Kane County Transportation Planning Area Study

West Upper Fox Planning Area Transportation Improvement Plan

CH2MHILL

August 2002

Report

West Upper Fox Planning Area Transportation Improvement Plan

Submitted to

Kane County Division of Transportation

August 2002

CH2MHILL

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Introduction

Background

In October 2000, the Kane County Division of Transportation and CH2M HILL began a transportation planning study to develop a recommended set of transportation improvements for areas within the County. The project consists of two phases; first, a countywide assessment of existing and future travel conditions, and then a more detailed study of transportation issues within each designated planning area. The Kane County travel demand model was used to evaluate existing and future travel conditions. Traffic performance was aggregated by Planning Partnership Area (PPA) to identify areas having the highest concentration of performance issues. These locations were used as a guide in the delineation and prioritization of planning areas. This report describes the results of the planning area process and presents a recommended plan for the West Upper Fox Area. It also serves as a prototype for other area plans. The plan consists of a toolbox of solutions including arterial improvements, new collector roads, transit enhancements, bike / pedestrian trails, regional connections, and access control guidelines.

Analysis of Existing and Future Conditions

Existing transportation facilities in Kane County are comprised of highways, public transportation routes and facilities, and accommodations for non-motorized modes. There are approximately 550 miles of highway in the county including two interstate highways, three U.S. highways, 11 state highways, and 307 route miles of county highway. Kane County is also served by Metra commuter rail and Pace buses, as well as, by a network of bike / pedestrian trails.

Performance of the existing street and highway transportation system was evaluated in three categories: (1) traffic service, (2) congestion, and (3) safety. Measures of performance in terms of traffic service include Vehicle Miles of Travel (VMT), Vehicle Hours of Travel (VHT), and Vehicle Hours of Delay (VHD). In examining the traffic performance of all highways in the county, principal arterials which account for approximately one-quarter of the lane miles, were found to carry the bulk of traffic (approximately 50 percent) and account for an even larger proportion of delay (approximately 55 percent). The primary performance measure for congestion is Level of Service (LOS).[1] Under existing conditions, 14 percent of the route-miles in Kane County were found to be operating at LOS D, E, or F and consequently were judged to be congested. Existing traffic safety performance was measured using predictive crash frequency models. Fifteen intersections and fifteen route miles of county roads were classified in the highest priority category for safety.

The next step in the countywide analysis was a forecast of future travel demand based on projected growth of population and employment. Population of Kane County is expected to grow from 317,000 in 1990 to 552,000 in 2020 and employment is expected to increase from 174,000 to 211,000 during the same period. Future travel demand was determined by incorporating increased population and employment by traffic analysis zone (TAZ) into the travel demand model. Growth factors were calculated for each highway segment using a

[1] See page 16 of *Existing Transportation Conditions and Forecasts of Future Travel Demand*, CH2M HILL (May 2001) for an explanation of LOS.

comparison of modeled volumes for the base year and 2020. These growth factors were then applied to 1997 counts to predict 2020 average daily traffic (ADT). Areas with the largest anticipated traffic growth would be Sugar Grove, West Geneva / West Batavia, Elgin, and West Upper Fox.

The 2020 trip table was then assigned to a network including both existing highways and committed projects. Future traffic service and congestion measures were calculated and compared to existing performance. Between 1997 and 2020, VMT within the county is expected to grow by 93 percent, VHT by 105 percent, and VHD by 750 percent. Also, by 2020, it is anticipated that 56 percent of the lane miles of highway within the county will be congested compared with just 14 percent in 1997.

The final step in the analysis of the existing and future transportation conditions was the aggregation of performance measures by Planning Partnership Area (PPA). The five measures analyzed for each PPA were:

- VMT per lane mile,
- VHT per lane mile,
- VHD per lane mile,
- Change in speed, and
- Percent-congested lane miles.

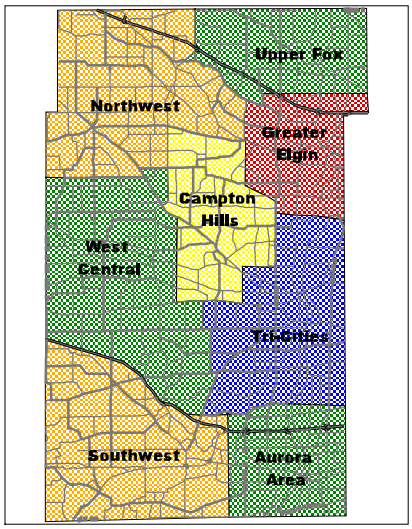
For each performance measure, the PPAs were classified into one of three priority categories: immediate need, near-term need, or long-term need. See Figure 1. The Greater Elgin PPA was the only area exhibiting the highest priority, immediate need, for all categories of performance. The West Upper Fox area fell into the immediate need category for three of the five performance measures. For more information regarding the analysis of existing and future transportation conditions in Kane County, refer to the *Existing Transportation Conditions and Forecast of Future Travel Demand* (May 2001) report.

Product of Delineation and Prioritization Process

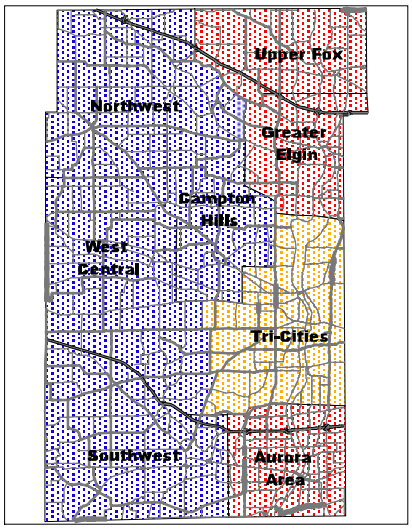
The delineation and prioritization of planning areas in Kane County was accomplished using a five-step process.

1. Analysis of Planning Partnership Areas
2. Layering of performance measures
3. Delineation of transportation planning districts
4. Prioritization of districts
5. Selection of planning areas for further study

At the county level, the relative priority of transportation need in each PPA was evaluated by performance . This assessment served as a guide in identifying locations of concern, but was not sufficient in itself to delineate and prioritize the planning areas. Therefore, a more detailed study was conducted by bounding the areas of influence of the individual performance issues. Clusters of performance problems were delineated to define the planning areas and then compared to one another to prioritize the order of study. Those areas classified as having immediate needs would be studied first and those areas designated to have longer-term needs would be studied at a later date. Figure 2 illustrates



Planning Area Boundaries



2020 VMT/Lane Mile

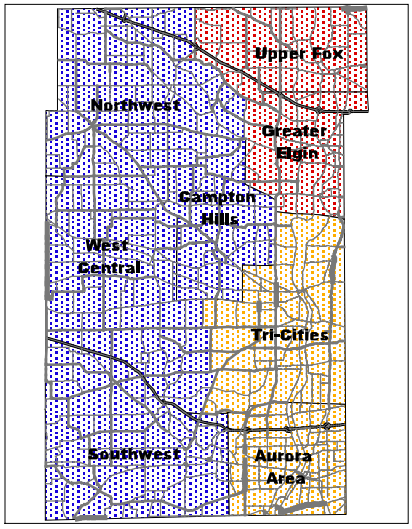
Legend

2020 VMT/Lane Miles

>10,000 VMT/Lane Mile

>5,000 VMT/Lane Mile

<5,000 VMT/Lane Mile



2020 VHT/Lane Mile

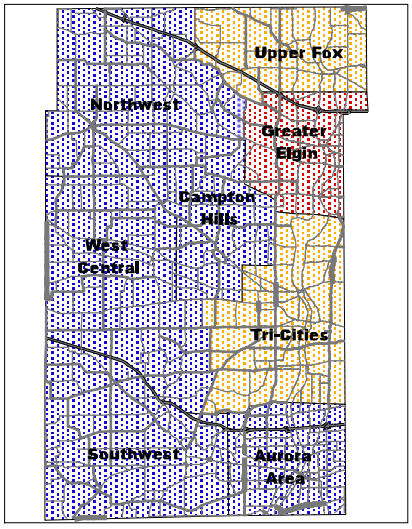
Legend

2020 VHT/Lane Miles

>300 VHT/Lane Mile

>150 VHT/Lane Mile

<150 VHT/Lane Mile



2020 VHD/Lane Mile

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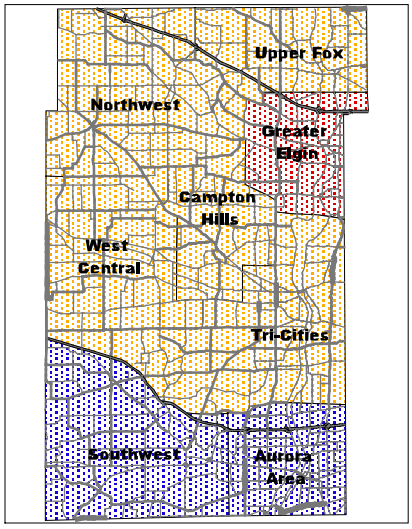
2020 VHD/Lane Miles

>40 VHD/Lane Mile

>20 VHD/Lane Mile

<20 VHD/Lane Mile



Change in Speed 1996 - 2020

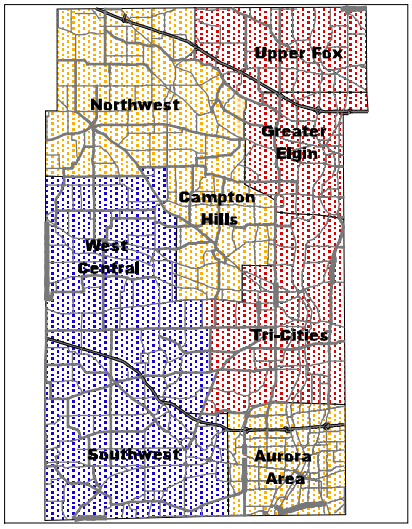
Legend

Percent Change in Speed

>8% Change in Speed from 1996

>4% Change in Speed from 1996

<4% Change in Speed from 1996



2020 Percent Congested by Lane Mile LOS D, E, and F

Legend

% Congested

>80% LOS D, E, and F

>40% LOS D, E, and F

<40% LOS D, E, and F

N

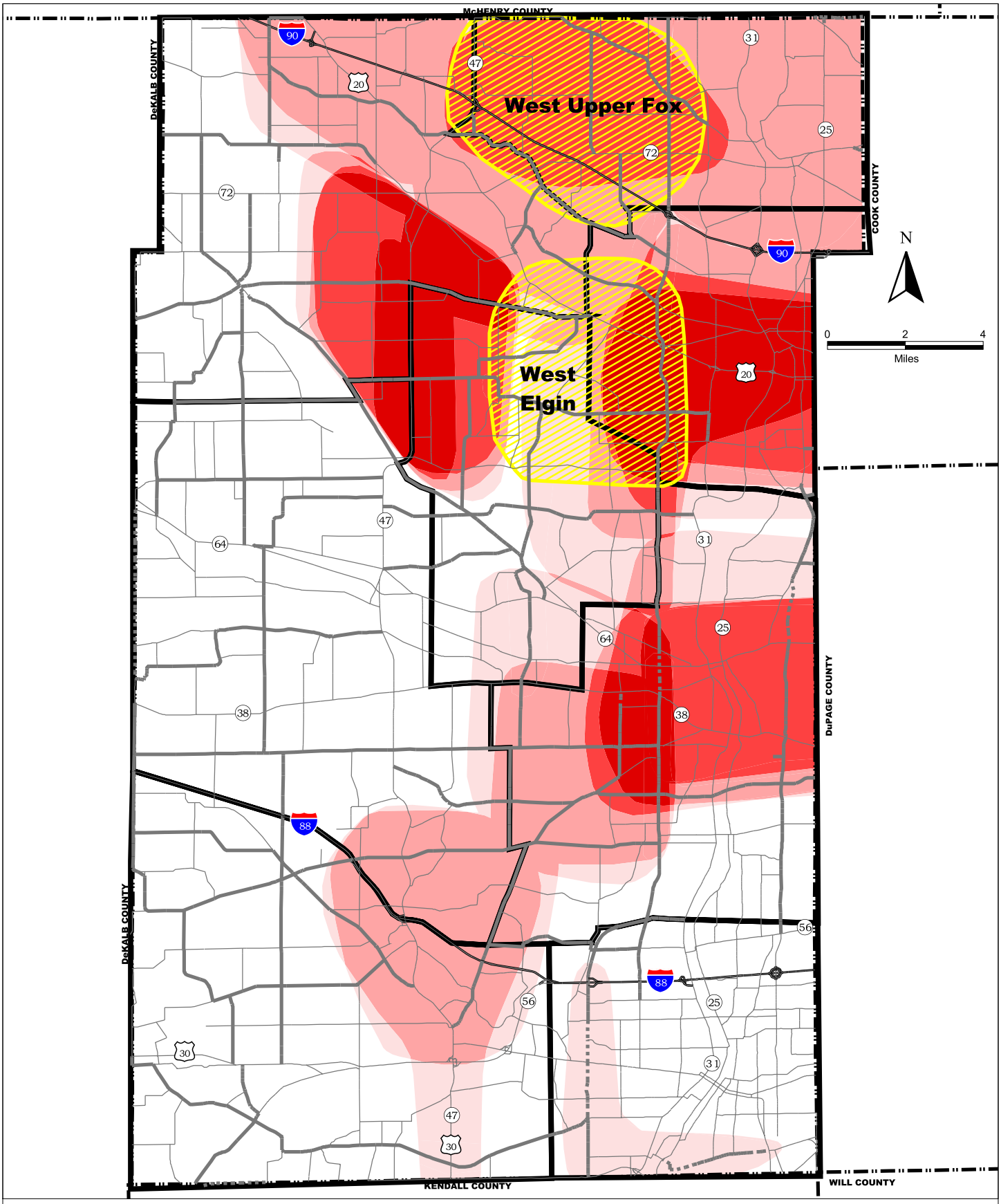
Legend

- Immediate Need
- Near-Term Need
- Long-Term Need

Planning Partnership Areas

Figure 1

Kane County Transportation Planning Area Study



Legend

Number of Measures of Future Performance Rated Poor

- 1 measure
- 2 measures
- 3 measures
- 4 measures

PPA Boundary

Selected Planning Areas

Planning Areas Selected for Immediate Study

Figure 2
Kane County Transportation Planning Area Study

the areas with a clustering of performance problems and the areas identified as having immediate need. Two areas have been designated for further study--West Upper Fox, which is the subject of the remainder of this report, and West Elgin. For more information regarding the delineation and prioritization of planning areas refer to the report, *Delineation and Prioritization of Planning Areas* (July 2001).

West Upper Fox Planning Area

Development Trends

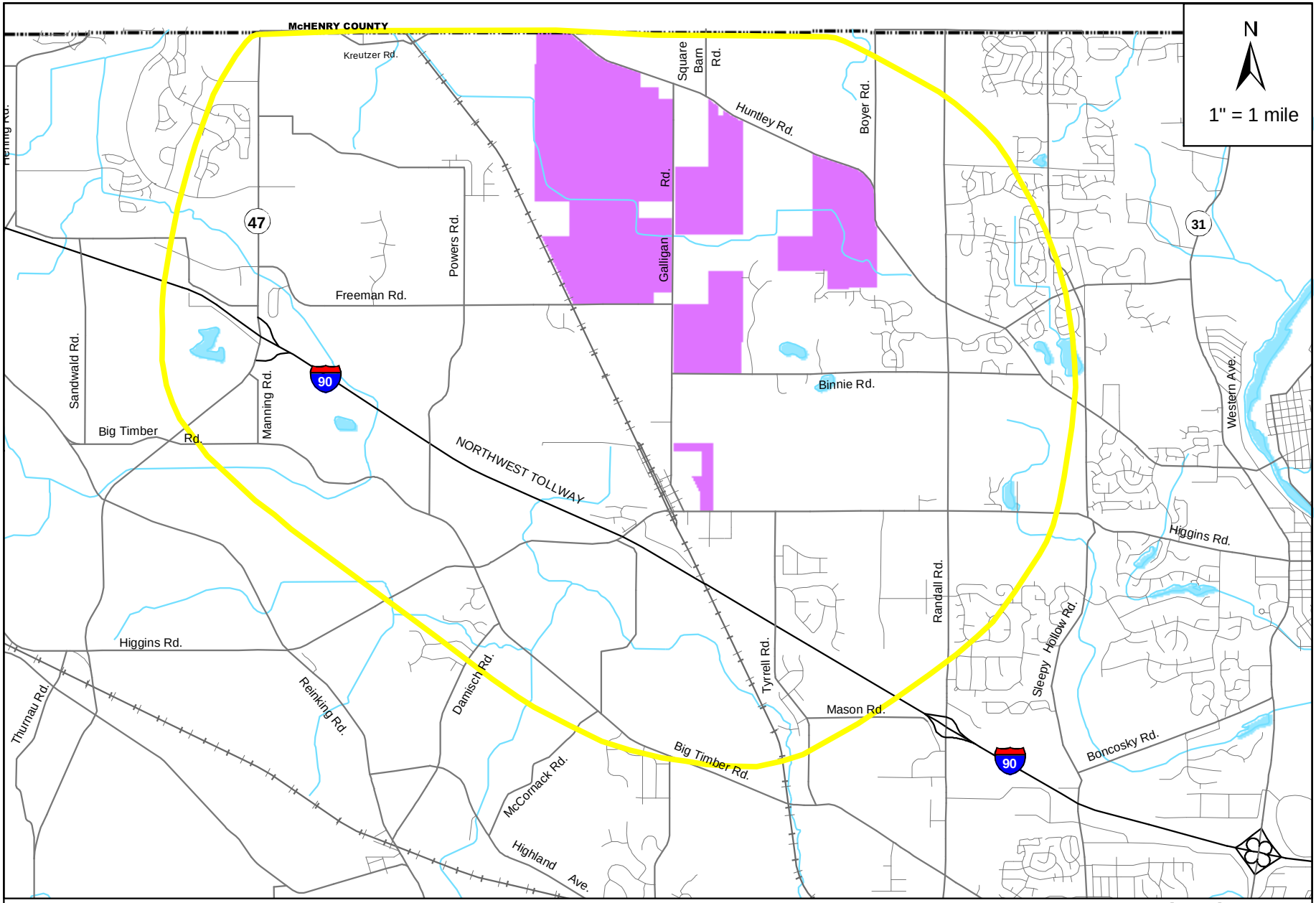
Currently, there is a large quantity of developable land in the West Upper Fox planning area. During the next twenty years, significant development (mostly residential) of varying density is projected to occur. In addition, an office park is proposed for the area near Randall Road and Huntley Road. Information was gathered regarding a number of planned developments. Plans of residential and commercial developments under construction, in the permitting process, or in the planning phase were provided by local communities or identified during a field review. These data varied in level of detail depending on the stage of implementation of each project.

A comparison was also made between socio-economic forecasts provided by the Northeastern Illinois Planning Commission (NIPC) and projected development trends. The number of dwelling units to be provided in each planned residential development was determined and compared to NIPC 2020 forecasts by Transportation Analysis Zone (TAZ). Where data pertaining to planned development did not contain detailed information on the exact number of households, assumptions were made regarding densities. Average densities were calculated for different types of existing development. These ranged from approximately 1.5 units per acre for low-density residential developments, to 2.3 for medium-density residential projects, and 2.9 for a mixture of medium-density residential and multi-family units. A density of 4.6 units per acre, or twice the single-family density, was assumed for multi-family only developments. Using the Geographic Information System (GIS) to calculate acreage of each development, and given an assumed density, the number of units could be calculated for each prospective development.

In comparing the socio-economic forecasts derived from planned development in the West Upper Fox planning area to the NIPC forecasts, it was found that some of the developments were completely accounted for, but others were not entirely included. In some cases, developments were assigned to a neighboring TAZ. For example, the planned development at Huntley and Boyer Roads was partially accounted for in the NIPC forecast while the development along Galligan Road was not entirely included. Even though the development along Galligan Road is in the very early stages of planning, the county still anticipates some type of residential development will occur there before 2020. Areas wherein adjustments were made to the NIPC population data are shown in Figure 3.

Employment growth was fully accounted for in the NIPC forecast, but in some instances the anticipated location might vary from that provided by NIPC. It was decided, however, not to modify the NIPC forecast for this type of variation.

For input to the travel forecasting model, residential occupancy was estimated at 2.77 persons per household. A total of 3,460 households were added in the West Upper Fox area,



West Upper Fox Planning Area
Additional Development

Figure 3

Kane County Transportation Planning Area Study

creating an increase in population of approximately 9,600 over the prior estimate. For details regarding the population data comparisons and adjustment refer to Appendix A.

Growth of Travel Demand

Figure 4 shows forecast travel growth in the West Upper Fox area. Projected traffic increases in this planning area would be among the greatest in Kane County. The largest increase would occur on the Illinois Tollway (I-90), particularly in the section between Randall Road and IL 47. Other highways that would experience appreciable traffic growth would be IL 47, Randall Road, IL 72 and Huntley Road.

Future System Performance

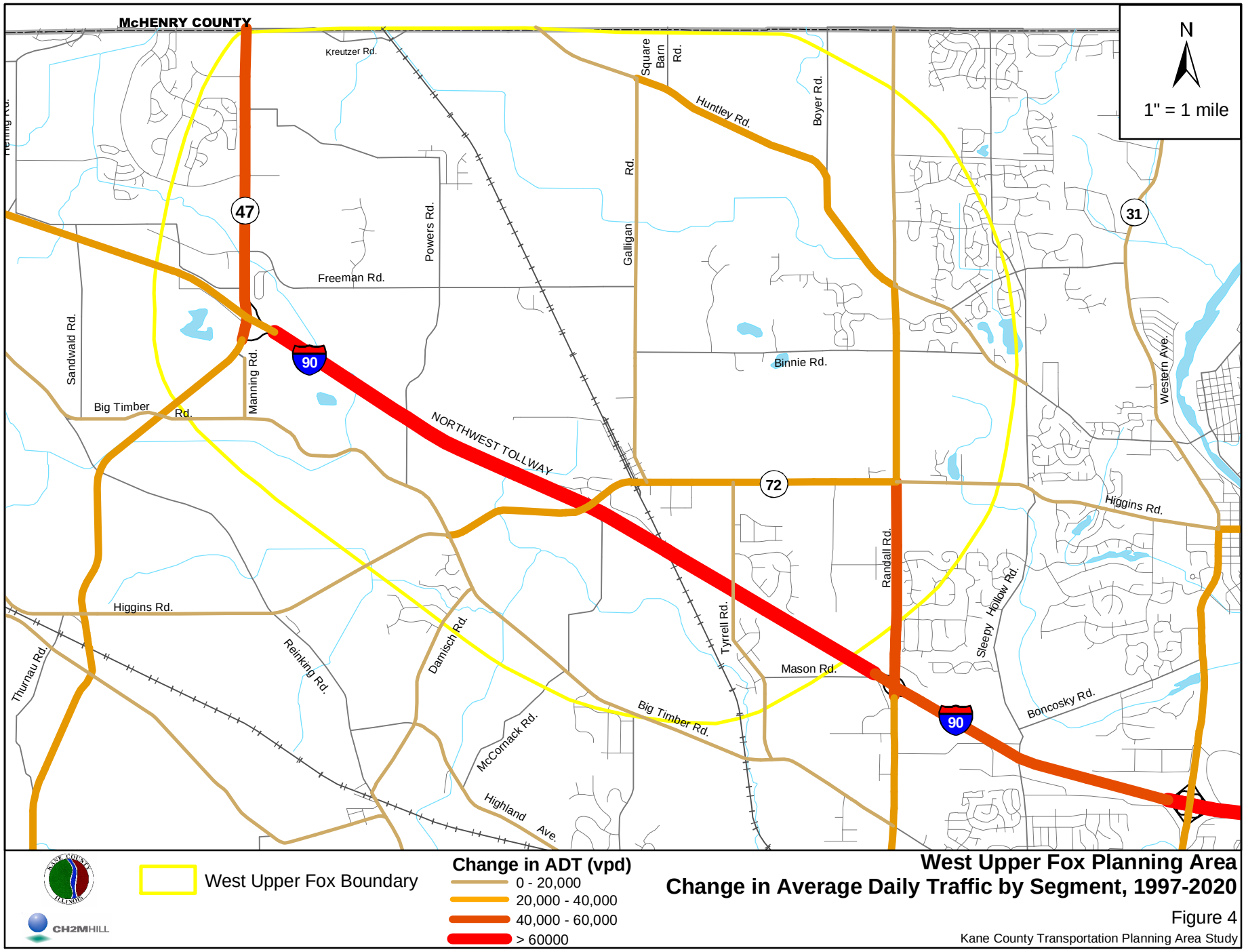
Performance of transportation facilities in the West Upper Fox area under future (2020) conditions was measured to identify roadways that would operate poorly. System performance was evaluated for conditions both including and excluding the interstate highways (tollways). Arterials comprise a majority of the lane miles in the area (53 percent) and account for much of the area's VMT (57 percent) and VHD (47 percent). Collector roads in the West Upper Fox area account for 30 percent of the lane miles, but only 9 percent of the VMT and 5 percent of the VHD. The weighted percentage of congested lane miles operating at LOS D or worse would be 88 percent considering all roadways, and 82 percent if I-90 were excluded from the performance summary. The average speed on the roadway network would be 38 mph and there would be 39 vehicle hours of delay per lane-mile with all facilities included in the summary. Sections of the following roadways would operate at LOS F (severe congestion) in the future (See Figure 5):

- Galligan Road
- Huntley Road
- Randall Road
- Tyrrell Road
- I-90
- IL 47
- IL 72

Select Link Analysis

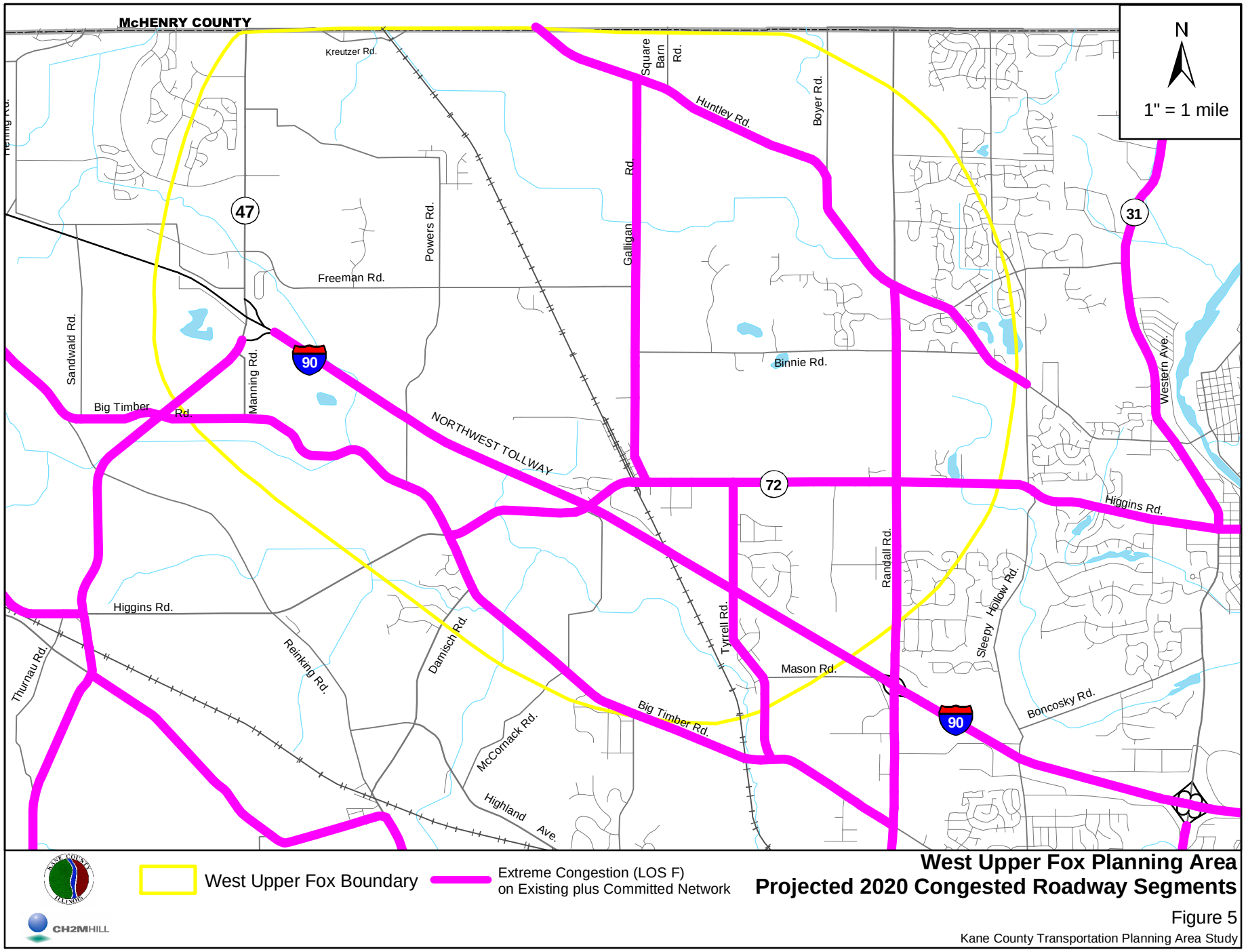
The select link analysis is a tool used by transportation planners to portray travel characteristics on a specific segment of the system. The select link process creates an origin-destination (O-D) table of trips that use a specific link(s). For this analysis, select link trip tables were assigned to both an uncongested and a congested network. Travel speeds on the uncongested network were representative of free flow conditions, while speeds on the congested network recognized delays resulting from traffic congestion.

Results of the select link assignments were portrayed in such a way as to produce a visual and analytical understanding of the distribution of trips that used the selected link. The travel patterns were analyzed visually using a bandwidth plot, where the width of the band increases with volume.



West Upper Fox Planning Area
Change in Average Daily Traffic by Segment, 1997-2020

Figure 4
Kane County Transportation Planning Area Study


McHENRY COUNTY
N
1" = 1 mile
Kreutzer Rd.
Square Barn Rd.
Huntley Rd.
Boyer Rd.
Galligan Rd.
Powers Rd.
Freeman Rd.
47
31
Sandwald Rd.
Manning Rd.
90
Big Timber Rd.
Binnie Rd.
Western Ave.
NORTHWEST TOLLWAY
72
Higgins Rd.
Randall Rd.
Sleepy Hollow Rd.
Tyrrell Rd.
Damisch Rd.
Reinking Rd.
Thurnau Rd.
Mason Rd.
Boncosky Rd.
McCornack Rd.
Highland Ave.
West Upper Fox Boundary
Extreme Congestion (LOS F)
on Existing plus Committed Network
West Upper Fox Planning Area
Projected 2020 Congested Roadway Segments
Figure 5
Kane County Transportation Planning Area Study
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The select links were chosen to represent a variety of travel patterns in the area and included the following locations:

- Binnie Road—Galligan Road to Randall Road
- Galligan Road—Freeman Road to Binnie Road
- Huntley Road—Boyer Road to Randall Road
- IL 72—Big Timber Road to McCornack Road
- IL 72—Tyrrell Road to Randall Road
- Randall Road—IL 72 to I-90
- Tyrrell Road—Mason Road to IL 72

Comparison of the select link analysis of the uncongested networks with that of the congested networks was useful in portraying changes in travel patterns that would result from congestion. These analyses along with a set of performance measures were instrumental in selecting roadway improvements that comprise the West Upper Fox area plan.

West Upper Fox Area Transportation Improvement Program

Objectives and Constraints

A planning framework was established to assist in development and evaluation of a transportation improvement plan for the West Upper Fox area. The two primary components of the framework would be determination of planning objectives and identification of area constraints.

Objectives were established to determine the relative effectiveness of a specific transportation improvement. Techniques were also developed to measure conformance of the planned improvement with each objective. In evaluating conformance, however, each objective was considered individually and was not weighted or prioritized in comparison with the others.

Five objectives, as follows, were established for development of a transportation improvement plan in the West Upper Fox area:

- **Enhance connectivity** to the rest of the county and surrounding areas.
- **Reduce delay** as measured by vehicle hours of delay (VHD) per lane mile. The VHD would be normalized using lane-miles because the number of lane-miles would vary from one proposal to another.
- **Reduce congestion** by lessening the percentage of congested lane-miles.
- **Be proactive towards development related to infrastructure improvements.** It would be desirable to plan for infrastructure improvements prior to development occurring, rather than reacting after the development is complete. This measure also would aid in prioritizing improvements according to the projected timing of developments.
- **Distribute trips to appropriate facility types.** The intent of this objective would be to encourage local trips to use the collector / distributor network and longer distance trips to utilize major arterials for regional travel. This measure would quantify the percentage of local trips on various facility types.

There are three primary categories of constraint that would influence the type and location of transportation improvements proposed in the West Upper Fox area: environmental, social-economic, and institutional. Environmental constraints in this area would include wetlands, forest preserves, parks, open space, and flood zones. Social-economic impacts to be avoided would include land uses such as churches, cemeteries, schools, and residential neighborhoods. Proposed improvements should also have minimal impact on downtown commercial areas, such as in Gilberts. In the institutional or political category, it is recognized that some potential improvements, such as widening of Randall Road beyond the extent provided in the Kane County 2020 plan, might lack support. The location of environmental and social-economic constraints in the West Upper Fox planning area is shown in Figure 6.

An important element of the planning process for the County has been the establishment of boundary agreements between adjacent municipalities throughout the County. Figure 7 shows the boundary line agreements that have been adopted and time of those agreements within the West Upper Fox Area. Boundary agreements assist the municipalities with defining their respective jurisdictions for land use and development planning. In the context of this area planning study, the boundary line agreements assist the County in coordinating recommended improvements with the municipalities.

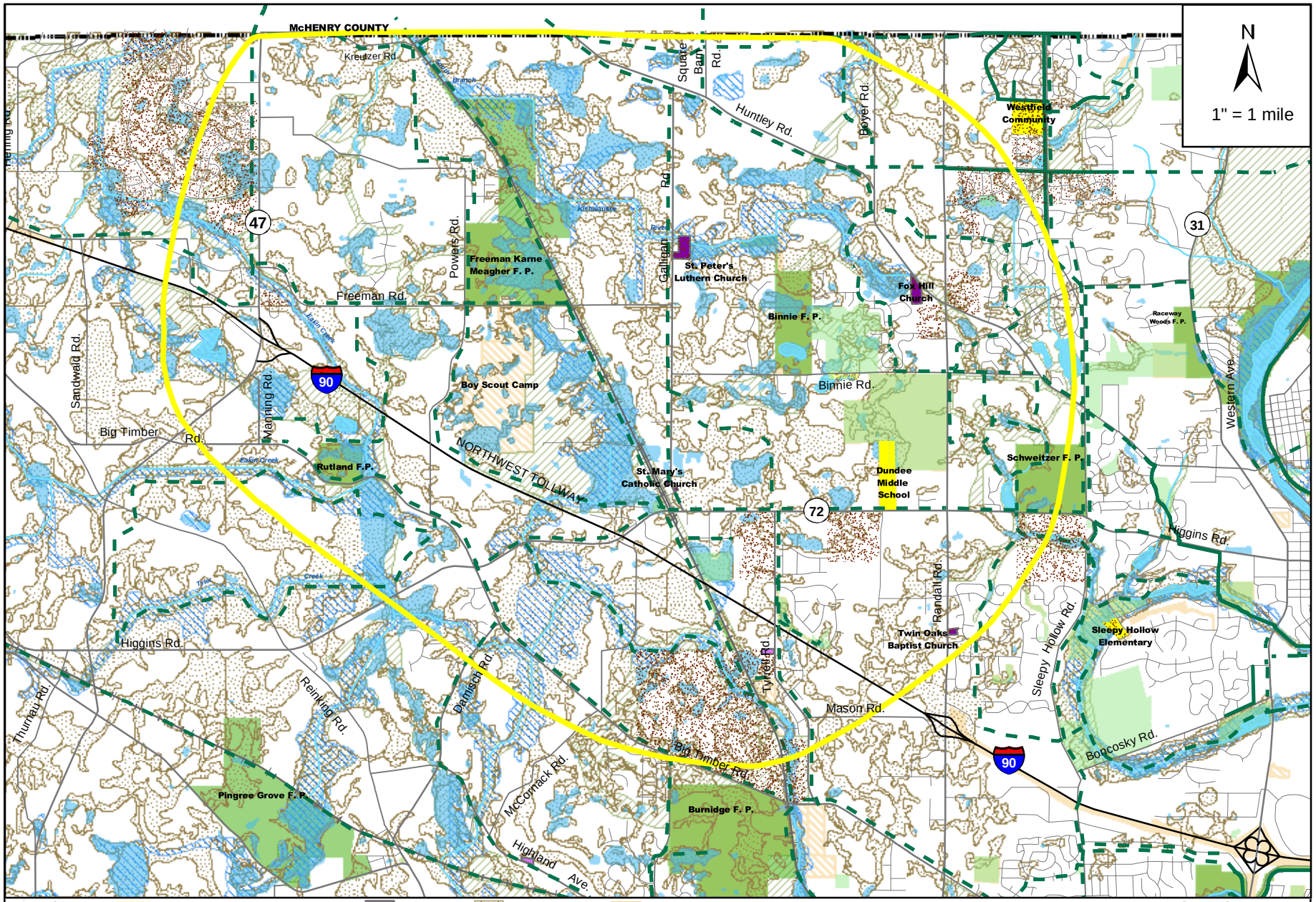
Planned Transportation Improvements

Roadways

The type and location of planned roadway improvements in the West Upper Fox area, in addition to those already committed and included in the base network, were obtained from the following sources.

- Kane County 2020 Transportation Plan
- Chicago Area Transportation Study Regional Transportation Plan (RTP), Appendix A
- Village of Algonquin Comprehensive Plan
- Village of Carpentersville, IL Comprehensive Plan
- Village of Huntley Draft Transportation Plan
- Village of Gilberts 2001 Comprehensive Plan
- Comprehensive Plan – Village of West Dundee
- Memorandum of Intergovernmental Agreement
  Randall Road – I-90 Illinois Tollway to Hopps Road
  City of Elgin and County of Kane
- Development Program and Market Strategy for the Algonquin Business Park

The various documents comprised a mix of major and minor projects and included widening or reconstruction of existing roadways as well as construction of new roadways. Major planned roadway improvements in the West Upper Fox area are summarized in Table 1.



West Upper Fox Planning Area
Environmental and Social-Economic Constraints

Figure 6

Kane County Transportation Planning Area Study

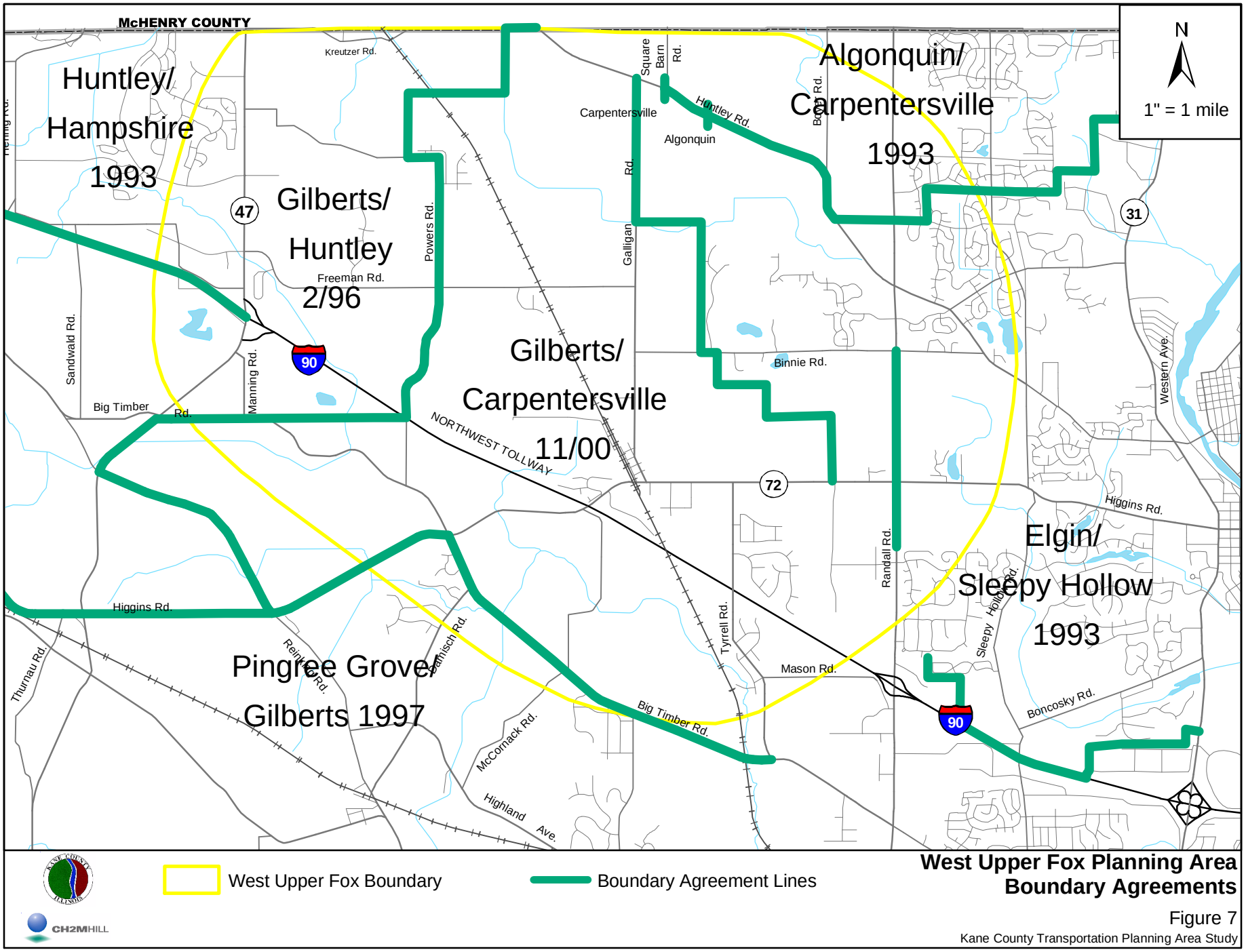

McHENRY COUNTY
Huntley/
Hampshire
1993
Gilberts/
Huntley
2/96
Algonquin/
Carpentersville
1993
Gilberts/
Carpentersville
11/00
Elgin/
Sleepy Hollow
1993
Pingree Grove/
Gilberts 1997
N
1" = 1 mile
Kreutzer Rd.
Square Barn Rd.
Carpentersville
Algonquin
Huntley Rd.
Boyd Rd.
Galligan Rd.
Powers Rd.
Freeman Rd.
Sandwald Rd.
Manning Rd.
Big Timber Rd.
Binnie Rd.
Western Ave.
NORTHWEST TOLLWAY
Higgins Rd.
Randall Rd.
Sleepy Hollow Rd.
Tyrrell Rd.
Mason Rd.
Boncosky Rd.
Thurnau Rd.
Reinking Rd.
Dernisch Rd.
McCornack Rd.
Big Timber Rd.
Highland Ave.
47
90
72
31
West Upper Fox Boundary
Boundary Agreement Lines
West Upper Fox Planning Area
Boundary Agreements
Figure 7
Kane County Transportation Planning Area Study
CH2MHILL

TABLE 1
Planned Major Roadway Improvements in the West Upper Fox Area

Roadway	Improvement	Limits
I-90	Widening to 6 Lanes	Randall Road to IL 47
Randall Road	Widening to 6 Lanes	Big Timber to IL 72
Huntley Road	Widening to 4/5 Lanes	Kreutzer Road to IL 31
Big Timber	Widening to 4 Lanes	Randall Road to IL 72
Long Meadow Parkway	New Construction	Bolz Road to Huntley Road
IL 72	Widening to 4 Lanes	Randall Road to IL 31
IL 31	Widening to 4 Lanes	Huntley Road to Bolz Road

Intersection improvements were also included in existing plans along with completion of the IL 47 / I-90 interchange and a possible new interchange on I-90 to be located between Randall Road and IL 47. Some of the improvements would be relatively minor such as a better connection between Galligan and Tyrrell Roads. Other new roadways would connect neighborhoods and provide additional collector service in developing areas. Figure 8 shows the location of planned improvements in the West Upper Fox area.

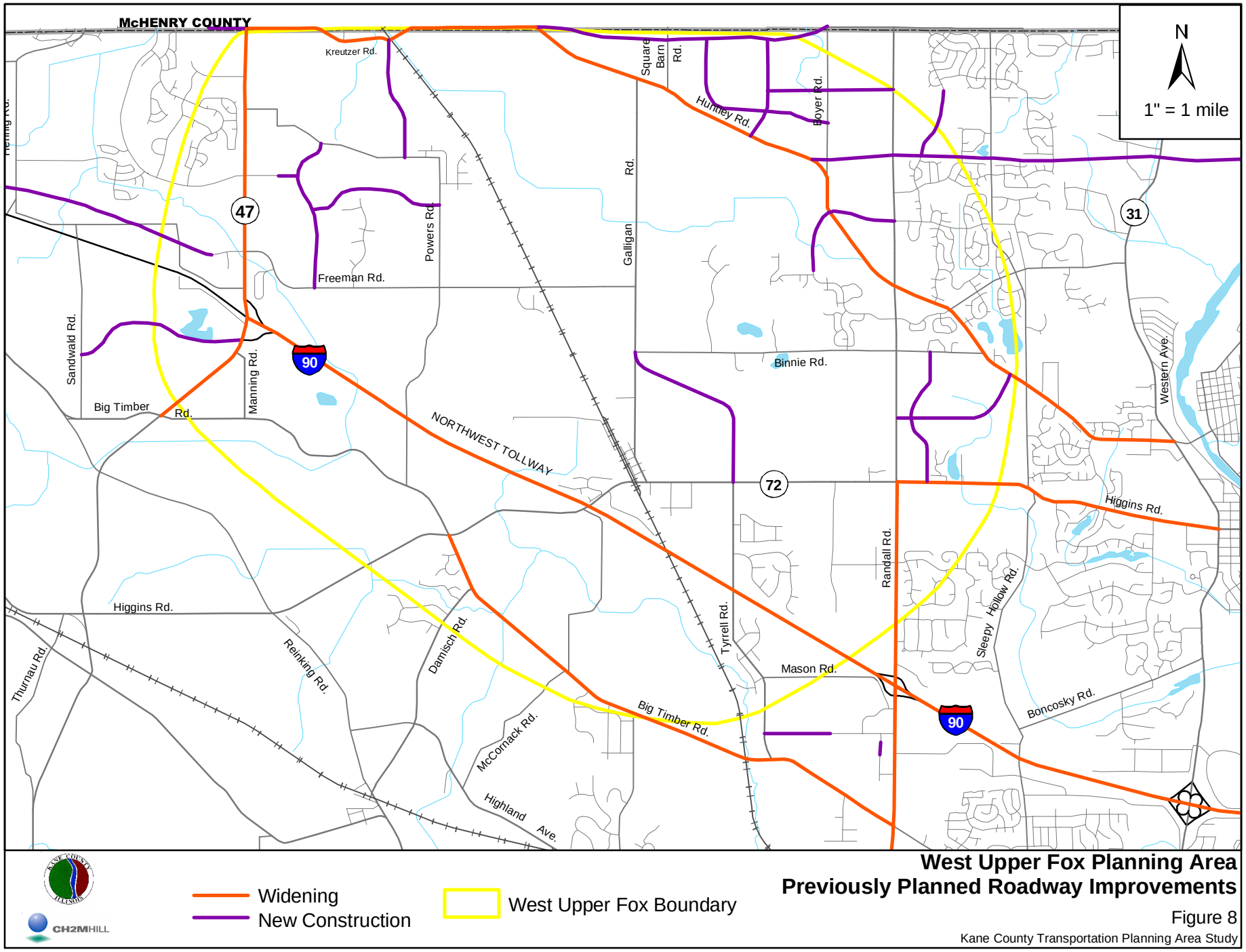
Public Transit, Bike and Pedestrian Facilities

The county and other agencies have already planned improvements to the area's transit, bike and pedestrian facilities. The Kane County 2020 Transportation Plan identifies a Metra rail extension in the West Upper Fox area along the Milwaukee District West rail line with new commuter stations at Gilberts and Huntley. No additional pace bus routes are planned for the West Upper Fox area. New bike / pedestrian trails in the West Upper Fox Area were identified in the Kane County 2020 Transportation Plan and the West Dundee Comprehensive Plan. Figure 9 illustrates the planned transit / bike and pedestrian improvements.

Plan Development Strategies

The development of a transportation improvement plan for the West Upper Fox area was accomplished using a toolbox approach. The basic implements in such a toolbox would be arterial improvements, new collector roads, regional connections, transit enhancements, bike and pedestrian paths, and access management strategies.

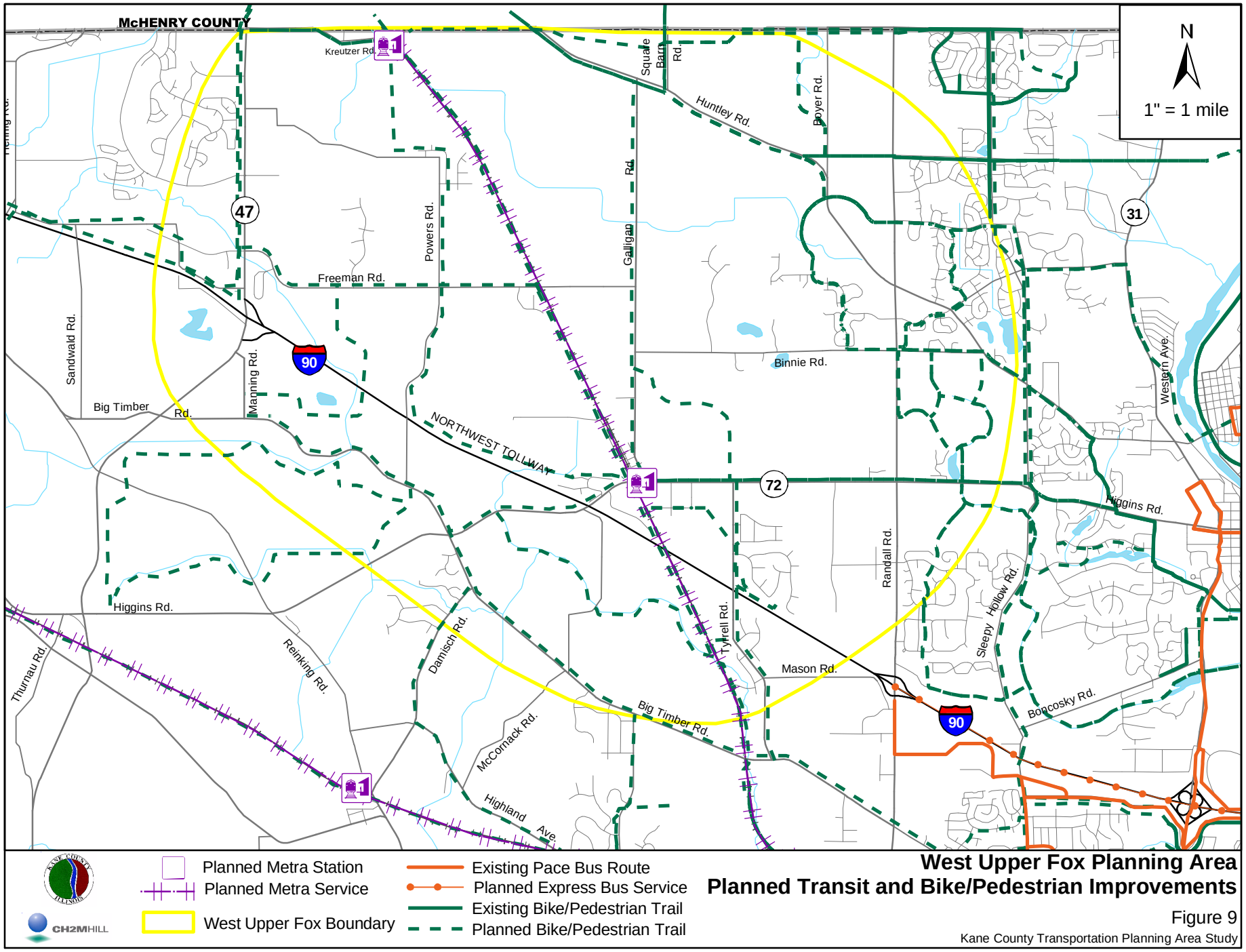
In the implementation of the toolbox concept, two basic strategies were explored to improve transportation service in the West Upper Fox area. One approach, referred to as the *arterial-based strategy*, would rely primarily on arterial improvements to upgrade transportation service. It would make use of a systematic screening approach to optimize the arterial highway network. The second strategy, referred to as the *collector-based strategy*, would rely primarily on a collector roadway network to distribute local trips in the area. The collector roads would also serve to relieve traffic on the arterial network.



West Upper Fox Planning Area
Previously Planned Roadway Improvements

Figure 8

Kane County Transportation Planning Area Study



West Upper Fox Planning Area
Planned Transit and Bike/Pedestrian Improvements

Figure 9
Kane County Transportation Planning Area Study

Arterial Based Strategy

The premise of the arterial-based strategy would be to create a network of arterials having sufficient capacity to meet anticipated traffic demand. The steps involved in applying this strategy are as follows:

- Identify potential arterial improvements
- Determine effectiveness of each individual improvement project
- Estimate the cost of each improvement project
- Develop an order of implementation that optimizes performance and cost

Identification of Potential Improvements. The base arterial network in the West Upper Fox area was assumed to consist of existing highways and those already committed for implementation. A list of potential additions to this network was developed beginning with planned but not committed arterial improvement projects (Table 1) and then adding other potential projects that appeared to be warranted based on future traffic demand. The resulting list of potential arterial improvement projects in the West Upper Fox area is shown in Table 2.

TABLE 2
Planned and Potential Major Improvement Projects in the West Upper Fox Area

Roadway	Improvement	Limits
Previously Planned Improvements		
I-90	Widening to 6 Lanes	Randall Road to IL 47
Randall Road	Widening to 6 Lanes	Big Timber to IL 72
Huntley Road	Widening to 4/5 Lanes	Kreutzer Road to IL 31
Big Timber	Widening to 4 Lanes	Randall Road to IL 72
Long Meadow Parkway	New Construction	Bolz Road to Huntley Road
IL 72	Widening to 4 Lanes	Randall Road to IL 31
IL 31	Widening to 4 Lanes	Huntley Road to Bolz Road
Potential Improvements		
North/South Connector	New Construction	Galligan Road to Coombs Road
Galligan Road	Widening to 4 Lanes	IL 72 to Huntley Road
Randall Road	Widening to 6 Lanes	IL 72 to Huntley Road
IL 72	Widening to 4 Lanes	Randall Road to Tyrrell Road
Tyrrell Road	Widening to 4 Lanes	Big Timber Road to IL 72

In addition, secondary roadway enhancements were considered including realignment of Binnie Road and Freeman Road, a connection between Tyrrell Road and Galligan Road, and a connection along the county line between Kreutzer Road and County Line Road.

Measures of Effectiveness. Six performance measures were used to evaluate the effectiveness of the roadway improvements in achieving the objectives previously stated. Four of the

measures were quantitative: vehicle hours of delay, weighted percent congested lane miles, percentage of lanes miles operating at LOS F, and distribution of local trips by facility type. Two of the measures were qualitative: connectivity to the roadway system, and the timing of roadway improvements relative to development trends.

Total delay was measured in vehicle hours of delay (VHD) summed for all roadways in the planning area including freeways and normalized using the number of lane miles. Delay is an important indicator of the quality of traffic operations, because it is most apparent to the driver.

The proportion of lane miles operating at LOS F and the weighted percent congested lane miles were used together to measure the level of congestion. The weighted percent congested lane miles measures the number of lane miles operating at LOS D, E, and F with relative weighting factors of 0.87, 1.0, and 1.2, respectively. The percentage of lane-miles operating at LOS F focuses on those roadways at the worst level of congestion. Often, a roadway enhancement may improve operation of a roadway segment from LOS F to LOS E. This change would not significantly affect the weighted percentage of congested lane miles, but a significant difference would be apparent when measuring only the percentage operating at LOS F.

Analyses of trip patterns evaluated the effectiveness of a roadway improvement in redistributing trips onto appropriate facilities. For example, through trips that are typically longer than local trips should use arterial and higher functional class roadways. Shorter trips should use the local and collector roadways. The distribution of trips by facility type was measured using the percentage of VMT by functional classification.

Connectivity is a qualitative measure indicative of the ability of the highway system to efficiently route traffic. Also, since one of the county's objectives is to stay ahead of development, the time when a specific development is expected to occur is considered important in prioritizing highway improvements. The effectiveness of a particular project in reference to the timing of related land use development would be a function of whether the development had already been built, was under construction, or was in the permitting or conceptual phases. It would be most advantageous if the implementation of transportation improvements preceded or accompanied the land use development.

Cost Estimates. Cost estimates for each of the individual improvements were determined using a cost model similar to that used for estimating the cost of Strategic Regional Arterials (SRAs). Costs were also applied to intersection and interchange improvements as well as for right-of-way acquisition. Appendix B presents a detailed explanation of the cost assumptions.

Optimizing Performance-to-Cost. The candidate roadway improvements were stratified into categories of major, secondary, or regional significance. See Table 3.

TABLE 3
Categories of Candidate Improvement Projects

	Improvement	Limits
Major Projects	I-90	Randall Road to IL 47
	Randall Road	Big Timber Road to Huntley Road
	Huntley Road	Kreutzer Road to IL 31
	Big Timber Road	Randall Road to IL 72
	IL 72	Tyrrell Road to IL 31
	Galligan Road	IL 72 to Huntley Road
	Tyrrell Road	Big Timber Road to IL 72
Secondary Projects	New Connection	Freeman Road to Binnie Road
	New Connection	Tyrrell Road to Galligan Road
	Along County Line (New)	Kreutzer Road to County Line Road
Regional Connectors	Long Meadow Parkway	Bolz Road to Huntley Road
	North/South Connector	Galligan Road to Coombs Road

At this point it was decided to create two arterial-based plans for the West Upper Fox area, one without modification of the Illinois Tollway (I-90), and another assuming tollway revisions. For reference, the plan without tollway improvements was termed “Plan 1” and the plan that incorporated tollway modifications was called “Plan 2.”

Next, a starting point was selected for developing each plan. The starting point would be the single improvement project that appeared to provide the greatest enhancement of performance for the cost involved. For Plan l (without tollway improvements), the starting point would be widening of Huntley Road from the county line to IL 31. For Plan 2, it was assumed that the tollway would be widened to six lanes between Randall Road and IL 47, and an interchange would be constructed at IL 72. The new interchange would be required since widening of I-90 alone would have little effect in the area unless access to the tollway was also improved. The starting point for Plan 2, therefore, would include widening of I-90 and a new interchange, as well as widening Galligan Road from IL 72 to Huntley Road.

For either Plan 1 or Plan 2 arterial-based strategy, the next step would be to test the effectiveness of the improvement selected as the starting point in combination with each of the other potential major improvements. The best combination would then be selected based on the MOEs described earlier compared to cost. The process would be repeated until significant additional benefit was not achieved by adding further improvements.

Finally, secondary and regional enhancements would be added to the plan and a concluding analysis would be made of the composite improvement plan.

Arterial-Based Plan 1 (without I-90 improvements)

Arterial-based Plan 1 was founded on the assumption that I-90 (tollway) would not be modified, and that the initial arterial improvement would be the widening of Huntley Road from the county line to IL 31. Examination of the operational effects of widening Huntley Road in conjunction with each of the other major potential arterial improvement projects resulted in selection of the widening of Randall Road to six lanes from Big Timber Road to Huntley Road as the second priority project. In a similar manner, widening of Galligan Road to four lanes from Gilberts to Huntley Road and then widening IL 72 to four-lanes from Tyrrell Road to IL 31 would follow as the third and fourth priority projects.

Three secondary road projects (a new connection between Galligan Road and Tyrrell Road, realignment of Freeman Road and Binnie Road, and a connection along the county line between Kreutzer Road and County Line Road) were then added to complete arterial-based Plan 1. See Figure 10. Total cost of the improvements described above would be approximately $125 million assuming full reconstruction of the arterials.

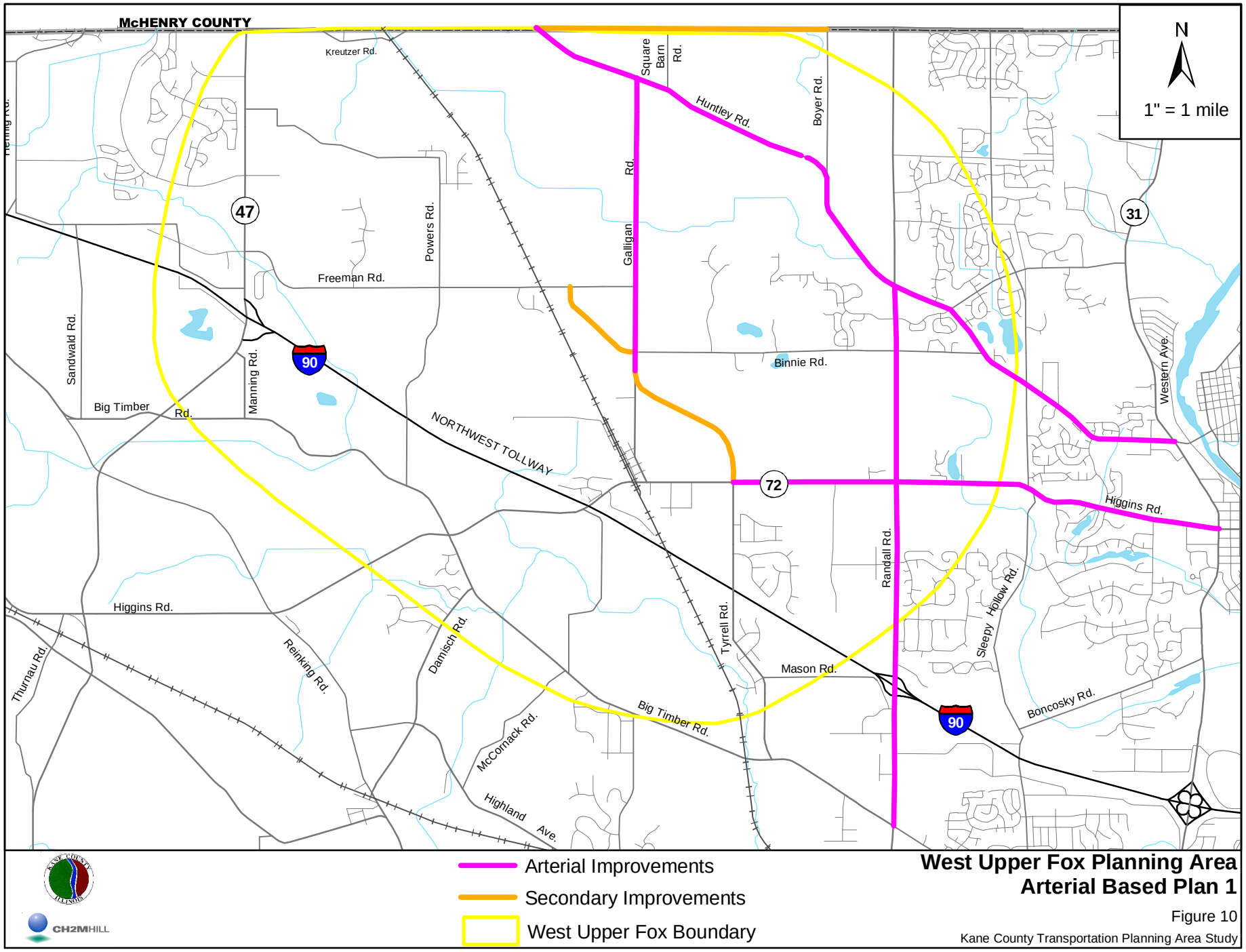
Figure 11 illustrates the change in various measures of effectiveness through each step in the plan development process. Values of the MOEs are plotted against the cumulative cost of the total program. Arterial-based Plan 1 would generally improve highway connectivity by increasing capacity on arterials in and through the West Upper Fox area. The daily areawide VHD per lane mile would improve from 39 VHD per lane mile to 20 VHD per lane mile, a 49 percent reduction. The weighted percentage of congested lane miles would improve from 88 to 80 percent. Plan 1 may also prove to be supportive of land development by adding roadway capacity in proximity to new development before it occurs. Plan 1 would not reduce the number of local trips on arterial roads, but would make the arterials more attractive for all types of trips. For example, the percentage of lane miles designated as arterials would increase slightly from 53 percent in the base case to 59 percent in Plan 1, but the percentage of VMT on arterials would remain nearly constant at 50 percent. Arterials would account only for 28 percent of VHD with Plan 1 compared with 48 percent in the base condition, thereby demonstrating the increased efficiency of the arterial system. A performance summary for Plan 1 is presented in Appendix C.

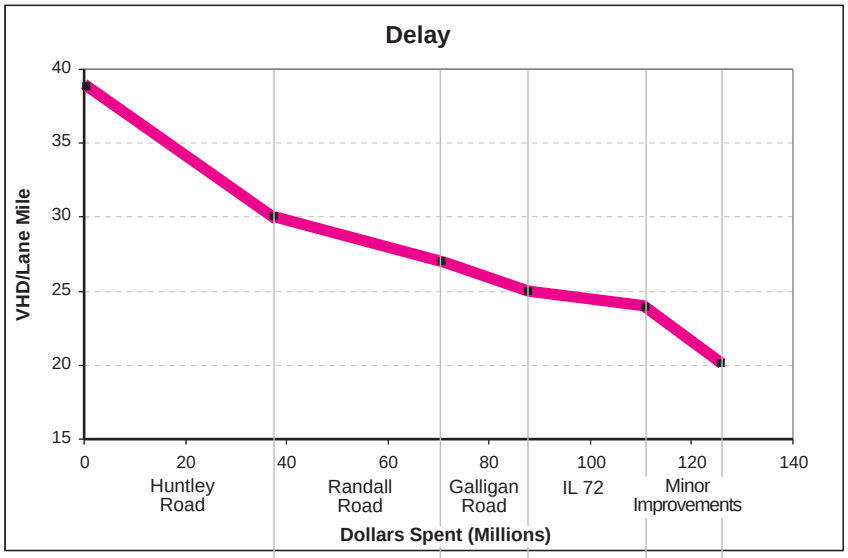
Arterial-Based Plan 2 (with I-90 improvements)

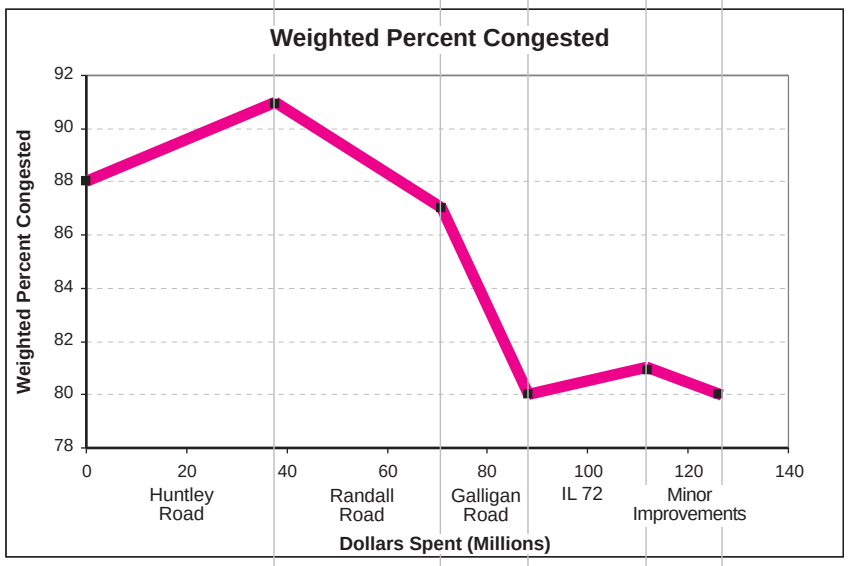
Arterial-based Plan 2 assumes that I-90 will be widened to six lanes between Randall Road and IL 47, and that a new interchange will be added at IL 72. The starting point for development of Plan 2 would be widening of Galligan Road from IL 72 to Huntley Road to provide the access required for the new interchange. Sequential improvements would be widening of Randall Road to six lanes from Big Timber Road to Huntley Road, and widening of Huntley Road from Kreutzer Road to IL 31.

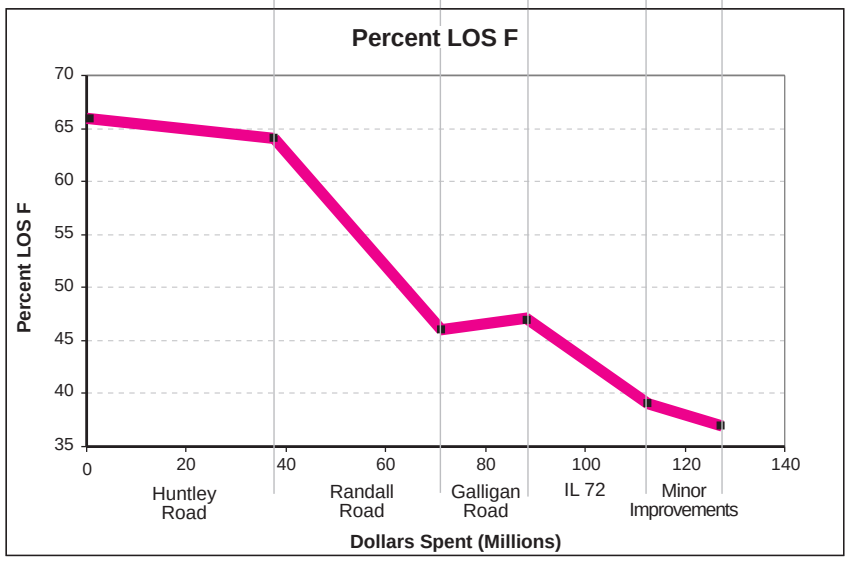
As in Plan 1, three secondary road projects (a new connection between Galligan Road and Tyrrell Road, realignment of Freeman Road and Binnie Road, and a connection along the county line between Kreutzer Road and County Line Road) would be added to complete arterial-based Plan 2. See Figure 12. Total cost of the improvements for Plan 2 would be approximately $140 million assuming full reconstruction of the arterials.

Figure 13 illustrates the change in various measures of effectiveness as plan development progressed, plotted against the cumulative cost of the set of roadway improvements.


McHENRY COUNTY
N
1" = 1 mile
Kreutzer Rd.
Square Barn Rd.
Huntley Rd.
Boyer Rd.
Galligan Rd.
Powers Rd.
Freeman Rd.
47
31
90
Sandwald Rd.
Manning Rd.
Big Timber Rd.
Binnie Rd.
Western Ave.
NORTHWEST TOLLWAY
72
Higgins Rd.
Randall Rd.
Sleepy Hollow Rd.
Tyrrell Rd.
Damisch Rd.
Reinking Rd.
Thurnau Rd.
Mason Rd.
Boncosky Rd.
Big Timber Rd.
McCornack Rd.
Highland Ave.
Arterial Improvements
Secondary Improvements
West Upper Fox Boundary
CH2MHILL
West Upper Fox Planning Area
Arterial Based Plan 1
Figure 10
Kane County Transportation Planning Area Study





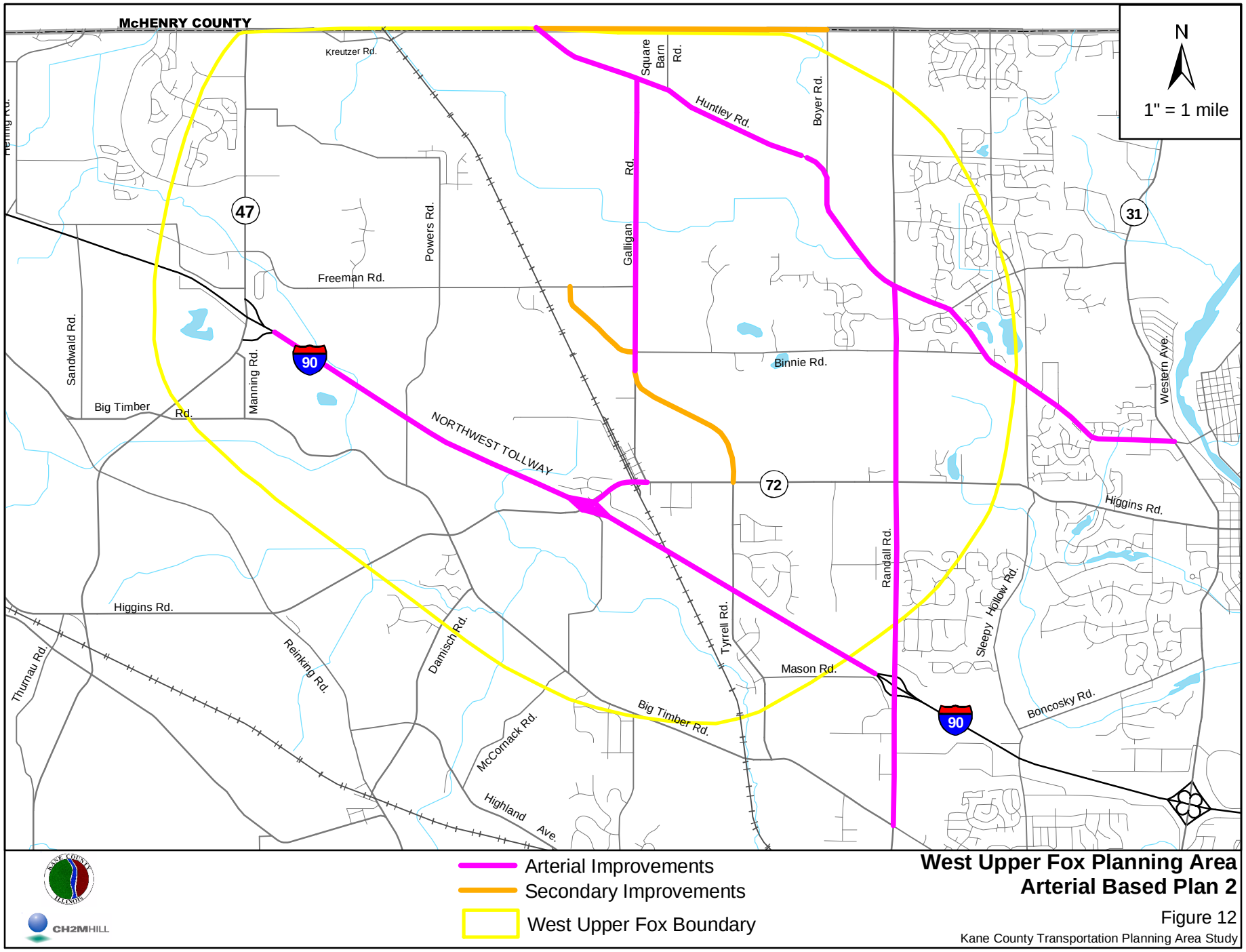


West Upper Fox Planning Area
Arterial Based Plan 1
Measures of Effectiveness

Figure 11

Kane County Transportation Planning Area Study

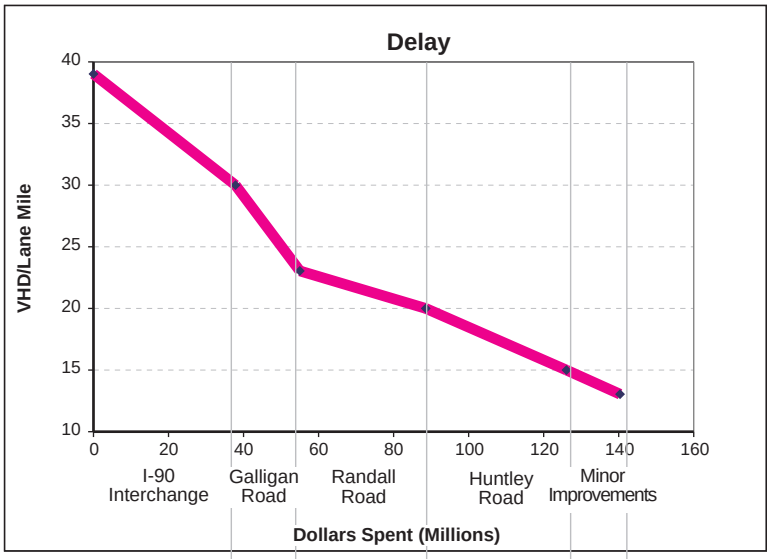
T161525.AA.07(.05) Alter_Base_Plan 11-13-01 lg

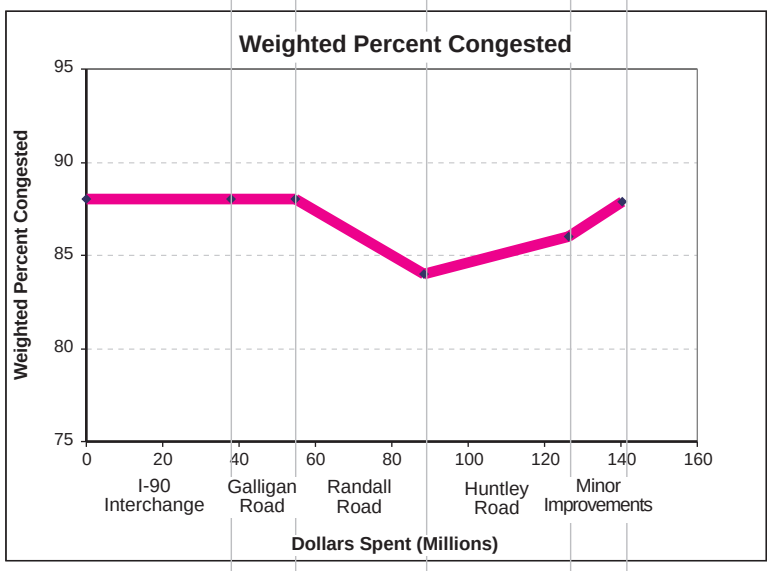


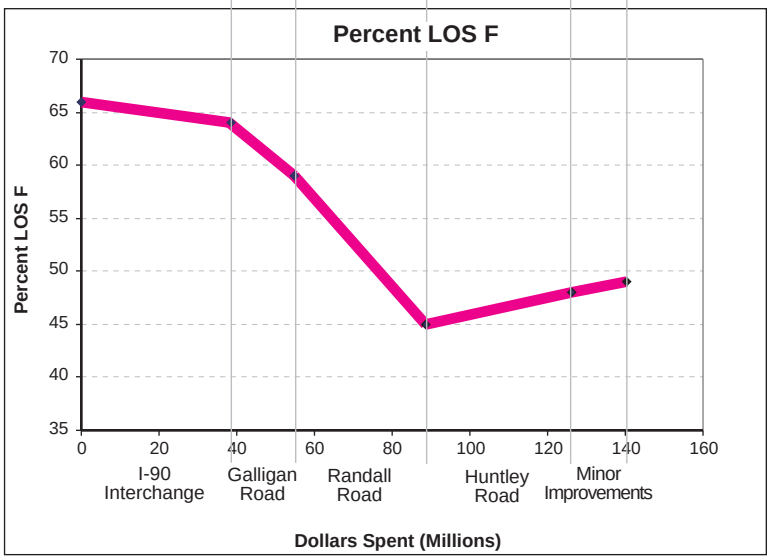
West Upper Fox Planning Area
Arterial Based Plan 2

Figure 12

Kane County Transportation Planning Area Study







West Upper Fox Planning Area
Arterial Based Plan 2
Measures of Effectiveness

Figure 13
Kane County Transportation Planning Area Study

T161525.AA.07(.05) Alter_Base_Plan_2 11-13-01 lg

Arterial-based Plan 2 would improve regional connectivity by adding improvements to I-90 along with a new interchange. Daily areawide delay would improve from 39 VHD per lane mile to 13 VHD per lane mile, for a 66 percent reduction in delay. However, the weighted percentage of congested lane miles (88 percent) would remain unchanged. Arterial-based Plan 2 would also accommodate development by adding roadway capacity in a timely manner. As with Plan 1, the improvements that are proposed for Plan 2 would not reduce arterial road usage by local trips given an increase in efficiency of the arterials. In addition, the arterials would carry 47 percent of daily VMT and account for 42 percent of daily VHD. A performance summary for Plan 2 is presented in Appendix D.

Collector Road Strategy

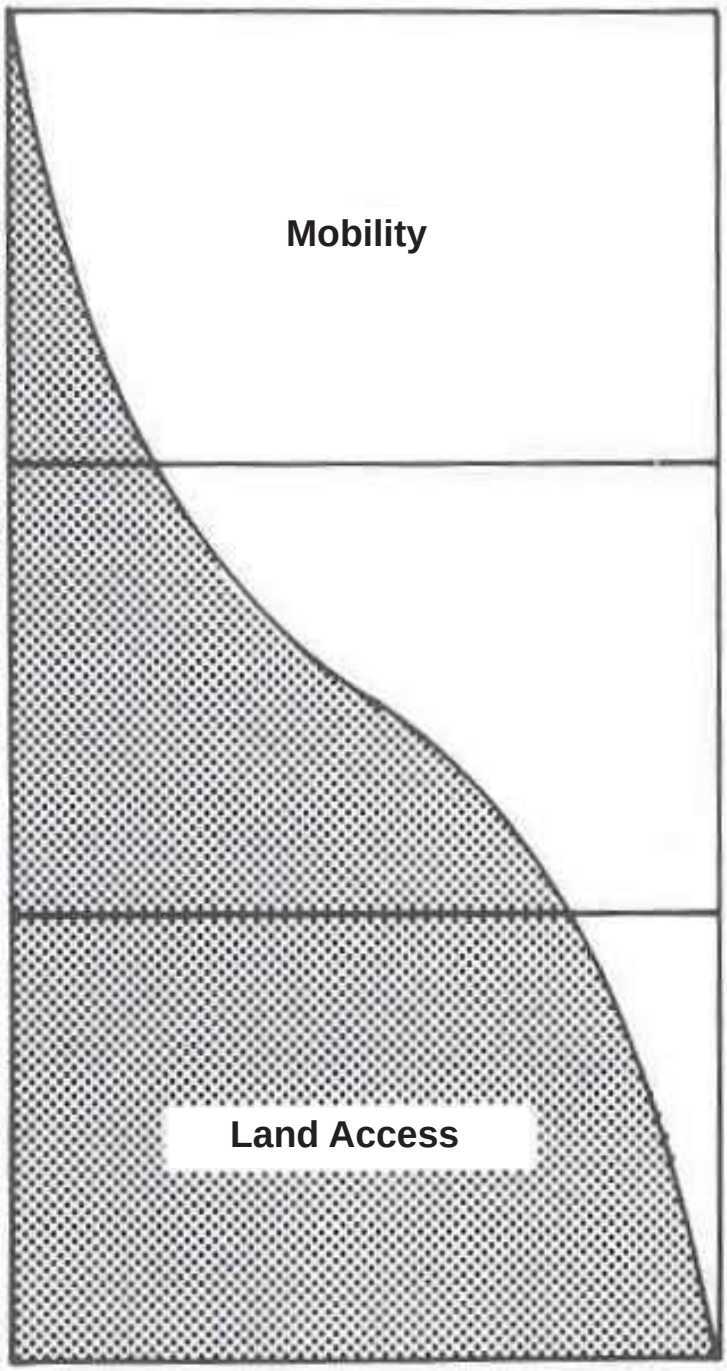
In contrast to the arterial-based strategies described above, a collector road network plan would attempt to accommodate as much of the travel demand as possible on a system of parallel collector roads rather than arterials. Whereas arterials are designed to primarily serve mobility needs, collectors serve a dual function of providing for mobility as well as access to abutting land uses. Figure 14 illustrates the role played by various functional classifications of highway.

An efficient and continuous collector road network would benefit the County. The collectors would be effective in removing local traffic from the arterial roads, thereby providing for enhanced mobility on the arterials. Collector roads would provide safe access to abutting residential areas and would help to control access onto the arterials. Also, the collector roads would provide an alternative route should an incident occur.

When modeling a collector-based transportation network, full efficiency was assumed. To ensure that the collector road system would operate at the highest level of efficiency, design of the collectors should conform to accepted standards for this type of roadway. The collector roads would provide two through lanes (one in each direction), with turn lanes as required and appropriate access control. It was also assumed that the collector road system would be continuous. A partial collector road network would not have the same impact as one that is fully developed. If any of these conditions were compromised, traffic diversion from the arterials would diminish. Figure 15 illustrates desirable collector road cross-sections.

Key to developing a collector-based plan is an understanding of the effectiveness of a collector network in diverting trips from the arterial system. To a large extent, diversion would be reliant on the proportion of trips that are captive to the arterial system. Longer regional trips would be unlikely to divert from the arterials, but shorter local trips might find a less congested system of collector streets more attractive than the arterials.

Local vs. Regional Trips. It was assumed that certain categories of trips using the arterial highways would not be diverted to a collector road network. For example, trips having an origin or destination outside of the influence area of an arterial would not be expected to divert to a collector system. These are referred to as “regional” trips and were assumed to be captive to the arterials. The estimated percentage of regional or captive trips on each of the arterials in the West Upper Fox area is shown in Table 4. The percentages of captive trips range from as high as 68 percent on a portion of Randall Road to only 14 percent on a segment of Galligan Road.



Arterials

Collectors

Locals

Source: A Policy on Geometric Design of Highways and Streets 2001

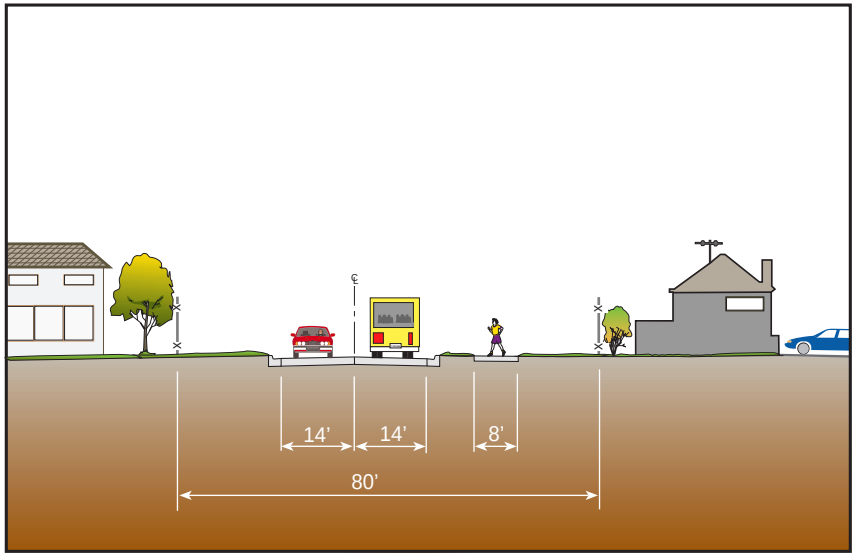
Access and Mobility Function of Highways

Figure 14
Kane County Transportation Planning Area Study

Three-Lane Cross Section

Open Drainage

Closed Drainage - Bike Path



Desirable Collector Road Cross Section

Figure 15
Kane County Transportation Planning Area Study

TABLE 4
Percentage of Captive Trips on Arterials in the West Upper Fox Area

Roadway	Location	Percent Captive
Randall Road	I-90 to IL 72	63
Randall Road	IL 72 to Binnie Road	56
Randall Road	Huntley Road to County Line Road	68
Galligan Road	IL 72 to Binnie Road	14
Galligan Road	Freeman Road to Huntley Road	34
Huntley Road	Boyer Road to Randall Road	19

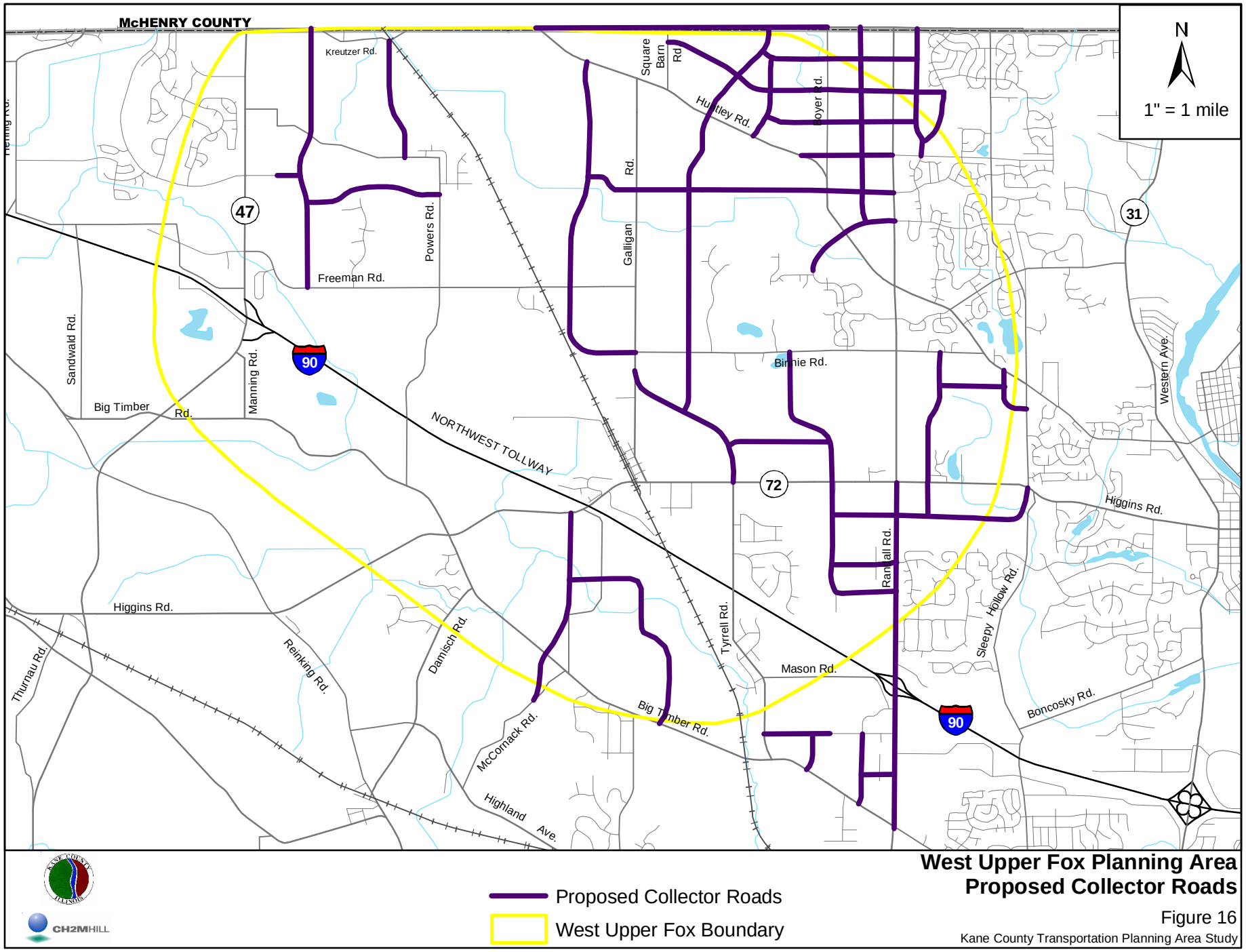
A collector-based transportation network for the West Upper Fox area is shown in Figure 16. Due to limitations of the travel-demand model, it was not feasible to incorporate all of the closely spaced collector roadways into the traffic assignment network. Instead, a skeleton collector network was incorporated into the model and adjustments were made to some of the centroid connectors to more accurately represent the traffic loading locations. The 2020 forecasted trip table was then assigned to the collector-based network and a comparison was made of the assigned volume on each arterial link versus the volume assigned without collectors. This difference was assumed to approximate the volume of travel that might be diverted from the arterials to collector roads. Table 5 shows the percentage of travel expected to be diverted from the arterial network to proposed collector roadways.

TABLE 5
Estimated Diversion of Travel from Arterials to Collectors

Roadway	Location	Percent Diverted
Randall Road	I-90 to IL 72	(16)*
Randall Road	IL 72 to Binnie Road	25
Randall Road	Huntley Road to County Line Road	21
Galligan Road	IL 72 to Binnie Road	64
Galligan Road	Freeman Road to Huntley Road	31
Huntley Road	Boyer Road to Randall Road	30

*Traffic would increase on Randall Road just north of I-90 because of diversion of some trips from adjacent corridors to the proposed collector roads. These collector road trips would divert back to Randall Road where the collector network ties back into the arterial. See Figure 16.

Collector-Based Plan Performance. The collector-based plan would improve local connectivity by adding an in-fill network to link up land uses throughout the area, but the addition of collector roads alone would do little to improve the regional connectivity. Daily systemwide VHD per lane mile would be reduced from 39 VHD for the base system to 22


McHENRY COUNTY
N
1" = 1 mile
Kreutzer Rd.
Square Barn Rd
Huntley Rd.
Boyer Rd.
Rd.
47
31
Powers Rd.
Galligan
Freeman Rd.
Sandwald Rd.
Manning Rd.
90
Big Timber Rd.
Birnie Rd.
Western Ave.
NORTHWEST TOLLWAY
72
Higgins Rd.
Randall Rd.
Sleepy Hollow Rd.
Higgins Rd.
Thurnau Rd.
Reinking Rd.
Damisch Rd.
Tyrrell Rd.
Mason Rd.
Boncosky Rd.
Big Timber Rd.
McCornack Rd.
Highland Ave.
Proposed Collector Roads
West Upper Fox Boundary
CH2MHILL
West Upper Fox Planning Area
Proposed Collector Roads
Figure 16
Kane County Transportation Planning Area Study

VHD for the collector-based system, or by 44 percent. The weighted percentage of congested lane miles would improve from 88 percent to 80 percent, approximately the same level of performance realized for arterial-based Plan 1. The proposed collector-based plan would also assist in establishing roads to connect future developments, and may even be partially constructed by the developers. The augmented collector road system would account for 48 percent of the area's lane-miles of roadway. The collectors would carry 19 percent of daily VMT and would experience 13 percent of the daily VHD on the highway system. A performance summary of the collector-based plan is found in Appendix E. Estimated cost of implementing the collector-based transportation plan in the West Upper Fox area would be approximately $160 million.

Comparison of Arterial-Based and Collector-Based Strategies

Either the arterial-based or collector-based strategies would ease congestion on arterial highways in the West Upper Fox area. The arterial-based strategy would do so by adding capacity to the arterial network, while the collector-based strategy would reduce arterial congestion by diverting travel from the arterials to collector roads.

Both strategies would be effective in accomplishing the objectives defined earlier. The arterial-based plans, especially Plan 2 which includes tollway enhancements, would improve regional connectivity, but would do little to improve local circulation. The collector–based strategy would provide local connectivity, but would not substantially benefit longer regional trips.

As shown in Table 6, the greatest reduction in vehicle hours of delay (VHD) per lane mile would be realized with arterial-based Plan 2 (which incorporates tollway improvements). The improvement of VHD in Plan 2, approximately a 67 percent reduction from the base case, would result largely from reduced congestion on the tollway. Arterial-based Plan 1 and the collector network would each result in about 50 percent less delay than the base network.

TABLE 6
Measures of Effectiveness for Alternative Transportation Improvement Strategies

Measure of Effectiveness (MOE)	Base Network	Arterial-Based Plan 1	Arterial-Based Plan 2	Collector Network
Vehicle-Hours of Delay (VHD)/Lane Mile	39	20	13	22
Percentage of Lane Miles at LOS F	66	37	49	44
Weighted Percentage of Lane Miles Congested	88	80	88	80
Percentage of VMT on Arterials/Collectors	50 / 9	50 / 10	48 / 9	41 / 19
Estimated Cost	N/A	$125 Million	$140 Million	$160 Million

The greatest reduction in percentage of lane miles operating at LOS F would be realized with the arterial-based Plan 1, followed by the collector network. Weighted percentage of congested lane-miles would be approximately the same for either the arterial-based Plan 1 or the collector network. The less apparent reduction in congestion for arterial-based Plan 2

would be a direct result of adding lanes to the tollway. However, although the additional lanes would serve to reduce delay, they would still operate at LOS F. There would be an increase, therefor, in both lane-miles at LOS F and the weighted percentage of congested lane miles.

Each of the plans would improve transportation service to new developments. The arterial-based plans would account for additional demand by adding more capacity on the arterials. The collector-based strategy would tie adjoining developments together and create alternatives for local trips. The collector-based strategy would also be most effective in diverting local trips from the more regionally based arterials.

The estimated cost of either of the plans would range from $125 million to $160 million. The most costly of the proposed plans would be the collector-based strategy due to an additional 43 route miles of new roadway needed to complete the network.

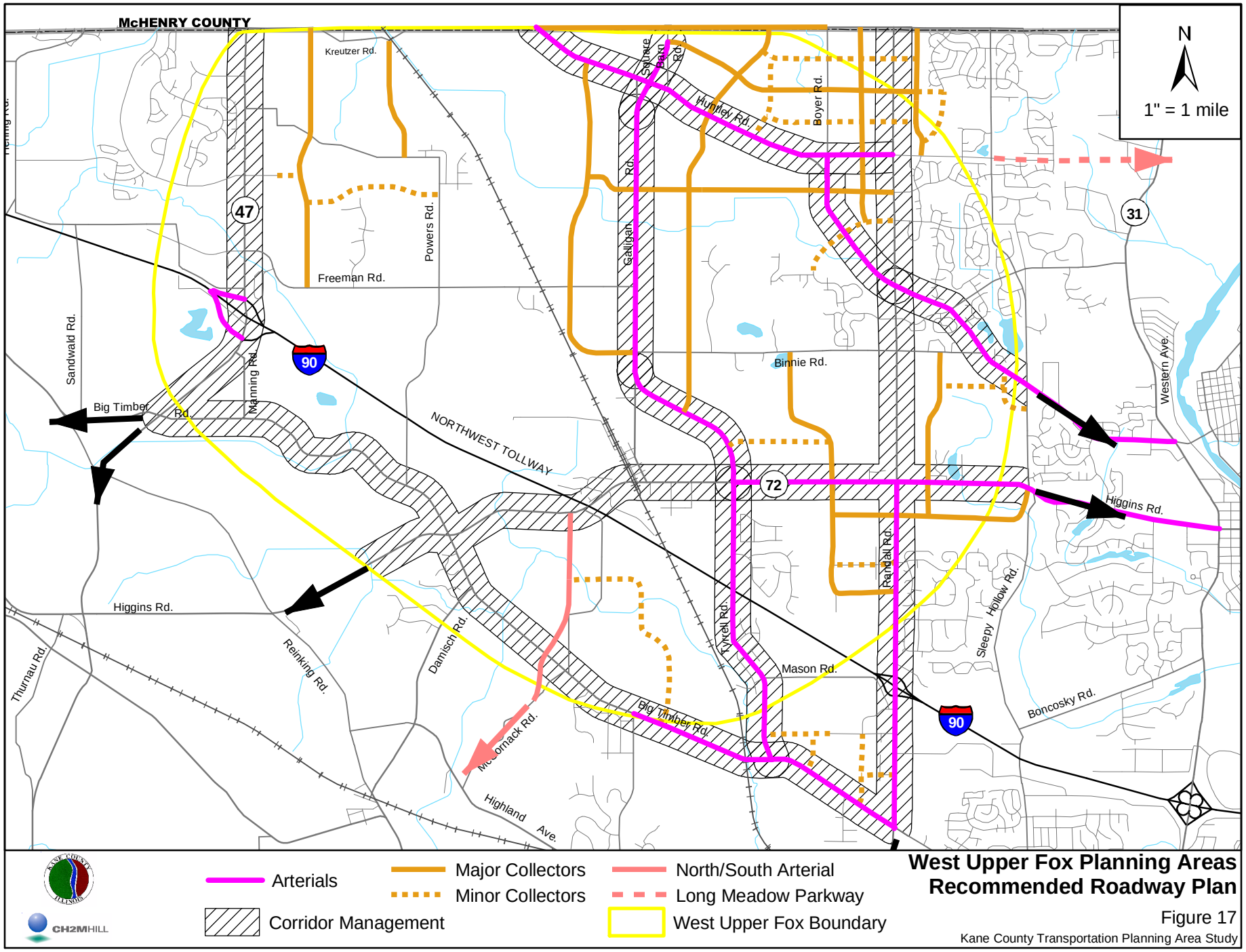
Recommended Plan

The recommended plan for the West Upper Fox area would encompass a full range of transportation solutions. Improvements would be made to both the collector and arterial systems to create a complete roadway network. The cost of the improvements would be distributed among the county and municipal agencies as well as to future development, creating a joint effort to improve transportation performance. Transit and pedestrian/bike trail improvements are also planned for the area. Additionally, the recommended plan would incorporate access management. The plan would recognize the importance of regional connectivity by incorporating improvements that are more regional in scope. Components of the recommend plan are illustrated in Exhibit 1 found in a pocket at the back of this document.

Collector Roadway Improvements

The foundation for the recommended plan is the establishment of an in-fill collector road network. The collector-based strategy affords several distinct advantages in this area of Kane County. Since the collector network would distribute traffic demand more evenly among the area's roadways, the existing arterial highways would be capable of functioning adequately over a longer time span. The implementation of a collector-based system would also provide an opportunity to shift some of the financial burden to developers and/or local governing bodies.

A comparison of the arterial- and collector-based strategies demonstrated the effectiveness of collector roads and helped to identify the level of improvement that the county could expect to realize. In order to maximize diversion of traffic from arterials to collectors, the collector network would need to be sufficiently complete and built to the recommended cross-section so as to afford a continuous and efficient alternative. Even then, not enough traffic would be diverted to the collectors to preclude having to widen parts of the arterial system to accommodate the projected growth in traffic. The collector road network might delay the requirement to widen some of the arterial highways, but would not totally prevent this need. Collector highways incorporated into the recommended plan are shown in Figure 17.



West Upper Fox Planning Areas
Recommended Roadway Plan

Figure 17

Kane County Transportation Planning Area Study

Arterial Roadway Improvements

In developing the recommended plan, the order of implementing arterial improvements, along with collectors was determined using the stepwise method developed for the arterial based plans and described earlier. With Galligan Road as a starting point, the proposed arterial improvements were prioritized in the following order

Galligan Road -- Eastern Bypass of Gilberts to Huntley Road
Big Timber Road -- Tyrrell Road to Randall Road
Huntley Road -- Kreutzer Road to IL 31
Randall Road -- Big Timber to IL 72
IL 72 -- Tyrrell Road to IL 31
Tyrrell Road -- Big Timber to IL 72

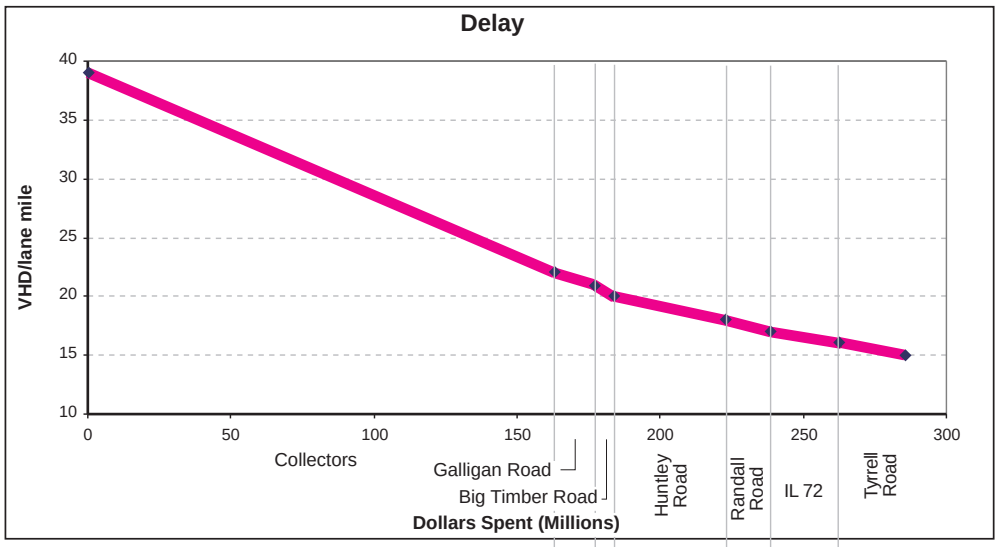
The order of implementing the improvements and the respective measures of effectiveness are shown in Figure 18.

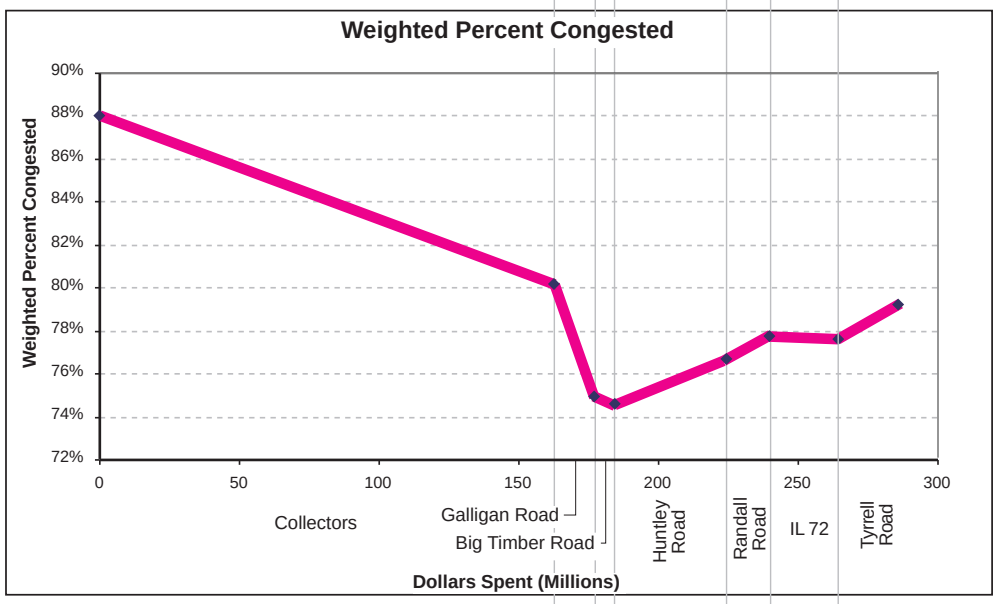
The Galligan Road / Tyrrell Road connection east of Gilberts as well as a new roadway segment between Huntley and Randall Roads would be upgraded to a four-lane arterial to complete the arterial system. Arterial roadway improvements that make up the recommended plan are also shown in Figure 17.

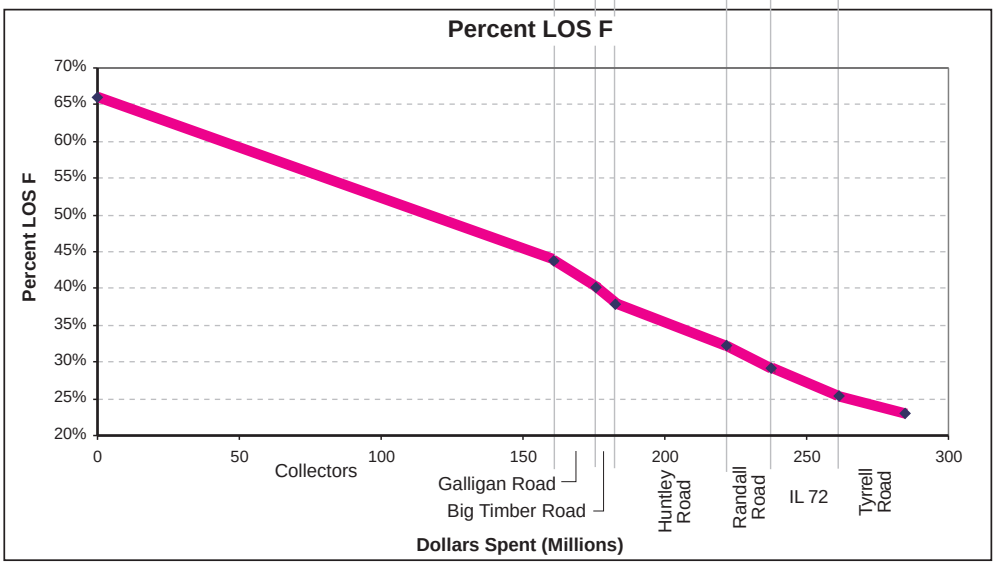
Table 7 identifies the improvement projects in the West Upper Fox Area. The overall recommended plan utilizes the Randall Road and parallel Tyrrell / Galligan Road combination to distribute north / south traffic, while east / west traffic would be distributed to Big Timber Road, Huntley Road, and IL 72. The collector roads provide an in-fill network to distribute traffic to local developments.

TABLE 7
West Upper Fox Roadway Improvements

Roadway	Location	Length (route-miles)	Type
Randall Road	Big Timber Road to IL 72	2.6	6-lanes
Huntley Road	Kreutzer Road to IL 31	6.1	4-lanes
Galligan Road	Gilberts Bypass to Huntley Road	2.3	4-lanes
Tyrrell Road	Big Timber Road to IL 72	2.2	4-lanes
IL 72	Tyrrell Road to IL 31	3.8	4-lanes
Big Timber Road	Coombs Road to Tyrrell Road	1.1	3-lanes
Big Timber Road	Tyrrell Road to IL 31	1.1	4-lanes
Huntley/Long Meadow Parkway Connector	Huntley Road to Randall Road	0.7	4-lanes
Galligan/Tyrrell Connector	Galligan Road to Tyrrell Road	1.2	4-lanes
North/South Connector		4.0	2-lanes
Long Meadow Parkway		2.3	2/4-lanes
Minor Collectors		19.6	2-lanes
Major Collectors		21.3	2-lanes







West Upper Fox Planning Area Recommended Roadway Plan Measures of Effectiveness

Figure 18

Kane County Transportation Planning Area Study

It is envisioned that along with the major improvements as listed in Table 7, other improvements such intersection capacity improvements would occur in preparation of or in conjunction with the proposed widening of the arterials and collectors. The location of these capacity improvements would be at the discretion of the County.

Regional Connections

The recommended plan would be completed with the addition of other improvements having a more regional need and effect. Such regional connections would include a north/south route between Randall Road and IL 47, the Long Meadow Parkway along with a new Fox River crossing, and the completion of the tollway interchange with IL 47. The addition of these improvements would not have a significant effect on traffic operational performance in the West Upper Fox area. The benefit of the proposed regional connections might be realized more prominently in other planning areas. Regional connectors would also serve to complete the countywide transportation system.

Performance and Cost

As arterial widening projects are added to the basic collector highway system, the daily vehicle hours of delay (VHD) per lane-mile would decrease from 39 VHD in the base case to 15 VHD with full implementation, or a reduction of more than 60 percent. The percentage of lane-miles operating at LOS F would experience a similar proportional decrease -- from 66 percent in the base case to 23 percent with implementation of the recommended plan. The weighted percentage of congested lane miles would decrease to 79 percent from 88 percent in the base condition. The area roadway system would consist of approximately equal proportions of arterials and collectors, 47 and 42 percent, respectively. However, arterials would carry a larger percentage of the daily VMT (44 percent) and would account for 19 percent of daily VHD, compared to just 17 percent of VMT and 9 percent of VHD on the collector roads. A summary of performance of the recommended plan is presented in Appendix F. Table 8 presents measures of effectiveness of the recommended plan along with comparative values for the future base condition.

TABLE 8
Comparison of Transportation Performance – Recommended Plan and Base Network

Measure of Effectiveness (MOE)	Base Network	Recommended Plan
Vehicle-Hours of Delay (VHD)/Lane Mile	39	15
Percentage of Lane Miles at LOS F	66	23
Weighted Percentage of Lane Miles Congested	88	79
Percentage of VMT on Arterials/Collectors	50 / 9	44 / 17
Estimated Cost	N/A	$210 - 290 Million

After implementation of the recommended plan, much of the remaining system delay would be experienced on the tollway, which would still operate at LOS F. Because the Tollway Commission has its own decision making process, toll highway improvements were not included as components of the recommended plan.

Estimated total cost of the recommended transportation improvements (construction and right-of-way) in the West Upper Fox area would amount to approximately $290 million. This includes $160 million for development of the collector road network and $130 million to reconstruct portions of Galligan, Big Timber, Huntley Randall, Tyrrell Roads and IL 72. Widening the arterials, as opposed to full reconstruction, would save $80 million, which would bring the total to $210 million. It is expected that developers and / or local municipalities would construct or contribute financially to a large share of the collector roads. County road widening would be accomplished utilizing a variety of funding sources including development impact fees. IL 72 is a state highway that would be widened as part of IDOT's capital improvement program. The cost estimate pertains to arterial and collector road improvements, but excludes the cost of regional connections, transit, and bike / pedestrian facilities.

The access control plan and the right-of-way guidelines would apply to roadway projects along with capacity and safety improvements. The latter encompass upgrades to signals or addition of new signals to improve capacity and safety at intersections. Additional turning lanes may also be provided.

Public Transit, Bicycle, and Pedestrian Facilities

The recommended public transit plan incorporates improvements already planned by Metra and Pace. As of the time of this study, Metra has an on-going feasibility study of the Milwaukee District West line extension from Big Timber Road to Huntley Road including a proposal for new stations at Gilberts and Huntley. The recommended plan incorporates these transportation improvements, but would conform to recommendations of the Metra study if plans for the commuter rail line extension are altered or the project is deemed to be infeasible. Ample parking would be provided at each station in conjunction with the rail line improvements.

General recommendations for improvements to Pace bus service include bus pullouts, bus prioritization, and the proposal for express bus service on I-90 to Randall Road. In addition, on-demand paratransit bus service has been proposed for the West Upper Fox area.

Bike / pedestrian proposals incorporate all previously planned improvements as well as bike paths along newly developed collector roadways. The proposed bike trails would be consistent with the recommendations of the countywide bike trail project that is being completed by the KCDOT. For improved safety along the proposed bike trails, bridges or underpasses should be considered at crossing with major roadways in the area. Other safety improvements incorporated in the bike / pedestrian trails would include clearly visible crossings with pedestrian buttons and signals incorporated in the intersection control. Bike / pedestrian trails also are proposed for additional connections to possible Metra extensions. Figure 9, presented earlier, illustrates proposed public transit, bicycle, and pedestrian improvements.

Access Management Plan

In order to achieve maximum benefit, transportation improvements in Kane County should be accompanied by an access management plan. The Federal Highway Administration (FHWA) defines access management as "the process that provides access to land development while simultaneously preserving the flow of traffic on the surrounding system in terms of

safety, capacity, and speed." Properly implemented access management will improve traffic operations, increase highway safety and minimize adverse environmental impacts.

The access management plan would consist of an access control policy and the provision of intersection capacity enhancements at critical locations throughout the study area. Kane County has an existing access control policy,[2] but the only roadway in the West Upper Fox area included under the policy is Randall Road.

According to the county's access control regulations, there are three areas in which the techniques and policies of access control are to be applied:

- the roadway,
- the access point , i.e. the driveway, and
- abutting property and its associated development.

Roadway safety and capacity are adversely affected by uncontrolled or poorly designed turning and cross traffic operations. These operations can be controlled through the development of turning lanes, medians, turning restrictions, traffic signals, and roadway lighting.

The policy also provides that an access point (driveway) or system of access points must be located so as to provide:

- the most favorable vision, grade and alignment conditions for users of the roadway and access point,
- no undue interference with the free and safe movement of roadway traffic, and
- maximum safety and convenience for pedestrians and other users of the roadway right-of-ways.

The county has policies regarding the number of access points, the location of access points, and internal circulation within a development. Providing adequate internal circulation within a development aids in the operation of major facilities. Finally, the access policy includes guidelines for development characteristics of abutting property regarding land use, internal circulation, aesthetics, and pedestrians / mass transit. Appendix G provides more detailed information regarding the Kane County Access Control Policy.

As noted, the Kane County access control policy applies to Randall Road in the West Upper Fox area. It is suggested that the policy be amended to include all arterials within the area. Each of these is presently classified as a minor arterial except Tyrell Road, which is a collector. It is recommended that the functional classification of each be changed to arterial. It is also recommended that Kane County work with the Illinois Department of Transportation (DOT) to define access control on IL 72 and IL 47.

Although collector roads in the West Upper Fox area are not in the county highway system, a means would be required to extend the access guidelines to cover collector roads. The recommended transportation improvement plan for this area, which relies heavily on a

[2] *Access Control Regulations for County Designated Freeways*, Kane County Division of Transportation, Last updated 3/14/89. (Note: the term "freeway" does not correspond with the functional classification described in this report.)

network of collector roads as well as arterials, will not function efficiently unless access management is imposed throughout the collector roadway system.

Access spacing should recognize that access and mobility are competing functions. Kane County's highways, which are functionally classified as principal arterials, minor arterials, or collectors, evidence this recognition. Highways classified as principal arterials provide mainly for mobility of through traffic. Minor arterials provide both functions. Two designations are suggested for the collector roads; major collector and minor collector. The major collector roads would serve to collect and distribute traffic between the local roadway system and arterials. The predominant role of minor collector roads would be to provide good access to abutting land uses and provide for inter-neighborhood traffic movement. Each class of roadway has its own geometric, traffic control, and spacing requirements. Table 9 provides an example of driveway spacing requirements as specified in a sample county access management ordinance found in the *Access Management Handbook* prepared by the State of Iowa.

TABLE 9
Sample Access Control Guidelines[1]

Roadway Category	Permitted Access	Driveway Spacing (ft)	Corner Clearance (ft)[a]
Local	All properties	no standards	10
Minor Collector	All residential, commercial & industrial uses, greater than or equal to 70 feet frontage[b]	no standards	50
Major Collector	All commercial, industrial, and institutional uses, greater than 150 feet frontage[c]	100	100
Minor Arterial	Collector roads and private direct access	600	600
Major Arterial	Collectors, minor arterials, and private direct access	1,000	1,000

[1] Iowa – Access Management Handbook, Appendix B

[a] Access near an intersection shall be located beyond the influence of standing queues; this requirement may result in a greater corner clearance than the minimum distance indicated.

[b] Uses with less than 70 feet of frontage shall not be permitted a permanent single or separate access; common (joint) access shall be used where available.

[c] Uses with less than 150 feet of frontage shall not be permitted a permanent single or separate access; common (joint) access shall be used where available.

Right-of-Way Guidelines

Right of way guidelines have been defined by functional class to ensure appropriate land acquisition for future widening of roadways. Also, the right of way guidelines establish adequate set backs from the roadways. The guidelines were created using input from the county. Acquisition of right of way could occur before widening is warranted. This early acquisition allows for land to be set aside before development occurs. Table 10 shows the right-of-way guidelines by functional classification.

TABLE 10
Right-of-Way Guidelines

Functional Classification	Right-of-Way
SRA – Major Arterial	170’
Minor Arterials	120’
Collectors	80’

Constraints

At this stage in the development of roadway improvements a detailed assessment of environmental impacts was not warranted. It was still deemed important, however, to consider environmental issues at the commensurate level of detail afforded by the available data. To this end, the recommended plan took into account the impact of major environmental factors in the developmental stages of the process. A more detailed assessment of environmental issues in terms of avoidance and mitigation will be required as each of the projects enter into the design phase.

A general environmental impact assessment was conducted by comparing the proposed improvements to the environmental features in the study area. As shown in Figure 19, the potential impact to sensitive environmental features are highlighted. The areas that are circled do not represent a delineation of the potentially impacted area, but merely show the location of critical areas of concern. One of the locations pertains to the North / South arterial. This proposed roadway was shifted east to avoid the larger area of flood zone and hydric soils. The three remaining areas, relate to potential impacts either a tributary of the Kishwaukee River or the Huntley marsh. The north-south and east-west proposed collector as these locations would need to be evaluated further to evaluate the feasibility and cost of these improvements. The location of these collectors roads were modified to minimize potential impacts.

Public Agency Involvement

Numerous meetings have been conducted as part of this planning effort. Initially, both the Technical Advisory Committee (TAC) and the Planning Area Group (PAG) were presented with a conceptual framework of the planning process. Next, a set of meetings were conducted with the municipalities and townships within and surrounding the study area. These meetings were used to achieve an understanding of future planning activities of each municipality and to discuss the planning process for this project.

Upon completion of a draft of the West Upper Fox area plan in December 2001, another series of meetings were conducted to review the plan, ask questions, and provide input. Along with the municipalities and townships, the following groups and organizations were presented with the draft plan.

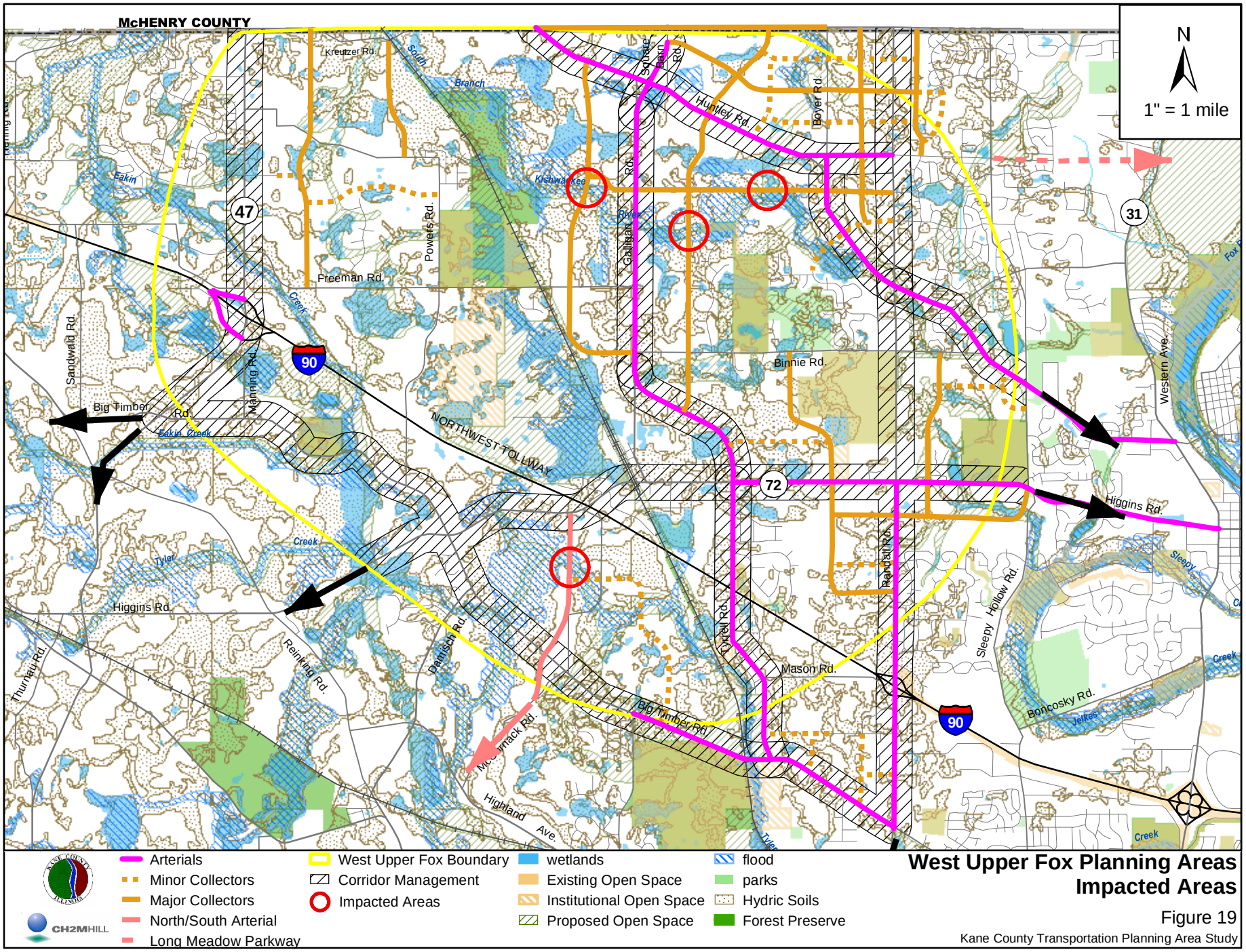
- Technical Advisory Committee
- West Upper Fox Planning Area Group
- Kane County Transportation Committee
- Kane County Council of Mayors Association

- Kane County Regional Planning Commission
- Binnie Hills Home Association

All comments received during these meetings were taken into consideration and assisted the project team in the development of the recommended plan.

Implementation

The recommended plan has been formulated to evolve in conjunction with land development in the West Upper Fox area. The intent of the planning process was to anticipate the amount and location of future developments in order to provide for construction of infrastructure improvements at the same time development occurs. The need for roadway improvements will have to be reevaluated if changes in development patterns result in less density in certain areas. In such instances, it may be found that some of the planned improvements are not needed. The collector roads that have been described as part of the area plan should be constructed along with development. However, it should be recognized that, in order to fully maximize the use of the collector roadway system, related arterial roadway improvements also will need to be complete. Widening projects should also be accomplished in conjunction with associated development. The entire development program must be flexible enough to adapt to change if or when development proposals are modified.



West Upper Fox Planning Areas
Impacted Areas

Figure 19

Kane County Transportation Planning Area Study

Appendix A

Socioeconomic Data for the West Upper Fox Area

APPENDIX A

Socioeconomic Data for the West Upper Fox Area

Data gathered from the municipalities was used to evaluate the projections of households and population within the study. The Comprehensive Plans were used to determine how at a local level the affect of projected development compared with regional socioeconomic projections (2020) by the Northern Illinois Planning Commission (NIPC) by TAZ. The first step in the process was to determine which proposed developments would be incorporated into the planning process. Some of the developments were already being considered for approval by the respective municipalities, others were more speculative. Through discussions with the county and municipalities, decisions were made as to which developments were to be included in the development of the area plan. These assumptions were critical, in that, the assumed development would influence the amount of traffic that would generate in the future. Ultimately, the level of development would translate to a measurable impact onto the transportation infrastructure.

Once the set of developments was agreed upon, the next step was to determine the number of households in each development. As mentioned before, some of these developments were already platted so the number of units were provided. In other instances, the only information available was gross developable area and the type of development. For these developments, assumptions were made to determine the number of households. Once all of the information was processed, comparisons were made between the sets of socioeconomic data. For a majority of the study area, the 2020 forecasts of households and population were accounted for by TAZ. At some locations, it appeared that the assumed development exceeded the 2020 regional socioeconomic forecasts and modifications were made to the NIPC data. Table A-1 shows the assumptions used for the developments that exceeded the original forecasts.

TABLE A-1
Development Assumptions

Development	Location	Acreage	Density	Households
Pulte Homes	Huntley Road & Boyer Road			458*
Neuman Homes	Along Galligan Road between Freeman Road & Huntley Road	658.9	1.5	988
		339.6	2.3	781
		224.1	2.9	650
Neuman Homes	Galligan Road & Binnie Road	196.5	2.9	570
Neuman Homes	Galligan Road & IL 72	56	4.6	258

* Number of Households was provided as part of development plan.

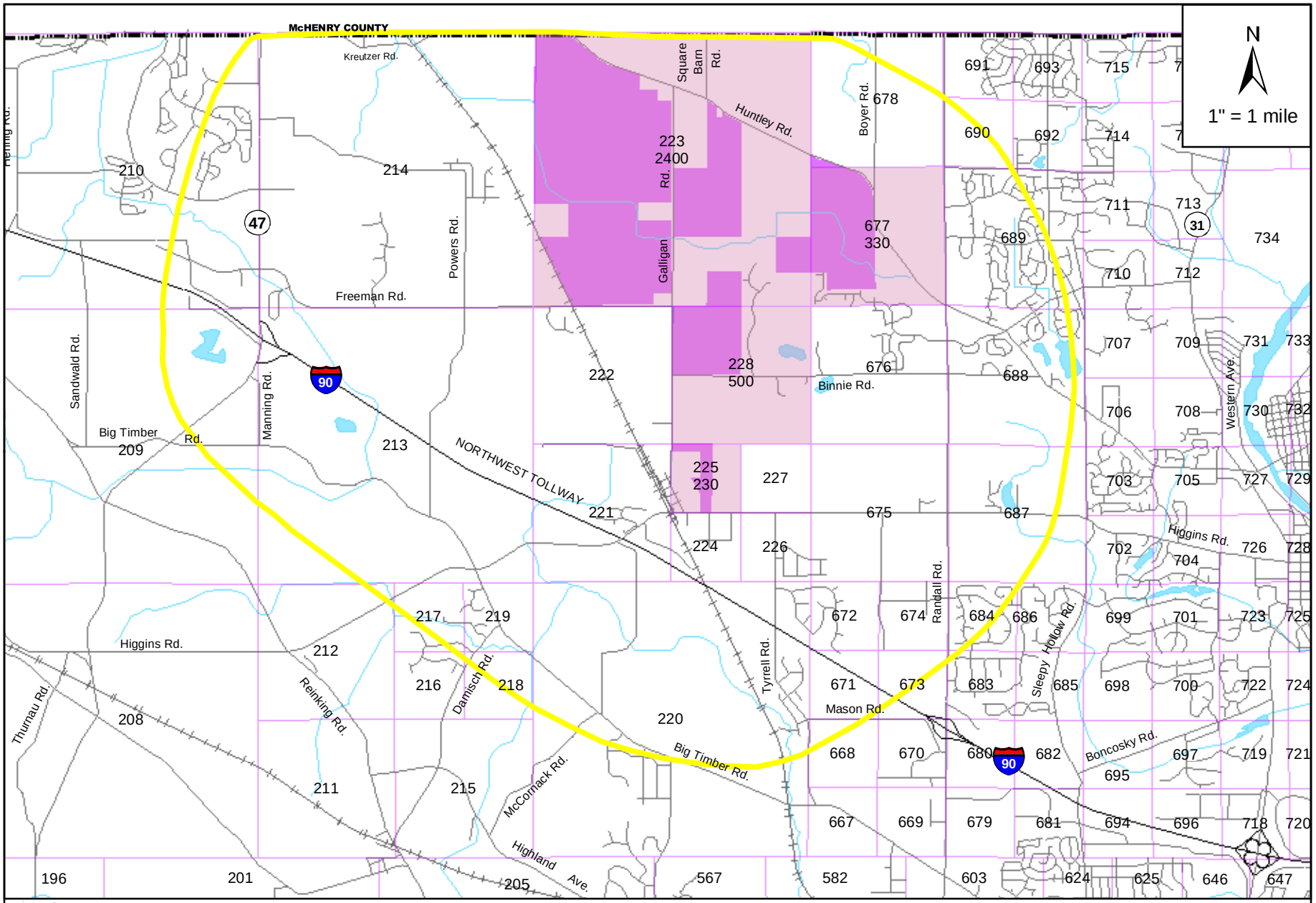
This information was then added to the NIPC data as shown in Table A-2. The table includes the original 2020 household and population forecasts along with what was added to the TAZ as a result of additional development. The location of these changes is illustrated in Figure A-1.

TABLE A-2
Socioeconomic Assumptions by TAZ

	2020 forecasts by TAZ		Added	
Zone	**Households**	**Population**	**Household**	**Population**
209	228	602		
210	6873	17515		
213	60	174		
214	202	589		
217	494	1430		
218	562	1617		
219	26	117		
220	2168	6505		
221	188	459		
222	38	110		
223	67	209	2400	6648
224	0	0		
225	34	78	230	637
226	93	291		
227	2	5		
228	67	202	500	1385
671	0	0		
672	160	490		
673	793	2267		
674	0	0		
675	828	2367		
676	859	2651		
677	132	432	330	914
678	13	43		
684	197	583		
687	195	561		
688	1079	3411		

TABLE A-2
Socioeconomic Assumptions by TAZ

	2020 forecasts by TAZ		Added	
Zone	**Households**	**Population**	**Household**	**Population**
689	509	1709		
690	541	1668		
Total	**16408**	**46085**	**3460**	**9584**



West Upper Fox Planning Area
Population Added by TAZ

Figure A-1

Kane County Transportation Planning Area Study

Appendix B
Cost Model

APPENDIX B

Cost Model

Introduction

This memorandum describes a construction and right-of-way cost estimation methodology developed by CH2M HILL for the study of the Strategic Regional Arterials (SRA) in northeastern Illinois. Note that since the projects being considered in Kane County are pre-Phase 1 types of improvement, the cost estimating methodology need not be as detailed as for preliminary engineering. Costs have been updated to 2001 dollars.

First, the cost items that are to be used are described, and then the methodology, documentation, and quality control procedures are explained.

Construction Costs

The construction cost methodology utilizes the following items: roadway, resurfacing, new structures, structure widening, intersections, interchanges, and retaining walls.

Roadway

The roadway cost item is measured in miles. It is meant to include the costs of upgrading the existing roadway to the proposed cross section, and constructing segments on new alignment. The roadway costs include reconstruction of the existing roadway due to the limited service life of the existing pavement, as well as the costs for earthwork, drainage, landscaping, etc. Where an urban arterial is proposed, with a cross section that is identical to that of the existing, resurfacing should be assumed (see next section), rather than reconstruction. In addition, a cost for widening the existing arterials instead of reconstruction was done for comparative purposes. As a general guideline, a unit cost of 0.5 million per lane mile was assumed as was confirmed by County staff.

The length of roadway to be measured is the centerline length, including through intersections and interchanges, but excluding segments on long bridges (longer than 500 feet).

Table B-1 shows construction costs in millions of dollars per mile based on the number of lanes on the existing road, if any, and the number of lanes and cross section type for the proposed route. Costs for suburban arterials with open drainage (outside shoulders instead of curbs) are also included. The table was developed to be used for the construction of 4-lane and 6-lane turning roadways and cross street realignments. Two-lane roadway costs are shown as being one-half the applicable 4-lane cost.

Structures

Cost of each new or widened structure should be estimated separately, except when part of an interchange. Estimated costs for interchanges will include all associated structures.

TABLE B-1
Cost Estimate for Roadway Construction/Reconstruction on Existing Cross Section

Proposed Cross Section	Cost ($ Millions per mile)		
	0–3 Lanes	4 Lanes	5 Lanes
Rural Arterial			
4 Lane	4.5	3.75	—-
6-Lane	5.25	5.25	4.5
Suburban or Urban Arterial			
4-Lane	5.25	4.5	—-
6-Lane	6.75	6.75	5.25
Suburban Arterial with Open Drainage			
4-Lane	5.0	4.0	—
6-Lane	6.0	6.0	5.0
Two-Lane Roadways			
Rural	2.25	—-	—-
Suburban or Urban	2.5	—-	—-

There may be situations where it appears that an existing structure can remain in use, perhaps with some widening. An example is the situation where one of the roadways can use an existing structure, while a new structure is constructed for the other roadway. However, due to the limited service life of structures, it should be assumed that some of these structures would be replaced. The smaller, more inexpensive structures should nearly always be replaced. Judgement should be used, however, for deciding whether to assume replacement of long, expensive structures whose horizontal and vertical alignments are consistent with the proposed highways.

New Structures

Table B-2 shows the estimated costs of new structures in millions of dollars, based on the number of lanes on the structure and the number of lanes spanned by the structure. If a median is carried by the structure, its width should be converted to an equivalent number of lanes. Similarly, medians that are spanned should be included. Shoulder and sidewalk widths should not be added, however, since they are already assumed to be included in the structure costs.

Railroads that are spanned can be treated as having two equivalent lanes per rail line. The widths of medium-sized rivers can also be converted to equivalent numbers of lanes for cost estimation purposes.

Table B-2 also supplies costs for short structures used for spanning minor water courses. For new structures longer than 200 to 250 feet, the estimated construction cost should be based on the bridge deck area, in square feet, as noted in the table.

TABLE B-2
Cost Estimate for New Roadway Construction/Reconstruction

Equivalent Number of Lanes Under	Cost ($ Millions per mile) Equivalent Number of Lanes Over 2–3 Lanes	4–5 Lanes	6–7 Lanes
2 to 5	1.0	2.0	3.0
6 to 7	2.0	3.0	4.0
Structures Over Minor Waterways	1.0	1.0	1.5

Note:
Structures that are part of interchanges are not costed separately. Equivalent lanes refer to travel lanes and medians only. See text. For extra long bridges (over 200 feet), use $75 per square foot of assumed deck

Widened Structures

The costs for widening existing structures is shown in Table B-3, on the basis of the square feet of deck area being added to the bridge. The widths of any medians, shoulders, and sidewalks should be included when determining the area of widening.

TABLE B-3
Cost Estimate for Widening of Structures

Item	Cost ($ per square foot of widening)
Widening of Structure	$150

Intersections

Some at-grade intersections are to have costs attributed to them that are over and above the per-mile roadway costs, which have already, been described. The intersection costs are meant to allow for the costs of signalization and additional turn lanes and/or through lanes.

Only three types of intersections are to have additional costs attributed to them. They are:

- Intersections with another arterial;
- Existing unsignalized intersections at which new signalization is proposed; and
- Newly proposed intersections at which signalization is also proposed, including turning roadway/cross street intersections.

No costs should be added for interchange ramp intersections, however, since those costs are included in the interchange cost estimate.

Costs of intersection improvements that are not listed above are not provided because they are felt not to be attribute to the highway improvement project, but rather to other improvement.

Table B-4 lists the additional construction costs to be attributed to some at-grade intersections based on intersection type.

TABLE B-4
Cost Estimate For At-Grade Intersections

Intersection Type	Additional Cost ($ each)
Cross street is another arterial	
Existing unsignalized intersection which is to be newly signalized, or newly proposed intersection which is to be signalized, where cross street is:	
4 lanes or wider	400,000
3 lanes or narrower	200,000
At an interchange ramp	-0-
Other intersections	-0-

Grade-separated intersections have no applicable additional costs. This is because the costs for the structure, the turning roadway(s), and the cost for any signalization at the turning roadway intersection(s) should be treated as discussed previously.

Interchanges

Cost of new or modified interchanges should be estimated based on interchange type. These costs are in addition to the per-mile costs of the roadway through the interchange area, discussed previously. The interchange costs include all associated structures, retaining walls and any signalization of ramp intersections. Table B-5 shows estimated interchange costs by interchange type.

TABLE B-5
Cost Estimate for Interchanges

Interchange Type	Cost ($ Millions, each)
Single Point Diamond	18.0
Typical Diamond or Parclo	12.0

Right-of-Way Costs

As part of the cost estimate, a general cost per acre was assumed for right-of-way acquisition. A value of $100,000 per acre was assumed for developed areas, and a value of $50,000 per acre was assumed for undeveloped areas. Right of way guidelines have been set to ensure that a minimum right of way is provided for each type of facility. The minimum right of way is shown in table B-6.

TABLE B-6
Right-of-Way Guidelines

Functional Classification	Right-of-Way
SRA – Major Arterial	170’
Minor Arterials	120’
Collectors	80’

Appendix C
Plan 1 Performance Summary

Area Routes Summary

(Summary of links with a route code > 0)

Route		Lane Miles (miles)	Sum of VMT	Sum of VHT	VMT/ VHT	Sum of VHD	LOS
0		1.3	24,603	1,102	22.3	471	F
6	Galligan Rd.	10.4	34,216	980	34.9	2	B
7	Damisch	2.3	2,484	71	34.9	0	A
21	Big Timber Rd.	11.3	72,041	2,127	33.9	65	E
30	Huntley Rd.	19.2	147,988	4,567	32.4	339	F
34	Randall Rd.	25.4	249,111	7,461	33.4	225	E
52	Manning Rd.	1.3	2,872	82	34.9	0	B
59	Tyrrell Rd.	4.3	24,963	746	33.5	35	F
190	Interstate 90	22.8	622,318	11,934	52.1	1,850	F
347	IL 47	11.2	138,243	3,287	42.1	215	F
372	IL 72	16.6	157,845	3,878	40.7	193	E
601	Drendl Rd	3.9	28,759	984	29.2	162	F
602	Kreutzer Rd	4.5	17,492	503	34.8	4	D
603	Powers Rd	7.1	9,096	260	35.0	0	B
604	Freeman Rd	6.1	13,871	397	35.0	1	B
605	Binnie Rd	5.4	10,149	290	35.0	0	B
606	Miller Rd	1.3	5,250	152	34.6	1	D
607	Boyer Rd	2.5	3,124	89	35.0	0	A
608	McCornack Rd	4.9	7,300	208	35.0	0	B
609	Coombs Rd	2.7	15,133	449	33.7	17	F
610	Mason Rd	2.1	6,353	183	34.7	1	C
611	Square Barn Rd	1.0	7,155	226	31.6	22	F
612	County Line Rd	5.5	29,461	869	33.9	27	E
613	Galligan/Tyrrell Connection	5.0	12,991	371	35.0	0	B

Summary of Links in Area

Area	Distance (miles)	Approximate Route Miles (miles)	Lane Miles (miles)	Sum of VMT	VMT/ LnMi	Sum of VHT	VHT/ LnMi	Sum of VHD	VHD/ LnMi	VMT/VHT
100	125.1	62.5	178	1,642,817	9,238	41,215	232	3,630	20	40

Summary of Links in Area (without Interstates)

Area	Distance (miles)	Approximate Route Miles (miles)	Lane Miles (miles)	Sum of VMT	VMT/ LnMi	Sum of VHT	VHT/ LnMi	Sum of VHD	VHD/ LnMi	VMT/VHT
100	114.0	57.0	155	1,020,500	6,584	29,282	189	1,780	11	35

Area Summary of Lane Miles by LOS

LOS	Lane Miles (miles)	
A	4.8	3%
B	40.18	23%
C	2.06	1%
D	5.74	3%
E	58.78	33%
F	66.28	37%
	177.84	

Area Summary of Lane Miles by LOS (without Interstates)

LOS	Lane Miles (miles)	
A	4.8	3%
B	40.18	26%
C	2.06	1%
D	5.74	4%
E	58.78	38%
F	43.44	28%
	155	

Jurisdiction Summary

(Summary of links in Area with Rte Code)

Jurisdiction	Distance (miles)		Approximate Route Miles (miles)		Lane Miles (miles)		Sum of VMT		Sum of VHT		Sum of VHD	
Interstate	11.1	14.9%	5.5	14.9%	23	18.3%	622,318	42.9%	11,934	34.0%	1,850	63.3%
State Highway	18.6	25.0%	9.3	25.0%	28	22.2%	296,088	20.4%	7,165	20.4%	408	13.9%
County	44.8	60.2%	22.4	60.2%	74	59.5%	533,674	36.8%	16,034	45.6%	666	22.8%
	74.5		37.3		124.8		1,452,079.4		35,132.9		2,923.8	

Area Roads Functional Class Summary

(Summary of links in area with Rte Code > 0)

Route	Distance (miles)		Approximate Route Miles (miles)		Lane Miles (miles)		Sum of VMT		Sum of VHT		Sum of VHD	
Collector	48.6	38.9%	24.3	38.9%	49	27.3%	169,591	10.3%	5,113	12.4%	269	7.4%
Expressways and Principal Arterials	28.4	22.7%	14.2	22.7%	53	29.9%	545,199	33.2%	14,626	35.5%	633	17.4%
Freeways and Ramps	12.4	9.9%	6.2	9.9%	24	13.6%	646,921	39.4%	13,035	31.6%	2,321	63.9%
Minor Arterials	35.7	28.5%	17.9	28.5%	52	29.2%	281,107	17.1%	8,441	20.5%	407	11.2%
	125.1		62.5		177.8		1,642,817.5		41,215.3		3,629.9	

Appendix D
Plan 2 Performance Summary

Area Routes Summary

(Summary of links with a route code > 0)

Route		Lane Miles (miles)	Sum of VMT	Sum of VHT	VMT/ VHT	Sum of VHD	LOS
0		2.0	31,214	1,391	22.4	626	F
6	Galligan Rd.	10.4	54,648	1,589	34.4	28	D
7	Damisch	2.3	3,188	91	34.9	0	A
21	Big Timber Rd.	11.3	52,175	1,510	34.6	16	D
30	Huntley Rd.	19.2	135,691	4,072	33.3	195	F
34	Randall Rd.	25.4	227,516	6,765	33.6	150	E
52	Manning Rd.	1.3	2,031	58	34.9	0	B
59	Tyrrell Rd.	4.3	18,540	539	34.4	11	E
190	Interstate 90	33.2	686,562	11,749	58.4	620	F
347	IL 47	11.2	142,880	3,416	41.8	241	F
372	IL 72	13.0	170,813	4,379	39.0	402	F
601	Drendl Rd	3.9	25,900	820	31.6	81	F
602	Kreutzer Rd	4.5	17,838	514	34.7	5	D
603	Powers Rd	7.1	3,729	106	35.0	0	A
604	Freeman Rd	6.1	6,523	186	35.0	0	A
605	Binnie Rd	5.4	7,242	207	35.0	0	B
606	Miller Rd	1.3	5,350	155	34.4	2	D
607	Boyer Rd	2.5	3,112	89	35.0	0	A
608	McCornack Rd	4.9	7,886	226	34.9	1	C
609	Coombs Rd	2.7	15,054	447	33.7	17	F
610	Mason Rd	2.1	5,680	163	34.8	1	C
611	Square Barn Rd	1.0	7,301	233	31.3	25	F
612	County Line Rd	5.4	30,604	908	33.7	34	F
613	Galligan/Tyrrell Connection	5.0	6,334	181	35.0	0	A

Summary of Links in Area

Area	Distance (miles)	Approximate Route Miles (miles)	Lane Miles (miles)	Sum of VMT	VMT/ LnMi	Sum of VHT	VHT/ LnMi	Sum of VHD	VHD/ LnMi	VMT/VHT
100	125.8	62.9	185	1,667,810	8,996	39,794	215	2,453	13	42

Summary of Links in Area (without Interstates)

Area	Distance (miles)	Approximate Route Miles (miles)	Lane Miles (miles)	Sum of VMT	VMT/ LnMi	Sum of VHT	VHT/ LnMi	Sum of VHD	VHD/ LnMi	VMT/VHT
100	114.7	57.4	152	981,249	6,449	28,046	184	1,832	12	35

Area Summary of Lane Miles by LOS

LOS	Lane Miles (miles)	
A	22.98	12%
B	6.64	4%
C	7	4%
D	27.5	15%
E	29.7	16%
F	91.57	49%
	185.39	

Area Summary of Lane Miles by LOS (without Interstates)

LOS	Lane Miles (miles)	
A	22.98	15%
B	6.64	4%
C	7	5%
D	27.5	18%
E	29.7	20%
F	58.33	38%
	152.15	

Jurisdiction Summary

(Summary of links in Area with Rte Code)

Jurisdiction	Distance (miles)		Approximate Route Miles (miles)		Lane Miles (miles)		Sum of VMT		Sum of VHT		Sum of VHD	
Interstate	0.7	1.1%	0.4	1.1%	2	2.2%	35,272	4.4%	647	2.9%	17	1.8%
State Highway	16.7	26.9%	8.4	26.9%	21	21.8%	276,454	34.3%	6,844	30.9%	517	55.4%
County	44.8	72.0%	22.4	72.0%	74	76.0%	493,789	61.3%	14,624	66.1%	400	42.8%
	62.3		31.1		97.6		805,514.3		22,115.0		933.8	

Area Roads Functional Class Summary

(Summary of links in area with Rte Code > 0)

Route	Distance (miles)		Approximate Route Miles (miles)		Lane Miles (miles)		Sum of VMT		Sum of VHT		Sum of VHD	
Collector	48.6	38.6%	24.3	38.6%	49	26.2%	153,455	9.2%	4,558	11.5%	175	7.1%
Expressways and Principal Arterials	28.4	22.6%	14.2	22.6%	50	26.7%	541,209	32.5%	14,560	36.6%	793	32.3%
Freeways and Ramps	13.1	10.4%	6.6	10.4%	35	19.0%	717,776	43.0%	13,139	33.0%	1,246	50.8%
Minor Arterials	35.7	28.4%	17.9	28.4%	52	28.0%	255,371	15.3%	7,537	18.9%	239	9.7%
	125.8		62.9		185.4		1,667,810.5		39,794.2		2,452.5	

Appendix E
Collector Base Performance Summary

Area Routes Summary

(Summary of links with a route code > 0)

Route		Lane Miles (miles)	Sum of VMT	Sum of VHT	VMT/ VHT	Sum of VHD	LOS
0		1.3	25,464	1,189	21.4	536	F
6	Galligan Rd.	6.2	36,721	1,166	31.5	119	F
7	Damisch	2.3	2,954	85	34.9	0	A
21	Big Timber Rd.	11.3	68,142	2,003	34.0	52	E
30	Huntley Rd.	9.6	73,617	2,351	31.3	244	F
34	Randall Rd.	19.5	182,920	5,601	32.7	297	E
52	Manning Rd.	1.3	2,785	80	34.9	0	B
59	Tyrrell Rd.	4.3	35,881	1,228	29.2	205	F
190	Interstate 90	22.8	627,605	12,100	51.9	1,932	F
347	IL 47	11.2	136,402	3,256	41.9	224	F
372	IL 72	12.0	152,149	3,880	39.2	324	F
601	Drendl Rd	3.9	25,950	838	31.0	97	F
602	Kreutzer Rd	4.5	13,047	375	34.8	2	C
603	Powers Rd	7.9	14,774	442	33.4	19	E
604	Freeman Rd	5.1	19,108	547	34.9	1	C
605	Binnie Rd	5.3	13,492	391	34.5	6	D
606	Miller Rd	1.3	4,425	127	34.9	0	C
607	Boyer Rd	3.1	8,377	264	31.7	24	F
608	McCornack Rd	4.9	10,045	289	34.7	2	C
609	Coombs Rd	2.7	16,597	501	33.1	27	F
610	Mason Rd	2.1	6,724	194	34.7	1	C
611	Square Barn Rd	1.0	5,948	177	33.6	8	F
612	County Line Rd	4.5	25,373	759	33.4	35	F
613	Galligan/Tyrrell Connection	2.5	20,814	707	29.5	113	F
614	Long Meadow Pkwy	2.8	2,856	82	34.9	0	B
616	West N-S Collector	4.1	19,536	578	33.8	21	E
617	East N-S Collector	2.6	9,330	268	34.8	1	C
618		6.4	18,523	532	34.8	3	C
619		5.0	11,300	323	35.0	0	B
620		4.4	14,151	410	34.5	7	D
621		2.1	8,788	258	34.1	7	E

Route	Lane Miles (miles)	Sum of VMT	Sum of VHT	VMT/ VHT	Sum of VHD	LOS
622	0.8	1,297	37	34.9	0	A
623	2.2	6,295	180	35.0	0	C
624	2.7	1,160	34	34.6	0	A
625	4.1	3,989	114	35.0	0	A
626	4.0	4,408	125	35.2	0	A
627	1.4	501	14	34.9	0	A

Summary of Links in Area

Area	Distance (miles)	Approximate Route Miles (miles)	Lane Miles (miles)	Sum of VMT	VMT/ LnMi	Sum of VHT	VHT/ LnMi	Sum of VHD	VHD/ LnMi	VMT/VHT
100	167.1	83.6	193	1,631,447	8,444	41,504	215	4,305	22	39

Summary of Links in Area (without Interstates)

Area	Distance (miles)	Approximate Route Miles (miles)	Lane Miles (miles)	Sum of VMT	VMT/ LnMi	Sum of VHT	VHT/ LnMi	Sum of VHD	VHD/ LnMi	VMT/VHT
100	156.0	78.0	170	1,003,842	5,892	29,404	173	2,373	14	34

Area Summary of Lane Miles by LOS

LOS	Lane Miles (miles)	
A	15.42	8%
B	9.08	5%
C	28.96	15%
D	9.66	5%
E	44.98	23%
F	85.1	44%
	193.2	

Area Summary of Lane Miles by LOS (without Interstates)

LOS	Lane Miles (miles)	
A	15.42	9%
B	9.08	5%
C	28.96	17%
D	9.66	6%
E	44.98	26%
F	62.26	37%
	170.36	

Jurisdiction Summary

(Summary of links in Area with Rte Code)

Jurisdiction	Distance (miles)		Approximate Route Miles (miles)		Lane Miles (miles)		Sum of VMT		Sum of VHT		Sum of VHD	
Interstate	11.1	21.1%	5.5	21.1%	23	32.3%	627,605	59.1%	12,100	50.2%	1,932	64.3%
State Highway	14.1	26.9%	7.0	26.9%	19	26.4%	227,472	21.4%	5,463	22.7%	410	13.6%
County	27.2	52.0%	13.6	52.0%	29	41.3%	206,029	19.4%	6,554	27.2%	661	22.0%
	52.4		26.2		70.6		1,061,106.1		24,117.1		3,002.6	

Area Roads Functional Class Summary

(Summary of links in area with Rte Code > 0)

Route	Distance (miles)		Approximate Route Miles (miles)		Lane Miles (miles)		Sum of VMT		Sum of VHT		Sum of VHD	
Collector	92.6	55.4%	46.3	55.4%	93	48.0%	304,258	18.6%	9,266	22.3%	577	13.4%
Expressways and Principal Arterials	28.4	17.0%	14.2	17.0%	43	22.1%	471,471	28.9%	12,737	30.7%	845	19.6%
Freeways and Ramps	12.4	7.4%	6.2	7.4%	24	12.5%	653,069	40.0%	13,290	32.0%	2,467	57.3%
Minor Arterials	33.7	20.2%	16.9	20.2%	34	17.5%	202,649	12.4%	6,212	15.0%	416	9.7%
	167.1		83.6		193.2		1,631,447.0		41,504.5		4,304.7	

Appendix F
Recommended Plan Performance Summary

Area Routes Summary

(Summary of links with a route code > 0)

Route		Lane Miles (miles)	Sum of VMT	Sum of VHT	VMT/ VHT	Sum of VHD	LOS
0		1.3	24,913	1,131	22.0	492	F
6	Galligan Rd.	10.4	37,929	1,095	34.6	13	D
7	Damisch	2.3	2,525	72	34.9	0	A
21	Big Timber Rd.	11.3	68,513	2,009	34.1	47	E
30	Huntley Rd.	19.2	92,421	2,717	34.0	72	E
34	Randall Rd.	22.3	189,075	5,589	33.8	105	E
52	Manning Rd.	1.3	2,724	78	34.9	0	B
59	Tyrrell Rd.	8.6	46,611	1,378	33.8	49	E
190	Interstate 90	22.8	624,651	11,998	52.1	1,877	F
347	IL 47	11.2	132,724	3,142	42.2	192	F
372	IL 72	16.6	151,871	3,707	41.0	172	E
601	Drendl Rd	3.9	26,125	849	30.8	103	F
602	Kreutzer Rd	4.5	11,957	343	34.9	1	C
603	Powers Rd	7.9	14,266	428	33.4	19	E
604	Freeman Rd	5.1	19,166	549	34.9	1	C
605	Binnie Rd	5.3	10,902	314	34.7	3	C
606	Miller Rd	1.3	4,967	144	34.6	1	D
607	Boyer Rd	3.1	8,430	267	31.6	25	F
608	McCornack Rd	4.9	7,312	209	35.0	0	B
609	Coombs Rd	2.7	15,279	455	33.6	18	F
610	Mason Rd	2.1	7,050	203	34.7	1	C
611	Square Barn Rd	1.0	6,757	208	32.6	15	F
612	County Line Rd	4.5	24,627	734	33.6	31	F
613	Galligan/Tyrrell Connection	5.0	27,977	806	34.7	8	D
614	Long Meadow Pkwy	2.7	1,332	38	34.9	0	B
616	West N-S Collector	4.1	11,771	348	33.8	12	E
617	East N-S Collector	2.6	9,756	281	34.7	2	D
618		6.4	16,452	470	35.0	0	C
619		5.0	12,111	347	34.9	1	B
620		4.4	15,208	439	34.6	6	D
621		2.1	10,765	319	33.7	12	E

Route	Lane Miles (miles)	Sum of VMT	Sum of VHT	VMT/ VHT	Sum of VHD	LOS
623	2.2	5,044	144	35.0	0	B
624	2.7	1,180	34	34.6	0	A
625	4.1	2,108	60	35.1	0	A
626	4.0	4,432	126	35.2	0	A
627	1.4	431	12	34.9	0	A

Summary of Links in Area

Area	Distance (miles)	Approximate Route Miles (miles)	Lane Miles (miles)	Sum of VMT	VMT/ LnMi	Sum of VHT	VHT/ LnMi	Sum of VHD	VHD/ LnMi	VMT/VHT
100	165.7	82.8	220	1,649,363	7,492	41,042	186	3,279	15	40

Summary of Links in Area (without Interstates)

Area	Distance (miles)	Approximate Route Miles (miles)	Lane Miles (miles)	Sum of VMT	VMT/ LnMi	Sum of VHT	VHT/ LnMi	Sum of VHD	VHD/ LnMi	VMT/VHT
100	154.6	77.3	197	1,024,712	5,194	29,044	147	1,402	7	35

Area Summary of Lane Miles by LOS

LOS	Lane Miles (miles)	
A	14.6	7%
B	16.02	7%
C	23.3	11%
D	23.64	11%
E	92.12	42%
F	50.46	23%
	220.14	

Area Summary of Lane Miles by LOS (without Interstates)

LOS	Lane Miles (miles)	
A	14.6	7%
B	16.02	8%
C	23.3	12%
D	23.64	12%
E	92.12	47%
F	27.62	14%
	197.3	

Jurisdiction Summary

(Summary of links in Area with Rte Code)

Jurisdiction	Distance (miles)		Approximate Route Miles (miles)		Lane Miles (miles)		Sum of VMT		Sum of VHT		Sum of VHD	
Interstate	11.1	21.1%	5.5	21.1%	23	28.6%	624,651	58.0%	11,998	49.9%	1,877	77.0%
State Highway	14.1	26.9%	7.0	26.9%	19	23.3%	223,732	20.8%	5,326	22.1%	356	14.6%
County	27.2	52.0%	13.6	52.0%	38	48.1%	228,185	21.2%	6,728	28.0%	203	8.3%
	52.4		26.2		79.9		1,076,568.3		24,051.3		2,436.6	

Area Roads Functional Class Summary

(Summary of links in area with Rte Code > 0)

Route	Distance (miles)		Approximate Route Miles (miles)		Lane Miles (miles)		Sum of VMT		Sum of VHT		Sum of VHD	
Collector	88.3	53.3%	44.1	53.3%	93	42.0%	274,883	16.7%	8,149	19.9%	299	9.1%
Expressways and Principal Arterials	28.4	17.1%	14.2	17.1%	50	22.7%	473,671	28.7%	12,439	30.3%	469	14.3%
Freeways and Ramps	12.4	7.5%	6.2	7.5%	24	11.0%	649,564	39.4%	13,129	32.0%	2,370	72.3%
Minor Arterials	36.7	22.1%	18.3	22.1%	53	24.3%	251,245	15.2%	7,325	17.8%	141	4.3%
	165.7		82.8		220.1		1,649,362.9		41,041.7		3,279.0	

Appendix G

Kane County Access Control Policy

APPENDIX G

Kane County Access Control Policy

Introduction

Kane County *Access Control Regulations for County Designated Freeways* was last updated in March 1989. The specified techniques and policies of access control are presented in three areas: the roadway, the access point, and the abutting property and its associated development.

The Roadway

Roadway safety and capacity are adversely effected by uncontrolled or poorly designed turning and cross traffic operations. The county's regulations call for control of these operations through the development of turning lanes and medians, restriction of turning movements, installation of traffic signals, and provision of roadway lighting.

If warranted by a traffic study, or determined by the County, turning lanes including a full width auxiliary lane and tapers should be provided for either right or left turns into abutting property. The cost of providing the turn lanes as well as any needed right-of-way would be the responsibility of the property owner.

The regulations identify seven conditions that would warrant the turning restrictions. Some examples of the restricting conditions include numerous low-volume access points with inadequate spacing, access points too close to an intersection, inadequate sight distance, prohibition of left-turns at an unsignalized access location if access to a parcel is also provided by a signalized access point, and other factors requiring prohibition of left turns at access locations.

The access control policy also provides for installation of traffic signals at high-volume crossroads or driveways to facilitate outbound left turn and through traffic movements. The signals shall meet the warrants set forth in the *Manual of Uniform Traffic Control Devices* (MUTCD). Spacing of signalized intersections, use of detectors, and compatibility with arterial progression patterns is addressed. The regulations also specify that whenever traffic signals are required to serve a private development, the entire cost of the installation shall be the responsibility of the property owner.

If warranted by a traffic study, or as determined by the County, property owners are required to install and maintain lighting at access locations.

The Access Point or Driveway

The regulations require that an access point or system of access points be located so as to provide:

- The most favorable vision, grade and alignment conditions for users of the roadway and access point.
- No undue interference with the free and safe movement of roadway traffic.
- Maximum safety and convenience for pedestrians and other users of the roadway right-of-ways.

Policies are presented regarding the number of access points, the location of access points, internal circulation within a development, and requirements during roadway reconstruction.

Number of Access Points

A set of guidelines are specified for the number of access points to be provided. Each development or property regardless of the number of parcels is limited to one access point. An additional access point may be permitted if it is demonstrated that the level of service at the primary access point would be substantially improved and the additional access point will not adversely affect traffic safety or operations on the county highway. If the approved access is signalized, no additional full access points are allowed. A right turn only access point may be permitted, provided that the property owner demonstrated the need and complies with all other policies. The access guidelines for abutting property located at the intersection of two county highways provide that the access point shall be permitted on the County highway with lower volumes. For corner lots at an intersection where only one of the abutting roads is a county highway, access should be provided to the other intersecting road rather than the county highway.

Location of Access Points

Guidelines were also established regarding the location of access points. The first guideline provides that access points be located so that ingress and egress maneuvers will not severely degrade safe and efficient traffic movements and operations on the County highways. The locations should provide adequate sight distance avoiding placement of access points on a horizontal curve or just below a crest of a vertical curve. If the sight distance is not adequate for specific movements those movements will not be allowed. Whenever possible, access should be provided via existing cross streets in lieu of additional County highway access points and will be prohibited when a property abutting a county highway has frontage on one or more roadways and reasonable access can be provided from said roadway. New access locations should be aligned with access points for existing development on the opposing side of the highway. Adjacent access points should be spaced to insure that conflicting movements do not overlap and that safe and efficient traffic movements and operations will be maintained. The distance between adjacent accent points should be spaced far enough apart as to provide for full left turn tapers and storage bays for both access points to the county highway. The county may require joint or shared access facilities. Finally access points in the vicinity of interchanges, interchange ramp terminals, crossroads, frontage roads, and service drive connections shall be restricted to minimize hazardous and congested conditions.

Internal Circulation

Providing adequate internal circulation within a development aids in the operation of major facilities. The county recognizes this through a guideline specifying that when property abutting a County highway is to be developed, direct access to the County highway shall not be used in lieu of an adequate internal traffic circulation system. Access will not be permitted if internal traffic patterns are not acceptable based on overall traffic circulation, drive-in reservoir and parking space capacities, internal turning movements, and projected trip / parking generation rates. No access shall be permitted if such access would require backing or turning maneuvers onto a county highway or would result in parking on a county highway or within the right-of-way of a county highway.

Property owners and Kane County are also required to accommodate roadway reconstruction.

Abutting Property Land Use and Site Development Characteristics

The final section in the access policy includes guidelines for development characteristics of abutting property regarding land use, internal circulation, aesthetics, and pedestrians / mass transit.

The policy provides that if the land use along a county highway changes, the existing driveway access and internal circulation of the site shall be reviewed and upgraded as if it were a new development. There are provisions concerned with adequate planning of land uses along a highway corridor.

Pedestrian traffic within the corridor should be directed to and from major crossroad intersections where crossing can be accommodated by the existing traffic signals and mass transit connections can be provided from either roadway. The policy also suggests consideration of wider rights-of-way, conservation easements and deeper setbacks to reduce strip commercial development and unnecessary traffic congestion.

An internal or integrated access plan is required for subdivision of land fronting county highways. Consolidation of parcels into a single development is encouraged along with aesthetic treatment of parking areas. There are also several provisions pertaining to aesthetic and landscaping improvements of the highway corridor.

Finally the regulations encourage actions that are compatible with mass transit service and accommodation of pedestrians within county highway corridors.