Harlem Avenue Multimodal Bridge Project

Benefit Cost Analysis Summary

Please refer the Benefit Cost Analysis provided in the excel attachment for full details. The following provides summary data and the process for each element of the BCA.

Summary

A cumulative total of benefits for the project of transit value of time savings, crash reduction savings, and property tax revenues are over $2.9 billion for the life of the project (80 years) in current dollars. A full description of the analysis is below; calculations are available via the "BCA" excel spreadsheet.

Project Costs and Benefits	
Costs	
Project Capital Costs	$25,117,375
Debt Financing for Local Match	$888,353
Net Costs	**$26,005,728**
Benefits	
Transit Value of Time Savings	$2,914,579,031
Crash Reduction Savings	$28,825,213
Net Benefits	**$2,943,404,244**

Assumptions Comparing the Build versus No-build

The no-build is the only other option for maintenance. We assume the bridge will no longer be functional for transit and freight purposes in 25 years (providing a 129 year life span). The assumption for the new bridge is an 80 year life span starting in year 2019.

- 80-year life of new bridge projecting BCA (2098).
- Year of bridge failure represents 25 years in the future (2042).

The BCA measures the build option, replacement of the multimodal bridge versus the no-build option of the current structure failing in 25 years. Other alternatives, as additional maintenance, are not applicable to this project because the current bridge (103 years old) is currently beyond its useful life.

- Major impacts measured in the BCA is additional travel time for impacted transit riders in 2040, the year of the bridge failure, reduction in crashes for and real estate values.

Impacts: Transit Ridership

CTA and Metra services will be greatly impacted if the 103 year-old bridge is not replaced. Please see the results of this analysis in the Transit tab of the excel spreadsheet.

CTA impacts starting in 2040 if current structure is not replaced:

CTA Green Line West Branch Ridership: The BCA assumes ridership on the Green Line Elevated would be negatively by 50%. The project since there is vital link not only for operations, but to the CTA Harlem Green Line rail yard located directly west of the project area. CTA would lose the ability to provide service levels or turn back trains on the Green Line inhibiting the ability to provide current service levels and causing major service disruptions.

- Current ridership on the Green Line West Branch (Harlem – Clinton stations) is 9,021,854 annual boardings (2015)
- Percent increase in CTA Green Line West Branch (Harlem – Clinton stations) Ridership is assumed at 2.5%, the annual increase between years 2009 (7,868,867 annual boardings) and 2012.

Metra impacts starting in 2040 if current structure is not replaced:

Metra Union Pacific West Line Ridership: The BCA assumes ridership would be impacted by 90%. This is due to the fact that the project area is almost at the maximum flow point for inbound and outbound riders. If the project is not built, the existing bridge failure would result in Metra losing the ability to provide service into the Chicago Loop from the West Suburbs on the UP West Line. Over 90% of Metra's ridership is traditional commute from the Suburbs AM peak inbound to the Chicago Loop and from the Chicago CBD to the West Suburbs in PM peak outbound.

- Current annual ridership on the Metra UP West Line (Elburn – Ogilvie Transportation Center) is 8,367,264 (2015)
- Percent increase for Metra UP West Line ridership is assumed at 3.4%, the annual increase between years 2005 (7,108,501 annual boardings) and 2015.

The assumption is that current transit riders are taking the most time-competitive and cost-effective solution. This stated, whether customers would shift to other transit options, drive, walk, or do a combination of these options, additional travel time is assumed. This additional impacts per rider is set at a conservative 10 minutes. This includes additional travel time for current transit riders:

- Walking to other rapid transit and commuter rail stations
- Driving to other rapid transit and commuter rail stations
- Driving to destinations as an alternative to the reduced transit availability
- Utilizing alternative bus connections
- Per the guidance in the TIGER Benefit-Cost Analysis (BCA) Resource Guide, this analysis will include the Local Travel All Purposes figure of $12.98 per person-hour inflated annually by a 10-year average of the CPI (at 1.99%).

This analysis is included in the BCA excel sheet in Tab 2: Transit.

Impacts: Safety

The new bridge will provide a safer environment for automobiles starting in 2018.

Currently, an average of 125 crashes per year occurs at the project site. Within this number, the breakdown for severity of crashes is as follows:

- 2.5 – Category AIS 1
- 1.6 – Category AIS 2
- .6 – Category AIS 3
- 20.3 – Property Damage Only

The new bridge will contain betters site lines, traffic calming elements, and intersection realignments. The results of this are estimated at the following changes:

- 2.25 – Category AIS 1
- 1.45 – Category AIS 2
- .2 – Category AIS 3
- 15 – Property Damage Only

The impacts of the crash reductions were quantified utilizing the methodology in the TIGER Benefit-Cost Analysis Resource Guide. The values were calculated for future years utilizing a 10-year average of the CPI (at 1.99%).

This analysis is included in the BCA excel sheet in Tab 3: Safety.

Impacts Property Values for properties on Harlem Avenue south of the bridge

With new lighting, traffic calming, and ADA accessible design, the new bridge will remove a perceived barrier between the north and south sides of Harlem Avenue. This is important as the retail environment is impacted on the south side of the bridge.

Harlem property value increase potential for south side parcels

The impact of property values in the BCA are calculated through the differences in real estate values between properties fronting Harlem Avenue directly north of the viaduct and those properties south of the viaduct. The current retail environment is much healthier north of the viaduct, but it is believed that retail would grow southward with the new infrastructure. The new enhanced pedestrian environment and safer vehicle operations through the viaduct on Harlem Avenue are expected to result in rising real estate values of properties on the south side to match those to the north.

The following procedure was used to calculate the positive impacts of the new bridge for retail on the south side:

Step 1: Current property taxes per square foot were calculated for properties fronting the west side of Harlem Avenue within 800 feet of the project site. The parcels and addresses included are found in the real estate tab of the BCA excel file.

Step 2: The calculated real estate property taxes/square foot for properties and were averaged for (1) north side parcels and (2) south side parcels.

Step 3: The delta between real estate property taxes/square foot on the north side and south side was calculated.

Step 4: The delta was then multiplied by the number of square feet of the property to the south side to provide a potential net increase in annual real estate taxes for south side property.

This value is added to 2019 in the BCA, the year of completion, and escalated to the 80-year useful life of the investment utilizing a 10-year average of the CPI (at 1.99%) for the project life.