Mega Project Data Collection Plan

This attachment to Oklahoma DOT's *Roosevelt Memorial Bridge Investment Project* FY 2023 – FY 2024 Multimodal Project Discretionary Grant (MPDG) application describes ODOT's plan for collection and analysis of data to identify the actual impacts of the Project five years after construction relative to the MPDG application's quantitative forecasts and narrative predictions for various outcome criteria specified in Federal guidance. (Note the application projects impacts to 2047, rather than 5 years after construction, so the methods described below adapt these projections to the shorter time span required of the Mega project reporting, which tends to somewhat reduce the apparent scale of impacts achieved.)

Outcome Criterion – Safety

Project outcomes measure: Actual annual average collisions reduced (compared to predicted reduction in collisions at the Project location)

Predicted Project Impact: According to the MPDG application and Benefit Cost Analysis (BCA), the new, wider bridge and associated improvements like standard 10-foot shoulders, lighting, and median barriers are projected to achieve a crash reduction rate of 56 percent. While the MPDG application predicts about 264 collisions including 28 serious injury and fatality collisions to be eliminated by 2047, an equivalent estimate for the first 5-year period from construction can be calculated for the required Mega project outcomes report.[1] Slightly fewer collisions per year are eliminated in the first 5-year period, since overall traffic volumes increase over the life of the project to 2047, which increases the risk of crashes over time and therefore the number of crashes eliminated.

Measure Methodology Summary

1. Collect data on actual total annual collisions for each of the five years following the Project's substantial completion (2028-2032).
2. Subtract the number of post-Project serious injury/fatality collisions from the forecasted number for 2028-2032 under the no build scenario (10)[2].
3. Determine if the Project's actual number of collisions eliminated is greater than 4 collisions per year, which is the forecasted impact of the project by 2032.

Outcome Criterion – State of Good Repair

Project outcomes measure: Sufficiency ratings of bridge five years after substantial completion (compared to condition at the Project location prior to construction.)

Predicted Project Impact: According to the MPDG application, the Roosevelt Bridge is at risk of becoming structurally deficient with a sufficiency rating of 42.3 including a deck rating

[1] The magnitude of expected reduction in collisions is based on comparing the project's scope with FHWA's database of Crash Modification Factors to select the most applicable crash reduction factor (CRF), which is for widening from 2 to 4 lanes and adding lighting, shoulder rumble strips, and median barrier and applying these CRFs to actual average annual crash data for 2016 to 2020 at the project's location, as well as adjusted crash projections over the life of the project to 2049.

[2] See BCA inputs under Safety tab.

of 5, superstructure rating of 5, and substructure rating of 6. This condition would be improved to good condition immediately upon substantial completion of the Project. A bridge in good condition is substantially more economical to maintain versus a bridge in fair or poor condition, while being safer for users and saving wear and tear costs for vehicles using the roadway.

Measure Methodology Summary

1. Analyze data on actual bridge condition at the Project location for the year closest to the Project's construction (estimated 2025). The Roosevelt Bridge is currently inspected every year, which would continue until the start of construction. Sufficiency ratings for each major bridge component and an overall rating will be assigned.
2. Analyze data on actual bridge condition for the year closest to the Project's five-year timepoint after substantial completion (2032).
3. Compare the ratings of the deck, superstructure, and substructure as well as the overall sufficiency rating to the pre-construction ratings. The MPDG application predicts the new bridge will improve structural condition and this should be reflected in the ratings. It is anticipated the new bridge will remain in good condition five years after completion.

Outcome Criterion – Economic Impacts, Freight, Job Creation

Project outcomes measure: Actual vehicle delay hours reduced within the Project's limits each weekday five years after substantial completion (compared to forecasted vehicle delay hours reduction)

Predicted Project Impact: According to the MPDG application and BCA, regional economic benefits flow from travel time savings which improve the cost-effectiveness of goods and people movement. The MPDG application and BCA predict that by 2047, the Project will save 69.8 vehicle hours per day of delay.[3] The BCA further notes that 25.7 hours of travel delay will be saved each workday in 2032 by the Project, which approximates the anticipated 5-year point after the Project's completion.

Measure Methodology Summary

1. If needed, re-run the Synchro model to generate estimated weekday travel delay reductions for the Project's 'no build' scenario in 2025 prior to construction.
2. Calculate actual vehicle delay in hours (each workday) for the project limits for the time-period closest to the project's five-year timepoint (presumed to be 2032) after substantial completion using Federally provided NPRMDS data on travel time.
3. Calculate the estimated savings in travel delay achieved through the Project by subtracting the number derived in step 2 from the forecast of weekday travel delay in 2032 under the Project's 'no build' scenario obtained in step 1.
4. Determine if the Project's actual daily vehicle delay eliminated is the same or greater than the prediction of 25.7 hours of travel delay saved each workday that is included in the BCA.

[3] Travel delay reductions described in the MPDG application are based on the use of Synchro traffic software to forecast the effects of the Project on future travel times.

Outcome Criterion – Climate Change, Resiliency, Environment

Project outcomes measure: Reduction in user costs due to flooding-related detours

Predicted Project Impact: The existing Roosevelt Bridge has been subject to two major flood events in the last 30 years where Lake Texoma has overtopped the bridge and/or causeway and caused ODOT to close US-70 for several days. In 2015, a storm event with an elevation of 645.72 feet resulted in a closure lasted nine days. The shortest detour length if the bridge is closed is approximately 40 miles. The BCA quantified the impacts of closing the bridge in its analysis of avoided detours. These calculations included additional travel time and vehicle operating costs but did not include costs to repair the bridge after a flood event. The proposed Project will avoid future flood related detours by raising the profile grade of the new causeway and bridge approximately 10 feet above these major storm levels. This criterion could be difficult to quantify over a 5-year period, as the frequency of the storm event of this magnitude is approximately 15-20 years. However, should such a flood event occur in the first five years after construction, the impacts could be measured.

Measure Methodology Summary

1. Determine the elevation of Lake Texoma during the storm event. Any event above 645 feet would have overtopped the previous bridge.
2. Determine the number of days before lake levels return to below 645 feet. This would be the number of days the previous bridge would have been closed.
3. Calculate increased travel times and vehicle operating costs that would have been incurred due to flood closure by using the monetization factors listed in the 2023 USDOT BCA guidance. Costs would be factor of the average annual daily traffic volume (AADT) at the time of closure, the duration of the closure, and the length of the detour.
4. Compare the costs calculated in step 3 with the MPDG application's predicted cost savings of $758,743 due to avoidance of flood detours[4]

Outcome Criterion – Equity

Project outcomes measure: Surveys of residents' perceptions of improvements in non-auto accessibility post Project.

Predicted Project Impact: The MPDG application makes no quantitative projection of equity, multimodal and quality of life impacts, but describes increased multimodal opportunities through a new pedestrian/bicycle facility across Lake Texoma. Many public comments were received expressing a desire for a non-vehicular crossing that could be used for recreation, including walking, cycling, and fishing. The Project would include a separated pedestrian/bicycle crossing of Lake Texoma where none exists today.

Measure Methodology Summary

1. At 5-year timepoint, conduct a survey of residents and visitors to Lake Texoma to determine if they perceive pedestrian and bicycle access has been improved. Surveys could

[4] Total vehicle delay due to flooding: 24,134 hours multiplied by BCA values for value of time and vehicle occupancy for passenger vehicles and trucks (per January 2023 USDOT BCA Guidance)

be distributed at Johnson Creek Campground, Lake Texoma State Park, Catfish Marina, and other nearby recreational facilities. The US Army Corps of Engineers could be a potential partner in gathering visitor input.

2. Conduct count survey of users on the new pedestrian/bike bridge over Lake Texoma built as part of project.