

# Recommended Roadway Plan

## Section 5 - Improvement Strategies

---

# Improvement Strategies

---

## 5.1 Roadway Improvements

A list of roadway projects was identified as part of the development of the transportation plan. Many of the projects were from previous planning efforts and some of the projects were identified from multiple sources. Level of service (LOS) E is characterized by significant delays where traffic is at or near the capacity of the roadway, however, it is sometimes accepted as a limiting design criterion when restricted conditions make it impractical to consider a higher level of service. In light of the limited financial forecast, and the likelihood that major roadway expansions will be difficult to fund in the future, the 2040 Recommended Roadway Plan recommends new improvements only for roadways that modeled at a LOS F (greater than 50 seconds of control delay per vehicle at a signalized intersection) under assumed 2040 conditions. Typically, at LOS F motorists experience stop-and-go traffic and significant delays at traffic lights. The resulting roadway improvement list incorporates the 2015 Impact Fee Comprehensive Road Improvement Plan (CRIP) and most of the previous recommendations from the 2030 Transportation Plan.

The initial set of improvements in the 2040 Recommended Roadway Improvement Plan includes the committed projects which consist of the Anderson Road Railroad Overpass, the widening of Orchard Road, the full interchange improvement at IL 47 and I-90, and elements of the Stearns Road Bridge Corridor project. These projects are underway and/or programmed in the County's 5-year Transportation Improvement Plan. Although the Impact Fee CRIP is vastly underfunded, many of the projects are intersection type projects, and are also considered to be near term needs (since the CRIP is a 10-year plan). Other recommended improvements are for roadways, limited access freeways, Strategic Regional Arterials (SRAs), expressways, and tollways with a regional significance. Improvement types include add lane projects, new alignments, realignments, Fox River Bridge crossing, grade separations, interchange improvements and isolated intersection projects. The projects were evaluated to determine their effectiveness at reducing congestion.

### 5.1.1 Connectivity – Collector Roadway Network

Aside from the *arterial-based* roadway improvements identified in the recommended roadway plan, the County is a strong proponent of *collector-based* improvement strategies, which rely primarily on a collector roadway network to distribute local trips in any given area. Collector roads serve a dual function of providing mobility and access, while the major arterial improvements primarily enhance mobility. An efficient and continuous collector road system improves mobility on arterials by providing better access to abutting land uses and connectivity using the local road network. In addition, the collector roads can provide an alternative route whenever an incident occurs or during a special event. Planned collector roadways can also connect future developments which may be partially or fully constructed by developers.

The County, in coordination with local agencies, assisted in the development and evaluation of local transportation improvement plans for high growth areas in the County, that focused on collector-based plans for the West Upper Fox planning area, the Elgin Far West planning area, the Sugar Grove, Aurora, Montgomery planning area and the Northwest Kane County planning area. (The plans also incorporate arterial-based improvements and access management.)

Five objectives were set up to guide the development of the plans including:

1. Enhance connectivity
2. Reduce delay
3. Reduce congestion
4. Be proactive towards development related to infrastructure improvements
5. Distribute trips to appropriate facility types

In addition to the joint effort Planning Area Studies, the County supports local municipal transportation planning efforts that provide collector improvements or in-fill network to link land uses throughout municipalities. These local improvements should be considered as development occurs. These improvements represent a joint effort to improve transportation performance, are crucial to create a complete roadway network and reduce congestion on the arterial highways.

### ***5.1.2 Access Management***

Management of access to area roadways is yet another method of improving the ability of the system to satisfy mobility requirements. Properly implemented access management will result in improvements to traffic operations, increase highway safety and minimize adverse environmental impacts.

Each new access located on an arterial reduces the arterial's traffic carrying capacity. After several new access locations have been installed, it often becomes clear that turning traffic has a negative impact on traffic speeds on the arterial. Studies indicate that average travel speeds during peak hours are considerably higher on well managed roads than on roads that are less well managed, even though the two types of roads carry approximately the same number of vehicles.<sup>1</sup>

A recommendation of the Transportation Plan is to include more County roads where access control management would be applied along with the coordination of access issues with various transportation agencies, as discussed in Section 2 – *Land Development and Roadway Access*, and the County's *Permit Regulations and Access Control Regulations*.

### ***5.1.3 Complete Streets***

As the County moves forward with roadway improvements, all projects are considered for improvements that will make the roadway safe and accessible for all users. Commonly

---

<sup>1</sup> *Access Management Handbook*, prepared for the Iowa DOT, the Safety Management System (SMS) Coordination Committee, and the Access Management Task Force, by the Center for Transportation Research and Education (CTRE), Iowa State University, Ames Iowa, October, 2000.

known as *Complete Streets*, this movement results in roadways designed and operated to enable safe, attractive and comfortable access and travel for all users, including motorists, pedestrians, bicyclists, public transportation users and people of all ages and abilities. Complete streets include one or more of the following elements: sidewalks, bike lanes (or wide paved shoulders), special bus lanes, comfortable and accessible public transportation stops, frequent and safe crossing opportunities, median islands, accessible pedestrian signals, curb extensions, narrower travel lanes, roundabouts, traffic calming measures and more. The elements in a complete street depend on the context of the roadway. For instance, a complete street in a rural area will look quite different from a complete street in a highly urban area, but both are designed to balance safety and convenience for everyone using the road.

Complete streets are intended to provide safe access to land uses and a variety of transportation options. Safe and attractive roadways for all users can reduce the reliance on the single occupancy vehicle; reduce congestion and therefore harmful vehicle emissions. This type of roadway design improves the efficiency and capacity of existing roads which could reduce the need for capacity improvements in the form of expensive additional traffic lanes.

Complete Streets also promote a healthy population by encouraging walking, bicycling and easy access to transit (transit users are typically pedestrians or cyclists for a portion of their trip). They also contribute to strong walkable and livable communities; provide opportunities for increased social interactions and lower transportation costs for users who don't travel by automobile.

### 5.1.4 Traffic Calming

While *generally* more applicable on lower volume residential streets, traffic calming is another important element in transportation planning and can be a component of an overall complete street suite of improvements. As defined by the Institute of Transportation Engineers (ITE), traffic calming is:

*The combination of many physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users.*<sup>2</sup>

More broadly defined, traffic calming applies to a number of transportation techniques developed to reduce motorist speed, decrease traffic volumes, increase safety for pedestrians and cyclists, and to educate and increase awareness of the traveling public. Some of the “tools” applied in traffic calming are:

- Roundabouts
- Turn restrictions and one-way operation
- Forced-turn channelization
- Median barriers and diverters
- Landscaping / tree-lined streets

---

<sup>2</sup> I.M. Lockwood, *ITE Traffic Calming Definition*, ITE Journal, Vol. 67, July 1997, pp 22-24

As reported by ITE, traffic calming can involve changes in street alignment, installation of barriers and other physical measures to reduce traffic speeds and cut-through volumes in the interest of street safety, livability, and other purposes. Traffic calming assists in making streets an attractive place to slow down. Reductions in traffic speed and volume, however, are just means to other ends such as traffic safety and active street life.

The County promotes the use of traffic calming techniques where appropriate, and is currently pursuing the implementation of roundabouts at select intersections across the County.

### ***5.1.5 Transportation System Management (TSM)***

TSM is the concept of more efficiently using existing transportation systems by means other than large-scale construction. Just as TDM strategies are aimed at managing transportation *demand*, TSM strategies are directed at managing the transportation *system*. The deployment of advanced traffic management systems continue to have a substantial benefit in terms of cost and effectiveness in terms of improving mobility, safety and the general quality of life. TSM strategies are low-cost but effective in nature, and studies have shown as much as a 40:1 cost benefit for these types of improvements at a significantly less capital cost as compared to more traditional capacity improvements such as the adding of additional thru lanes.

The County is pursuing the following TSM strategies from the *2007 Kane County Intelligent Transportation Systems Strategic Plan* and *2011 Concept of Operations for the Kane County Arterial Operations Center*:

Advanced traffic control and surveillance systems that provide information to the transportation agency in real-time and allows traffic management responses and/or useable information to be provided to the motoring and non-motoring public (user information distribution) to improve mobility and reduce delay.

These can include Intelligent Transportation Systems (ITS) for which current efforts/projects include:

- Partial construction of a centralized traffic signal/ITS control fiber optic network
- Planning and design of an Arterial Operations Center (to begin operations in early 2012)
- Roadway Weather Information Systems (2 bridge locations)
- CCTV traffic monitoring cameras (various intersection and bridge locations)
- Driver feedback (speed control) signing (2 locations)
- Uninterruptable Power Supply (battery backup) systems for many traffic signals

Future efforts/projects include:

- Completion of a centralized traffic signal/ITS control fiber optic network
- Roadway Weather Information Systems at additional locations

- CCTV traffic monitoring cameras at additional intersection and bridge locations)
- Driver feedback (speed control) signing at additional locations
- Adaptive Traffic Signal Control
- Traffic signal modernization (phase modification) to increase signal efficiency and reduce delay
- Improved/additional pedestrian & bicycle accommodations to existing traffic signal infrastructure and operations
- Improved management of special event traffic
- Dynamic Message Signs (permanent and portable)
- Real time traffic info. (webpage, mobile phone applications, e-mail subscription, in-vehicle navigation systems, third party provides, etc.)
- Traffic incident management strategies for the allocation of resources in response to unplanned incidents (i.e. severe crash(s), road closures, evacuations, etc.) which result in major disruption and delay of traffic on highways.

Implementation of ongoing and future TSM programs within Kane County includes expansion of the existing Advance Traffic Management System/Traffic Signal System network, centralized traffic signal control, Arterial Operations Center, and demonstration of adaptive Traffic Signal Control. Roadway advisory information will be provided to various other agencies and roadway users not only within the County but also throughout the Chicago land region through various outlets including Kane County web pages, cell phone applications, e-mail subscription services, Travelmidwest.com and third party commercial traffic information providers. Greater detection and mitigation of incidents and unplanned/planned special events will be possible by using the above technologies together with previously planned strategies and increased coordination/interaction with other parties - emergency responders, etc. to reduce the time and degree of adverse impact to traffic.

TSM strategies also include roadway infrastructure improvements such the addition of turn lanes at intersection, intersection modifications to roundabout, Continuous Flow intersections and Divergent Diamond Interchanges, which decrease delay and congestion through innovation.

## 5.2 Summary

Overall, the proposed improvements included widening of arterials and the tollways, creation of new corridors, realignments, and the promoting of a local collector road system. To support the transportation system, alternative strategies are also explored to include the development and promotion of Transportation System Management practices.