

5.0 Capital and Operating Cost Estimation

5.1 Capital Cost Estimation

Cost estimates for design and construction for the MTTC were developed under this study. The total cost for the MTTC that includes professional services and contingencies for cost unknowns at this level of project planning is estimated at just under \$12.36 million. This estimate is meant to be highly conservative and includes annual escalation of project costs. This estimate also includes land acquisition costs. Total MTTC project costs will be further refined as the project is advanced into more detailed design and engineering phases.

PRELIMINARY TOTAL PROJECT BUDGET

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1. This budget is based on construction dates as follows:			
Construction Contract Award Date:		1-Jul-21	
Final Completion Date:		30-Oct-22	
Construction Duration (Days):		486	
2. Escalation Rates:			
Annual Rate:		3.0%	
Mid-Point of Construction:		1-Mar-22	
Current Date:		28-Apr-20	
Years to Mid-Point:		1.84	
Escalation Rate (Current to Mid-Point):		5.6%	
3. Budget for Construction Contract Award Price (CCAP)			
CCAP		8,455,101	includes design contingency
Escalation	5.6%	472,882	
Total CCAP		\$ 8,927,983	
4. Construction Phase Contingency			
Percent of Item 3	10.0%	\$ 892,798	
5. Total Construction Budget		\$	9,820,781
(Line 3 plus Line 4)			
6. Professional Services		\$	1,017,078
Architecture / Engineering	10.0%	\$ 982,078	
Land Survey		\$ 10,000	
Geotechnical Investigation		\$ 15,000	
Specialty Consultants		\$ 10,000	
7. Other Costs		\$	400,000
A/E Expenses		\$ 10,000	
Bid Documents Print & Distribute		\$ 5,000	
Land Acquisition Cost		\$ 385,000	
Other Expenses			
8. TOTAL PROJECT COST			\$ 12,361,645
Construction + Professional Services + Other Costs		\$11,237,859	
Owner's Contingency	10%	\$ 1,123,786	

5.2 MTTC Project Funding Opportunities Review

Planning, designing, engineering, and constructing a new MTTC is a significant investment in the future of public transit, improved personal mobility, and access to opportunities for the Lincoln metropolitan region. As is the case with many significant infrastructure projects, locating and securing all funds to deliver the project and make it a reality can be a challenge. To potentially assist in overcoming this challenge, multiple programs exist that could be targeted to share the cost to construct the MTTC. Those programs most likely to have the greatest impact on securing the capital funding needed for StarTran and the City of Lincoln to bring the vision of a new transit center in downtown Lincoln to reality are outlined below.

5.2.1 BUILD

Originating from the 2008 Great Recession, the US Congress began appropriating funds annually to the United States Department of Transportation (USDOT) for a competitive infrastructure spending program whose purpose was to inject federal dollars into transportation projects of local, regional, or national impact. Initially this competitive infrastructure grant program was known as Transportation Investments Generating Economic Recovery, or TIGER. As the economic effects of the Great Recession were seen to be in the past, the current presidential administration renamed the TIGER program Better Utilizing Investment to Leverage Development, or BUILD.

Eligible recipients for BUILD funding include cities, counties, states, transit agencies/authorities, and tribal governments. Since the inception of the BUILD / TIGER program, Congress and USDOT have funded nearly \$8.0 billion for multimodal infrastructure projects across the nation for highway, bridge, port, freight rail, and public transit projects.

StarTran and the City of Lincoln have submitted two previous applications to the USDOT for BUILD/TIGER funding in 2016 and 2018 to support the construction of a downtown transit center, but unfortunately neither application was selected for funding. The BUILD program has allocated \$1.0 billion for FY 2020 projects. Each year of the program's existence, competition for the limited nationwide funding is challenging with USDOT receiving billions more in grant application requests than funding available. The minimum BUILD grant size is \$5.0 million and maximum grant award is capped at \$25 million. BUILD grants can fund up to eighty percent of a project's capital construction cost with a minimum local matching contribution of twenty percent. In many cases, successfully selected projects commit more local matching funds beyond the minimum twenty percent. BUILD applications examine a project's merits on the following:

- **State of Good Repair:** An assessment of how the project will improve the condition of existing transportation facilities and systems, with particular emphasis on minimizing lifecycle costs.
- **Economic Competitiveness:** An assessment of how the project will contribute to regional economic competitiveness over the medium- to long-term by improving the transportation system while creating and preserving jobs.
- **Quality of Life:** An assessment of how the project will increase transportation choices and access to transportation services for local residents.
- **Environmental Sustainability:** An assessment of how the project will improve energy efficiency, reduce dependence on oil, reduce greenhouse gas emissions, and benefit the environment.

- Safety: An assessment of how the project will improve the safety of U.S. transportation facilities and systems.
- Innovation: An assessment of how the project uses innovative strategies, such as innovative technology, innovative funding and financing mechanisms, or innovative project delivery and management techniques.
- Partnership: An assessment of whether the project includes collaboration across a broad range of participants or an integration of other public service efforts or processes.

The BUILD program remains one of the most viable opportunities to secure federal funding for the construction of the MTTC. The program has remained popular with the US Congress and it is anticipated that it will continue to be funded annually for the foreseeable future. StarTran and the City of Lincoln should continue to submit applications to USDOT to fund MTTC construction and work to clearly identify committed local match funding that will be necessary to support the federal funds if appropriated prior to federal funds being awarded. Given the initial project cost estimate of approximately \$12.0 million would require a local match of roughly \$2.4 million to meet the minimum twenty percent local commitment.

5.2.2 FTA 5339 Bus and Bus Facilities Program

Another viable funding opportunity for the MTTC project is through the Federal Transit Administration's (FTA) 5339 (b) Bus and Bus Facilities Program. Grants for Bus and Bus Facilities program (49 U.S.C. 5339) makes FTA funding available to States and designated recipients of federal transit funds to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities such as transit centers. In FY 2020, FTA made nearly \$290 million available through the Bus and Bus Facilities competitive grant program. Applications for this program are generally made annually. Like BUILD, the funding split for projects request a minimum local funding match commitment of twenty percent.

While the overall program is significantly lower than the BUILD program, securing funding through the 5339(b) Bus and Bus Facilities could potentially be less challenging in that the MTTC's funding application would only be competing against like-transit facility projects, as opposed to highway, freight, rail, ports, or other modal projects that can make the BUILD program more challenging to be selected for funding award. StarTran should plan to apply to the 5339(b) program in FY 2021 if construction funding is still required at the time the next Notice of Funding Opportunity (NOFO) is published, likely in early 2021.

5.3 Benefit-Cost Analysis

A benefit-cost analysis (BCA) was conducted for the MTTC for submission to the US Department of Transportation (USDOT) as a requirement of the grant application for the BUILD 2020 program. A BCA is an evaluation framework to assess the economic advantages (benefits) and disadvantages (costs) of an investment alternative. Benefits and costs are broadly defined and are quantified in monetary terms to the extent possible. The overall goal of a BCA is to assess whether the expected benefits of a project justify the costs from a national perspective. A BCA framework attempts to capture the net welfare change created by a project, including cost savings and increases in welfare (benefits), as well as disbenefits where costs can be identified (e.g., project capital costs), and welfare reductions where some groups are expected to be made worse off as a result of the proposed project.

The BCA framework involves defining a Base or "No-Build" Case, which is compared to the "Build" Case, where the grant request is awarded, and the project is built as proposed. The BCA assesses the

incremental difference between the No-Build Case and the Build Case, which represents the net change in welfare. BCAs are forward-looking exercises which seek to assess the incremental change in welfare over a project lifecycle. The importance of future welfare changes is determined through discounting, which is meant to reflect both the opportunity cost of capital as well as the societal preference for the present.

The analysis was conducted in accordance with the benefit-cost methodology as recommended by USDOT in the 2020 Benefit-Cost Analysis Guidance for Discretionary Grant Programs.¹⁵ This methodology includes the following analytical assumptions:

- Defining existing and future conditions under a No-Build Case and under the Build Case;
- Estimating benefits and costs during project construction and operation, including 30 years of operations beyond the Project completion when benefits accrue;
- Using USDOT recommended monetized values for reduced injuries, travel time savings, and emissions, while relying on best practices for monetization of other benefits;
- Presenting dollar values in real 2018 dollars. In instances where cost estimates and benefits valuations are expressed in historical or future dollar years, using an appropriate inflation factor to adjust the values; and
- Discounting future benefits and costs with a real discount rate of 7 percent, consistent with USDOT guidance.

The evaluation period for this project includes a 3-year design and construction period, from 2020-2022, during which capital expenditures are undertaken, plus 30 years of operations beyond Project completion within which to accrue benefits, through 2052.

Dollar figures in this analysis are expressed in constant 2018 dollars (2018\$). Capital and O&M costs estimated in 2020 are conservatively assumed to reflect 2018 dollar values.

The real discount rate used for this analysis was 7.0 percent, consistent with USDOT guidance for 2020 BUILD grants and OMB Circular A-94.¹⁶

5.3.1 BCA Capital and Operating Costs

Capital costs for the Project professional services/design costs expected to equal \$1.1 million in undiscounted dollars. Construction, which is planned to start in July 2021 and last through October 2022, is anticipated to cost \$10.2 million in undiscounted 2018 dollars. Other capital costs, including right-of-way acquisition total \$44,000 in undiscounted 2018 dollars. Together, these capital costs equate to \$11.8 million in undiscounted 2018 dollars, or \$10.0 million when discounted at 7 percent. These costs do not include escalation and therefore may differ from those reported in the application narrative. In addition, costs developed in 2020 are conservatively assumed to reflect 2018 dollars and are not reduced further from the 2020 valuation.

Table 16 presents cost information by type of expense and year of expenditure.

¹⁵ U.S. Department of Transportation. Benefit-Cost Analysis Guidance for Discretionary Grant Programs. January 2020.

¹⁶ White House Office of Management and Budget, [Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs](#) (October 29, 1992).

Table 16: Project Costs by Category and Year, in Millions of 2018 Dollars

Cost Category	2020	2021	2022	Total
Construction	\$0.00	\$3.84	\$6.39	\$10.23
Professional Services	\$0.56	\$0.56	\$0.00	\$1.12
Other Costs	\$0.44	\$0.00	\$0.00	\$0.44
Total (Undiscounted)	\$1.00	\$4.40	\$6.39	\$11.79
Total (Discounted, 7%)	\$0.93	\$3.84	\$5.22	\$9.99

Source: StarTran, WSP 2020

The annual costs of operating and maintaining the transportation center are included in the analysis, calculated as the net costs between the Build and No-Build scenarios. As the project consists of new construction, operations and maintenance (O&M) costs are incurred when the project opens in 2023, continuing throughout the analysis period.

In the “Build” Case, the O&M costs include annual preventive maintenance, annual maintenance and replacement (M&R), and periodic replacements for the transportation center building, as well as the periodic repair and replacement of the pavement. O&M costs for the new canopies are excluded, as these are assumed to be comparable to the O&M costs associated with the existing transfer point’s bus shelters, thus resulting in no net-change in costs (while the transfer station’s canopies will have a larger surface area than the existing transfer point’s bus shelters, they will use lower-maintenance materials).

The schedule of net undiscounted O&M costs for the Project are shown for each year in Table 17. Total net O&M costs for the Project are estimated to be \$2.0 million in undiscounted dollars, or \$495,000 in present value using a 7 percent discount rate. Per USDOT guidance, these net O&M costs are included as a negative benefit in the numerator of the benefit-cost equation.

Table 17: Schedule of Operations and Maintenance Costs (in Undiscounted 2018 Dollars)

Year	Building			Pavement	Total
	Preventive	M&R	Replacement	Repair/Replacement	
2023	\$15,072	\$9,168	\$0	\$0	\$24,240
2024	\$15,072	\$9,305	\$0	\$0	\$24,377
2025	\$15,072	\$9,620	\$0	\$0	\$24,691
2026	\$15,072	\$14,145	\$0	\$0	\$29,217
2027	\$15,072	\$16,308	\$0	\$10,000	\$41,380
2028	\$15,072	\$9,757	\$0	\$0	\$24,828
2029	\$15,072	\$9,260	\$0	\$0	\$24,332
2030	\$15,072	\$14,333	\$49,680	\$0	\$79,085
2031	\$15,072	\$12,167	\$0	\$0	\$27,238
2032	\$11,506	\$19,920	\$6,242	\$10,000	\$47,669
2033	\$15,072	\$9,168	\$0	\$0	\$24,240
2034	\$15,072	\$16,154	\$0	\$0	\$31,226
2035	\$15,072	\$9,168	\$0	\$0	\$24,240
2036	\$15,072	\$9,397	\$0	\$0	\$24,469
2037	\$12,285	\$51,529	\$37,353	\$10,000	\$111,167
2038	\$15,072	\$14,333	\$49,680	\$0	\$79,085
2039	\$15,072	\$9,168	\$0	\$0	\$24,240
2040	\$15,072	\$12,304	\$0	\$0	\$27,375
2041	\$15,072	\$9,168	\$0	\$0	\$24,240
2042	\$8,921	\$259,456	\$27,404	\$10,000	\$305,782
2043	\$15,072	\$9,712	\$0	\$0	\$24,783
2044	\$15,072	\$9,305	\$0	\$0	\$24,377
2045	\$15,072	\$9,168	\$0	\$0	\$24,240
2046	\$15,072	\$16,342	\$49,680	\$0	\$81,094
2047	\$14,957	\$162,740	\$75,366	\$10,000	\$263,064
2048	\$15,072	\$9,305	\$0	\$0	\$24,377
2049	\$15,072	\$12,167	\$0	\$0	\$27,238
2050	\$15,072	\$14,237	\$0	\$0	\$29,309
2051	\$15,072	\$9,168	\$0	\$0	\$24,240
2052	\$8,720	\$50,693	\$408,924	\$10,000	\$478,336
Total	\$433,179	\$826,670	\$704,331	\$60,000	\$2,024,180

Source: WSP, 2020

5.3.2 MTTC Project Benefits

The MTTC Project generates several benefits primarily by:

- Increasing travel time savings of bus passengers
- Generating new transit trips and thereby decreasing automobile vehicle miles travelled and the consequent vehicle operating costs and emissions
- Enhancing the city's economic competitiveness
- Enhancing quality of life for city residents

These benefits are monetized and quantified. Details pertaining to the monetization and quantification of the MTTC Project benefits are included in the BCA Summary Report in Appendix B.

By far, the greatest benefit of the MTTC Project comes from significant reduction in passenger transfer waiting times. StarTran's current scheduling and infrastructure at the Gold's on-street transfer point hamper passengers' ability to seamlessly and quickly transfer between lines. The MTTC will provide more bus bays to increase efficiency of connections and transfers between routes. The current configuration has capacity for five buses at one time; demand reaches 15 buses at one time. To accommodate today's demand, bus schedules are offset by five minutes to stagger arrivals at the existing downtown transfer site. Transfers in the second and third wave of buses typically miss opportunities to transfer to buses that arrived in the earlier wave of buses. Because buses operate at 30- and 60-minute frequencies, riders that miss transfers to earlier buses can wait up to 50 minutes for the next bus.

Travel time savings were determined by calculating the difference between the current average transfer time at 11th and N Streets and the average transfer time under a new pulse operations system. These savings were calculated for StarTran's three schedule blocks: morning peak service, weekday off-peak service, and Saturday service, as shown on a per-trip basis in Table 18. In total, the project will save 1.8 million hours of travel time over the 30-year operations period.

Table 18: Travel Time Savings Assumptions and Sources

Variable	Unit	Value	Source
Value of Travel Time Savings – Personal (Wait-time)	2018\$ per person hour	\$30.40	US DOT Guidance, 2020
Value of Travel Time Savings – Business	2018\$ per person hour	\$27.10	US DOT Guidance, 2020
Personal Share of Total Person-Miles of Travel	%	88.2%	US DOT Guidance, 2020
Business Share of Total Person-Miles of Travel	%	11.8%	US DOT Guidance, 2020
AM/PM Peak Transfer Time Savings	Minutes	6.48	WSP Calculations, 2020
Weekday Transfer Time Savings	Minutes	6.21	WSP Calculations, 2020
Saturday Transfer Time Savings	Minutes	7.50	WSP Calculations, 2020

These benefits were monetized by multiplying the hours of benefits by the value of time for bus passengers. Per USDOT guidance, because the time savings is related to a reduction in waiting/transfer

time, a higher value-of-time assumption is used for personal travel. Travel time savings benefits total \$16.8 million in present value over the 30-year analysis period (see Table 19).

Table 19: Travel Time Savings Benefits, Millions of 2018 Dollars

Benefit	Project Opening Year		Project Lifecycle	
	Undiscounted	Discounted (7%)	Undiscounted	Discounted (7%)
Travel Time Savings - Bus Passengers	\$1.37	\$1.05	\$54.21	\$16.77

Source: WSP, 2020

5.3.3 BCA Results Summary

The BCA converts potential gains (benefits) and losses (costs) from the Project into monetary units and compares them. The following common benefit-cost evaluation measures are included in this BCA:

- **Net Present Value (NPV):** NPV compares the net benefits (benefits minus costs) after being discounted to present values using the real discount rate assumption. The NPV provides a perspective on the overall dollar magnitude of cash flows over time in today's dollar terms.
- **Benefit-Cost Ratio (BCR):** The evaluation also estimates the BCR; the present value of incremental benefits is divided by the present value of incremental costs to yield the BCR. The BCR expresses the relation of discounted benefits to discounted costs as a measure of the extent to which a project's benefits either exceed or fall short of the costs.
- **Internal Rate of Return (IRR):** The IRR is the discount rate which makes the NPV from the Project equal to zero. In other words, it is the discount rate at which the Project breaks even. Generally, the greater the IRR, the more desirable the Project.
- **Payback Period:** The payback period refers to the period of time required to recover the funds expended on a Project. When calculating the payback period, the time value of money (discounting) is not taken into account.

Table 20 presents the evaluation results for the Project. Results are presented in undiscounted values and discounted at 7 percent as prescribed by the USDOT. All benefits and costs were estimated in constant 2018 dollars over an evaluation period extending 30 years beyond project completion in 2023.

At a discount rate of 7 percent, the Project yields total benefits of \$17.0 million and total costs of \$10.0 million, yielding a BCR of 1.8 and an NPV of \$7.0 million. The IRR is 12 percent and the payback period is 16.6 years. These results indicate that the benefits of the Multimodal Transit Transfer Center far outweigh its costs.

Table 20: Benefit-Cost Analysis Results, Millions of 2018 Dollars

BCA Metric	Undiscounted	Discounted (7%)
Total Benefits	\$56.2	\$17.0
Travel Time Savings	\$54.2	\$16.8
Vehicle Operating Cost Savings (including Fuel)	\$1.5	\$0.5
Reduced Emissions	\$0.008	\$0.003
Reduced Agency O&M Costs	(\$2.0)	(\$0.5)
Residual Value	\$2.6	\$0.3
Total Costs	\$11.8	\$10.0
Net Present Value (NPV)	\$44.4	\$7.0
Benefit-Cost Ratio (BCR)	4.8	1.7
Internal Rate of Return (IRR)	12%	
Payback Period (Years)	16.6	

Source: WSP, 2020