



MCHENRY COUNTY DIVISION OF TRANSPORTATION'S

# ALGONQUIN WESTERN BYPASS

AMERICAN PUBLIC WORKS ASSOCIATION  
**2015 PUBLIC WORKS PROJECT OF THE YEAR**  
TRANSPORTATION - PROJECTS OF \$25 MILLION TO \$75 MILLION

DECEMBER 5, 2014



## PROJECT DESCRIPTION AND BACKGROUND



A Congestion Mitigation Feasibility Study began in 1996 to identify a solution to the decades-old congestion at the Illinois Route 31/Illinois Route 62 intersection. Through an extensive public outreach process, fifteen (15) different alternatives were studied to address the congestion and stakeholder concerns. From these alternatives, the Algonquin Western Bypass was selected as the Preferred Alternative that adequately addressed congestion, while minimizing impacts to the surrounding area.

In 1998, Phase I Engineering began in order to satisfy the requirements of the National Environmental Policy Act (NEPA). The Phase I work included refining the roadway geometrics and assessing the social and environmental impacts of the Western Bypass. Seven interchange alternatives were evaluated for the intersection of Route 62 and realigned Route 31. Designs were evaluated for level of operation, impacts to Towne Park and the Prairie Trail as well as overall cost. Once a Compressed Diamond Interchange was chosen as the preferred design, detailed environmental studies commenced. These studies included transplanting State-listed threatened and endangered plant species, field studies to evaluate the presence of the Federally-listed endangered Indiana Bat, identification of historic features and documentation of potential special waste sites. Extensive coordination was undertaken with the Village of Algonquin regarding impacts to Towne Park and the development of an



acceptable mitigation plan. In January 2008, the Federal Highway Administration issued a Finding of No Significant Impact, thus completing NEPA requirements. This was followed by the Illinois Department of Transportation issuing Design Approval, signifying the end of Phase I Engineering.

Phase II design engineering began in October, 2008 and required extensive coordination with multiple agencies including the McHenry County Division of Transportation (MCDOT), the Illinois Department of Transportation (IDOT), the Village of Algonquin, the McHenry County Conservation District (MCCD), various utility companies, approving agencies, and the U.S. Postal Service (USPS).

Advanced contracts and specifications were developed for various aspects of the project, including environmental mitigation of contaminated properties and a mass grading contract for the area north of Route 62 through the Meyer Material gravel pit that included over 1,000,000 cubic yards of earth excavation. The mass grading contract also involved investigating access alternatives to parcels cut off by the new Bypass alignment and reconfiguration of gravel pit haul roads, as well as modifications to some remaining mining operations to allow continued functioning of the pit. Right-of-way acquisition from 37 parcels required continuous coordination with IDOT's Bureau of Land Acquisition to provide design solutions to minimize the impact of property acquisitions, while also providing opportunities to reduce the overall project costs and affect the acquisitions in a timely manner.

The 2.11 mile four lane divided highway improvement included three bridges over Crystal Creek, one mainline bridge over Algonquin Road, twelve retaining walls, a significant noise/visual screen wall, five signalized intersections, signal timing modifications for the traffic signals along Route 62, roadway lighting at the new interchange, relocations and improvements to the Village of Algonquin's sanitary sewer and watermain systems, a complete reconfiguration of Towne Park including the relocation of Crystal Creek, relocation of the MCCD's Prairie Trail, and a new parking lot.



Mainline and ramp crossings at Crystal Creek

## PROJECT LOCATION



## CONSTRUCTION SCHEDULE, MANAGEMENT AND CONTROL TECHNIQUES

Two contracts (six building demo and Mass Grading) were completed on time and within budget. One contract, the Roadway Contract, was completed within the contract's extended completion date. The Roadway Contract was substantially completed on time but an extension was required for the ornamental lattice due to a late change request for a non-specified, non-standard powder coating for the finish.

Weekly coordination meetings were the prime tool to manage the project. General contractor

supervisory staff, IDOT staff, the Construction staff, utility personnel, and related agency staff attended the meetings. A sixteen topic agenda was used to orchestrate the meeting. Planned activities, actual activities completed, utility coordination and progress hindering concerns were addressed in depth at the meetings. Requests for Information (RFI's), submittal and change order logs were distributed and discussed. Meeting minutes were distributed to all associated parties within days of each meeting that helped hold the team accountable for items that needed to be accomplished. The distribution list typically included over 30 people from the various parties associated with the project. Special topic meetings were also held throughout the duration of construction as needed. Topics included specific issues brought up by the Village of Algonquin, roadway closings and traffic staging, environmental concerns, and subcontractor performance. These meetings were a key to help review and resolve issues as the project progressed.

With the separate contracts and all the different trades working on them, communication was vital to the success and the final product. Professional and timely communication maintained by all parties throughout construction was the key component to the success of the improvement.

## SAFETY PERFORMANCE

The contractors were required to report any and all work place injuries. Construction of the multiple contract project lasted over three years with only one injury reported. This was a minor injury that resulted in no lost work time. This is a testament to the contractor's safety policy that was in place throughout construction.



## ENVIRONMENTAL CONSIDERATIONS

With the extensive amount of earthwork involved and Crystal Creek cutting through the center of the improvement, stormwater best management practices and erosion control were very important during the construction of the project. A “treatment train” was implemented to treat stormwater before it reached Crystal Creek. Vegetated ditches, temporary and permanent ditch checks, inlet filters and erosion blanket were all included in the project. An oversized detention basin was incorporated north of Route 62 to reduce the peak flows to Crystal Creek. The detention basin included a forebay to allow settlement of suspended solids prior to entering the storm sewer system and Crystal Creek. The forebay and ditch checks included upstream polymers to promote particle settlement. The project included the installation of two separate water quality structures to capture sediment from the Route 62 runoff and the Towne Park parking lot runoff prior to outletting to Crystal Creek.



Erosion control measures north of IL Route 62



Erosion control measures near Crystal Creek



Detention basin north of IL Route 62

## COMMUNITY RELATIONS

Prior to the start of the Roadway Contract, IDOT's Community Relation Manager went door to door to all residents and businesses within and adjacent to the project limits and delivered an informational flyer for the project. The flyer described the project, anticipated schedule, project highlights, and included contact information for anyone who desired additional information or had questions regarding the improvement. Throughout construction, IDOT received calls and e-mails from the public as a result of the initial information provided in the flyer. These inquiries were forwarded to the project field office for resolution.



IDOT also maintained a project page on their website throughout construction. The site was updated bi-monthly with progress photos and updates for the public regarding construction stage changes. The website provided a portal that provided an easy mechanism for the public and businesses to e-mail questions, concerns and comments about the project. These inquiries were forwarded to the project field office to make sure the construction staff were abreast of the public's concerns. All issues that required a response or resolution were handled by the appropriate construction personnel.

The Village of Algonquin had Administration staff, Public Works staff, Police Department staff, and staff from the Fire District attend the weekly progress meetings throughout the duration of construction. Staff from the McHenry Division of Transportation also attended the meetings as needed. Public concerns were frequently presented and addressed by IDOT and the Resident Engineer. The Village of Algonquin's web site included a project page with a description of the project, provided traffic updates, and provided a web-link to IDOT's website for additional information. The Village maintained a portal on their website for public comments, inquiries and complaints regarding issues within the Village. Project related inquiries were forwarded by the Village to the Resident Engineer and construction staff for follow-up and resolution. The Village also fielded e-mails and phone calls from the general public. When Village Staff could not provide a response, they were sent on to the Resident Engineer and construction staff for resolution.



The Resident Engineer and construction staff came in contact with numerous residents and businesses during the course of construction. Positive interaction between the residents and businesses with field staff resulted in the additional open communication as residents and businesses shared contact information with their neighbors who had project related issues to resolve. The McHenry County Division of Transportation and McHenry County Conservation District also received inquiries regarding construction of the project. These inquiries were followed up by the respective staffs, or forwarded to the Resident Engineer and construction staff for follow-up and resolution.



Maintenance of traffic devices were checked multiple times throughout the day by the construction and IDOT staff to be sure all devices were in proper working order. They were also checked by-weekly at night to ensure they were adequately displayed and provided the motoring public with proper direction. The general contractor was immediately made aware of any deficiencies warranting immediate attention.

## UNUSUAL ACCOMPLISHMENTS

With the size of the project, there were many accomplishments during both the Mass Grading Contract and the Roadway Contract. The Mass Grading Contract, completed by Ryan Inc. Central, included moving over 1,000,000 cubic yards of material with excavations over 100 feet deep and embankments 30 feet high. The work also included 47-acres of tree removal, removal of several buildings, the construction of a detention basin with required forebays for water quality, and restoration. This work was accomplished within a short timeframe of six months.



The majority of the grading occurred in an active gravel pit that was being used as a wash pit for gravel brought in from other sites in the area. During construction, the gravel pit operation needed to remain active. To allow this, the grading contractor was required to re-grade internal access roads and reconfigure the existing gravel wash basins. During construction of the southern access road, very poor soils were encountered during the excavation requiring plan revisions and revisions to the washing operation. The revisions were accomplished

within the original schedule and the final access road allowed the gravel pit to continue operation during construction. Today, the access road remains in its permanent location and serves the operation well. The in-situ soils within the gravel pit varied throughout. This required fourteen distinct proctor samples to define the required compaction requirements. The grading contractor was adept at adjusting their embankment operations (changing the type of sheepsfoot compactor, varying the extent of disking, decreasing lift thickness, and rotating areas of embankment placement) to allow construction to proceed while exceeding the compaction specifications.

Grading such a large area within an active gravel pit created additional challenges. Numerous springs and seeps occurred as the excavations proceeded. The grading contractor channelized these flows through temporary ditches and bypass pumping to keep the water out of the active work areas until the elevation of the permanent ditches were achieved or until the sideslopes were sufficiently established. Additional French Drains were installed to contain these flows. There was a significant amount of buried debris encountered as excavation progressed. The debris included buried concrete, trees, machinery and tires. Ten semi-loads of truck and off-road equipment tires needed to be sorted, hauled and legally disposed of off-site.

With the large excavations and embankments, embankment settlement was a concern. The Roadway Contract, completed by F.H. Paschen, S.N. Nielsen, Inc., included settlement periods anticipated to last up to 7.5 months for the new bridge embankments and retaining wall fills. Settlement needed to occur before construction could proceed with the MSE wall cast-in-place concrete facings, anchorage slabs and parapets, approach slabs and approach roadways could be constructed. There were a total of 44 settlement platforms used to monitor the settlement. Thirty-three of these platforms were associated

with the bridges and their contiguous retaining walls. The contractor needed to schedule work based on the actual settlement rates observed from the platforms.



Bridge construction at Crystal Creek

With Crystal Creek located in the heart of the project and Towne Park, the bridge work required extraordinary care so adverse impacts to creek and adjacent wetlands would not occur. The IEPA, US ACOE, and the McHenry/Lake Soil and Water Conservations District made frequent visits to the site to ensure Crystal Creek and the wetlands would not be adversely impacted. During construction of the new bridges, the area experienced several 100-year storm events which the contractor needed to overcome.



Flooding conditions during construction



Bridge construction

As the Crystal Creek bridges are located within the Village of Algonquin's Towne Park, bridge aesthetics were very critical. The design included decorative lattice, railings, and stained stone-looked cast-in-place facings for the walls. The wall facings were stained with a four

color stain with a final seal coat for protection. A two-color powder coated aluminum lattice hung from the bottom of the deck which was supported in front of the fascia girders. A black powder coated parapet railing was mounted on top of the parapets. The parapets were cast-in-place with a special form liner consisting of a geometric pattern of overlaid arcs and semi-circles at three different depths. The aesthetic treatments required significant coordination with the Village of Algonquin as they were a commitment made during early design of the project.



Bridge parapet



Decorative wall



Bridge aesthetics

## ADDITIONAL CONSIDERATIONS

The primary intent of this project was to develop a plan that would mitigate the severe congestion at the intersection of Route 62 and Route 31, without major negative impacts to the business and residents of the area. The Algonquin Western Bypass relocated Route 31 to the west of its existing location and grade separated it from Route 62. The proposed location resulted in a minimum amount of disruption to the area and required no residential displacements. Elimination of the conflicting through traffic movements allowed for retiming of the traffic signals to provide almost double the amount of “green time” for Route 62 movements, resulting in greatly increased capacity for that route. Through traffic on Route 31 now flows over Route 62 completely unimpeded by intersecting traffic, with turning movements between Route 62 and Route 31 being handled at locations better able to accommodate them.



Former Toastmaster site

The proposed improvement has brought several positives to the Village, local businesses and area residents. An abandoned warehouse/manufacturing facility, located next to Towne Park, which formerly housed the Toastmaster Corporation had become a blighted parcel, fire hazard and eyesore for years in downtown Algonquin. The Toastmaster site contained a 100-year old building that had at one time been a factory but had become derelict in recent years. This site was listed as a Comprehensive Environmental Response, Compensation,

and Liability Act (CERLA), or Superfund site and over the years contamination had spread to the surrounding area. As a result of this project, the Toastmaster and adjacent sites were remediated. Not only was an environmental hazard addressed but removal of the building provided a safety benefit to the community and removal of an eye-sore. The selected alignment for the Bypass was through this property. Before the property could be purchased, environmental cleanup of the site was required. The abandoned building on this site along with the adjacent buildings on the former Prairie Oasis site, were removed and an environmental cleanup took place. The removal of the abandoned Toastmaster building was welcomed by the Village, the local businesses and its residents.



New Crystal Creek parking lot

Towne Park is the location of the Village’s annual Founders Day celebration. Although the centrally located park in downtown Algonquin provided a good location, the lack of parking, erosion on the banks of Crystal Creek through the park, and the presence of the Toastmaster building adjacent to the park, were all negative aspects. With the construction of the Bypass, the parking lot was redesigned to provide a total of 100 parking stalls with decorative lighting, and a new entrance and signage from the west end of Washington Street. The entrance from Jefferson Street was removed and replaced with a paved multi-use path adjacent to Crystal Creek. The retaining walls along Route 62 and the new bridges that carry Route 31 and the ramps over Crystal Creek and Route 62 have all been designed with decorative stone finished formliner to provide improved aesthetics for the park users. In addition, the McHenry County Conservation District bike path now navigates through the park; under the new bridges adjacent to Crystal Creek before winding back up the hill and reconnecting to the existing path. This connection allows for a trail head to be created with parking, restroom facilities, benches, and drinking fountains.

## Social, Economic and Sustainable Considerations

One of the advantages of the Western Bypass is that relocating north-south through-traffic out of Algonquin's downtown district allows for improved community cohesion. The downtown district not only has commercial but also residential, church, school and recreational land uses. Prior to implementation of the Bypass, heavy traffic volumes on Main Street (old Illinois Route 31) made walking and even driving through the downtown difficult and oftentimes unsafe. With the implementation of the Bypass, Main Street has become less of a barrier for residents and businesses. Access to and from Towne Park and Waterfront Park near the Fox River is now easier and safer, promoting a more pedestrian friendly atmosphere in downtown Algonquin. Travel to the local businesses along Main Street is now easier and on-street parking is safer, which will make the downtown more attractive from an economic development standpoint. The Village has created a Downtown Revitalization Plan to serve as a roadmap to redevelop the Old Town District and provide additional aesthetic streetscaping features.

The severe congestion that existed along Route 62 and old Route 31, particularly at their intersection resulted in safety deficiencies not only for pedestrians but vehicles as well. Typically, as congestion increases, safety decreases. When severe congestion exists, the most common crashes are left-turn, rear-end and right-angle. These are indicative of motorist's impatience and willingness to "sneak-through" on the yellow/red clearance phases. The reduction in congestion in the project corridor will result in a reduction in collisions. Further, the realignment of the Prairie Trail through the Towne Park will no longer require users to cross the heavy Route 31 traffic as they will now cross Main Street on the east side of Bypass. This will create a safer condition for all users of the path.

The expansion of Towne Park provides an important social benefit to the Village. This park is heavily used for many purposes and the provision of the additional parking will accommodate many more users than was possible prior to construction. This park serves as the location for the Village's annual Founders' Day celebration. The increased size of the park, better access and increased parking will make this event easier to implement and attend each year. The realignment of the Prairie Trail through the park provides a connection that previously did not exist and provides an important trail head and amenities. The realignment of Crystal Creek provides reassurance that the park and adjacent properties will not be jeopardized by stream bank erosion with large rainfalls.



## Complexity

There were several challenges that were overcome during the design of the project. The first challenge involved impacts to two properties protected under Section 4(f) of the U.S. Department of Transportation Act of 1966, which states that there must be no prudent or feasibility alternative to use of these lands. The first property is the Village of Algonquin's Towne Park which is a community park with a citizen built playground, a natural spring, picnic areas, basketball courts and open space/playing fields. The second property is the McHenry County Conservation District's Prairie Trail which is a multi-use recreational trail used mainly by hikers and cyclists and extends north to Wisconsin and south to Kane County. Extensive coordination with both governing bodies and FHWA was needed for approval of the final plan. A three party land exchange was ultimately developed between the Village, M CCD, and the U.S. Postal Service with IDOT being the facilitator. The final agreement resulted in a net increase of 2.62 acres of parkland to Towne Park as well as the provision of a number of new amenities including a 100 space parking lot, a new foot bridge and extensive landscaping. The continuity of the Prairie Path was maintained and it now winds through Towne Park providing additional amenities to the users of the path.



Another significant challenge for the project was land acquisition from the Meyer Materials property located just north of Route 62. While the area in the vicinity of the Bypass within the gravel pit had been mined out for many years, the area is still used to wash the stone from other quarries in the area. Maintaining this operation along with access to the site was critical both during and after construction. Several options were investigated to find a solution acceptable to all parties. Meyer Materials also wanted to retain the rights to mine under

the proposed Bypass should the need ever occur and agreements were developed between Meyer Materials and IDOT to address this issue.

Scour was a major concern during the design of the three highway bridges over Crystal Creek. The anticipated stream velocities combined with the streambed soil type and hydraulic bridge opening resulted in calculated scour depths for the 500 yr event of up to 13.5 feet. The eventual substructure elements consist of stub abutments founded on driven H-piles and wrapped with MSE walls. Options considered to protect these elements from the calculated scour included lengthening the bridges, changing the substructure type to cast-in-place concrete highwall abutments founded on driven piles, driving sheet piling in front of the MSE walls and lowering the base of the MSE walls to be below the critical scour elevations. The result of our analysis of these options was to lower the base of the MSE walls.

Acquisition of the Toastmaster property and the adjacent Prairie Oasis property was another large hurdle for the project. The 100-year old Toastmaster building, which had become derelict over the years, had been a heavily used industrial facility for decades. The site contained elevated levels of heavy metals that had also spread onto the adjacent properties. The Illinois Department of Transportation completed environmental investigations, which indicated that both properties needed to be remediated before they could be acquired. This led to the preparation of an advanced contract to demolish the buildings and remediate the site. Before this could happen, however, the Toastmaster Building caught fire and was severely damaged. This required an emergency contract to be executed by IDOT to remove what remained of the existing building as the site was now a hazard for the Village. This course of action required rapid plan revisions and rebidding for the cleanup portion of the sites.

### Exceeding Owner Needs

The intersection of Route 31 and Route 62, adjacent to the Fox River in downtown Algonquin has been one of the most congested intersections in McHenry County for as long as most anyone can remember. Travel delay caused by this intersection in the afternoon peak hour routinely exceeded 30 minutes for westbound traffic on Route 62, while eastbound traffic in the morning regularly experienced delays of 10 to 15



minutes. Delays on Route 31 were consistently 10 to 15 minutes in both directions throughout most of the day. While a number of “add-lane” projects have been constructed in the project area in an attempt to reduce congestion in the area, the rapid development that took place to the west of the Fox River during the 1980’s and early 1990’s overwhelmed any improvements that could be built. The construction of the Algonquin Western Bypass has improved the traffic flow through the area tremendously. With Route 31 traffic now being able to flow uninterrupted over Route 62 and Route 62 traffic only delayed by turning movements from Route 31, congestion has been reduced considerably.

The McHenry County Division of Transportation is pleased with the improved traffic flow along both Route 31 and Route 62. This improved operation provides McHenry County residents and business owners with better access into and out of the County. Queues along both routes are substantially reduced and commute times have been dramatically reduced.

The Village of Algonquin has also expressed positive feedback in regard to auto and specifically truck traffic being relocated out of the downtown and onto the Bypass. The Village now has the opportunity to reclaim their downtown and make it more pedestrian friendly. Main Street (old Route 31) has become less of a barrier for residents and businesses in the downtown area. Access to and from Towne Park and Waterfront Park is now easier, allowing a more pedestrian friendly atmosphere in downtown Algonquin.



The Village of Algonquin is very pleased with the outcome of the Towne Park modifications. The size of the park has been increased by more than two acres and there is now a direct connection to the MCHD Prairie Trail. The aesthetic amenities incorporated into the retaining walls and bridges blends in with the natural surroundings and additional plantings throughout the park will only improve as they grow toward maturity. The provision of the noise wall along a portion of the Bypass limits highway noise in the park. The realignment and armoring of Crystal Creek provides reassurance to adjacent property owners that their properties and structures will not be jeopardized by stream bank erosion with large rainfalls. Demolishing the Toastmaster building not only eliminated an eye-sore and safety hazard to the community, it allowed for construction of a much needed 100-space parking lot with decorative lighting.

Feedback from the general public has also been extremely positive regarding traffic flow improvements, aesthetics of the project and the enhancements to Towne Park.

























