Kane County Transportation Planning Area Study

Northwest Kane County Planning Area Transportation Improvement Plan

CH2MHILL

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Report

Northwest Kane County Planning Area Transportation Improvement Plan

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Kane County Division of Transportation

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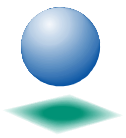

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Introduction

Background

In October 2000, the Kane County Division of Transportation and CH2M HILL began a transportation planning study to develop a recommended plan 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[1] 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 Northwest Kane County (NWKC) Planning Area. The plan consists of a toolbox of solutions including new collector roads, arterial improvements, 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 about 310 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).[2] 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[2] 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

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[1] *Development and Calibration of Kane County Transportation Systems Planning Model*, CH2M HILL (May 2000)

[2] See *Existing Transportation Conditions and Forecasts of Future Travel Demand*, CH2M HILL (May 2001) for an explanation of LOS. This analysis was completed prior to the release of the 2030 forecast.

travel demand model. Growth factors were calculated for each highway segment using a 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, without improvements, 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.

Each PPA was classified into one of three priority categories for each performance measure: 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 Northwest Kane County Planning Area fell into the near-term need category for two 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 or near-term needs would be studied first and those areas designated to have longer-term needs would be studied at a later date. Figure 2

illustrates the areas with a clustering of performance problems and the areas identified as having immediate or near-term need. A number of areas have been designated for further study. The West Upper Fox Area served as a prototype for the planning area process. The Northwest Kane County planning area, which is the subject of the remainder of this report, has also been selected for further study and will follow the West Upper Fox planning model. For more information regarding the delineation and prioritization of planning areas refer to the report, *Delineation and Prioritization of Planning Areas* (July 2001).

Northwest Kane County Planning Area

Development Trends

Currently, there is a large quantity of developable land in the Northwest Kane County (NWKC) planning area. During the next 20 years, significant development (mostly residential) of varying density is projected to occur. Commercial development is proposed along IL 47 especially at the intersection with U.S. 20 and IL 72, north of I-90 between Brier Hill Road and IL 47, and in the central areas of the municipalities. Information was gathered regarding a number of planned developments. See Figure 3. 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 made between the socioeconomic forecast 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 the NIPC 2020 forecast by traffic 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. The assumed densities used were 2.0 units per acre for low-density residential developments, 3.0 unites per acre for medium-density residential developments and 4.0 units per acre for the highest density developments. Using the Geographic Information System (GIS) to calculate acreage of each development (if not provided), and given an assumed density, the number of units could be calculated for each prospective development.

Commercial and industrial development assumptions were used to convert gross acreage to leasable/usable square footage. For commercial development leasable square footage has been assumed to be equivalent to 0.25 times the gross square footage. For industrial development the gross square footage would be multiplied by 0.75 to obtain net square footage. This value would then be multiplied by 0.4 to determine the leasable area.

In comparing the socioeconomic forecast derived from planned development in the NWKC planning area to the NIPC forecast 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 neighboring TAZs. Areas wherein adjustments were made to the NIPC population and employment data are shown in Figure 3.

For input to the travel demand model, residential occupancy was estimated at 2.77 persons per household. A total of 3,006 households were added in the NWKC area, creating an increase in population of approximately 8,300 more than the prior forecast. For details regarding the population and employment data comparisons and adjustments refer to Appendix A.

To more accurately represent the network for the NWKC area, nine large TAZs were split into thirty-six TAZs. This allows the trips originating or destined to each TAZ to access the network at multiple locations via centroid connectors. Each four square mile TAZ was split into four equal TAZs, each 1 mile square. The socioeconomic forecast for the larger TAZ was then distributed to the four smaller TAZs according to the NIPC distributions or based on the location of proposed development.

Development occurring west and north of the county line would also have an impact on travel demand within Kane County. For this reason, anticipated growth in the southern sections of McHenry County and the northeastern sections of DeKalb County was also investigated. It was found that the NIPC 2030 land use forecasts adequately represented these areas with regard to anticipated growth.

Growth of Travel Demand

Figure 4 shows forecast travel growth between 2003 and 2030 in the NWKC area. The largest increases would occur on the Illinois Tollway (I-90), and Illinois Route 47. Other highways experiencing appreciable growth would be Illinois Route 72, U.S. 20 and Big Timber Road. Other highways experiencing appreciable traffic growth would be Highland Avenue, and Damisch Road.

Future System Performance

Performance of transportation facilities in the NWKC area under future (2030) conditions was measured to identify roadways that would operate poorly. Arterials comprise a large percentage of the lane miles in the area (43 percent) and account for much of the area's VMT (58 percent), and VHD (73 percent). Collector roads in the NWKC area account for 50 percent of the lane miles but only 19 percent of the VMT and 23 percent of the VHD. The weighted percentage of congested lane miles operating at LOS D or worse would be 51 percent considering all roadways. The average speed on the roadway network would be 39 mph with all facilities included in the summary. Figure 5 shows roadways operating at LOS F (extreme congestion).

Northwest Kane County Planning Area Transportation Improvement Plan

Objectives and Constraints

A planning framework was established to assist in development and evaluation of a transportation improvement plan for the NWKC 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 NWKC 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 quantity of lane-miles varies from one alternative 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 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.

Two primary categories of constraints or sensitive areas would influence the type and location of transportation improvements proposed in the NWKC area: environmental and socioeconomic. Environmental constraints in this area would include wetlands, forest preserves, parks, open space, and flood zones. Sensitive land uses would include churches, cemeteries, schools, and residential neighborhoods. These constraints should be considered and potential impacts avoided or mitigated related to the recommended transportation projects. Locations of constraints in the NWKC planning area are shown in Figure 6.

An important element of the planning process for the County has been the establishment of boundary agreements between adjacent municipalities. Figure 7 shows the adopted boundary line agreements and time of those agreements within the NWKC 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 NWKC area, in addition to those already committed and included in the base network, were obtained from the following sources.

- Kane County 2030 Transportation Plan
- Chicago Area Transportation Study 2030 Regional Transportation Plan (RTP),

- Village of Hampshire 2003 Comprehensive Plan Update
- Comprehensive Plan Update Village of Pingree Grove, Illinois
- Village of Huntley Comprehensive Plan
- City of Elgin Comprehensive Plan and Design Guidelines
- Village of Gilberts Comprehensive Plan
- Feasibility Report for Plank Road Realignment Study
- Feasibility Report for French-Harmony Road Alignment
- Feasibility Report for Burlington By-Pass
- Romke-Ketchum Road Feasibility Study

The various documents comprise a mix of major and minor improvements and include widening or reconstruction of existing roadways as well as construction of new roadways. Major planned roadway improvements in the NWKC area are summarized in Table 1.

TABLE 1
Planned Major Roadway Improvements in the NWKC Area

Roadway	Improvement	Limits
U.S. 20	Widening to 4 Lanes	North County Line to Randall Road
IL 47	Widening to 4 Lanes	Plato Road to Big Timber Road
IL 47	Widening to 6 Lanes	Big Timber Road to Powers Road
I-90	Widening to 6 Lanes	Sandwald Road to Elgin Toll Plaza
IL 47 & I-90	Complete Full Interchange	
U.S. 20 & IL 72	Realignment/Grade Separation	
Corron Road Extension	New Construction	Bowes Road to IL 72
Burlington By-pass	New Construction	Peplow Road to French Road
French/Harmony	New Construction	French Road to Harmony Road

Some improvements would be relatively minor such as realignments of existing roadways. Many new roadways, collectors and arterials, have been identified and would connect neighborhoods and provide additional collector service in developing areas. Figure 8 shows the location of planned improvements in the NWKC area.

Public Transit, Bike and Pedestrian Facilities

Kane County DOT and other agencies have planned improvements to the area's transit, bike, and pedestrian facilities. The Kane County 2030 Transportation Plan identifies a Metra rail extension in the NWKC area along the Milwaukee District - West rail line with new commuter stations in Gilberts and Huntley with a possible spur to Pingree Grove and Hampshire. New bike/pedestrian trails in the NWKC area were identified in the Kane County Bicycle and Pedestrian Plan. Figure 9 illustrates the planned transit, bike, and pedestrian improvements.

Plan Development Process

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

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.

An analysis of trip patterns is used to evaluate 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.

New Roadways

New roadways are identified in the area both through existing plans and determination of system deficiencies. New roads are also identified to enhance connectivity within and across the planning area boundary. A new road could be classified either as a collector road or an arterial, and may include the realignment of existing facilities.

Collector Road Improvements

Collector roads serve a dual function of providing for mobility as well as access to abutting land uses. 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. Figure 10 illustrates the role played by various functional classifications of highway.

When modeling a collector-based transportation network, full efficiency was assumed. To ensure that the collector road system operates at the highest level of efficiency, design of the collectors should conform to conventional 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 fully developed. If any of these conditions were compromised, traffic diversion from the arterials would diminish. Figure 11 illustrates desirable collector road cross-sections.

Local vs. Regional Trips. 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.

It was assumed certain categories of trips using the arterial highways would not be diverted to a collector road network for the entire length of the trip. 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.

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 centroid connectors as needed to more accurately represent the traffic loading locations. The revised 2030 forecasted trip table was then assigned to the collector-based network.

Collector Performance. The collector-based plan would improve local connectivity by adding an in-fill network to link land uses throughout the area, but the addition of collector roads alone would do little to improve the regional connectivity. Daily system-wide VHD per lane mile would be reduced from 14 VHD/lane mile for the base system to 10 VHD/lane mile for the collector-based system. The weighted percentage of congested lane miles would improve from 56 percent to 52 percent. 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 56 percent of the area's lane-miles of roadway. The collectors would carry 23 percent of daily VMT and would experience 29 percent of the daily VHD on the highway system. Estimated cost of implementing the collector-based transportation plan in the NWKC area would be approximately $225 million.

Arterial Improvements

Once the collector road network had been established, arterial improvements were added to create a network having sufficient capacity to meet anticipated traffic demand. The steps involved in defining arterial improvements are as follows:

- Identify potential arterial improvements
- Determine effectiveness of each individual improvement project
- Estimate the cost of each improvement project
- Summarize performance of the improvement projects

Identification of Potential Improvements. The base arterial network in the NWKC area was assumed to consist of existing highways. 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 major improvement projects in the NWKC area is shown in Table 2.

TABLE 2
Planned and Potential Major Improvement Projects in the NWKC Area

Roadway	Improvement	Limits
Previously Planned Improvements		
U.S. 20	Widening to 4 Lanes	North County Line to Randall Road
IL 47	Widening to 4 Lanes	Plato Road to Big Timber Road
IL 47	Widening to 6 Lanes	Big Timber Road to Powers Road
I-90	Widening to 6 Lanes	Sandwald Road to Elgin Toll Plaza
IL 47 & I-90	Complete Full Interchange	
U.S. 20 & IL 72	Realignment/Grade Separation	
Corron Road Extension	New Construction	Bowes Road to IL 72
Burlington By-pass	New Construction	Peplow Road to French Road
French/Harmony	New Construction	French Road to Harmony Road
Potential Improvements		
IL 72	Widen to 4 Lanes	State Street to Tyrrell Road
Big Timber Road	Widen to 4 Lanes	U.S. 20 to Randall Road
Brier Hill Road	Widen to 4 Lanes	U.S. 20 to North County Line

In addition, additional roadway enhancements were considered including realignment of existing roadways to improve connectivity. Such realignments include Plank Road in Burlington, Reinking Road with Sandwald Road, U.S. 20 and Allen Road, U.S. 20 through Pingree Grove, and U.S. 20 and Brier Hill Road. Also included was the extension of Kreutzer Road to the west as a by-pass around Huntley.

Cost Estimates. Cost estimates for each of the individual improvements were determined using a cost model similar to the model developed 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 major improvements were modeled individually to determine the relative impact on the overall system performance. System performance for

the alternative was then graphed against the cumulative cost of the alternative to compare the effectiveness of the improvements. The process was repeated by combining the remaining improvements with the one selected previously and completing an independent assessment. The output from the process was graphed by accumulating for the set of the improvements, the change in network performance and the estimate of construction cost.

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

Recommended Plan

The recommended plan for the NWKC 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 state, 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 recognizes the importance of regional connectivity by incorporating improvements with a more regional scope. Components of the recommend plan are illustrated in Exhibit 1 found in a pocket at the back of this document.

New Roads

New roads are proposed as part of the NWKC Plan. Most of the new roads are collector roadways providing increased access to local land uses. Also included in the new road system would be arterials and realignments of existing roads. The result of the in-fill collector roads would be a more complete grid network that would provide access to abutting land uses. The proposed new roads are shown in Figure 12.

Collector Roadway Improvements

The foundation for the recommended plan is the establishment of an in-fill collector road network, which 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 operating at an acceptable of performance for a longer span of time. The implementation of a collector system would also provide an opportunity to shift some of the financial burden to developers and/or local governing bodies.

In order to maximize the collector road system the collector network would need to be sufficiently complete and built to the recommended cross section so as to afford a continuous and efficient roadway network. Even then, not enough traffic would be diverted to the collectors to preclude the need 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 in the recommend plan are shown in Figure 13. The alignment of the proposed roadways in Figure 13 is meant to represent an approximate alignment of the recommended roadway project. The preferred roadway alignment will be determined in the engineering phases of project development.

Arterial Roadway Improvements

In developing the recommended plan, the arterial improvement performance was summarized using the stepwise method described above. Arterial roadway improvements incorporated in the recommended plan are shown in Figure 13. The alignment of the proposed roadways in Figure 13 is meant to represent an approximate alignment of the recommended roadway project. The preferred roadway alignment will be determined in the engineering phases of project development. Table 4 identifies recommended improvement projects in the NWKC area. The overall recommended plan utilizes the IL 47 as the primary corridor to distribute north/south traffic through the area. The railroad provides a barrier for north/south movements. An additional north/south arterial corridors is the Peplow/French/Harmony corridor. North/south collector corridors through the area include the Romke Road, Damisch Road, and Coombs Road Corridors. Since much of the traffic flows in a northwest/southeast movement multiple corridors are established in this orientation. These corridors include the U.S. 20, Big Timber, and I-90 corridors. Direct east/west movements are accommodated on IL 72. The collector roads would provide an in-fill network to distribute traffic to local developments.

It is envisioned that along with the major improvements, as listed in Table 4, other enhancements such as 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 governing agency.

TABLE 3
NWKC Roadway Improvements

Roadway	Location	Length (route-miles)	Type
U.S. 20	N. County Line to Randall Road	12.9	4 – Lanes
IL 47	Plato Road to Big Timber Road	7.3	4 – Lanes
IL 47	Big Timber Road to Powers Road	2.3	6 – Lanes
Brier Hill Road	U.S. 20 to N. County Line	2.3	4 – Lanes
Big Timber Road	U.S. 20 to Randall Road	6.7	4 – Lanes
IL 72	State Street to Tyrrell Road	9.1	4 – Lanes
Corron Road	Bowes Road to U.S. 20	2.9	2 – Lanes
I-90/IL 47			Complete Interchange
U.S. 20/IL 72			Realignment/Grade Separation
Collectors*		57.1	2 – Lanes
Realignments*		5.4	2 – Lanes

* Only includes alignments within planning area – others are shown to demonstrate connectivity

Regional Connections

The recommended plan would be completed with the addition of improvements established in neighboring study areas. Such improvements would include the Longmeadow Parkway, the widening of IL 72 east of Tyrrell Road, the connecting collector road systems. The addition of these improvements would not have a significant effect on traffic performance in the NWKC area, but do have a benefit 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 14 VHD/lane mile in the base case to 5 VHD/lane mile with full implementation. The percentage of lane-miles operating at LOS F would decrease from 28 percent to 23 percent. The weighted percentage of congested lane miles would decrease to 34 percent from 56 percent. The area roadway system would consist of 50 percent collectors and 45 percent arterials based on lane miles. However, the arterials would carry a large percentage of the daily VMT (57 percent) and would account for 24 percent of daily VHD, compared to 22 percent of VMT and 67 percent of VHD on the collector roads. A summary of performance of the recommended plan is presented in Appendix C. Table 5 shows measures of effectiveness of the recommended plan along with comparative values for the future base condition.

TABLE 4
Comparison of Transportation Performance

Measure of Effectiveness (MOE)	Base Network	Recommended Plan
Vehicle-Hours of Delay (VHD)/Lane Mile	14	5
Percentage of Lane Miles at LOS F	28	23
Weighted Percentage of Lane Miles Congested	56	34
Percentage of VMT on Freeways/Arterials/Collectors	23 / 58 / 19	21 / 57 / 22
Estimated Cost	N/A	$425 – 540 Million*

* Does not include cost outside the planning area boundary

After implementation of the recommended plan, much of the remaining system delay would be experienced on the tollway, which the projections indicate, would operate at a poor LOS. Additional delay would occur in the collector road system in the vicinity of Damisch and Coombs Road and along IL 47.

The widening of I-90 has not been evaluated as part of this recommended plan. As shown in development of the West Upper Fox planning area, improvements to the tollway may reduce the need for infrastructure improvements to the local roadway system. Therefore, it was decided, for the purpose of planning, the county and municipalities would concentrate efforts on resolving local transportation issues. The Illinois State Toll Highway Authority includes in their plan a widening of I-90 from Randall Road through the IL 47 interchange.

The Soo Line railroad line runs east/west through the center of the NWKC planning area. Three grade separations exist currently or would be proposed within the planning area. The crossing at U.S. 20/IL 47/IL 72 exist currently with a four lane under pass. The realignment of U.S. 20 and IL 72 would include an additional grade separation in the area. The third grade separation would be a part of the French/Harmony connection. The extension of Romke Road would have an at-grade crossing.

Estimated total cost of the recommended transportation improvements (construction and right-of-way) in the NWKC area would amount to approximately $540 million. This includes $225 million for development of the collector road network. Widening the arterials, as opposed to full reconstruction would reduce construction costs $115 million, for a total construction cost of $425 million. Developers and/or local municipalities are expected to 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 the recently enacted imposition of impact fees. Many of the improvements in the NWKC area are on state facilities and would be administered by IDOT through a capital improvement program. The cost estimate pertains to arterial and collector road improvements, and excludes the cost of regional connections, transit, and bike/pedestrian facilities. The cost stratified by jurisdiction is shown in Table 6.

TABLE 5
Stratified Cost by Jurisdiction

Jurisdiction	Route Miles	Cost (millions)	% of Total Cost
State (IDOT/ISTHA)	31.6	$220	41%
County	13.8	$70	13%
Others (Local/Developers)	60.6	$250	46%
Total	106	$540	100%

The access control plan and the right-of-way guidelines would apply to roadway projects along with capacity and safety improvements. The latter encompasses upgrades to signals or the addition of new signals to improve capacity and safety at intersections. Full channelization of improved intersections is also a requirement set forth by KCDOT.

Public Transit, Bicycle, and Pedestrian Facilities

The recommended public transit plan incorporates improvements already planned by Metra. An extension of the Milwaukee District West line to Huntley with a spur to Hampshire is incorporated into the recommended plan with a station in Gilberts, Huntley, Pingree Grove, and Hamphsire. Ample parking would be provided at each station in conjunction with the rail line improvements.

No expansion of pace services to the NWKC planning area is anticipated. Park–n-ride locations within local communities should be provided for access to existing or proposed Metra stations.

Bicycle/pedestrian trail improvements incorporate all previously planned improvements as well as paths along newly developed collector roadways. The proposed bike trails would be

consistent with the recommendations of the countywide bicycle and pedestrian plan. 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 bicycle/pedestrian trails would include clearly visible crossing with pedestrian buttons and signals incorporated in the intersection control. Bike/pedestrian trails are also proposed in connection with proposed Metra stations to better connect the transportation systems. Figure 14 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.[3] Currently no roads within the NWKC area are included under this policy.

The county's access control regulations specify the techniques and policies of access control to be applied in the following areas:

- Location of Access Points
- Number of Access Points
- Internal Circulation
- Intersection Spacing and Application of Access Control Guidelines
- Turn Lane Improvements
- Intersection Signalization and Street Lighting
- Abutting Land Use and Site Development Characteristics
- Design Requirements

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 safe and efficient movement of roadway traffic, and

[3], *Transportation Permit Regulations* approved by the Kane County Board on January 14, 2003.

- maximum safety and convenience for pedestrians, bicyclists 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 D provides more detailed information regarding the Kane County Access Control Policy.

It is not suggested that arterials within the planning area be redesignated as limited access freeways. What is recommended is that the arterials within the planning area be considered for corridor management. It is also recommended that Kane County work with the Illinois Department of Transportation (DOT) to implement access control on state maintained routes.

Although collector roads in the NWKC area are not in the county highway system, a means would be required to extend the access guidelines to cover this classification of roadway as well. The recommended transportation improvement plan for this area, which relies heavily on a 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 arterial, minor arterials, or collectors, evidence this recognition. Highways classified as principal arterials provide mainly for mobility of through traffic. Minor arterials provide both land access and mobility. 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 would have its own geometric, traffic control, and spacing requirements. Table 7 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 6
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 to accommodate future roadway widening. Also, the right-of-way guidelines, created with County input, establish adequate set backs from the roadways. 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 8 shows the right-of-way guidelines by functional classification.

TABLE 7
Right-of-Way Guidelines

Functional Classification	Right-of-Way (Minimum)
SRA & County Freeways	170’ – 200’
Principal Arterials	120’ – 150’
Minor Arterials	120’
Collectors	80’ – 120’
Local	66’ - 80’

Constraints

At this stage in the development of roadway improvements a detailed assessment of environmental impacts would not be 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 appraisal was conducted by comparing the proposed improvements to the environmental features in the study area. Figure 15 highlights the potential impact to sensitive environmental features. The circled area does not represent a delineation of the potentially impacted area, but merely show the location of concern. The area circled is the Thurnau Road corridor, which is classified as a rustic road. The plan to preserve the corridor has been documented in the Thurnau Road Corridor Management Plan, adopted in September 2003.

The proposed collectors would have to be evaluated further in order to determine their feasibility and cost. The location of collector roads and realignments, which have been defined to minimize potential impacts, only represent a selected corridor. The actual alignment of each roadway will be finalized during the design phase.

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, 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. Meetings were also conducted with representation from McHenry and DeKalb Counties to account for growth in this area resulting in additional traffic affecting Kane County roadways.

Upon completion of a draft of the NWKC area plan in May 2004, another series of meetings was conducted to allow the public and agencies 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
- NWKC Planning Area Group
- Kane County Transportation Committee
- Kane County Board

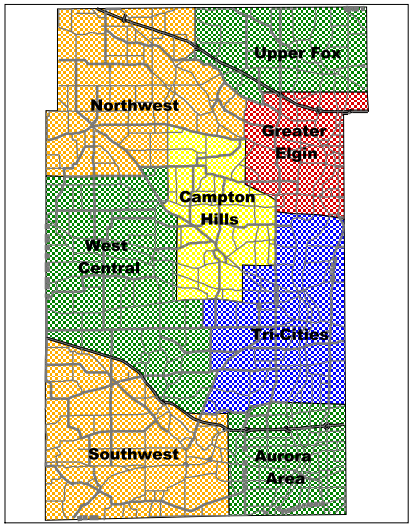
All comments received during these meetings were taken into consideration and assisted the project team in the refinement of the recommended plan.

Implementation

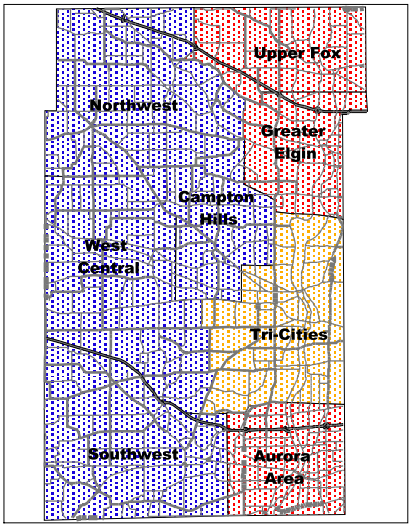
The recommended plan has been formulated to evolve in conjunction with land development in the NWKC area. The intent of the planning process was to anticipate the amount and location of future developments in order to provide for construction of infrastructure improvements concurrently with development. The need for roadway improvements will have to be reevaluated if changes in development pattern result in a change in density for certain areas. In such instances, it may be found that some of the planned transportation 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 would also need to be completed. Widening projects should also be accomplished in conjunction with associated development. The entire development program must be flexible enough to adapt to change with the dynamics of how development occurs. Once the recommended plan has been finalized the next objective of the implementation process would be to adopt the recommendations through county and municipal resolutions.

Figures



Planning Area Boundaries

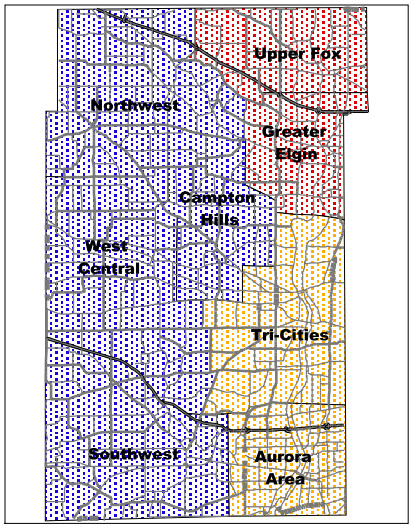


2020 VMT/Lane Mile

Legend

2020 VMT/Lane Miles

- >10,000 VMT/Lane Mile
- >5,000 VMT/Lane Mile
- <5,000 VMT/Lane Mile

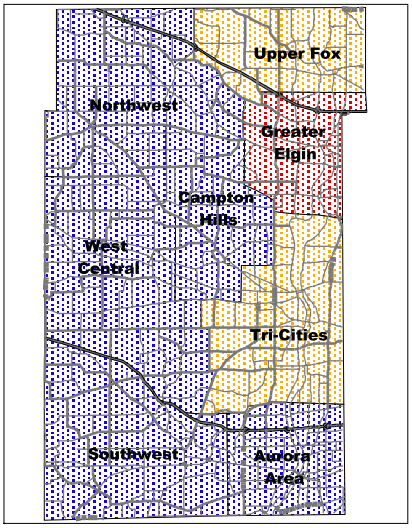


2020 VHT/Lane Mile

Legend

2020 VHT/Lane Miles

- >300 VHT/Lane Mile
- >150 VHT/Lane Mile
- <150 VHT/Lane Mile

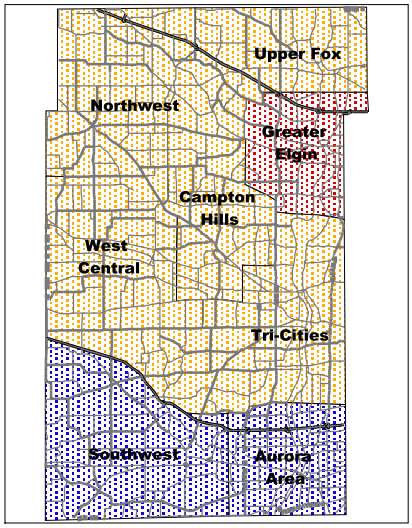


2020 VHD/Lane Mile

Legend

2020 VHD/Lane Miles

- >40 VHD/Lane Mile
- >20 VHD/Lane Mile
- <20 VHD/Lane Mile

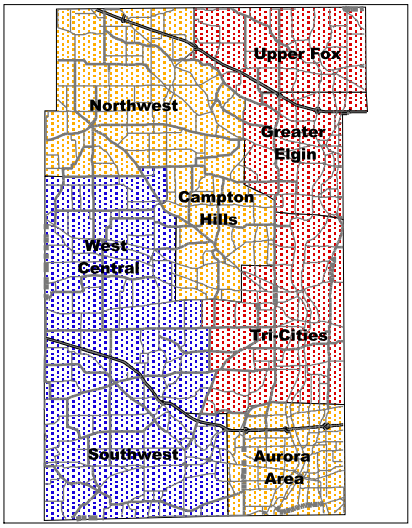


Change in Speed 1996 - 2020

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

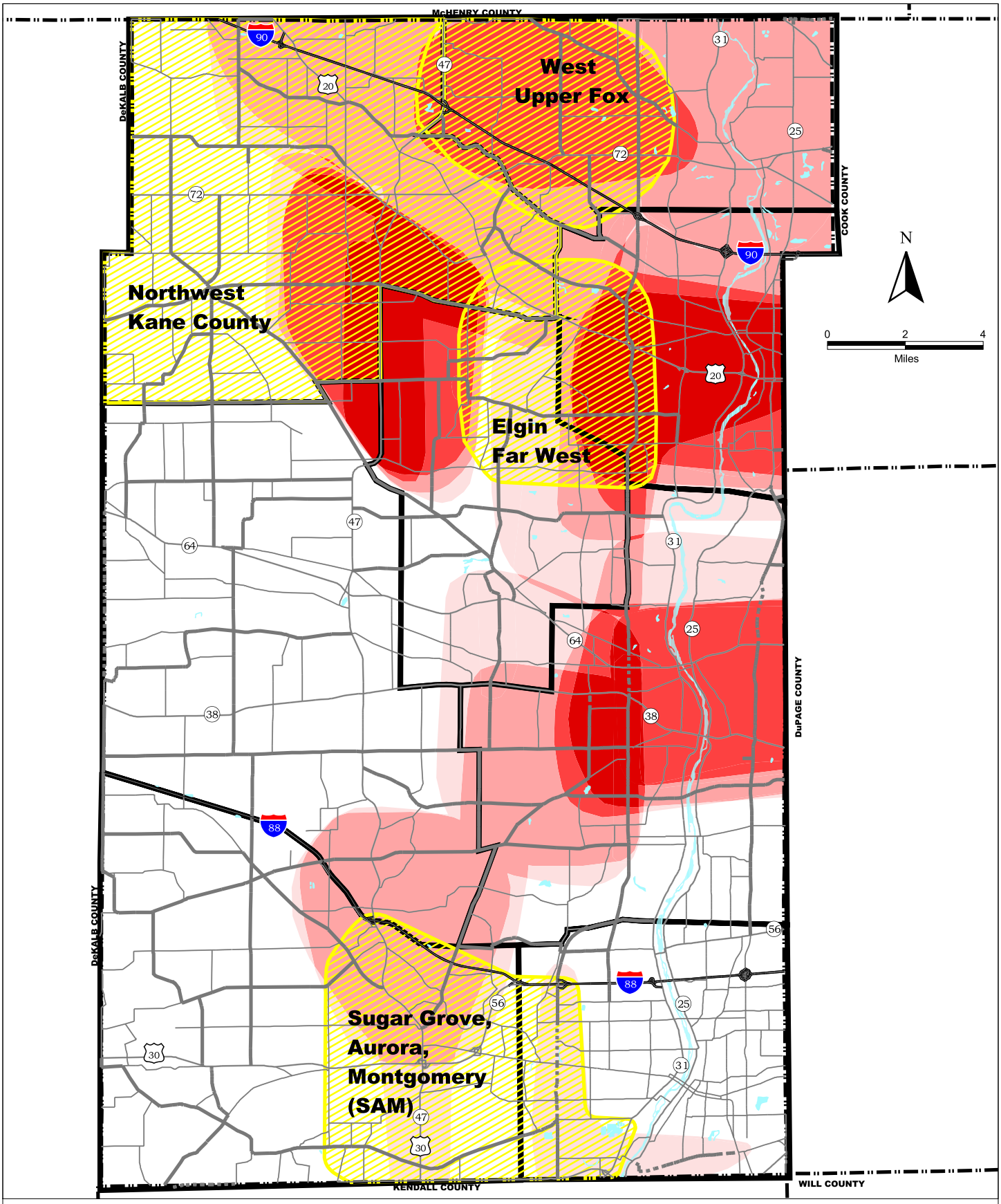
- Immediate Need
- Near-Term Need
- Long-Term Need

Planning Partnership Areas

CH2MHILL

Figure 1

Kane County Transportation Planning Area Study



Legend

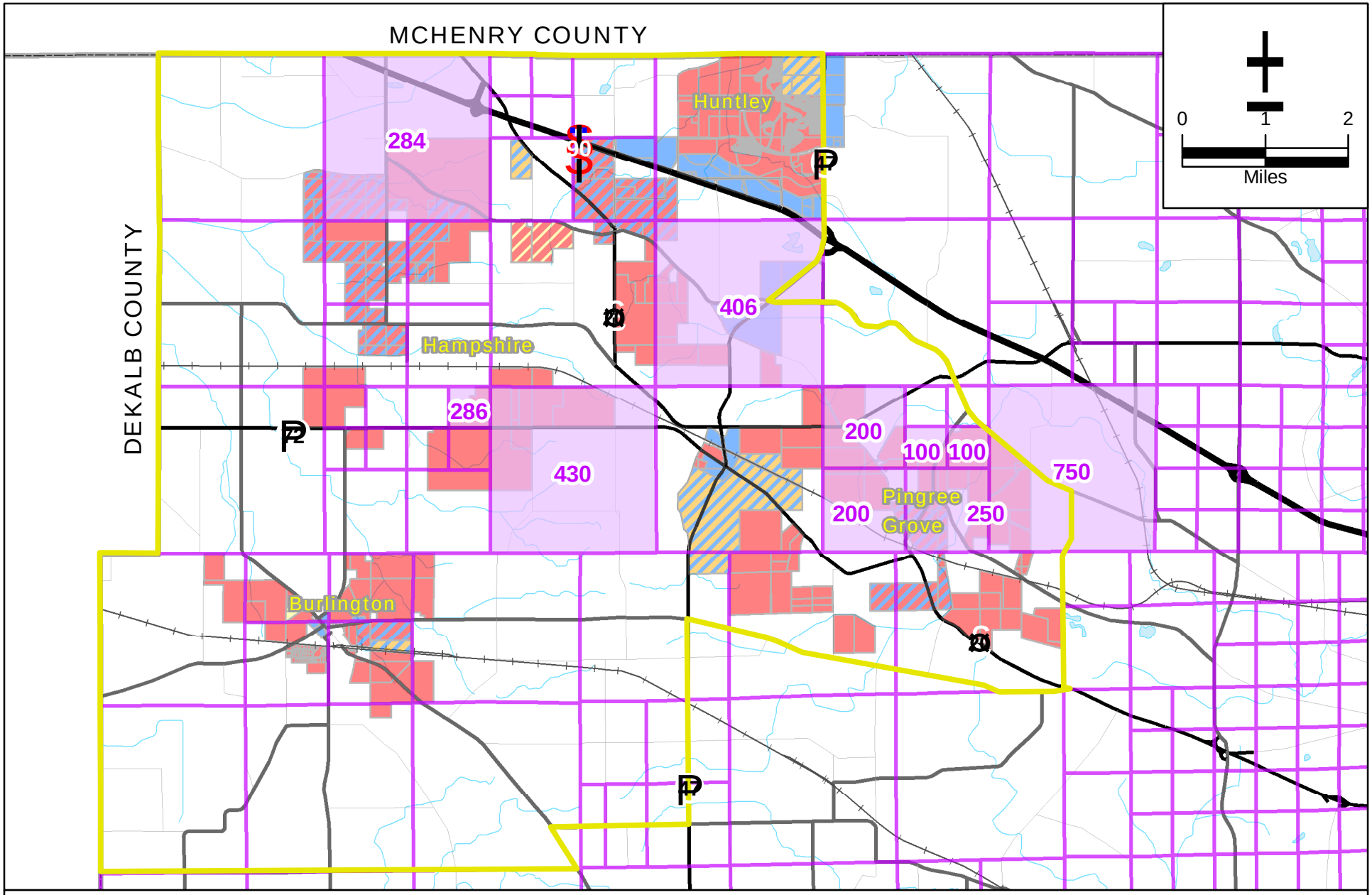
Number of Measures of Future Performance Rated Poor

- 1 measure
- 2 measures
- 3 measures
- 4 measures
- PPA Boundary
- Selected Planning Areas

Planning Areas Selected for Further Study

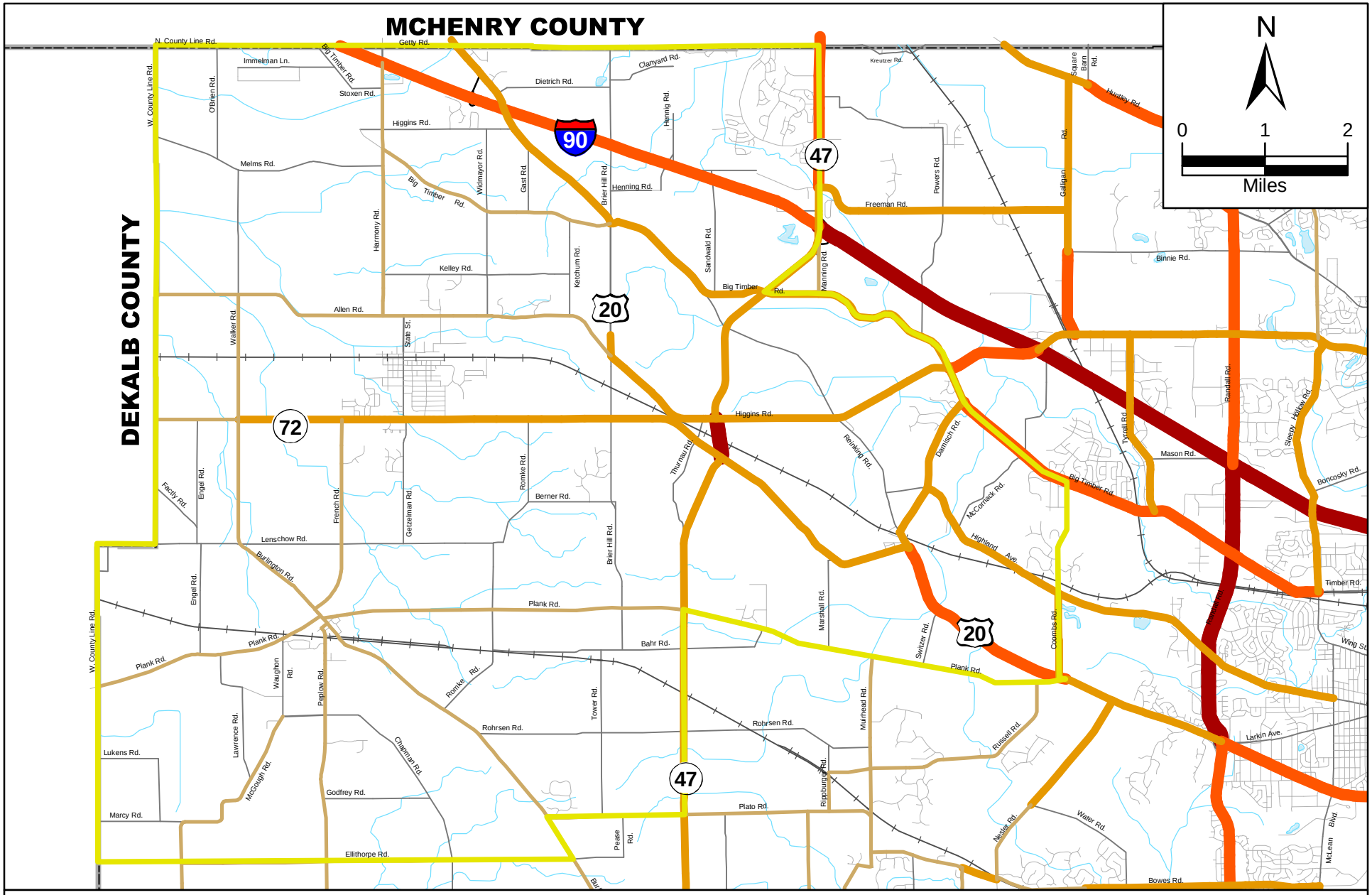
Figure 2

Kane County Transportation Planning Area Study



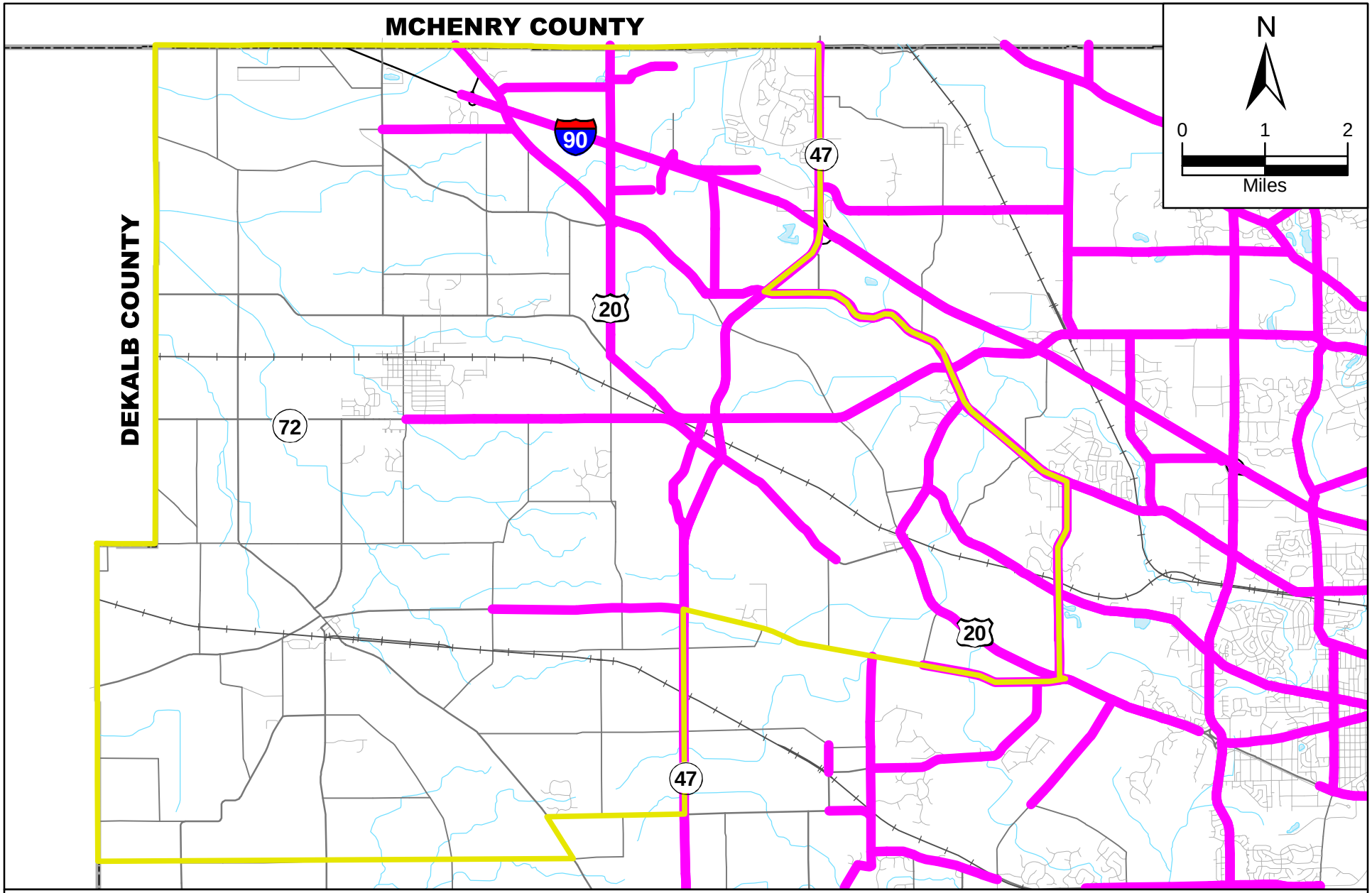
NWKC Planning Area
Planned Development

Figure 3
Kane County Transportation Planning Area Study



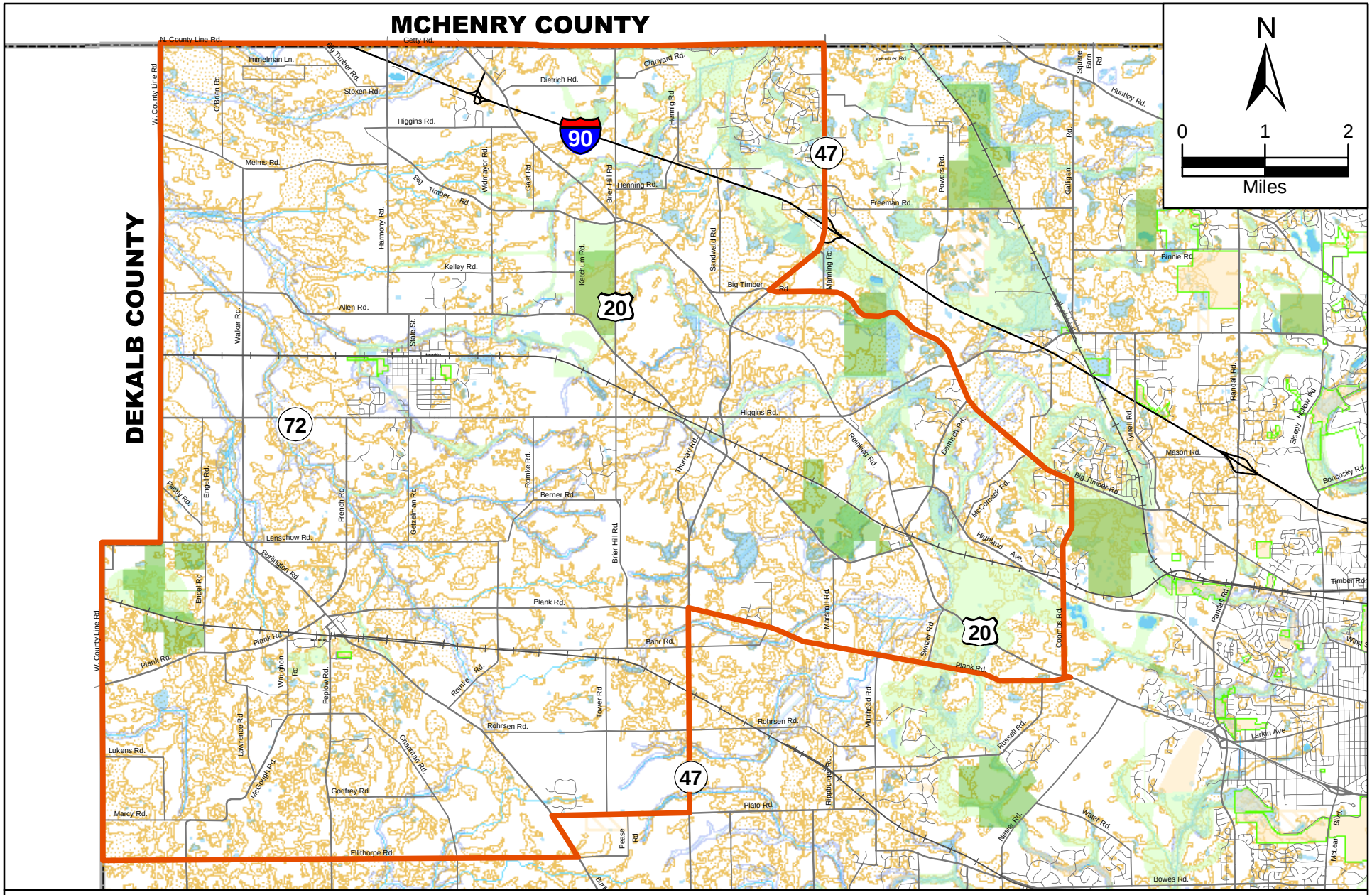
NWKC Planning Area
Change in Average Daily Traffic by Segment, 2003-2030

Figure 4
Kane County Transportation Planning Area Study



NWKC Planning Area
Projected 2030 Congested Roadway Segments

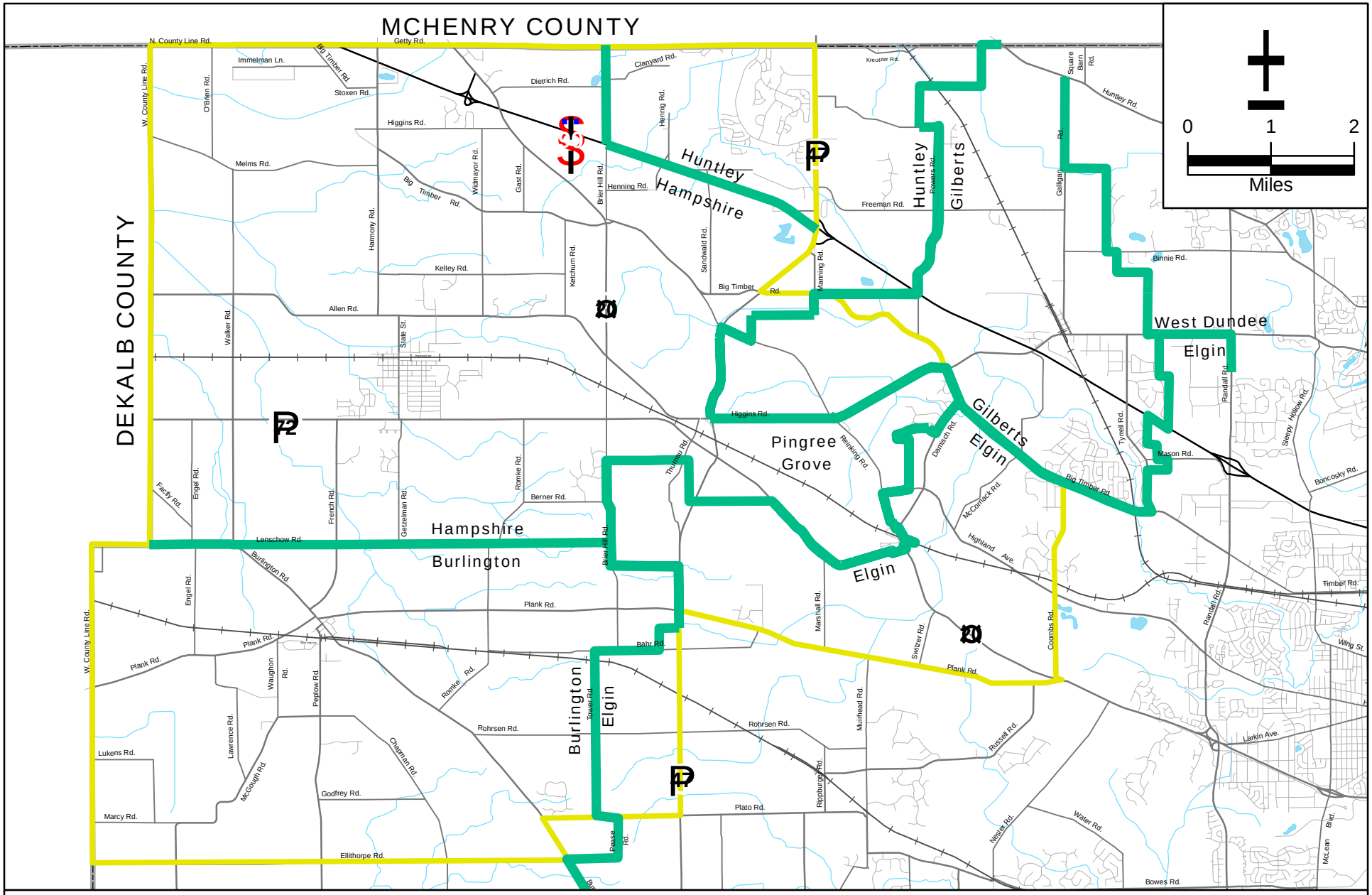
Figure 5
Kane County Transportation Planning Area Study



NWKC Boundary
Forest Preserve
Parks
Existing Open Space
Institutional Open Space
Proposed Open Space
Wetlands
Flood
Hydric Soils

NWKC Planning Area Constraints Map

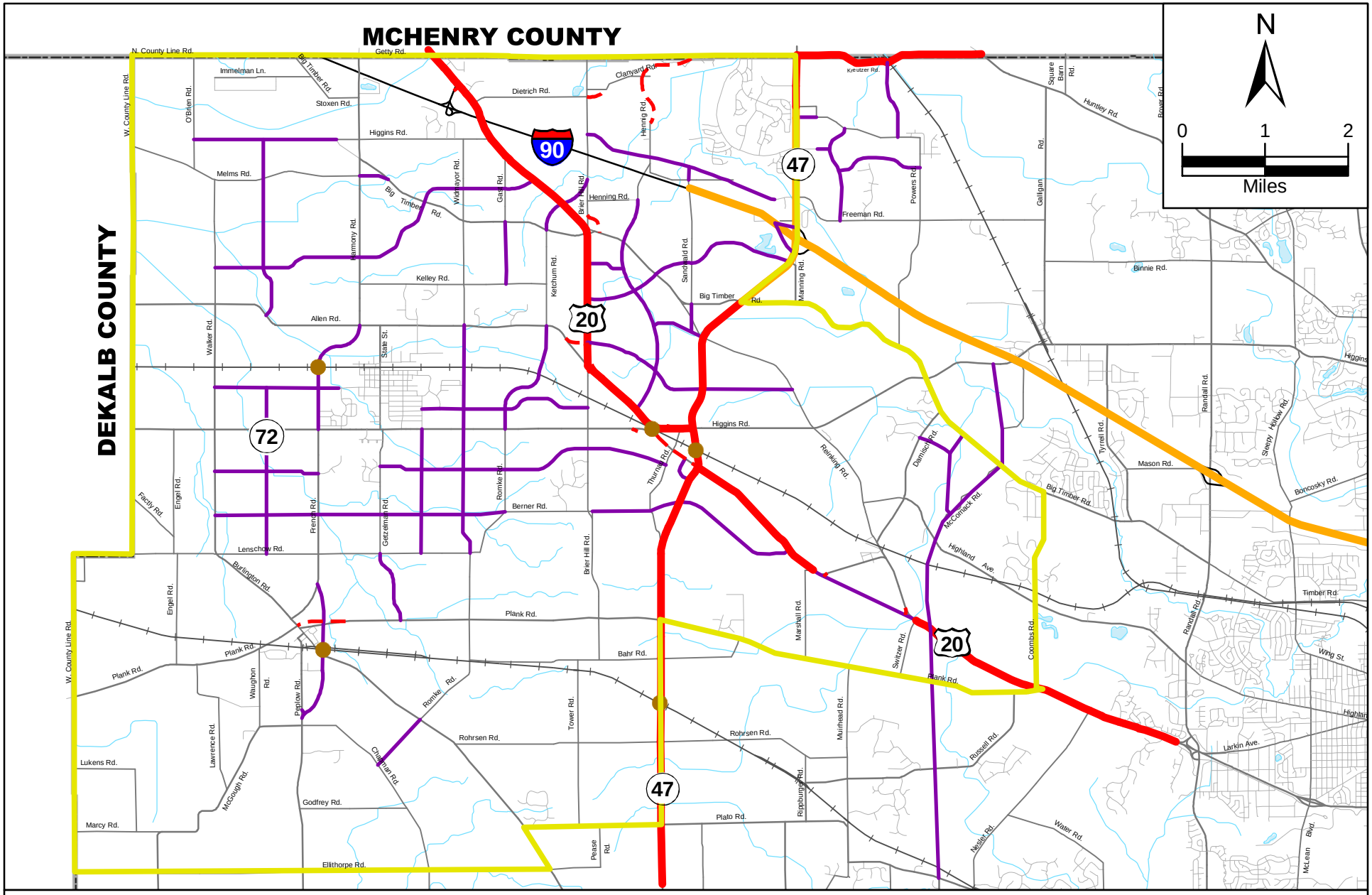
Figure 6
Kane County Transportation Planning Area Study



NWKC Boundary Planning Boundary Agreement Lines

NWKC Planning Area
Planning Boundary Agreements

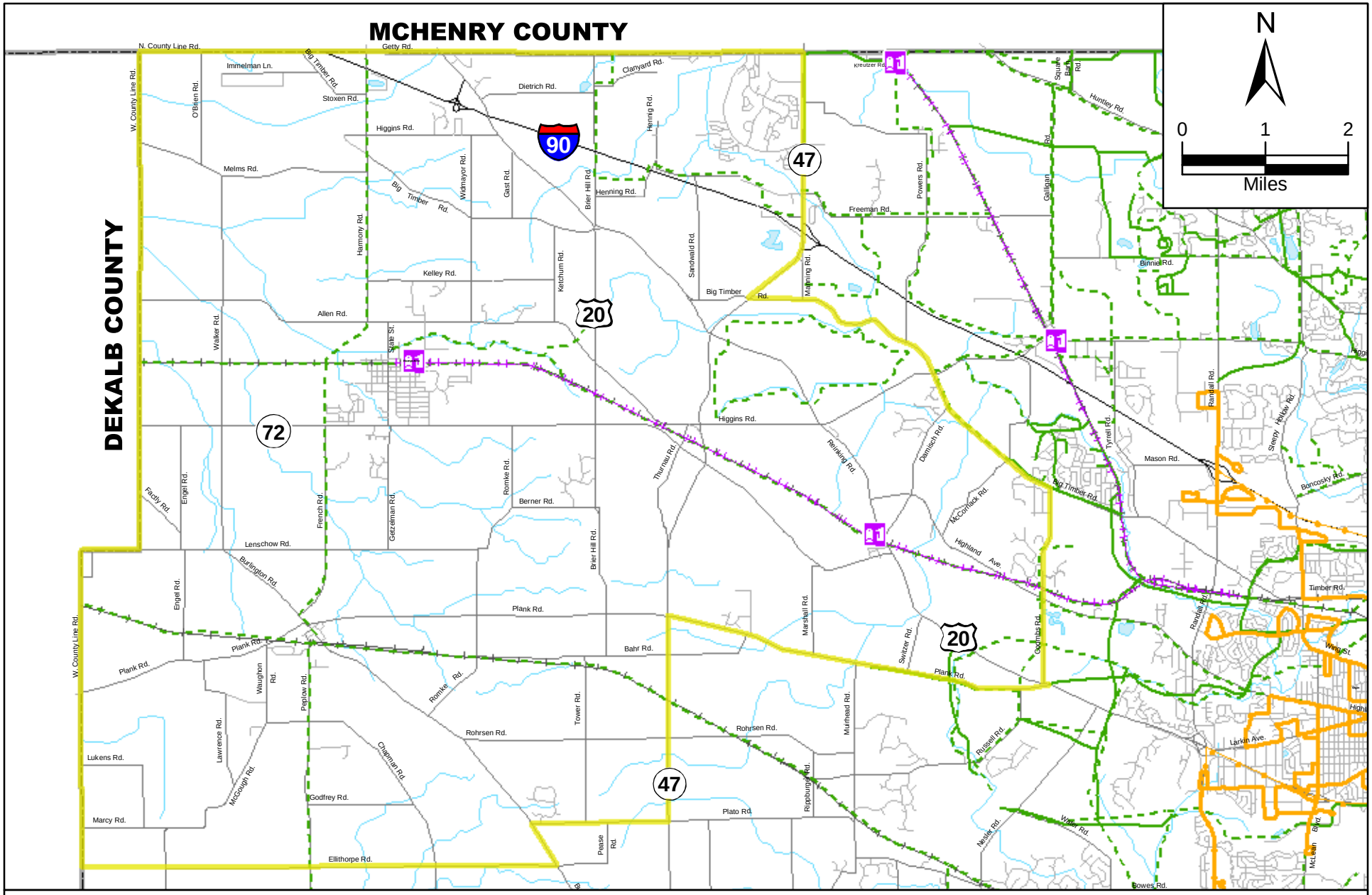
Figure 7
Kane County Transportation Planning Area Study



NWKC Boundary
Grade Seperation
6 Lane Widening
4 Lane Widening
Realignment
New Construction

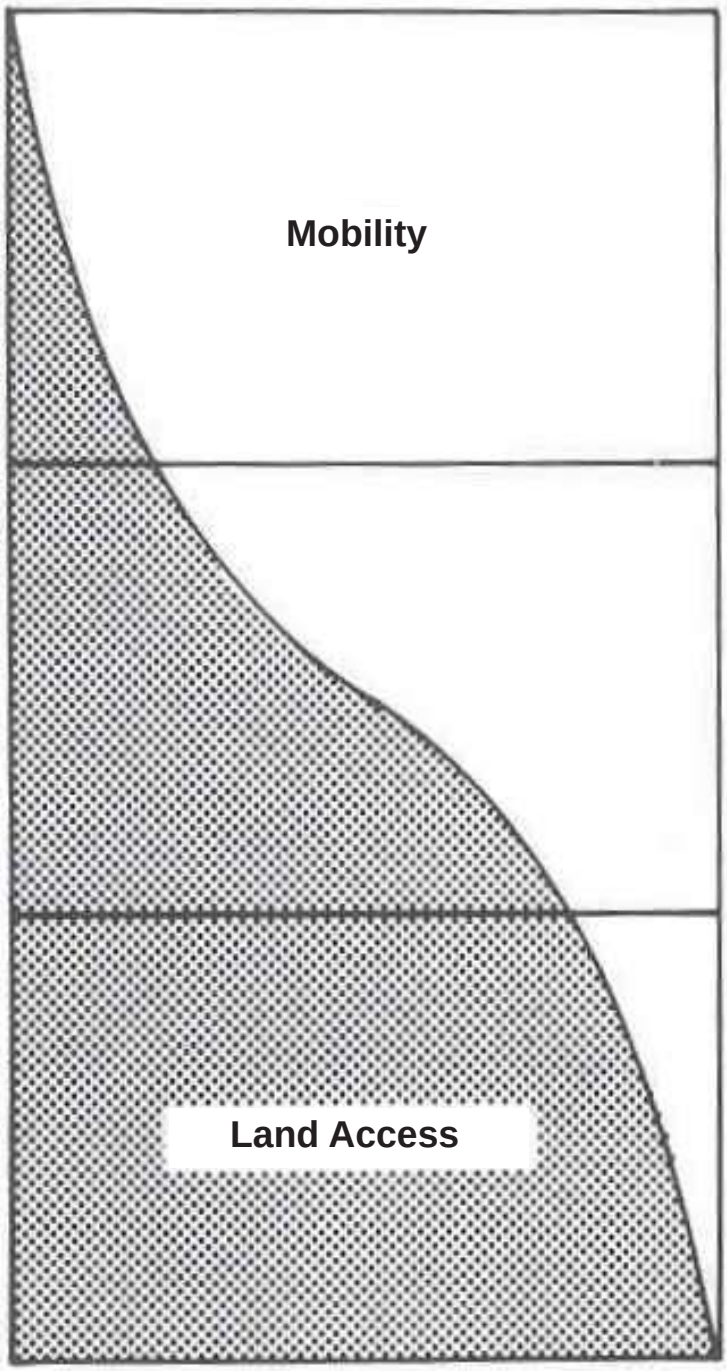
NWKC Planning Area
Previously Planned Road Improvements

Figure 8
Kane County Transportation Planning Area Study



NWKC Planning Area
Previously Planned Transit and Bike/Ped Improvements

Figure 9
Kane County Transportation Planning Area Study



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

Access and Mobility Function of Highways

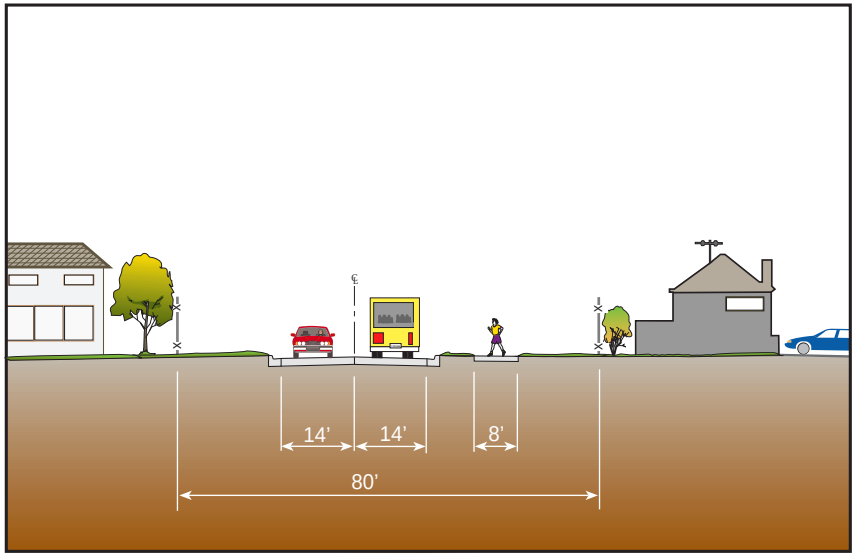
Figure 10
Kane County Transportation Planning Area Study

T161525.BB.10.02 Access_Mobility 10-02-03 lg

Three-Lane Cross Section

Open Drainage

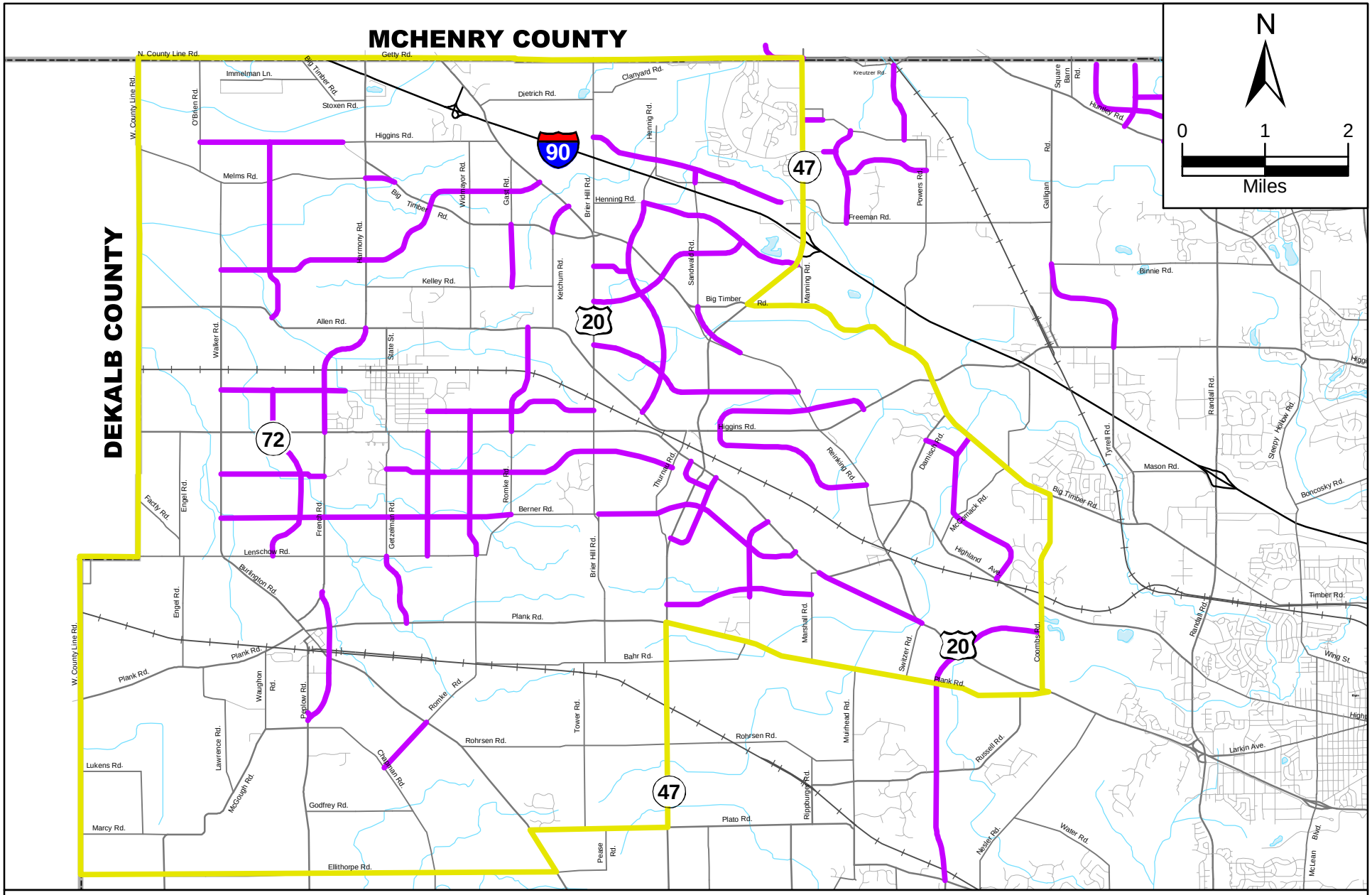
Closed Drainage - Bike Path



Desirable Collector Road Cross Section

Figure 11
Kane County Transportation Planning Area Study

T161525.BB.10.02 Collec_Rd_CroSec 10-3-03 lg

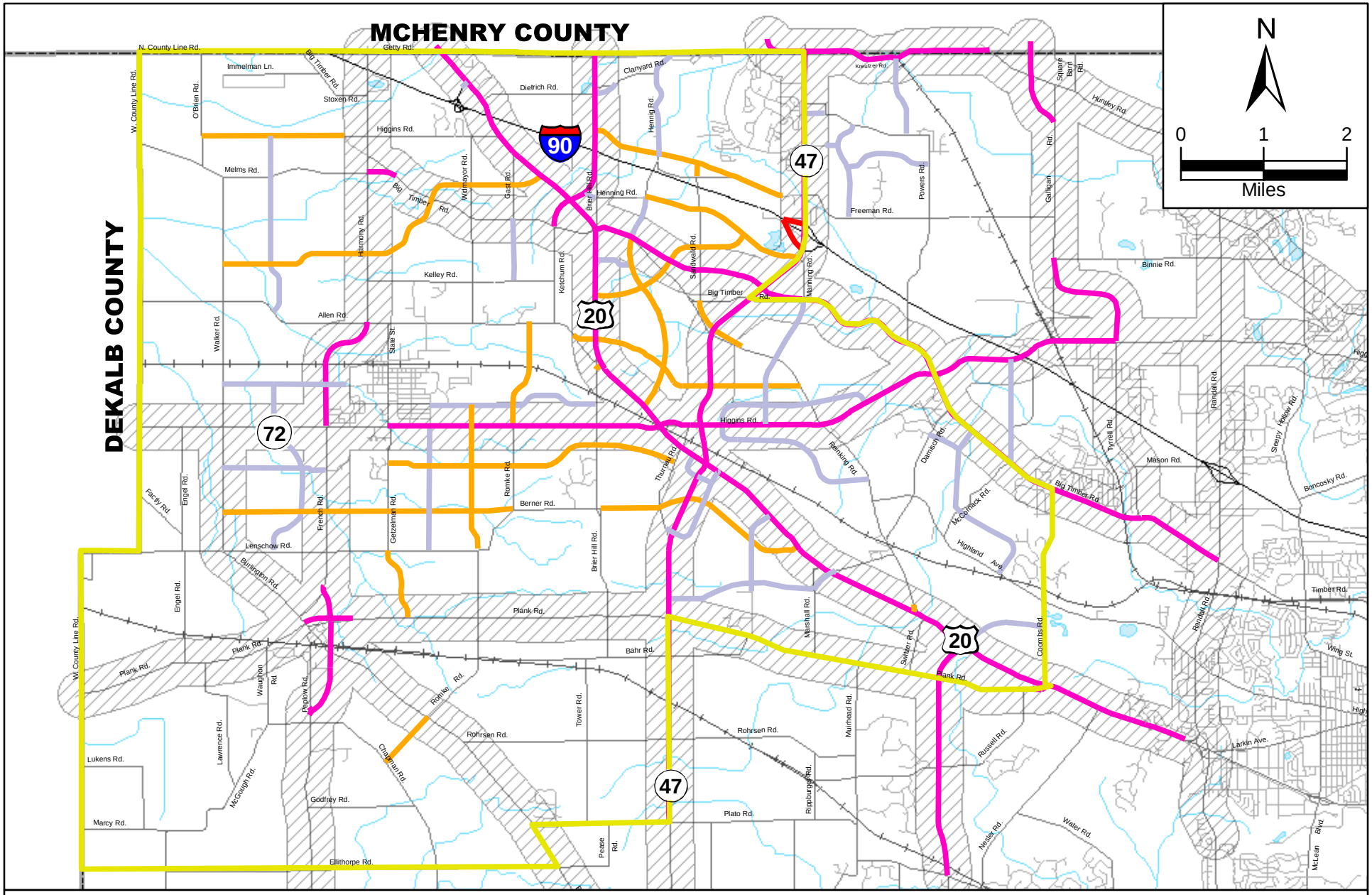


NWKC Boundary

Proposed New Roads

NWKC Planning Area
Proposed New Roads

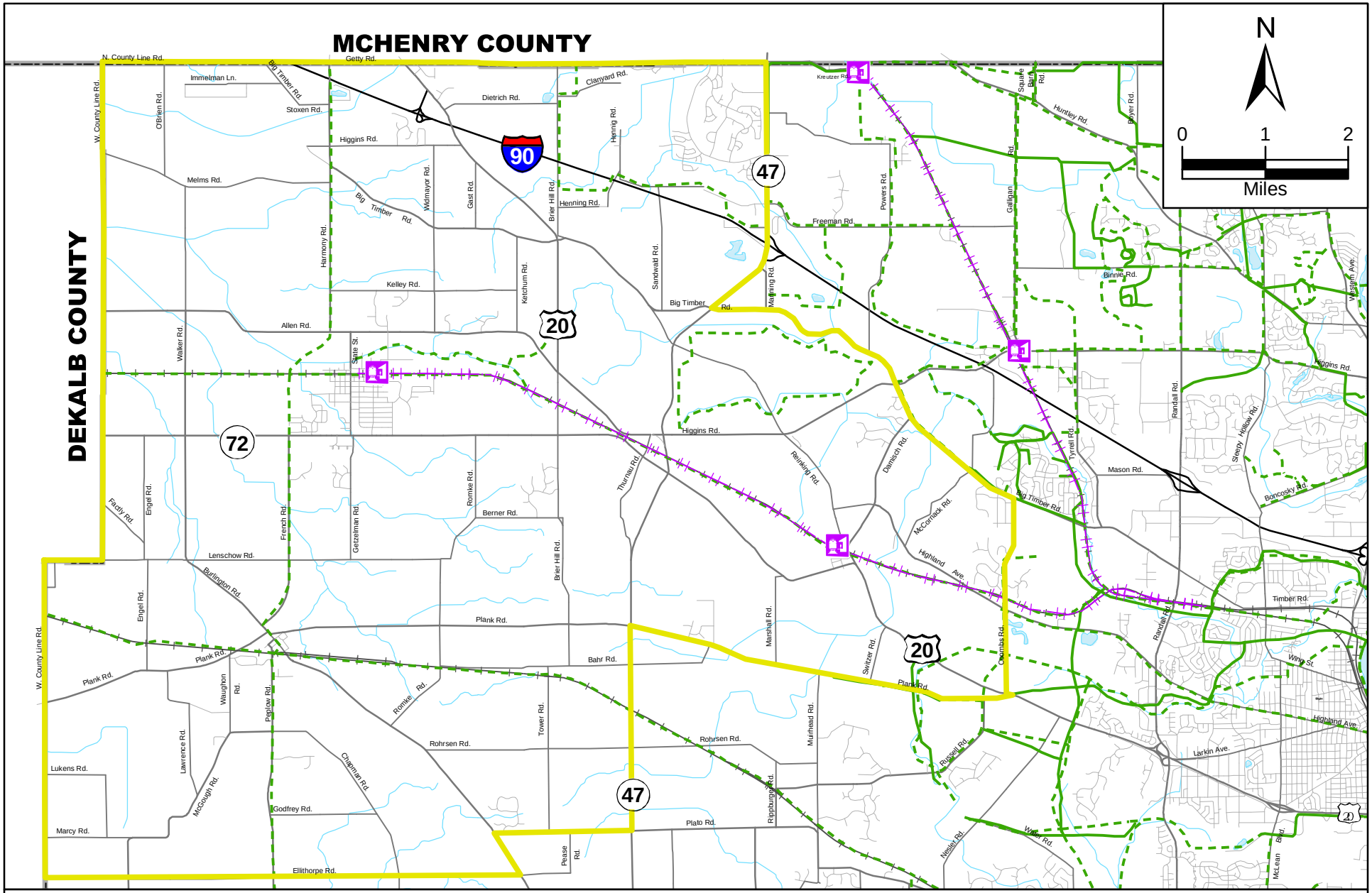
Figure 12
Kane County Transportation Planning Area Study



NWKC Boundary
Corridor Management
Arterial Improvement
Interchange Improvement
Major Collector Improvement
Minor Collector Improvement

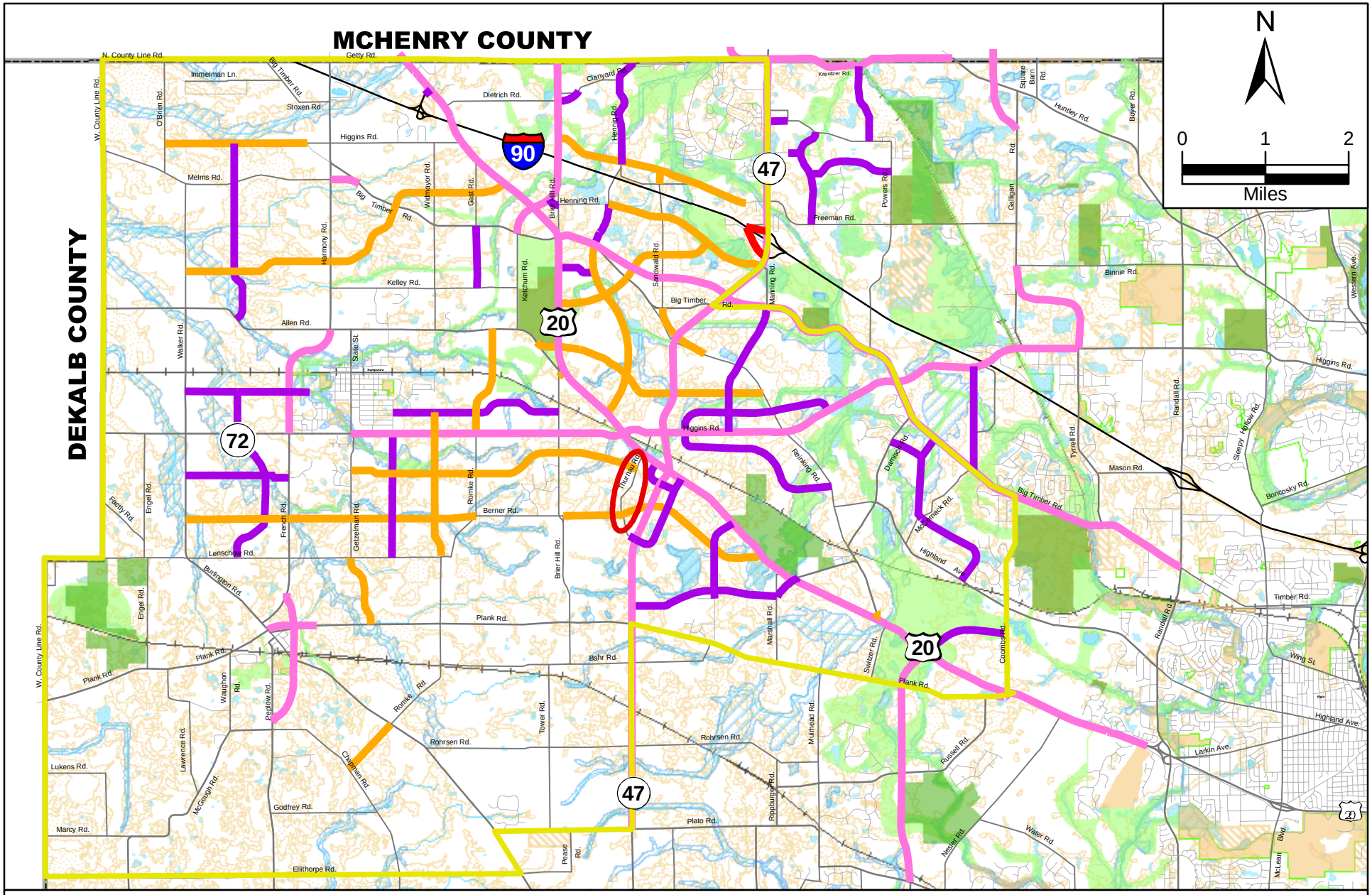
NWKC Planning Area
Recommended Roadway Plan

Figure 13
Kane County Transportation Planning Area Study



NWKC Planning Area
Recommended Transit and Bike/Ped Plan

Figure 14
Kane County Transportation Planning Area Study



Improved Facilities
- Arterial
- Interchange
- Major Collector
- Minor Collector

- NWKC Boundary
- Parks
- Hydric Soils
- Wetlands

- Forest Preserves
- Existing Open Space
- Institutional Open Space
- Proposed Open Space

- Flood
- Sensitive Areas

NWKC Planning Area
Potentially Impacted Sensitive Areas

Figure 15
Kane County Transportation Planning Area Study

Appendix A
Socioeconomic Data for the NWKC Area

APPENDIX A

Socioeconomic Data for the Northwest Kane County 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 (2030) 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 under consideration 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 2030 forecasts of households and population were accounted for by TAZ. At some locations, it appeared that the assumed development exceeded the 2030 regional socioeconomic forecasts and modifications were made to the NIPC data. Table A-1 shows the assumptions used for residential developments in Kane County.

TABLE A-1
Kane County Residential Development Assumptions

Development	Municipality	Density	Households
Del Web	Huntley	3.0	2520
Brier Hill Crossing	Hampshire	*	560
Tamms Farm	Hampshire	*	177
Prairie Ridge	Hampshire	*	1838
Oakstead	Hampshire	*	811
Youngs Farm	Hampshire	*	641
Hampshire Highlands	Hampshire	*	225
Hampshire Meadows	Hampshire	*	165

TABLE A-1
Kane County Residential Development Assumptions

Development	Municipality	Density	Households
HA – R1	Hampshire	*	390
HA – R2	Hampshire	*	690
HA – R3	Hampshire	*	200
HA – R4	Hampshire	*	210
HA – R5	Hampshire	*	120
HA – R6	Hampshire	*	410
Cambridge Homes	Pingree Grove**	2.0	2400
Shodeen	Pingree Grove**	*	2140
KPI 1	Pingree Grove**	*	1753
Crown	Pingree Grove**	*	1077
Grand Point 1	Pingree Grove**	2.0	320
KPI 2	Pingree Grove**	*	659
Grand Point 2	Pingree Grove**	2.0	340
KPI 3	Pingree Grove**	*	700
B – R1	Burlington	2.0	244
B – R2	Burlington	2.0	290
B – R3	Burlington	3.0	631
B – R4	Burlington	3.0	380
B – R5	Burlington	*	5
B – R6	Burlington	4.0	100
B – R7	Burlington	2.0	388
B – R8	Burlington	3.0	500
B – RC1	Burlington	3.0	160
B&B Development	Burlington	*	750

* Number of Households was provided as part of development plan.
** Information based on compilation of data from Pingree Grove and Elgin

This information was then added to the NIPC data as shown in Table A-2. The table includes the original 2030 household and population forecasts along with what was added to the TAZ as a result of additional development. Figure A-1 shows the TAZ structure for the area.

TABLE A-2
Socioeconomic Assumptions by TAZ

	2030 Forecasts by TAZ			Added		
Zone	Households	Population	Employment	Household	Population	Employment
38	45	119	1			
39	484	1746	2			
41	395	1383	26			
42	651	2366	55			
43	598	2211	337			
44	935	3205	822			
45	754	2584	10			
47	148	400	0			
48	479	1648	191			
49	170	587	101			
50	79	275	26			
51	67	186	25			
52	86	310	0	1830	5070	
53	72	274	0	140	390	
54	435	1441	0			
55	84	327	0			
56	259	766	75			
57	470	1546	548			
58	278	1112	0			
59	766	3029	1019	284	787	
60	64	248	0			
61	147	511	0			
62	465	1331	194			
63	199	682	0			
64	15	52	0	286	790	
65	274	821	1260			
66	502	1791	0			
67	469	1795	2	430	1190	
68	761	3031	131			
69	151	611	544			
70	1	4	195			
71	0	0	1113			
72	2	4	350			
73	1	4	330			

TABLE A-2
Socioeconomic Assumptions by TAZ

	2030 Forecasts by TAZ			Added		
Zone	Households	Population	Employment	Household	Population	Employment
74	1	5	789			
75	10	30	3			
191	0	0	60			
192	0	0	0			
193	3	9	124			
194	1	4	0			
195	28	84	33			
196	542	1566	0			
197	24	69	0			
198	16	46	0			
201	1225	2858	797			
205	3946	11023	0			
208	1829	5782	0			
209	144	554	60	406	1130	
210	6246	15245	837			
211	451	1275	116	200	550	
212	394	1216	0	200	550	
213	176	592	476			
215	394	980	2	250	690	
216	103	258	0	100	280	
217	68	192	0			
218	89	222	0	100	280	
219	57	160	0			
220	1074	3267	68	750	2080	
Total	**27125**	**81837**	**10720**	**3006**	**8327**	**0**

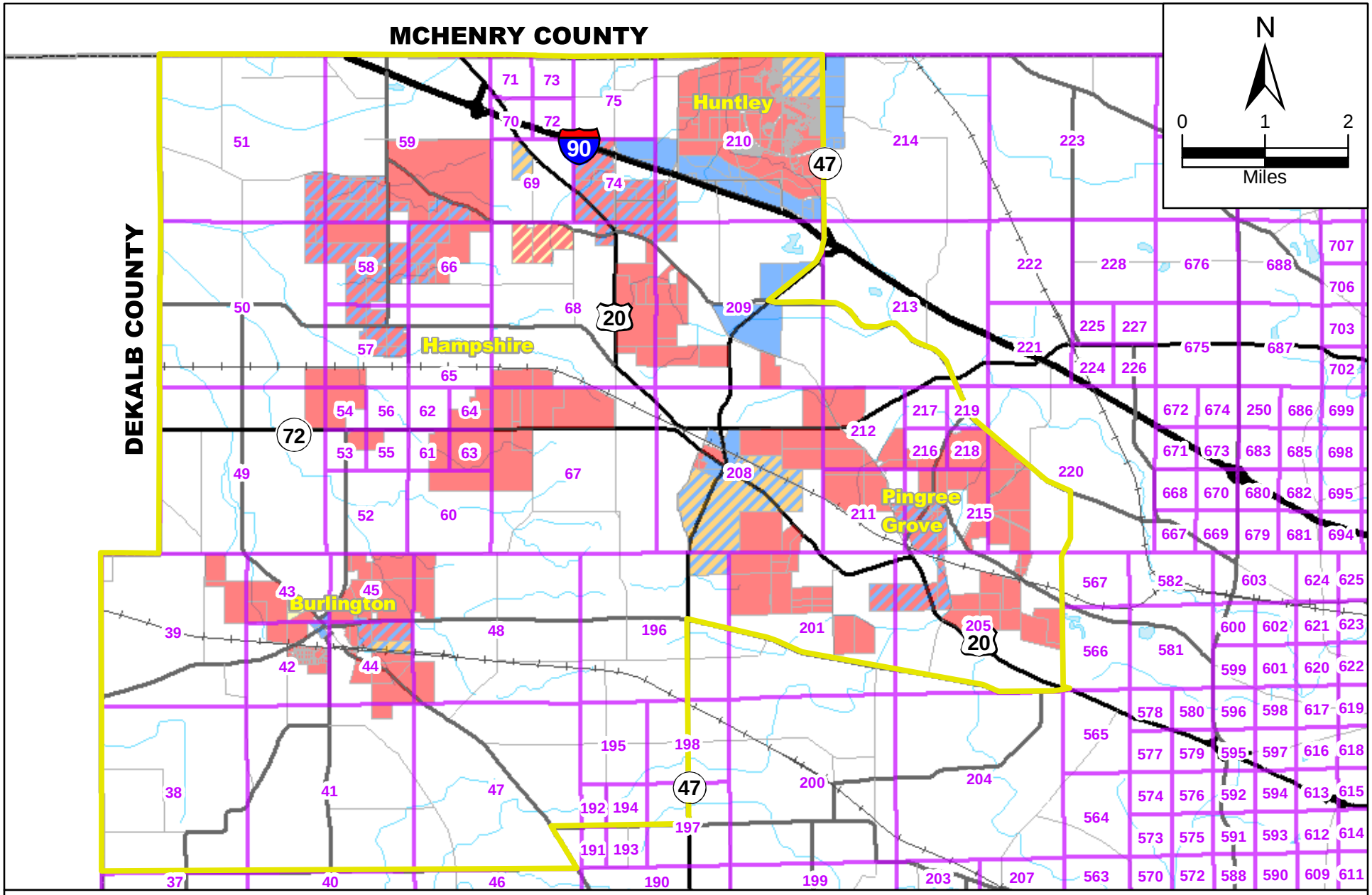


Figure A-1
Kane County Transportation Planning Area Study

Appendix B
Cost Model

APPENDIX B

Cost Model

Introduction

This appendix 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 type of improvements, 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, railroad grade separations, and interchanges.

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 and confirmed by County staff for widening projects.

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.

Grade Separations

New grade separations with railroad tracks are applied a cost of ten million. This unit cost was confirmed by the county based on recently completed projects.

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 8.

Appendix C
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		54.2	11,427	402	28.4	110	F
2	Burlington Rd.	8.5	33,567	1,025	32.7	4	C
3	Allen Rd.	5.1	15,137	437	34.7	3	C
7	Damisch	5.7	28,804	860	33.5	23	E
11	Peplow Rd.	10.4	41,357	1,259	32.9	12	C
21	Big Timber Rd.	32.6	77,613	2,232	34.8	11	C
22	Plank Rd.	13.8	25,415	761	33.4	40	C
28	McGough Rd.	5.6	4,429	131	33.9	0	A
32	Plato Rd.	3.3	1,737	50	35.0	0	A
36	State St.	10.8	14,400	419	34.4	0	A
38	Plank Rd.	5.7	4,737	136	34.9	0	B
45	Allen Rd.	6.0	1,570	45	35.1	0	A
46	Burlington Rd./Walker Rd.	8.8	16,131	495	32.6	1	B
47	Highland Rd.	4.0	10,022	288	34.8	1	C
49	Ellithorpe	9.4	3,580	102	35.0	0	A
80	Corron Ext.	5.0	13,546	390	34.7	2	C
190	Interstate 90	24.4	445,910	7,100	62.8	248	E
220	US 20	47.0	330,887	7,398	44.7	57	C
347	IL 47	42.9	454,614	11,205	40.6	576	F
372	IL 72	33.7	201,155	4,481	44.9	19	C
601	Drendl Rd	5.8	67,905	3,289	20.6	1,352	F
609	Coombs Rd	4.7	32,037	1,006	31.9	92	F
701	Marshall Rd	3.9	4,718	135	35.0	0	B
702	Rohrsen Rd	5.0	2,150	61	35.0	0	A
1001	Melms Rd.	5.6	2,484	71	34.9	0	A
1002	Higgins Rd.	3.1	4,227	120	35.2	0	B
1003	Widmayer Rd.	4.5	5,701	163	35.0	0	A
1004	Kelley Rd.	4.5	6,519	187	34.9	0	B
1005	Gast Rd.	0.8	261	7	35.1	0	A
1006	Ketchum Rd.	2.3	8,675	250	34.7	3	D
1007	Dietrich Rd.	2.7	11,171	322	34.7	3	D

Route		Lane Miles (miles)	Sum of VMT	Sum of VHT	VMT/ VHT	Sum of VHD	LOS
1008	Brier Hill Rd.	7.3	22,727	652	34.9	2	C
1009	Clanyard Rd.	6.0	47,048	1,592	29.5	247	F
1010	Hennig Rd.	8.8	29,160	901	32.4	69	F
1011	Freeman Rd.	2.1	13,652	421	32.4	31	F
1015	Sandwald Rd.	3.9	26,486	768	34.5	64	F
1033	Reinking Rd.	6.6	12,602	367	34.3	0	B
1037	Tower Rd.	4.0	217	6	35.1	0	A
1038	Thurnau Rd.	0.8	90	3	35.0	0	A
1039	Brier Hill Rd.	7.0	4,290	123	35.0	0	A
1040	Berner Rd.	2.0	3,413	97	35.1	0	B
1041	Bahr Rd.	4.6	2,675	76	35.1	0	A
1042	Romke Rd.	7.7	16,177	464	34.9	1	B
1044	Lenschow Rd.	11.6	10,544	302	34.9	0	B
1045	Engel Rd.	5.7	6,098	175	34.9	0	A
1046	Factly Rd.	3.2	634	18	35.0	0	A
1047	Waughon Rd.	1.9	2,288	72	31.6	0	A
1048		1.1	334	10	34.8	0	A
1049	Lawrence Rd.	3.2	608	17	35.0	0	A
1050	Lukens Rd.	2.1	125	4	34.9	0	A
1051	Marcy Rd.	2.0	373	11	35.2	0	A
1052	Chapman Rd.	4.7	860	29	30.2	0	A
1053	Godfrey Rd.	2.6	966	28	35.0	0	A
1250	Farnsworth Ave.	1.4	6,286	182	34.5	3	E
1268	Highland Ave.	1.0	2,167	62	35.0	0	B
1280	Walker Rd.	3.0	3,048	87	35.0	0	A
1601		2.0	84	2	35.1	0	A
1602		3.7	3,312	94	35.1	0	A
1603		3.0	23	1	35.2	0	A
1604		1.6	12	0	34.7	0	A
1606		2.5	5,878	168	35.0	0	B
1607		3.3	1,361	39	35.2	0	A
1608		2.0	6,897	200	34.5	2	C
1611		2.9	5,000	163	30.6	0	C
1614		1.9	23	1	34.5	0	A

Route	Lane Miles (miles)	Sum of VMT	Sum of VHT	VMT/ VHT	Sum of VHD	LOS
1615	8.0	5,559	159	35.0	0	A
1616	6.2	17,448	505	34.5	6	C
1618	3.6	1,269	36	35.1	0	A
1619	4.3	8,729	249	35.0	0	B
1620	3.6	1,954	56	34.8	0	A
1621	5.0	765	22	34.9	0	A
1636	2.8	7,912	225	35.1	0	B
1640	4.0	59	2	35.3	0	A
1642	1.9	247	7	34.9	0	A
1645	3.5	727	21	35.2	0	A
1652	3.4	2,756	79	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
16	463.1	231.6	553	2,164,774	3,916	53,322	96	2,982	5	41

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
16	450.9	225.5	528	1,718,864	3,253	46,221	87	2,734	5	37

Area Summary of Lane Miles by LOS

LOS	Lane Miles (miles)	
A	145	26%
B	64.42	12%
C	178.38	32%
D	5	1%
E	31.46	6%
F	128.48	23%
	552.74	

Area Summary of Lane Miles by LOS (without Interstates)

LOS	Lane Miles (miles)	
A	145	27%
B	64.42	12%
C	178.38	34%
D	5	1%
E	7.06	1%
F	128.48	24%
	528.34	

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	12.2	6.2%	6.1	6.2%	24	8.6%	445,910	25.9%	7,100	18.3%	248	24.9%
US Highway	23.5	12.0%	11.7	12.0%	47	16.6%	330,887	19.2%	7,398	19.1%	57	5.7%
State Highway	39.3	20.0%	19.7	20.0%	77	27.1%	655,769	38.0%	15,686	40.4%	595	59.7%
County	121.2	61.8%	60.6	61.8%	135	47.6%	292,046	16.9%	8,629	22.2%	98	9.8%
	196.2		98.1		282.5		1,724,611.9		38,813.1		997.3	

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	247.9	60.4%	124.0	60.4%	251	50.2%	483,954	22.4%	15,821	29.7%	2,008	67.3%
County Freeway & SRA	0.9	0.2%	0.4	0.2%	2	0.4%	19,624	0.9%	453	0.9%	15	0.5%
Freeways and Ramps	13.0	3.2%	6.5	3.2%	25	5.0%	450,918	20.8%	7,215	13.5%	251	8.4%
Minor Arterials	86.8	21.2%	43.4	21.2%	100	20.0%	243,246	11.2%	7,201	13.5%	71	2.4%
Principal Arterials	61.9	15.1%	31.0	15.1%	122	24.3%	967,032	44.7%	22,631	42.4%	637	21.3%
	410.6		205.3		500.2		2,164,773.9		53,321.5		2,982.3	

Appendix D
Kane County Access Control Policy

APPENDIX D

Kane County Access Control Policy

Introduction

On January 14, 2003, the Kane County Board approved comprehensive Transportation Permit regulations. The County subsequently published Permit Regulations and Access Control Regulations on January 1, 2004. The Transportation Permit Regulations replace the Access Control Regulations adopted in March 1989 and include updated policies, detailed procedures, design standards, and quality control checklists for various types of permits.

The guiding philosophy of the Access Control Regulations is to "Provide safe, efficient transportation systems compatible with land use" by controlling access on roadways to minimize curb cuts and local street intersections and maintaining existing roadway capacity. The Regulations provide that the highest degree of access control is to be applied to the County Limited Access Freeways[1] and Major Arterial Roads, with lesser degrees of access control on minor arterial and collector roads.

The degree of access control is based on two basic criteria:

1. The size and nature of the development, which determines the volume and type of traffic generated: and

2. The current and future significance of the highway being accessed.

In all cases, the operational characteristics of the new access point must meet, in the opinion of the County Engineer, traffic engineering criteria for safe traffic operations. In many cases, roadway improvements such as turning lanes, medians, turning restrictions, traffic signals, and roadway lighting must be funded and constructed by the Developer in order to ensure safe traffic operations. In the interest of public safety and general welfare, the county may restrict the location and number of access points.

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

[1] The County Highways designated by the County Board as Limited Access Freeways are:
- Fabyan Parkway from Randall Road to DuPage County Line
- Kirk Road from IL 56 (Butterfield Road) to Dunham Road
- Dunham Road from Kirk to IL 25
- Orchard Road from U.S. 30 to Randall Road
- Randall Road from East-West Tollway (I-88) to North County Line

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. Adjacent access 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. 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. Finally, access points shall be located to provide safety and convenience for pedestrians, bicyclists, and other users of the roadway right-of-ways.

Number of Access Points

A set of guidelines is 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. When subdividing existing developed parcels to create new lots, no additional access will be permitted. 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.

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.

Intersection Spacing and Application of Access Control Guidelines

The regulations apply different degrees or levels of access control depending on the type and operational characteristics of the highway in question, in combination with the type and intensity of the proposed land use generating the request for access. Three levels of access control guidelines are specified.

Level 1 – High level of access control based upon conservative parameters of driver behavior, vehicle performance characteristics, and a high margin of safety.

Level 2 – Moderate level of access control based on normal or median parameters for both driver behavior and margin of safety.

Level 3 – Minimum guidelines typically representative of physical or geometric constraints or considerations; not based on driver or vehicle performance criteria.

Guidelines for each level of control are presented for the following situations:

- Signalized Full Access Intersection Spacing
- Unsignalized Full Access Spacing
- Right-in/Right-out and Right-in Only Driveways (Policies, Corner Clearance, Spacing, and Design)

Turn Lane Improvements

As determined by the County Engineer, turning lanes (consisting of an approach widening, turn bay taper, and a full width auxiliary lane) for either right or left turns into an abutting property are required. Generally, most developments requesting access to arterials will be required to construct turning lanes.

Intersection Signalization and Street Lighting

The access control policy provides for installation of traffic signals at 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 IDOT policy, or as determined by the County, property owners are required to install and maintain lighting at access locations.

Pedestrian/bicycle push button activated signal heads at traffic signal installations are also required when the MUTCD "pedestrian signal warrant" is met, or as otherwise determined by the County Engineer.

Abutting Land Use and Site Development Characteristics

The access policy includes guidelines for development characteristics of abutting property regarding land use, internal circulation, and aesthetics. The following elements are to be reviewed as part of the access permit review process.

- Safety considerations
- Regional impacts to the Highway System
- Internal circulation as it affects ingress or egress to the site
- Aesthetics of the improvements on the county right-of-way

- Right-of-way requirements
- Pedestrian/bicycle/mass transit circulation

Design Requirements

The regulations call for design of access points and accompanying highway improvements complying with the county requirements. The standards and specifications set forth in these regulations are to ensure a safe and efficient highway system for the motoring public. Design features addressed in the regulations are design speed, intersection and driveway sight distance requirements, access design widths and standards, radius return, angle of intersection, islands, medians, driveway profile, culverts, mailbox turnouts, shoulders, curb and gutter, bikepaths, sidewalks, cross-section and materials, traffic control and on-site design elements.