

# **FEDERAL BUILD TRANSPORTATION DISCRETIONARY GRANT APPLICATION**

**DUE DATE – JULY 19, 2018**

**PROPOSED CANTILEVERED SIDE WALK OVER THE  
CONNECTICUT RIVER ON THE  
EAST HADDAM / HADDAM SWING BRIDGE**

**APPLICANTS – THE TOWNS OF EAST HADDAM AND HADDAM,  
CONNECTICUT AND THE LOWER CONNECTICUT RIVER VALLEY  
COUNCIL OF GOVERNMENTS**



**BUILD 2018 GRANT APPLICATION – JULY 19 2018**  
**CANTILEVERED SIDE WALK OVER THE**  
**CONNECTICUT RIVER ON THE**  
**EAST HADDAM / HADDAM SWING BRIDGE**

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# 1. Project Description

The Towns of East Haddam and Haddam, Connecticut and the Lower Connecticut River Valley Council of Governments are requesting \$18,280,000 dollars in BUILD Grant funding for a pedestrian and bicycle access across the Connecticut River. Broken down this includes approach sidewalks on the Haddam side (\$1.923 million) and the East Haddam side (\$357,000) along with a cantilevered walkway (\$16 million) alongside of the East Haddam / Haddam Swing Bridge. This bridge (Connecticut Department of Transportation Bridge #01138) carries CT Route 82 over the Connecticut River and is the only connection between the Towns of East Haddam and Haddam. The proposed work requested in this grant would be done concurrently with the scheduled Connecticut Department of Transportation rehabilitation of the existing Swing Bridge. The Swing Bridge was originally constructed in 1913 and has a total length of approximately 885 feet. The project would connect the two sides of the Connecticut River creating a walkable / bikeable, multimodal (car, train, marine, and airport) village that will open opportunities for economic growth through tourism and providing opportunities, local services, and create a safe livable community. The partners in this application are the Towns of East Haddam and Haddam, the Lower Connecticut River Valley Council of Governments and the State of Connecticut Department of Transportation (ConnDOT). The East Haddam / Haddam Swing Bridge is located in a rural portion of Connecticut according to the most recent U.S. Census report.

Presently the Connecticut Department of Transportation proposes to start the rehabilitation of Bridge No. 01138 in late fall of 2019 or the beginning of 2020. The project will be completed by 2022. The ConnDOT project cost for the bridge rehabilitation is \$45 million dollars. This does not include the approach ways or the cantilevered sidewalk along the bridge that will cost an additional \$18,280,000 dollars. The timing of this project requires that the bridge rehabilitation and the cantilevered walkway be done concurrently. There will be a substantial cost savings if disruption to vehicular and marine traffic will be concentrated into a single construction project and not spread out into several construction phases. During the bridge reconstruction there will be disruption with emergency services and mutual aid. This is a significant risk as both towns are rural with volunteer emergency services and the Town of Haddam is divided by the River with a portion of the municipality located on the eastern banks of the River in a borough called Haddam Neck. Simultaneous construction of the walkway and bridge will not only make this project feasible from a public safety perspective, but significantly reduces the project's cost and impacts to the community. If the project is not funded now, it is doubtful there would be a time in the future to start the project. ConnDOT has decided to reinvest in this bridge because it is one of the few locations where the road crossing is level and it is also one of the narrowest crossings in the area. Constructing a new bridge would be prohibitive in cost and environmental impacts if relocated elsewhere. This provides an unique opportunity in Connecticut for a level pedestrian and bicycle crossing on the river, without having to climb and descend approximately 100 feet up and over as in other crossings on the river.

The proposed ConnDOT project scope includes strengthening of structural steel members, replacement of electrical and major mechanical systems, deck repairs in span #1, #2 and over the machinery pit, bearing and joint replacement and repairs, installation of a new bridge rail, painting of steel members, substructure patching and masonry repointing repairs, relocation of the electrical house and operator house staircase, localized painting of steel members, and new

safety cameras and equipment.. (See Exhibits #2 – #7 for Construction reports, feasibility reports, and cost estimates)

Exhibits can be found listed on the Town of Haddam web site at:

<https://www.haddam.org/projects/pages/swing-bridge-project>

Exhibit 1. See 2012 Rural Designation Map

Exhibit 2. See CT DOT Presentation with Preliminary Construction diagrams – October 2, 2017

Exhibit 3. See Hardesty and Hanover Sidewalk Feasibility Report – November 2016

Exhibit 4. See CME Engineering Rehabilitation Study Report – June 2017

Exhibit 5. See CME Engineering Construction Cost for the cantilevered walkway – 5/10/ 2018

Exhibit 6. See Nathan L. Jacobsen preliminary construction cost for approach walkway from the western side of the bridge – June 13, 2018

Exhibit 7. See Nathan L. Jacobsen preliminary construction cost for approach walkway from the eastern side of the bridge – June 28, 2018

## **Project History and Transportation Challenges**



**1913 construction photo from the East Haddam side. Completed in 1914.**

The transportation challenges are two-fold. The first is the rehabilitation of a 1913 bridge that is not designed for today's traffic counts and weigh loads. At the time of construction in 1913 the main mode of transportation was still horse and wagon. The original engineers could have never imagined fully loaded tractor trailers crossing the bridge. Previous rehabilitation efforts were done in 1988, 1999, and 2007 but those efforts did not strengthen the bridge structurally to meet

Town of Haddam web site at <https://www.haddam.org/projects/pages/swing-bridge-project>



the needs of today and into the future. Multiple times a year the bridge failed to open or close and created vehicular and marine traffic jams. Vehicular detours of an average of 30 miles are needed to reach the destination to the other side. The Swing Bridge operating properly is also important to the vessels that navigate the Connecticut River. If it cannot open, navigation is impossible for larger vessels.



**Photo from the Haddam side. Bridge is open for boat traffic. The Old Town Office site, the Goodspeed Opera House, and the Gelston House Restaurant are in the background.**

The second transportation issue for which this BUILD Grant Application is being submitted is to construct a cantilevered walkway to create a safe access across the bridge for pedestrians and cyclists. Pedestrians and cyclists cannot safely cross the East Haddam / Haddam Swing Bridge. When the bridge was originally designed, pedestrians, horses, and early motor vehicles could co-exist. Today crossing the bridge on foot or by bicycle has been nothing short of dangerous. This has separated East Haddam Village and Tylerville (a village within the Town of Haddam) from pedestrian traffic even though they are in walking distance. The distance from East Haddam Village to the intersection of Rte 82 – Bridge Street and Rte 154 in Tylerville is only four thousand (4000) feet – less than a mile. The incorporation of a cantilevered walkway was originally presented as part of an ISTEA application from the Towns of East Haddam and Haddam in 1997 - (See Exhibit #8). Although the grant was not awarded, ConnDOT commissioned a feasibility study for the walkway in 1999. The Sidewalk Study Report from Lichtenstein and Associates, Inc, October 1999 concluded the project was feasible - (See Exhibit #9). The discussion of a cantilevered walkway is also included in the East Haddam 2008 Plan of Conservation and Development and the Haddam 2018 Plan of Conservation and Development - (See Exhibits 10 & 11). More recently the ConnDOT hired the firm of Hardesty and Hanover to review the feasibility and costs associated with the construction of a cantilevered walkway in 2016. (See exhibit #3) The ConnDOT also held a public information session to discuss the bridge rehabilitation and the cantilevered walkway in October of 2017. (See Exhibit #2)

- Exhibit 8. See 1997 ISTEA Grant Application for the Swing Bridge Walkway  
Exhibit 9. See Sidewalk Study Report from Lichtenstein and Associates – October 1999  
Exhibit 10. See Sections of the East Haddam 2008 Plan of Conservation and Development.  
Exhibit 11. See sections of the Haddam 2018 Plan of Conservation and Development

## 2. Project Location

The project is located on the Connecticut River between the Towns of East Haddam and Haddam in Middlesex County, Connecticut. The Swing Bridge connects the Villages of East Haddam and Tylerville which is a village of Haddam. This bridge connection is the only connection between East Haddam and Haddam without taking a thirty-mile detour to the north through Portland and Middletown or a thirty-mile detour to the south through Old Lyme and Old Saybrook to cross the Connecticut River. The rehabilitation of the bridge is particularly critical to the Town of Haddam as it is one of the few municipalities in the country to be split by a major waterway. Residents of the Haddam Neck portion of Haddam need to cross this bridge to get to the main portion of the Town of Haddam where the schools and other municipal services are located. Although a rural portion of the state, state forest and parks, a scenic railroad, world class-theater, and natural beauty of the Connecticut River bring significant tourism and activity to the immediate area around the East Haddam / Haddam Swing Bridge.



**Overhead view of the East Haddam / Haddam Swing Bridge Area.**

### 3. Grant Funds, Sources and Use of Project Funds

- (A) **Project Cost** – \$18,280,000 dollars    Cantilevered Sidewalk on the bridge is \$16 million, approach from the Haddam side \$1.923 million, approach from the East Haddam side is \$357,000
- (B) **Funds for Eligible Project Cost** - Listed above
- (C) **Non-Federal Funds** – State of Connecticut has committed \$45 million for the rehabilitation of the bridge excluding the walkway. 20% or \$9 million is to be funded directly by the State of Connecticut, the rest is federally funded.
- (D) **Required non-Federal match Funds** – Rural Areas do not require a match, upon discretion of the Secretary of Transportation.
- (E) **Budget** – The State of Connecticut Department of Transportation will administer all funds received for this project. Separate sf424c forms for the approach walkways and the Swing Bridge walkway are attached as Exhibit # 12 - 14. A combined sf-424c form was submitted as part of the grant application.

### 4. Criteria

#### (1) Merit Criteria

##### (a) Safety

With traffic counts exceeding 10,000 vehicles per day, crossing the Swing Bridge by foot or bike is simply not safe. ConnDOT has even posted signs on the bridge warning pedestrians not to walk across. This is problematic as most of the available parking in the area for such events as East Haddam's Music on the River concerts lies on the western (Haddam) side of the river. The existing bridge is twenty-four feet, six inches wide, when measured curb to curb. With the metal railings on each side there is no additional room or snow shelf area to safely walk. Pedestrians and bicyclist could be pinned against the railings. For this reason, it is barely used by pedestrians and bicyclist therefore there are no reports of serious injuries. The placement of the walkway would open up access to both villages and reduce vehicle use across for such a short distance. Private schools such as Mercy and Xavier High School along with Vinal Technical School bus their East Haddam students from a parking lot in Tylerville, adding to the commuting traffic in the morning and afternoon. None of the East Haddam students attempt to cross the bridge even if they live in East Haddam Village. The goal of providing safe routes to school can be achieved with the addition of this walkway.

**Sign posted by ConnDOT prior to the Music on the River Concert from the Haddam side of the swing bridge.**



**(b) State of Good Repair** *(described in Section E.1.(b))*

**(1) The project is consistent with relevant plans etc.**

The ConnDOT is moving forward with plans to repair the Swing Bridge that will structurally and mechanically repair the bridge for the next thirty to fifty years. The Towns of East Haddam and Haddam have considered the walkway an important component for safety and economic growth of the Villages since 1997 and is part of their State require Plans of Conservation and Development - (See exhibits 10 & 11). The State of Connecticut Bicycle Plans direct cyclist over the bridge even though it is not safe. The only way bicyclist travel safely is when they group up in a peloton and occupy the entire travel lane as they cross. It is noted on the State's 2009 Bicycle and Pedestrian System Map that the Swing Bridge is proposed for improvement. The 2017 Connecticut Bicycle and Pedestrian Transportation Plan Update map still has the bridge listed as an important east-west bicycle connection - (See exhibit 15).

Exhibit 15. See page 67 of the 2017 Connecticut Bicycle and Pedestrian Transportation Plan by Fitzgerald & Halliday, Inc – July 2017.

**(2) If left unimproved etc. – Continued inability to cross, grow economically**

If the walkway is not funded, the bridge continues to be an unsafe pinch point that restricts access and potential economic development. The impacts to the communities and the region are best described in Safety and Economic Competiveness portions of this narrative.

**(3) Project is appropriately capitalized**

The walkway would be owned and maintained by the ConnDOT. The Commitment to repair the bridge has already been made by ConnDOT and the start date is late 2019 or early 2020. The project will be completed by 2022. Until the walkway is in place, the crossing is dangerous, and local economic growth is impeded. The rehabilitation project is in the TIP (Transportation Incentive Program) and STIP (Statewide Transportation Improvement Program).



**(4) Sustainable Operation & Maintenance**

Again the ConnDOT will maintain the walkway along with the bridge as part of the normal schedule of bridge maintenance.

**(5) Supports border security functions** – The rehabilitated bridge will continue to provide access for the US Coast Guard. With the former Connecticut Yankee Nuclear Power Plant and a spent fuel rod facility in Haddam Neck which is north of the Swing Bridge, it is critical that river access be maintained as a national security concern.

**(6) Plan to maintain transportation infrastructure** – The State of Connecticut’s commitment to maintain the existing structure and rehabilitation will extend the life of the structure for another thirty to fifty years. The continued access across the river is critical for both Towns. The alternative is to travel fifteen miles to the north or south just to cross the River. In Haddam’s case, the long term maintenance of the bridge is also critical to a portion of the population since the Town is divided by the River. The construction of the walkway is critical for economic growth and safety. (See c. Economic Competitiveness)

**(c) Economic Competitiveness**

The Swing Bridge Walkway project will provide the greatest benefit in strengthening the local and regional economy if completed. The opportunity to link numerous tourism attractions, Essex Steam Train, River Quest Cruises, Goodspeed Opera House, marinas, restaurants, Goodspeed Airport, shopping, will allow tourist to spend more time in Tylerville and East Haddam Village and provide the impetus for significant private investment on both sides of the river.

Web links for the businesses and attractions discussed in this narrative are listed on the Haddam web site. <https://www.haddam.org/projects/pages/swing-bridge-project>

When discussing regional importance, the Essex Steam Train and River Boat excursions bring over 160,000 visitors to the Connecticut River Valley and Middlesex County annually. The Essex Steam Train travels along the Connecticut River through Essex, Deep River, Chester, with a final destination in Haddam at the Swing Bridge. Unfortunately, due to the lack of a safe pedestrian crossing on the Swing Bridge, their tourism options are limited.

Located on the East Haddam side of the river is the award winning Goodspeed Opera House originally constructed in 1876, that attracts over 100,000 annual visitors to their shows. Next to it is the Gelston House Restaurant which was reconstructed in 1853 to its present configuration and can seat over 350 guest at one time. East Haddam Village Historic District is on the National Historic Register and these buildings include the Nathan Hale School House and sixty-five other historic buildings built between 1750 and 1880. All of these structures are within walking distance of the Swing Bridge. There also is a variety of other shops and stores and the potential for much more growth.

The Town of East Haddam has recently moved out of the former the Town Office complex which was located on 2.9 acres next to the Swing Bridge and across the road from the Goodspeed Opera House and the Gelston House. The relocation of the Town Offices opens this

Town of Haddam web site at <https://www.haddam.org/projects/pages/swing-bridge-project>

2.9 acre parcel area to commercial and mixed use growth in East Haddam Village. The Town has also completed a Brownfield Phase I, II, and part of a Phase III environmental review of the site so it will be able to market the property. Phase III review should be finished by the end of the summer of 2018. Previous reviews and clean up has total around \$150,000 in expenses and final cost if any additional cleanup is still to be determined. The Town Office site is capable of holding up to 40,000 square feet of commercial and mixed use development. The addition of a walkway will enhance the value of this property and make it more attractive to market.

**Existing Conditions – former Town Office site**



**Potential Buildout of the Former Town Office Site**



Exhibit 16. See East Haddam Village Revitalization Committee Design Plans by Felner Associates Architects 2010.

Town of Haddam web site at <https://www.haddam.org/projects/pages/swing-bridge-project>

The Village also has the Goodspeed Airport which is located just south of the Swing Bridge and they cater to small aircraft, float planes and helicopters.

The Town of East Haddam holds an outdoor concerts series which host seven to eight events on the Goodspeed Opera House lawn next to the Connecticut River throughout the summer. The Music on the River series has attracted over 2000 people for some of the more popular musicians. These events required people to park on the Haddam side of the river due to the overflow of people attending. They are not allowed to cross the bridge on foot from the Haddam side and a special shuttle is needed just to get across a 1,500 foot bottleneck.

Exhibit 17. See Music on the River 2018 Brochure

A major problem on the East Haddam side is the lack of parking. The Haddam side with Eagle Landing State park offers ample public parking adjacent to the Swing Bridge. The lack of pedestrian facilities and the prohibitive cost of busing people the short distance over the bridge prevents this lot from being used for events in East Haddam. The alternative for East Haddam would be the construction of a parking garage in the flood plain. An expensive proposal that would be difficult to permit due to environmental factors.

Eagle Landing State Park on the Haddam side of the river is also home Lady Katherine, River Quest, and Adventure Cruise lines which operate from the state park and offers a variety of spring, summer, and fall cruises along with winter eagle cruises departing from the park's waterfront on the Connecticut River. These cruise lines entertain between 12,000 to 13,000 guests annually. The ability to cross the river will enhance the opportunities for lengthening guest's visits and increase tourism revenues.

Exhibit 18. See Eagle Landing State Park Brochure.



**Lady Katherine with Goodspeed Airport in background.**

This park and section of the state is also a destination for the Essex Steam Train located in Essex which teams up with the Becky Thatcher Steam Boat in Deep River to provide scenic tours of the lower Connecticut River Valley. Essex Steam Train already provides a Concert Express for Music on the River Concerts but has to shuttle train passengers across the bridge by bus. The cost of the shuttle bus limits the expansion of service by the railroad. The bus also bypasses many storefronts that could have been patronized if walking was possible. In addition, the shuttle when it runs, contributes to congestion and carbon emissions in the area. Essex Steam Train and Riverboat attracts 160,000 visitors annually. With the addition of a walkway, many of these passengers would cross the Swing Bridge and patronize businesses and events in East Haddam Village. This doesn't include those visitors who will just come to see the historic bridge open and close.



**The Becky Thatcher with the Swing Bridge and the Goodspeed Opera House in the background.**

- a. Just to the north and west of the bridge in Haddam is Andrew's Marina with 65 slips and 12 moorings. Five of the slips are transient slips that can be rented by the day. Most of the transient slips are for people interested in attending the Goodspeed Opera House which is across the river which they can't safely access on foot. Next to the marina is the Goodspeed Station which is a converted Rail Road Station that has a gift shop and amenities for railroad and tourist. A short distance to the west on CT Route 82 is The River House Restaurant which caters to weddings and special events and has the capacity for over 250 guest per event. Just a little further to the west is the Connecticut River Provisions (groceries and deli) and Steady Habit Brewing Company. Down the hill to the west is Tylerville Center is a mix of stores, eateries, convenient stations, and residential units. These destinations in Tylerville will be connected by a half mile long sidewalk being funded by the Town of Haddam and federal STP – Transportation Alternatives. The total cost is \$1.6 million dollars and construction is to be completed in 2020. The new sidewalk will connect the railroad passenger and state park visitors to the Swing Bridge and the businesses in Tylerville.





**Andrews Marina with 65 slips and 12 moorings**



**Essex Steam Train along the Connecticut River**

East Haddam and Haddam are rural communities with little in commercial and industrial tax base. In East Haddam the commercial and industrial properties only account for 6% of the taxable income while in Haddam commercial and industrial accounts for 7% of the tax base. East Haddam and Haddam are off the beaten path when it comes to logical locations for major commercial and industrial growth. Away from major highway and lacking infrastructure, these small rural towns do not attract businesses and industry like metropolitan communities. Haddam and East Haddam must work with the assets at hand which includes scenic beauty, historical architecture, spectacular vistas, and a scenic river. Fortunately, there is vast untapped potential to build on a tourist based economy for our towns and the region. Although within a quarter mile radius of the Swing Bridge there is a train station, parking, airport, marinas, and cruise lines yet all of these transportation assets are disconnected because it is impossible to walk across the river. The walkway on the Swing Bridge would resolve this issue by connecting surrounding attractions and modes of transportation while also help traffic congestion by reducing the need for those attending events in East Haddam from having to drive across and struggle with the scarcity of parking spaces. It always been thought that villages next to the swing bridge could be used as a base area for those who wish to walk or bike the surrounding areas. The removal of the barrier to safely cross the river will attract cyclists and hikers who previously had to drive to access nearby parks and attractions.

Twenty years ago the Connecticut River Watershed was designated an American Heritage River. The American Heritage River program was designed to restore the historic, economic, and environmental viability of some of the nation's most important waterways. The lower section of the Connecticut River has been designated one of the "40 Last Great Places" by the Nature Conservancy; and the entire river designated as the Silvio O Conte Wildlife Refuge by the U.S. Fish and Wildlife Service. In May of 2012 the Connecticut River was named the first National Blueway by the U.S. Department of the Interior.

The area around the Swing Bridge has exciting potential to build upon a wealth of natural, cultural, and transportation assets, if only connected. The Towns of East Haddam and Haddam are proposing additional projects that compliments and enhance the present transportation options available to residents and visitors. One such project is to create seven miles of hiking trails that connect from East Haddam Village through the forest south to Chapman's pond and ending further south at Gillette's Castle State Park. Travelers could the cross the Connecticut River on the Hadlyme Ferry (the second oldest operating ferry in Connecticut) and pick up the Essex Steam Train and head north to their original destination point. Alternate modes of viewing and accessing the historical and natural treasures of this area could be available in the form of trails, both walking and biking. If the walkway is created, the bottleneck of the Swing Bridge could experience reductions of vehicular traffic by offering visitors and residents these new options. The ability to bring the public closer to the Connecticut River and attract them to experience historic New England villages will assist in their preservation by maintaining the traditional nature of the places and assisting their economic viability through increased tourism economy.

**(1) decrease transportation cost and improve access – Allows walking & biking as a mode of transportation.**

With all of the tourist based entities in this small area, the creation of the walkway will benefit for those who arrive by cars, bicycle, boats, trains, and planes. East Haddam Village and Tylerville are within walking and biking distance but it is unsafe to cross the swing bridge even with light traffic. The walkway would benefit the residents and visitors of both Villages. There are approximately one hundred and fifty households and businesses that reside on either side of the river and are within a half mile radius of the Swing Bridge.

The Goodspeed Opera House employs a number of actors, choreographers, set designers and costume designers for their musical season that runs from April until November. Auditions for these coveted jobs are held in Manhattan. At any one time, the Goodspeed Opera House can house up to one hundred actors in their actor housing complex in East Haddam Village. Most of the Goodspeed employees reside in New York and do not own vehicles. While in East Haddam their mode of transportation is walking or biking. Being a rural community is no local taxi or transit service and Uber service is scarce and expensive. Nevertheless, in Tylerville - a short walk from their dorms, is a grocery store and other shops and services. This artistic community would be a primary beneficiary from the walkway.

**(2) improve long-term efficiency**

Creating walkable villages will open up even more opportunities for tourist to access attractions and generate economic activity. This would create safer and convenient modes of transportation not only for the tourist and the Goodspeed Opera House actors and employees, but for the residents of Haddam and East Haddam.

**(3) increase the economic productivity**

The creation of the walkway will add value to most of the existing commercial entities in Tylerville and East Haddam Village and creates new opportunities for future ventures. The visitors of the Essex Steam Train, River Quest Boat, Lady Catherine Boat, Adventure, and Becky Thatcher Steam Boat could extend their visits to include a meal or shopping or even an overnight stay, generating new revenue for local businesses. Visitors who travel by foot to a destination tend to stay longer and spend more money in that location than locations that are exclusively accessible by car. The Gelston House Restaurant, the LaVita Restaurant, and other restaurants could be part of a day trip package that includes scenic rivers tours, excursions through historic streets and shops, and dining before heading home. If enough private businesses are expanded and created, then some of the existing large historic homes in the villages could be restored and converted to bed and breakfast sites or country inns to accommodate the tourist visiting the area. Visitors could spend the weekend, and this area could attract more for wedding and small-conference business. We also hope that providing visitors a means to walk across the bridge will induce wedding and party attendees to walk instead of driving to their inn after a day of celebration. The properties on both sides of the bridge will gain value if connected to each other by foot. This would increase the redevelopment potential of now vacant and underutilized properties. The walkway becomes the starting point of the growth of these two villages.

#### **(4) result in long term job creation**

Connected villages will be vibrant villages. The lack of pedestrian and bicycle connections between the two villages and to a lesser extent the lack of parking stymies commercial growth. Opportunities arise for both year-round employment and seasonal employment. The ability to walk or bike to work becomes more sustainable for seasonal and part time employees. By creating the option to visit both villages, without having to drive, will make it possible for visitors to spend a full day, instead of a few hours. In tourism, more time spent equals to more monies spent.

The construction of this bridge is not the only project underway to enhance the economic productivity of the villages. As for other infrastructure investment, the Towns of East Haddam and Haddam and the State of Connecticut are making considerable investments. These projects are as follows;

- b. The Town of Haddam was awarded a Transportation Alternative Program Funding for Haddam Swing Bridge Sidewalk Plan which runs along Ct Route 82 / Bridge Street from the Eagle Landing State Park entrance to Route 154 in Tylerville. The length of the walkway is approximately 2700 linear feet. The total cost is \$1.6 million dollars and construction is to be completed in 2020.

Exhibit 19. See <https://www.haddam.org/projects/pages/swing-bridge-project> for concept drawings and information on the TAP grant.

- c. Connecticut Department of Energy and Environmental Protection authorized over \$7.3 million dollars to run water lines to the Tylerville section of Haddam from Chester to resolve a long standing water contamination issue. This water line will make Tylerville a viable location for both commercial and residential growth. This project has started and completed by 2020.

Exhibit 20. See CT Department of Energy and Environmental Protection Consent Order – December 2017

- d. The Town of East Haddam has recently moved out of the former the Town Office complex which was located on 2.9 acres next to the Swing Bridge and across the road from the Goodspeed Opera House and the Gelston House. The moving of the offices opens this 2.9 acre parcel area to commercial and mixed use growth in the Village. The Town has also completed a Brownfield Phase I, II, and part of a Phase III environmental review of the site so it will be able to market the property. Phase III review should be finished by the end of the summer. Previous reviews and clean up has total around \$150,000 of expenses and final cost if any additional cleanup is still to be determined. The Town Office site is capable of holding up to 40,000 square feet of commercial and mixed use development - (Exhibit # 13). Once the Phase III review is completed, the Town of East Haddam will send out Request For Proposals (RFP) for the development of the site. That should occur at the end of the summer or in early fall of 2018.



- e. The Town of East Haddam is looking to implement a 2004 Mobility Improvement Study which called for the reconstruction of existing sidewalks, expansion of sidewalks, and addition of cross walks to increase the walkability of the East Haddam Village. Total length is just under a mile of construction work.

Exhibit 21. See 2004 East Haddam Mobility Improvement Study.

- (5) ***help facilitating efficient and reliable freight movement*** – The reconstruction of the bridge will allow better movement of products and good without delays and breakdowns along State Highways and for barge delivery on the Connecticut River. By constructing the walkway at the same time as the reconstruction project, the walkway can be built without additional delays to vehicular and marine freight if done concurrently with the ConnDOT rehabilitation project.

#### **(d) Environmental Protection**

Walking and biking are non-polluting forms of travel. Fossil fuel consumption and greenhouse gas emissions will be reduced. Fewer vehicles will lead to better air quality for the villages. It is the desire over time to not only have the tourist population use the walkway but also encourage the resident to shift to non-motorized forms of transportation. This portion of Connecticut is in non-conformity of the Clean Air Act. Both ozone levels and particulates exceed the federal limits.

The construction of the walkway and approach access will not require the filling of wetlands or the watercourses. Other work associated with the reconstruction of the bridge will require reviews and approvals and the ConnDOT has initiated that review process.

The creation of this walkway will add value to all properties but especially to the recently vacated Town Office site in East Haddam. This site, a former ConnDOT and Town garage, is in the final phases of environmental review for potential contaminants. If additional contaminants are found, the added value of the parcel will make the removal of any brownfield issues more affordable.

#### **(e) Quality of Life**

Pedestrian access across the Swing Bridge connecting Tylerville and East Haddam Village has not been done safely for generations. It is simply not possible to cross the bridge on foot with any assurance of safety. The creation of the walkway opens opportunities for the residents on both sides of the bridge to gain access to potential work places, grocery services, restaurants, and other essential services. The actors of the Goodspeed Opera House would find working in the rural setting less confining with access to the stores, shops, and restaurants in the Tylerville portion of Haddam. Visitors who arrive by tour boat, private boat, airplane, Essex Steam Train and by bus would have the opportunity to make the necessary connections among area attractions to extend their stay. Local businesses will have more customers, causing them to add employees to meet increased demand. Local employees could walk or bike to work, and residents will be able to walk to the three State Parks and one Town Park that lie within a mile

of the bridge. The walkway opens up recreational, business, and employment opportunities for all of the residents and will allow tourists to explore both sides of the Connecticut River without the need of a car or shuttle.

## **(f) Innovation**

### **(i) Innovative Technologies**

Due to the mechanics and the age of this historic bridge (completed in 1914), all supports for the walkway will need to be of light weight material and to be perfectly counter balanced so it does not impact the functionality of the Swing Bridge.

### **(ii) Innovative Project Delivery - NA**

### **(iii) Innovative Financing - NA**

## **(g) Partnership**

The immediate partners in this project are the Towns of Haddam and East Haddam, The Lower Connecticut River Council of Government, and the State of Connecticut Department of Transportation. This project has been recognized as a necessity by the Towns since 1997. The secondary partners are the businesses on both sides of the river who know the walkway would enhance the business plans, and thirdly the residents in the villages who would gain access through walking and biking.

## **(h) Non-Federal Revenue for Transportation Infrastructure Investment**

The State of Connecticut is investing \$9 million in state funds for the reconstruction of the Bridge.

The Town of Haddam is investing \$320,000 in municipal for the sidewalks from Tylerville to the Eagle Landing State Park.

## **5. Project Readiness**

### **(a) Technical Feasibility**

Connecticut Department of Transportation contracted the firm of Hardesty & Hanover to produce a “Sidewalk Feasibility Study Report” in 2016. (See exhibit #3) The report to the ConnDOT concludes the project is feasible. The Connecticut Department of Transportation then hired CME Engineering to produce a “Rehabilitation Study Report” for the entire bridge including the walkway in 2017. (See exhibit #4)

## **(b) Project Readiness**

### **(1) Funds to be Obligated prior to September 30, 2020**

The Connecticut Department of Transportation has scheduled construction to start on the Swing Bridge in late 2019 or early 2020. The preliminary design work for the walkway has been completed and final design is underway. Preliminary design work has been done for the walkway and the approach work that would be done concurrently with the bridge reconstruction.

### **(2) BUILD Funds to be expended by September 30, 2025**

The entire project is to be completed by 2022.

### **(3) Real Property & Right-of-Ways**

No property or right-of-way are required. All work is to be done on property that is part of the State of Connecticut highway system.

## **(c) Required Approvals**

### **(1) Environmental Permits and Reviews**

ConnDOT has initiated the environmental, historical, and NEPA reviews necessary to start the project by the end of 2019. The list of what has started and what will be done is include below.

#### **a. Reviews, Approvals, and Permits**

ConnDOT has notified the US Coast Guard of the intent to initiate bridge rehabilitation.

Exhibit 22. ConnDOT letter to US Coast Guard dated October 16, 2017.

ConnDOT has sent a letter and documentation to the Deputy State Historic Preservation Officer on the intent to rehabilitate the bridge and add a cantilevered walkway.

Exhibit 23. ConnDOT letter and documentation to Catherine Labadia, Deputy State Historic Preservation Officer dated April 6, 2017.

#### **b. Environmental Studies**

1. The Preliminary Assessment Review for the Natural Diversity Data Base was conducted on January 26, 2016. It was noted that field surveys should be performed by qualified biologist and reports sent to CT DEEP NDDB.

Exhibit 24. See Connecticut Department of Energy and Environmental Protection letter dated January 26, 2016.

2. A Revised CT DEEP Inland / Marine Fisheries Division Permit was submitted on September 20, 2017

Exhibit 25. See CTDEEP Inland/Marine Fisheries Division Coordination Transmittal Memorandum

3. A Task 100 Environmental Screening for Project No. 0040-01411 was requested by ConnDOT. TRC Environmental Group is will survey the project for contaminants or hazardous materials.

Exhibit 26. See State of Connecticut Department of Transportation Memorandum dated May 31, 2017.

### **Other tasks to be completed by ConnDOT**

National Marine Fisheries (NFM) Coordination Letter (being drafted)

Bathometric (Channel) Survey for Section Seven NFM Coordination – Coordination to be initiated by CME Engineering.

Magnetic Field Mapping to locate existing cables - Coordination to be initiated by CME Engineering.

Boring for Sediment Plume Analysis for NFM - Coordination to be initiated by CME Engineering.

Mussel Survey – Coordination initiated by OEP and anticipated to be executed by the spring/summer of 2019.

Essential Fish Habitat review required by NOAA NMF - Coordination to be initiated by CME Engineering.

Field soil sampling to evaluate contaminated materials – To be coordinated by TRC Environmentals.

Permit Needs Determination Form (PNDF) – Connecticut DEEP

- c. **Compliance with NEPA** and other applicable Federal environmental reviews and approvals – As demonstrated above, the NEPA process is underway and will be completed prior to the start of construction.

#### **d. Public Engagement**

The Connecticut Department of Transportation and representatives of CME Associates and Hardesty & Hanover Engineering discussed the project with representatives from the Towns of East Haddam and Haddam on July 13, 2017.



Exhibit 27. See Town Meeting held with Haddam and East Haddam July 13, 2017 (Part of the NEPA process)

The Connecticut Department of Transportation held a public meeting on October 2, 2017 to bring the public up to date on the planning and design process.

Exhibit 2. See Public Information Meeting held October 2, 2017 (Part of the NEPA process)

A presentation was made before the Town of Haddam's Board of Selectmen on June 11, 2018 and the Haddam Planning and Zoning Commission on June 21, 2018.

A presentation was made to the East Haddam Board of Finance on June 9, 2018 and the East Haddam Planning and Zoning Commission on July 26, 2018.

The concept of a walkway is part of both communities Plans of Conservation and Development. (See exhibits 10 & 11)

Exhibit 28 - Please find the brief video of the proposed swing bridge project filmed by Valley Shore Community Television Westbrook, CT as exhibit 27 at [haddam.org](http://haddam.org)

**(2) State and Local Approvals**

No local approvals are necessary since it is a ConnDOT project on a ConnDOT bridge on state owned right of way.

**(3) Federal Transportation Requirements Affecting State and Local Planning**

The cantilevered walkway has been part of several requests from the Towns of East Haddam and Haddam along with the Lower Connecticut River Valley Council of Governments. The walkway is in both Town's Plans of Conservation and Development. It is noted as a potential improvement that could occur is several successive State of Connecticut Bike / Pedestrian Plans.

**e. Assessment of Project Risks and Mitigation Strategies**

The engineering report of CME Associates on June 18, 2018 reviewed the project risks. Their concerns related to the age of the structure, the additional weight load to the structure and the mechanicals, and the counter balancing of the structure especially with snow loads.

The mitigation will occur through continued thorough inspection and analysis of the structure prior design and construction. Final design will incorporate the necessary strengthening and mechanical components for the sidewalk to be installed.

f. **Benefit Cost Analysis** – Conducted by



1435 Walnut Street, 4<sup>th</sup> Floor  
Philadelphia, PA 19102

See Exhibit 29 – Cost Benefit Narrative - ESI ECONSUL SOLUTIONS INC.

See Exhibit 30 - Cost Benefit Analysis - ESI ECONSUL SOLUTIONS INC.

**I. Results of Benefits-Cost Analysis**

**Executive Summary**

The proposed cantilevered sidewalk on the East Haddam/Haddam Swing Bridge (the Bridge), and additional sidewalk improvements, provides significant quantifiable benefits across a number of categories. The project will: reduce the need for vehicle miles traveled by residents and visitors who can now walk or bike freely through the area, greatly improve safety across and around the bridge, promote active recreation and health, spur economic development, and improve the lives and experience of the residents and visitors of Haddam and East Haddam. Overall the project creates benefits well over its costs. The quantified value of each of the benefits described below represents the economic value lost by failing to construct the cantilevered sidewalk.

**Table 1 – Benefit Summary Table**

<b>Long-Term Outcome</b>	<b>Associated Benefit Types</b>
State of Good Repair	Reduced Vehicle Operating Costs Reduced Road Maintenance Costs Reduced Vehicle Accident Property Damage
Economic Competitiveness	Reduced Oil Imports Property Value Increase Health Benefits Reduced Fuel Costs
Environmental Sustainability	Car Air Pollution Reduction
Safety	Reduced Traffic Injuries Pedestrian and Cyclist Accident Reduction
Quality of Life	Recreation Benefits Improved User Experience

**Baseline Assumptions**

The BCA compares the proposed project against the baseline over a span of forty years. The baseline projection used in this BCA assumes that the sidewalk improvements are not constructed and the East Haddam/Haddam Swing Bridge remains unpassable to pedestrians, and extremely dangerous for cyclists.

## Background

The area around the Bridge is full of many attractions, businesses, tourist destinations, and other amenities. On the west side of the bridge, the Eagle Landing State Park launches the Adventure Cruise lines, and a number of other operations. These activities attract at least 12,000 guests each year. The CT Valley Railroad Steam Train also stops on the west side of the Bridge; this major tourist attraction draws over 150,000 visitors each year. Also located near the bridge are a marina, a brewery and pub, a large parking lot (available as overflow parking to the east side of the Bridge), and the village of Tylerville where most essential services (e.g. pharmacy, convenience stores, and other such services) are located. On the east side, East Haddam is home to the Goodspeed Opera House, the Gelston House event venue, and a number of restaurants and boutique retail businesses.

Each of the above businesses and destinations have healthy synergy with one another. However, in order to capitalize on that synergy, a visitor at one attraction must be able to freely access each of the others. With the current design of the Bridge, this is impossible. The restriction of pedestrian traffic effectively isolates each side of the river as two distinct areas, as there is no alternative pedestrian crossing for many miles.

This lack of pedestrian and cyclist accessibility is a clear gap of essential transportation for a rural community. That gap continues to cause real economic detriment to the residents and businesses of that community. By improving the Bridge to include pedestrian and cyclist access, the project is really creating a stronger more robust community. Infrastructure improvements like these are essential for the continued health of rural communities like Haddam and East Haddam.

## Project Costs

The construction cost of the project is estimated at \$18 million. However, for benefit-cost purposes the most appropriate cost to use is not the actual construction cost but the opportunity cost of the resources used to build the project. In instances in which minimum labor rates are set by law, for example, wages paid to workers are greater than the wages they could command in the open, unregulated labor market. The unregulated wage rate is the appropriate rate to use for benefit cost purposes. In this case, we have adjusted the projected labor cost down by 15 percent to account for the effect of non-market conditions in the project costs.<sup>1</sup> After the market price adjustment, the present value of the project cost is \$15.9 million.

The analysis below monetizes the benefits listed in Table 1 and values those benefits in dollar terms over forty years. Benefits are then discounted to 2018 dollars and compared to project costs to calculate the cost benefit ratio. This detailed Benefit-Cost Analysis (BCA) approach indicates that the quantifiable benefits are 1.7 to 5.4 times the total costs of the project, as shown in Table 2.

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<sup>1</sup> See, e.g., Leef, George C, "Prevailing Wage Laws: Public Interest or Special Interest Legislation?", Cato Journal, Vol. 30, No.1 (Winter 2010) [<http://www.cato.org/pubs/journal/cj30n1/cj30n1-7.pdf>]

**Table 2 - Benefit Cost Summary**

<b>Metric</b>	<b>Nominal Sum</b>	<b>Present Value (3%)</b>	<b>Present Value (7%)</b>
Present Value of Benefits	\$85,276,567	\$43,974,782	\$22,650,827
Present Value of Costs	\$15,880,000	\$14,536,682	\$12,982,598
<b>Net Present Value</b>	<b>\$69,396,567</b>	<b>\$29,438,100</b>	<b>\$9,668,229</b>
<b>Benefit / Cost Ratio</b>	<b>5.4</b>	<b>3.0</b>	<b>1.7</b>

### *1. State of Good Repair*

Approximately 11,000 vehicle trips are made over the Bridge each day. While many of those trips are through-traffic from the surrounding area, a sizeable portion of those trips can be attributed to locals and visitors. A number of complementary attractions and essential services exist on either side of the bridge, as noted above. With viable pedestrian access, some of these trips would be completed without a vehicle. This creates state of good repair benefits by reducing road maintenance costs, reducing vehicle maintenance and depreciation, and reducing property damage from reduced car accidents.

#### *Avoided Car Maintenance Costs*

Reducing vehicle miles (VMT) reduces the depreciation and required maintenance associated with those marginal trips. These savings are estimated at \$24,415 per year.

#### *Avoided Road Maintenance (Reduced VMT)*

Less vehicle miles across a discreet portion of road directly reduces the amount of damage and wear on that road. This effectively extends the useful life of the road, as it reduces the required maintenance associated with damage from use. The incremental savings from this reduction in damage are estimated at \$2,058 per year.

#### *Reduced Car Accidents – Property Damage*

The reduction in VMT also leads to fewer car accidents. This reduces future property damage costs incurred by the avoided accidents. These incremental savings are estimated at \$688 per year.



**Table 3 – State of Good Repair Benefit Cost Summary**

<b>State of Good Repair</b>	<b>Average Annual Value</b>	<b>Nominal Value</b>	<b>3% Discount Value</b>	<b>7% Discount Value</b>
Reduced Vehicle Operating Costs	\$24,415	\$1,049,837	\$520,221	\$251,580
Reduced VMTs - Road Maintenance Costs	\$2,058	\$88,495	\$43,851	\$21,207
Reduced Car Accidents - Property Damage	\$688	\$29,564	\$14,650	\$7,085
<b>Subtotal</b>	<b>\$27,160</b>	<b>\$1,167,896</b>	<b>\$578,723</b>	<b>\$279,871</b>

## ***2. Economic Competitiveness***

As previously noted, the area around the Bridge attracts a healthy number of visitors, and is home to a small community of local residents. The benefits created by this project will directly affect all of those people in turn, creating economic benefits for those individuals in a number of ways. The reduction in VMT noted above will create additional benefits from consuming less fuel and importing less oil. Bridging the gap in transportation service will also create additional recreational use (running, jogging, biking), which will confer active recreation benefits, as well as promoting significant additional spending at local businesses, which will improve property values in the area.

### ***Fuel Cost Savings***

Residents choosing to travel by foot or bicycle because of the Bridge improvements will benefit from a reduction in fuel usage costs. Assuming an average fuel efficiency of 20.3 miles per gallon<sup>2</sup>, we estimate that the reduction in VMTs will save 4,064 gallons and generate in \$10,289 in associated savings.

### ***Reduced Oil Imports***

The reduction in commuting by automobile as described above translates to a reduction in gasoline usage, which, in turn, translates into the need to import less oil. This results in a range of savings in terms of direct macroeconomic costs, national security costs, and environmental extraction costs. These incremental savings are estimated at \$12,349 per year.

### ***Health Benefits***

The proposed improvements will create a connected and accessible pedestrian and bicycle pathway and thus encourage visitors and residents to exercise more, which has extensive proven health benefits. These health benefits include reduced direct and indirect healthcare costs, direct and indirect workers compensation costs, and lost productivity costs. Using population data from the surrounding area and visitation estimates, we estimate that there will be 540 new

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<sup>2</sup> Average of short and long wheel base light duty vehicles from:  
[http://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/national\\_transportation\\_statistics/html/table\\_04\\_23.html](http://www.rita.dot.gov/bts/sites/rita.dot.gov/bts/files/publications/national_transportation_statistics/html/table_04_23.html)

walkers/runners and 270 recreational bikers<sup>3</sup>. We assume that 80 percent of the exercise will be a result of the improvements and that 33 percent of those who do exercise, do so at a level that will generate positive health impacts. Based on data from the literature, we estimate that these incremental savings will amount to \$191,013 per year.

### Property Value Increase

The sidewalk improvements to the Bridge have direct and indirect value to users and residents. Walkability in communities is a heavily researched topic, and a significant body of literature exists which quantifies the marginal increase in home values associated with nearby improvements to walkability. For this effect on property values, it is important to understand that though the physical size of this improvement is relatively small (less than a mile), it represents a complete shift from absolute zero walkability, to reliable, safe, attractive walkability between the communities around the Bridge. Such a large margin confers sizeable benefits to nearby properties.

For commercial properties, the sidewalk improvements would allow a large body of visitors and tourists to freely access either side of the Bridge, which will allow for significant additional spending within the area. Further, the improvements will also allow free access to the overflow parking on the west side of the bridge. This access will permit additional programming at the Opera House, the Gelston house, and other programming along the waterfront. The increase in commercial income from these effects is capitalized into property value, creating a one-time enduring increase in economic vitality for the area. Overall, residential and commercial property value increase is valued at \$4,680,258.

**Table 4 – Economic Competitiveness Benefit Cost Analysis**

<b>Economic Competitiveness</b>	<b>Average Annual Value</b>	<b>Nominal Value</b>	<b>3% Discount Value</b>	<b>7% Discount Value</b>
VTMT reduction - Reduced oil imports	\$12,349	\$531,011	\$263,130	\$127,250
Property Value Increase	N/A	\$4,680,258	\$4,037,231	\$3,336,959
Health Benefits	\$191,013	\$8,213,553	\$4,070,027	\$1,968,272
Reduced Fuel Costs	\$10,289	\$442,423	\$219,232	\$106,021
<b>Subtotal</b>	<b>\$4,893,908</b>	<b>\$13,867,244</b>	<b>\$8,589,620</b>	<b>\$5,538,502</b>

### **3. Quality of Life**

#### Recreation Benefits

Safe accessible biking and walking paths, such as the one created by these improvements, are considered to be an amenity for local residents, visitors, and general users. In addition to the health benefits mentioned above, the new recreation users have a direct value for space to exercise safely, which is commonly measured by a user's willingness-to-pay (WTP) for a public good. Aesthetically, the significant improvement to connectivity from the Bridge sidewalk

<sup>3</sup> We assume that 4 percent of the population walk/run and that 2 percent bike ride.

improvements would likely command above-average willingness-to-pay values. Using information from the Army Corp of Engineers and other sources on willingness-to-pay for recreational assets, total benefits from recreation users are \$212,251 per year.

#### Improved Experience

In addition to those that benefit from exercise and recreation, there are far more residents, tourists, and visitors, that benefit from being able to travel freely and safely across the Bridge. The WTP for walkability and connectivity is a well-supported and studied concept. People value access and safety not only in terms of the tangible benefits it provides (access to services, and avoided harm), but also mentally and psychologically; there is clear value for the right to travel with ease, and to do so without stress or concern of injury. Further, the drivers on the road also value that same reduction in stress. Being able to drive without the risk of injuring or killing a pedestrian or cyclist is a significant benefit to drivers above and beyond the avoided tangible damages. The reduced concern of pain and suffering, and reduction of stress while driving have notable value to drivers. Together, these experiential benefits are valued at \$1,094,334 per year.

**Table 7 – Quality of Life Benefit Cost Analysis**

<b>Quality of Life</b>	<b>Average Annual Value</b>	<b>Nominal Value</b>	<b>3% Discount Value</b>	<b>7% Discount Value</b>
Recreation Benefits	\$212,251	\$9,126,807	\$4,522,568	\$2,187,122
Improved Experience	\$1,094,334	\$47,056,373	\$23,317,647	\$11,276,454
<b>Subtotal</b>	<b>\$1,306,586</b>	<b>\$56,183,179</b>	<b>\$27,840,215</b>	<b>\$13,463,576</b>

#### **4. Environmental Sustainability**

The reduction in VMTs due to an increase in pedestrian trips reduces costs associated with air pollution. Avoided emissions (NO<sub>x</sub>, SO<sub>2</sub>, CO, PM<sub>10</sub>, etc.) yield incremental savings estimated at \$5,509 per year.

**Table 5 – Environmental Sustainability Benefit Cost Analysis**

<b>Environmental Sustainability</b>	<b>Average Annual Value</b>	<b>Nominal Value</b>	<b>3% Discount Value</b>	<b>7% Discount Value</b>
Car Air Pollution Benefits	\$5,509	\$236,906	\$117,393	\$56,772
<b>Subtotal</b>	<b>\$5,509</b>	<b>\$236,906</b>	<b>\$117,393</b>	<b>\$56,772</b>

#### **5. Safety**

Safety benefits from sidewalk improvements on the Bridge are accounted for by measuring the reduction in injuries and fatalities as a result of reduced car accidents, and reduced pedestrian accidents as a result of the sidewalk improvements.

### Reduced Traffic Accidents

As noted earlier, the reduction in VMTs reduces traffic accidents, effectively reducing injuries and deaths.

Based on a national average of 1.14 deaths per 100 million VMTs and 80 non-fatal injuries per 100 million VMTs, we estimate that the reduction in VMTs will result in 0.004 prevented deaths and 0.301 prevented injuries.<sup>4</sup> Based on the value of the statistical life (VSL) and injury valuation data from the BUILD Benefit-Cost Analysis Resource Guide, we estimate these annual savings at \$24,975 per year.

### Reduced Pedestrian and Bicycling Accidents

Currently, pedestrian traffic across the bridge is prohibited. That prohibition does not completely prevent pedestrians from crossing, however. Anecdotal evidence from the area clearly identifies pedestrian crossing as an uncommon, but regular occurrence. Considering the complete lack of shoulder or room to maneuver, a crash scenario would likely result in serious injury or loss of life. Further, cyclists on the bridge have no protection or room as cars pass them. Again, the lack of maneuverability and shoulder make this an extremely dangerous situation. No reported accident has occurred recently, but the continued pedestrian crossings, and the unsafe condition of the bridge, are serious risks of injury and mortality. The proposed sidewalk improvements, however, would almost completely reduce the risk of these occurrences. Studies from various state level DOT's point to 90% accident reductions from sidewalks like the one proposed here. Using a conservative estimate of one incident in four years, avoided pedestrian and cyclist accidents generate \$296,451 in benefits each year.

**Table 6 – Safety Benefit Cost Analysis**

<b>Safety</b>	<b>Average Annual Value</b>	<b>Nominal Value</b>	<b>3% Discount Value</b>	<b>7% Discount Value</b>
Pedestrian and Bicycling Accident Reduction	\$296,451	\$12,747,413	\$6,316,672	\$3,054,753
Reduced Car Accidents - Injuries and Fatalities	\$24,975	\$1,073,927	\$532,159	\$257,353
<b>Subtotal</b>	<b>\$321,427</b>	<b>\$13,821,340</b>	<b>\$6,848,831</b>	<b>\$3,312,106</b>

### **Results of the Benefit-Cost Analysis**

**Table 8 – Benefit Cost Summary**

<b>Metric</b>	<b>Nominal Sum</b>	<b>Present Value (3%)</b>	<b>Present Value (7%)</b>
Present Value of Benefits	\$85,276,567	\$43,974,782	\$22,650,827
Present Value of Costs	\$15,880,000	\$14,536,682	\$12,982,598
<b>Net Present Value</b>	<b>\$69,396,567</b>	<b>\$29,438,100</b>	<b>\$9,668,229</b>
<b>Benefit / Cost Ratio</b>	<b>5.4</b>	<b>3.0</b>	<b>1.7</b>

<sup>4</sup> National Highway Traffic Safety Administration (NHTSA) of US DOT, 2012 Quick Facts (Republished 2014)

