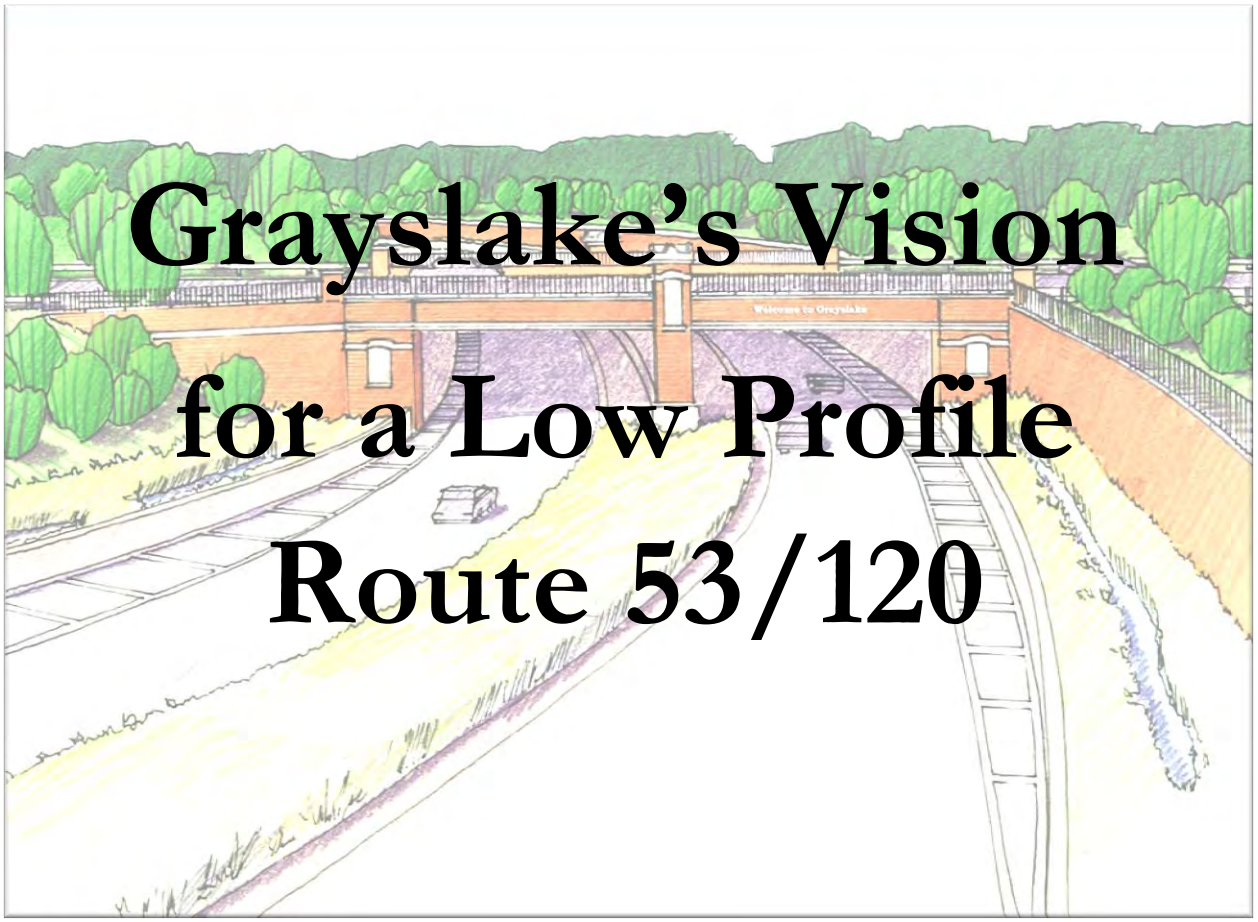
Grayslake's Vision for a Low Profile Route 53/120



March 2012

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Grayslake's Vision for a Low Profile Route 53/120

March, 2012

The Illinois Route 53/120 Blue Ribbon Advisory Council was formed in 2011 to identify consensus and develop a framework of principles to guide the future study and design of the corridor. Since a significant portion of the proposed Route 53/120 project – including a potential Route 53/120 interchange – will be located within Grayslake, the Village is taking a proactive position advising the Council. Grayslake believes that any Route 53/120 design should fit within the character of the Village and Central Lake County.

This visioning document is a follow up to a letter dated December 7th, 2011 summarizing our design parameters. We have partnered with the firm HDR Engineering to help us identify ***best management practices*** (BMPs) and incorporate these BMPs into our design parameters. The Village requests that these design parameters be incorporated into any report or recommendation from the Blue Ribbon Council to the Illinois Tollway.

The construction of Route 53/120 will have an impact on the Village of Grayslake – the Village wants this impact to be positive. To maintain a positive impact, the Village reviewed numerous design concepts and roadway design/construction BMPs used throughout the county, and is recommending several to the Council.

The Village's Route 53/120 design parameters fall under six (6) broad categories:

- **Low Impact Design to Reduce Adverse Impacts**
- **Aesthetics**
- **Community Connectivity – Vehicles**
- **Community Connectivity – Bicycles**
- **Mass Transit**
- **Best Management Practices and Environmental Design Standards**
    - *Best Management Practices for Design*
    - *Best Management Practices for Storm Water Control*
    - *Best Management Practices for Construction and Maintenance*
    - *Awards*

Low Impact Design to Reduce Adverse Impacts

The design parameters envisioned by the Village will result in a low impact design to our community and Central Lake County. These parameters include the development of a low profile roadway, minimizing the footprint of the roadway, eliminating roadway noise and lighting impacts, and minimizing the impacts to wetlands and open space.

Low Roadway Profile

The Village desires that the Route 53/120 corridor be constructed below grade. A low roadway profile design concept offers numerous environmental and operational benefits over an elevated roadway, *as originally proposed by IDOT,* or an at-grade roadway which requires significant profile adjustments to the local street system. A low roadway profile would greatly reduce adverse noise and visual impacts and would not form a barrier through the Village.

The Village understands that a low roadway profile can require significant amounts of earth relocation and can complicate roadway drainage. These challenges do not outweigh the vast benefits. The Village offers a design concept that minimizes earth relocation, by using the excavated earth to form berms aligning the corridor. An earth balance is achieved when earth removed from cut sections equals the earth required in fill sections. The potential Route 53/120 interchange offers ample opportunities to create berms and achieve an earth balance.

These berms serve multiple purposes; they will cut-off or impede noise and roadway lighting from leaving the corridor and can be used to direct run-off from adjacent properties to its natural outfall. Once natural outfalls are maintained, only the storm water that falls within the footprint of the corridor would need to be mitigated. At natural low points and outfalls along the corridor storm water will return to its natural course. As discussed in more detail under the Best Management Practices section of the report, the low roadway profile design should make extensive use of bioswales and natural infiltration to minimize and improve storm water that leaves the corridor.

Minimize Footprint

Available land is a precious commodity in Lake County. Land that is used to construct the roadway, the interchanges, and to accommodate storm water, cannot be used to accommodate businesses or to preserve open space. A portion of the corridor passes through areas identified in the Village of Grayslake's Comprehensive Plan as Planned Office/Industrial Development. The Village seeks to minimize the area utilized for this project by constructing the roadway with a minimal footprint.

Minimizing the footprint can be accomplished through the use of temporary easements, grading easements, or retaining walls. Temporary or grading easements include areas where the leveling of the earth is required to construct the roadway, but the land remains sole property of the owner. Maintaining maximum ownership of a property is important to owners because the type of development that can be placed on a site is dependent on the size of the parcel. Minimizing the footprint also will permit expanding or preserving open lands adjacent to the corridor. This open land can be maintained for wetland restoration, landscaping, or open space. Grading easements can be used to build berms to naturally screen the roadway. Where easements are not feasible, retaining walls can be used to retain earth vertically as opposed to using an embankment or slope. The Village understands that the use of retaining walls can reduce the natural landscape that is also desired, thus retaining walls should only be used where the value of the land outweighs the development of the natural landscape.

Potential roadway cross section is illustrated below

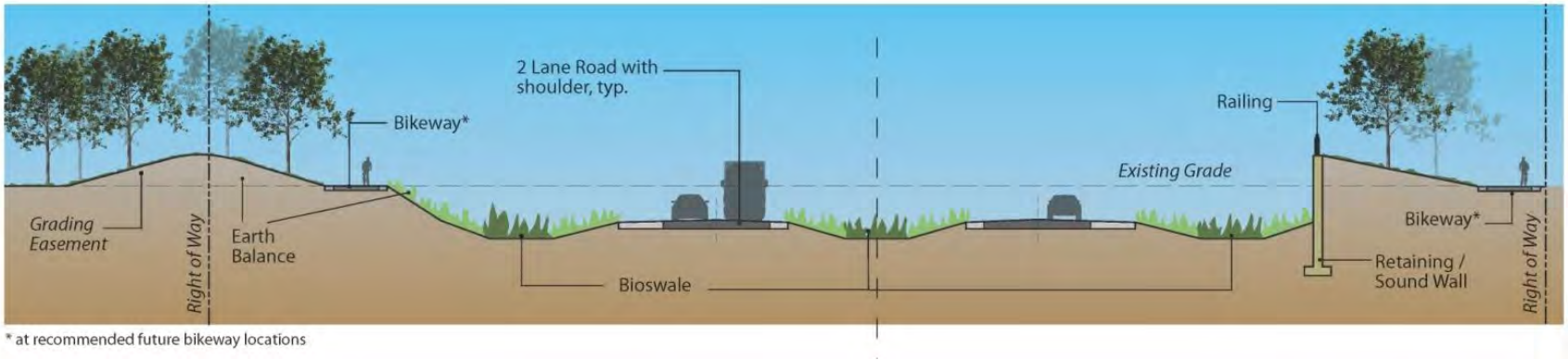


Figure 1 – Cross Sections for Consideration

Roadway Cross Section
A low roadway profile is desired where practical along the corridor. A low profile offers the visual and acoustical benefits over an at-grade or above grade roadway and does not disrupt the connectivity of the local street system. Extensive use of natural landscaping and bio-swales is desired to maintain the character of the surrounding environment.

Minimize Noise

Roadways generate a significant amount of noise through engine noise, tire friction noise, and aerodynamic noise having significant adverse impact on a community. The Village of Grayslake desires to maintain noise levels at or below the existing level of 64 DBA. Utilizing design features that minimize noise include the choice of pavement and omitting shoulder rumple strips in the design. Toll plaza placement (if required) would generate a significant amount of noise from breaking and acceleration, thus should be placed away from residential or other sensitive areas.

Figure 2 – Decorative Sound Wall

Where noise will be generated, the Village desires mitigation measures to be implemented in the following order;

- Lower roadway profile
- Install natural barriers/berms
- Install decorative sound walls

Sound walls, where installed, should be decorative and blend into the Village's unique natural landscape.

Minimize Light Pollution

Adding roadway lighting is a proven technique to improve safety – thus lighting is continually being installed along roadways. Unfortunately roadway lighting is often installed at levels in excess of what is required to achieve safe conditions. Lighting can have an adverse impact on the areas adjacent to a roadway due to light trespass (light entering adjacent property), light glow blocking visibility of the night sky, or glare. Unwanted lighting can impede sleep cycles and impede visibility. In addition to the nuisance of excessive lighting to people, nocturnal wildlife is also adversely impacted.

Safely reducing roadway lighting levels has received increased attention over the last decade to minimize the adverse impacts of over-illumination. Current research is now showing that existing lighting guidelines for limited access roads is excessive and may not be as great of a safety benefit as once thought. Improvements to vehicle headlights and sign/pavement marking retro-reflectivity have reduced the need for overhead lighting. The Center for Environmental Excellence by AASHTO maintains a database of research on numerous environmental factors including roadway lighting. Illumination standards are continuously being refined to best identify the level of lighting required to maintain safe roadway conditions and minimize adverse impacts.

The Village believes that the entire Route 53/120 corridor does not need to be artificially illuminated. The lighting design should seek to reduce overhead lighting to the greatest extent possible using the latest research and BMPs. At locations where lighting is installed, it should be below grade or directed downward toward the pavement through the use of full-cut off fixtures. Light sources should be shielded from adjacent lands through the use of a low roadway profile and installing natural landscaping. Natural landscaping should be able to screen the light source year-round.

In-Pavement Lighting

As an innovative design consideration the Village of Grayslake suggests the installation of in-pavement lighting to illuminate the lane lines and using highly retro-reflective pavement markings to drastically reduce or eliminate the need for overhead lighting.

Figure 3 – In-pavement Lighting

Signage is required to provide guidance and directional information to motorists. Recent changes to the Manual on Uniform Traffic Control Devices (MUTCD) have increased font sizes thus increasing the size of sign panels. While the Village is supportive of these changes, the design should consider the adverse impact that these signs have on the environment. The area around each sign should be landscaped such that only the motorists have visibility of the sign. Well placed retro-reflective signs should not require illumination, however where sign lighting is required the Village desires downward facing lighting to minimize the light halo.

Wetlands

Much of the Route 53/120 corridor is in or adjacent to environmentally sensitive wetlands and portions of the proposed Route 53/120 Interchange are within the 50-year or 100-year flood plain. The design of this corridor must protect these lands. The use of BMPs will greatly improve the quality of the rainwater discharged into the local streams. BMPs include:

- Low Road Profile
- Storm water cleansing through the use of bio-swales in the median and roadside
- Operations (reduced salt usage)

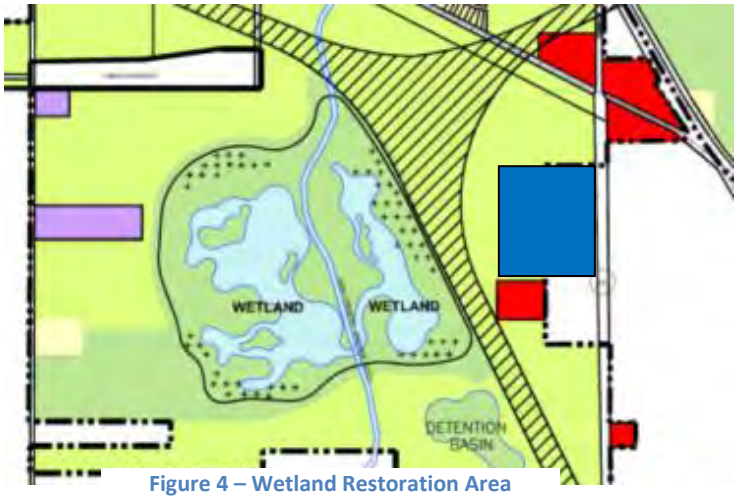


Figure 4 – Wetland Restoration Area

Aesthetics

Central Lake County is a naturally beautiful place with wooded areas, large prairies, and wetlands. The Village believes that the proposed roadway should not impose on the environment; rather the environment should be enhanced by the road. Corridor beauty can be achieved by bringing the environment into the design of the roadway through the use of a low profile, use of Village landscaping guidelines, and including bioswales where feasible. Plantings should provide variety and add year-round beauty to the corridor.

> ***Do not impose the road upon the environment; rather enhance the environment with the road.***

The required roadway and structural elements should match the character of Grayslake. The Village envisions the bridges through Grayslake matching the architectural style of the Village's way finding signage. The name of the cross street should be visible to motorists by etching it in the concrete façade of the bridge or internally illumined sign. The rendering of the bridge below illustrates the architectural style of the Village.

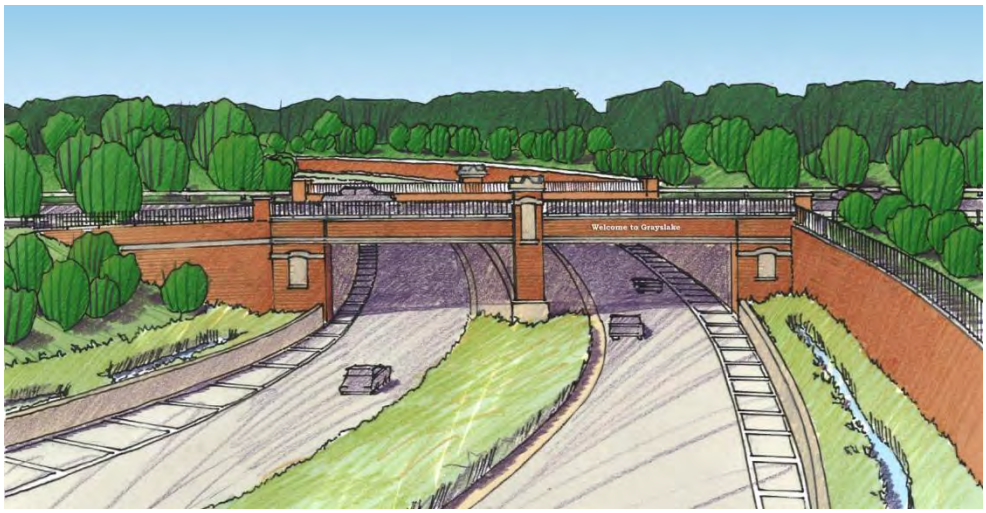


Figure 5 – Bridge Rendering Matching Grayslake's Architectural Style

Along the bicycle/pedestrian trails adjacent to the corridor, trail maps and directional signage should be incorporated into the design to provide direction to downtown Grayslake, train stations, recreational areas, and wetland preserves.

Landscaping

Landscaping is a prime means to provide and maintain a signature appearance to the Village and the Central Lake County region. The Village suggests developing landscape design guidelines as part of any proposed corridor design. We envision a design that emphasizes the distinctive natural environment of prairie, wetlands and fields that form natural lines that become the preferred landscape.

The landscape design goals include:

- Using native materials where possible to increase sustainability and reduce maintenance
- Enhance views through framing and buffering that emphasize Grayslake's unique natural environment; recognize visual and clear zone restrictions
- Provide visual interest that blends with the natural design theme of the corridor

The Village's landscape design goals are illustrated in Exhibits A through D.

Figure 6 – Example of Landscaped Interchange

Community Connectivity – Vehicles

The Village of Grayslake must stay connected to and across the proposed Route 53/120 corridor. The corridor cannot be a barrier to the community; rather it must allow connectivity for our community. Cross corridor connections for the local collector and arterial street system, the Village's bicycle path network, and all existing utilities all must be maintained.

The Village envisions vehicular corridor connections at Alleghany Road, Peterson Road, and U.S. Route 45 serving the west, south, and east sides of the Village. These connections are illustrated in Exhibit F - *Connections Plan*. Several interchange design concepts were reviewed that would meet the low impact design parameters previously discussed. The objective of each interchange concept was to minimize the roadway footprint, protect environmentally sensitive lands, and maximize access to the Village of Grayslake.

Alleghany Road

Full access is envisioned at Alleghany Road with Route 120 connecting western and central Grayslake to the corridor. The Village envisions a folded diamond/pareclo or similar style interchange design. The folded diamond/pareclo interchange design offers an advantage over a full diamond because full access is provided, while only occupying two of the four quadrants. At Route 120 and Alleghany this would avoid the existing residential area on the northeast quadrant, and minimize the loss of industrial land that could be developed around the remaining quadrants. A rendering of a folded diamond at Alleghany Road is illustrated in Exhibit D – *View of 120 Bypass from Alleghany Road.*

Figure 7 – Folded Diamond/ Pareclo Interchange

Peterson Road/Route 83

Similarly to Route 120 at Alleghany Road, folded a diamond/pareclo style interchange is suggested at Route 53 and Peterson Road/Route 83. This interchange would provide a full access to future light industrial developments and the new Lake County Fairgrounds while minimizing the footprint of interchange. The area around the proposed interchange is zoned light industrial and will likely increase in value once a proposed roadway is constructed.

Due to the close proximity of the new corridor to Route 83 and Peterson Road intersection, consideration should be given to relocating Route 83 to the west as suggested in the Cornerstone Development Plan. Exhibit A – *View of Route 53 Extension from Winchester Road* illustrates a potential interchange at Peterson Road.

U.S. Route 45

A full Single Point Urban Diamond Interchange (SPUD) is recommended for Route 120 at U.S. Route 45 providing full access to the eastern portion of the Village, including direct access to Northwestern/Lake Forest Hospital. A SPUD interchange requires less of a footprint than a traditional diamond interchange and improves operation. Operation is improved by permitting concurrent left turns for greater capacity. Exhibit C – *View of Route 120 Bypass from US Route 45* illustrates a potential SPUD interchange at Route 45.

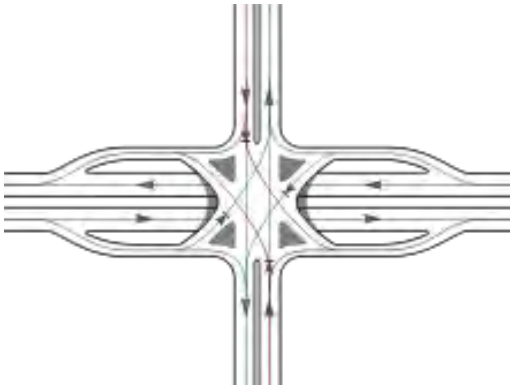


Figure 8 – Single Point Urban Diamond Interchange

Route 53/120 Interchange

The Route 53/120 Interchange in the form of structures and bridges would cause a significant amount of environmental change. Similarly to the desired roadway cross-section, the Village envisions a low profile interchange and a compact interchange footprint to minimize impacts to the surrounding environmentally sensitive areas. The Village proposes an interchange concept of tunnels and low profile roadways to maintain open space while maintaining connectivity between the two routes. Where portions of the interchange extend above the existing grade, landscaped berms should be constructed with the excavated earth to shield adjacent land uses from the roadway noise and the light pollution emitted from the interchange.

The area above the tunnel provides an opportunity to create wetlands as well as bike path connections through the interchange. These connections will lessen the impact that the proposed interchange will have on the Village – while meeting all the transportation objectives of the Blue Ribbon Advisory Council. Exhibit B - *View of Route 53 Extension from Peterson Road* illustrates the proposed interchange, the use of tunneling and depressed roadways and use open space.

The Village acknowledges that costs for tunneling and constructing a low profile interchange can be higher than an elevated structure; however there is precedent nationally for constructing roadway tunnels to avoid environmentally sensitive areas.

Community Connectivity - Bicycles

The use of bicycle trails for both commuter and recreational trips is growing. The Route 53/120 project must maintain connections between Village's existing comprehensive trail network, provide connections to Alleghany Park, the Central Range Economic District, and existing local and regional path systems. The planned east-west corridor from Prairie Crossing to Alleghany Road shall be included in the plan. Exhibit E – *Greenways/Bikeways Plan* illustrates a proposed bicycle path network following the construction of a new roadway.

In addition to maintaining the Village's network, two path options parallel to the corridor should be considered. Where sound or retaining walls are utilized, the path should be placed on the outside of the retaining wall. Placing the path on the outside of the wall places the path closer to the community. Where retaining walls are not installed, the path should meander along the outside of the right-of-way. Where this right-of-way is not linear, the extra space can be used to create small natural areas along the path.

Figure 9 – Trail parallel to Roadway (Custis Trail - Arlington VA)

Where bicycle paths cross the corridor together with the local streets, consideration should be made to widen the bridges to accommodate the full cross section path to path, or sidewalk to sidewalk. A wider bridge will maintain physical separation between the path and the roadway users across the bridge. Aesthetically, widening bridges would also allow the continuation of the parkway landscape across the bridge, further reducing the separation feeling that a long bridge can bestow.

Mass Transit

While the primary mode of transportation through Lake County is and will remain the personal auto, there is a growing percentage of the population that does not own a car. Providing transportation options to those without a personal auto increases the job pool for the growing industrial areas of Central Lake County, reduces our reliance on automobiles, and improves air quality resulting in a more livable community.

Mass transit is already a key element in the Village. The area hosts four Metra Stations on two Metra Rail Lines. However, these stations are currently not connected to the nearby employment centers. The Village envisions a corridor design that provides direct access from the station(s) to the corridor. Direct access will facilitate Pace Bus or private shuttle service to major employment centers such as the College of Lake County, the Lake County Fairgrounds, the Central Range Economic District, and the Cornerstone Project. Direct connections can also foster the use of the Metra Parking Lots for over-flow parking and shuttle people to major events at the Lake County Fairgrounds.

Best Management Practices and Environmental Design Standards

Desiring the highest standards is in-line with the guiding principles set by the Route 53/120 Blue Ribbon Panel, however "highest" or "best" is hard to define and quantify. The Village of Grayslake recommends that design standards that can be qualified and measured be selected. Best management practices for design are defined by the Federal Highway Administration for safety and work zone management and by the Center for Environmental Excellence by AASHTO. At a minimum the design of the Route 53/120 project should achieve the highest level for each design category and seek to advance national design practices in multiple design categories.

Best Management Practices for Design

Several design categories have been established by the Center for Environmental Excellence and through the Illinois – Livable and Sustainable Transportation Rating System and Guide (I-LAST). I-LAST includes a comprehensive list of practices that can bring sustainable results to highway projects, establishes a scoring method, and recognizes the results. The manual divides sustainable practices into eight categories: planning, design, environmental, water quality, transportation, lighting, materials, and innovation. The Village believes that the full use of the I-LAST Guide book should be implemented for the Route 53/120 project, and set the bar for I-LAST scoring. A construction category will soon be added to the I-LAST Guide.

Best Management Practices for Storm Water Control

Storm water that falls within the limits of the corridor, as well as storm water that naturally flows across the corridor would need to be addressed as part of the Route 53/120 project. Historically, roadway projects channeled storm water to natural outfalls though engineered channels or piping. This storm water would pick up roadway pollutants and degrade water quality. Great improvements to storm water management have been developed that decrease the volume of storm water released and improve the quality of the water at an outfall. Bioswales are used to cleanse storm water before an outfall, permeable pavements are used to permit natural infiltration, and rainwater harvesting is used to capture and store storm water and to be later used for irrigation. The Route 53/120 project should make extensive use of storm water best management practices to maintain the high water quality throughout Central Lake County.

Best Management Practices for Construction and Maintenance

The Village desires the continuation of best management practices beyond the design of the corridor. Best management practices should be developed for construction activities as well as operation and maintenance of the roadway once constructed. The Center for Environmental Excellence details design/management practices for environmental stewardship for construction and maintenance operation and winter maintenance. Improvements to snow control equipment now apply chemicals more precisely to avoid over-application. Road weather information systems (RWIS) measure the temperature and moisture contact on the roadway and communicates to a maintenance facility the salt mixture to be applied, or more importantly what not to apply. The Village encourages the Blue Ribbon Council to address construction and maintenance techniques as a continuation of coordinating efforts.

Awards

While the purpose of building a 21st Century Boulevard has little to do with winning awards, meeting the criteria required to qualify for these awards represents high level of accomplishment as viewed by our peers. American Road and Transportation Builders (ARTBA), American Council of Engineering Consultants, Transportation Research Board (TRB), American Association of State Transportation Officials (AASHTO) and numerous more organizations each organize yearly awards for transportation projects. Qualifying for each of these awards would symbolize that the "best" practices in the industry were utilized as part of this project.

Continued Involvement

The Village of Grayslake wishes to continue to be a partner to Illinois Route 53/120 Blue Ribbon Advisory Council through the design stage, and through the potential construction of the project.

Exhibit A - View of Route 53 Extension from Winchester Road

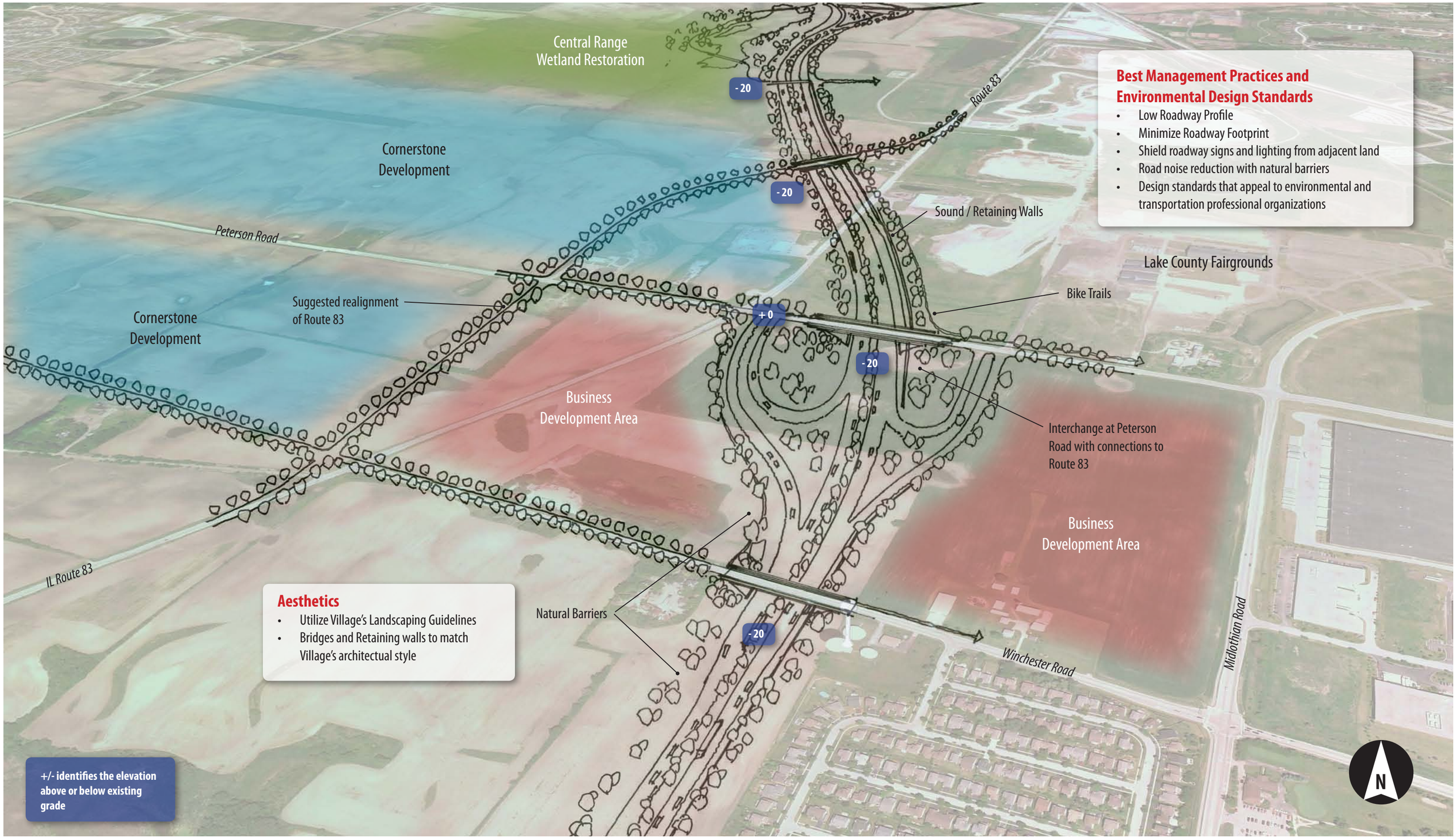


Exhibit B - View of Route 53 Extension from Peterson Road

A significant proposed Route 53/120 project – including a potential Route 53/Route 120 interchange - will be located within the Village of Grayslake. The design of a new roadway could have a significant adverse impact or a positive impact to the Village. The Village will be taking a proactive position with regard to the development of the corridor design elements.

Grayslake Vision for Route 53 / 120:

- Utilization of the highest design / environmental standards
- Low impact design
- Preserve / expand bikeway network
- Support economic development
- Accommodate mass transit
- Adherence to Central Lake Thruway / Unified Vision

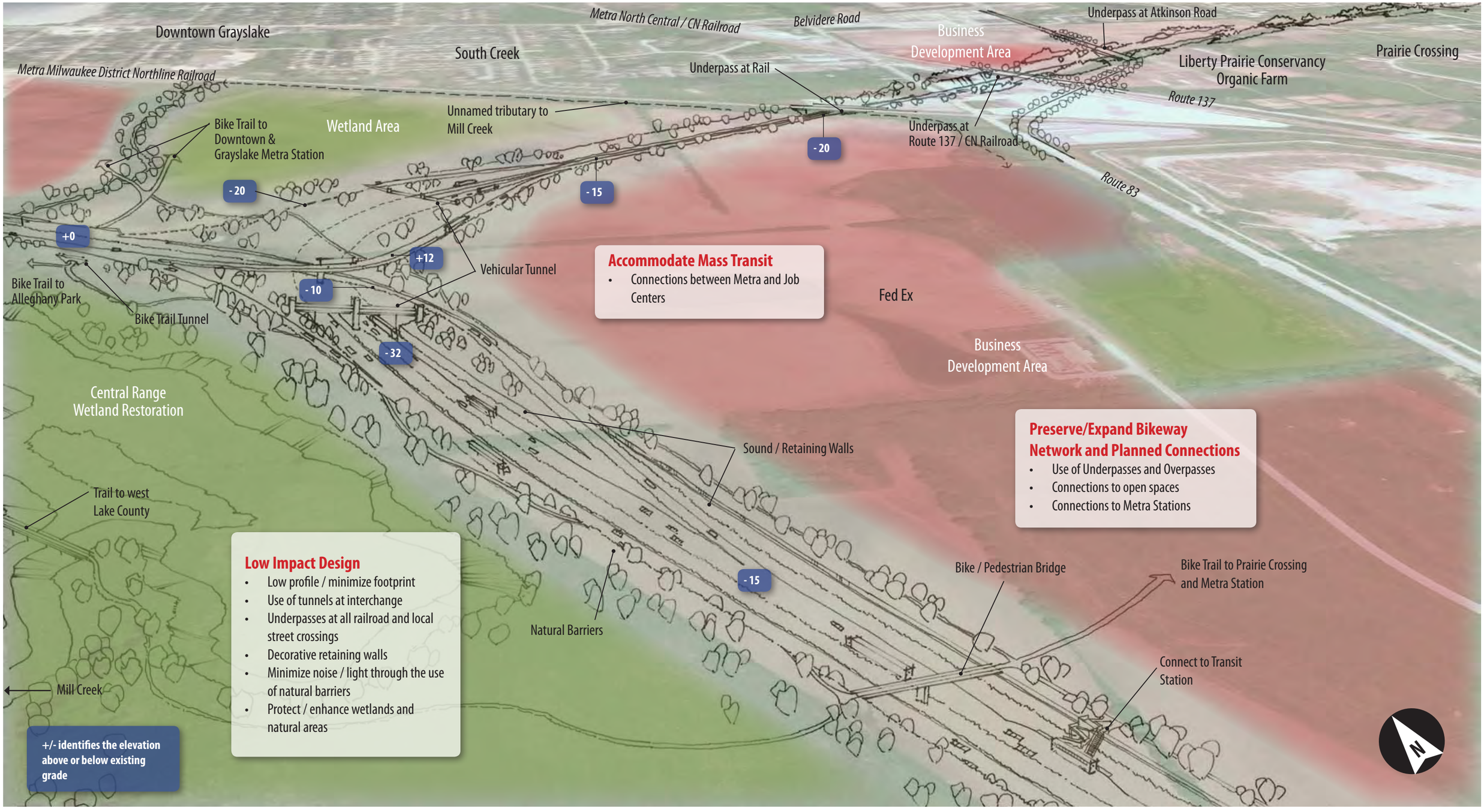
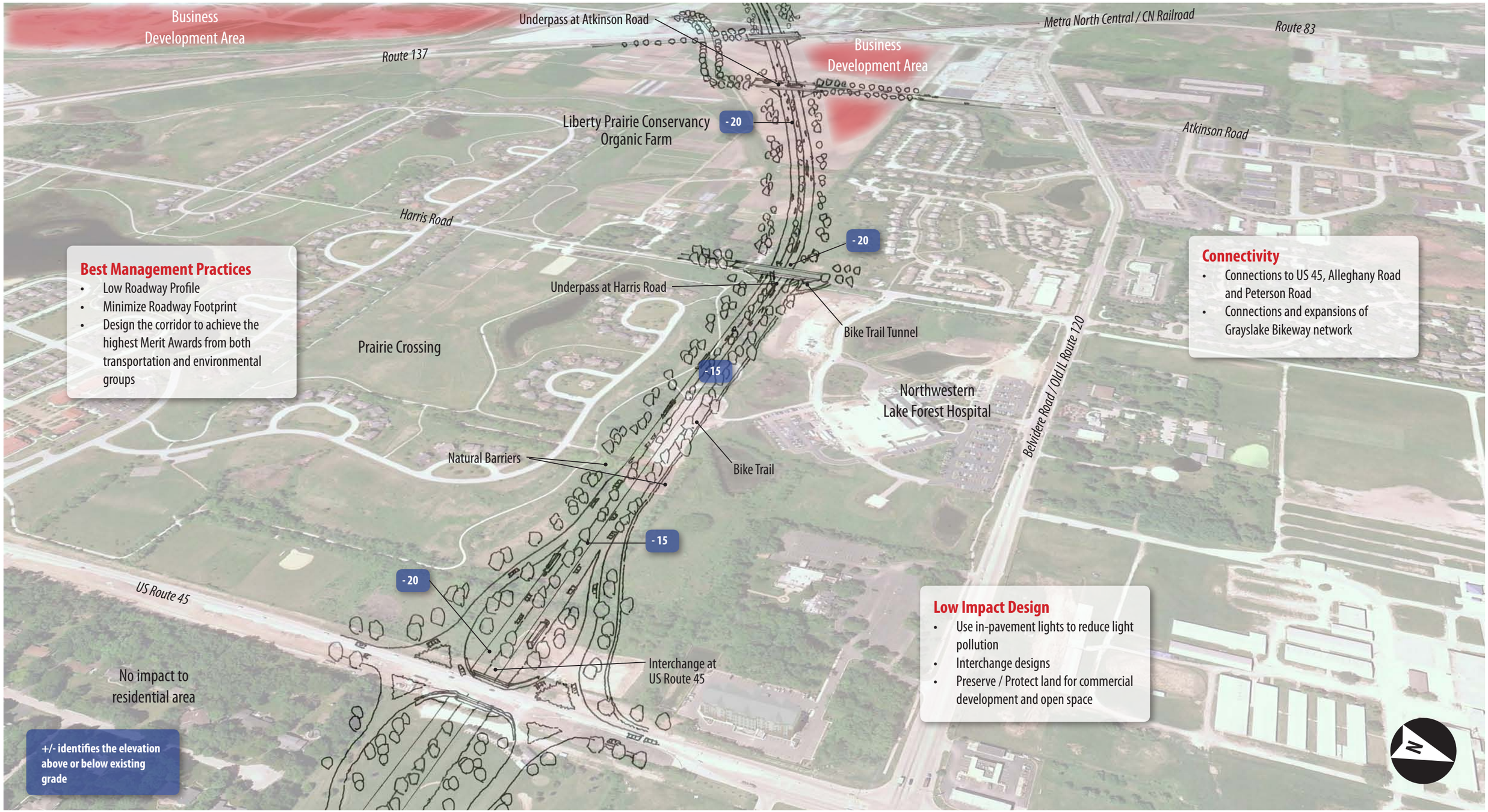


Exhibit C - View of Route 120 Bypass from US Route 45

The Route 120 portion east of the interchange begins the transition to a lower speed boulevard. The Village desires connections to State highways through Grayslake.

Grayslake Vision for Route 53 / 120:

- Utilization of the highest design / environmental standards
- Low impact design
- Preserve / expand bikeway network
- Support economic development
- Accommodate mass transit
- Adherence to Central Lake Thruway / Unified Vision



Best Management Practices

- Low Roadway Profile
- Minimize Roadway Footprint
- Design the corridor to achieve the highest Merit Awards from both transportation and environmental groups

Connectivity

- Connections to US 45, Alleghany Road and Peterson Road
- Connections and expansions of Grayslake Bikeway network

Low Impact Design

- Use in-pavement lights to reduce light pollution
- Interchange designs
- Preserve / Protect land for commercial development and open space

Exhibit D - View of Route 120 Bypass from Alleghany Road

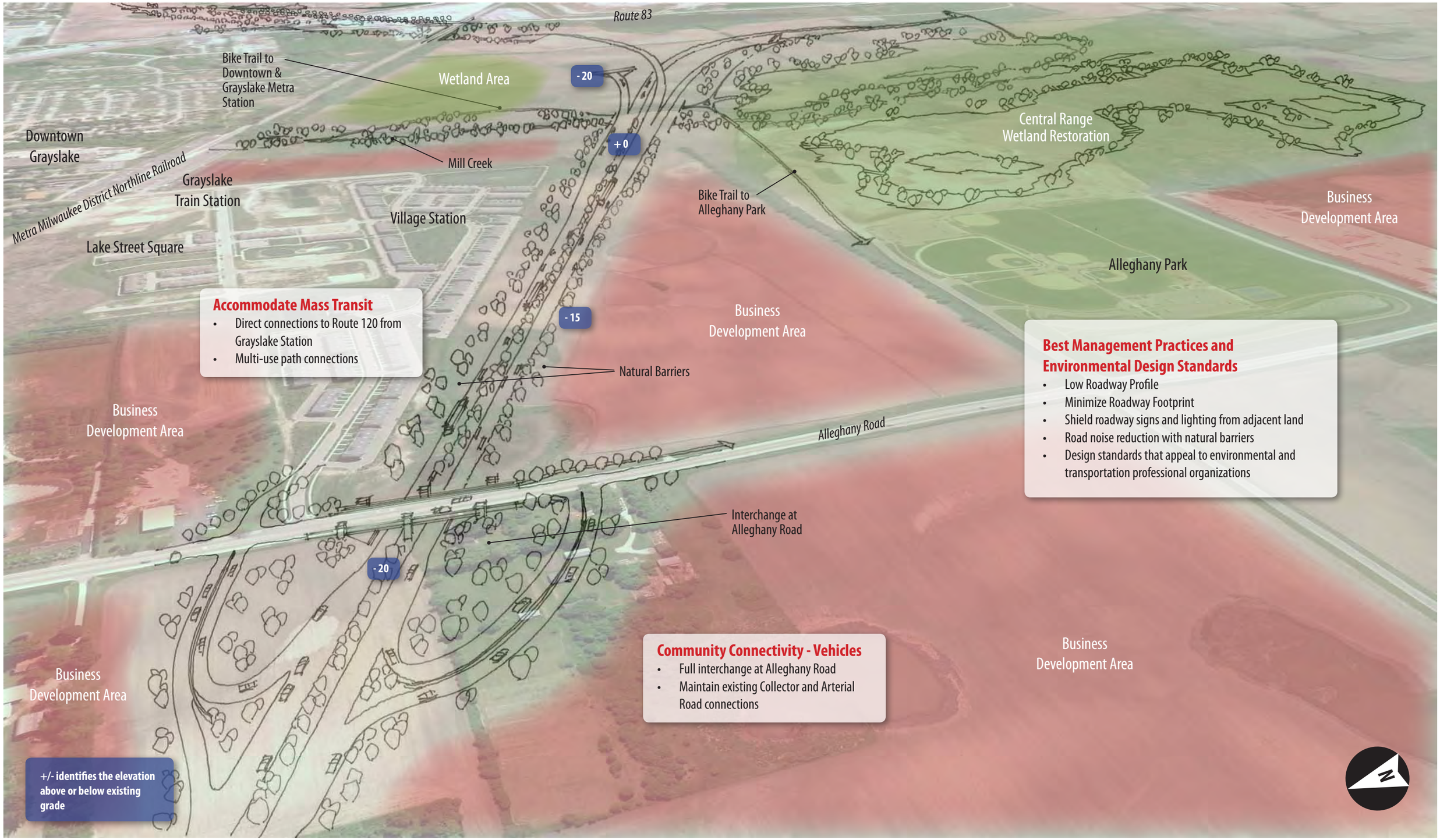
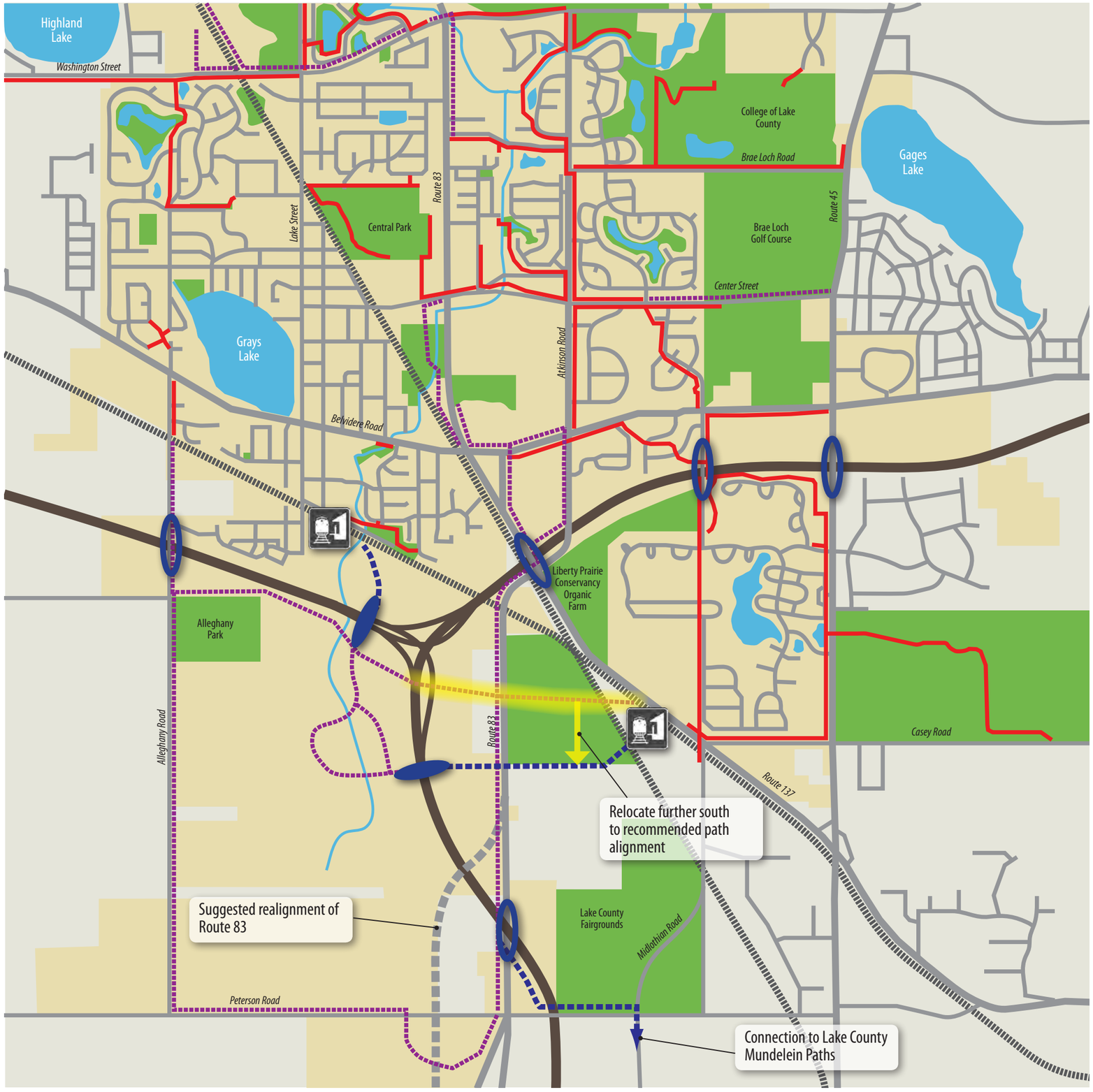


Exhibit E - Bikeways Plan

The use of bicycle trails for both commuter and recreational trips is growing. The Route 53/120 project must maintain connections between the Village's existing multi-use trail network and provide for connections to Alleghany Park, the Central Range Economic District and Metra Stations. The planned corridor from Prairie Crossing to Alleghany Road shall be included in the plan. Special attention to maintaining the connections to the Village's existing comprehensive trail system to the Libertyville Township and regional systems shall be included as part of the design.



LEGEND

- Existing Paths (from Greenway Corridor Bikeways Plan (GCBP))
- Future Path (GCBP)
- Recommended Path
- Bike-only bridge or underpass
- Bike accommodation on proposed roadway bridge

Exhibit F - Connections Plan

Route 53/120 cannot be a barrier to the community but must provide connectivity. Cross corridor connections for the local collector and arterial street system, the Village's bicycle path network, and existing utilities all must be maintained. The Village understands that some of the desired aesthetic treatments, community identifiers and proposed utility connections will be at the Village cost, however connections maintaining cross corridor connections must be considered as part of the project cost.

Connections between the village and the corridor are proposed at Alleghany Road, Peterson Road and US Route 45. Interchange designs concepts were developed for each connection with the goal of minimizing the roadway footprint, protecting environmentally sensitive and existing commercial/residential lands, and providing access to Grayslake.