



## 8. PROJECT COSTS AND BENEFITS

An economic benefit-cost analysis (BCA) was conducted for the Project using a model developed by WSP that follows USDOT’s 2018 *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*. The analysis found that the Project will generate an estimated \$91.4 million in present-value benefits (in 2017 dollars, discounted at 7 percent), resulting in a benefit cost ratio of 7.53. As such, the Project is expected to generate economic benefits that outweigh its costs. Table 10 shows the overall results of the BCA for the LINK Tulsa Project. The BCA Technical Memorandum can be found at <https://www.cityoftulsa.org/BuildGrant2018>.

TABLE 10. Benefit-Cost Analysis Summary

| Category                        | Undiscounted         | Present Value @ 7%  |
|---------------------------------|----------------------|---------------------|
| <b>Costs</b>                    |                      |                     |
| Capital Cost                    | \$9,500,000          | \$7,503,669         |
| Maintenance Cost                | \$13,012,705         | \$4,635,350         |
| <b>Total Costs</b>              | <b>\$22,512,705</b>  | <b>\$12,139,019</b> |
| <b>Evaluated Benefits</b>       |                      |                     |
| Travel Time (TT) Savings        | \$85,318,662         | \$30,860,183        |
| Transit TT Savings              | \$8,359,567          | \$2,801,411         |
| Safety                          | \$105,255,375        | \$36,589,439        |
| Emissions                       | \$58,379,088         | \$21,061,436        |
| Residual Value                  | \$400,000            | \$49,109            |
| <b>Total Evaluated Benefits</b> | <b>\$257,712,691</b> | <b>\$91,361,578</b> |
| Net Present Value               | \$235,199,986        | \$79,222,559        |
| Benefit-Cost Ratio              | 11.45                | 7.53                |

### Costs

The project capital cost of \$9.5 million will be expended between 2019 and 2024. Annual O&M costs for maintenance are estimated at \$495,000 annually.

### Safety

The safety benefits of reduced accidents are the largest source of benefits, accounting for 40 percent of total benefits. As noted in the safety section, these corridors have relatively high levels of accidents. There are a number of unquantified safety benefits that will occur, primarily from the improved pedestrian crossings. The quantified benefits were estimated by adding up the average annual accidents over the five-year 2012-2016 period (**Table 5**), and applying a conservative 6.7 percent accident reduction based on an FHWA study. Additional information safety benefits is in Section 6.1 above, as well as in the BCA Tech Memo, posted on the project website.

### Travel Time Savings

Travel time benefits are substantial for this Project. The use of transit signal priority ensures that the largest per-trip travel time savings are for transit vehicles, amounting to 3 minutes end-to-end on the Peoria Corridor, and two minutes end-to-end for the Route 66 corridor. The average travel time (TT) savings for riders was less, as few riders take a bus route from one end to the other. The value of transit travel time savings over the 30-year analysis (discounted at 7 percent) is \$2.8 million.



Benefits for general traffic were lower per-trip, for two reasons (1) the benefit of signal coordination is less than that of signal priority, and (2) an allowance had to be made for the times when cross-street traffic is delayed by the signal priority along the corridors. The resulting value over 30 years was \$30.9 million, primarily a result of the large number of vehicles travelling these two corridors.

### Environmental Benefits

Because the travel time savings is largely a result of less time spent idling at intersections, waiting for the signal to turn green, there would be a substantial reduction in emissions. As with travel time savings, the benefits of reduced idling for traffic along Peoria and Route 66 were reduced to account for additional idling that might occur for cross-street traffic. The net value over the 30 years was \$21.1 million, accounting for 23 percent of the quantified benefits.

### 8.1. Summary

The LINK Tulsa Project improves safety and system performance (**Image 6** shows real-time INRIX data over a 24 hour period during weekdays) along two of Tulsa’s busiest travel corridors. Overall, the Project generates several quantifiable benefits, including safety, emissions reductions, and travel time savings for both transit and general traffic. The greatest quantified benefits derive from the reduction in accidents and the reduction in travel time. The Project also provides a number of qualitative benefits, including the connection of several Tulsa populations, improved access to jobs, more reliable travel times, and improved ride quality for future BRT users. These benefits will encourage transit use and support the many public and private investments that are planned, and underway along these two key corridors.

IMAGE 6. 24 Hour Traffic Flow Chart for the Peoria Corridor

