



# Illinois Route 120 Corridor U.S. Route 12 to U.S. Route 41

## Feasibility Study December 2009

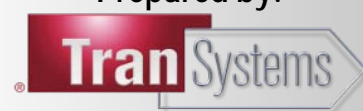
### Feasibility Report



Prepared for:



Prepared by:



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## 1. EXECUTIVE SUMMARY

The 14.5-mile corridor of Illinois Route 120 from U.S. Route 12 to U.S. Route 41 represents a slice through the center of Lake County. Illinois Route 120 is the backbone of the area's east-west traffic. It is central to Lake County's road network providing connection to a grid of north-south roadways ranging from an interstate highway and principal arterials down to collectors and local streets.

Development within and around the project corridor in Lake County and into McHenry County have led to increases in both regional and local traffic volumes along Illinois Route 120. However, other than the expansion of turn lanes at some key intersections, the number of travel lanes on Illinois Route 120 remains unchanged from its original constructed condition for significant lengths.

The focus of this project is the construction of an Illinois Route 120 bypass, named the Central Lake Thruway, from near Fish Lake Road in Volo to near Almond Road in Grayslake. The nine-mile bypass would be constructed as a four-lane boulevard in a wide 300-foot right-of-way. The bypass would connect to sections of existing Illinois Route 120 that are already two lanes in each direction separated by a paved or grass median. The Central Lake Thruway would be a mixture of mostly at-grade intersections with some grade separated intersections. Two railroads would be grade separated from the new bypass. The project also includes reconstructing the Des Plaines River bridge and raising the bridge and its roadway approaches out of the floodplain along with certain intersection improvements along existing Illinois Route 120 west and east of the bypass.

An improved Illinois Route 120 corridor was identified as a consensus priority at the Lake County Transportation Summit held in September 2005. From that summit, a planning group called the Corridor Planning Council (CPC) was developed to guide the development of a feasibility study. The CPC consists of representatives from 11 municipalities within the corridor along with five members of the Lake County Board. The CPC established a Governance Board to lead a feasibility study. Four task forces were formed to support the Governance Board. The goal of the feasibility study was to develop a plan that will be technically and politically feasible and will be preferred by the local communities along the corridor.

This feasibility study established the framework for a future Phase I study. A purpose and need statement was developed and coordinated with the Illinois Department of Transportation. The statement identified the needs of improved system linkage and continuity, capacity, roadway deficiencies, and safety. The purpose of the project is to address these needs.

Studies by the task forces and the consultants analyzed land use, economic development, environmental, and technical components along the corridor. Land use studies were conducted to develop a future land use map of the corridor to ensure thoughtful planning and avoid conflicting developments. An economic development analysis was completed to determine the economic benefit of the project. Environmental studies documented the existing stormwater and environmental features in the corridor and guided the development of the road character and road placement decisions. Technical studies of travel demand, intersection capacity, and alignment studies were prepared in the consideration of all technically feasible alternates.

Selection of the type of future road, or road character, by the Governance Board was based on the studies of the task forces and public input. A decision matrix of 22 unique criteria was used to help compare the alternates. The No-Build Alternate and the Widen Existing Illinois Route 120 Alternate were both eliminated from the study as they would not fully meet the identified needs. A Four-Lane Boulevard was selected by the Governance Board as the locally preferred road character.

Road placement decisions along the bypass were made by the Governance Board based on the studies of the task forces and public input at three areas identified as the Western Terminus, Central Section and Eastern Terminus. A decision matrix using seven of the road character's 22 criteria was used to compare the road placement alternates. The Governance Board selected a locally preferred road placement.

A feasibility study level financial analysis was completed to identify the project cost and future funding scenarios for the project. Five separate projects were identified that make up the Illinois Route 120 corridor program. The construction cost of the project is \$272.9 million and the total cost including right-of-way, environmental mitigation and engineering is \$461.2 million. Both figures are based on 2009 dollars. The studies concluded that there is a funding shortfall with either a traditional public only funding scenario or a user fee supported only funding scenario. More detailed studies will be conducted in the future Phase I study to determine the expected traffic diversion from a user fee collected roadway, potential user fee rate, and other financing details. Legislative action will be required to allow for the construction of a user fee collected arterial, the development of a local user fee group and/or a potential Public Private Partnership.

On October 14, 2009 the Governance Board endorsed the document called the Unified Vision for the Illinois Route 120 Corridor (see Exhibit A-1 in Appendix A). Ten of the eleven present voting Governance Board members voted to support the Unified Vision. The Unified Vision represents the locally preferred plan developed by the CPC and summarizes the feasibility study. The CPC has asked its member communities and the County to work together to preserve the planned right-of-way corridor and follow the land use and access control concepts shown on the Unified Vision.

With the locally preferred plan approved, the CPC, Lake County Division of Transportation, and Illinois Department of Transportation will pursue funding to conduct a Phase I study by a highway building agency. The federal process will require that the Phase I study consider alternatives that were eliminated as part of this feasibility study in more detail, including the Road Character and Road Placement alternatives.

An improved Illinois Route 120 will provide an enhanced east-west transportation corridor across Lake County, stimulate job growth, expand economic development opportunities, and enhance the livability of the communities. The mayors and county board members that comprise the CPC are in support of the conclusions and recommendations shown on the Unified Vision. An improved Illinois Route 120 corridor will contribute to the economic success of these communities, the County and the region.

## **2. FEASIBILITY STUDY DESCRIPTION**

### **2.1. Corridor Planning Council**

An improved Illinois Route 120 corridor was identified as a consensus priority at the Lake County Transportation Summit held in September 2005. From that summit, a planning group called the Corridor Planning Council (CPC) was developed to guide the development of a feasibility study. The CPC consists of representatives from 11 municipalities (Lakemoor, Volo, Wauconda, Round Lake, Round Lake Park, Hainesville, Grayslake, Mundelein, Libertyville, Gurnee, and Waukegan) within the corridor along with five members of the Lake County Board.

#### **2.1.1. Governance Board**

The formation of the CPC began in 2006 with the establishment of a Governance Board. The Governance Board consists of 5 Lake County Board Members and 11 elected mayors and trustees of the communities within the corridor.

#### **2.1.2. Task Forces**

Four task forces were formed to support the Governance Board.

- The Technical Task Force has guided the technical components of the study, including traffic and alignment studies. Task force members include representatives from the Lake County Division of Transportation, the Illinois Department of Transportation, Wauconda, Round Lake, Grayslake, Gurnee, and a business representative.
- The Land Use, Economic Development and Municipal Impact Task Force has developed a unified land use plan in the corridor and developed an economic development analysis for the project. Task force members include representatives from Grayslake, the Lake County Department of Planning and Development, Volo, Round Lake, Round Lake Park, Hainesville, Mundelein, Libertyville, Gurnee, Waukegan, and a public representative.
- The Environmental and Stormwater Impact Task Force has completed an inventory of all the features in the project area and reviewed the development of alignment studies. Task force members include representatives from the Lake County Stormwater Management Commission, the Lake County Division of Transportation, the Lake County Forest Preserve District, the Lake County Department of Building and Zoning, Volo, U.S. Fish & Wildlife Service, and two public representatives.
- The Public Information Task Force has assisted in coordinating public information meetings, providing information to communities within the corridor, and helping to maintain the project website ([www.120now.com](http://www.120now.com)). Task force members include representatives from Waukegan, the Lake County Administrators Office, the Lake County Division of Transportation, the Lake County Stormwater Management Commission, and a public representative.

## **2.2. History**

The logical termini for the project area are U.S. Route 12 on the west and U.S. Route 41 to the east. The study evaluates an area bounded by the border of McHenry County on the west, Green Bay Road (Illinois Route 131) on the east, and approximately 0.5 miles north and 1.25 miles south of Illinois Route 120. The approximate 14.5-mile long route from U.S. Route 12 to U.S. Route 41 represents a slice through the center of Lake County from its west end to its east end. Twelve municipalities are within the study area (from west to east): Lakemoor, Volo, Wauconda, Round Lake, Round Lake Park, Hainesville, Grayslake, Mundelein, Libertyville, Gurnee, Park City and Waukegan. (see Exhibit A-3 in Appendix A for a location map)

Multiple studies of Illinois Route 120 have been conducted prior to this study. However, the studies never reached a technically or politically feasible conclusion which met the needs of the local communities along the corridor. Previous studies of the corridor include the original FAP 342 Phase I Study by the Illinois Department of Transportation (IDOT), the Lake County Transportation Improvement Project by IDOT and the Illinois State Toll Highway Authority, and the Illinois Route 120 Strategic Regional Arterial study by IDOT. Long range planning activities by the Northern Illinois Planning Commission (NIPC) and its replacement agency, the Chicago Metropolitan Agency for Planning (CMAP), have maintained the construction of an Illinois Route 120 bypass in their long range plans. Expansion of the corridor west to connect with the terminus of the U.S. Route 12 expressway in Wisconsin near Richmond, Illinois has also been planned by NIPC and CMAP as the Richmond-Waukegan Expressway (FAP 420).

Development within and around the project corridor in Lake County, and into McHenry County, have led to increases in both regional and local traffic volumes along Illinois Route 120. However, other than the expansion of turn lanes at some key intersections, the number of travel lanes on Illinois Route 120 remains unchanged from its original constructed condition for significant lengths.

## **2.3. Feasibility Study Process**

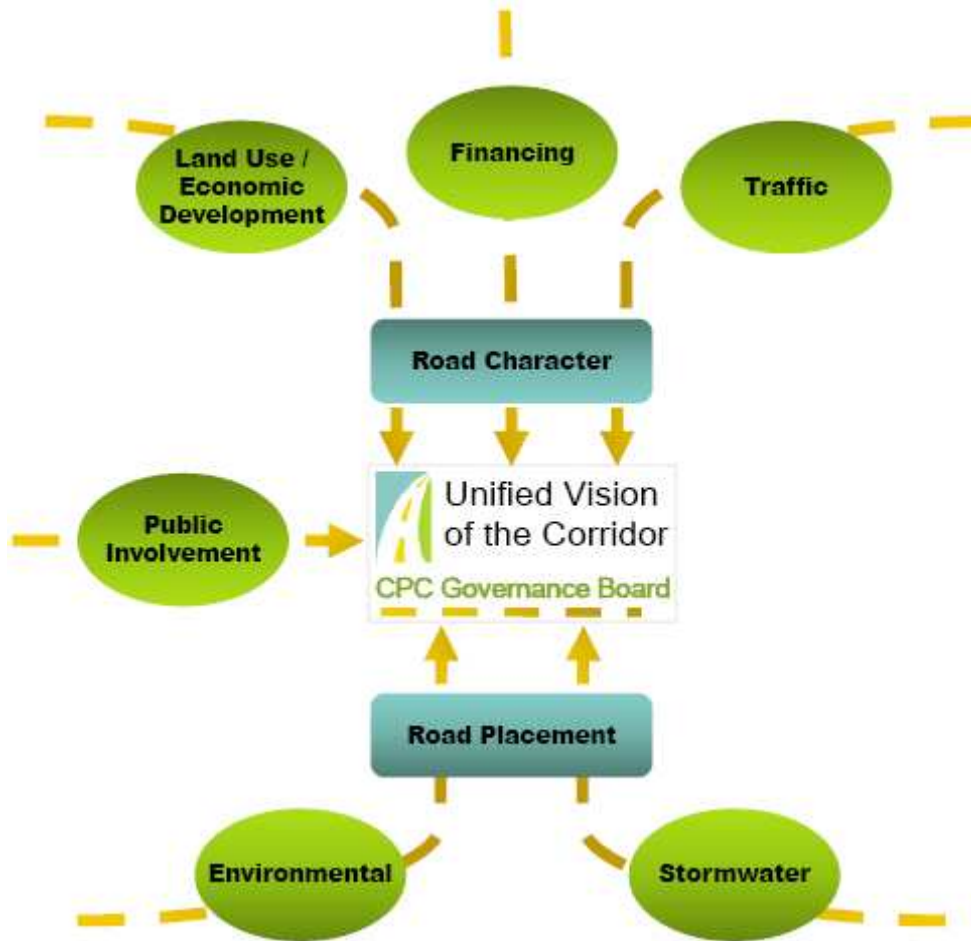
The CPC has guided the creation of a feasibility study. The goal of the feasibility study was to develop a plan that will be technically and politically feasible and will be preferred by the local communities along the corridor.

The purpose of the feasibility study is to establish the framework for a future Phase I study that will meet the requirements of the National Environmental Policy Act (NEPA). The federal process will require that the Phase I study consider alternatives that were eliminated as part of this feasibility study in more detail, including the Road Character and Road Placement alternatives.

### **2.3.1. Unified Vision Introduction**

At the beginning of the feasibility study, a project approach philosophy (see Figure 1) was developed to guide the feasibility study process and decisions. Road Character decisions were made in consideration of Land Use & Economic Development, Traffic, and Financing components. Road Placement decisions were guided by Environmental and Stormwater components. Public involvement was a constant component throughout the feasibility study.

**Figure 1**  
Project Approach



### 2.3.2. Feasibility Study Decisions

All project decisions were made by the Governance Board and guided by recommendations from its task forces. The Technical Task Force served as a steering council to compile the reports and conclusions from the other three task forces and then made recommendations to the Governance Board. The Lake County Division of Transportation served as the project manager providing information to the task forces and overseeing the work of the consultant team.

Governance Board and task force meetings began on January 11, 2006 and ended on October 14, 2009. Minutes from these meeting are arranged chronologically in Appendix B. Included with the minutes are handouts, reports, and other information used to make decisions at the meetings. The decision making process was based on introducing a concept at a round of task force and Governance Board meetings, presenting results, and then asking for decisions at the following task force or Governance Board meeting.

### **2.3.3. Public Involvement**

Two open house public meetings were held at key points during the feasibility study. The first open house on November 12, 2008 asked for public input on the road character alternatives. The second open house on April 15, 2009 requested public input on the road placement alternatives. Information presented at the public meeting is available on the project website ([www.120now.com](http://www.120now.com)).

Information from the public meetings including all the comments and a summary of the comments is included in Appendix C and Appendix D.

### **3. EXISTING CONDITIONS**

#### **3.1. Technical Task Force**

##### **3.1.1. Task Force Studies**

The Technical Task Force guided the technical components of the study, including traffic and alignment studies. The task force developed a summary of the opportunities, barriers and constraints along the Illinois Route 120 corridor. The task force also prepared a map of existing traffic volumes and functional classification map of all the area roadways. These studies were used throughout the project in the development of other technical components of the project. These studies are included in Appendix E.

##### **3.1.2. Consultant Studies**

As part of travel demand studies described in Section 5.3 below, an existing traffic volume map based on 2005 conditions was developed (see Exhibit A-4 in Appendix A). This exhibit shows the 2005 traffic volumes on the roadways in the study area based on historic traffic counts from the Illinois Department of Transportation and the Lake County Division of Transportation.

#### **3.2. Land Use, Economic Development and Municipal Impact Task Force**

##### **3.2.1. Task Force Studies**

The Land Use, Economic Development and Municipal Impact Task Force studied the land use, economic development, and other municipal issues along the corridor. The task force studies focused on combining the land use plans from the municipalities in the corridor with county planned land uses into a single set of maps for the feasibility study. These maps were then used to prepare development strategies that would combine with a future transportation alternative. Historic architectural resources along the corridor were also studied by the task force. The studies completed by the task force and are included in Appendix F.

##### **3.2.2. Consultant Studies**

The consultant team worked with the task force to develop more detailed existing land use maps for use in the project (see Exhibits A-5 to A-8 in Appendix A).

#### **3.3. Environmental and Stormwater Impact Task Force**

##### **3.3.1. Task Force Studies**

The Environmental and Stormwater Impact Task Force categorized the environmental and stormwater resources in the corridor. The task force studies focused on compiling GIS level data on the various environmental resources in Lake County to prepare project maps and studies for use in the project. The task force also developed a summary of the opportunities, barriers and constraints along the Illinois Route 120 corridor. The studies completed by the task force are in Appendix G.

### **3.3.2. Consultant Studies**

The consultant team completed a study of the habitat, bird species, and populations at Almond Marsh Forest Preserve, a Lake County Forest Preserve District property of 473 acres between U.S. Route 45 and Almond Road (see Appendix H). The study summarized the behavior and population habits of the Great Blue Herons at Almond Marsh Forest Preserve, and presented discussion points about the potential direct and indirect impacts to bird species at Almond Marsh Forest Preserve as a result of construction activities from a future Illinois Route 120 project.

## **4. PURPOSE AND NEED**

This feasibility study has established the framework for a future Phase I Study. A purpose and need statement was developed and coordinated with the Illinois Department of Transportation. The statement identified the needs of improved system linkage and continuity, capacity, roadway deficiencies, and safety. The purpose of the project is to address these needs.

### **4.1. Identified Project Needs**

#### **4.1.1. System Linkage and Continuity**

Illinois Route 120 bisects the middle of Lake County, running generally on a west to east line. It has a direct connection to Interstate 94 via a partial interchange to and from the south. It also has direct connection to multiple Strategic Regional Arterials at U.S. Route 12/Illinois Route 59, U.S. Route 45, Milwaukee Avenue (Illinois Route 21), and U.S. Route 41, other principal arterials at Illinois Route 60 and Illinois Route 83, minor arterials at Gilmer Road, Wilson Road, Fairfield Road, Cedar Lake Road, Illinois Route 134, Hainesville Road, Alleghany Road, Almond Road, Hunt Club Road, O'Plaine Road, and Illinois Route 43, and collectors or local streets at Fish Lake Road, Lake Street, Ivanhoe Road, Atkinson Road, Mill Road, River Road, and Greenleaf Avenue (see Exhibit A-9 in Appendix A).

Beyond Lake County, Illinois Route 120 continues west into the center of McHenry County providing access to the Cities of McHenry and Woodstock and other surrounding communities. East of Green Bay Road, Illinois Route 120 continues as Belvidere Road into Waukegan for approximately 2 miles before ending at Illinois Route 137 near Lake Michigan.

West of Illinois Route 60 in the vicinity of the county line and the intersection with U.S. Route 12/Illinois Route 59, Illinois Route 120 widens to two lanes in each direction with a paved median. This cross section continues west six miles into and beyond the City of McHenry. From Illinois Route 60 to near Almond Road, a distance of about 9.2 miles, Illinois Route 120 has just one lane in each direction. East of Almond Road, Illinois Route 120 widens out to two lanes in each direction separated by a grass or paved median. This cross section continues for most of the final 4.5 miles of the study area toward U.S. Route 41. The proposed action will provide a connecting link with a continuous four lane cross section to the east and west of the project's logical termini.

Illinois Route 120 is the backbone of the region's east-to-west traffic. It is central to Lake County's road network providing connection to a grid of north-south connections to roadways ranging from principal arterials to collectors and local streets. Improvements to the Illinois Route 120 corridor would facilitate travel through the region. Improvements would also ease local trips within the region. The proposed action will also provide enhanced north-south cross connections with Interstate 94, multiple Strategic Regional Arterials, and other principal arterials, collectors, and local streets.

Improvements to Illinois Route 120 should promote a consistent cross section and facility type throughout the corridor. Continuity across the roadway system promotes a safer roadway as the driver does not have to adapt to unnecessary changes (i.e. lane widths, speed limits, intersection spacing, etc.). The various cross sections and roadway types which the driver experiences along existing Illinois Route 120 do not promote system continuity.

#### **4.1.2. Capacity**

Throughout the corridor, existing and 2030 traffic volumes along Illinois Route 120 exceed the design capacity for a two-lane roadway. In addition, 2030 traffic volumes exceed the design capacity for a four-lane roadway. The

average daily capacity of a two-lane highway for safe and efficient operations is approximately 20,000 vehicles. For a four-lane highway, the volume threshold for safe and efficient operations increases to 30,000 vehicles. Traffic counts above this threshold indicate a need for additional through lanes. The existing number of lanes of Illinois Route 120 does not have the ability to meet the present or future traffic demands across the study area.

Traffic volumes were obtained from Chicago Metropolitan Agency for Planning (CMAP) for both existing conditions and for the 2030 no-build scenario. CMAP is responsible for developing land use and travel forecasts for the six counties in northeastern Illinois.

Traffic modeling information from CMAP was supplemented with traffic counts in and around the project corridor to develop an existing conditions sub-regional model. The sub-regional model allows detailed analyses at an intersection by intersection basis that the CMAP model did not provide. This new sub-regional model was used to develop models for each future scenario that was studied. These models were the basis for the comparison of alternatives for any of the 2030 project scenarios including the no-build scenario.

Many of the intersections along Illinois Route 120 do not have adequate turn lanes to accommodate the large volumes of turning vehicles. Over time, traffic growth in the study area is expected to continue due to the anticipated growth in population, employment, and increased residential and commercial development in the adjacent communities.

#### **4.1.3. Design Deficiencies**

Elements of Illinois Route 120 are considered deficient in comparison to roadway standards established by the American Association of State Highway Officials (AASHTO) *A Policy on Geometric Design of Highways and Streets*, 2004 and the Illinois Department of Transportation's *Bureau of Design and Environment Manual* (BDE), 2002 (Exhibit A-10, in Appendix A, graphically depicts the design deficiencies within the study area). The proposed action is needed to correct these deficiencies and improve safety and capacity within the corridor.

Substandard elements include:

- Varying roadway design speeds. Roadway speed limits along Illinois Route 120 vary from 35 miles per hour up to 55 miles per hour. Lower speeds are generally within the limits of the municipalities of Hainesville and Grayslake, while the higher speeds are in rural areas and in areas where the roadway already has four lanes. The lower speed limits are indicative of the more restrictive design standards for smaller radius curves. Multiple changes in roadway design speed require driver flexibility to adapt to changing conditions. In the municipal areas of Hainesville and Grayslake, Illinois Route 120 changes from a four-lane urban or two-lane rural cross section with shoulders, open drainage, and widely spaced intersections of mostly arterial roadways to a two-lane suburban cross section with curb and gutter, closed drainage, and closely spaced intersections of collector and local streets.
- Vertical and horizontal alignment deficiencies. Vertical curves with substandard sight distance limit the driver's ability to slow down to avoid stopped or turning vehicles. An example of this is the rolling terrain on Illinois Route 120 from Fairfield Road to Wildspring Road. These sharp vertical curves create a potential safety problem. Smaller radii horizontal curves exist on Illinois Route 120 near the Village of Grayslake. These smaller radius curves are one factor for the lower speed limits within Grayslake.
- Angle of intersection. Angles of intersection within 15 degrees of perpendicular are recommended. Angles greater than 15 degrees lead to potential safety problems. Sight lines at these skewed intersections can be restrictive for turning movements. These intersections also require turning vehicles to travel a longer distance to cross an intersection. All-way stop traffic control or traffic signals can be used at these

intersections to help improve safety but these traffic control measures impact capacity. Examples of intersections within the corridor with angles greater than 15 degrees are:

- Illinois Route 120 at Wilson Road – 35 degrees
- Illinois Route 120 at Illinois Route 83 – 30 degrees
- Illinois Route 120 at Atkinson Road – 30 degrees
- Lack of storage for turning vehicles at intersections. Many of the major intersections along Illinois Route 120 do not have adequate turning lanes like the intersection of Illinois Route 120 at Illinois Route 83. Turning vehicles have difficulty reaching the turn lanes due to the amount of through vehicles that block access to the turn lanes. Through traffic can also be blocked by the turning vehicles forced to queue in the through lanes. These conditions limit the capacity of the intersection and can lead to potential safety problems.
- Lack of center median for left turn lanes. Some residential areas along Illinois Route 120 lack any left turn lanes for driveways or minor cross streets. Examples of this include the section of Illinois Route 120 between Alleghany Road and Illinois Route 83, and also the section of Illinois Route 120 between U.S. Route 45 and Almond Road. These areas are potential safety problems.
- Uncontrolled access/consolidated driveways. Some commercial developments near the Villages of Hainesville and Grayslake have multiple, wide driveway throats that can lead to turning movement conflicts and driver confusion.
- Flooding/drainage concerns. Illinois Route 120 over the Des Plaines River east of Milwaukee Avenue is within the floodplain and the freeboard requirements are not met. During storm events within the past five years, the roadway has been closed due to floodwaters overtopping the roadway. Floodwaters have also overtopped the roadway on Illinois Route 120 between Atkinson Road and Ashford Lane.

#### 4.1.4. Safety

Safety is a significant concern given the lack of capacity along Illinois Route 120 and the design deficiencies along the existing roadway. Congested roadways lead to vehicles using secondary roads to reach their destinations. This spillover effect can in turn lead to increased safety problems along those secondary roads. Intersections without adequate turn lanes also lead to safety problems. Intersections like these yield impatient drivers who cross intersections or make turning movements during yellow and red traffic signal phases and increase the likelihood of crashes (Exhibit A-10 in Appendix A shows the locations of the safety deficiencies in the study area). The proposed action is needed to address the existing safety and design deficiencies and improve safety within the corridor.

In previous years, IDOT has identified the intersection of Illinois Route 120 at Illinois Route 83 and the intersection of Illinois Route 120 at U.S. Route 45 as high crash locations. High crash locations are locations where the frequency, rate, and cost of accidents exceed statewide criteria. The intersection of Illinois Route 120 at U.S. Route 45 was upgraded with additional through lanes and turning lanes in 2000 to address the safety problems at this intersection. However, no significant changes have been made to the intersection of Illinois Route 120 at Illinois Route 83.

The FHWA has moved to a new system to analyze roadways with safety problems. State Departments of Transportation are now required to report a minimum of 5 percent of the highway locations state wide as exhibiting safety needs. Recent IDOT reports from 2007 show two intersections fall within the top 5 percent priority areas. These locations are:

- The intersection of Illinois Route 120 at U.S. Route 12/Illinois Route 59
- The intersection of Illinois Route 120 at Illinois Route 83

Another area of safety concern is the two at-grade railroad crossings of Illinois Route 120. The Metra Milwaukee District North Line crosses Illinois Route 120 just west of the Illinois Route 134 intersection near the Village of Hainesville. The Canadian National (Metra North Central Line) crosses Illinois Route 120 just west of the intersection of Illinois Route 120 at Illinois Route 83. The Canadian National railroad carries freight and commuter rail traffic while the Metra Milwaukee District North Line carries commuter rail traffic only. Both crossings are fully protected with flashing signals, cross bars, signs, and pavement marking.

Also an area of safety concern is the offset intersection of Bacon Road and Cedar Lake Road near the center of Lake County. These two streets both end at Illinois Route 120. Bacon Road extends south of Illinois Route 120 and Cedar Lake Road extends north of Illinois Route 120. The streets are offset by approximately 0.25 miles. Vehicles that use these two streets for north-south travel movements must make right turn and left turn movements onto and off of Illinois Route 120. With the short distance between the intersections these vehicles travel at speeds lower than the 55 miles per hour speed limit. The mixture of slower turning traffic with high speed through traffic and lack of vertical sight distance leads to a pattern of rear end and turning crashes and is an area of safety concern.

#### **4.2. Land Use and Transportation Relationship**

Although development has spread rapidly across most of Lake County, growth is expected to continue into 2030. Population, employment, and household forecasts from CMAP project 30 percent growth rates for all three focus areas through 2030. This 30 percent growth rates over 30 years represent a decrease from the rate of increases experienced from 1980 to 2000 (40 percent increase in population and 79 percent increase in employment). Growth rates exceeding 100 percent are predicted for the Lake County townships of Fremont, Grant, and Wauconda near the western portion of the county. Rapid growth is also predicted for McHenry County with growth rates over 75 percent by 2030 for population and households and 60 percent growth in employment.

Identifying potential alternate modes of transportation is an important element of this project. Examples include bike paths, sidewalks, bus accommodations, transportation centers, and park & ride centers. Alternate modes of transportation should be included in the corridor and local land use planning as right-of-way, access, and location is considered. Today there are limited alternatives to vehicular travel within the project corridor. There are no bicycle paths or trails within the Illinois Route 120 corridor other than two 0.5 mile sections between Ivanhoe Road and Ashford Lane and between Harris Road and U.S. Route 45 in the Village of Grayslake. These paths connect with a path north of Illinois Route 120 along Atkinson Road and south of Illinois Route 120 to the Prairie Crossing subdivision. Transit routes operated by PACE only cross Illinois Route 120 or use the roadway for short segments.

As development occurs, access to roadways must be carefully planned. Appropriate zoning for undeveloped areas is critical to ensure a balanced region where the land use meets the needs of the existing communities and the new development areas. It is important that this project consider the effects of changes to Illinois Route 120 on existing land use and the effects on potential new development areas.

The County's and communities' growth and development drives the need for the road improvements and has helped determine in part what the roadway's character will be (i.e. number of lanes, facility type, access needs, etc.) Important goals of this project are to encourage thoughtful planning to coordinate the competing land use interests within the corridor and develop community land use plans with the roadway facility and transportation needs. The plan must take a regional look to promote coordinated development across the corridor and promotes access control, driveway consolidations, alternate modes of transportation, natural areas, buffers, and quality of life issues. The feasibility study is the mechanism Lake County and the Corridor Planning Council will use to promote awareness and encourage thoughtful planning consistent with the transportation needs.

## **5. FUTURE CONDITIONS**

### **5.1. Land Use Studies**

The work of the Land Use, Economic Development and Municipal Impact Task Force established the future land use for the corridor. Through the task force process, existing land use plans, conceptual development plans, and future land use plans from the municipalities within the corridor were incorporated into the Unified Vision. Through collaboration the future land use for the corridor was developed to insure thoughtful planning and avoid conflicting developments near community borders (see Exhibits A-11 to A-20 in Appendix A).

Development strategies for different transportation alternatives were prepared for the no-build, bypass arterial, and bypass expressway alternatives. The work concluded that the municipalities planned for similar future development independent of the selected roadway alternative. Minor land use differences were noted between the alternatives and these are shown on the exhibits.

The Unified Vision (see Exhibit A-1 in Appendix A) shows future land use changes based on the development strategy refined by the Task Force and approved by the Governance Board. Only parcels whose land use will change from its existing land use are shown.

### **5.2. Economic Development Studies**

The work of the Land Use, Economic Development and Municipal Impact Task Force determined that constructing the bypass will encourage new development in heavily congested areas. The studies showed that development other than residential has not occurred due to the congestion in the corridor. If the congestion were alleviated, balanced development could occur.

An analysis of tax generation based on the road character alternatives concluded that with the greater facility type, the more traffic, less congestion, and greater rate of development for non-residential properties (see Exhibit A-21 in Appendix A). Property values will also increase at a higher rate with respect to the facility type. Alternatives that carry more traffic would lead to higher amounts of economic development, particularly near the bypass roadway.

### **5.3. Travel Demand Studies**

A travel demand model was developed to predict future traffic volumes based on the Chicago Metropolitan Agency for Planning (CMAP) travel demand model for the area. A portion of CMAP's model was extracted and then refined for use in the study as a subarea model that allows more detailed analysis than a region wide model. The subarea model was refined to reflect the current street network and the correct number of lanes. With minimal differences in land use between the different development strategies, it was concluded that the changes in land use would have little effect on the travel demand for the different roadway alternatives.

Future 2030 traffic volumes and different measures of effectiveness were derived from the model to compare the benefits of the alternatives studied. Model growth from existing to 2030 was then applied to existing traffic counts to develop 2030 traffic maps for the various roadway scenarios. This type of analysis allowed for a comparison of alternatives at an Average Daily Traffic (ADT) level.

The following exhibits in show the 2030 traffic maps for the following studied alternatives:

- 2030 No-Action (Exhibit A-22, in Appendix A)
- 2030 Widen Existing to Four-Lanes with No Bypass (Exhibit A-23)
- Illinois Route 120 Bypass with Four-Lane Boulevard/Arterial (Exhibit A-24)
- Illinois Route 120 Bypass with Six-Lane Arterial (Exhibit A-25)
- Illinois Route 120 Bypass with Six-Lane Expressway (Exhibit A-26)
- Illinois Route 120 Bypass with Six-Lane Expressway and Illinois Route 53 Extension (Exhibit A-27)

With the No-Action scenario, traffic volumes will build along existing Illinois Route 120 to 17,400 to 27,400 vehicles per day (vpd) leading to more congestion. Widening existing Illinois Route 120 to four lanes will allow for traffic volumes to increase to 27,100 to 39,100 vpd.

Build scenarios that include construction of a bypass have higher volumes along the bypass as the classification of the bypass changes from a four-lane boulevard to a six-lane arterial and then from a six-lane arterial to an expressway. The alternative of a six-lane expressway combined with the extension of Illinois Route 53 led to the highest volumes along the bypass of 37,500 to 65,200 vpd. The six-lane arterial alternative has volumes of 35,800 to 61,400 vpd while the four-lane boulevard or arterial would have volumes of 26,800 to 46,200 vpd.

With any bypass alternative, traffic volumes on existing Illinois Route 120 are similar to existing conditions but less than the no-build alternative. The modeling studies show that the bypass will be used primarily for arterial type traffic using the roadway to cross central Lake County for destinations to the west or to the multiple north-south routes within the corridor. Existing Illinois Route 120 will serve as the road providing access to the existing residential and business areas in the Villages of Round Lake, Round Lake Park, Hainesville, and Grayslake.

Travel demand modeling work determined that with construction of a bypass, traffic growth is pulled off of other east-west routes across Lake County and placed on the bypass. With more available lanes along the bypass, traffic volumes would increase, and volumes on other east-west roads would decrease. This occurs because the east-west traffic in central Lake County avoids Illinois Route 120 due to congestion and uses other parallel routes that are not intended for east-west cross county traffic. As capacity is added with the bypass, vehicles return to their desired location along Illinois Route 120. It was concluded by the modeling work that a 6-lane expressway was most efficient in accommodating the travel demand in the area.

#### **5.4. Intersection Studies**

The theoretical capacity of different intersection types was developed to compare their effectiveness. Both four-legged and t-intersection types were analyzed including:

- Two-lane and three-lane roundabouts with and without bypass lanes
- Signalized intersection with two through lanes, dual left turn lanes and exclusive right turn lanes on all four legs
- Signalized intersection with three through lanes, dual left turn lanes and exclusive right turn lanes on major legs combined with two through lanes, dual left turn lanes and exclusive right turn lanes on minor legs
- Continuous Flow Intersections

A planning level analysis based on daily entering volumes was used to compare intersections. Principles from the Highway Capacity Manual were used to establish the benchmark of a signalized intersection's ability to meet Level of Service "D". Guidelines from the Transportation Safety Board's NCHRP Report 572 (National Cooperative Highway Research Program) was used to determine the capacity benchmark for roundabouts.

## 6. ROAD CHARACTER DECISIONS

### 6.1. Alternatives

The type of road, or its geometric design elements, defines its character:

- Number of lanes: four or six lanes
- Median type: barrier or depressed median
- Access: controlled or uncontrolled access
- Intersection type: interchange, traffic signal, or roundabout
- Drainage: curb and gutter with storm sewer system or shoulder with ditches and swales
- Multimodal: incorporation of transit, bike paths, or sidewalk accommodations
- Right-of-way width

Five alternatives were considered by the Governance Board for this project.

Alternate 1: No-Build Alternate

Alternate 2: Widen Existing Illinois Route 120

Alternate 3A: Illinois Route 120 Bypass, Four-Lane Roundabout Boulevard

Alternate 3B: Illinois Route 120 Bypass, Four-Lane Signalized Boulevard

Alternate 4: Illinois Route 120 Bypass, Six-Lane Signalized Arterial

Alternate 5: Illinois Route 120 Bypass, Six-Lane Expressway

The bypass alternates differed in their number of lanes, median type, access, intersection treatments, and drainage. Alternate 2 includes widening existing Illinois Route 120 to two lanes in each direction separated by a 30-foot barrier median with uncontrolled access, signalized intersections and curb and gutter with storm sewers. Alternates 3A and 3B are both four-lane bypass roadways with a wide 50-foot depressed median, partial access control, and shoulders with ditches. Alternate 3A would have roundabouts at all intersections in the corridor while Alternate 3B would have signalized intersections. Alternate 4 is similar to Alternate 3B but has six lanes instead of four lanes and a 60-foot depressed median. Alternate 5 is a six-lane expressway with a wide 60-foot depressed median and full access control.

An Illinois Route 120 Bypass as a six-lane expressway combined with an extension of Illinois Route 53 as an expressway was considered in the travel demand modeling but was not considered a feasible road character alternative due to the uncertainty of the Illinois Route 53 extension. It is clear that if Illinois Route 53 is extended as an expressway that Illinois Route 120 would need to be an expressway due to the traffic volumes and connectivity to Interstate 94.

A 300-foot right-of-way corridor has been preserved along portions of the bypass alignment and all alternates considered the use of a 300-foot corridor along the entire bypass alignment. Such a wide right-of-way width allows for the development of a roadway cross section that incorporates special features like bike paths on both sides of the roadway, a large grass median, wide drainage areas for stormwater management and water quality elements, and open areas that can be used for landscaping, buffers, and noise or sight screening.

## 6.2. Evaluation Methodology

Eight categories were developed to compare alternatives: Cost, Right-of-Way, Environmental, Traffic, Road User, Network, Economic Development, and Enhancement Opportunities. These eight categories were further refined into 22 unique criteria that made up a decision matrix (see Table 1).

**Table 1**  
**Road Character Decision Matrix Criteria**

<b>Cost</b>	<b>Road User</b>
<ul style="list-style-type: none"> <li>• Total Cost per Mile</li> <li>• Compatibility with User Fee Collection</li> <li>• Probability of Achieving Financing</li> </ul>	<ul style="list-style-type: none"> <li>• Travel Time</li> <li>• Address Existing Safety Problems</li> </ul>
<b>Right-of-Way</b>	<b>Network</b>
<ul style="list-style-type: none"> <li>• Proposed Right-of-Way Acquisition Areas</li> <li>• Building Property Acquisitions</li> </ul>	<ul style="list-style-type: none"> <li>• Traffic Reduction on Parallel Routes from No-Build Scenario</li> <li>• Traffic Change on Major North-South Routes from No-Build Scenario</li> <li>• Performance of Connectivity with Existing Roadway at Bypass Termini</li> </ul>
<b>Environmental</b>	<b>Economic Development</b>
<ul style="list-style-type: none"> <li>• Free and Clear Areas /</li> <li>• Lowest Impact Areas /</li> <li>• Moderate Impact Areas /</li> <li>• High Impact Areas /</li> <li>• Highest Impact Areas</li> </ul>	<ul style="list-style-type: none"> <li>• Compatibility with Existing Land Use</li> <li>• Compatibility with Proposed Land Use</li> <li>• Potential for Economic Development</li> </ul>
<b>Traffic</b>	<b>Enhancement Opportunities</b>
<ul style="list-style-type: none"> <li>• Demand Accommodation</li> <li>• Level of Service</li> <li>• Mean Delay</li> <li>• Vehicle Hours of Travel</li> <li>• Vehicle Miles of Travel</li> </ul>	<ul style="list-style-type: none"> <li>• Opportunity for Open Space</li> <li>• Opportunity for Transit Accommodations</li> <li>• Opportunity for Bike Network</li> </ul>

The 22 items are a mixture of qualitative and quantitative items. Where quantitative items were based on calculated results, the qualitative items were analyzed subjectively. See Table 2 for how the qualitative items were compared.

**Table 2**  
**Road Character Decision Matrix Qualitative Criteria**

<b>Cost</b>	
Compatibility with User Fee Collection	Ability to minimize access points, accommodate high traffic volumes and maximize capitalization
Probability of Achieving Financial Strategies	Ability to minimize shortfall between funding and construction cost
<b>Road User</b>	
Address Existing Safety Problems	Ability to remove or remedy safety problems
<b>Network</b>	
Performance of Connectivity with Existing Roadway at Bypass Termini	Ability to maintain a consistent cross section at bypass termini (number of lanes, access control, speed limit)
<b>Economic Development</b>	
Compatibility with Existing Land Use	Ability to mesh with existing properties
Compatibility with Proposed Land Use	Ability to mesh with proposed developments
<b>Enhancement Opportunities</b>	
Opportunity for Transit Accommodations	Ability to connect to transit centers
Opportunity for Bike Network	Ability to encourage bike traffic and maintain compatibility with existing bike paths

A five-level colored comparison chart was used to visually compare alternatives on a decision matrix (see Table 3). Each criterion has at least one red (weakest in comparison to the other alternates) and one dark green (strongest in comparison to the other alternates). The colors for the remaining alternates are determined relative to the strongest and weakest alternates. If results were determined to be insignificant, the gray color was used to show no difference in comparison.

**Table 3**  
**Road Character Decision Matrix Key**

MATRIX KEY	Potential Comparison
	Weak in Comparison
	∨
	∨
	∨
	Strong in Comparison
	No Difference in Comparison

### 6.3. Purpose and Need Alternative Screening

The purpose and need statement identified the needs of improved system linkage and continuity, capacity, roadway deficiencies, and safety. Any alternate considered for the Illinois Route 120 project must meet these needs or it cannot be considered a feasible alternate.

The identified needs were tied to the decision matrix criteria to use as a tool to screen the alternates. Both Alternate 1 (No-Build Alternate) and Alternate 2 (Widen Existing Illinois Route 120) were eliminated from further study by the Governance Board as they would not fully meet the identified needs.

Alternate 1 would not improve system linkage, enhance continuity, reasonably meet capacity needs, or improve the design and safety deficiencies of the corridor. The No-Build Alternative does not include any widening of the existing roadway and all the current deficiencies along existing Illinois Route 120 would remain.

Alternate 2 would not enhance continuity or improve the design deficiencies of the corridor. Widening of the existing roadway would address the safety deficiencies but would not correct the deficient design elements or develop a consistent cross section along the entire corridor.

Alternates 3A, 3B, 4, and 5 were all recommended for study by the Governance Board.

#### **6.4. Alternative Evaluation**

Four alternates, Alternates 3A, 3B, 4 and 5 were carried forward for evaluation by the Governance Board (see Typical Section Exhibits A-28 to A-31 in Appendix A) as each meet the project's purpose and need. A decision matrix was used to compare the remaining road character alternates (see Exhibit A-32 in Appendix A). Assignment of colors to the quantitative items was based on the numerical results. Color assignments for the qualitative items were based on technical judgment in collaboration with the task forces. Alternate 1 was shown on the matrix for comparison purposes only.

Alternate 3A would remove traffic bottlenecks in the corridor and provide the most access along the bypass. Alternate 3B would remove traffic bottlenecks and provide a moderate amount of access along the bypass. Alternate 4 provides increased traffic capacity with moderate access on the bypass. Alternate 5 has limited access but the most efficient traffic flow characteristics.

No single alternate was shown to be the strongest alternate for all of the 22 criteria. Strong and weak potential was identified in all of the alternates. Alternates 3A and 3B had the lowest cost, and low environmental impacts, but with limited traffic benefits. Alternate 4 had low environmental impacts but was more effective in moving traffic. Alternate 5 had the highest cost, highest environmental impacts and worst compatibility with land use, but was the most effective in moving traffic.

#### **6.5. Public Meeting Results**

On November 12, 2008, an open house public meeting for the Illinois Route 120 Feasibility Study was held at the Prairieview School, 103 E. Belvidere Road, Hainesville, Illinois, from 6:00 P.M. to 8:00 P.M. The purpose of the meeting was to obtain public comments on the road character alternatives. See Appendix C for information from the public meeting.

Comments from the public meeting were a mix of support and opposition for the four alternates. In review of all of the supporting comments, there is a preference for a four-lane alternate (Alternates 3A or 3B) with a slight preference for Alternate 3A. The significant use of a preprinted letter from Liberty Prairie Foundation led to the

preference of a four-lane alternate instead of a six-lane alternate. Considering the opposition comments of the two four-lane alternates, Alternate 3A had stronger opposition than Alternate 3B.

There is a difference in the comments between the communities within the limits of the bypass and those communities outside of the bypass limits. Supporting comments from municipalities outside of the bypass limits showed a preference for a six-lane alternate over a four-lane alternate, with a slight preference for Alternate 5. However, considering the opposition comments of the six-lane alternates, Alternate 5 has stronger opposition than Alternate 4.

For the communities within the bypass footprint (Grayslake, Hainesville, and Round Lake), the supporting comments showed a strong preference of a four-lane alternate over a six-lane alternate, with a slight preference for Alternate 3A. Considering the opposition comments of the two four-lane alternates, Alternate 3A had stronger opposition than Alternate 3B. Significantly more comments were received from Grayslake than from Hainesville or Round Lake. Comments from Hainesville and Round Lake were evenly split in their preference for a four-lane alternate or a six-lane alternate. Of the opposition comments in Hainesville and Round Lake, there is stronger opposition to both Alternate 3A and Alternate 5 than to Alternate 3B and Alternate 4.

## **6.6. Governance Board Selection**

The Governance Board selected a four-lane boulevard as the preferred alternate (see Exhibit A-33 in Appendix A). A differentiation between Alternate 3A and 3B was not concluded. The Governance Board did not have a preference on the use of roundabouts or signalized intersections at the locations where the intersection type was warranted. The Governance Board indicated that the intersection type is a technical issue to be determined by more detailed traffic engineering studies and not a policy decision to be made by the Governance Board. A future Phase I study would likely be required to reanalyze traffic conditions for 2040 instead of 2030. Therefore, the locally preferred road character is a four-lane boulevard.

## **7. ROAD PLACEMENT DECISIONS**

### **7.1. Alternatives**

The goal of selecting the road placement is to decide where the new road should go. Numerous constraints are located within the corridor and must be balanced to make these road placement selections. The project corridor follows both the existing alignment and a new bypass alignment. The total project length from U.S. Route 12 on the west to U.S. Route 41 on the east is 14.5 miles. Included in this length is the nine mile bypass section that departs existing Illinois Route 120 west of Wilson Road and rejoins the existing road east of U.S. Route 45 near Almond Road.

The bypass corridor has been identified in previous studies over the years. Portions of the alignment have already been dedicated as right-of-way and other portions have been preserved from development. Road placement alternates still exist at the two bypass termini near Wilson Road on the west and near Almond Road on the east. Also, the bypass alignment near the Big Sag Wetland Mitigation Bank west of Alleghany Road has potential for modification to limit impacts to the mitigation bank and avoid complete acquisition of the nearby Northbrook Sports Club.

These three areas were studied to determine the best way to transition from the bypass back to the existing alignment and to determine the best way to preserve a future corridor near the Big Sag Wetland Mitigation Bank and the Northbrook Sports Club. These areas are called the Western Terminus, Central Section, and Eastern Terminus.

#### **7.1.1. Design Criteria**

The road placement analysis was developed based on a future vehicle design speed of 60 miles per hour. The horizontal alignment was developed to accommodate all road character alternatives. The design speed was used through the bypass corridor to maintain flexibility in design for the future Phase I study. Other technical design elements like length of curve and angle of intersections were conducted based on the IDOT's Bureau of Design and Environment Manual Rural Strategic Regional Arterial guidelines (see Table 4). The future bypass will only provide full access to minor arterials and higher level roadways with a minimum one-quarter mile intersection spacing. Collectors and local streets will have access to the new roadway via the existing arterial road network.

Access from adjacent parcels to the new bypass will be minimized to the extent possible. Full access will be provided to the bypass at 1/4 mile intervals for arterial roadways. Right-in/right-out access shown on the Unified Vision will be provided at 1/8 mile intervals.

**Table 4**  
**Road Placement Design Criteria**

<b>Description</b>	<b>Design Criteria</b>
Design Speed	60 MPH
Maximum Superelevation	4%
Minimum Radius	1,505'
Minimum Curve Length	400'
Angle of Intersection *	Preferred: Within 15° of perpendicular Accepted: Within 30° of perpendicular
Intersection Spacing +	IL 120 Bypass: ½ Mile Minimum All Other roads: ¼ Mile Minimum

\*Angle of Intersection: The angle of intersection between the 120 Bypass and Fairfield Road is 70°, within 20° of perpendicular.

+Intersection Spacing: The distance between the Old Route 120, Wilson Road and Fairfield Road intersections is 0.46 miles and 0.47 miles, respectively.

## 7.2. Evaluation Methodology

Eight categories were developed to compare alternatives for the road character decision. For the road placement alternates, not all categories or criteria are relevant in comparison. Five of the eight categories containing seven of the 22 criteria were assessed for the road placement alternates (see Table 5). A decision matrix with these seven items was prepared for the Western Terminus, Central Section, and Eastern Terminus placement areas.

**Table 5**  
**Road Placement Decision Matrix Criteria**

<b>Cost</b>	<b>Network</b>
<ul style="list-style-type: none"> <li>• Total Cost</li> </ul>	<ul style="list-style-type: none"> <li>• Connectivity with Existing Roadway</li> </ul>
<b>Right-of-Way</b>	<b>Economic Development</b>
<ul style="list-style-type: none"> <li>• Proposed Right-of-Way Acquisition Areas</li> <li>• Building Property Acquisitions</li> </ul>	<ul style="list-style-type: none"> <li>• Compatibility with Existing Land Use</li> <li>• Compatibility with Proposed Land Use</li> </ul>
<b>Environmental</b>	
<ul style="list-style-type: none"> <li>• Free and Clear Areas /</li> <li>Lowest Impact Areas /</li> <li>Moderate Impact Areas /</li> <li>High Impact Areas /</li> <li>Highest Impact Areas</li> </ul>	

These remaining items are a mixture of qualitative and quantitative items as with the road character criteria. Where quantitative items were based on calculated results, the qualitative items were analyzed subjectively. See Table 6 for how the qualitative items were compared.

**Table 6**  
**Road Placement Decision Matrix Qualitative Criteria**

<b>Network</b>	
Connectivity with Existing Roadway	Ability to provide access to old Illinois Route 120
<b>Economic Development</b>	
Compatibility with Existing Land Use	Ability to mesh with existing properties
Compatibility with Proposed Land Use	Ability to mesh with proposed developments

A similar five-level colored comparison chart from the road character analysis was used to visually compare alternatives on a decision matrix (see Table 7). Each criterion has at least one red (weakest in comparison to the other alternates) and one dark green (strongest in comparison to the other alternates). The colors for the remaining alternates are determined relative to the strongest and weakest alternates. If results were determined to be insignificant, the gray color was used to show no difference in comparison.

**Table 7**  
**Road Placement Decision Matrix Key**

MATRIX KEY	Potential Comparison
	Weak in Comparison
	∨
	∨
	∨
	Strong in Comparison
	No Significant Difference in Comparison

Multiple alignments were considered by the Governance Board and task forces for the three road placement areas. Summarized below are the alignments considered by the Governance Board, the decision matrix for each section as presented to the Governance Board and the public, and the final alignment selected by the Governance Board.

### 7.3. Western Terminus Alternative Evaluation

#### 7.3.1. Alignments Studied

Three alignment alternates were brought forward by the task forces to the Governance Board for consideration (see Exhibit A-34 in Appendix A). Additional alternates were analyzed but not recommended for Governance Board consideration. The Western Terminus alternates consist of a north alternate and south alternates with and without impacts to the Kettle Grove Forest Preserve.

- Alternate 2W (North alternate that meets existing Illinois Route 120 east of Fairfield Road)
- Alternate 4W (South alternate with forest preserve impacts that meets existing Illinois Route 120 west of Wilson Road)
- Alternate 6W (South alternate without forest preserve impacts that meets existing Illinois Route 120 east of Fish Lake Road)

### **7.3.2. Decision Matrix Results**

A decision matrix was used to compare the road placement alternates (see Exhibit A-35 in Appendix A). Assignment of colors to the quantitative items was based on the numerical results. Color assignments for the qualitative items were based on technical judgment in collaboration with the task forces.

Alternate 2W has the least environmental impacts but the worst traffic connectivity. Alternate 4W is the most compatible with proposed land use but has the most environmental impacts. Alternate 6W has the least amount of building displacements but is the least compatible with proposed land use.

No single alternate was shown to be the strongest alternate for all of the seven criteria. Strong and weak potential was identified in all of the alternates. Many criteria were concluded to have no significant difference in comparison.

### **7.3.3. Public Meeting Results**

On April 15, 2009, an open house public hearing for the Illinois Route 120 Feasibility Study was held at the Prairieview School, 103 East Belvidere Road, Hainesville, Illinois, from 6:00 P.M. to 8:00 P.M. The purpose of the meeting was to obtain public comments on the road placement alternatives. See Appendix D for information from the public meeting.

In review of all of the comments, there is a preference for the north alternate (Alternate 2W) over the south alternates (Alternate 4W or 6W). For those comments preferring the south alternates, the comments show a preference for Alternate 6W over Alternate 4W. For those comments preferring the north alternate, the comments show a preference for the north alternate (Alternate 2W) due to the lower cost and less environmental impacts. For those comments preferring the north alternate, the additional traffic added to Cedar Lake Road and less compatibility with land use were not noted as a concern in the comments.

A small number of comments were received from property owners within the Western Terminus area. Those property owners north of Illinois Route 120 only prefer the south alternates (Alternate 4W or 6W). Those property owners south of Illinois Route 120 only prefer the north alternate (Alternate 2W).

### **7.3.4. Governance Board Selection**

The Governance Board selected Alternate 6W (south alternate without forest preserve impacts that meets existing Illinois Route 120 east of Fish Lake Road) as the locally preferred alternate. Revisions to the alignment were requested by the Governance Board to shift the roadway north away from impacting Sergeant's Marsh ADID (Advanced Determination) wetland thus minimizing impacts to the wetland and floodplains and shifting the road away from the Kettle Grove Forest Preserve (see Exhibit A-36 in Appendix A).

## **7.4. Central Section Alternative Evaluation**

### **7.4.1. Alignments Studied**

Three alignment alternates were brought forward by the task forces to the Governance Board for consideration (see Exhibit A-37 in Appendix A). Additional alternates were analyzed but not recommended for Governance Board consideration. The Central Section alternates consist of a north alternate with impacts to the Big Sag Wetland Mitigation Bank and two south alternates with impacts to the Northbrook Sports Club.

- Alternate 1C (North alternate without impacts to the Northbrook Sports Club)
- Alternate 2C (Center alternate without impacts to the mitigation bank)
- Alternate 3C (South alternate without impacts to the mitigation bank)

### **7.4.2. Decision Matrix Results**

A decision matrix was used to compare the road placement alternates (see Exhibit A-38 in Appendix A). Assignment of colors to the quantitative items was based on the numerical results. Color assignments for the qualitative items were based on technical judgment in collaboration with the task forces.

Alternate 1C has the least environmental impacts but has impacts to the Big Sag Wetland Mitigation Bank. Alternate 2C has no impacts to the Big Sag Wetland Mitigation Bank but has impacts to the Northbrook Sports Club and ADID wetlands. Alternate 3C has no impacts to the Big Sag Wetland Mitigation Bank but has the most environmental impacts.

No single alternate was shown to be the strongest alternate for all of the seven criteria. Strong and weak potential was identified in all of the alternates. Many criteria were concluded to have no significant difference in comparison.

### **7.4.3. Public Meeting Results**

In review of all of the comments (see Appendix D), there is a preference for the north alternate (Alternate 1C) impacting the mitigation bank over the alternates avoiding the mitigation bank but impacting the Northbrook Sports Club (Alternates 2C or 3C). For those comments preferring the alternates impacting the sports club, the comments show a preference for Alternate 2C over Alternate 3C. For those comments preferring the north alternate, the comments show a preference for the north alternate (Alternate 1C) due to less overall environmental impacts and more compatibility with existing land use. The additional impacts to the mitigation bank and sports club were not significantly noted as a concern.

A small number of comments were received from property owners within the Central Section area. Those property owners are split between the north alternate (Alternate 1C) and the south alternates (Alternate 2C or 3C).

### **7.4.4. Governance Board Selection**

The Governance Board selected Alternate 1C (north alternate without impacts to the Northbrook Sports Club) as the locally preferred alternate. Revisions to the alignment were requested by the Governance Board to further reduce impacts to the Northbrook Sports Club and to allow for redesign of the Big Sag Wetland Mitigation Bank to accommodate the bypass roadway. The Big Sag Wetland Mitigation Bank is owned by the Northbrook Sports Club and the owners have expressed a desire to work to allow the roadway through its property (see Exhibit A-39 in Appendix A).

## **7.5. Eastern Terminus Alternative Evaluation**

### **7.5.1. Alignments Studied**

Four alignment alternates were brought forward by the task forces to the Governance Board for consideration (see Exhibit A-40 in Appendix A). Additional alternates were analyzed but not recommended for Governance Board consideration. The Eastern Terminus alternates consist of two north alternates meeting existing Illinois Route 120 east of U.S. Route 45 and two south alternates meeting existing Illinois Route 120 west of Almond Road.

- Alternate 2E (South alternate that meets existing Illinois Route 120 west of Almond Road)
- Alternate 3E (North alternate that meets existing Illinois Route 120 east of Sears Boulevard)
- Alternate 5E (South alternate located north of Alternate 2E that meets existing Illinois Route 120 east of Mill Road)
- Alternate 6E (North alternate located south of Alternate 3E that meets existing Illinois Route 120 west of John Mogg Road)

### **7.5.2. Decision Matrix Results**

A decision matrix was used to compare the road placement alternates (see Exhibit A-41 in Appendix A). Assignment of colors to the quantitative items was based on the numerical results. Color assignments for the qualitative items were based on technical judgment in collaboration with the task forces.

Alternate 2E uses existing right-of-way but has the most environmental impact. Alternate 3E has the least environmental impact but is the least compatible with existing and proposed land uses. Alternate 5E has the best traffic connectivity but has more proposed right-of-way than Alternate 2E. Alternate 6E has better traffic connectivity than 3E but is the least compatible with existing land use.

No single alternate was shown to be the strongest alternate for all of the seven criteria. Strong and weak potential was identified in all of the alternates. Many criteria were concluded to have no significant difference in comparison.

### **7.5.3. Public Meeting Results**

In review of all of the comments (see Appendix D), there is a slight preference for the north alternates (Alternate 3E or 6E) over the south alternates (Alternate 2E or 5E). Of those comments preferring the north alternates, the comments show a preference for Alternate 3E over Alternate 6E. For those comments preferring the south alternates, the comments show a slight preference for Alternate 2E over 5E. For those comments preferring the north alternates, the comments show a preference for the north alternates (Alternate 3E or 6E) due to the less environmental impacts. The additional traffic added to U.S. Route 45 for Alternate 3E was not noted as a concern to those preferring Alternate 3E. For those comments preferring the north alternates, the increased right-of-way needs, greater property impacts, and less compatibility with land use were not noted as a concern to those preferring the north alternates (Alternate 3E or 6E). For those preferring the south alternates, the comments noted decreased right-of-way needs, less property impacts, and access issues. For those preferring the south alternates, the comments noted that these issues are a bigger concern than the environmental impacts.

Comments were received from property owners within the Eastern Terminus area. Those property owners north of Illinois Route 120 only prefer the south alternates (Alternate 2E or 5E). Those property owners south of Illinois Route 120 only prefer the north alternates (Alternate 3E or 6E).

#### **7.5.4. Governance Board Selection**

The Governance Board selected Alternate 5E (South alternate located north of Alternate 2E that meets existing Illinois Route 120 east of Mill Road) as the locally preferred alternate. Revisions to the alignment were requested by the Governance Board to push the alignment as far north as possible. Alternate 5E bisects property owned by the Lake County Forest Preserve District and the Governance Board preferred an alignment that minimized the amount of forest preserve property north of the alignment. Alternate 5E was also revised to avoid property from a recently approved development on the south side of Illinois Route 120 near Mill Road (see Exhibit A-42 in Appendix A).

## 8. FINANCING

### 8.1. Corridor Program

A funding program of improvements was studied to determine the financing for the project. The plan proposes to divide the corridor into 5 separate projects. All costs shown are in 2009 dollars.

#### Project 1 – Gilmer Road Realignment

Gilmer Road will be realigned along Ellis Drive to be shifted east of the Illinois Route 120 at U.S. Route 12 intersection to provide appropriate signal spacing along Illinois Route 120. Old Gilmer Road will remain at its current location at Illinois Route 120 as a right-in/right-out access until improvements to the intersection of U.S. Route 12 and Illinois Route 120 require it to be closed.

Construction	\$7,200,000
Right-of-Way	\$100,000
Environmental Mitigation	\$0
Engineering	\$1,800,000
<b>Project 1 Total Cost</b>	<b>\$9,100,000</b>

#### Project 2 – U.S. Route 12 Intersection

The U.S. Route 12 and Illinois Route 120 intersection is anticipated to be modified to separate the two roads, carrying Illinois Route 120 over U.S. Route 12. Volo Village Road will act as a ramp between the two routes. Feasibility level intersection studies indicate that an at-grade intersection will not function at an acceptable level of service in 2030.

Construction	\$10,800,000
Right-of-Way	\$1,700,000
Environmental Mitigation	\$1,700,000
Engineering	\$2,800,000
<b>Project 2 Total Cost</b>	<b>\$17,000,000</b>

#### Project 3 – Central Lake Thruway (Illinois Route 120 Bypass)

The Illinois Route 120 Bypass will be constructed from Fish Lake Road to Almond Road. The bypass will have a four-lane cross section and will provide access to all major routes. A grade separation will be provided where the bypass crosses Illinois Route 83, Illinois Route 137, Atkinson Road, the Canadian National Railroad and Metra Milwaukee District North Line Railroad. A bike path will be constructed on each side of the bypass, providing connections to existing and future bike paths proposed by local agencies.

Construction	\$236,400,000
Right-of-Way	\$51,800,000
Environmental Mitigation	\$57,600,000
Engineering	\$56,900,000
<b>Project 3 Total Cost</b>	<b>\$404,300,000</b>

**Project 4 – Des Plaines River Bridge**

The Illinois Route 120 over Des Plaines River Bridge will be replaced and the bridge and its approaches to the bridge will be raised out of the floodplain.

Construction	\$11,300,000
Right-of-Way	\$800,000
Environmental Mitigation	\$6,200,000
Engineering	\$2,800,000
<b>Project 4 Total Cost</b>	<b>\$21,100,000</b>

**Project 5 – O’Plaine Road Intersection**

The intersection of O’Plaine Road and Illinois Route 120 will be improved to a continuous flow intersection.

Construction	\$7,200,000
Right-of-Way	\$500,000
Environmental Mitigation	\$200,000
Engineering	\$1,800,000
<b>Project 5 Total Cost</b>	<b>\$9,700,000</b>

**Illinois Route 120 Corridor Program**

	<u>Construction Cost</u>	<u>Total Cost</u>
Project 1 – Gilmer Road Realignment	\$7,200,000	\$9,100,000
Project 2 – U.S. Route 12 Grade Separation	\$10,800,000	\$17,000,000
Project 3 – Central Lake Thruway (Illinois Route 120 Bypass)	\$236,400,000	\$404,300,000
Project 4 – Des Plaines River Bridge Replacement	\$11,300,000	\$21,100,000
Project 5 – O’Plaine Road Intersection	<u>\$7,200,000</u>	<u>\$9,700,000</u>
<b>Total:</b>	<b>\$272,900,000</b>	<b>\$461,200,000</b>

Separating the projects will increase the chances for matching up smaller scale projects with varying public funding sources.

**8.2. Limitations of Public Funding Only**

It is anticipated that funding the \$461 million program will not come from a single public funding source. The feasibility level financing studies determined what are the likely maximum levels of funding the program could receive. Those are:

FHWA/Illinois Department of Transportation	<u>\$200,000,000</u>
Lake County Division of Transportation	\$35,000,000
Municipal/Developer	\$15,000,000
Railroad	<u>\$5,000,000</u>
<b>Total:</b>	<b>\$255,000,000</b>

These values were based on a study of typical funding levels of similar projects. Municipality involvement could be offset by donations of right-of-way from developments as they occur in the future. Those donations would reduce the program costs and reduce the municipal funding level accordingly.

### **8.3. Limitations of User Fee Funding Only**

A feasibility level study was developed to assess the financial feasibility of a bypass route of Illinois Route 120 with user fee collection from electronic transponders only. The electronic user fee collection was found to be technically feasible on the bypass section of the Central Lake Thruway due to the restriction of access between the intersections. Illinois Route 120 users without electronic transponders would continue to use the old Illinois Route 120 alignment.

The analysis determined that implementing user fees on the new route will provide some but not all the funding needed to fully construct the facility. The study developed a recommended user fee of \$0.25 to \$0.30 per mile (in 2020 dollars) that would balance traffic diversion from a user fee imposition with the travel time benefits associated with the bypass (see Appendix I). Total project funding from user fees is anticipated to be between \$170 million to \$240 million.

This total project funding from user fees includes the use of Federal TIFIA loans. TIFIA loans are limited to 1/3 of the total project cost. TIFIA loans are available at a low interest rate and are paid back through user fees. The use of TIFIA loans is contingent on the collection of user fees.

User fee collection on an arterial road with controlled access is an innovative proposal new to projects of this type in the nation. The bypass corridor will support the use of user fees by limiting access and ensuring the corridor provides a traffic benefit to the user.

### **8.4. Financing Summary**

The feasibility study level financing analysis identified a shortfall with either a traditional public only funding scenario or a user fee supported only funding scenario (see Exhibit A-43 in Appendix A). In each case, approximately half of the required total funding is available and likely makes a joint traditional public/user fee funded scenario attractive.

More detailed studies will be conducted during the future Phase I study to determine the expected traffic diversion from a user fee collected roadway, potential user fee rate, and other financing details. Legislative action would be required to allow for the construction of a user fee collected arterial, the development of a local user fee group and/or a potential Public Private Partnership, if this scenario were selected.

Funding through the U.S. Department of Transportation's Grants for Transportation Investments Generating Economic Recovery (TIGER) Discretionary Grants were applied for in September 2009. If selected, this funding could be used to fund the future Phase I study and other phases of the project.

## **9. UNIFIED VISION**

### **9.1. Purpose**

The focus of this project is the construction of an Illinois Route 120 bypass, named the Central Lake Thruway, from near Fish Lake Road in Volo to near Almond Road in Grayslake. The nine-mile bypass would be constructed as a four-lane boulevard in a wide 300-foot right-of-way. The bypass would connect to sections of existing Illinois Route 120 that are already two lanes in each direction separated by a paved or grass median. The Central Lake Thruway would be a mixture of mostly at-grade intersections with some grade separated intersections. Two railroads would be grade separated from the new bypass. The project also includes reconstructing the Des Plaines River bridge and raising the bridge and its roadway approaches out of the floodplain along with certain intersection improvements along existing Illinois Route 120 west and east of the bypass limits.

On October 14, 2009 the Governance Board endorsed the Unified Vision for the Central Lake Thruway (see Exhibit A-1 in Appendix A). A signed resolution indicating support for the Unified Vision was endorsed by the Governance Board (see Exhibit A-2 in Appendix A). Individual resolutions from each of the local agencies along the corridor have been included in Appendix J.

The Unified Vision represents the conclusions and decisions made during the feasibility study. The front side shows the study area, future land uses changes, the alignment of the new roadway, where access will be allowed to adjacent properties, and locations of intersections or grade separations. The back side of the Unified Vision provides snapshots of the decisions made regarding typical section, multi-modal accommodations, environmental, stormwater, land use, financing, access, traffic, purpose & need, economic development and other areas.

Each local agency along with IDOT will use the Unified Vision to guide development with the corridor until the Phase I study is completed and proposed right-of-way can be secured. Each agency will plan for the proposed land use, preserve right-of-way, and guide access within the corridor.

### **9.2. Land Use | Economic Development**

The work of the Land Use, Economic Development and Municipal Impact Task Force established the future Land Use for the corridor. Through the Task Force process, existing land use plans, conceptual development plans, and future land use plans from the municipalities within the corridor were incorporated into the Unified Vision. Through collaboration the future land use for the corridor was developed to insure thoughtful planning and avoid conflicting developments near community borders.

The Unified Vision shows future land use changes based on the development strategy refined by the Task Force and approved by the Governance Board. Only parcels whose land use will change from its existing Land Use are shown.

Studies completed by the Land Use, Economic Development and Municipal Impact Task Force determined that constructing the bypass will encourage development in heavily congested areas. The rate of development and value of land along the bypass will increase and lead to an expanded tax base for the communities and Lake County.

### **9.3. Road Character | Road Placement**

Determining the type of road, Road Character, was the work of the Technical Task Force with input from the Land Use, Economic Development and Municipal Impact Task Force. Multiple road character alternatives were considered before selection of a four-lane boulevard by the Governance Board as the locally preferred alternative. Determining the location of the road, Road Placement, was the work of the Technical Task Force with input from the Environmental and Stormwater Impact Task Force. The Unified Vision shows the locally preferred road placement for those areas.

The Road Placement was developed to maintain flexibility in design for the future Phase I study. Technical design criteria were based on the Illinois Department of Transportation's Bureau of Design and Environment Manual. The four-lane boulevard follows IDOT's Rural Strategic Regional Arterial criteria.

#### **9.3.1. Traffic**

Detailed traffic studies were conducted as part of the road character decisions. The Unified Vision shows projected 2030 traffic volumes based on the selected four-lane boulevard alternative. These traffic volumes assume the extension of Illinois Route 53 is not constructed. Intersection studies based on the 2030 traffic volumes were introduced but final decisions deferred to the future Phase I study. It is possible that the future Phase I study will be required to plan for 2040 traffic volumes.

#### **9.3.2. Typical Section**

A wide 300-foot right-of-way corridor has been preserved along portions of the bypass alignment and the future vision considers the use of a 300-foot corridor along the entire bypass alignment. Such a wide right-of-way width allows for the development of a roadway cross section that incorporates special features like bike paths on both sides of the roadway, a large grass median, wide drainage areas for stormwater management and water quality elements, and open areas that can be used for landscaping, buffers, and noise or sight screening. Many of these features will be refined in the future Phase I study. The Unified Vision depicts a 300-foot corridor until the future Phase I study fully analyzes these special features in conjunction with more detailed profile and cross section analysis to determine if the right-of-way width can be minimized. Municipalities along the bypass have requested a narrower right-of-way.

#### **9.3.3. Access Recommendations**

Access to the new bypass will be based on the standards shown on the Unified Vision and at the locations identified on the map. Full access will be provided to the bypass at one-quarter mile intervals for arterial roadways. Right-in/right-out access where necessary and allowable will be provided at one-eighth mile intervals. Collectors and local streets will have access to the new roadway via the existing arterial road network. Access from adjacent parcels to the new bypass will be minimized to the extent possible.

Existing Illinois Route 120 bisects the middle of Lake County with direct connection to Interstate 94 and to multiple Strategic Regional Arterials, other principal arterials, minor arterials, collectors, and local streets. The future bypass will only provide full access to minor arterials and higher level roadways with a minimum one-quarter mile intersection spacing. Collectors and local streets will have access to the new roadway via the existing arterial road network.

The Unified Vision recommends locations for future intersections or interchanges. The future Phase I study will determine the type of intersection or interchange for each location. The following intersections or interchanges with Illinois Route 120 (from west to east) are recommended: U.S. Route 12/Illinois Route 59, Gilmer Road, Illinois Route 60, Fish Lake Road, future full access point 1/2 mile east of Fish Lake Road, connection to existing Illinois Route 120 west of Wilson Road, Wilson Road, Fairfield Road, Cedar Lake Road, Hainesville Road (extended), Alleghany Road, Lake Street (extended), connector road to Illinois Route 83, U.S. Route 45, connection to existing Illinois Route 120 west of U.S. Route 45, Almond Road, Hunt Club Road, River Road, and O'Plaine Road. Modifications to existing interchanges will also be studied in the future Phase I at the following locations: Illinois Route 21, Interstate 94, Greenleaf Street, and U.S. Route 41.

Right-in/right-out access at locations within the Villages of Lakemoor and Volo near the U.S. Route 12/Illinois Route 59 intersection with Illinois Route 120 may require removal depending on the intersection or interchange type constructed at this location.

#### **9.3.4. Transit Accommodation**

There are limited existing transit facilities within the Illinois Route 120 corridor. The Metra Milwaukee District North Line and the Metra North Central Service commuter rails cross near the center of the Illinois Route 120 corridor. The Unified Vision shows a connection from the new Illinois Route 120 bypass to the Grayslake Metra train station along the Milwaukee District North line near Lake Street. Bus routes operated by PACE only cross Illinois Route 120 or use the roadway for short segments. The Phase I study will evaluate the demand for an Illinois Route 120 bus route through the corridor. Additional transit opportunities for the Illinois Route 120 corridor will be studied in the future Phase I study. Ride share opportunities within the corridor will also be studied.

#### **9.3.5. Bicycle Accommodation**

Existing and planned bike paths are located within the Illinois Route 120 corridor, including the Millennium Trail, the Grayslake bike network, and the Des Plaines River Trail. The Unified Vision plans for east-west bike paths along the Illinois Route 120 Bypass from the Millennium Trail at Fish Lake Road to the Des Plaines River Trail and farther east with connections to existing and planned bike paths within the Illinois Route 120 corridor.

### **9.4. Environmental | Stormwater**

The project's typical cross section provides large areas on both sides of the road and the center median for the creation of special features that will meet the environmental and stormwater needs of the project. The future Phase I study will evaluate the use of bioswales, landscaped areas, open space, buffers, and noise or sight screening. Addition of noise walls along the right-of-way will be based on Federal Highway Administration and Illinois Department of Transportation regulations and desire for inclusion by the public.

The future Phase I Study will determine in greater detail the effect of this project on the environment. The preparation of the environmental documents will determine the project's impact on the environment. Future studies will be conducted to study the projects direct and indirect impacts to wetlands, floodplains, cultural resources, air quality, noise, energy, natural resources, water quality, and special lands like Illinois Natural Area Inventory Sites, Lake County Forest Preserves, and other publicly owned lands.

The Unified Vision for the project plans to meet all Federal, State, and County environmental and stormwater requirements, including the Watershed Development Ordinance of the Lake County Stormwater Management

Commission. Mitigation to wetlands impacted by the project will be done at regional wetland banking sites. Floodplain compensatory storage will be located adjacent to the floodplain fill areas on available land. Stormwater detention will be provided in ditches near each outlet. Regional detention sights will be considered for each watershed.

## **9.5. Unified Vision Notes**

The Unified Vision identifies multiple locations where additional analyses are necessary in the future Phase I study. The limited scope of the feasibility study did not allow detailed studies needed to make conclusions in these areas.

- Grade separation of the Central Lake Thruway with Illinois Route 83, Illinois Route 137, Metra and CN railroads
- Future intersection types
- Future interchange types
- Right-of-way needs

The locally preferred recommended alignment may require additional studies in multiple areas along the corridor.

- Sergeant's Marsh/Kettle Grove Forest Preserve
- Big Sag Wetland Mitigation Bank/Northbrook Sports Club
- Almond Marsh

Emergency access to Harris Road from the bypass is necessary to maintain an agreement between the Village of Grayslake and the Prairie Crossing subdivision. The Unified Vision shows construction of cul-de-sacs on either side of the bypass at Harris Road. Emergency vehicle accommodations will be added to the cul-de-sacs and across the median to insure accessibility across the bypass.

The Village of Grayslake requests that the future Phase I Study include the analysis for a future at-grade connection between the Village's Atkinson Road project and the Central Lake Thruway. The Village recognizes that the southern leg from the Central Lake Thruway intersection to Illinois Route 137 would have to be abandoned at the time of the construction of the bypass, with that connection being replaced by a road through the adjacent private development on the north side of the Illinois Route 120 bypass right-of-way.

## **9.6. Next Steps**

This Unified Vision represents the locally preferred plan developed by the Corridor Planning Council. The Corridor Planning Council has asked its member Communities and the County to work together to preserve the planned right-of-way corridor and follow the land use and access control concepts shown on the Unified Vision.

With the locally preferred plan approved, the Corridor Planning Council, Lake County Division of Transportation, and Illinois Department of Transportation will pursue funding to conduct a Phase I study by a highway building agency. The federal process will require that the Phase I study consider alternatives that were eliminated as part of this feasibility study in more detail, including the Road Character and Road Placement alternatives.

A finance committee including representatives from local politicians, the County Board and Lake County Division of Transportation staff has been formed to study opportunities to fund the future Phase I study.