INVEST Report

George V. Voinovich Bridge
Trumbull | Great Lakes | Ruhlin
February 13, 2017
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INVEST Report

What is INVEST?

INVEST (Infrastructure Voluntary Evaluation Sustainability Tool) is the FHWA Sustainable Highways Self-Evaluation Tool. With this voluntary tool, transportation agencies have the ability to evaluate and aid the integration of sustainability into their programs and projects. The INVEST tool considers the full lifecycle of projects and has three modules to self-evaluate the entire lifecycle of transportation services. The module chosen for this project is the Project Development (PD) module, which is used during construction.

Scoring Sessions

A standard part of the process developed for the George V. Voinovich Bridge INVEST certification is a biannual INVEST Scoring Session to review and score the work done by the Sustainability Task Force. The Sustainability Task Force Team include the following members: Adam Blesik, Jason Tucker, Mark Girdina, Jackie Jacob, Phil Hannah, Matt Blesi, Jocelynn Clemings, Jennifer LeMasters Wirtz, Karen Lenehan, Margaret Hewitt, Laura Steinbrink, Anna-Katlin Strauss and Arelis Lattimer. On each INVEST Scoring Session the INVEST Scoring team reviews and scores the criteria submitted. Members of the INVEST Scoring Team include David Lastovka (ODOT), Jason Tucker (TGR), Fernando Rodriguez (AECOM), Jeff Lechak (Parsons Brinckerhoff), and Chris Forney.

This report intends to inform the Trumbull-Great Lakes-Ruhlin (TGR) staff, project team and the public about all the INVEST updates, regarding the criteria, for the CCG2 George V. Voinovich Bridge project. There have been five INVEST Scoring Sessions, August 4, 2014, February 9, 2015, August 10, 2015, February 8, 2016 and August 15, 2016. In these five scoring sessions the Scoring Team members reviewed and scored all criteria pursued for certification. The INVEST Scoring Team determined that the project should be awarded 95 points, which positions the project at Platinum Level.

This report contain the following information about each criterion: a summary of the criterion, summary of the project efforts, the points that have been achieved and a list of future compliance activities. Also in this report you can find a page called “follow up items” which contains a list of each criterion and it’s to do list. Appendix A contains a list of helpful resources with links.

Please be conscious that this report is a draft due to the fact that not all of the criteria will be done until completion of the project. All information will be final June 2017.

Scorecard Summary

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Achieved</th>
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<tbody>
<tr>
<td>PD01: Economic Analyses</td>
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<td>PD03: Context Sensitive Project Delivery</td>
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<td>PD14: ITS for System Operations</td>
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<td>PD17: Energy Efficiency</td>
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<td>PD21: Earthwork Balance</td>
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<td>PD22: Reduce Energy and Emissions in Pavement Materials</td>
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<td>PD23: Construction Environmental Training</td>
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<td>PD27: Construction Waste Management</td>
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<td>Total</td>
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Points required: Bronze 38 Silver 50 Gold 63 Platinum 76
Economic Analyses

Conducting an economic analyses supports all the triple bottom line sustainability principles by ensuring that user benefits exceed the investment cost for the project through analysis of impact to local businesses, emissions, and others.

Summary:
The goal of this criterion is to use the principles of benefit-cost analysis (BCA) or economic impact analysis (EIA), provide the evidence that the user benefits, including environmental, economic and social benefits, and justify the full life-cycle cost.

A benefit-cost analysis is typically applied in transportation studies to identify the net present value (NPV) of the societal benefits that can be associated with a project or program, net of the investment costs. This includes benefits that are not reflected in any monetary transaction.

An economic impact analysis evaluates the monetary transactions that affect the generation of income in the area’s economy due to the investment in the project. It includes broad estimates of impacts and evaluates the risk to the economy of not investing in the project. The maximum possible points for this criterion is five (5) points.

Project Compliance:
The team submitted in INVEST the Benefit Cost Analysis (BCA), which contains information on the benefits of the project in comparison to its costs. The BCA includes all direct costs and benefits that TGR estimated, including Operating Costs, Safety Summary, Delay Reduction, Rate of Return Costs and Crashes, Emissions Reduction, and Monetized Values.

Additionally, provided is a report created for the Ohio Department of Transportation dated July 2008, which provides extensive Net Present Value analysis for different bridge design options.

The project team also submitted an Economic Impact Analysis, which included forecasting and quantification of revenues and costs of the project; quantification of benefits; including social, environmental, and economic factors; and quantification of impacts to regions, land values, and businesses.

Points Achieved:
The George V. Voinovich (GVV) team achieved five (5) points for this criterion.

Future Compliance Activities:
No future compliance activities are required.
Life-Cycle Cost Analyses

The project team achieved this criteria by providing detailed life-cycle cost comparison for five major designs / scenarios relating to repairing and replacing the main structure.

Summary:
The goal of this criterion is to reduce life-cycle costs and resource consumption through the informed use of Life-Cycle Cost Analysis (LCCA) of key project features during the decision-making process of the project.

Performing an LCCA of the project’s major feature (bridges, tunnels, retaining walls, or other items not listed in the preceding options) provides standard input values for a wide range of potential bridge projects and referenced sources for other input data. The maximum possible points for this criterion is three (3) points.

Project Compliance:
The team submitted a Risk Report in INVEST, which provides detailed life-cycle cost comparison for five major designs / scenarios relating to repairing and replacing the main structure. The report analysis includes a 50-year operating life span as a criteria, and incorporates considerations such as first costs, maintenance costs, permanent costs and funding costs. The analysis in this report is categorized as “by hand,” relating to the criteria definitions of acceptable methods for conducting the LCCA.

Points Achieved:
The project team achieved one (1) point for this criterion.

Future Compliance Activities:
No future compliance activities are required.
Context Sensitive Project Development

There were many public champions in this project, however, three stand out as very influential and committed throughout the entire process.

Summary:
The goal of this criterion is to deliver projects that harmonize transportation requirements and community values through effective decision-making and thoughtful design. The maximum possible points for this criterion is five (5) points.

Project Compliance:
The project efforts for this criterion include creating a Six Step Framework for Context Sensitive Solutions (CSS) Based Project Development; deploying a Multi-Disciplinary Team; creating Public Champions; and creating an Acceptance of Project-level Problems, Opportunities and Needs document.

The Six Step Framework for CSS Project Development document shows that the project team employed a 14-step process to guide decision making. The 14-step process encompasses the required six-step process for INVEST, including: developing a decision-making process and management structure; defining the problem; developing the project and the evaluation framework for the project; determining alternatives; screening the alternatives; and evaluating and selecting an alternative.

A 19-member multi-disciplinary team guided design decisions for this project.

There were many public champions of this project, such as Senator George V. Voinovich, Stuart Pearl and Councilman Joe Cimperman, proving to be very influential and committed throughout the entire process.

The Acceptance of Project-level Problems, Opportunities and Needs document states that the project is moving forward as designed, having won funding awards at the federal and state levels.

Points Achieved:
The project team achieved five (5) points for this criteria.

Future Compliance Activities:
No future compliance activities are required.
Highway and Traffic Safety

These images show ODOT’s digital message boards spreading traffic safety messages as part of a campaign from the Ohio Department of Transportation (ODOT) and the Ohio State Highway Patrol (OSHP).

Summary:
The goal of this criterion is to safeguard human health and reduce social and economic impacts from crashes by incorporating science-based quantitative safety analysis processes within project development that will reduce serious injuries and fatalities within the project footprint. The maximum possible points for this criterion is ten (10) points.

Project Compliance:
The project team incorporated human factors considerations. The team also built awareness among the public regarding contributing factors to crashes. The purpose of the awareness is to support an improved understanding of road users about their personal responsibility in preventing crashes and to improve overall safety culture.

Also, for this criterion the team provided explicit consideration of safety using quantitative, scientifically proven methods.

Points Achieved:
The project team achieved (8) point for this criterion

Future Compliance Activities:
No future compliance activities required.
Educational Outreach

This image shows one of the tours hosted by TGR for the honors geometry class from Villa Angela St. Joseph High School.

This tour took place on April 10, 2014 and the students used the Tremont Sideyard as their land development project.

Summary:
The goal for this criterion is to increase public, agency and stakeholder awareness of the integration of the principles of sustainability into roadway planning, design and construction. The maximum number of points that could be achieved in this criterion is two (2), these points can be determined by one or more educational elements selected like the following: Include sustainability in the project development process, public involvement, project website, stakeholder guide, school presentations and professional presentations.

Project Compliance:
The following are efforts made by the project to educate the public about the project. The INVEST Program Management Plan was submitted which specifies the strategies being used to achieve the highest level of sustainability in this project.

One of the initiatives was the creation of the INVEST Sustainability Board, a green board produced to inform TGR staff and visitors of what INVEST is and how it is being used in this project. This board contains information about the triple bottom line sustainability principles: social, economic and environmental. Also, it contains a blank space were new green board inserts are placed every quarter to inform the staff and visitors about how specific criteria are being used. A green board also is placed in the TGR Project Management Office. This board emphasizes how the management office is helping the environment by being more sustainable.

Screenshots of the project’s sustainability website were submitted onto INVEST. The purpose of this website is to educate users about sustainability methods being used in the George V. Voinovich Bridge project.

Also, school presentations were done as well as a video which captures and explains the sustainable efforts being completed in the project. A newsletter (Construction Connection) is produced regularly with the purpose of informing and giving updates related to the George V. Voinovich Bridge project to the community.

Points Achieved:
The project team achieved two (2) points for this criterion.

Future Compliance Activities:
No future compliance activities are required.
Tracking Environmental Commitments

Environmental commitments help maintain the quality of clean water, air, and land near the project area.

Summary:
The goal for this criterion is to ensure that environmental commitments made by the project are completed and documented in accordance with all applicable laws, regulations, and issued permits. The maximum possible points for this criterion is five (5) points.

Project Compliance:
During project development, an environmental compliance tracking system was identified and specified throughout the Project Scope and Quality Management Plan (QMP). A single comprehensive list identifying all environmental commitments is found in the QMP, Chapter 2 – Appendix A. In addition, commitments related to development work and additional properties were analyzed in several Environmental Site Assessment Work Plans and compiled in the Final Environmental Impact Statement (FEIS). The FEIS results were incorporated in the Project Scope, which complies with the environmental commitments in Chapter 5 of the Project Scope.

The project performs environmental tracking reports, this tracking mechanism incorporates environmental analysis through planning, design, and construction. Maintenance requirements are also evaluated, but are not tracked during the project phase under consideration.

The team indicated an Independent Environmental Compliance Monitor. QMP Chapter 2 indicates that the Independent Quality Environmental Monitor and the Independent Quality Design Manager will be responsible for completing independent reviews of the design plans and specifications to verify compliance with all environmental commitments.

Points Achieved:
The project team achieved five (5) points.

Future Compliance Activities:

• Regular tracking report updates are being submitted.
Habitat Restoration

The project team is committed to restoring natural river function and improving habitats for fish whose lifecycles demand that they migrate downstream through the ship channel. The image shows a green bulkhead constructed by the project.

Summary:
The goal of this criterion is to avoid, minimize and compensate the loss and alteration of natural (stream and terrestrial) habitats caused by project construction; and/or restore, preserve and protect natural habitats beyond regulatory requirements. The maximum possible points for this criterion is three (3) points.

Project Compliance:
A known peregrine falcon nest was located on the now demolished “Innerbelt Bridge.” They are protected as a threatened species under the Federal Migratory Bird Treaty of 1918. The project team committed to comply with the requirements of this treaty, and to work with the Ohio Department of Natural Resources to construct a new habitat for the birds to be relocated. This was done by constructing and installing two new nesting boxes for the falcons prior to demolition of the old bridge. The falcons did nest in the boxes, they were closely monitored and their habitat was protected.

The project team is committed to restoring natural river function and improving habitats for fish whose lifecycles demand that they migrate downstream through the ship channel. One green bulkhead addition will be constructed on the east bank of the Cuyahoga River within the limits of the new bulkhead construction, to provide larval fish habitats along the Cuyahoga River. Green bulkheads or “pocket habitats” help fish populations grow by providing food, shelter and oxygen. Pocket habitats utilize aquatic plantings and design elements that can provide cover for the fish and increase dissolved oxygen levels, thus creating a better environment for the aquatic species.

Points Achieved:
The project team achieved three (3) points.

Future Compliance Activities:
No future compliance activities are required.
Stormwater

Implementing more sustainable stormwater management practices supports the environmental principle by improving water quality, managing runoff and using technology that mimics natural hydrology.

Summary:
The goal of this criterion is to improve stormwater quality from the impacts of the project and control flow to minimize their erosive effects on receiving water bodies and related water resources, using management methods and practices that reduce the impacts associated with development and redevelopment. Stormwater Management, is divided into three categories: Water Quality, Flow Control and Low-Impact Development (LID). Each category has a maximum of three (3) points, for a total of nine (9) possible points.

Project Compliance:
The project team has enhanced features by implementing a habitat restoration effort.

Water Quality: A hundred percent of the run-off from construction areas is treated in some fashion. A hundred percent of the run-off on this project is treated for sediment by some form of BMP. The treated impervious area is significantly higher than the added impervious area, the percentage of added is significantly higher than 125 percent.

Flow Control: All run-off is mainly treated for sediments using swales and ponds, the flow control standard used would be flow duration. A hundred percent of the run-off is to be treated in some fashion, and the percentage of added is greater than 125 percent.

LID: There are both detention ponds and biofilter swales on the project. Percentage of added is greater than 125 percent. The project is considered an “Urban Project.”

Points Achieved:
The project team achieved 8 points.

Future Compliance Activities:
No future compliance activities required.
Ecological Connectivity

These images show the peregrine falcons that nested on the old Innerbelt Bridge; the bottom picture shows one of the nesting boxes made for the falcons to nest after the old Innerbelt Bridge was demolished.

Summary:
The goal of this criterion is to avoid, minimize or enhance wildlife, amphibian and aquatic species passage access and mobility; and reduce vehicle-wildlife collisions and related accidents. The maximum possible points for this criterion is three (3) points.

Project Compliance:
The project team has included letters between the State of Ohio Environmental Protection Agency (OEPA), the Ohio Department of Natural Resources (ODNR) and the Ohio Department of Transportation (ODOT) that show the agreement between these organizations to minimize any disturbance to the aquatic environment.

Also, the GVV team impacted the fauna by increasing the number of migrating warblers in Northeast Ohio. Stories posted on September 3, 2014 and October 8, 2014 on the local newspaper website stated that about 21 species of warblers were seen migrating in Northeast Ohio. The majority of the birds were visible at close-range; many bird species that are not usually seen in the Ohio area were seen this migration season.

Points Achieved:
The project team achieved three (3) points

Future Compliance Activities:
No future compliance activities are required.
Pedestrian Access

The integration of the Towpath Trail to the design and construction of the George V. Voinovich Bridge project will serve as a neighborhood connector. This trail will connect adjacent areas such as Tremont, Downtown, the Lakefront and Ohio City which will serve as convenience to the neighborhood.

Summary:
The goal of this criterion is to improve the safety and convenience of pedestrian networks for people of all ages and abilities by providing or enhancing facilities within the project footprint. The maximum possible points for this criterion is two (2) points.

Project Compliance:
The project integrated the Towpath Trail which will be used as a shared trail between pedestrians and bicyclists. The integration of the Towpath Trail to the design and construction of the George V. Voinovich Bridge project will serve as a neighborhood connector. This trail will connect adjacent areas such as Tremont, Downtown, the Lakefront and Ohio City which will serve as convenience to the neighborhood.

Also, re-alignments of Tremont Neighborhood were completed. The re-alignments of the streets included the implementation of a combined two two-way park streets into two one streets. This re-alignment helped move the two-way road away from the park improving safety and comfort of pedestrian access.

Points Achieved:
The project team achieved two (2) points for this criterion.

Future Compliance Activities:
No future compliance activities are required.
Bicycle Access

Implementation of alternative bike paths were developed for the biking community. The Towpath Trail will be used as a shared trail between pedestrians and bicyclists.

Summary:
The goal of this criterion is to promote bicycle access which supports all of the triple bottom line sustainability principles by improving safety, access and mobility for the public while also increasing the modal choices available to travelers, reducing traffic congestion and emissions. The maximum possible points for this criterion is two (2) points.

Project Compliance:
The public input process in the George V. Voinovich Bridge project raised the concept of a bicycle/pedestrian accommodation on the proposed alignment. This issue was considered and determined to not be practical. The provision of a bike lane on the bridge is complicated by the speed difference between freeway traffic and bicycle traffic. The choice of implementing alternative bike paths instead of providing a bike lane on the bridge was previously decided by the Ohio Department of Transportation (ODOT) who instead incorporated a new, $4.5 million, 14.5 foot wide multi-purpose path on the Lorain-Carnegie Bridge.

In addition ODOT has participated in the Towpath Trail planning process and has designed the new bridge to accommodate the trail underneath. The Towpath Trail will connect adjacent areas such as Tremont, Downtown, the Lakefront and Ohio City which will serve as a convenience to the neighborhood.

Points Achieved:
The project team achieved two (2) points for this criterion.

Future Compliance Activities:
No future compliance activities are required.
Transit and HOV Access

The George V. Voinovich Bridge CCG2 will provide 12' wide shoulders that could potentially be converted to accommodate bus bypass lanes in the future.

Summary:
The goal of this criterion is to promote the use of public transit and carpools in communities by providing new transit and high occupancy vehicle (HOV) facilities, or by upgrading existing facilities within the project footprint.

The project should implement physical or constructed changes to the roadway structure, dimension or form that provides HOV access or minor dedicated transit access within the right of way, such as a carpool lanes for HOV vehicles, queue jump lanes for transit vehicles or shoulder-running buses. The maximum possible points for this criterion is five (5) points.

Project Compliance:
The design and construction of the project includes 12' shoulders that can be used as queue jump lanes for transit vehicles or shoulder-running buses. There has been communication between the Ohio Department of Transportation and the Greater Cleveland Regional Transit Authority about the use of the shoulders for this purpose.

Points Achieved:
The project team achieved two (2) points.

Future Compliance Activities:
No future compliance activities are required.
Freight Mobility

The project provides the following features that make freight transportation more efficient: safety improvements for freight mobility by extending East 9th Street, and included improvements for freight mobility by setting up radius returns at intersections to allow for truck turns.

Summary:
The goal of this criterion is to enhance mobility of freight movements, decrease fuel consumption and emissions and reduce freight-release noise. The maximum possible points for this criterion is seven (7) points.

Project Compliance:
The project included improvements for freight mobility by setting up radius returns at intersections to allow for truck turns. The project runs turning templates at intersections to allow for trucks to turn without encroaching on other lanes. The project team also considered trucks turning during maintenance of traffic (MOT) phasing. The vertical grades used on the freeway met ODOT maximum vertical grade standards which account for trucks climbing the grades.

Points Achieved:
The project team achieved four (4) points for this criterion.

Future Compliance Activities:
No future compliance activities required.
ITS for System Operations

ODOT has 1,700 trucks available with plows. During the winter months roughly 3,000 ODOT employees are available for snow and ice removal.

Summary:
The goal of this criterion is to improve the efficiency of transportation systems without adding infrastructure capacity in order to reduce emissions and energy use, and improve economic and social needs. The team is doing this by including the following applications for intelligent transportation systems: Crash Prevention and Safety, Road Weather Management, Response and Treatment, Information Dissemination and Information Management. The installations of the above mentioned intelligent transportation systems will improve mobility, reduce congestion and improve safety. The maximum possible points for this criterion is five (5) points.

Project Efforts:
The following applications will be installed in the George V. Voinovich Bridge.

Information Dissemination: Dynamic Message Signs - ODOT employs the use of both portable and fixed message boards to convey upcoming traffic impacts. Also, when necessary the signs will be used to indicate a change in traffic conditions due to emergency situations.

Response and Treatment: Mobile Winter Maintenance - Snow plowing, salting and clearing has to be done in the winter months to access work areas and in the work areas to keep the areas drivable. Along with this, a lot of MOT equipment is moved or replaced due to the amount of snow each winter in the Cleveland area. These areas will be used by ODOT in the future.

Road Weather Management: Pavement Conditions - TGR has to install a new weather station on the project. The data from this weather station gets sent to OHGO.com to view the current road conditions, like icy, wet or snow-covered roads.

Crash Prevention and Safety - ODOT employs the use of portable and fixed message boards to convey upcoming traffic impacts. Also, when necessary the signs will be used to indicate a change in traffic conditions due to crash situations.

Information Management: Data Archiving - ODOT has video cameras placed on public streets and highways; this footage is archived for 72 hours when it is reviewed by ODOT employees.

Points Achieved:
The team achieved five (5) points for this criterion.

Future Compliance Activities:
No future compliance activities required.
Historical, Archaeological and Cultural Preservation

The Towpath Trail being constructed is part of the Ohio and Erie Canalway which is designated as one of America’s Byways by the Federal Highway Administration and it has been designated as a National Heritage Area by Congress.

Summary:
The goal of this criterion is to preserve, protect or enhance cultural and historic assets, and/or feature the National Scenic Byways Program (NSBP) historic, archeological or cultural intrinsic qualities in a roadway. The maximum possible points for this criterion is three (3) points.

Project Compliance:
The project team preserved and/or enhanced historic, archeological or cultural resources. A plaque is being designed for this criterion, with the purpose of enhancing the features of the bridge and informing the visitors about the demolition of the old Innerbelt Bridge. The plaque will be located in the overlook near the Towpath Trail.

In addition, the Towpath Trail is part of the Ohio and Erie Canalway which is designated as an America’s Byway by the Federal Highway Administration.

Points Achieved:
The team achieved three (3) points for this criterion.

Future Compliance Activities:
- Submittal of “as-built” drawing and photo of plaque.

POSSIBLE 3

ACTUAL 3
Scenic, Natural or Recreational Qualities

The George V. Voinovich Bridge project has planned a number of improvements to enhance the scenic and recreational qualities of the roadway. One of those improvements is the Tremont Sideyard which will be a public park designed to serve the Tremont area of Cleveland.

Summary:
The goal of this criterion is to preserve, protect and/or enhance routes designated with significant scenic, natural and/or recreational qualities in order to enhance the public enjoyment of facilities. The maximum possible points for this criterion is three (3) points.

Project Compliance:
The project team has planned a number of improvements to enhance the scenic and recreational qualities of the roadway. A new park, named the Tremont Sideyard, is being constructed as a part of this project, and will be located across the street from the planned extension of the Towpath Trail, thus creating multiple other options for public enjoyment of scenic, natural and recreational experiences. The bridge spans the Ohio and Erie Canal, earning its designation as one of America’s Byways.

Points Achieved:
The project achieved three (3) points.

Future Compliance Activities:
No future compliance activities required.
Energy Efficiency

Reduce the energy consumption on the project through the installation of energy efficient lighting and signal fixtures and through the installation of autonomous, on-site, renewable power sources.

Summary:
The goal of this criterion is to reduce energy consumption of lighting systems through the installation of efficient fixtures and the creation and use of renewable energy. The project team should evaluate energy needs for the project and implement alternatives to reduce power consumption while still meeting lighting and safety standards. These alternatives could include reduction of lighting; retrofit or installation of energy efficient luminaires, beacons and traffic signal equipment and lamps; and installation of renewable energy sources. The maximum possible points for this criterion is eight (8) points.

Project Compliance:
The team will reduce energy consumption of the lighting system while still meeting the lighting and safety standards. Information is being collected for the aesthetic lighting on the bridge and other areas. This criterion’s submission should include the energy usage evaluation and reduction plan, calculations documenting energy usage, contract documents of the luminaries, sample cut sheets and specification for every technology installed, and documentation of plan for audit energy use after construction. The Ohio Department of Transportation announced the approval for changing all the roadway lighting on the bridge to LEDs. This change will help the team reduced the total energy consumption of the project by using these efficient lighting fixtures. LED lamps are a new technology compared to HPS lamps, which have been the industry standard for years.

Points Achieved:
The project team achieved four (4) point in this criterion.

Future Compliance Activities:
No future compliance activities required.
Site Vegetation

The project team will complete a landscape management plan by the end of the job. The plan will include management of site vegetation and management of invasive species.

**Summary:**
The goal of this criterion is to promote sustainable site vegetation within the project footprint that does not require long-term irrigation, considering mowing or invasive/noxious weed species removal. The maximum possible points for this criterion is three (3) points.

**Project Compliance:**
The project team will achieve one (1) point for no long-term irrigation and one (1) point for a long-term vegetation plan. As evidenced in the project landscape plans, no long-term irrigation will be used (after the plant establishment period). The long-term vegetation plan will be submitted later on when the project has all the information available. The project team will complete a management plan by the end of the job. The plan will include management of site vegetation and management of invasive species (or continued efforts to eradicate them).

**Points Achieved:**
The project team achieved two (2) points

**Future Compliance Activities:**
No future compliance activities required.
Reduce and Reuse Materials

The majority of the waste that is generated on the jobsite will be recycled. Structural steel scrap, slap rebar scrap and concrete have been recycled in this project.

Summary:
Reduce lifecycle impacts from extraction and production of virgin materials by recycling materials. The team can achieve points by: preserving pavement, retrofitting bridges and reusing industrial by-products. The maximum possible points for this criterion is eight (8) points.

Project Compliance:
The following features include a brief description about how the project team are achieving points.

Pavement Preservation - In an effort to preserve existing paving where possible, West 11th / Kenilworth Avenue were milled 2” and resurfaced to provide an increased remaining service life of two to five years.

Retrofitting Bridges - In order to reduce the need for new structures and materials, elastomeric bearings on Bridge 21 were refurbished. This should avoid the need for new materials for another 2 to 5 years.

Reuse Industrial By-Products - In an effort to reuse industrial by-products in materials, slag was used in the project team’s approved concrete mix design. See attached delivery ticket indicating slag was part of the mix used.

Points Achieved:
The project team achieved eight (8) points.

Future Compliance Activities:
No future compliance activities required.
Recycle Materials

Currently the project has recycled 99.95% of the materials from this project.

Summary:
The goal of this criterion is to reduce lifecycle impacts from extraction, production and transportation of virgin materials by recycling materials. The maximum possible points for this criterion is eight (8) points.

Project Compliance:
The project team is committed to reducing the amount of virgin paving required on the project by using reclaimed asphalt pavement (RAP) in paving mixes throughout the project. The amount of RAP used in the mixes will be continuously monitored and reported throughout the duration of the project, and is expected to remain at or above 20 percent of the average recycled material content (ARC) when the project is complete. The tracking mechanism for the project includes: mix designs for various areas, area takeoff quantities, RAP percent for each mix design and calculations of the ARC.

Points Achieved:
The project team achieved two (2) points.

Future Compliance Activities:
• Regular tracking report updates are being submitted.
• Add information about concrete being used for slope protection.
Earthwork Balance

The George V. Voinovich team reduced the need for the transportation of earthen materials by maintaining all dirt on the project.

Summary:
The goal of this criterion is to reduce the need for transport of earthen materials by balancing cut (excavation) and fill (embankment) quantities. The project team will balance the earthwork volume such that the percent difference between cut and fill is less or equal to 10 percent of the average total volume of the material moved. This criterion’s submission includes a grading plan, reporting total cut and fill quantities and the inspector or contractor’s actual earthwork volumes of the project. The maximum possible points for this criterion is three (3) points.

Project Compliance:
All earthwork material excavated on the job will be used as fill in other areas within the job limits. No material will be hauled away as “excess fill” or “waste” to an off-site location. Similarly, no off-site material will be used as fill on the project. This means that the amount of cutting and filling equal each other after swelling and compacting factors are applied making the earthwork balanced. The George V. Voinovich team reduced the need for the transportation of earthen materials by having the actual construction volume difference between cut and fill be less than 10 percent. The team anticipates using topographic drawings to determine the amount of earthwork relocated on the project site.

Points Achieved:
The project team achieved three (3) points.

Future Compliance Activities:
- Submittal of final topographic drawings
Reduced Energy and Emissions in Pavement Materials

This project is getting its pavement materials from St Marys Cement. They use ISO 50001 which is considered a higher energy management system than ENERGY STAR.

Summary:
The goal for this criterion is to reduce energy use in the production of pavement materials; which supports all of the triple bottom line principles by lessening impacts to air quality through reduced emissions and reducing energy consumption. The maximum possible points for this criterion is three (3) points.

Project Compliance:
The project is using cement that is ISO 50001 certified. The cement for this project is supplied from St Marys Cement INC that operates an energy management system which complies with ISO 50001:2011. ISO 50001 guidelines requirements are considered a higher energy management system than Energy Star.

Concrete for this project is supplied from the Cuyahoga Concrete Corporation. The cement used for this project is blended using limestone addition. The limestone addition decreases the cement clinker in concrete and reduces the carbon footprint.

Points Achieved:
The project team achieved three (3) points.

Future Compliance Activities:
No future compliance activities required.
Construction Environment Training

Employees receive environmental awareness training through the use of various “Toolbox Talks.” These “Toolbox Talks” were performed consistently throughout the course of the project.

Summary:
The goal of this criterion is to provide construction personnel with the knowledge to identify environmental issues and best practice methods to minimize impacts to the human and natural environment. The maximum possible points for this criterion is one (1) point.

Project Compliance:
The project effort for this criterion was to create a “Construction Environmental Awareness Plan.” The goal of this plan is to provide tools and information for construction personnel regarding environmental concerns relevant to this project. The Construction Environmental Awareness Plan includes the following: Responsibilities and Strategic Approach; Environmental Commitments; Risk for Compliance Work Activities; Required Environmental Qualifications/Certifications; Environmental Compliance Monitoring and Reporting Procedures; Environmental Notification Triggers and Emergency Response Procedures; Spill Prevention Control and Countermeasures Plan; Reduction of Air Pollution; Environmental Records Management; Tracking Procedure and Productivity Measurement Tool.

Points Achieved:
The project team achieved one (1) point.

Future Compliance Activities:
No future compliance activities required.
Construction Equipment Emission Reduction

Trumbull-Great Lakes-Ruhlin utilizes larger, non-road hauling vehicles for transporting earthwork during project. Larger loads reduce the number of trucks required. The image below shows an articulated truck.

Summary:
The goal for this criterion is to reduce emissions from construction equipment. This supports environmental and social principles by lessening impacts to air quality and reducing fossil fuel consumption. The maximum possible points for this criterion is two (2) points.

Project Compliance:
The Ohio Department of Transportation has required the contractor, TGR, to implement an “Idling Policy” as mentioned in the proposal section 3.1 Energy and Efficiency. This project implements a No-Idling Policy during construction and as a final project feature.

Another project effort is that the George V. Voinovich Bridge team has utilized Compressed Natural Gas (CNG) project vehicles for the project duration. Natural gas is a proven alternative fuel that significantly improves local air quality.

Also, TGR utilizes larger non-road hauling vehicles for transporting earthwork during the project.

Points Achieved:
The project team achieved two (2) points.

Future Compliance Activities:
No future compliance activities required.
Summary:
The goal of this criterion is to reduce or eliminate annoyance or disturbance on surrounding neighborhoods and environments from road construction noise, and improve human health. The maximum possible points for this criterion is two (2) points.

Part of the project’s goal is to establish, implement and maintain a formal Noise Mitigation Plan (NMP) during roadway construction.

Project Compliance:
The project team created a NMP. The NMP is a list of applicable construction devices to be used at site, approved protective devices (muffs, earplugs) which shall be used in high noise exposure areas, a list of the activities that shall be waived from restricted hours, names of the people responsible for the NMP and working hours proposed by the City of Cleveland to minimize any adverse construction noise impacts. Also, this document includes drawings of the surroundings of the work site.

Points Achieved:
The project team achieved one (1) point.

Future Compliance Activities:
No future compliance activities required.
Construction Quality Control

The image below displays the Quality Organizational Chart, which shows the reporting relationships and lines of communication.

Summary:
The goal of this criterion is to improve quality by requiring the contractor to have a formal Quality Control Plan (QCP). This plan should require the contractor to plan and implement quality control measures throughout construction with care for materials above and beyond what is typically required by specifications and regulations. The Owner shall require the Contractor to establish, implement, and maintain a formal QCP during roadway construction. The maximum possible points for this criterion is five (5) points.

Project Compliance:
The QCP should cover all project construction, not just the pavement, and subcontractors need to be included in this plan, which typically means identifying a responsible party and obtaining a quality control procedure from the subcontractor. Also, the prime contractor shall maintain authority to enforce the QCP for work performed by all subcontractors. The QCP should be approved by the owner before construction begins.

The project team leveraged the use of quality price adjustment clauses to link payment and performance of the constructed products. Quality assurance specifications generally include statistically based acceptance plans, require contractor process control testing and have provisions for pay adjustments based on the degree of compliance with specified requirements.

Points Achieved:
The project team achieved five (5) points.

Future Compliance Activities:
No future compliance activities required.
Construction Waste Management

The final percentage of recycled waste is 75%+.

Summary:
The goal of this criterion is to utilize a management plan for road construction waste materials to minimize the amount of construction-related waste destined for landfill. The maximum possible points for this criterion is three (3) points.

Project Compliance:
The project team worked together to create a Construction Waste Management Plan (CWMP) prior to the commencement of any construction or demolition work. The CWMP outlines the following information: type of construction and demolition waste expected, expected tonnage, goal for percentage of waste diverted from landfills, contact information of responsible party for hauling, destination of waste & contact information of responsible party at disposal site, strategy for waste generated from mobile-office activities and personal workers, opportunities for recycling of construction waste materials and a plan of documentation and reporting of landfill diversion rates.

In order to make sure all parties were on board with the information and procedures outlined in the CWMP, a Construction Waste Management Plan meeting occurred prior to the start of construction/demolition and included the Project Manager, Project Superintendent, and Director of Sustainable Building Practices. Care was taken (as outlined in the CWMP) to ensure that each individual on the job is made aware of the policies of the CWMP.

The George V. Voinovich bridge project has diverted over seventy five (75) percent of the construction waste from landfills.

Points Achieved:
The project team achieved three (3) points.

Future Compliance Activities:
- Regular tracking report updates are being submitted.
Appendix A
Resources & Links

Federal Highway Administration – INVEST
sustainablehighways.org

George V. Voinovich Bridge Project
innerbelt.org

Ohio Department of Transportation
transportation.ohio.gov

OHGO
ohgo.com

Cleveland Urban Core Projects
dot.state.oh.us/projects/ClevelandUrbanCoreProjects

Greater Cleveland Regional Transit Authority
riderta.com/innerbelt

Ohio RideShare
ohiorideshare.com/

Canalway Partner
canalwaypartners.com/

Land Studio
land-studio.org/projects/cleveland-innerbelt-project-mural-art-program

Peregrine Falcon
wildlife.ohiodnr.gov/wildlife-watching/falcon-cam

Cleveland Memory Project
clevelandmemory.org

Acknowledgements
The success and final outcome of this INVEST certification was made possible by the effort of many people in the George V. Voinovich Bridge project. We would like to thank the following for their contribution:

| The Ohio Department of Transportation |
| TGR Leadership: |
| Adam Belasik, George Mezey, George Palko, and Jim Ruhlin. |

| Sustainability Task Force Members: |
| Adam Belasik, Matt Blesi, Jocelynn Clemings, Mark Grdina, Phil Hannah, Margaret Hewitt, Thomas Hyland, Jackie Jacob, Arelis Latimer, Jennifer LeMasters Wirtz, Karen Lenehan, Anna-Katrin Strauss, and Laura Steinbrink. |

| INVEST Scoring Team: |
| Chris Forney, David Lastovka, Jeff Lechak, Fernando Rodriguez, and Jason Tucker. |