selected for further discussion in the Implementation Plan:

**Overall Listing of Top Ten Technologies/Strategies**
- Arterial Operations Center
- Traffic Signal Timing Upgrades along Priority Corridors
- Instrumentation on Priority Corridors
- Countywide Construction/Maintenance Database
- Emergency Responder Communications Integration
- Expanded Emergency Vehicle Preemption (EVP)
- DMS/HAR on Priority Corridors
- Detour/Alternate Route Maps
- Motorist Warning Systems
- Work Zone Traffic Management
4. Implementation Plan

4.1 Priority Corridors

To help in the identification of deployment locations for ITS devices, ITS priority corridors will be defined in this section. Deployment of ITS technologies on these corridors is intended to address the identified stakeholder needs while also providing the greatest benefits. While this Implementation Plan identifies the top ten ITS projects based on the particular ITS application, ITS tools can also be built as part of corridor deployments (see Figure 4-1). A corridor-based deployment facilitates the staged approach to ITS deployment, helps to mainstream ITS projects into other construction projects, and maximizes the effectiveness of the deployed elements.

Criteria for Defining Priority Corridors

The following criteria have been applied for use in prioritizing non-expressway roadway segments in Kane County for ITS device implementation:

- Current usage of capacity/level of congestion (i.e., volume/capacity ratio)
- Expected growth in usage/congestion according to the Kane County 2030 Transportation Plan (see Figure 2-3)
- Significance to regional travel (i.e., Strategic Regional Arterials)
- Feasibility as an alternate route to high-volume arterials or freeways
- Crash rate
- Major transit routes
- Routes planned for construction (which could be leveraged)

Based on available data, those routes in Kane County that meet these criteria or have demonstrated unsatisfactory levels of operation for these criteria have been targeted for ITS improvements.

Identified Priority Corridors

Based on the criteria for prioritizing corridors, the following is a list of potential arterial corridors for ITS implementation (in geographical order, west to east and north to south):

- IL Route 47 (from McHenry County Line to Kendall County Line)
- Randall Road/Orchard Road (from McHenry County Line to Kendall County Line)
- IL Route 31 (from McHenry County Line to Kendall County Line)
- IL Route 25 (from IL Route 62 to I-90 and from Stearns Road to Kendall County Line)
- Kirk Road/Farnsworth Road (from IL 64 to New York Street)
- Huntley Road/(future) Longmeadow Parkway (from McHenry County Line to IL 62)
- IL Route 72 (from IL Route 47 to DuPage County Line)
- US 20 (from McHenry County Line to DuPage County Line)
- (future) Stearns Road/McDonald Road (from Randall Road to Dunham Road)
- IL Route 64 (from IL Route 47 to DuPage County Line)
- IL Route 38 (from IL Route 47 to DuPage County Line)
- Fabyan Parkway (from Randall Road to DuPage County Line)
- IL 56 (from IL 47 to Interstate 88 and from Farnsworth Avenue to DuPage County Line)
Kane County Priority Corridors Map

Legend:
- Priority Corridors
- Other Road
- Interstate
- Fox River

June 27, 2007

Figure 4-1 – Kane County Priority Corridors Map
4.2 Proposed Projects

The ITS solutions described in Section 3.2 were prioritized based on a subjective Steering Committee voting process and an objective evaluation by the consultant team. This process resulted in a list of top ten ITS solutions. This section of the Implementation Plan identifies future projects for deployment based on the Technology / Strategy Assessment. The following is a list of ten proposed ITS projects for Kane County (see Figure 4-2 and Appendix E):

- Arterial Operations Center
- Traffic Signal Timing and Coordination
- Traffic Incident Management Work Group
- Emergency Responder Communications Integration
- Instrumentation of Priority Corridors
- Dynamic Message Signs (DMS)/Highway Advisory Radio (HAR) on Priority Corridors
- Work Zone Traffic Management
- Countywide Construction/Maintenance Database System
- Countywide Dynamic Alternate Route Maps
- Performance Based Crash Prevention System

The following subsections discuss each of these projects in further detail. This includes:

1) Project description
2) Needs categories addressed
3) ITS market packages addressed
4) Project champion
5) Project partners
6) Other related projects
7) Work description
8) Performance measures
9) Estimated project timeframe
10) Conceptual cost estimate
11) Potential project benefits
12) Potential project funding sources

Estimated project timeframes are classified as either short-term (0-2 years), medium-term (2-5 years), or long-term (5+ years). As discussed further in Section 4.3, the proposed deployment timeframes for each of the proposed projects are based on several factors, including identified “early winner” projects, interdependencies between projects, and balancing overall costs between the deployment terms.

It is important to note that these projects are focused on addressing the identified stakeholder needs and needs categories discussed in Section 2. Most of the projects address these needs directly (e.g., the Arterial Operations Center project is designed to improve arterial operations), while others target the identified needs indirectly (e.g., the Traffic Signal Timing and Coordination, which includes a transit signal priority component, would promote transit use).
Arterial Operations Center

Project Description: A Kane County Arterial Operations Center (AOC) would allow KDOT staff to monitor traffic along major/priority arterial corridors in Kane County and remotely operate ITS devices along those corridors to improve traffic flow and better respond to traffic incidents. The physical component of this center would be deployed at the Kane County Division of Transportation offices, located at 41W011 Burlington Road in St. Charles. The operations center staff would work closely with KDOT maintenance staff located on-site to assist them with their activities, especially during severe weather or other emergencies.

The center would start off by integrating existing KDOT traffic and ITS functions (e.g., monitoring traffic and coordinating traffic signal operations), consolidating control in one location. This concept would gradually expand to increase functionality and integrate new ITS systems as they are deployed. Future functions include controlling DMS and HAR messages, additional CCTV camera monitoring, managing traffic for planned special events, distributing messages on emergency events, and automated vehicle location (AVL) for county vehicles and other resource tracking.

The center would also serve as a coordinating point with other transportation (e.g., Illinois Tollway, IDOT, municipal traffic departments) and emergency (e.g., Kane County Office of Emergency Management, Kane County Sheriff, municipal police & fire departments) management agencies.

Needs Categories Addressed:
- Arterial Operations
- Data Collection
- Operational Coordination
- Traveler Information

Market Packages Addressed:
- Surface Street Control (ATMS03)
- Regional Traffic Control (ATMS07)
- Traffic Information Dissemination (ATMS06)
- Emergency Routing (EM02)
- Disaster Traveler Information (EM10)

Project Champion: Kane County Division of Transportation, Traffic Section

Project Partners: Illinois Tollway, IDOT District 1, Kane County OEM, municipalities
**Related/Dependent Projects:** The Arterial Operations Center is a linchpin for coordinated arterial operations in Kane County and therefore is related to several projects. When fully functional, the Traffic Signal Timing and Coordination, Instrumentation along Priority Corridors, DMS/HAR on Priority Corridors, and other arterial management projects will be integrated with it.

**Work Description:**
The fully deployed Arterial Operations Center will be tied into a number of functionalities and field devices (primarily in eastern Kane County). Operational components of the AOC can be drawn from the Kane County ITS Concept of Operations (Section 3.1) to describe how the systems will operate when the AOC is deployed, including the roles and responsibilities of agencies and individuals. The stages of deployment should be laid out in advance to identify when systems and functionalities should be incorporated into the center.

After a location within the Kane County DOT building is selected for the AOC, a preliminary design and detailed engineering plan for the operations center will have to be developed. Functional requirements for AOC equipment and software will also be necessary to support a successful deployment. The central system software should be compatible with existing equipment and also meet applicable ITS standards so that it will be compatible with devices that will be integrated in the future. While the equipment is being installed, communications links must be extended in the AOC to connect the workstations with equipment in the field. Control equipment in the center can then be integrated with equipment in the field (initially traffic signal controllers and CCTV cameras), and this integration must be tested. The vendors for the equipment and software should provide some training on the operations and maintenance of the system. An AOC Operations and Maintenance Plan will also be necessary to consider ongoing AOC efforts.

Building on efforts to date, KDOT will need to engage other stakeholders to determine how the Arterial Operations Center will interact with other centers, what information should and can be shared, and how communications with other facilities should be executed. This includes communications with the GCM Gateway Traveler Information Center and the future Illinois 511 Traveler Information System. This may require formal written agreement(s) or may be limited to informal understandings and incorporation into the Concept of Operations.

**Performance Measures:**
- Number of devices controlled/coordinated
- Number of centerlane miles covered
- ADT on roadway sections covered
- Congestion (variance between projected and annual hours of congestion on roadways)
- Percentage “up time” of equipment
- Number of planned special events supported
- Number of emergencies supported
Timeframe: Medium-term (2-5 years)

Conceptual Cost Estimate: $700,000 for initial implementation
- $100,000 for AOC site design
- $150,000 for initial integration
- $450,000 for construction and equipment

In the extended long term, as traffic congestion continues to increase, the AOC may take on more responsibilities and require more space. This could be addressed by constructing an extension to the existing Kane County DOT offices, or a separate, freestanding building (on County property). Assuming an extension to the current building, at a unit cost of $500/sq ft, a new AOC facility (5,000 sq ft) would cost approximately $2.5 million to construct.

Staffing Estimate: A budget estimate of $45,000/year is included for AOC equipment operations and maintenance (10% of deployment cost). This includes regular preventive maintenance and unscheduled repair of AOC hardware. It is assumed that system components will have a minimum two-year warranty from the date of installation.

It is estimated that 2.0 full-time employees (FTE) would be required to operate the AOC, in addition to existing KDOT Traffic staff. This includes operators and an AOC manager (assumes that the AOC would operate during peak traffic periods only; in later phases additional staff might be needed to address new functionalities or for extended AOC hours of operation). As described above an in the Concept of Operations (Section 3.1), operator duties would include system monitoring, dissemination of traveler information, coordination with other traffic management agencies, etc.

Potential Benefits:
- More system operation information for managers and incident responders
- Centralized control of traffic operations
- Reduction in travel times
- Reduction in vehicle emissions
- More traveler information available to the public
- Increased coordination between traffic operations, maintenance, and emergency operations in Kane County

Funding Options: Coordinated arterial operations can reduce congestion and vehicle emissions, making them eligible for Congestion Mitigation and Air Quality (CMAQ) or Surface Transportation Program (STP) funding. Inclusion of the AOC (as the “Kane County TMC”) in the Northeastern Illinois Regional ITS Architecture makes this project eligible for funding from the Highway Trust Fund. The AOC’s role in assisting in emergency or security events might also make it eligible for Homeland Security funding. Other potential sources of funding are federal earmarks, local transportation funding, and developer fees.

Traffic Signal Timing and Coordination

Project Description: Improving traffic signal timing and coordinating closely spaced signals are two of the most cost-effective ways to help move traffic and basic strategies to help mitigate
congestion. This project would entail optimization of traffic signal timing plans, expansion of signal control systems along all major signalized arterials in the county, and interconnecting signals, in some cases across jurisdictions. This would require cooperation amongst participating agencies for the funding, design and construction of proposed projects, including traffic signal optimizations and signal interconnects.

The optimization of signal timing requires regular collection of traffic condition data (e.g., traffic counts, traffic flow speed). With the continued growth of development in Kane County, data collection must be carried out frequently. Improved and increased traffic condition measurement, described below under “Instrumentation of Priority Corridors,” would help in gathering a larger pool of data and, in turn, allow the traffic agencies in the county to identify signal timing improvements to be made. Development of a countywide traffic simulation model (e.g., Synchro®) would allow the existing travel condition data to be evaluated to identify potential signal timing improvements (including those that stretch across jurisdictions). This model would also be useful in determining the impacts of construction projects and theoretical incidents.

To promote coordinated countywide traffic signal modifications, an Arterial Management Team (AMT) would be developed to provide a forum for regional traffic managers to identify operational problem areas and collectively find their solutions. This team would consist of traffic managers from County, State, and local agencies.

Needs Categories Addressed:
- Arterial Operations

Market Packages Addressed:
- Surface Street Control (ATMS03)

Project Champion: Kane County Division of Transportation

Project Partners: Kane/Kendall Council of Mayors (municipal traffic departments), IDOT District 1 Bureau of Traffic, Illinois Tollway

Related/Dependent Projects: Instrumentation of Priority Corridors, Arterial Operations Center

Work Description: The first step in developing improved signal timing plans is standardizing and improving the collection, storage, and reporting of traffic counts data across the county. The “Instrumentation of Priority Corridors” project (see below) would support the real-time collection of traffic data. The multi-agency Arterial Management Team would also provide a forum for the development of common traffic data standards.
Once collected, this traffic data would then be utilized to develop a countywide traffic simulation model. The Kane County traffic simulation model would be used as the basis for traffic signal operational improvements within and across jurisdictions in Kane County. In addition, the City of Aurora, the DuPage County DOT, and the McHenry County Division of Transportation, among others, all have (or will soon have) traffic simulation models of their jurisdictions. These models could be linked to the Kane County model to identify regional traffic issues and signal timing improvements. Overall, the model could be used to test incident/emergency impacts, define performance measures, model operational coordination with Illinois Tollway traffic models, and ultimately implement optimized timings on field controllers.

The next phase of the project would be to develop a list of the most heavily congested corridors and intersections across the country. This task would build on existing assessments carried out by regional traffic agencies on a regular basis, as well as the identified priority corridors shown in Figure 4-1. Later phases of the project would consider other congested corridors based on the current countywide traffic simulation model. Where applicable, priority for signal timing improvements should be placed on transit routes with the highest ridership volumes. This optimization process would consider interconnecting nearby intersections (including linkages to Illinois Tollway ramps to facilitate integrated arterial-expressway corridor traffic movement), multi-jurisdictional signal coordination, changes in signal phasing, and upgrading traffic signal equipment. Optimized timings would be implemented on a priority basis (see Table 4-1). Any hardware upgrades necessary to implement optimized timings would be deployed as part of proposed signal interconnect projects (see Table 4-2). Through this process, procedures would be developed for regular system evaluation and prioritization.

Table 4-1 – Traffic Signal Timing Optimization Deployments

<table>
<thead>
<tr>
<th>Deployment Period</th>
<th>Roadway Segment</th>
<th>Number of Signals to Optimize</th>
<th>Agencies Involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short</td>
<td>Randall Road (between Red Haw Drive/Oakcrest Circle and Silver Glen Road)</td>
<td>5</td>
<td>KDOT, IDOT</td>
</tr>
<tr>
<td></td>
<td>Randall Road (between Orchard Road/Mooseheart Rd and Red Haw Drive/Oakcrest Circle)</td>
<td>18</td>
<td>KDOT, IDOT</td>
</tr>
<tr>
<td></td>
<td>Randall Rd (between Silver Glen Road and North County Line)</td>
<td>31</td>
<td>KDOT</td>
</tr>
<tr>
<td>Medium</td>
<td>IL Route 31 (between Kendall County and IL Route 64)</td>
<td>33</td>
<td>North Aurora, Batavia, Geneva, St. Charles, IDOT</td>
</tr>
<tr>
<td></td>
<td>IL Route 31 (between McHenry County and IL Route 64)</td>
<td>19</td>
<td>IDOT, South Elgin,</td>
</tr>
</tbody>
</table>
Interconnection of traffic signals would require establishing multi-jurisdictional technical standards for signal hardware, developing common data sharing and signal control agreements between various agencies, and filling the communication gaps for linking traffic signal between the regions. The multi-agency Arterial Management Team would cultivate multi-agency support and establish regional traffic signalization standards.

To truly optimize traffic operations in Kane County, several advanced traffic signal control options should also be considered. These include transit signal priority (TSP) along priority corridors (Randall Road has been identified by Pace as a potential TSP deployment corridor), crash reduction concepts that can leverage existing traffic signal equipment to reduce dilemma zones, and truck priority systems to improve truck operations and safety at signalized intersections.

### Table 4-2 – Traffic Signal Interconnect Locations

<table>
<thead>
<tr>
<th>Deployment Period</th>
<th>Corridor Boundaries</th>
<th>Length (mi.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short</td>
<td>Randall Road (between Huntley Road and Corporate Parkway)</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>IL Route 38 (between Anderson Boulevard and Williamsburg Avenue)</td>
<td>0.75</td>
</tr>
<tr>
<td>Medium</td>
<td>IL Route 31 (between State Street and Fabyan Parkway)</td>
<td>4.75</td>
</tr>
<tr>
<td></td>
<td>IL Route 64 (between Tyler Road to 7th Avenue)</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>IL Route 72 (between Randall Road and Tartans Drive)</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>Huntley Road (between Square Barn Road and Sleepy Hollow Road)</td>
<td>3.0</td>
</tr>
<tr>
<td>Long</td>
<td>IL Route 25 (between IL Route 62 and Bolz Road)</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td>IL Route 25 (between Besinger Drive and IL Route 72)</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>IL Route 31 (between IL Route 72 and Boncosky Road)</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>IL Route 31 (between Chicago Raw Hide and Lawrence Avenue)</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Farnsworth Ave. (between Indian Trail Road and New York Street)</td>
<td>1.75</td>
</tr>
<tr>
<td></td>
<td>Orchard Road (between US Route 30 and Rochester Drive)</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td><strong>Total:</strong></td>
<td><strong>21.25</strong></td>
</tr>
</tbody>
</table>

**Performance Measures:**
- Intersection delay (seconds/vehicle)
- Travel times (minutes/corridor)
- Customer satisfaction
- Crash frequency
- Number of stops
- Emission levels
**Timeframe:**  Short- to long-term (0-5+ years)

**Conceptual Cost Estimate:** Administration of the AMT would cost approximately $5,000 annually, exclusive of staff time, which would include the facilitation of regular meetings, production of publications, etc. (considered operations and maintenance costs).

Development of a comprehensive countywide traffic simulation model of the identified priority corridors (approximately 250 signalized intersections) would cost approximately $150,000, assuming existing models and available traffic data in the county could be leveraged. This would include one model each for the peak morning and evening periods.

The cost of retiming traditional signals is estimated to be $5,000 per intersection. This includes the cost to collect traffic data, analyze and implement the optimized signal timings (any associated hardware upgrades would be carried out as part of signal interconnect projects). For the 125 signals proposed for optimization in Table, the overall cost would be $625,000.

Traffic signal interconnections would cost approximately $100,000 per one (1) mile segment. This includes the cost of fiber optic cable, conduit, handholes for cable installation and access, and communications hardware located at interconnected traffic signal controller cabinets. For the 21.25 miles of traffic signal interconnect proposed in Table, the overall cost would be $2,100,000.

**Staffing Estimate:** It is estimated that 0.5 FTE of new personnel on the part of KDOT, the project champion, would be required to oversee the various components of this project.

**Potential Benefits:**
- Optimizing traffic signals can result in savings of as much as $120,000 per signalized intersection in terms of fuel efficiency and productivity gains due to increased mobility.\(^1\)
- Interconnecting traffic signals and optimizing the traffic signal timing can result in travel time reductions ranging from 8% to 25% along a corridor or arterial.\(^2\)2
- In addition, adaptive signal control saves users $8 for every reduced vehicle-hour of delay and $20 for each reduced commercial vehicle-hour of delay.\(^2\)3

**Funding Options:** It is important to consider that traffic signal improvements can overlap jurisdictions, reducing congestion along state, county, and municipal routes. As such, several participating agencies should be involved in the funding of these projects.

Traffic signal timing improvements can reduce congestion and the degradation of air quality that vehicle emission cause. As such, Congestion Mitigation and Air Quality (CMAQ) or Surface Transportation Program (STP) funding can be applied to this project. Maintenance funds, developers’ funds and public-private partnerships (PPP) could also be applied toward this project. Part of these projects may be included within currently proposed improvement projects along Randall Road, Kirk Road, and Orchard Road, which may provide additional sources for

\(^{22}\) Public Works Magazine, April 15 2006, “Manage Traffic Via Innovative Signal Control”

\(^{21}\) USDOT FHWA, Turner-Fairbank Highway Research Center, “Adaptive Control Software”
partial funding. As an overarching group for countywide traffic issues, the Kane/Kendall Council of Mayors may also be a potential funding source for this project.

**Traffic Incident Management Work Group**

*Project Description:* This project would establish an informal stakeholder work group to collaborate on ways to prevent, respond, and recover from transportation incidents. Members of the group would consist of emergency responder personnel (e.g., police, fire, emergency medical services, HAZMAT agencies) as well as towing and recovery services and transportation agency personnel. Typically, these groups are formed and supported by transportation agencies with the hope that this collaboration will improve response processes, thereby reducing delay, improving safety, and travel reliability.

This group could be formed as a subcommittee to a countywide organization. This would provide oversight and potential linkages to funding sources that would be necessary to deploy any projects developed by the group. Such an organizational structure would also emphasize the importance and utility of the work group to the upper management of the stakeholder organizations. This, in turn, should strengthen their support of the group by allowing key personnel to spend a modest amount of time meeting and getting involved in various projects. The primary investment is their time, and the primary outcomes are shared knowledge, improved processes and shared resources that would not otherwise occur.

*Needs Categories Addressed:*
- Operational Coordination

*Market Packages Addressed:*
- None directly

*Project Champion: Kane County Division of Transportation*

*Project Partners: Kane County Sheriff’s Department, Kane County Office of Emergency Management (OEM), municipal police and fire departments, IDOT District 1, Illinois Tollway, private towing companies*

*Related/Dependent Projects:* The Traffic Incident Management Work Group would be related to several other incident-based projects proposed in this document (e.g., Emergency Responder Communications Integration, Work Zone Traffic Management, Countywide Dynamic Alternate Route Maps, Performance Based Crash Prevention System).

*Work Description:* The first step in the development of a Traffic Incident Management Work Group is to organize the group. This includes the following tasks:
- Identifying a champion(s)
- Establishing a member base
- Getting established as a subcommittee to a county organization
- Establishing a meeting schedule and the associated logistics
- Developing a work process
- Creating a list of common needs
• Generating a prioritized list of potential group projects
• Creating detailed work plans for the top few concepts

The second step involves developing a work plan. Work group members would brainstorm to develop a rich list of potential projects. The brief list below demonstrates what these projects might look like.

• Interdisciplinary training
• Shared training programs (e.g., the FHWA’s Peer to Peer program)
• Preplanned dynamic detour routing system for critical routes (see the Countywide Dynamic Alternate Route Maps project description)
• Interagency posting of lane restrictions (see the Countywide Construction/Maintenance Database System)
• Establish standard policies and technical solutions for emergency vehicle preemption (EVP) usage
• Application of new tools for speeding up the crash investigation process
• Establishment of a system whereby responders can get rapid reports of specific utilities on demand
• Ways to incorporate the new ITS tools proposed in this Implementation Plan into day-to-day operations
• Increased coordination with sponsors of special events
• Establishment of improved coordination with the Illinois Tollway for sudden surges of traffic that occur when major incidents occur on the Interstates

Timeframe: Short-term (0-2 years)

Conceptual Cost Estimate: Administration of the work group would primarily amount to the expenditure of staff time, which would include the facilitation of regular meetings (typically bi-monthly), and the production of documentation. Typically groups of this type host the meetings at their sites, reducing the venue costs. An annual cost of $5,000 for meetings and associated materials will be applied for estimation purposes (considered operations and maintenance costs).

The costs associated with any specific project they are working on would be identified in the detailed Project Work Plan and this would include the identification of resources needed to complete that project.

Potential Benefits:
• Joint training sessions should lower the cost of such training and would promote better coordination between agencies that participate in joint training. Each of the member agencies have expertise that can be shared with their fellow stakeholders. For example, fire agencies have a wealth of training credentials ranging from the Incident Command System to first aid, to handling HAZMAT. Police have expertise in handling hostile environments and traffic control methods. Transportation agencies provide the big picture about the impacts that various response strategies have on traffic flow and secondary collisions.
• Sometimes regulations and agency policies can create problems for the response agencies. These groups can help the policy makers refine their regulations to **alleviate cost and legal issues** that their policies create.

• Member agencies often find tools and equipment that they own can be shared with their fellow members, expanding their use and **saving on procurement costs**.

• Regular collaboration creates **effective working relationships and trust** that can be extremely valuable during times of crisis.

• These groups can pre-plan for a variety of potential scenarios, which can result in **faster incident response times**.

**Funding Options**:

Staff labor, venue costs and clerical support for documentation would be the only direct costs, and these would come from normal operating costs. Some training could be obtained from the Peer-to-Peer program, ITS Midwest, ITE, vendor demonstrations, and various federally funded training programs. Project specific costs could come from agency budgets if costs are minor. Larger scale projects would be promoted by this group who would also play a role in the subsequent project oversight. This group would not fund projects themselves, but instead would promote them as regional collaborations among the various agencies.

**Emergency Responder Communications Integration**

**Project Description**: Integrating communications between emergency responders in the field is essential to ensuring timely and effective coordination of emergency response. Improved communications between emergency dispatch centers and between those centers and emergency vehicles out in the field are needed to reach this goal. This project would build off existing efforts to provide a common frequency for responders to communicate directly with each other and address any gaps in existing coverage or procedures. Several common radio frequencies are or will be available in Illinois, including the satellite-based EMnet for emergency data sharing between centers/agencies, IREACH for public safety communications, KLERN, ITECS, and IFERN for fire personnel.

This project will review the current practices in Kane County and identify ways to enhance existing communications. The project would review how the available systems fit with Kane County stakeholder response practices, identify gaps in communications between public safety answering points (PSAP) and dispatch centers, identify geographic areas with poor coverage, identify any needed upgrades in communications or procedures, and procure and integrate the needed communication equipment. It will determine common communication standards to link dispatch centers now and to enable integration of future communication. The project will also explore the use of existing radio frequencies as redundant communication channels for emergency response.

**Needs Categories Addressed**: Operational Coordination
Market Packages Addressed:
- Traffic Incident Management System (ATMS08)
- Disaster Response and Recovery (EM08)

Project Champion: Kane County Office of Emergency Management

Project Partners: Kane County Sheriff’s Department, Kane County DOT, municipal police and fire departments, Illinois State Police, Illinois Emergency Management Agency, emergency medical services, IDOT District 1, Illinois Tollway

Related/Dependent Projects: As stated above, this project is related to the Traffic Incident Management Work Group, as well as ongoing efforts by public safety agencies for improved radio integration.

Work Description: The first step of this project will be to review local practices and national best practices. Local PSAP and dispatch center-to-center communication standards will also be reviewed to identify differences in the standards and potential changes to enable greater integration. The local communications infrastructure will also be inventoried to see how the existing systems fit with Kane County stakeholder response practices and to identify any gaps in communications coverage, especially areas with poor radio coverage for the emergency radio frequencies used in the counties.

After this review has been performed, a summary of the findings and an initial list of upgrades to procedures, standards, and equipment will be developed. A stakeholder workshop will be held to discuss the findings and initial list of upgrades to determine whether they are feasible, whether they would interfere with existing successful practices, and whether they would address the emergency response needs. After stakeholder input is received through the workshop, a plan will be developed for the next steps. The plan will focus on achievable improvements to procedures, standards, and equipment that can increase communications coverage, ensure its reliability, and position the stakeholders to enable integration of future dispatch centers and PSAPs. Standards would then be revised and equipment would be installed and tested to cover current gaps in communication.

Performance Measures:
- Number of responders linked
- Number of incidents where the integrated communications systems are applied
- “Up time” of time communications links

Timeframe: Medium-term (2-5 years)

Conceptual Cost Estimate: The initial identification of gaps and development of an implementation plan should cost about $50,000. Upgrading systems to meet common standards would vary by agency and center. Costs for procurement and integration of equipment can vary widely (between $100,000 to $1 million or more), depending on the equipment required and the number of stakeholders requiring new equipment. For estimation purposes, $250,000 is
proposed for deployment. The on-going operations and maintenance of the systems would vary by agency.

**Staffing Estimate:** For estimating purposes, $10,000 and 0.25 FTE are identified for operations and maintenance.

**Potential Benefits:**
- This integration will allow for a more efficient, coordinated use of emergency response resources, reducing operating costs.
- Better coordinated response will reduce fatalities and injuries as well as property damage lost in emergencies. These reductions in losses will affect both the general public and emergency response agencies.

**Funding Options:** This emergency response project could be funded through Federal or State Homeland Security funds.

### Instrumentation of Priority Corridors

**Project Description:** This project would entail installation of vehicular detection, CCTV cameras, road weather information systems (RWIS), and associated communications infrastructure to support real-time monitoring of the transportation network. This could involve various methods for measuring traffic flow, speed, vehicle classification, etc., at predetermined locations. To enhance corridor traffic data collection, vehicle detectors at actuated traffic signals would be modified to collect sampling data for operational and planning purposes. At bridge locations, dedicated mid-block detection devices would also be used to collect such data at these critical locations. In the future, additional mid-block detection could also be provided where there are wide areas between signalized intersections. Data from these mid-block locations would be transmitted to nearby intersections to utilize existing communications links back to the AOC.

KDOT and municipal traffic departments (e.g., Elgin) have begun to install pan-tilt-zoom (PTZ) cameras to monitor key intersections. As part of this project, camera video and control could be shared with partner agencies to support incident management functions.

A critical aspect of this project is building a robust communications network which can link all the data collection points to their respective local storage hubs, and these individual storage hubs to each other, across Kane County. This would ensure effective utilization and sharing of individual resources. Where possible, existing or planned communications infrastructure for other traffic uses (i.e., traffic signal interconnect) can be used to build a more comprehensive communications network.

**Needs Categories Addressed:**
- Arterial Operations
- Data Collection
• Data Management

*Market Packages Addressed:*

• ITS Data Mart (AD1)
• Network Surveillance (ATMS01)
• Road Weather Data Collection (MC03)

*Project Champion:* Kane County Division of Transportation

*Project Partners:* Municipal traffic departments, IDOT District 1 Bureau of Traffic, Illinois Tollway

*Related/Dependent Projects:* Arterial Operations Center, Traffic Signal Timing and Coordination

*Work Description:* Specific planning and design tasks for the deployment of traffic monitoring devices include the following:

• A detailed design study for analyzing the future vehicle detection/surveillance deployment locations (preliminary locations are provided below to serve as a starting point for this task)
• A detailed design study for assessing the associated communications infrastructure needs
• Development of design plans and deployment of vehicle detection/surveillance/weather monitoring systems, required communications infrastructure, and data storage hardware
• Establishment of standard data storage/sharing formats between various agencies (this effort could be led by the Arterial Management Team)

Intersections with the highest crash rankings\(^{24}\) and traffic volumes\(^{25}\), or those mentioned during the project outreach process, were considered for the deployment of CCTV cameras. The recommended deployments are shown in Figure 4-2 and Table 4-3 below.

**Table 4-3– CCTV Camera Deployment**

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Deployment Period</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Randall Road</td>
<td>Short</td>
<td>Randall Road and IL 72/Higgins Road</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randall Road and I-90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randall Road and Big Timber Road</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randall Road and US 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randall Road and Bowes Road</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randall Road and IL 64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randall Road and IL 38</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>Randall Road and Huntley Road</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>Randall Road bridge &amp; Union Pacific Railroad/Tyler Creek (south of Big Timber Road)</td>
</tr>
</tbody>
</table>

\(^{24}\) As identified by KDOT staff

\(^{25}\) Kane County 2030 Transportation Plan, 2004.
<table>
<thead>
<tr>
<th>Corridor</th>
<th>Deployment Period</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>IL 47</td>
<td>Short</td>
<td>IL 47 and I-88</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>IL 47 and IL 56</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL 47 &amp; IL 72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL 47 and US 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL 47 &amp; Bypass 30</td>
</tr>
<tr>
<td>IL 31</td>
<td>Short</td>
<td>US 31 and I-88</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>IL 31 and I-90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL 31 and IL 72/Higgins Road</td>
</tr>
<tr>
<td>Kirk Road/Farnsworth Ave</td>
<td>Short</td>
<td>Farnsworth Avenue and I-88</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kirk Road and IL 64</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>Kirk Road bridge &amp; Union Pacific Railroad (south of IL 38)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kirk Road &amp; IL 56</td>
</tr>
<tr>
<td>US 20</td>
<td>Short</td>
<td>US 20 and I-90</td>
</tr>
<tr>
<td>IL 25</td>
<td>Short</td>
<td>IL 25 and I-90</td>
</tr>
<tr>
<td>Stearns Road</td>
<td>Medium</td>
<td>Umbdenstock Road and Stearns Road</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stearns Road @ Fox River</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>IL 25/Stearns Road &amp; Dunham Road/IL 25</td>
</tr>
<tr>
<td>IL 64</td>
<td>Medium</td>
<td>IL 64 @ Fox River</td>
</tr>
<tr>
<td>IL 38</td>
<td>Medium</td>
<td>IL 38 @ Fox River</td>
</tr>
<tr>
<td>Orchard Road</td>
<td>Medium</td>
<td>Orchard Road and Galena Boulevard</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>Orchard Road &amp; US Bypass 30</td>
</tr>
<tr>
<td>IL 56</td>
<td>Long</td>
<td>Galena Boulevard &amp; IL 56</td>
</tr>
</tbody>
</table>

Based on the present and future congestion levels\textsuperscript{26} and average daily traffic volumes\textsuperscript{27}, Table 4-4 shows the locations that are recommended for deployment of vehicle detection systems.

**Table 4-4 – Vehicle Detection Deployment**

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Deployment Period</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Randall Road</td>
<td>Short</td>
<td>Randall Road and I-90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randall Road and Big Timber Road</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randall Road and US 20</td>
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<tr>
<td></td>
<td></td>
<td>Randall Road and Bowes Road</td>
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<tr>
<td></td>
<td></td>
<td>Randall Road/McDonald Rd.</td>
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<tr>
<td></td>
<td></td>
<td>Randall Road and IL 64</td>
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<tr>
<td></td>
<td></td>
<td>Randall Road and IL 38</td>
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<tr>
<td></td>
<td></td>
<td>Randall Road and Fabyan Parkway</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randall Road and Orchard Road</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>Randall Road and County Line Road</td>
</tr>
</tbody>
</table>

\textsuperscript{26} Kane County Transportation Planning Area Study, May 2001

\textsuperscript{27} Kane County 2030 Transportation Plan, October 2004
<table>
<thead>
<tr>
<th>Corridor</th>
<th>Deployment Period</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orchid Road</td>
<td>Short</td>
<td>Orchard Road and I-88</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>Orchard Road and Oak Street</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>Orchard Road and Galena Boulevard</td>
</tr>
<tr>
<td>Kirk Road / Farnsworth Avenue</td>
<td>Short</td>
<td>Farnsworth Road and I-88</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>Kirk Road and Wilson St</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kirk Road and Fabyan Parkway</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kirk Road and Cherry Lane</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kirk Road and IL 38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kirk Road and Division Street</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kirk Road and Tyler Road</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kirk Road and IL 64</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>Kirk Road/Farnsworth Avenue &amp; IL 56</td>
</tr>
<tr>
<td>IL 72</td>
<td>Long</td>
<td>IL 72 and Big Timber Road</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL 31 and IL 72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL 72 and IL 68</td>
</tr>
<tr>
<td>IL 31</td>
<td>Short</td>
<td>IL 31 and I-90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL 31 and I-88</td>
</tr>
<tr>
<td>IL 47</td>
<td>Short</td>
<td>IL 47 and I-90</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL 47 and I-88</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>IL 47 and IL 56/Butterfield Road</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL 47 and IL 72</td>
</tr>
<tr>
<td>US 20</td>
<td>Short</td>
<td>US 20 and I-90</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td>US 20 and Plank Road</td>
</tr>
<tr>
<td></td>
<td></td>
<td>McLean Boulevard and US 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL 31 and US 20</td>
</tr>
<tr>
<td>IL 25</td>
<td>Short</td>
<td>IL 25 and I-90</td>
</tr>
<tr>
<td>Stearns Road (midblock)</td>
<td>Medium</td>
<td>Stearns Road @ Fox River</td>
</tr>
<tr>
<td>Fabyan Parkway (midblock)</td>
<td>Medium</td>
<td>Fabyan Parkway @ Fox River</td>
</tr>
<tr>
<td>IL 64 (midblock)</td>
<td>Medium</td>
<td>IL 64 @ Fox River</td>
</tr>
<tr>
<td>IL 38 (midblock)</td>
<td>Medium</td>
<td>IL 38 @ Fox River</td>
</tr>
</tbody>
</table>

Based on the needs assessment from the project outreach process, the following locations are recommended for deployment of a road weather information system (RWIS) stations:

**Table 4-5 – Road Weather Information System (RWIS) Deployment**

<table>
<thead>
<tr>
<th>Deployment Period</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long Term</td>
<td>Stearns Road @ Fox River</td>
</tr>
<tr>
<td></td>
<td>Randall Road bridge &amp; Union Pacific Railroad/Tyler Creek (south of Big Timber Road)</td>
</tr>
<tr>
<td>Deployment Period</td>
<td>Location</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------</td>
</tr>
<tr>
<td></td>
<td>Kirk Road bridge &amp; Union Pacific Railroad (south of Il 38)</td>
</tr>
</tbody>
</table>

**Performance Measures:**
- Intersection delay (seconds/vehicle)
- Travel time (minutes/corridor)
- Incident response time (minutes/incident)
- Customer satisfaction

**Timeframe:** Short- to long-term (0-5+ years)

**Conceptual Cost Estimate:** The following estimated installation unit costs are assumed for each of the devices:
- Enhanced detection - $5,000 per site for conversion of existing intersection detection to provide sufficient sampling of traffic data, including cabinet equipment and wiring; $20,000 for mid-block detection (river crossings) including vehicle detectors, cabinets and cabinet equipment, conduit, and wiring;
- CCTV cameras - $25,000 per site for camera, support, cabinet and cabinet equipment, conduit, wiring and service communications drops
- Cost of RWIS deployment is $60,000 per location

**Staffing Estimate:** Operations and maintenance costs for these devices would come in the form of power and communications (recurring monthly costs), equipment repair and replacement, and staff time to service the equipment. For estimation purposes, O&M costs are estimated to be 10% of deployment costs. To perform regular maintenance of the system elements, 0.5 FTE would be required.

**Potential Benefits:** This project will provide more data for determining real-time travel conditions, increasing traveler information and allowing travelers to make better-informed travel decisions. This should result in a decrease in vehicle-hours of delay, decrease in total number of stops, and higher levels of customer satisfaction.

**Funding Options:** Federal CMAQ, STP, and National Highway System (NHS) programs could be used to fund this project, as could possible future grants from FHWA’s Integrated Corridor Management Program. Leasing the fiber optic connectivity for use by private agencies can also be an alternate funding solution.

This project could also be tied into the currently planned Stearns River Bridge Corridor, Randall Road, Kirk Road and Fabyan Parkway improvements, and the Plank Road project, as potential sources of funding.

**DMS on Priority Corridors**

**Project Description:** Portable and permanent dynamic message signs (DMS) are proven methods of providing en route traveler information that helps keep drivers informed of current
roadway conditions. Potential applications for these devices include traffic incidents, special events, severe weather, and AMBER alerts.

This project would implement portable and permanent DMS at key decision points on the identified priority corridors; HAR could be considered for deployment in the future. Portable DMS with cellular-based communications stationed at strategic locations across the county would allow partner agencies to deploy the devices as incidents arise. Permanent DMS would also be deployed at key decision points to provide motorists with location-specific traveler information.

**Needs Categories Addressed:**
- Traveler Information

**Market Packages Addressed:**
- Traffic Information Dissemination (ATMS06)

**Project Champion:** Kane County Division of Transportation

**Project Partners:** Illinois DOT, Illinois Tollway, municipalities, Kane County OEM, Kane County Sheriff

**Related/Dependent Projects:** The Kane County Arterial Operations Center will be the central point for deploying portable DMS and developing and posting DMS messages. Instrumentation on Priority Corridors would also enhance the information that would appear on the signs.

**Work Description:**
Deployment of DMS should follow the systems engineering process. Table 4-6 provides a recommended listing of permanent DMS deployment locations. Building on this list, a concept of operations should be developed describing the roles and responsibilities of agencies involved in operating and maintaining the equipment. Next, a set of system requirements would be developed based on the needs of partner stakeholders (potentially developed by the AMT) and industry standards for the equipment. Portable DMS could be procured based on these requirements. For permanent DMS, a detailed communications plan will then be developed identifying existing and planned communications infrastructure that could be used to link the AOC with the signs.

Preliminary engineering would detail the site design at the selected permanent DMS sites (e.g., power sources, communications links). A detailed design package will then be developed containing specific information on the site, hardware, performance specifications, and installation. After the hardware is acquired, it will be installed by contractors, integrated with the county operations systems, and tested to ensure proper operation. The vendor would also provide operations and maintenance training to KDOT staff to make sure that they know how to perform necessary tasks for effective operations and maintenance.

Part of the integration activity includes developing policies or even preprogrammed messages for travelers and integrating location information so that operators know where the equipment is and
what roads drivers will be on or near when they receive messages. These message standards and common abbreviations could be developed by the Arterial Management Team or Traffic Incident Management Work Group based on guidelines set forth by the Gary-Chicago-Milwaukee (GCM) Corridor Coalition or national publications. Messages would be coordinated with the Illinois Tollway, IDOT, and other partner agencies to support regional transportation.

**Performance Measures:**
- Number of messages displayed
- Number of events triggering messages
- Number of AMBER/safety/security messages posted
- Percentage uptime of equipment

**Table 4-6 – Dynamic Message Sign Deployment**

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Deployment Period</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Randall Road</td>
<td>Medium</td>
<td>Randall Road and Fabyan Parkway (SB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randall Road and US 20 (NB)</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>Randall Road and IL 72 (SB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randall Road &amp; Big Timber (NB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randall Road and Mooseheart Road/Orchard Road (SB)</td>
</tr>
<tr>
<td>Kirk Road/ Farnsworth Ave</td>
<td>Medium</td>
<td>Kirk Road and Fabyan Parkway (SB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Farnsworth Avenue and Indian Trail Road (NB)</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>Kirk Road and IL 56/Butterfield Road (SB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kirk Road and IL 38 (SB)</td>
</tr>
<tr>
<td>IL 31</td>
<td>Medium</td>
<td>IL 31 and US 20 (NB)</td>
</tr>
<tr>
<td></td>
<td>Long</td>
<td>IL 31 and Mooseheart Road (SB)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IL 31 and IL 72 (SB)</td>
</tr>
<tr>
<td>Stearns Road</td>
<td>Medium</td>
<td>Stearns Road @ the Fox River (EB and WB)</td>
</tr>
<tr>
<td>Orchard Road</td>
<td>Medium</td>
<td>Orchard Road and Indian Trail Road (NB)</td>
</tr>
</tbody>
</table>

**Timeframe:** Medium- to long-term (2-5+ years)

**Conceptual Cost Estimate:** As part of this Implementation Plan, a total of four (4) portable and fourteen (14) permanent DMS are proposed. The estimated unit costs for these signs are:
- Portable DMS: $22,000 per sign capital cost
- Permanent arterial DMS: $80,000 per sign capital cost for a complete, installed unit

**Staffing Estimate:**
- Portable DMS: $1,600/year in equipment operations and maintenance costs, including 0.25 FTE of new KDOT staff
- Permanent arterial DMS: $2,500/year for equipment operations and maintenance

**Potential Benefits:**
- **Reduced travel times** for drivers who utilize alternate routes
- **Reduction in traffic incidents** from awareness of changing traffic conditions ahead
- **Increased awareness** of emergency information
**Funding Options:** Traveler information broadcast through DMS can reduce congestion and vehicle emissions, making them eligible for Congestion Mitigation and Air Quality (CMAQ) or Surface Transportation Program (STP) funding. Their ability to broadcast messages related to safety and security events might also make DMS and HAR deployment eligible for security funding.

Participating agencies could also pool funds to procure DMS for shared use. In addition, the Illinois Tollway has expressed interest in installing arterial DMS near Tollway junctions to alert motorists of conditions on the Tollway network.

DMS (both portable and permanent) could also be procured and installed as part of a roadway construction project (e.g., Stearns Road Corridor, Randall Road/Fabyan Parkway improvement project). Portable DMS obtained in this manner could then be used for other projects, or for day-to-day maintenance operations or incidents.

**Work Zone Traffic Management**

**Project Description:** Starting with a pilot project, this project would procure and deploy traffic monitoring and traveler information devices for use specifically within work zones across the county. These devices could include DMS, vehicle detection systems, HAR, and CCTV cameras as described in related projects, as well as devices that can calculate travel times through the work zone, motorist and worker safety systems (e.g., intrusion alarms), lane merging systems, and speed warning devices. This project could also include multi-jurisdictional work zone safety training, including joint training exercises to promote interagency coordination at work zones.

The project would consist of an evaluation of various work zone traffic management tools and a pilot project to test one or more of these applications in work zones in Kane County.

**Needs Categories Addressed:**
- Arterial Operations
- Operational Coordination
- Traveler Information

**Market Packages Addressed:**
- Traffic Information Dissemination (ATMS06)
- Work Zone Management (MC08)
- Roadway Safety Monitoring (MC09)
- Maintenance and Construction Activity Coordination (MC10)

**Project Champion:** Kane County Division of Transportation
Project Partners: Municipal departments of public works, IDOT District 1 Bureau of Maintenance, Illinois Tollway

Related/Dependent Projects: Countywide Construction/Maintenance Database System, Arterial Operations Center

Work Description: This project will consist of an evaluation of work zone applications and the deployment of a pilot project to improve safety and/or traveler information in construction zones. Based on the pilot project, subsequent deployments of the application can be planned.

Individual project tasks include the following:

- Identify potential work zone ITS applications.
- Evaluate applications based on predefined criteria (rating factors from the Technology Assessment could be used as a starting point).
- Select work zone ITS application for deployment.
- Follow systems engineering process to develop concept of operations, functional requirements, and performance measures for deployment.
- Identify construction project for work zone ITS deployment and implement.
- Measure effects of ITS application before and after deployment to determine effectiveness. Plan additional deployments based on positive results.

Performance Measures:

- Average delay in work zone areas
- Change in traffic volumes in work zones
- Number of crashes/worker injuries in work zones

Timeframe: Short-term (0-2 years)

Conceptual Cost Estimate: An engineering study to identify a work zone ITS application and carry out system design would cost approximately $30,000. Deployment and operations and maintenance costs would be highly dependant on the ITS application selected. For estimating purposes, a budget of $100,000 will be used. For more expensive work zone technologies, this cost may only cover an equipment lease; for less costly deployments, the County may be able to purchase the equipment with that budget. In addition, deployment and operations costs could be absorbed within a larger construction project if the recommended technologies have an application in such a project.

Potential Benefits: Work zone ITS tools have minimized traffic disruptions in construction areas, improved work zone safety, and heightened safety awareness through driver feedback. Increased traveler information in work zones can also lead to increased driver satisfaction.

Funding Options: Federal CMAQ or STP funding could be applied to this project. Maintenance funds or FHWA Work Zone Safety grants could also be used toward this project. ITS devices identified as part of this project could also be included in the deployment costs of the associated roadway projects where they will be applied.
Part of this project’s deployment could be tied into the Stearns River Bridge corridor or Kirk Road improvement projects as a means of potential funding.

**Countywide Construction/Maintenance Database System**

*Project Description:* This project would be deployed to periodically collect roadway construction and maintenance information from various agencies in the county (including directly from contractors), assimilate and process the information, and broadcast this processed information to various agencies and the public through a user-friendly interface (e.g., a web-based interactive map). Data for the system could include projected project timeframes from the Transportation Improvement Plan, weekly construction schedules, and daily updates on roadwork. The system would leverage existing systems, such as KDOT’s Project Management Development (PMD) website, wherever possible.

This system would use a common platform (e.g., GIS) for collecting information from various users, and a standard format would be used for displaying this data (e.g., map colors to signify incident impact). The web map could also be configured provide more detailed information about the incident with a mouse click. Each participating agency would be responsible for actively inputting their respective project information into the website, and also for timely updating the status of these projects. This would reduce the workload of a system administrator who would be responsible for ensuring that construction and maintenance data is collected, assimilated and displayed correctly, and removed when no longer applicable.

**Needs Categories Addressed:**
- Arterial Operations
- Data Management
- Data Collection
- Traveler Information Sources

**Market Packages Addressed:**
- Winter Maintenance (MC06)
- Roadway and Maintenance Construction (MC07)
- Maintenance and Construction Coordination (MC10)
- ITS Data Mart (AD1)

*Project Champion:* Kane County Division of Transportation
**Project Partners:** Kane County Highway Maintenance Department, IDOT District 1 Bureau of Construction, IDOT District 1 Bureau of Maintenance, Illinois State Toll Highway Authority, Kane County municipalities, Kane/Kendall Council of Mayors

**Related/Dependent Projects:** Arterial Operations Center, existing construction information databases (e.g., KDOT’s PMD), Countywide Dynamic Alternate Route Maps

**Work Description:** Specific design and deployment tasks include the following:
- Identification of existing construction/maintenance information collection and the development of procedures for such data collection across all participating agencies
- Development of system architecture that defines the central system data repository and the sharing of construction/maintenance data with the central repository
- Development of system requirements for data entry, processing, storage, and dissemination on the website
- Hardware and software procurement, installation, and testing
- Integration of communication links between the various participating agencies and the central system data repository
- Deployment of a publicly accessible website for providing the construction related information

**Performance Measures:**
- Number of participating agencies
- Number of construction data sets uploaded (transmissions/day)
- Number of “hits” to Kane County Construction/Maintenance Information website (hits/month)
- Travel times (minutes/corridor)
- Customer satisfaction

**Timeframe:** Medium-term (2-5 years)

**Conceptual Cost Estimate:** The estimated cost for designing the system would be $40,000, and the cost for hardware, software, map database installation and communication infrastructure would be approximately $100,000.

**Staffing Estimate:** System operations and maintenance would cost approximately $10,000 per year. Administration of the system would require 0.5 FTE not including the efforts of participating agencies to input construction and maintenance information on a regular basis.

**Potential Benefits:** Potential benefits include reductions of travel times, efficient emergency routing, improved maintenance and operations activities, and an increase in user satisfaction

**Funding Options:** This project could apply Federal funds from the Unified Work Plan, National Highway System (NHS), Surface Transportation funds, or ITS Research Program funding because of its potential to reduce congestion and vehicle emissions. Other funding options include asking Council of Mayors to incorporate this project within their budget, and including this project within construction contracts.
Countywide Dynamic Alternate Route Maps

Project Description: This project would be a regional initiative for developing alternate route information, which can be accessed by various agencies through a secure Internet website using a graphical user interface (GUI). A GIS database would be developed (building on existing Kane County databases) which would contain the various characteristics of the roadway infrastructure (e.g., truck routes, bridge clearances) and current incident and emergency management status (perhaps from the Countywide Construction/Maintenance Database or local emergency dispatching software). This database will be used to develop information about viable routes in Kane County for different conditions, such as construction, major incidents, or planned events. Incident and emergency management information would also be available so that agencies can make the appropriate contacts as conditions change and decisions need to be made.

This database would be used to pre-plan detours for critical roadway links and then applied as incidents arise. A more advanced version would allow the emergency management agencies to dynamically input the current status of the roadway network and let the software develop the optimal detour links. This enhanced version would produce multiple detours for traffic in the immediate vicinity and for traffic that is approaching from a distance and still has other opportunities to bypass the incident site. This enhanced version could produce the best available detours even if multiple links are closed. It could operate on several criteria (such as shortest route, route with the best capacity, route with the fewest at-grade rail crossings, etc.).

Actuation of the alternate routes would be carried out by emergency personnel on-site, but with these tools at their disposal, rerouting and detouring would be done in a more timely, coordinated manner.

Needs Categories Addressed:
- Arterial Operational
- Data Management
- Operational Coordination

Market Packages Addressed:
- Traffic Incident Management System (ATMS06)
- Emergency Routing (EM02)
- Maintenance and Construction Activity Coordination (MC10)

Project Champion: Traffic Incident Management Work Group
Project Partners: Kane County Division of Transportation, IDOT, Illinois Tollway, Kane County Sheriff, Kane County OEM, municipal police, fire, and traffic departments, Illinois State Police, Illinois Emergency Management Agency


Work Description: One of the first tasks for this project would be to develop a GIS database that would contain the various travel links in the county and their respective characteristics (e.g., width/number of lanes, average daily traffic, bridge clearances, rail crossings). This database would be built from the extensive geographic data currently managed by the Kane County GIS Department. Next, various alternate routes would need to be defined for the major arterials/corridors in the County. These predefined alternate routes would be limited to State and County Highways with traffic signals, routes parallel to high crash frequency zones, etc. Emergency traffic plans and signal timing plans could also be developed for these predefined routes using the countywide traffic simulation model.

This database could be used by responding agencies using a static, report-style document (e.g., Adobe® PDF files), or it could be linked to a secure Internet website which would provide a user friendly GUI for the users to input the current road/incident/construction information and get the desired detour links. The Traffic Incident Management Work Group, discussed above, would be tasked with developing procedures for timely notification of roadway link closures and re-openings and to develop routine public information dissemination process to broadcast long term detours. The Work Group will also be establishing agreements between various local agencies for mutually providing local resources for incident management at these alternate routes (e.g., providing portable DMS, personnel, etc.).

Performance Measures:
- Number of alternate routes included in the system
- Successful applications of alternate routes from database (based on user surveys)

Timeframe: Short-term (0-2 years)

Conceptual Cost Estimate: A basic version of this project would cost approximately $100,000, with development costing approximately $50,000.

Staffing Estimate: System operations and maintenance would cost approximately $10,000 per year, requiring 0.25 FTE to administer. The enhanced version would require the purchase of existing route optimization software or the development of custom software. The cost of this enhanced version could vary considerably, and could potentially be developed as a pooled fund study with costs shared by multiple agencies around the country.

Potential Benefits: This project will speed emergency response, reduce congestion caused by incidents, take advantage of available capacity during incidents, and promote interagency operational coordination.
**Funding Options:** Homeland Security grant funding could be used for this project, either through IEMA or the Illinois Terrorism Task Force (ITTF). CMAQ and STP funds could also be used because of the project’s potential to reduce congestion and vehicle emissions. Donated local agency labor and programming talent could be used to defray the cost as well.

**Performance-Based Crash Prevention System**

**Project Description:** This project would establish a systematic methodology for preventing crashes at intersections. This system would maximize the available resources by focusing on the most critical sites that have demonstrated the strongest crash patterns first. Building on current efforts in the county, this project would begin by sorting an annual list of all crash reports in the county to identify the most problematic intersections in terms of crash frequency and severity. This list would then be prioritized and those sites that exhibit strong crash patterns would be targeted for improvement countermeasures.

The assumption is that if many motorists are making the same mistakes (i.e., a strong pattern is emerging) there is probably an engineering solution, or at least a remedy that can be applied.

This process would stay on track by incorporating performance measures. These measures can quickly gauge the effectiveness of each countermeasure deployed, enabling the user to know when to make mid-course corrections or, if they have succeeded, to know when to move on to the next most significant intersection.

Agencies have been focusing attention on high crash sites for years. What distinguishes this project is that it establishes a more structured program that would be routinely repeated, and provides performance measures to be used to guide corrective actions. A team of agency personnel would be assigned to this project, trained on the process and expected to periodically document their progress. An oversight group would support this team by helping them obtain the resources needed to implement the various countermeasures.

**Needs Categories Addressed:**
- Data Management

**Market Packages Addressed:**
- ITS Data Warehouse (AD2)

**Project Champion:** Kane County Sheriff’s Department
**Project Partners:** Kane County DOT, municipal police departments, Illinois State Police, IDOT District 1, Illinois Tollway

**Related/Dependent Projects:** Traffic Incident Management Work Group, Traffic Signal Timing and Coordination, and existing crash pattern studies conducted independently by traffic and public safety agencies in Kane County (e.g., Kane County Division of Transportation, Kane County Sheriff, Illinois State Police).

**Work Description:** The first step is to establish a new process for collecting and sorting the crash reports. The State of Illinois currently requires that all local enforcement agencies report all crashes on the standardized crash report form and the completed forms are to be delivered to IDOT. If the Countywide Crash Database initiative is created, this would provide a very convenient, and probably faster, source for this information.

Once the crash reports are obtained, the next step involves electronically sorting on select fields of the standard crash reports to obtain the frequency and locations of the most significantly represented intersections. For example, right angle collisions might be a good type of crash for starters because they are typically the most serious type of crash. After the file is sorted on the frequency of crashes, then the list is narrowed one more time for those sites that exhibit the strongest patterns of right angle collisions. This refined listing then becomes the basis for an annual work plan for the Crash Prevention Team.

Depending on resources, the Team would apply engineering expertise to the top few sites to identify specific performance measures. These can include measures such as red light violation rates, speed violation rates, counts of evasive vehicle maneuvers, insurance statistics, etc., that would pertain specifically to those candidate intersections. A performance measurement plan would be predetermined for each intersection to clearly identify the level of effort required and to gauge the success or failure of any specific countermeasure.

Once baseline performance levels are measured and documented, various countermeasures are identified and deployed. The sequence of deployment is based on the likelihood of success, ease of implementation and available resources. Follow up performance is then measured immediately according to the performance measurement plan. The process loops back with additional countermeasures as needed until the performance measure goals are satisfied or until all reasonable countermeasures are exhausted.

In the event that engineering countermeasures do not achieve the desired results, or if the resources are not available to fix the problem, then the local police agencies would be notified and a targeted enforcement program requested. This includes periodic (e.g., weekly or monthly) performance reports that identify the hours of the week when the measured events are most severe so the police can conspicuously enforce to encourage compliance.

The process is then repeated indefinitely by the Crash Prevention Team on the next most critical sites. Once per year a new crash report search would be conducted to refresh the list and to account for recent changes in crash rates.
**Performance Measures:**
- Crash rate
- Crash frequency
- Crash severity
- Red light violation rate
- Late yellow entries
- Vehicle approach speeds

**Timeframe:** Short-term (0-2 years)

**Conceptual Cost Estimate:** Administration of the system would cost approximately $5,000 annually, exclusive of staff time, which would include the facilitation of regular meetings, and production of documentation.

**Staffing Estimate:** This project would leverage existing staff availability where possible, but would require an additional 0.25 FTE for ongoing work.

Engineering countermeasures would vary substantially, depending on what is involved. They might be very modest as is the case for simple timing changes, minor pavement marking improvements or sight distance obstruction removal. Intermediate level investments might include upgrading traffic signal displays, adding detectors, or highway lighting. Major improvements might include changing the geometrics of the intersection, removing parking, or changing traffic flow patterns.

**Potential Benefits:**
- For purposes of comparison, transportation engineers estimate crash damage at $3.4 million for each fatality, $50,000 for each personal injury crash, and $2,600 for each property damage-only crash.\(^{28}\) From these numbers it is easy to see that even a small reduction in an intersection’s crash rate can result in **substantial savings to the public.**
- A comprehensive program that reduces the crash rate across the County would also **reduce the police and emergency services expenditures** for those who must respond to these incidents.
- Over a period of time the reduction in damages would have a **positive impact on insurance rates** for residents of the county.
- A reduction in crashes would also have a **positive impact on motorist delay.** Even small fender bender crashes typically create significant bottlenecks that measurably add delay.
- A reverse use of this system would be to apply the performance measures to low crash rate intersections to optimize the phase splits and clearance intervals without compromising safety. This would be particularly useful in coordinated signal systems where bi-directional flows are being synchronized. In these systems, it is quite common for one or more intersections in the group to be critical to the progression in both directions. Increasing the green time splits for these intersections can have measurable **benefits in traffic flow.**

\(^{28}\) AASHTO Subcommittee on Traffic Engineering
Funding Options: The most likely source of funding would be Highway Safety Improvement Program (HSIP) funding. Because the improvements that improve driver behavior can often reduce congestion, this can also reduce the air quality problems from excessive vehicle emissions. As such, Congestion Mitigation and Air Quality (CMAQ) or Surface Transportation Program (STP) funding can be applied to this project. Developers’ funds and public-private partnerships (PPP) (i.e. the Insurance Industry participation) might also be used for this project.

4.3 Implementation Strategy

Implementation Issues

While each proposed project will have its own set of concerns, there are some issues that apply to several, or even all, of the identified projects:

- **Funding** – Has funding been set aside for the initial and on-going costs? The project should be included in the Kane County TIP to secure county-directed funding.
- **Operations and Maintenance** – Does the agency have personnel and funding to operate and maintain the system when it has been deployed?
- **Integration** – Does the project require integration with existing systems? Integration can require substantial commitments of time and expertise, especially if equipment was not built to the same standards.
- **Inter-agency Coordination and Agreements** – Does the solution require coordination with another agency? Coordination can be informal through regular contact with the right person at the other agency or it can be formalized in an interagency agreement or memorandum of understanding (MOU).
- **Integration with Improvement Projects** – Can or should the solution be coordinated with an engineering or construction project? By including a solution into a construction project, you can reduce the installation costs by performing the work while the area is under construction. This might also open up mainstream funds to be used for the ITS project. Engineering and construction projects are programmed many years in advance, so this type of coordination should occur as early as possible.
- **Public Acceptance** – Will the public react favorably to a project? Public reaction can be critical to getting a project underway. If the solution raises questions in especially sensitive areas, such as privacy of information, then it may be necessary to be proactive and educate the public about the solution’s benefits of the solution and present factual information addressing the public’s concerns.

Operational Issues

Operations and maintenance (O&M) planning is a critical component to any transportation system, especially in the case of ITS where new and complex technologies are being deployed. To promote the successful use of these technologies, consideration needs to be made for O&M aspects of ITS during the planning and implementation of projects.

O&M costs consist of equipment maintenance costs (e.g.,
hardware replacements, upgrades) and personnel wages. A comprehensive project-level O&M plan will address each of these recurring costs, which should then be incorporated into the overall project budget and/or the annual program budget.

Table 4-9 summarizes the O&M costs and resource requirements for the high priority projects identified in previous sections. These O&M costs are in 2007 dollars and reflect the total cost to operate and maintain a particular project. Note that the O&M costs repeat every year after the initial deployment of the project and continue as long as the system or equipment is in operation.

**Equipment Maintenance**

While some of the proposed projects consist of committee activities and other studies, most include the procurement of hardware and/or software. For these projects, over the long term, the ongoing cost of operating and maintaining the functionality of these systems can become more expensive than the implementation cost. Care should be given in the writing and enforcement of project materials specifications to ensure that reliable products are procured and implemented. This is best accomplished by specifying product warranties and including product support in the cost of implementation.

The equipment operations and maintenance costs shown in Table 4-9 include a number of factors, including:

- Equipment repair/replacement (estimated based on a percentage of the conceptual implementation cost)
- Outside maintenance labor (hours not incurred by partner agency staff)
- Software upgrades
- Communications and power costs (ITS field devices)

**Personnel**

An important part of O&M budgeting involves the estimation of new full-time employee (FTE) person-hours and the definition of required skill sets for those personnel. The following list of skill sets would be required for different aspects of the proposed projects described above:

- Traffic engineering: includes, but is not limited to, traffic signal optimization software operation and signal timing implementation
- Traffic management coordination: includes, but is not limited to, traffic and emergency management dispatching and coordination
- Traffic signals: includes, but is not limited to, traffic signal hardware and software operation, administration, and maintenance
- ITS standards: includes, but is not limited to, familiarity of current and developing ITS standards
- Data administration: includes, but is not limited to, administration of the various countywide traffic databases and associated user websites
- Computer administration: includes, but is not limited to, computer system administration, computer security setup and maintenance, hardware installation and configuration
- Local Area Network (LAN) administration: includes, but is not limited to, LAN systems administration, LAN security setup and maintenance, hardware installation and maintenance
In some cases, existing staff may be able to take on additional work tasks to support the recommended projects (e.g., Traffic Incident Management Work Group participation). In other instances, roadway construction project budgets may fund additional personnel that are needed (e.g., Work Zone Traffic Management). However, other projects will require new personnel for operations and maintenance of the new traffic management tools described in this Implementation Plan (e.g., Arterial Operations Center, Countywide Construction/Maintenance Database). From the list of defined skill sets listed above, specific ITS O&M job positions can be defined. These positions include:

- **Signal Engineer**—responsible for the monitoring, regular assessment, and optimization of signalized intersections in the county using the countywide traffic simulation model in coordination with consultant support (could be provided by a consultant)
- **AOC Operator**—responsible for functionality associated with the Arterial Operations Center, including coordination with other transportation and emergency management agencies; responsible for system monitoring (could be provided by a consultant)
- **Field Engineer**—responsible for the physical maintenance of ITS field devices, including traffic signal equipment, CCTV cameras, and DMS (could be provided by a consultant)
- **Computer Systems Administrator**—responsible for maintenance of the databases associated with systems in the Arterial Operations Center, Performance Based Crash Prevention System, Countywide Dynamic Alternate Route Maps, and Countywide Construction/Maintenance Database, as well as AOC hardware

To provide these positions, it is estimated that a total of four (4) additional full-time equivalent employees would be needed at different partner agencies, distributed as depicted below in Table 4-7. As the breakdown in the table shows, this would consist of two full-time employees at the Arterial Operations Center. Since the other listed projects would not individually require dedicated full-time employees, the other listed projects would need either 1) the assignment of additional tasks to existing employees at various participating agencies or 2) the hiring of new employees at those agencies assuming that a portion of their workload would consist of other tasks. At an average annual salary of $80,000, the overall cost for new FTEs would amount to $80,000 per year in additional personnel costs. Those values with an asterisk could be partially or fully provided by a consultant.

<table>
<thead>
<tr>
<th>Project</th>
<th>Kane County Division of Transportation</th>
<th>Kane County Office of Emergency Management</th>
<th>Traffic Incident Management Work Group</th>
<th>Kane County Sheriff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arterial Operations Center</td>
<td>2.0*</td>
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<td></td>
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<tr>
<td>Traffic Signal Timing and Coordination</td>
<td>0.5*</td>
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<tr>
<td>Emergency Responder Communications Integration</td>
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<td>0.25</td>
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</tr>
<tr>
<td>Instrumentation of Priority Corridors</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DMS on Priority</td>
<td>0.25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Corridors
Construction/Maintenance Database 0.5
Dynamic Alt. Route Maps 0.25
Performance Based Crash Prevention System 0.25

Table 4-7 – Staffing Needs by Partner Agency

Project Sequencing
This section describes a sequence of deployment for the projects defined in Section 4.2. This sequence is based on conceptual project costs (both design/deployment and operations/maintenance), anticipated benefits, identified “early winner” projects, interdependencies between projects, and balancing overall costs between the short-, medium-, and long-term. Table 4-8 provides an overall sequencing of the ten proposed ITS projects.

Short-term projects (Years 1 and 2) include “early winner” projects to quickly demonstrate benefits (e.g., Traffic Incident Management Work Group, Performance Based Crash Prevention System, Countywide Dynamic Alternate Route Maps) and phased infrastructure projects that can begin in the short-term (e.g., Traffic Signal Timing and Coordination, Instrumentation of Priority Corridors Plan).

Medium-term projects (Years 3-5) include continuing phases of infrastructure projects that began in the short-term (e.g., Traffic Signal Timing and Coordination, Instrumentation of Priority Corridors) and more costly infrastructure projects that require a longer deployment timeframe (e.g., Arterial Operations Center, Emergency Responder Communication Integration, Countywide Construction/Maintenance Database, DMS/HAR on Priority Corridors).

Long-term projects include continuing phases of infrastructure projects that began in the short-term (e.g., Traffic Signal Timing and Coordination, Instrumentation of Priority Corridors, DMS/HAR on Priority Corridors).

Procurement
By their very nature, ITS projects involve a combination of technology and more traditional transportation elements. As such, they are not always well-suited for low-bid contracts that transportation agencies traditionally use for capital improvements. Studies have shown that, for ITS projects, the procurement method applied can have substantial influence on the ultimate success of the project. Quite often, the procurement method for ITS projects is dictated not by the unique nature of the project, but rather by prevailing procedures of the champion agency which may not be the best approach to deployment. This can disrupt the systems engineering process that has been followed throughout this ITS planning process and should be used for all ITS deployments.

To assist transportation agencies as they seek to procure ITS products and services, the Transportation Research Board (TRB), through the National Cooperative Highway Research Program (NCHRP), produced its Report 560 titled “Guide to Contracting ITS Projects.” This report provides a logical process for procurement of ITS products and services. The guide focuses on four dimensions: work distribution (e.g., low-bid contractor, systems integrator, design-build), method of award (e.g., low-bid, sole source, best value), contract form (e.g., phased contracts, task orders), and contract type (e.g., fixed price, time and materials). It is recommended that NCHRP Report 560 be applied before procurement of each of the proposed projects described herein by using the NCHRP Web-based Decision Model, which can be accessed at www.trb.org/nchrp/its/index.htm.
Figure 4-2 – Kane County Recommended Field Deployment Map
Table 4-8 – Proposed Project Deployment Sequence with Estimated Deployment Costs

<table>
<thead>
<tr>
<th>Project</th>
<th>Estimated Deployment Costs*</th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Short-Term</td>
<td>Mid-Term</td>
<td>Long-Term</td>
<td>Total</td>
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<td>Arterial Operations Center</td>
<td>$</td>
<td>-</td>
<td>$ 700,000</td>
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<td>$ 700,000</td>
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<td>Traffic Signal Timing and Coordination</td>
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<td>$ 1,610,000</td>
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<td>Traffic Incident Management Work Group</td>
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<td>-</td>
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<td>Countywide Construction/Maintenance Database</td>
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<td>-</td>
<td>$ 140,000</td>
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<td>Countywide Dynamic Alternate Route Maps</td>
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<tr>
<td>Performance Based Crash Prevention System</td>
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<td>$ 250,000</td>
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</tr>
</tbody>
</table>

Totals: $ 1,289,000 $ 3,965,000 $ 2,410,000 $ 7,670,000

* 2007 dollars
Table 4-9 – Proposed Annual Operations and Maintenance Costs

<table>
<thead>
<tr>
<th>Project</th>
<th>Estimated O &amp; M Costs*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Short-Term**</td>
</tr>
<tr>
<td>Arterial Operations Center</td>
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<tr>
<td>Traffic Signal Timing and Coordination</td>
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<td>Work Zone Traffic Management</td>
<td>$-</td>
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<tr>
<td>Countywide Construction/Maintenance Database</td>
<td>$-</td>
</tr>
<tr>
<td>Countywide Dynamic Alternate Route Maps</td>
<td>$30,000</td>
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<td>Performance Based Crash Prevention System</td>
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<tr>
<td><strong>Totals:</strong></td>
<td><strong>$218,000</strong></td>
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</table>

* 2007 dollars
** Amounts shown reflect total annual O&M costs at the completion of each deployment timeframe (including salaries)
Funding Sources
A significant part of effective project deployment is securing adequate funding. The following are several funding alternatives that are available for financing transportation related projects:

Federal Sources
The following federal funding sources are available for ITS programs:
- National Highway System (NHS) funds
- Surface Transportation Program (STP) funds
- Congestion Mitigation and Air Quality (CMAQ) funds
- Federal transit funds
- Interstate maintenance funds
- Interstate discretionary funds
- USDOT safety initiatives (e.g., 511 and Mayday)
- USDOT Research and Special Programs Administration (RSPA)
- University Transportation Centers program
- Federal Emergency Management Agency (FEMA) funds
- Department of Homeland Security funds
- Highway Bridge Replacement and Rehabilitation Program funds
- Scenic Byways Program funds

In early 2001, as a further incentive for the development of regional ITS architectures, the Federal Highway Administration (FHWA) developed a Rule and the Federal Transit Authority (FTA) developed a parallel Policy to enact Section 5206(e) of the Transportation Equity Act for the 21st Century (TEA-21) in April of 2001. This Rule/Policy states that, in order to receive funding through the Highway Trust Fund, any region in the United States that has deployed or will soon deploy ITS projects must develop a regional ITS architecture. The inclusion of Kane County ITS initiatives in the Northeastern Illinois Regional ITS Architecture satisfies these requirements.

State Sources
- **Traditional Funding** – National Highway System (NHS) and Interstate Maintenance projects are selected by the State, in consultation with the local metropolitan planning organization (MPO), and consistent with the Long Range Transportation Plan (LRTP). With all other federally funded projects, the MPOs select the projects for inclusion in the TIP in consultation with the State, consistent with the LRTP.
- **National Highway System (NHS)** – NHS funds can be used in most places in the state on any roadway designated as part of the national highway system. However, there are certain subcategories of NHS funds that are restricted to certain kinds of projects.
- **Surface Transportation Program (STP)** – ITS projects are also eligible for use of STP in most places in the state including the interstate system.
- **State Primary Highways** – These funds can be used for ITS projects on any state highway, bus system or rail system without any program restrictions on eligibility.
Other Sources
These include other sources of funding which lie outside of the traditional federal and state funding sources described earlier.

- **ITS Deployment Program** – Under this program, eligible project must demonstrate integration of multi-modal ITS components in metropolitan areas, rural areas etc. to improve mobility, promote safety, increase traffic flow, etc. The Federal share is 50%. Proposals are submit to FHWA. However, traditionally these funds have been earmarked by the Congress. Thus, this requires sponsors of projects to gain local congressional support for candidate projects.

- **Public/Private Partnerships** – This is a relatively new funding source in which the private entity provides ITS service and/or system elements, but instead of direct reimbursement from a public agency, part of private entity’s cost is recouped by selling ITS based services to other private entities including end users. This offers a possible advantage of public cost reduction, and offers the public agency the opportunity to capitalize on the private sector’s market orientation.

- **State Infrastructure Banks (SIB)** – The SIB is an investment fund that offers loans, credit enhancements etc. to surface transportation projects that meet federal standards and are eligible for assistance under Title 23 and capital projects defined by Title 49.

- **Developer Impact Fees** – This funding source consists of fees that local governments charge on development projects to offset the additional public service cost of a new deployment. This private source of funds is applied to enhancements that adjust for the impact of a development in an area.

Legal Issues
Certain legal issues might arise as Kane County and other stakeholders deploy and integrate ITS projects. These issues are over and above the normal legal issues that are connected to deploying structures and equipment near or over a roadway.

One issue that is common for ITS projects is proprietary software. This is a term used to describe software which the user cannot study or edit the code, in contrast to free or open software. If a contractor is hired to develop software or if pre-developed software is used, the original developer often owns the rights to that code and only they are allowed to make changes to the code in order to modify the software. If an agency wants any modifications or enhancements, they must deal with that developer. This can leave the agency in a poor position to negotiate what it sees as a reasonable price for these changes. The best strategy is to address this in the initial agreement with a software developer, either allowing the agency to assume the rights to the software, including a warranty that covers future modification for a defined number of years, or by specifying a price or rate for the cost of future work on the software by the agency.

The only legal issues with any of the identified top priority projects are data privacy and correctly identifying drivers performing illegal actions in some of the countermeasures for the Performance Based Crash Prevention System project. While none of the countermeasures have been determined at this time, agencies should be aware of data and identification issues as they determine which countermeasures to implement.
Agreements

Many of the projects recommended in this plan require coordination between multiple partners. This coordination can formally be clarified and responsibilities can be identified through agreements. Agreements that might be required or beneficial to the projects are listed below:

- **Arterial Operations Center** – This project will require agreements on operating equipment and sharing data between agencies involved (e.g., Kane County Division of Transportation, Kane County OEM, IDOT District 1, Illinois Tollway, City of Elgin, City of Aurora).

- **Traffic Signal Timing and Coordination** – This project will likely require data sharing agreements between agencies operating traffic signals as well as agreements for operating signals on coordinated timing. In addition, as many of the identified priority corridors overlap jurisdictional boundaries, cost sharing agreements will be necessary to fund the subprojects identified.

- **Traffic Incident Management Work Group** – This project requires no agreements necessary, though interagency agreements might be necessary for individual projects the work group pursues.

- **Emergency Responder Communications Integration** - This project might require operational agreements between participating agencies. At the least, the agreed upon procedures and communication routes should be documented. This effort might also require an agreement for license to access certain frequencies, such as the FCC and APCO Co-Primary Frequency Advisors for use of IREACH.

- **Instrumentation on Priority Corridors** – This project will require operations, maintenance, and data sharing between stakeholders. Where the field devices provide data to multiple partner agencies, cost sharing agreements may also be necessary to fund deployment and/or operations and maintenance of the equipment.

- **DMS/HAR on Priority Corridors** – This project might require an agreement with Illinois Tollway on deploying and operating DMS on major arterials. It might also require an agreement with Kane County OEM for posting information regarding emergencies or rerouting of traffic. If highway advisory radio is deployed in the future, appropriate FCC licenses would be required.

- **Work Zone Traffic Management** – This project might require an agreement between agencies on the usage and operations of the traffic management equipment.

- **Countywide Construction/Maintenance Database** – This project will require agreements between agencies to share crash data, as well as documentation of the format the data will be provided in. The project may also require a joint agreement with a consultant system administrator, if one cannot be provided by a participating agency.

- **Countywide Dynamic Alternate Route Maps** – This project might require agreements between agencies on who develops the maps, how they are distributed, and under what circumstances maps can be available to third parties (i.e., distributed to the public). This project may also require a joint agreement with a consultant to develop alternate routes and project materials, if one cannot be provided by a participating agency.

- **Performance Based Crash Prevention System** – This project will require agreements between enforcement agencies to share crash data, as well as documentation of the format the data will be provided in.
# APPENDIX A

## LIST OF ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AASHTO</td>
<td>American Association of State Highway and Transportation Officials</td>
</tr>
<tr>
<td>AVL</td>
<td>Automatic Vehicle Location</td>
</tr>
<tr>
<td>CAD</td>
<td>Computer-Aided Dispatch</td>
</tr>
<tr>
<td>CATS</td>
<td>Chicago-Area Transportation Study</td>
</tr>
<tr>
<td>CCTV</td>
<td>Closed-Circuit Television</td>
</tr>
<tr>
<td>CMAQ</td>
<td>Congestion Mitigation and Air Quality (Improvement Program)</td>
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<tr>
<td>CVO</td>
<td>Commercial Vehicle Operations</td>
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<tr>
<td>DMS</td>
<td>Dynamic Message Signs</td>
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<tr>
<td>DOT</td>
<td>Division of Transportation</td>
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<tr>
<td>ESDA</td>
<td>Emergency Services and Disaster Agency</td>
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<tr>
<td>FHWA</td>
<td>Federal Highway Administration</td>
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<tr>
<td>FRA</td>
<td>Federal Railroad Administration</td>
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<tr>
<td>FTA</td>
<td>Federal Transit Administration</td>
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<tr>
<td>GCM</td>
<td>Gary-Chicago-Milwaukee ITS Priority Corridor</td>
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<tr>
<td>GPS</td>
<td>Global Positioning System</td>
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<tr>
<td>HAR</td>
<td>Highway Advisory Radio</td>
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<tr>
<td>HOV</td>
<td>High Occupancy Vehicle (lane)</td>
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<tr>
<td>HRI</td>
<td>Highway Railroad Intersection</td>
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<tr>
<td>IDOT</td>
<td>Illinois Department of Transportation</td>
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<tr>
<td>IEMA</td>
<td>Illinois Emergency Management Agency</td>
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<tr>
<td>IEPA</td>
<td>Illinois Environmental Protection Agency</td>
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<tr>
<td>IFERN</td>
<td>Interagency Fire Emergency Radio Network</td>
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<tr>
<td>IREACH</td>
<td>Illinois Radio Emergency Assistance Channel</td>
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<tr>
<td>IRP</td>
<td>International Registration Plan</td>
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<tr>
<td>ISP</td>
<td>Illinois State Police</td>
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<tr>
<td>ISPERN</td>
<td>Illinois State Police Emergency Radio Network</td>
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<tr>
<td>ISTHA</td>
<td>Illinois State Toll Highway Authority</td>
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<tr>
<td>ITS</td>
<td>Intelligent Transportation Systems</td>
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<tr>
<td>ITSPO</td>
<td>Intelligent Transportation System Program Office</td>
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<tr>
<td>ITTF</td>
<td>Illinois Terrorism Task Force</td>
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<tr>
<td>IWIN</td>
<td>Illinois Wireless Information Network</td>
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<tr>
<td>KKCOM</td>
<td>Kane/Kendall Council of Mayors</td>
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<tr>
<td>LRTP</td>
<td>Long Range Transportation Plan</td>
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<tr>
<td>MABAS</td>
<td>Mutual Aid Box Alarm System</td>
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<tr>
<td>MDT</td>
<td>Mobile Data Terminal</td>
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<tr>
<td>MOE</td>
<td>Measures of Effectiveness</td>
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<tr>
<td>MPO</td>
<td>Metropolitan Planning Organization</td>
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<tr>
<td>NTCIP</td>
<td>National Transportation Communications for ITS Protocol</td>
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<td>PSAP</td>
<td>Public Safety Answering Point</td>
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<tr>
<td>RTA</td>
<td>Regional Transportation Authority</td>
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<tr>
<td>RTIP</td>
<td>Regional Transit ITS Plan</td>
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<td>Acronym</td>
<td>Description</td>
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<tr>
<td>SEDP</td>
<td>Strategic Early Deployment Plan</td>
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<td>SEOC</td>
<td>State Emergency Operations Center</td>
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<tr>
<td>STIP</td>
<td>Statewide Transportation Improvement Plan</td>
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<tr>
<td>TIMS</td>
<td>Traffic and Incident Management System (Illinois Tollway), Train Information Management System (Metra)</td>
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<tr>
<td>TIP</td>
<td>Transportation Improvement Plan</td>
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<tr>
<td>TMC</td>
<td>Traffic Management Center</td>
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<tr>
<td>TSC</td>
<td>Traffic Systems Center</td>
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<tr>
<td>USDOT</td>
<td>United States Department of Transportation</td>
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</tbody>
</table>
Kane County Division of Transportation

COUNTYWIDE ITS/TMC FEASIBILITY STUDY
Kane County Division of Transportation
Stakeholder Interview

DATE
Kane County Division of Transportation
41W011 Burlington Road
St. Charles

Goal: Capture transportation needs, services, current & planned projects, and integration opportunities within Kane County

1. Project Overview
2. Kane County ITS Activities Discussion (see next page)
3. Roles and Responsibilities
4. Anticipated Kane County Connections / Interfaces
5. Agreements
6. Regional Transportation Needs / Issues
7. Next Steps
Current Initiatives

• Programming & Administrative Services
  o 5 Year TIP (Transportation Improvement Plan)
  o Current outside funding source/project efforts (CMAQ, HSIP, HRRRP)
  o Bicycle and pedestrian planning
  o GIS databases
  o 2006/2007 Transportation Improvement Program - Permitting

• Project Implementation
  o 2006 Transportation Improvement Program
  o Traffic control / signal interconnects
  o Emergency vehicle signal preemption
  o Traffic surveillance
  o Paratransit coordination
  o Traffic counts (online interactive map)
  o Work zones

• Maintenance & Operations
  o Work zones
  o Maintenance scheduling software
  o Field equipment fault monitoring
  o Pavement / weather condition monitoring

Future Initiatives

• Programming & Administration
  o 2030 Transportation Plan
  o GIS database expansion
  o Transportation hubs / centers (transit)
  o Park & ride lots

• Project Implementation
  o 5 Year TIP (Transportation Improvement Plan)
  o Stearns Road Corridor
  o Transit signal priority
  o Bus rapid transit
  o High-occupancy vehicle (HOV) lanes
  o Highway-rail crossing technologies
  o High crash location improvements
  o Automated enforcement technologies (i.e., red light running etc.)

• Maintenance & Operations
  o Automatic vehicle locationing (AVL)
  o Expansion of Pavement / weather condition monitoring
  o Automated de-icing technologies
MEETING NOTES

DATE: Friday, October 20, 2006
LOCATION: Kane County Division of Transportation Offices
ORIGINATED BY: Tom Szabo, Kane County DOT
RECORDED BY: Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey
PARTICIPANTS: Kurt D. Lebo, Kane County DOT
Tom Szabo, Kane County DOT
Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey
SUBJECT: Kane County ITS/TMC Feasibility Study – KDOT GIS Department Interview

These meeting notes reflect our understanding of the discussions and key decisions reached during this meeting. Please forward any questions, additions, and/or corrections within ten (10) business days of the date issued. Please note that we will consider the record to be accurate unless written notice is received within these ten (10) business days.

After self-introductions, Matt Letourneau, Edwards and Kelcey (EK) project manager, provided an overview of the project scope and schedule.

Systems/Projects
There is a new fiber optic line planned from Rockford to Northern Illinois University (NIU) to the new Argonne National Laboratory Technology Park in West Chicago via Kane County that could provide fiber connectivity between municipalities along the way.

KDOT Geographic Information Systems (GIS) Department is involved in data management and asset management for KDOT. Working with the County GIS Department, KDOT GIS uses a linear referencing system with ESRI ArcView/ArcMap to provide base data for maintaining...
street sign inventory data, maintenance vehicle AVL records, ADT, and engineering project tracking.

The GIS Department is interested in obtaining signal inventory data that the Chicago Metropolitan Agency for Planning (CMAP) is currently collecting.

KDOT GIS does collect crash data, but it is not geo-coded and must be hand entered into an MS Access database from hard copies of crash reports from the police. KDOT uses Intersection Magic for crash data analysis, but is not completely satisfied with the product.

KDOT GIS provides online annually updated ADT maps for the general public on the KDOT website.

GIS is also used for project planning and prioritization for the impact fee program areas.

Kane County DOT has a Virtual Road Driver video log (available internally) of all county roads that is attached to the KDOT GIS database.

KDOT’s Project Management Development (PMD) website provides current construction project information to the public (www.kanecountyprojects.com). However, it no longer includes municipal construction projects.

Roles and Responsibilities
The main responsibilities for the GIS Department are investigating new technologies to facilitate business processes and troubleshooting IT related problems. Once a month, KDOT GIS gathers data relating to various project locations and statuses from KDOT departments (Engineering, Land Acquisition, etc.), but not from municipalities. It also provides monthly maintenance of the PMD website.

Links
The GIS Department has good working relations with other KDOT departments and the County GIS Department. It provides timely maintenance activity updates to the Sheriff’s Department. However, there is not much coordination with the municipal agencies and IDOT data is difficult to access. The KDOT GIS Department provides feedback for the GIS Coalition Clearinghouse data.
Agreements
The KDOT GIS Dept. has an agreement with State of Illinois GIS Coalition for Navteq map data and NPDES Data.

Needs
- KDOT GIS Department expressed a need for more spatial data (with appropriate Metadata), such as municipal work planning activities, ADTs for township and municipal routes, and geocoded crash data for GIS mapping.
- A centralized GIS database would be beneficial (currently, St. Charles, Aurora and Geneva participate in joint GIS data sharing)
- Would like to develop a crash data map that incorporates crash data from various sources (25 agencies currently provide crash data to KDOT). KDOT would also like to have access to IDOT’s Crash Data Mart and Mobile Crash Reporting (MCR) system (through a more interactive and easily accessible interface).
- Would like to have a comprehensive inventory of equipment along with updates (i.e., speed limits, parking zones)
DATE: Friday, October 20, 2006
LOCATION: Kane County Division of Transportation Offices
ORIGINATED BY: Tom Szabo, Kane County DOT
RECORDED BY: Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey
PARTICIPANTS: Scott Ver Vynck, Kane County DOT
Tom Szabo, Kane County DOT
Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey
SUBJECT: Kane County ITS/TMC Feasibility Study – KDOT Maintenance & Operations Department Interview

These meeting notes reflect our understanding of the discussions and key decisions reached during this meeting. Please forward any questions, additions, and/or corrections within ten (10) business days of the date issued. Please note that we will consider the record to be accurate unless written notice is received within these ten (10) business days.

After self-introductions, Matt Letourneau, Edwards and Kelcey (EK) project manager, provided an overview of the project scope and schedule.

Systems
- KDOT uses **dynamic message signs (DMS)** in work zones to provide traveler information.
- KDOT uses **Cartegraph** maintenance scheduling software to keep an inventory of manholes, signals, lights, etc. and also for generating and prioritizing work orders.
- **Computerized Fleet Analysis (CFA)** is used for monitoring maintenance vehicles by keeping record for driver-hours, mileage, etc.
- The Maintenance Department has been using automatic vehicle location (AVL) to track maintenance vehicles of the last 6 years. Although there was initial opposition to its use, these issues have been resolved and it is used as a positive tool for the drivers.
- Many vehicles are equipped with instruments to measure live data for pavement temperature, amount of spreading, outside temp, etc. Each of these vehicles is coded with their respective capabilities and this information is used for maintenance dispatch. (esp. in snow conditions). KDOT has one bridge with a de-icing system (Peck & Keslinger).
- KDOT does not have road weather information systems (RWIS), but instead use IDOT’s website and DTN data from airports to gather weather information.
- The KDOT Maintenance dispatch room serves as the “Snow Plow Command Center” during winter events.

Agreements
There are no written agreements between KDOT Maintenance any other departments, but they assist other departments in incident management when required.

Roles and Responsibilities
- The KDOT M&O Department maintain only County roadways (culverts, potholes, signs, etc.) and assist police departments at incidents when asked (e.g., traffic control, cleanup).
- They regularly alert Sheriff, police, fire, and schools about road closures, with updates within 48-72 hours.
- They post maintenance schedules.
- KDOT patrol trucks check for road kill, roadway spills, and maintain pull-off bays.
- KDOT does not tow disabled vehicles at incident sites.

Links
Coordinate with other agencies on construction projects through permitting and traffic departments.

Needs
- The KDOT M&O Department would like access to bridge deck video and condition data (as they freeze first during winters).
- They would like IP addressable cameras and RWIS at certain intersections.
- They would like de-icing systems on any four-lane bridge decks and at other locations that are not easily accessible.
• They expressed a need for a single command center with DTN, camera feeds, radio, TV, maps, AVL data, etc.
• Dangerous geometry and animal collisions are an issue in rural parts of the county.
MEETING NOTES

DATE: Friday, October 20, 2006
LOCATION: Kane County Division of Transportation Offices
ORIGINATED BY: Tom Szabo, Kane County DOT
RECORDED BY: Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey
PARTICIPANTS: Steve W. Coffinbargar, Kane County DOT
Kurt E. Nika, KDOT
W. Jefferey Dickson, KDOT
Tom Szabo, Kane County DOT
Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey
SUBJECT: Kane County ITS/TMC Feasibility Study – KDOT Planning & Programming Department Interview

These meeting notes reflect our understanding of the discussions and key decisions reached during this meeting. Please forward any questions, additions, and/or corrections within ten (10) business days of the date issued. Please note that we will consider the record to be accurate unless written notice is received within these ten (10) business days.

After self-introductions, Matt Letourneau, Edwards and Kelcey (EK) project manager, provided an overview of the project scope and schedule.

Current Systems
The permitting department uses K-PASS, a permitting software that is tied with the Buildings, Health, Water, Zoning Departments, etc. for collection of permit information with other departments. It also takes into account maintenance work/work zones while developing truck routes. K-PASS is not linked with the Construction & Maintenance Departments (but the system would benefit from timely information of maintenance work activities).
The Impact fee program uses GIS interface on local intranet for land, parcel information, and uses K-PASS for raising permitting flags. The Planning & Programming Department also has volume/capacity ratio maps for County roads. The CRIP projects are determined after traffic modeling analysis (v/c ratio of over 0.8 is used as the criteria)

“Your Speed Is” signs and bridge de-icing systems are in use in the county.

Planned Systems
A signal interconnect project on Fabyan Parkway is slated for 2007. Some other projects that are being considered are: transit centers at Elgin & Aurora, an Elburn Metra Station grade separation, an alternative analysis study for the UP-W line through Geneva, Pace’s Transit Signal Priority project on some of the corridors in the region, and a provision for communication infrastructure in the Stearns Road corridor. The KDOT Planning Department is currently in process of updating the 2040 transportation plan.

The following are the various funding sources for the projects:
- HPP for Stearns Road
- STP for local projects
- Impact Fee funding (CRIP) is a growing source for funding
- MFT
- STP-Rural
- “Magic” Money

The 2030 Plan has identified projects worth billions of dollars, however funding is only available for approx. 20% of these.

Agreements
Although there are no written agreements with any department, the Planning % Programming Department works with any agency according to the project’s funding needs.

Roles and Responsibilities
KDOT Planning & Programming Department is responsible for access improvements on all county roads and other related improvements (e.g., sidewalk upgrades, utilities, signals). The Permitting Department authorizes moving permits/truck weight fees.
Links

- The Planning & Permitting Department has strong ties with the Kane/Kendall Council of Mayors (KKCOM), the agency that determines the application of federal funds.
- They also coordinate activities with FHWA, IDOT, CMPA, NPSE, CAT, Metra, Pace, Townships, Municipalities, and adjacent counties.

Needs

- The Permitting Department has a number of ongoing projects and sees a need for a user-friendly mapping tool to visualize and track these projects (something related to the PMD system, but – due to limited staffing levels – not very labor intensive).
- The Planning Department has few administrative issues with data management of credit agreements. They are currently working on an on-line application interface.
- The Programming Department is mapping the 5-year fiscal programs in the region for planning purposes, and would like to combine this information with other sources. However, there are sensitivities with sharing information with other planning agencies. They are also trying to convince local municipalities to make effective land-use policies.
DATE: Friday, October 20, 2006, 10:00 am

LOCATION: Kane County Division of Transportation Offices

ORIGINATED BY: Tom Szabo, Kane County DOT

RECORDED BY: Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey

PARTICIPANTS: Manny Gomez, Kane County DOT
Tom Szabo, Kane County DOT
George M. Brown, HLR, Inc.
Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey

SUBJECT: Kane County ITS/TMC Feasibility Study – KDOT Project Implementation Department Interview

These meeting notes reflect our understanding of the discussions and key decisions reached during this meeting. Please forward any questions, additions, and/or corrections within ten (10) business days of the date issued. Please note that we will consider the record to be accurate unless written notice is received within these ten (10) business days.

After self-introductions, Matt Letourneau, Edwards and Kelcey (EK) project manager, provided an overview of the project scope and schedule.

Current Systems
The Traffic Department has a few pan-tilt-zoom CCTV cameras for video detection and inductive loops for sampling the traffic flow on the roadway system. Almost 80-90% of the traffic signals at present are on interconnected systems (via POTS) and 70% of County routes have emergency vehicle preemption (EVP). Fire, EMS and some police departments have access to EVP transmitters for preempting traffic signals.
KDOT’s Land Acquisition Department can access Kane County’s GIS database for land ownership, parcel id no., new sales information, etc. for land acquisition for transportation related projects. They also provide feedback to the County GIS Department on various issues.

Planned Systems
The 2006 Kane County Transportation Improvement Plan has been published and work on the 2007 plan is currently underway. In these plans, KDOT is seeking funding for a number of signal interconnect projects (e.g., Kirk Road), installing more pan-tilt-zoom CCTV cameras, upgrading system interconnectivity through DSL lines, and re-optimizing existing traffic signal timings (e.g., Randall Road) including Level of Service (LOS) Maps and interactive tools with space-time diagrams.

With Pace, KDOT is considering transit signal priority (TSP) on Randall Rd with potential plans for bus rapid transit (BRT) and high-occupancy vehicle (HOV) lanes in the future. The department is currently seeking funding for a grade separation of highway rail intersections (HRI) at Orchard Road.

A new state law is now in place that allows the deployment of automated red light enforcement systems on County and municipality routes. The City of Elgin is considering deploying such a system at the 72nd Street and Randall Road intersection; KDOT is planning on deploying such a system at the Fabyan Parkway and Randall Road intersection.

Agreements
- Municipalities pay for the construction and maintenance of EVP transponders.
- Through its Master Agreements, IDOT controls signal timings of all traffic signals on State routes, provides electrical service, and bears the cost of energy and signal maintenance.
- For signals on County roads within municipal boundaries, the municipal agencies are responsible for energy while KDOT is responsible for maintenance of these signals.

Roles and Responsibilities
The KDOT Project Implementation Department’s main responsibilities include tracking project status, land acquisition, design, and construction. KDOT also monitors the transportation network, receives comments, and responds to the complaints. HLR, Inc., KDOT’s electrical maintenance contractor, maintains KDOT field equipment. Private consultants are used for
traffic signal maintenance, optimization, and electrical maintenance (HLR, Inc.; Metro Transportation Group; and Meade Electric, respectively).

**Links**
There is limited coordination with ISTHA (the issue of queuing of traffic on the ramps is worsening) and IDOT (KDOT and IDOT share electrical contractors).

**Needs**
- Due to huge growth, new technologies are needed to mitigate capacity/congestion issues in the region.
- Truck traffic is a problem in some parts of the county. The County is at present considering truck turning lanes on Stearns Road.
- Highway-rail intersections are not an issue on the county roads.
- Incident management affects the regular traffic operations.
- KDOT needs more traffic related data.
- Interagency operational coordination is required (ramp queuing).
DATE: Tuesday, November 21, 2006

LOCATION: Aurora DPW, 44 E. Downers Place, 4th Floor, Aurora, IL 60507

ORIGINATED BY: Tom Szabo, Kane County DOT

RECORDED BY: Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey

PARTICIPANTS: Bob Greene, City of Aurora
Tom Szabo, Kane County DOT
Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey

SUBJECT: Kane County ITS/TMC Feasibility Study – Aurora DPW Interview

These meeting notes reflect our understanding of the discussions and key decisions reached during this meeting. Please forward any questions, additions, and/or corrections within ten (10) business days of the date issued. Please note that we will consider the record to be accurate unless written notice is received within these ten (10) business days.

After self-introductions, Matt Letourneau, Edwards and Kelcey (EK) project manager, provided an overview of the project scope and schedule.

Existing Systems
There are 110 traffic signals owned by Aurora DPW and 60 by other departments within the City. The Department is trying to be consistent with KDOT for deploying traffic signal systems by using Eagle systems.

The Aurora Fire Department has requested Aurora DPW to upgrade all city traffic signals with emergency vehicle preemption (EVP) system. However, the DPW is not using any coded EVP equipments. They are interested in deploying transit signal priority (TSP) at various intersections in the City, but do not have any plans in near future.
Three highway rail intersections (HRI) in the City have preemption systems installed on them.

Since radar detection technology has not been very effective in the past, the Department is shifting towards video detection. After a few residential complaints, they have started using tube counters for collecting traffic data (speed, vehicle class, and counts). Aurora has a citywide Wi-Fi network and a fiber optic backbone.

Some of the Metra parking lots in Aurora are undergoing expansion.

Construction information about roadway projects is updated through press release and through a website, which is updated annually. Portable dynamic message signs (DMS) are used mostly in construction areas for providing advanced warning to the traveling public. These DMS can be activated through cell phones and compliment press releases and police speed trailers.

The Department has GIS capabilities which they use for preparing maps of various traffic infrastructure and construction activities.

At present, Civiltech is preparing a traffic model for the Aurora downtown region using Synchro 7 software. They will be able to directly upload the timings from this model onto the traffic signals in the future.

The Department expressed an interest in IDOT’s Mobile Crash Reporting (MCR) System (although there might be some issues raised by the Aurora Police Department).

Planned Systems
The City of Aurora DPW has recently received CMAQ grants for fiber optic connectivity project on IL-25, IL-31, and on Galena from New York St. to Farnsworth Road.

Red light running cameras are planned for deployment in 2007. Although there is reluctance from some quarters, the Department is at present looking into the various locations, vendors and permit processes for deployment of this program.

A new alternative 911 center is planned in Aurora to serve as a backup (to be located at McCoy and Gregory). There are long range plans for a new police station, a potential opportunity for centralized traffic management operations in the future.
The Department is thinking about adding wireless interconnect to link up Aurora Metra parking lots for providing **dynamic parking information**, with a future possibility of combing park-n-ride lots also.

**Needs**

- There are few traffic queue back-up issues at some HRI locations (e.g., intersection of Indian Trail and Highland Ave., intersection of IL 25 and Indian Trail Road). Most of the traffic backup is during the morning peak period in the eastbound direction.
- Rapidly changing developer construction projects are an issue for regularly updating construction website.
- Due to high usage and limited capacity, Metra parking capacity is a major issue.
- Pre-trip traveler information is needed for certain corridors within the city. Effective deployment of DMS would be a viable option.
- The electrical maintenance department is acutely understaffed. They spend most their resources on lighting issues and the Department is thus looking for supplemental maintenance related funding.
- Accident reporting is an issue for the region.
- The Department expressed an interest in emphasizing the use of bus transit system, which is not utilized as heavily as Metra, for lessening the burden on the roadway system.
MEETING NOTES

DATE: Tuesday, November 21, 2006
LOCATION: Elgin DPW, 1900 Holmes Road, Elgin, IL 60120
ORIGINATED BY: Tom Szabo, Kane County DOT
RECORDED BY: Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey
PARTICIPANTS: John M. Loete, City of Elgin DPW
Tom Szabo, Kane County DOT
Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey
SUBJECT: Kane County ITS/TMC Feasibility Study – Elgin DPW Interview

These meeting notes reflect our understanding of the discussions and key decisions reached during this meeting. Please forward any questions, additions, and/or corrections within ten (10) business days of the date issued. Please note that we will consider the record to be accurate unless written notice is received within these ten (10) business days.

After self-introductions, Matt Letourneau, Edwards and Kelcey (EK) project manager, provided an overview of the project scope and schedule.

Existing Systems
There are 52 traffic signals in City of Elgin, 42 are owned by them and ten are owned by IDOT but maintained by Elgin DPW. New signal controllers are installed for controlling these traffic signals along with fiber connectivity to link them to the IDOT master controllers. Many of the signals are being upgraded to LED systems and all the “Econolite” systems are being replaced by “Eagle” systems.

At present many of the intersections have emergency vehicle preemption (EVP) system installed on them by the Elgin Fire Department. EVP is installed at all new/upgraded signals.
There are a few Highway Rail Intersections (HRI) in the region with most of them owned by IDOT. The City signals follow IDOT pre-emption phasing.

Many of these systems have video detection capabilities (no PTZ cameras) with the video feed viewable at the DPW office through an Ethernet based connection. At present, these cameras and other vehicle detectors are used only for signal control and not for traffic data collection.

There is a citywide Wi-fi network available for wireless interconnectivity. The Department buys base GIS maps form KDOT and uses private consultants to update the layers for water, sanitary, lighting, signage, etc.

Some of the maintenance vehicles have GPS installed on them (Teletrac) which helps them to track the vehicles in real-time. Other vehicles download their route reports when they return to the garage.

Maintenance dispatch is made through cell phones (Nextel) and radios (Motorola) in the “snow room”. The Maintenance Department uses a Maintenance Management System (Cassworks) which is linked to GIS, for issuing work orders and for asset management.

Construction information is made available through press releases and city website. Construction inspectors call the Elgin Fire and Police Departments to inform them about roadway construction closures.

Pace has recently taken over the Elgin Bus Company. At present, Pace routes funnel to a hub, but in future, they would support system-wide passenger transfers.

The Elgin DPW owns and maintains parking facilities (13 decks, 19 lots) and provides free parking.

**Planned Systems**
- The City plans to use automatic vehicle location (AVL) on all its vehicles in the future.
- Pace is working on “Next Bus” signing in Elgin.

**Agreements**
The City will develop memoranda of understanding on a project-by-project basis.
Roles and Responsibilities
The Elgin DPW is responsible for maintenance and construction of roadways, traffic signals, signage, and parking lots.

Links
The Elgin DPW Maintenance Department does not have working links with any other maintenance agencies. They are able to communicate with the Elgin and Police Fire Department through two-way phones, but do not contact private EMS.

Needs
- There is traffic congestion on Randall Road (McLean and IL Rte. 20)
- There is a lack of sufficient access points to major arterials like Randall Road.
- Rapid development in the region and along the major arterial routes is causing congestion problems in some areas.
- There are a few conflicts for the pedestrians due to the construction activities.
- Sometimes the rail operations disrupt the traffic flow at highway rail intersections (HRI).
DATE: Tuesday, November 21, 2006
LOCATION: Rutland Dundee FPD, 11 E Higgins Rd., Gilberts, IL 60136
ORIGINATED BY: Tom Szabo, Kane County DOT
RECORDED BY: Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey
PARTICIPANTS: Richard Thomas, Rutland Dundee Townships FPD
Tom Szabo, Kane County DOT
Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey
SUBJECT: Kane County ITS/TMC Feasibility Study – Kane County Fire Chiefs Assn. (Rutland-Dundee FPD) Interview

These meeting notes reflect our understanding of the discussions and key decisions reached during this meeting. Please forward any questions, additions, and/or corrections within ten (10) business days of the date issued. Please note that we will consider the record to be accurate unless written notice is received within these ten (10) business days.

After self-introductions, Matt Letourneau, Edwards and Kelcey (EK) project manager, provided an overview of the project scope and schedule.

Systems
- The Rutland Dundee FPD has a **paper mapping system** for use at the dispatch center and in all emergency vehicles. These maps provide information about emergency response locations on a square-mile scale.
- The command car is equipped with a laptop and an electronic version of the mapping system. The **electronic mapping system** is linked with aerial photographs of the response site. This provides critical information for emergency response planning. This
system will soon be used by Quadcomm dispatch, which includes East & West Dundee, Rutland, Carpentersville and MABAS Division 2.

- There are **four ETSBs and seven PSAPs** operating in Kane County. They are: Quadcom ETSB (QuadCom PSAP), Elgin ETSB (Elgin PSAP), South Elgin ETSB (South Elgin PSAP), and Kane County ETSB (Aurora PSAP, Montgomery PSAP, TriCom PSAP and Kane County Sheriff PSAP).

- The Fire Association is supportive of the County’s use of **emergency vehicle preemption (EVP)**.

- With the recently passed law passed supporting **red light running enforcement** programs in Illinois, the Fire Association is supportive of the County’s is looking into it for certain intersections.

- MABAS Division 2 and Aurora FPD are equipped to manage larger **hazardous material incidents**. The other fire departments in the county are only qualified to contain these incidents and oversee the safety issues.

- **IFERN** is used to communicate between different fire departments within the County. **IREACH** is used for communicating with IDOT, while telephones are used to communicate with KDOT.

- The command vehicle is equipped with different communication systems and can serve as a command post.

**Agreements**
The fire departments within the county have mutual agreements with MABAS and Quadcom. They also aid their neighboring agencies in emergency response, equipment assistance, etc.

**Roles and Responsibilities**
The fire departments are responsible for incident response, providing emergency medical services (EMS), and closing of travel lanes at the incident sites.

**Links**
As only City of Elgin Fire Department is fully equipped to respond to incidents on its own, there is mutual cooperation between all other fire departments in the county for providing emergency assistance. However, there is poor coordination between fire departments and KDOT (KDOT M&O Department assists in incident cleanup but not with traffic control). The fire departments also coordinate their activities with the police departments within the county (the fire department provides emergency signs, cones with LEDs, etc. while police departments reroute traffic and investigates the incident site).
Needs

- Lack of Emergency Vehicle Preemption (EVP) is a concern for the FPD (e.g., IL Route 72 and Randall Road intersection).
- There are safety issues at certain intersections (e.g., left turn on red at IL Rte. 72 and Randall Road intersection). These can be addressed by upgrading EVP, signal timing and phasing, etc.
- The low number of repeaters causes weak communication signals in the western side of the County.
- Locating addresses at incident sites for emergency response is an issue for the fire departments.
- The FPD expressed a need for regularly updated routing, road closure, construction information (esp. in regions outside their own jurisdiction), and real time incident status information. This information can play a critical role in emergency response planning and dispatching, thus saving critical response time.
- There is not much coordination between KDOT and fire departments for mutual cooperation in incident management.
- The fire departments are not able to effectively communicate with the police departments during emergency response.
- A dynamic traffic routing system (esp. on major roads) around incident sites and signal retiming would be helpful in emergency response. Arterial dynamic message signs (DMS) would be helpful for rerouting.
- The fire departments are open to integration of various CAD systems countywide. However, software upgrades would seem to be a costly option. They are more open to low-end solutions like automatic email updates for incident information.
MEETING NOTES

DATE: Tuesday, November 21, 2006
LOCATION: St. Charles Police Station#1, 2 State Ave., St. Charles, IL 60174
ORIGINATED BY: Tom Szabo, Kane County DOT
RECORDED BY: Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey
PARTICIPANTS: Dave Kintz, St. Charles Police Department
Tom Szabo, Kane County DOT
Matt Letourneau, Edwards and Kelcey
Mayank Goyal, Edwards and Kelcey
SUBJECT: Kane County ITS/TMC Feasibility Study – Kane County Police Chiefs Assn. (St. Charles Police Department) Interview

These meeting notes reflect our understanding of the discussions and key decisions reached during this meeting. Please forward any questions, additions, and/or corrections within ten (10) business days of the date issued. Please note that we will consider the record to be accurate unless written notice is received within these ten (10) business days.

After self-introductions, Matt Letourneau, Edwards and Kelcey (EK) project manager, provided an overview of the project scope and schedule.

Systems/Projects
The St. Charles Police Department has pre-defined emergency and planned-incident detour routes but do not have detour routes for unplanned incidents.

The St. Charles Police use total station equipment for collecting data at incident sites, which is faster than the laser equipment they used previously. The St. Charles PD participates in the Kane County Crash Analysis Reconstruction Team (KCART), a countywide incident reconstruction team.
The St. Charles PD is currently awaiting IDOT approval for its **red light camera enforcement** program deployment (Red Flex).

The County has a paper based state crash report (SCR-1050) but is currently planning to use IDOT’s computerized **Mobile Crash Reporting (MCR)** system. The vehicle crash reporting system is not yet on a wireless network.

**TriCom** is the consolidated police/fire dispatch center for the Cities of St. Charles and Elburn. **Computer-aided dispatch (CAD)** systems are used both at the dispatch center and in police vehicles. The emergency vehicles are equipped with laptops, which have a CAD interface and associated GIS capabilities. The St. Charles Police Department is also awaiting a CAD upgrade.

Police departments in the tri-cities region also have access to **emergency vehicle preemption (EVP)** transmitters.

The Police Departments use **IREACH** and **ISPERN** for communicating with different agencies within the county. They also have mobile transmitter boxes called **MOBECS** and a mobile command center. There are plans of upgrading the communication infrastructure to the statewide STARCOM21 system.

**Roles and Responsibilities**
The police department directs traffic at incident sites but do not provide rerouting information. They contact EMA for larger incidents.

**Needs**
- The Police Department expressed a need to provide information to drivers ahead of incidents. This could be done with the assistance of KDOT through deployment of DMS, HAR, etc.
- They also expressed a need to enhance their surveillance system. They expressed interest in obtaining video feed of major intersections, etc.
MEETING NOTES

DATE: Tuesday, November 21, 2006
LOCATION: 891 Knell Road, Montgomery, IL 60538
ORIGINATED BY: Tom Szabo, Kane County DOT
RECORDED BY: Matt Letourneau, Edwards and Kelcey
               Mayank Goyal, Edwards and Kelcey
PARTICIPANTS: Ronald G. Naylor, Engineering Enterprises, Inc.
              Peter G. Wallers, Engineering Enterprises, Inc.
              Tom Szabo, Kane County DOT
              Matt Letourneau, Edwards and Kelcey
              Mayank Goyal, Edwards and Kelcey
SUBJECT: Kane County ITS/TMC Feasibility Study – Montgomery DPW / KKCOM Interview

These meeting notes reflect our understanding of the discussions and key decisions reached during this meeting. Please forward any questions, additions, and/or corrections within ten (10) business days of the date issued. Please note that we will consider the record to be accurate unless written notice is received within these ten (10) business days.

After self-introductions, Matt Letourneau, Edwards and Kelcey (EK) project manager, provided an overview of the project scope and schedule.

Existing Systems
The Village of Montgomery has only one traffic signal in its jurisdiction. The rest of signals are owned and operated by either KDIT or IDOT. Overall, 31 signals in the region operate in a coordinated system. Emergency vehicle preemption (EVP) systems are installed at all new traffic signals.
The Village of Montgomery uses the County’s GIS database for mapping their data, e.g., zoning, planning. The Village and their consultants add other information like street signage to the County GIS data.

There are two highway rail intersections (HRI) in Montgomery (both of which are owned by IDOT) that have signal preemption.

The Montgomery Police Department would like EVP installed on all the traffic signals in the region. Their emergency vehicles are GPS-enabled and use computer-aided dispatch (CAD) based at the Montgomery PSAP for dispatching. The PSAP posts lane closure information as part of an alert system. KDOT requests construction information from Montgomery and other municipalities.

Planned System
Village of Montgomery has recently received grant to explore park and ride lots as part of Metra extension.

The Kane/Kendall Council of Governments (KKCOM) is currently considering other corridors for potential signal interconnect projects.

Montgomery and other municipalities are considering red light running enforcement.

Needs
- The Village of Montgomery DPW expressed a need for signal interconnectivity on key corridors.
- There is a requirement for alternate route planning for effective emergency management.
- The Village of Montgomery requires more wider pavement for mitigating the growing traffic congestion problems.
- HRIs conflict with traffic operations. There is a need to coordinate operations with Amtrak and other freight carriers.
- There is a need for more traveler information (e.g., in-vehicle information systems, arterial DMS, advanced warning systems).
- There is a need for information sharing between various agencies through 911 center.
MEETING NOTES

DATE: Monday, February 5, 2007
LOCATION: Kane County Office of Emergency Management, 777 E. Fabyan Pkwy.
ORIGINATED BY: Tom Szabo, Kane County DOT
RECORDED BY: Matt Letourneau, Edwards and Kelcey
PARTICIPANTS: Don Bryant, Kane County Office of Emergency Management
Matt Letourneau, Edwards and Kelcey
SUBJECT: Kane County ITS/TMC Feasibility Study – Kane County Office of Emergency Management Interview

These meeting notes reflect our understanding of the discussions and key decisions reached during this meeting. Please forward any questions, additions, and/or corrections within ten (10) business days of the date issued. Please note that we will consider the record to be accurate unless written notice is received within these ten (10) business days.

After introductions, Matt Letourneau, Edwards and Kelcey (EK) project manager, provided an overview of the project scope and schedule.

Systems/Projects
The Office of Emergency Management (OEM) is moving in the near-term. Potential relocation sites are the Wards’ Building (540 South Randall Rd., St. Charles, home of the Kane County Circuit Court Clerk) or the B Building of the Kane County Government Center (719 S. Batavia Ave., Geneva). A move to the Government Center would put the OEM near the County GIS and IT departments.

The Emergency Operations Center (EOC) is the central response facility in the county for major emergencies. In major events, it is staffed by the Crisis Team, which consists of such agencies as the County Board, Division of Transportation, OEM, Coroner, Health Department,
and Red Cross. The EOC is activated at four (4) different levels, although Level 4 has never been reached. Level 3 involves briefings of emergency situations.

The OEM uses GIS for emergency operations.

The OEM communications system mirrors that of the 911 center (operated by the County Sheriff), which is currently co-located with the OEM. The OEM is linked with adjacent counties and with Springfield. OEM (and 911) operators use Motorola MCC5500 dispatch consoles (the same as used at QUADCOMM and Tri-Comm). The OEM is linked to other emergency management agencies, municipal public safety agencies, and hospitals via the EMnet System digital alert network.

The Kane Local Emergency Radio Network (KLERN), a VHF repeater system, allows any municipal public safety agency in the county (e.g., police, fire, EMS) to speak to another.

The OEM has obtained grants to cover the costs of KLERN and EMnet.

The OEM has its own radio channel. IREACH is used to communicate with the Illinois Tollway; the OEM does not communicate with IDOT directly.

Most public safety agencies in Kane County use the UHF or VHF frequency bands, with the exceptions of Elgin and Aurora which use 800 MHz trunked systems. The OEM has programmable repeaters to link UHF and VHF systems, and the OEM will switch to the 800 MHz channels when working with Elgin or Aurora.

Mr. Bryant provided a listing of the basic radio channel utilization for incident communications and frequency bands for each emergency management agency in Kane County (from the Kane County Emergency Response Plan).

ITECS devices are available to the OEM, but are not used.

The OEM has a 35’ mobile command vehicle, a search & rescue vehicle, an emergency lighting vehicle, a decontamination container (for HAZMAT incidents), and command vehicles.

There are two HAZMAT teams in the county, one in each MABAS district in the county.
**CodeRED** is a reverse 911 system recently deployed by the OEM. The OEM also has the **Emergency Alert Radio System (EARS)**, which is a one-way voice alert system for warning County facilities of emergencies. EARS is linked to KLERN.

**SKYWARN** is part of the Kane County Severe Weather Plan. SKYWARN consists of a number of severe weather spotters who report to the OEM on real-time weather conditions. Kane County was the first Illinois county to achieve “storm ready” status in Illinois. DuPage County is the central source for regional weather information.

**Interagency Agreements**
The OEM has developed the following agreements for emergency management:
- Fox River MOU – memoranda of understanding with the Red Cross for shelter identification and use
- Mutual Aid Agreements – with the six collar counties
- Municipal Mutual Aid Agreements – for emergency response responsibilities and costs

**Roles and Responsibilities**
The OEM is responsible for **evacuation planning** in the county, and how to deal with evacuees from the Chicago area, although IDOT is leading the transportation issues associated with such evacuations. As part of this process, the OEM is studying interstate closures and using GIS to identify major routes for evacuations. Within Kane County, evacuations are administered at the local level.

**Needs**
- The OEM would like to have greater control of traffic signal patterns to help direct traffic away from an incident.
- The OEM would like to have dynamic message signs (DMS) for traveler information during incidents and to explain detours to motorists.
MEETING NOTES

DATE: Monday, February 5, 2007
LOCATION: Kane County Sheriff Offices, 777 E. Fabyan Pkwy.
ORIGINATED BY: Tom Szabo, Kane County DOT
RECORDED BY: Matt Letourneau, Edwards and Kelcey
PARTICIPANTS: John Marszalek, Kane County Sheriff
Don Kramer, Kane County Sheriff
Matt Letourneau, Edwards and Kelcey
SUBJECT: Kane County ITS/TMC Feasibility Study – Kane County Sheriff Interview

These meeting notes reflect our understanding of the discussions and key decisions reached during this meeting. Please forward any questions, additions, and/or corrections within ten (10) business days of the date issued. Please note that we will consider the record to be accurate unless written notice is received within these ten (10) business days.

After introductions, Matt Letourneau, Edwards and Kelcey (EK) project manager, provided an overview of the project scope and schedule.

Systems/Projects
The Sheriff is testing automatic vehicle location (AVL) devices. The Sheriff also has two (2) in-vehicle cameras, and hopes to deploy additional cameras as funding allows.

There are seven public safety answering points (PSAPs) in Kane County, but there is no good communications link between them. The Kane County Sheriff PSAP receives 911 emergency calls and dispatches for numerous police and fire agencies in the county. The County is considering a hardware upgrade of its 911 system (voice and data).

There is a virtual private network (VPN) for mobile data terminals (MDTs) in Sheriff vehicles. This system would not support real-time GIS tools, but could support access to PDF files for
alternate route information dissemination. At present there is a consistency issue with the MDTs that the Sheriff is addressing.

The Sheriff responds to crashes and provides limited traffic control. If the crash involves a fatality, the OEM provides traffic control support.

The Kane County Analysis Reconstruction Team (KCART), which consists of members from across the county, has the training and resources necessary to quickly perform crash investigations. KCART resources include total station and laser survey equipment for crash site data collection.

Speed trailers that measure and display a vehicle’s travel speed are used in the county.

There is no good form of universal crash data management in the county. Paper reports and information from emergency computer-aided dispatch (CAD) systems are collected by the Kane County GIS Department, who record the data for reporting purposes. A query system has been developed to help identify high crash locations from this database. IDOT’s Mobile Capture Reporting (MCR) system has been considered for use in Kane County, but this system would be implemented until county agencies learn more about MCR. Overall, there seems to be a duplication of crash reporting efforts between the Division of Transportation and the County Sheriff/GIS Department on crash reporting. Improved coordination between agencies could help to streamline the crash reporting process and improve crash data sharing and access.

Needs
- The Sheriff would like access to emergency vehicle preemption (EVP) systems and information about crash rates at EVP locations.
- The Sheriff would like to know where CCTV cameras are being installed, if the video is available to the Sheriff and emergency responders, and if the video is recorded.
- Jurisdictional boundaries need to be defined better to speed incident response.
- The Sheriff would like to know what roadwork is underway in real-time to speed incident response. A dynamic alternate route map would be helpful in this regard.
- The Sheriff would like to have a good tool for alerting the public of incidents.
- The Sheriff would like to be able to communicate with townships and highway commissioners more easily.
• The Sheriff would like to better coordinate crash reporting with KDOT. The Sheriff welcomed the idea of a Traffic Incident Management Work Group to coordinate transportation and emergency operations.
MEETING NOTES

DATE: Monday, February 5, 2007
LOCATION: Kane County Division of Transportation, 41W011 Burlington Road
ORIGINATED BY: Tom Szabo, Kane County DOT
RECORDED BY: Matt Letourneau, Edwards and Kelcey
PARTICIPANTS: Marc Bagherpour, Kane County Division of Transportation
Tom Szabo, Kane County Division of Transportation
Matt Letourneau, Edwards and Kelcey
SUBJECT: Kane County ITS/TMC Feasibility Study – Stearns Road Coordination

This meeting was arranged to discuss the Stearns Road Corridor Project and the potential use of ITS devices within the corridor for traffic and incident management.

Project Overview
The project consists of a 4.6 mile realignment of Stearns Road (including a new Fox River bridge) from the County Line to Randall Road. The estimated project cost is $165 million, of which approximately $95 million has been secured. Engineering design and right-of-way acquisition continues in 2007, as do initial project construction stages. The six-stage project is expected to be completed in late 2010.

To help meet the potential funding shortfall, gas tax increases are being considered. Tolling is also an option for funding the project, as well as for creating a sinking fund to address ongoing operations and maintenance costs.

The roadway will be either two or four through lanes, will include signalized and non-signalized intersections (limited access), and may include a parallel bike path. The anticipated ADT is 25,000, with approximately 5% heavy vehicles.

Potential Traffic Issues
The following potential traffic issues were raised during the discussion:

- With limited access to the corridor, **incident management** will be critical. This includes incident detection, emergency response routes, and traffic diversions/rerouting.
- The corridor may see **high travel speeds** (speed limit: 45 mph).
- There may be high **directional traffic volumes** in the peak periods, i.e., eastbound in the morning and westbound in the evening.
- **Traffic progression** should be enhanced wherever possible.
- **Tolling** within the corridor may create congestion on either side of the toll plaza.
- There are a number of bridges and culverts in the corridor that may ice over during **cold weather**.

**Potential ITS Applications**

- Involve **emergency response agencies** in the design and construction stages of the project to promote incident management operations. This could involve identifying emergency response routes to the corridor, suggesting locations for ITS devices, or incorporating locations for police officers to enforce travel speeds.
- Install **CCTV cameras** at signalized intersections, bridges, and other key locations within the corridor (e.g., Umbdenstock Rd. intersection) for traffic monitoring, incident detection, and incident response.
- Install **dynamic message signs (DMS)** approaching the corridor (e.g., Randall Rd. NB/SB, McLean Blvd. NB/SB, IL Rte. 25 NB, Stearns Rd. at the County Line WB) to alert motorists of real-time travel conditions in the corridor.
- Install **vehicle detectors and “Your Speed Is” signs** between Umbdenstock Rd. and IL Rte. 25 to discourage excessive speeds, both during construction and after its completion.
- Depending on the number of lanes built, **reversible lanes** might be beneficial.
- To support the installation of ITS devices and to provide direct communications to signalized intersections in the corridor, **communications media** (e.g., fiber optic cable) should be installed in the corridor from Randall Rd. to the County Line.
- If a toll station is implemented between McLean Blvd. and the Fox River, it should be **integrated with the Illinois Tollway system**. This would leverage the Tollway’s existing infrastructure (e.g., IPASS electronic payment, payment collection, violation enforcement). It may also allow the use of IPASS toll tag readers to monitor travel times in the corridor.
• Install a **road weather information system (RWIS) station** at the new Fox River bridge to monitor environmental conditions. Install de-icing systems at the Fox River bridge and other bridges in the corridor to increase driver safety in winter weather conditions.
APPENDIX C

APPLICABLE ITS MARKET PACKAGES FOR KANE COUNTY

Arterial Operations

Network Surveillance (ATMS01) – This is the foundational market package that enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. Functionality includes traffic detectors, other surveillance equipment, the supporting field equipment, and fixed-point to fixed-point communications to transmit the collected data back to the Traffic Management Subsystem. The derived data can be used locally, such as when traffic detectors are connected directly to a signal control system, or remotely, such as when a CCTV system sends video data back to a central monitoring facility.

Many municipal departments of public works (DPW)/township highway departments, including Aurora and Elgin, as well as IDOT and KDOT use intersection vehicle detectors for traffic signal actuation. In the future, these detectors could be used to determine the type and speed of an approaching vehicle so that the signal timing can be adjusted to avoid abrupt stops or red light running. Many of these detection systems include fixed cameras that could provide a video feed for traffic management purposes. At present, these cameras and other vehicle detectors are used almost exclusively for signal control and not for traffic data collection (tube counters are instead used to collect traffic volume, speed, and vehicle classification data), but in the future this functionality could provide more comprehensive traffic data for system optimization and planning purposes.

In addition, pan-tilt-zoom (PTZ) CCTV cameras can be used at signalized intersections, bridges, and other key locations for traffic monitoring, incident detection, and incident response. As part of its ongoing signal interconnect projects, the KDOT Traffic Department has installed a limited number of PTZ cameras to monitor key intersections. In the future, camera video and control could be shared with partner agencies to support incident management functions.

Probe Surveillance (ATMS02) – This market package provides an alternative approach for surveillance of the roadway network. This is done using on-board devices (e.g., GPS receivers in cell phones for wide-range systems or toll transponders for short-range systems) to anonymously track vehicles on the transportation system. These systems enable traffic managers to monitor road conditions, identify incidents, analyze and reduce the collected data, and make it available to users and private information providers. The Illinois State Toll Highway Authority (ISTHA) applies this market package using IPASS toll tags and overhead detectors at tollbooths to monitor travel conditions on Tollway routes. This type of system could also be applied on arterial routes in Kane County.
Surface Street Control (ATMS03) – This market package is geared toward providing the central control and monitoring equipment, communication links, and the signal control equipment that support local surface street control and/or arterial traffic management. A range of traffic signal control systems ranging from time-based control systems to fully responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests are supported in this market package.

Several agencies own and maintain traffic signals in Kane County. These include the City of Aurora (110 traffic signals), the City of Elgin (42 traffic signals owned, another ten IDOT signals maintained), and the Village of Montgomery (one traffic signal). Most signals are owned and operated by either KDOT or IDOT. Emergency vehicle preemption (EVP) systems, which provide a green signal indication to an approaching emergency vehicle, are installed at all new traffic signals in the county. Many traffic signals (including 80-90% of those owned by KDOT) are interconnected to a central facility that implements timing plans. In the near future, KDOT plans to upgrade the communications links to these signals to support dedicated connections and higher data rates. The Kane/Kendall Council of Governments (KKCOM) is currently considering other corridors for potential signal interconnect projects.

Pace Suburban Bus is currently conducting a pilot test of transit signal priority (TSP), which modifies traffic signal timings to accommodate transit vehicle movements. Pace is considering candidate corridors for TSP deployment, including Randall Road.

Recent state legislation now provides moderate sized metropolitan areas with the opportunity to deploy red light running enforcement systems to improve safety at signalized intersections. As a result, the St. Charles and Elgin Police Departments, as well as KDOT, are considering deploying automated red-light running cameras in their jurisdictions. IDOT is in the process of developing design and deployment standards for red light running systems.

Freeway Control (ATMS04) – This market package encompasses the communications and roadside equipment to support ramp control, lane controls, and interchange control for freeways. Coordination and integration of ramp meters are included as part of this market package, as well as the capability to utilize surveillance information for detection of incidents. Typically, the processing would be performed at a TMC; however, developments might allow for point detection with roadway equipment. IDOT and ISTHA have deployed technologies to support this market package. These technologies would support operational coordination between expressway and arterial routes.

High-Occupancy Vehicle (HOV) Lane Management (ATMS05) – This market package manages HOV lanes by coordinating freeway ramp meters and connector signals with HOV lane usage signals. Preferential treatment is given to HOV lanes using special bypasses, reserved lanes, and exclusive rights-of-way that may vary by time of day. Vehicle occupancy detectors may be installed to verify HOV compliance and to notify enforcement agencies of violations.
While no HOV lanes exist in Kane County, they are under consideration for deployment on Randall Road.

**Traffic Information Dissemination (ATMS06)** – This market package provides driver related information (e.g., traffic and road conditions, incident information, and driver advisories) at specific locations on the road network through roadside equipments like dynamic message signs (DMS) or advisory radio. This service also includes the link between traffic management centers and media for providing traffic information. A link to a maintenance and construction center can provide real-time road closure status information due to maintenance or construction activities.

IDOT, ISTHA, KDOT, and municipal traffic and maintenance agencies that have DMS participate in this market package. KDOT and City of Elgin construction information is made available through press releases and websites. In addition, there are a few static warning signs with flashing beacons in some of the rural areas of the county for providing advanced warning to travelers.

**Regional Traffic Control (ATMS07)** – This market package supports the sharing of traffic information and control among TMCs to support regional traffic control. It advances the Surface Street Control (ATMS03) and Freeway Control (ATMS04) market packages by adding the communications links and integrated control strategies that enable integrated inter-jurisdictional traffic control. The nature of optimization and extent of information and control sharing is determined through working arrangements between jurisdictions. This market package can be deployed in future in Kane County as centralized traffic signal control is deployed.

**Traffic Forecast and Demand Management (ATMS09)** – This market package includes advanced algorithms, processing, and mass storage capabilities that support historical evaluation, real-time assessment, and forecast of the roadway network performance. This includes the prediction of travel demand patterns to support better link travel time forecasts. The City of Aurora is currently preparing a traffic model for downtown Aurora region using Synchro® traffic capacity analysis software.

**Electronic Toll Collection (ATMS10)** – This market package provides the functionality to collect tolls electronically and detect process violations. ISTHA uses toll-tag readers and vehicle detectors to collect tolls on Tollway routes in northeastern Illinois.

**Standard Rail Grade Crossing (ATMS13)** – This market package manages highway traffic at highway-rail intersections (HRI) where operational requirements do not warrant more advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Both passive (e.g.,
the cross-buck signs) and active warning systems (e.g., flashing lights and gates) are supported. This market package is applied at HRIs across Kane County.

According to the Interstate Commerce Commission (ICC), there are 226 at-grade highway rail crossings in Kane County.\(^1\) Many HRIs at or near signalized intersections have preemption systems to promote driver safety. Most of these systems follow IDOT pre-emption phasing. At present, IDOT is working with the ICC to develop an intersection controller that will consolidate control processing at HRI sites.

**Advanced Railroad Grade Crossing (ATMS14)** – This market package manages highway traffic at HRIs where operational requirements demand advanced features (e.g., where rail operational speeds are greater than 80 miles per hour). This market package includes all capabilities from the Standard Railroad Grade Crossing market package and augments these with additional safety features to mitigate the risks associated with higher rail speeds. This market package can be deployed in Kane County at intersections with high crash rates and high operational speeds.

Another example of an advanced HRI application are that monitor crossing status and report such information to emergency responders and the traveling public. Like other transportation agencies in the region, municipalities/townships in Kane County are considering such applications.

**Railroad Operations Coordination (ATMS15)** – This market package facilitates operational coordination between freight rail operations and traffic management centers. This includes sharing train schedules, maintenance schedules and any other forecast events that could lead to highway-rail intersection (HRI) closures. This market package can be deployed within the county for alleviating traffic congestion and traffic disruptions at HRI locations.

**Parking Facility Management (ATMS16)** – This market package provides enhanced monitoring and management of parking facilities. It assists in the management of parking operations, coordinates with transportation authorities, and supports electronic collection of parking fees. An example of this market package is Metra’s Parking Management Guidance System (PGMS), which collects and disseminates parking availability data to help motorists find parking near Metra stations. The City of Aurora is interested in applying this system, with the possibility of incorporating park-n-ride lots in the future.

In addition, the City of Elgin owns and operates 32 parking facilities (13 decks, 19 surface lots).

**Transit Vehicle Tracking (APTS1)** – This market package represents automated vehicle location (AVL) systems that track transit vehicles using GPS or fixed “beacons” to identify their location. These systems forward location information to transit management centers, where they are used to update the dispatch system and to provide real-time location information to transit users. AVL systems for fixed route service permit dispatchers to quickly identify and respond to service

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\(^1\) ICC Crossing Inventory, April 1, 2006.
problems, leading to quicker recovery times. AVL for paratransit operations allows dispatchers to pick the best vehicles to respond to service calls and other same-day trip requests as well as handle cancellations and no-shows. PACE has deployed their Intelligent Bus System (IBS) on a large portion of their fixed route bus fleet and AVL on many of their paratransit vehicles.

**Transit Fixed-Route Operations (APTS2)** – This market package encompasses the functions of driver assignment, vehicle routing, and scheduling for fixed-route and flexible-route transit services. It also supports real-time transit schedule adherence calculations and transit status data sharing with information service providers for use in their multimodal traveler planning and information systems.

As discussed in the Kane County ITS Needs Assessment, transit services in the county are provided by Pace Suburban Bus (33 fixed routes) and Metra commuter rail (three rail lines terminating in Aurora, Geneva, and Big Timber, with line extensions planned). Additionally, Pace has recently taken over the Elgin Bus Company.

**Demand Response Transit Operations (APTS3)** – This market package performs vehicle routing and scheduling as well as automatic operator assignment and monitoring for demand responsive transit services. Through the use of AVL, this market package supports the function of identifying the best vehicle to respond to rider requests. It provides status displays to the paratransit dispatcher for vehicle management and allows for direct trip requests from travelers, as well as trip requests through a regional trip broker or multimodal trip planner. Pace, in cooperation with numerous municipalities, provides “Dial-a-Ride” paratransit services throughout Kane County.

**Transit Passenger and Fare Management (APTS4)** – This market package manages passenger loading and fare payments on-board transit vehicles using electronic means. This market package includes the collection and management of fares and fare transactions, as well as data on passenger loading. Pace vehicles support this functionality.

**Transit Security (APTS5)** – This market package facilitates physical security of transit vehicles and passengers with the help of on-board surveillance equipment (e.g., CCTV cameras) and event recorders. Public areas (e.g. transit stops, stations) are also monitored using similar equipment and are activated by security alarms.

In Kane County, Metra, Pace and municipal transit agencies deploy this market package to enhance transit security (with a future option of sharing the surveillance data with municipal TMCs to enhance their operations).

**Multi-modal Coordination (APTS7)** – This market package covers coordination among transit agencies and between transit and traffic management agencies. Multi-modal coordination incorporates schedule coordination and real-time connection protection, with the goal of
seamless travel between different agency services. Coordination with traffic management agencies includes transit agencies receiving real-time traffic information to support optimal routing and transit signal priority. As discussed above under Surface Street Control (ATMS03), Pace is leading an effort to assess TSP in the region, including a potential deployment on Randall Road.

**Transit Traveler Information (APTS8)** – This is a market package that covers the provision of static and real-time transit information to travelers before and during transit rides, including connections. It includes on-board information, such as audio and video announcements, as well as information delivered via signs at stations, kiosks, the Internet, and through personal information devices. It also incorporates transit itinerary planning systems available to potential transit travelers.

Pace is currently testing a “Next Bus” service that would include a website and real-time signing in Elgin. The RTA has begun deploying kiosks at high tourist traffic centers in the region as part of a pilot project. These kiosks provide trip information as well as tourist information provided by the Illinois Bureau of Tourism and the Mayor’s Office of Special Events.

**Broadcast Traveler Information (ATIS1)** – This market package collects traffic conditions, advisories, general public transportation, toll and parking information, incident information, roadway maintenance and construction information, air quality and weather information, etc. and broadly disseminates this information through existing infrastructures (e.g., the media, Internet) and low cost user equipment (e.g., FM subcarrier, cellular data broadcast).

IDOT, ISTHA, Metra, Pace, and the media are the primary participants in this market package. The KDOT GIS Department’s Project Management Development (PMD) website provides periodic construction project information to the public (www.kanecountyprojects.com). However, it no longer includes municipal or township construction projects. The Cities of Aurora and Elgin update their construction project information through websites, which are updated annually.

**Interactive Traveler Information (ATIS2)** – This market package supports both real-time interactive request/response systems and information systems that "push" a tailored stream of information to the traveler based on a submitted profile. The traveler can obtain current information regarding traffic conditions, roadway maintenance and construction, transit services, ride share/ride match, parking management, detours and pricing information. A variety of interactive devices may be used by the traveler to access information prior to a trip or en route, including phone via a 511 Traveler Information, kiosks, personal digital assistants, personal computers, and a variety of in-vehicle devices.
The forthcoming Illinois 511 Traveler Information System, RTA’s transit information kiosks, and IDOT’s [www.iltrafficalert.com](http://www.iltrafficalert.com) website are examples of this market package.

**ISP Based Trip Planning and Route Guidance (ATIS5)** – This is the most advanced traveler information market package. It provides the ability to offer the user pre-trip route planning and turn-by-turn route guidance services. Routes may be based on static information or reflect real time network conditions. The RTA’s Trip Planner service is an example of this market package.

**Dynamic Ridesharing (ATIS8)** – This is a market package that offers advanced route planning and guidance that is responsive to current conditions. The package combines the autonomous route guidance user equipment with a digital receiver capable of receiving real-time traffic, transit, and road condition information, which is considered by the user equipment in provision of route guidance. While not real-time, IDOT’s “Share the Drive” campaign relates to this market package.

**ITS Data Mart (AD1)** – In this market package, a focused archive houses transportation data collected and owned by a single agency. This focused archive typically includes data covering a single transportation mode and one jurisdiction that is collected from an operational data store and archived for future use. It provides the basic data quality, data privacy, and meta-data management common to all ITS archives and provides general query and report access to archive data users.

KDOT, IDOT, and various municipalities/townships perform annual vehicle counts for transportation planning purposes. The KDOT GIS Department and Kane County Sheriff collect and process crash data. KDOT GIS provides annually updated maps that provide average daily traffic volumes and planned construction projects on the KDOT website. The Kane County DOT also has a virtual road driver video log of all county roads that is attached to the KDOT GIS database.

**ITS Data Warehouse (AD2)** – This market package includes all the data collection and management capabilities provided by the ITS Data Mart (AD1) market package, and adds the functionality and interface definitions that allow collection of data from multiple agencies and data sources spanning across modal and jurisdictional boundaries. The Data Warehouse performs the additional transformations and provides the additional meta-data management features that are necessary so that all this data can be managed in a single repository with consistent formats. The potential for large volumes of varied data suggests additional on-line analysis and data mining features that are also included in this market package in addition to the basic query and reporting user access features offered by the ITS Data Mart.
The Gary-Chicago-Milwaukee (GCM) Corridor “Gateway” serves as the regional ITS data warehouse for numerous transportation agencies. As additional traffic data becomes available in Kane County through the continued deployment of the Network Surveillance (ATMS01) market package, Kane County agencies will be able to exchange data with the GCM Gateway.

To expedite the processing of crash reports and the availability of crash data across the state, IDOT has developed the Mobile Crash Reporting (MCR) System. The City of Aurora DPW, among other agencies in Kane County, has shown interest in applying this technology.

**Traffic Incident Management**

*Traffic Incident Management System (ATMS08)* – This market package manages both unexpected incidents and planned events so that the impact to the transportation network and traveler safety is minimized. The market package includes incident detection capabilities through roadside surveillance devices (e.g. CCTV) and supports traffic operations personnel in developing an appropriate response in coordination with emergency management, maintenance and construction management, and other incident response personnel to confirmed incidents. Incident response also includes presentation of information to affected travelers using the Traffic Information Dissemination (ATMS06) market package and dissemination of incident information to travelers through the Broadcast Traveler Information (ATIS1) or Interactive Traveler Information (ATIS2) market packages. All transportation and emergency management agencies in Kane County participate in this market package.

To accelerate the recovery period at crash sites, various law enforcement personnel in the county have created the Kane Crash Analysis Reconstruction Team (KCART). Personnel trained in crash data collection and reconstruction techniques are posted at various locations in the county to quickly arrive at a crash site and collect all necessary data so the roadway can be reopened to traffic.

*Emergency Call-Taking and Dispatch (EM01)* – This market package provides the functionality for basic public safety call-taking and dispatch services. It includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between emergency management subsystems supports emergency notification between agencies. All emergency management agencies in Kane County participate in this market package.

*Emergency Routing (EM02)* – This market package has the ability to use automated vehicle location and dynamic routing of emergency vehicles for provide emergency vehicle routing. Traffic information, road conditions, and suggested routing information can be provided to enhance emergency vehicle routing. Special
priority or other specific emergency traffic control strategies can be coordinated to improve the safety and time-efficiency of responding vehicle travel on the selected route(s). The emergency management subsystem provides the routing for the emergency fleet based on real-time conditions and has the option of requesting a route from the traffic management subsystem.

Rutland Dundee Fire Protection District (FPD) command cars are equipped with an electronic mapping system and are linked with aerial photographs of the response site. This system will soon be used by Quadcom dispatch, which includes East & West Dundee, Rutland, Carpentersville and MABAS Division 2.

Emergency vehicle preemption, discussed above, is in place on State, County, and municipal/township routes across the county. Fire, emergency medical services, and some police agencies carry EVP transmitters in their vehicles.

Roadway Service Patrols (EM04) – This market package supports roadway service patrol vehicles that monitor roads that aid motorists, offering rapid response to minor incidents (flat tire, accidents, out of gas) to minimize disruption to the traffic stream. Incident information collected by the service patrol is shared with traffic, maintenance and construction, and traveler information systems. ISTHA’s Highway Emergency Lane Patrol (HELP) exemplifies this market package. Arterial service patrols could be applied on high-volume corridors (e.g., Randall Road) to reduce the impacts of arterial traffic crashes and other unplanned incidents.

Wide Area Alert (EM06) – This market package uses ITS driver and traveler information systems (DMS, HAR etc.) to alert the public in emergency situations such as child abductions, severe weather events and other situations that pose a threat to life and property. The alert includes information and instructions for transportation system operators and the traveling public, improving public safety and enlisting the public’s help in some scenarios.

The Kane County Office of Emergency Management (OEM) would lead wide area alerts in the county. The OEM uses the Emergency Alert Radio System (EARS), a one-way voice alert system for warning County facilities of emergencies; EMnet, a statewide emergency alert network; and CodeRED, a reverse 911 system to distribute wide area alerts.

Disaster Response and Recovery (EM08) – This market package enhances the ability of the surface transportation system to respond to and recover from disasters. It addresses the most severe incidents that require an extraordinary response from outside the local community. All types of disasters are addressed including natural disasters and technological and man-made disasters. This market package supports coordination of emergency response plans and activities, including general plans as well as specific tactical plans. The OEM would serve as the lead agency for this market package.
Evacuation and Reentry Management (EM09) – This market package addresses evacuations for all types of disasters, including disasters like severe storms that are anticipated and occur slowly, allowing a well-planned orderly evacuation, as well as disasters like terrorist acts that occur rapidly, without warning, and allow little or no time for preparation or public warning. This involves coordination of evacuation plans and resource sharing among various agencies (e.g. law enforcement, emergency, transportation, transit etc.) within the affected jurisdictions. The OEM would serve as the lead agency for this market package.

Maintenance and Construction Management

Maintenance and Construction Vehicle and Equipment Tracking (MC01) – This market package tracks the location of maintenance and construction vehicles and other related equipment to ascertain the progress of their activities. These activities can include ensuring that work activity is being performed at the correct locations. This market package also helps maintenance dispatchers to identify the closest vehicle to respond to a road maintenance issue.

KDOT Maintenance and Operations Department and City of Elgin DPW maintenance vehicles have GPS devices installed on them, which helps to track the vehicles in real-time. The City of Elgin plans to use automatic vehicle location (AVL) on all of its vehicles in the future.

Maintenance and Construction Vehicle Maintenance (MC02) – This market package manages maintenance vehicle scheduling and performs regular and corrective maintenance activities on vehicles and other maintenance equipments.

The KDOT Maintenance and Operations Department uses Computerized Fleet Analysis (CFA) for monitoring maintenance vehicles by keeping record for driver-hours, mileage, etc.

Road Weather Data Collection (MC03) – This market package deploys environmental sensors on the roadways or on maintenance vehicles to collect the current road and weather conditions for use in making decisions on operations.

The only KDOT Maintenance and Operations Department weather sensor is part of an automated treatment system (see Roadway Automated Treatment, MC05). Instead, KDOT uses IDOT’s website and DTN data from local airports to gather weather information. In addition, many KDOT maintenance vehicles are equipped with instruments to measure live condition data, including pavement temperature, amount of spreading, outside temp, etc. Each of these vehicles is coded with their respective capabilities and this information is used for maintenance dispatching (esp. in snow conditions).

Weather Information Processing and Distribution (MC04) – This market package encompasses the distribution of environmental data collected from the Road Weather Data Collection (MC03) market package. Real-time weather updates can be used to more effectively deploy road maintenance resources, issue general traveler advisories, issue location-specific warnings to drivers. At present, these services are performed at maintenance dispatch centers.
**Roadway Automated Treatment (MC05)** – This market package automatically treats a roadway section based on environmental or atmospheric conditions (e.g., fog dispersion, anti-icing chemicals, etc.) and warns drivers when the treatment system is applied (e.g., DMS). The KDOT Maintenance and Operations Department has deployed an automated de-icing system on the bridge at the intersection of Peck & Keslinger.

**Winter Maintenance (MC06)** – This market package supports winter road maintenance including snow plow operations, roadway treatments (e.g., salt spraying and other anti-icing material applications), and other snow and ice control activities. This package monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations. The KDOT Maintenance Dispatch Room serves as the “Snow Plow Command Center” during winter snowstorms. Municipalities/townships in Kane County also utilize their maintenance dispatch centers as “snow rooms” during plowing operations.

**Roadway Maintenance and Construction (MC07)** – This market package covers a broad set of functionality aimed at scheduled and unscheduled maintenance and construction activities along the roadway and/or right-of-way.

KDOT, IDOT, ISTHA, and municipalities/townships across Kane County participate in this market package. KDOT Maintenance and Operations Department uses Cartegraph maintenance scheduling software to keep an inventory of manholes, signals, lights, etc. and also for generating and prioritizing work orders. The City of Elgin Maintenance dispatch is made through cell phones and radios. The Elgin Maintenance Department uses a Maintenance Management System which is linked to GIS, for issuing work orders and for asset management.

**Work Zone Management (MC08)** – This market package directs activity in work zones, controlling traffic through portable DMS and informing other groups of activity (e.g., information service providers, traffic management agencies, and other maintenance and construction centers) for better coordination.

KDOT Maintenance and Operations Department, IDOT, the City of Aurora DPW, and other municipal/township maintenance departments use DMS in work zones to provide traveler information. While most of these DMS are programmed in the field, the City of Aurora can activate these DMS using cell phones.

**Maintenance and Construction Coordination (MC09)** – This market package supports the dissemination of maintenance and construction activity information to centers that can utilize it.
as part of their operations, such as a traffic management center. At present, construction projects are promoted by maintenance agencies through their respective websites. In the future, a central construction data repository can provide real-time lane closure information to transportation agencies, emergency responders, and the traveling public.

**Rural Operations**

*Emergency Routing (EM02)* – See above. Rural emergency routing can also benefit from such applications as EVP, dynamic alternate routing, and E911 services.

*Mayday and Alarm Support (EM03)* – This market package allows the user (driver or non-driver) to initiate a request for emergency assistance and enables the emergency management subsystem to locate the user, gather information about the incident, and determine the appropriate response. This market package also includes general surveillance capabilities that enable the emergency management subsystem to remotely monitor public areas (e.g., rest stops, parking lots) to improve security in these areas.

In those areas of Kane County that are more rural in nature as opposed to metropolitan, this market package is applicable to a significant number of rural user needs with some augmentation for the rural environment.

*Traffic Information Dissemination (ATMS06)* – See above. Deployment of DMS, highway advisory radio, and other forms of location-specific traveler information devices can provide travelers with tourism information in rural areas.

*Broadcast Traveler Information (ATIS1)* – See above. Media and Internet travel advisories can be useful before and during rural trips.

*Network Surveillance (ATMS01)* – See above. This market package can enable traffic managers to remotely monitor traffic and road conditions and identify and verify incidents in remote locations. This will speed incident response and increase traveler safety.

*Traffic Incident Management System (ATMS08)* – See above. Just as in urban/suburban areas, transportation and emergency management agencies work together to respond to incidents in rural areas.

*Work Zone Management (MC08)* – See above. Rural work zones pose unique challenges for motorist and worker safety. Under this market package, advanced warning signs, work zone encroachment detectors, and other ITS applications can be used to promote safety in rural work zones.

*Transit Vehicle Tracking (APTS1)* – See above. Rural paratransit services like Pace’s Dial-a-Ride program cover wide geographic areas. Incorporation of on-board AVL allows paratransit dispatchers to track their assets and reduce travel times.

*Demand Response Transit Operations (APTS3)* – See above. In rural areas, disabled and senior citizens rely on paratransit services for mobility. ITS tools are available to process trip requests,
identify the nearest paratransit vehicle to respond to a rider request, schedule vehicle maintenance, and promote coordination between rural paratransit services.

*Speed Monitoring (ATMS19)* – This market package monitors the speeds of vehicles traveling through a roadway system. If the speed is determined to be excessive, roadside equipment can suggest a safe driving speed. Environmental conditions may be monitored and factored into the safe speed advisories that are provided to the motorist.

At certain rural locations in Kane County, roadway curves, bridge decks, and other infrastructure can become dangerous at high speeds or during inclement weather. Application of this market package would include dynamic safety warning systems at such locations. This could also include animal crossing warning systems that would detect the presence of animals on the highway and warn motorists of an impending collision.

*Standard Rail Grade Crossing (ATMS13)* – See above. There are numerous HRI locations in rural portions of Kane County.

*Advanced Railroad Grade Crossing (ATMS14)* – See above. Advanced HRI monitoring systems discussed earlier would have potential application in rural locations where plausible diversionary routes exist, especially for crossings where extended freight rail lines can block crossings for several minutes.

*Maintenance and Construction Vehicle and Equipment Tracking (MC01)* – See above. Just as with urban/suburban areas, the ability for agencies like KDOT and townships to track maintenance vehicles is critical for snow plowing operations.

*Roadway Automated Treatment (MC05)* – See above. Roadway automated treatment systems are most beneficial at remote locations that could take up to an hour or more to deliver treatment.

*Road Weather Data Collection (MC03)* – See above. Deployment of road weather information stations (RWIS) in rural areas of the county would provide transportation and emergency management agencies with additional data about impending weather conditions.
APPENDIX D

TECHNOLOGY / STRATEGY ASSESSMENT EVALUATION TABLES

Arterial Operations
1. Arterial Operations Center
2. Traffic Signal Timing Upgrades Along Key Corridors
3. Queue Detection on Tollway Ramps
4. Truck Signal Priority System
5. Integrated Corridor Management
6. Red Light Running Strategies
7. De-icing Systems
8. Intersection Occupancy Measurement
9. Roadway Service Patrols

Data Collection
10. Instrumentation on Key Corridors
11. Performance Measures
12. IPASS Readers along Key Corridors
14. Speed Detection Systems

Data Management
15. Performance Measurement Website
16. Transportation Data Warehousing
17. Equipment Inventory and Tracking GIS Database
18. Countywide Crash Database
19. Performance-Based Crash Prevention System

Operational Coordination
20. System Monitoring Data Sharing
21. Countywide Construction/Maintenance Database
22. Communications Lines along Key Corridors and Between Centers
23. Multi-agency Incident Management Work Group or Training
24. Emergency Responder Communications Integration
25. Emergency Control of Traffic Signals
26. Computer Aided Dispatch (CAD)
27. Integrate Emergency/Maintenance Computer Aided Dispatch (CAD)
28. Highway-Rail Intersection (HRI) Status Information Integration
29. Expanded Emergency Vehicle Preemption (EVP)

Promotion of Transit Use
30. Transit Promotional Campaign
31. Metra Parking Management Guidance System (PMGS)
32. Transit Signal Priority (TSP)

Traveler Information
33. Highway Rail Intersection (HRI) Status Alerts Prior to Decision Points
34. Arterial Operations Center Link to GCM Gateway
35. Dynamic Message Signs/Highway Advisory Radio on Key Corridors
36. Detour/Alternate Route Maps
37. Motorist Warning Systems
38. Work Zone Traffic Management
# Technology Assessment Matrix Worksheet

<table>
<thead>
<tr>
<th>Agreement Scale</th>
<th>ITS Technology Item No.</th>
<th>Rating Factors</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8</td>
<td></td>
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<td>32 33 34 35 36</td>
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<tr>
<td>37 38 39 40 41</td>
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<tr>
<td><strong>Initial Operations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - 5</td>
<td></td>
<td>Financing is available</td>
<td>Only if total costs only. Can include design, procurement, installation.</td>
</tr>
<tr>
<td>0 - 4</td>
<td></td>
<td>Transition issues are manageable</td>
<td>Technical or functional issues required to get technology up and running.</td>
</tr>
<tr>
<td>0 - 4</td>
<td></td>
<td>Staff is available</td>
<td>Requires minimal training to keep the system running. Does not include charging training.</td>
</tr>
<tr>
<td>0 - 4</td>
<td></td>
<td>Integration issues are manageable</td>
<td>High if switching from one system (perhaps a manual system) to a new system (i.e. automated) is manageable.</td>
</tr>
<tr>
<td>0 - 4</td>
<td></td>
<td>Coordination is not a problem</td>
<td>High if transitioning agencies are prepared to modify their work procedures to support the new technology.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>14 19 17 16 12 17 18 16 17 19 18 21 17 18 19 16 21 19 18 20 18 20 18 21 18 19 20 20 19 18</strong></td>
<td><strong>(Max score = 25)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maintenance</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - 10</td>
<td></td>
<td>Life cycle costs are within budget</td>
<td>Pertains to the agency’s ability to fund maintenance and operational costs (other than labor). Does not include setup costs.</td>
</tr>
<tr>
<td>0 - 10</td>
<td></td>
<td>Staff is available</td>
<td>Pertains to the agency’s ability to provide labor (in-house or contract) for the life cycle of the technology.</td>
</tr>
<tr>
<td>0 - 5</td>
<td></td>
<td>Training is possible</td>
<td>Refers to the resources for on-going training to support the system over its life cycle.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>12 18 17 15 16 18 19 15 16 18 16 21 16 18 15 22 16 18 15 18 15 18 17 16 15 18 17 16</strong></td>
<td><strong>(Max score = 25)</strong></td>
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<td></td>
</tr>
<tr>
<td><strong>Maturity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - 4</td>
<td></td>
<td>Proven technology</td>
<td>Assumes that high if the technology has been used successfully by others over an extended period of time – a measure of risk.</td>
</tr>
<tr>
<td>0 - 4</td>
<td></td>
<td>Enabling Technologies are available</td>
<td>Pertains to other systems, such as communication equipment, that are needed to support the new technology.</td>
</tr>
<tr>
<td>0 - 4</td>
<td></td>
<td>Competitive procurement</td>
<td>Rate high if a suitable procurement mechanism is in place or available to support the new technology.</td>
</tr>
<tr>
<td>0 - 4</td>
<td></td>
<td>Technology will not be replaced</td>
<td>Rate low if technology is available and suitable for intermittent or non-essential needs.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
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<tr>
<td><strong>12 18 17 15 16 18 16 19 16 17 17 18 19 19 18 12 19 14 16 13 17 18 16 17 18</strong></td>
<td><strong>(Max score = 25)</strong></td>
<td></td>
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<tr>
<td><strong>Potential Benefits</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - 5</td>
<td></td>
<td>Customer Satisfaction</td>
<td>The “customer” can be the public, or the end users. Would rate low if new technology creates negative political or labor issues.</td>
</tr>
<tr>
<td>0 - 5</td>
<td></td>
<td>Energy and Environment</td>
<td>Energy and Environmental attributes: does not include fuel usage.</td>
</tr>
<tr>
<td>0 - 5</td>
<td></td>
<td>Mobility</td>
<td>Rate high if new technology will reduce delay or increase operational reliability.</td>
</tr>
<tr>
<td>0 - 5</td>
<td></td>
<td>Productivity</td>
<td>Rate high if new technology will reduce energy demand or pollution levels (e.g. automated time).</td>
</tr>
<tr>
<td>0 - 5</td>
<td></td>
<td>Safety</td>
<td>Rate high if new technology can improve public or agency personnel safety/security.</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>69 80 74 68 67 67 71 66 69 78 62 78 74 70 78 85 76 79 88 69 75 69 76 72 81 75 76</strong></td>
<td><strong>(Max score = 30)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: matrix scores reflect the extent they agree with the statement in the “rating factors” column. High marks indicate strong agreement.
### Strategy Assessment Matrix Worksheet

<table>
<thead>
<tr>
<th>Agreement Scale</th>
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<tr>
<td>11 19 23 30</td>
<td>Human Resources</td>
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<td></td>
</tr>
<tr>
<td>0 - 10</td>
<td>6 6 7 6</td>
<td>Staff is available</td>
<td>High Rating implies that the new strategy will be easy to implement.</td>
</tr>
<tr>
<td>0 - 5</td>
<td>4 4 5 4</td>
<td>Staff skill set requirements are not a problem</td>
<td>Rate high if existing staff has the necessary expertise to adopt the new strategy.</td>
</tr>
<tr>
<td>0 - 10</td>
<td>6 7 7 6</td>
<td>Time commitments are achievable</td>
<td>Rate high if staff time is available to conduct the new strategy.</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td>16 17 19 16</td>
<td></td>
<td>(Max score = 25)</td>
</tr>
<tr>
<td><strong>Supporting Costs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - 10</td>
<td>8 7 8 7</td>
<td>Meeting costs are affordable</td>
<td>High ratings if venue, travel and clerical costs are within the budget or potentially available.</td>
</tr>
<tr>
<td>0 - 15</td>
<td>11 12 12 12</td>
<td>Deliverable costs are affordable</td>
<td>High ratings can be given if cost of producing the work products are within the available or projected budget.</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td>19 19 20 19</td>
<td></td>
<td>(Max score = 25)</td>
</tr>
<tr>
<td><strong>Coordination issues</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - 10</td>
<td>9 8 8 9</td>
<td>Agreements are possible</td>
<td>Rate high if high probability of success in reaching agreements or getting MOU's executed.</td>
</tr>
<tr>
<td>0 - 10</td>
<td>8 8 8 9</td>
<td>There are no Legal or policy impediments</td>
<td></td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td>17 17 16 18</td>
<td></td>
<td>(Max score = 20)</td>
</tr>
<tr>
<td><strong>Potential Benefits</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 - 5</td>
<td>4 4 4 4</td>
<td>Customer Satisfaction</td>
<td>The &quot;customer&quot; can be the public, or the end users. Rate low if the new strategy will create negative political or labor issues.</td>
</tr>
<tr>
<td>0 - 5</td>
<td>5 4 5 3</td>
<td>Efficiency</td>
<td>Rate high if the new strategy increases the agency's ability to produce their services.</td>
</tr>
<tr>
<td>0 - 5</td>
<td>4 2 3 4</td>
<td>Energy and Environment</td>
<td>High ratings if the new strategy can produce a measureable improvement in energy or environmental conservation.</td>
</tr>
<tr>
<td>0 - 5</td>
<td>4 3 4 4</td>
<td>Mobility</td>
<td>Rate high if new strategy will reduce delay or increase operational reliability.</td>
</tr>
<tr>
<td>0 - 5</td>
<td>5 4 4 4</td>
<td>Productivity</td>
<td>Rate high if the new strategy increases the agency's ability to deliver their service or expands their services.</td>
</tr>
<tr>
<td>0 - 5</td>
<td>4 5 5 2</td>
<td>Safety</td>
<td>High marks if strategy will improve public or agency personnel’s safety record.</td>
</tr>
<tr>
<td><strong>Sub Total</strong></td>
<td>25 23 25 21</td>
<td></td>
<td>(Max score = 30)</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>76 76 80 74</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Rater's scores reflect the extent they agree with the statement in the "Rating Factors" column. High marks indicate strong agreement.
Kane County Recommended Field Deployment Map for Traffic Signal Coordination
Kane County Recommended Field Deployment Map for CCTV Cameras
Kane County Recommended Field Deployment Map for Vehicle Detection Systems
Kane County Recommended Field Deployment Map for Dynamic Message Signs