MEGA PROJECT DATA COLLECTION PLAN

This attachment to Oklahoma DOT's *Enhancing Safety and Mobility in West Tulsa: I-44 and US-75 Corridor Improvements Project* FY2022 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 mostly projects impacts to 2050, 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 serious injury/fatality collisions eliminated (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, safer interchange and associated improvements like standard 12-foot shoulders and median barriers are projected to achieve a crash reduction rate of 45 percent. While the MPDG application predicts about 110 collisions including 23 serious injury and fatality collisions to be eliminated annually by 2050, 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 2050, 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 serious injury/fatality collisions for each of the five years following the Project's substantial completion.
2. Calculate average actual annual number of serious injury/fatality collisions for the five-year period using data above. A five-year average will help even out any outlier years that break from an overall trend.
3. Calculate the post-Project number of serious injury/fatality collisions eliminated by subtracting the number derived in step 2 from the forecast of 39.73 serious injury/fatality collisions in 2030 under the Project's 'no build' scenario. (This projection is described in the application's Benefit Cost Analysis report, Table 2.)

[1] Note: 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 replacing cloverleaf interchanges with directional lanes and applying this CRF to actual average annual crash data for 2014 to 2018 at the project's location, as well as adjusted crash projections over the life of the project to 2050.

4. Determine if the Project's actual number of collisions eliminated is greater than 17.83 serious injury/fatality collisions per year, which is the forecasted impact of the project by 2030.

Notes on Data Sources

- Serious injury/fatality collisions are defined as collisions rated either 'injury severity 3,' 'injury severity 4,' or 'fatal,' which are approximately equivalent to the KABCO scale.
- ODOT already collects the collision data required for step 1 above.
- 'No build' versus 'build' Project-level collision estimates used to predict safety outcomes were developed as part of the BCA and are available in Table 2 of the BCA Report attached as an appendix to the MPDG application.

OUTCOME CRITERION – STATE OF GOOD REPAIR

Project outcomes measure: Percent of pavement with 'good,' 'fair' or 'poor' condition rating at project location five years after substantial completion (compared to condition at the Project location prior to construction.)

Predicted Project Impact: According to the MPDG application, the I-44/US-75 corridor's pavement is currently rated in fair to poor condition, which would be transformed to good condition immediately upon substantial completion of the Project. Pavement in good condition is substantially more economical to maintain versus pavement 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 pavement condition at the Project location for the time-period closest to the Project's construction. Each year, ODOT oversees collection of pavement surface condition data for the SHS and non-ODOT-owned NHS. Data is collected using a state-of-the-art 3D Laser Crack Measurement System (LCMS), which captures detailed road surface conditions via longitudinal and transverse profiling. After data collection and validation, ODOT aggregates raw pavement surface condition data from 0.01-mile collection sections into the ODOT inventory subsections. These inventory subsections form the basis of ODOT pavement management decision making and reporting.
2. Analyze data on actual pavement condition at the Project's location for the time-period closest to the Project's five-year timepoint after substantial completion.
3. Determine if the percent of pavement with a 'good,' 'fair' or 'poor' condition rating at the Project's location five years after substantial completion is greater than prior to construction and by what margin.

Notes on Data Sources

- ODOT follows Federal standards for translating pavement distress data into 'good,' 'fair' or 'poor' condition rating classifications.

- The five-year timepoint represents roughly one quarter of typical pavement life, so 100% 'good' rating is unlikely, but condition is expected to be much improved overall.

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 2050, the Project will save 423,500 hours of delay for passenger vehicles and freight trucks annually and 6.9 million hours over the Project's lifespan.[2] The BCA further notes that 933 hours of travel delay will be saved each workday in 2030 by the Project, which approximates the anticipated 5-year point after the Project's completion.

Measure Methodology Summary

1. If needed, re-run VISSIM model to generate estimated weekday travel delay reductions for the Project's 'no build' scenario in 2030. (If information is not available in existing project documentation.)
2. Calculate actual vehicle delay in hours (each workday) for roadway segments within the project limits for the time-period closest to the project's five-year timepoint (presumed to be 2030) 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 reductions in 2030 under the Project's 'no build' scenario obtained in step 1.
4. Determine if the Project's actual daily vehicle delay each workday eliminated is the same or greater than the prediction of 933 hours of travel delay saved each workday that is included in the BCA.

Notes on Data Sources

- ODOT has access to NPMRDS data on all of Oklahoma's NHS routes via FHWA. This data is updated monthly.

OUTCOME CRITERION – CLIMATE CHANGE, RESILIENCY, ENVIRONMENT

Project outcomes measure: Actual annual CO^2 reduction (compared to projected annual CO^2 reduction)

Predicted Project Impact: Based on runs of the U.S. Environmental Protection Agency (USEPA) MOVES model, the MPDG application and BCA predict that the Project will result in a total

[2] Travel delay reductions described in the MPDG application are based on use of the VISSIM traffic simulation model to forecast the effect of the Project on future travel times.

reduction of over 125,000 tons of carbon dioxide (CO^2) emissions derived primarily due to increases in vehicle speed that come from congestion relief; this translates to an annual reduction of 5.023 tons of CO^2 emissions.

Measure Methodology Summary

1. Follow instructions 1 to 3 above in 'Economic Impacts' criterion to estimate savings in travel delay achieved through the Project by 2030 using NPMRDS data.
2. Evaluate the vehicle mix for this time period using traffic count data to identify share of vehicles attributable to cars, light trucks, and heavy trucks.
3. Apply emissions factors to travel delay savings/fleet mix information as defined in the BCA (from the TREDIS model and which were derived from a national-level analysis using the EPA's MOVES model) to calculate total CO_2 emissions reduced, based on post-Project data.
4. Compare post-Project estimate of CO^2 reduced to MPDG application's prediction of 5.023 tons of CO^2 reduced annually.

Notes on Data Sources

- ODOT currently has access to NPMRDS data on all NHS routes through FHWA. This data is updated on a monthly basis. ODOT traffic counts will be used to identify the vehicle-type mix.

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 improvements that will be constructed will reconnect community assets and expand multimodal options.

Measure Methodology Summary

1. At 5-year timepoint, conduct a survey of neighborhood residents and users at local assets to determine if they perceive access has been improved; assets in the survey might include the Herman and Kate Keiser YMCA, 26 miles of multi-use trails, the Turkey Mountain Urban Wilderness Area, the Zarrow Regional Library
2. Conduct count survey of users on new pedestrian/bike bridge over Tulsa-Sapulpa Union Railway built as part of project.