



STARTRAN MULTIMODAL TRANSIT CENTER

Feasibility & Concept Design Study
Summer 2020

Appendix A - Public Comments



MetroQuest Survey #1 Comments

Transit Center Topic	Comment
Project Goals Comments	
Create Adaptable Facility	In my mind, create an adaptable facility and create a sustainable facility are two pieces of the same puzzle. Planning for the future means thinking through the environmental mess we're in, too.
Create Adaptable Facility	These are not well enough explained.
Create Adaptable Facility	Cleanliness is a Huge... There should be portable trash cans available for the riders to discard their trash and to Not just throw trash in to the yards of the homes that have a Bus stop in front of or beside of their houses. Especially on both corners at NW 22nd and Q street. Its left a trashy mess at times.
Create Adaptable Facility	Who writes and designs these things?! I have a Master's degree, demonstrable writing skills, and sufficient sense to write to my audience. I'm a licensed healthcare professional and am tasked with writing letters to Medicaid recipients about their insurance benefits. Our accrediting bodies mandate that we write for individuals who have, at maximum, 6th grade reading comprehension. Do you really think a sixth grader could make adequate sense of your survey, so as to answer questions in a *meaningful* way? You have a responsibility to all our citizens to be inclusive, you can do better than this, in both site design and verbiage. All Lincolniters deserve the opportunity to participate. Thank you.
Create Adaptable Facility	Still would love to see trolleybuses here in Lincoln someday.....
Create Adaptable Facility	Need shaded bus stops and when snow/ice accumulates near bus stops, Bus Drivers can stop bus little further near Traffic Stop as Stepping on Ice/snow causes injury
Create Adaptable Facility	we could use more bus shelters around Lincoln on both sides of the street there are some people who can't stand while waiting for the bus!!!!
Economic development	How about restroom access for those waiting for a connection bus?
Economic development	None of those things about a deli or a coffee shop concern me at this point for
Economic development	If I struggle to get around town, I would really appreciate some resources collocates at my bus station especially if I have a 20 or 30 minute wait before my next bus. Prepared food to go, small grocery items and convenience items, much like what you might find at the airport.
Economic development	Absolutely
Economic development	I feel like what I pay for a bus pass is expensive compared to cost of living adjusted prices in other cities.
Improve Comfort of Riders	A public restroom would be one of the best offerings.
Improve Comfort of Riders	With Nebraska weather it would really help to increase the amount of covered or indoor waiting space.

Transit Center Topic	Comment
Improve Comfort of Riders	All bus stops should have at least a bench and if possible a shelter. A lot of the passengers are Elderly and cannot stand for 30 to 45 minutes waiting for a bus. Especially at Heart Hospital.
Improve Comfort of Riders	This is very important to me. The current waiting station has no heating or cooling. The A street bus is unbearably crowded.
Improve Comfort of Riders	It is very cold and there is no restrooms. Bus times could be up to an hour long.
Improve Comfort of Riders	I commute via Route#40 from Golds to Van dorn in evening. Older versions of Bus are not at all comfortable , In contrast , Routr#53 always gets newer version of StarTran Bus and always on time. Please fix that
Improve Comfort of Riders	restrooms are very important!
Improve Efficiency	Need longer hours and full service between East Campus and City Campus. Preferably from 6:00am-1:00am daily.
Improve Efficiency	Provide Later services and Sunday Services
Improve Efficiency	Improve efficiency with multiple transfer centers and more overlapping routes in the city. I don't or shouldn't need to go downtown to go to North 27th Walmart from the Highlands.
Improve Efficiency	My son rides the bus regularly and when it broke down a few weeks ago another bus was there and he got home only 20 minutes late. So good job! But I think this is a priority that always needs to be looked at.
Improve Efficiency	Perform maintenance on a regular basis to keep buildings in good condition
Improve Efficiency	Stop firing good bus drivers. We like having drivers we know. Lisa B was a great driver. We liked her. She was always on time and very dependable. She should not have been fired.
Improve Efficiency	Having a North/South bound only bus on 70th or 84th street would greatly improve transit times for those not wanting to go downtown first to change routes.
Improve Efficiency	There should be more than one transfer center with facilities.
Improve Efficiency	Transit center should be in center of city to increase efficiency and time for all passengers, avoid everything being downtown and at unl
Improve Safety	Why did you all take out the weather shelters at the bus stops?! People freeze outside, and get rained on. What were you thinking?!
Improve Safety	I don't know if the drivers are in a hurry usually or what but I'm usually afraid they're about to hit something.
Improve Safety	This is important!
Improve Safety	Need to have safety mechanism for early commute passengers as bus stops does not have light posts
Improve Safety	Yes
Improve Safety	I have felt creeped out at bus stations, bus stops, and on the bus.
Multimodal Connections	electric scooters
Provide Equitable Access	Accessible busses would be amazing!

Transit Center Topic	Comment
Provide Equitable Access	Make sure that people are not getting left just because they take a second to get to the door like a mother with a special needs child or a disabled person in a wheelchair.
Provide Equitable Access	When the routes were redrawn a couple years ago, they pulled buses out of the neighborhoods that they serviced and made it harder to effectively connect with the buses. Some neighborhoods, including several in the west Lincoln area have been excluded from the bus's new system due to the distance you have to walk to get to a bus stop.
Provide Equitable Access	Provide access and routes on Saturday and Sunday, especially to the Farmers Market and area Churches and Stores.
Provide Equitable Access	Equitable access needs to be provided to all city residents, not just focusing on downtown, low income and unl students
Suggest another	Better routes/ 24/7 run times
Suggest another	Please focus on improving the driving of bus operators. I'm surprised there are not more accidents. They get incredibly close to hitting parked vehicles. They do not follow driving guidelines.
Suggest another	Provide opportunities for higher density redevelopment, including affordable housing.
Suggest another	Turn a profit !!
Suggest another	Halt expansion plans, begin a cost/benefit study, assess if this is for the citizenry or image. Let's take care of basic citizen needs FIRST.
Suggest another	offer transportation to more than downtown
Suggest another	offer transportation to more than downtown run transportation after 5pm
Suggest another	Low cost few amenities
Suggest another	Develop efficient routes with connections between them to minimize time passengers have to spend commuting.
Suggest another	More routes and less waiting. Easier to figure out connections and timing for trip
Suggest another	Create multiple transfer centers in city
Suggest another	We're Soo glad that we have such awesome star Tran bus's and also the driver's
Suggest another	Allow for connections to potential other mass transit types like rail,etc.
Suggest another	More ways to ride North-South and transfer along that route more midtown rather than downtown.
Suggest another	Most of these seem to overlap?? People will use the bus if it's convenient and a nice environment!
Suggest another	Adding Bus Shelters Around Lincoln
Suggest another	Even though they didn't make my top 3, all other options except economic development are very important to me.
Suggest another	Amtrak Depot
Suggest another	Tourism guide
Sustainable Transit Center	New and Improved Transfer Center will also provide a environment

Transit Center Topic	Comment
Sustainable Transit Center	That is an ambitious plan. Definitely agree with incorporating what can be done with a reasonable return for the money. It should not be the main focus.
Sustainable Transit Center	Do not sink any more taxpayer dollars into the transit system that is already dependent on subsidies. No one uses the bus system or wants to. If you put wifi in it will only attract homeless people. A deli will not generate enough revenue to support itself. Stop funding bad ideas with taxpayer money.

MetroQuest Survey #2 Comments

Transit Center Topic	Comment
Image Rating Comments	
Seating	Keep disabled individuals in mind when planning seating areas.
Seating	Need handrails so elderly/inform can get out of seat.
Seating	advertising will support local businesses while lowering costs for the taxpayer
Shelters	whatever is cheapest for taxpayer dollars, they all look fine.
Shelters	whatever is cheapest for taxpayer dollars, they all look lovely.
Shelters	I like what we have!!! It gets you in and out of the rain and cold winter winds!!!
Shelters	Make sure it is large enough to actually provide cover for number of people expected to stand under it.
Shelters	Flat roof for solar
Shelters	Least expensive option that holds up to NE weather
Technology	Anything touch looks scared in covid era to come But more modern screen info attractive with photos/video/graphics than simple letter signs
Technology	touchscreen will be ruined and unusable within a year or two
Art	whatever is least likely to be destroyed by graffiti. In this day and age anything touch would seem to be wrong
Art	None necessary, unless donated privately. Functionality most important.
Art	Also, incorporate art into the building, the fencing, the roofing, handrails, etc.
Landscaping	Native, low maintenance and low water use.
Landscaping	I am allergic to most plants
Landscaping	native grasses show city commitment to our environment!
Visual Preference Comments	
Lobby Waiting Area	This whole concept is a joke. Why are we, the taxpayers of Lincoln being forced to pour even more money into an already failed system. It would actually be cheaper to just pay the Uber bills of every person that uses the bus system in this town. Another reason I cannot wait to retire and get out of Lincoln.
Lobby Waiting Area	I like that the chairs have backs and are not benches, but it would be better if they didn't have armrests to accommodate more people.
Lobby Waiting Area	The benches should not have arm rests to accommodate more people.

Transit Center Topic	Comment
Lobby Waiting Area	It would be preferable for the benches not to have armrests, so that the benches could accommodate more people.
Lobby Waiting Area	Benches should not have armrests in order to accommodate more travelers.
Lobby Waiting Area	Lots of empty space not being utilized. Second level of seating?
Lobby Waiting Area	Seems to be a very large space.
Lobby Waiting Area	Please have signs that state no alcoholic beverages. Plenty of Trash Cans. No loitering Signs.
Lobby Waiting Area	Does not need to be a Taj Majal
Lobby Waiting Area	I want it to feel safe enough for my LHS freshman to wait at alone.
Lobby Waiting Area	People sleeping in there, crime. Late to get on their buses.
Lobby Waiting Area	Good
Lobby Waiting Area	What are you thinking!?! All we need is what we had! Restrooms! To get something to eat or drink!!! Out of rain and hot sun and cold!!! What we have should stay the same!!! Stop spending money and enforce the around the bus stop!!
Lobby Waiting Area	Don't need to be fancy
Lobby Waiting Area	Nice lighting. Where are the socially distant seats?
Digital Signage	TOO SMALL. Too high up.
Digital Signage	Display is too small. People will need to crowd together closely to see it. It should be larger to people can keep walking while glancing at it
Digital Signage	You just need to make sure the font is large enough to see. Those are high up
Digital Signage	Let's get real!! What we have works just fine!!! People have your apps to do all that!!!
Digital Signage	Good
Digital Signage	the brick looks dated and trashy
Digital Signage	It seems like this should be standard; not something requiring a rating.
Digital Signage	Bigger, lower
Digital Signage	Blind and low vision people need to have access to the same information as other travelers. There will need to be an audio output feature for these devices.
Digital Signage	Blind and low vision people need to have access to the same information as other travelers. There will need to be an audio output feature for these devices.
Digital Signage	Blind and low vision people need to have access to the same information as other travelers. There will need to be an audio output feature for these devices.
Digital Signage	There should also be voice output in order to ensure that people who are blind and low vision have access to the same information.
Convenience Store	Please include some healthy snack options.
Convenience Store	Please include healthy snack options.
Convenience Store	Please include healthy options.
Convenience Store	This takes away from surrounding local businesses or opportunities for new business.
Convenience Store	Attendant should also be knowledgeable about area and business

Transit Center Topic	Comment
Convenience Store	Have fresh produce and coconut water
Convenience Store	trash cans are accessible in this area will be important.
Convenience Store	I like to eat fresher foods it's healthier for you and there is nothing to steal!!! Hot food not what you're thinking fast and cold.
Convenience Store	We don't need this we are not a city of a million or more
Convenience Store	Unstaffed 'convenience store' allows papers, etc. to be strewn about.
Convenience Store	This seems like a good start but consider leaving space to expand this to include more, serve more.
Passenger Services	Should have staff there
Passenger Services	Come on get real!!! We don't have the taxes to even take care of are roads!!! What you have works just fine.
Passenger Services	Color HD Video Cameras on the outside and inside of the help desk. Particularly if there is money transactions involved.
Passenger Services	San Francisco uses vending machines to dispense fare tickets. Why don't we do that instead of employing a person to do that?
Passenger Services	Am I rating the image or the service? This survey is confusing.
Passenger Services	That would be plus for us drivers. To have their questions answered and not taking up our time.
Passenger Services	Good
Passenger Services	Should be there from first bus to last bus
ATM	Would live this but my first thought is the people who hang out around sidewalk-facing ATMs downtown would love to intimidate us in the comfort of the transit center. Can you co-locate it with Passenger Services so staff see the people using it and prevent that?
ATM	Good
ATM	good chance for muggings
ATM	You do not need this at a bus stop!!!
ATM	If exact change required need it
Temperature Controls	Are these controls accessible to the public?
Temperature Controls	Duh
Temperature Controls	For real!?bump!!!
Temperature Controls	Junk
Temperature Controls	Who controls?
Seating at Bus Bays	middle bars are designed to prevent homeless sleeping. Sad, but probably a good idea
Seating at Bus Bays	We don't need this in my family, but I can see how this might be very important to many individuals.
Seating at Bus Bays	Might want to spread seating for distancing purposes

Transit Center Topic	Comment
Seating at Bus Bays	Seating as it appears in the image might not be adequate for people with mobility devices
Seating at Bus Bays	HD Video Recording Cameras should be a must in this area.
Seating at Bus Bays	More seats
Seating at Bus Bays	Benches should not have backs in order to accommodate more travelers.
Seating at Bus Bays	The benches should not have armrests in order to accommodate more people.
Seating at Bus Bays	The benches should not have armrests in order to accommodate more travelers.
Seating at Bus Bays	Would prefer if the benches did not have arm rests.
Seating at Bus Bays	Think you need to redo these for coronavirus social distancing.
Seating at Bus Bays	Common sense
Seating at Bus Bays	Good
Digital Displays	Good
Digital Displays	You need just one display!!!
Digital Displays	Helps
Digital Displays	too small. too high. Look to big metro areas on how they do things.
Digital Displays	Blind and low vision people need to have the same access to information as other travelers. There will need to be audible announcements as well that provide the same information.
Digital Displays	Blind and low vision people need to have access to the same information as other travelers. There will need to be an audio output feature for these devices.
Digital Displays	Blind and low vision people need to have access to the same information as other travelers. There will need to be an audio output feature for these devices.
Digital Displays	Blind and low vision people need to have access to the same information as other travelers. There will need to be an audio output feature for these devices.
Digital Displays	just in case the system malfunction, should have paper schedules available for passengers.
Digital Displays	Yes please
Digital Displays	Again, seems like this should be standard.
Windscreen Shelter	I don't quite understand how this option fits in - is this at bus stops across town or at the transit center.
Windscreen Shelter	The rules of loitering and must be enforce, otherwise this will be some home. NO SMOKING and NO Open Beverages of Alcohol signs should be present.
Windscreen Shelter	Benches should not have armrests in order to accommodate more travelers.
Windscreen Shelter	The benches should have backs.
Windscreen Shelter	It would be preferable for the benches to have backs.
Windscreen Shelter	You have covered platform no need for windscreen or free standing shelter
Windscreen Shelter	Nothing new
Windscreen Shelter	Need to just have the door open with four sides!!!
Windscreen Shelter	Good

Transit Center Topic	Comment
Covered Platform	Good
Covered Platform	Dump!!! Keep it like it is!!
Covered Platform	Limited overhang doesn't appear to provide pedestrians and bus riders sufficient protection from the weather.
Covered Platform	Waste of money
Covered Platform	Pull in and back out? That doesn't seem efficient unless it's Greyhound.
Covered Platform	doesn't look very covered
Radiant Heaters	Better source and why are we heating the outdoors?
Radiant Heaters	That sounds lovely! Would never have thought of it.
Radiant Heaters	I give this 10 stars for the winter
Radiant Heaters	having a timer on these would be nice. Otherwise you will have people making this their home over night.
Radiant Heaters	As someone who has had to stand outside waiting for a bus in the winter these would be amazing. I'm just afraid our transient community would take over.
Radiant Heaters	Will draw homeless
Radiant Heaters	Dump!!! Bring it down so are feet can feel it!!! This is what gets the coldest on me for they get wet!!!
Radiant Heaters	Good
Radiant Heaters	warm is nice in winter
Vehicle Parking	Kiss and ride please. Plenty of garages in the area otherwise.
Vehicle Parking	How are you going to know if they are passengers who are parking here and not pedestrians who is looking for a place to park for football games or otherwise not connected at all to the out transit system.
Vehicle Parking	No unless it is underground and incorporated into a multiple use building
Vehicle Parking	At this point in time, I don't see Lincoln as a Park and Ride town, especially if the only parking is at the transit center. Why would I drive my car 20 minutes to downtown and not just drive the 20 minutes to work.
Vehicle Parking	Good
Vehicle Parking	Where??
Vehicle Parking	Why
Vehicle Parking	Depends on where the parking is in relation to the transfer station. Is this parking free?
Uber/Lyft Pickup Dropoff	Why
Uber/Lyft Pickup Dropoff	No need!!! I'm riding the bus!!!
Uber/Lyft Pickup Dropoff	Good
Uber/Lyft Pickup Dropoff	This may be helpful to some, but similar to vehicle parking, I imagine that if you're going to take an Uber, why wouldn't you just take it all the way?
Uber/Lyft Pickup Dropoff	GREAT idea!

Transit Center Topic	Comment
Uber/Lyft Pickup Dropoff	The more traffic in a bus area, the harder it is for us drivers.
Uber/Lyft Pickup Dropoff	Have to be clear away from the buses. So that the drivers wont get in the way of our buses.
Uber/Lyft Pickup Dropoff	This should be the whole system.
Solar	only if no added cost and can withstand NE hail storms
Solar	LOVE this!!!
Solar	And possible ground thermo as well
Solar	Only if cost efficient too.
Solar	Junk
Solar	Duh
Solar	will they pay for themselves before needing replaced? If not, waste of money just for the PR
Solar	Since there isn't a place to put comments anywhere else on a general nature. The proposed design is a waste of valuable real estate space in downtown Lincoln. And most other developments wouldn't allow the front facing of a parking lot on the street. Generally we want buildings facing the street. Also why can't you partner with a de eloped and go taller! I believe the building height limit there is close to 250 feet. This is an ugly bad design.
Solar	Whole area should be covered by those especially with electric buses coming online.
Shared Scooters	That looks like a lot of fun. :)
Shared Scooters	Junk
Shared Scooters	This image doesn't appear to provide racks or some other device to hold the scooters. Scooters may fall over or be placed at random.
Shared Scooters	Why not
Shared Scooters	Prefer not to see scooters, but I suppose a specific space is best. It will be necessary for staff to watch for ones laying around.
Shared Scooters	Cameras in this area will be a must.
Low Water Use Fixtures	Duh
Low Water Use Fixtures	be sure that they keep towels over air dryers. The cost is worth the benefit of improved sanitation! Air dryers blow germs all over the place!
Low Water Use Fixtures	Good
Low Water Use Fixtures	Good
Low Water Use Fixtures	Must have a custodian available to keep this area clean.
Bike Racks	What's this got to do with riding the bus??? I see so many bikes get messed up around the bus stop!!! Take it to the parking garage it will be safer thire!!!
Bike Racks	Can these hold a lot of bikes? Being able to lock up many bikes should be a consideration for the types of racks. They look nice though

Transit Center Topic	Comment
Bike Racks	These are dumb and how can they hold bikes. They also look like a nightmare to shovel snow around in the winter.
Bike Racks	These racks are not very useful. Need to choose a more universal design. The black racks in the Haymarket area are better.
Bike Racks	Duh
Bike Racks	Junk
Bike Racks	Make sure people with recumbent tricycles can use the bike racks
City Bike Share	My family is unlikely to utilize this; however, I can see how many people may find this important.
City Bike Share	Junk
City Bike Share	No way!!!
City Bike Share	Why not
LED Efficient Lighting	Yes
LED Efficient Lighting	Where???
LED Efficient Lighting	Good
Transit Center Tradeoffs	
Architecture: STAND OUT or BLEND IN	Don't do weird stuff.
Architecture: STAND OUT or BLEND IN	A combination of these two options would be my preference
Architecture: STAND OUT or BLEND IN	Leave things alone!!!
Architecture: STAND OUT or BLEND IN	A traditional enclosed design is preferred downtown
Design: INNOVATIVE or STATUS QUO	Dump
Design: INNOVATIVE or STATUS QUO	I like more modern, but this won't protect people from weather as well with the slanted roof.
Design: INNOVATIVE or STATUS QUO	whichever is least expensive
Security: TECHNOLOGY or PERSONNEL	I've worked at Gold's for years. I think you need both.
Security: TECHNOLOGY or PERSONNEL	Both!!
Security: TECHNOLOGY or PERSONNEL	Cameras are preferred but personnel available for immediate response should also be provided.

Transit Center Topic	Comment
Security: TECHNOLOGY or PERSONNEL	tech is good, but a visible reminder of security (person) does so much more for lowering crime (and creepers - few women comfortable riding city transport) also, security guard will create jobs!
Security: TECHNOLOGY or PERSONNEL	Both!
Security: TECHNOLOGY or PERSONNEL	both
Security: TECHNOLOGY or PERSONNEL	Technology as well as on site. The on site staff to back up technology. Local law enforcement already have enough to do. Park & Go also a lot to handle. Company contracted should be National not a Local with a multi year (3 year initial w/ opinional years.
Security: TECHNOLOGY or PERSONNEL	A combination of camera and personnel is desirable
Public Art: INTEGRATE ART or FEATURED ELEMENTS	Standalone art and building murals are desirable
Public Art: INTEGRATE ART or FEATURED ELEMENTS	Don't waste money on art, spend money on Makin functional and efficient
Public Art: INTEGRATE ART or FEATURED ELEMENTS	No one cares! We just want to get home.
Public Art: INTEGRATE ART or FEATURED ELEMENTS	save money
Public Art: INTEGRATE ART or FEATURED ELEMENTS	Art is NOT a significant feature!
Public Art: INTEGRATE ART or FEATURED ELEMENTS	Dump
Public Art: INTEGRATE ART or FEATURED ELEMENTS	Don't need art Keep it functional space
Public Art: INTEGRATE ART or	A combination of these two options would be my preference

Transit Center Topic	Comment
FEATURED ELEMENTS	
COMMUNITY SPACE or BUS SERVICE ONLY	Bus serve only.
COMMUNITY SPACE or BUS SERVICE ONLY	current "community interaction" is a lot of drug dealing and harassment of women
COMMUNITY SPACE or BUS SERVICE ONLY	Whatever the bus drivers want.



STARTRAN MULTIMODAL TRANSIT CENTER

Feasibility & Concept Design Study
Summer 2020

Executive Summary

A benefit-cost analysis (BCA) was conducted for the Multimodal Transit Transfer Center (MTTC) for submission to the U.S. Department of Transportation (USDOT) as a requirement of a discretionary grant application for the BUILD 2020 program. The analysis was conducted in accordance with the benefit-cost methodology as outlined by USDOT in the 2020 Benefit-Cost Analysis Guidance. The period of analysis corresponds to 33 years and includes 3 years of design and construction and 30 years of benefits after operations begin in 2023.

The project, located in Lancaster County in downtown Lincoln, Nebraska, will build a multimodal transportation center at the corner of Ninth and M Streets. This facility will provide indoor waiting areas, restrooms, and bicycle storage to passengers. It will also allow StarTran to establish administrative offices on site.

The current primary transfer location in downtown Lincoln, at the corner of 11th and N Streets, has suffered from traffic congestion, pedestrian circulation issues, and design challenges that delay bus trips by forcing operators to wait for the bus in front of them to depart. The location is undersized and is not conducive to the safe and timely transfer of passengers between bus lines.

The new transportation center will allow StarTran to expand on recent service enhancements implemented from its 2016 Transit Development Plan¹. This plan reconfigured many routes in the system, decreased headways and expanded operating hours for several key routes, and reconfigured interlined routes to maximize on-time performance. Additionally, StarTran eliminated flag stops in favor of only picking up passengers at designated stops in 2016, which improved on-time performance and safety for drivers and customers.

The transportation center will reduce bus passengers' travel times, encouraging additional transit trips due to the added safety of a dedicated, off-street facility. As a "pulse operations" facility, the transportation center will increase the efficiency of coordinated transfers of reduced duration. The transportation center will offer seating, protection from weather elements, and relief to bus operators.

In addition to promoting StarTran use due to enhanced wayfinding and system-wide efficiencies, the transportation center presents numerous additional benefits to the city of Lincoln. The facility will encourage economic development in the vicinity, including mixed-used and transit-oriented development (TOD).

The facility will accommodate a suite of mobility services, including, but not limited to; buses, pedestrians, cyclists, electric scooters, transportation network companies (i.e. Uber/Lyft), inter-city buses. Eventually, it would be conducive to bus rapid transit and autonomous vehicles. This will promote a network of non-automotive transportation in Lincoln, expanding access to employment, social and recreational opportunities to a broader swath of the regional population of all ages and abilities.

Transfer centers have successfully been implemented in several peer Midwestern cities, including Springfield, Missouri, and Des Moines and Sioux Falls, Iowa, allowing their bus networks to initiate efficient "pulse operations" with safer, element-protected transfer areas, while adding new businesses, community space, park-and-ride space and bicycle infrastructure to the community.

¹ City of Lincoln. April 2016. Transit Development Plan Study. <https://lincoln.ne.gov/city/ltu/startran/tdp/>

1.1 Costs

The capital cost for this Project is expected to be \$11.8 million in undiscounted 2018 dollars through 2022, as shown in Table ES-1. At a 7 percent real discount rate, these costs are \$10.0 million. These costs do not include escalation and therefore may differ from those reported in the application narrative.

Table ES-1: Project Costs by Category and Year, in Undiscounted 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

Operating and maintenance (O&M) costs are projected to total \$2.0 million in undiscounted 2018 dollars, or \$495,000 when discounted at 7 percent.

1.2 Benefits

In 2018 dollars, the Project is expected to generate \$17.2 million in discounted benefits using a 7 percent discount rate. These benefits are produced primarily via travel time savings for bus passengers, as well as reduced vehicle operating costs for drivers. This leads to an overall project Net Present Value (NPV) of \$7.7 million and a Benefit Cost Ratio (BCR) of 1.8. The overall project benefit matrix can be seen in Table ES-2.

Table ES-2: Project Impacts and Benefits Summary, Monetary Values in 2018 Dollars

Current Status/ Baseline & Problem to be Addressed	Change to Baseline	Type of Impact	Population Affected by Impact	Economic Benefit	Results Summary (7% Disc.)	Page Ref.
Bus transfers are not synced, and the on-street transfer point is haphazard, causing lengthy transfers and discouraging ridership.	New transfer center with pulse operations designed for the efficient, comfortable, simultaneous connections of passengers from multiple routes.	Decrease in transfer times	StarTran riders transferring between routes in downtown Lincoln	Travel Time Savings	\$16.8 Million	8
	New transportation center will streamline and simplify StarTran trips, encouraging a shift of passengers from automobile to bus.	Decrease in automobile vehicle operations costs	New StarTran riders	Vehicle Operating Cost Savings	\$0.5 Million	9
		Decrease in emissions levels	Residents of Lincoln	Emissions Reduction	\$2,701	9

SOURCE: WSP, 2020

Table of Contents

Executive Summary	i
1.1 Costs.....	ii
1.2 Benefits	ii
Table of Contents	iii
List of Tables	iv
1 Introduction.....	1
1.1 BCA Framework	1
1.2 Report Contents.....	1
2 Project Overview.....	2
2.1 Description	2
2.2 General Assumptions	3
2.3 No-Build Case and Build Case.....	3
3 Project Costs	4
3.1 Capital Costs	4
3.2 Operating and Maintenance Costs	4
4 Project Benefits.....	6
4.1 Demand Projections.....	6
4.2 Economic Competitiveness	8
4.2.1 Travel Time Savings	8
4.2.2 Vehicle O&M Cost Savings.....	9
4.3 Environmental Sustainability.....	9
4.4 Residual Value	10
4.5 Safety	10
4.6 Quality of Life	11
5 Summary of Results.....	12
5.1 Evaluation Measures.....	12
5.2 BCA Results.....	12
6 Sensitivity Analysis	13

List of Tables

Table 1: Project Costs by Category and Year, in Millions of 2018 Dollars	4
Table 2: Schedule of Operations and Maintenance Costs (in Undiscounted 2018 Dollars)	5
Table 3: Ridership Projection Assumptions and Sources.....	6
Table 4: Ridership Projections.....	7
Table 5: VMT Reduction Assumptions and Sources	7
Table 6: VMT Reduction Projections	7
Table 7: Travel Time Savings Assumptions and Sources	8
Table 8: Travel Time Savings Benefits, Millions of 2018 Dollars.....	9
Table 9: Vehicle Operating Cost Savings Benefits, Millions of 2018 Dollars.....	9
Table 10: Environmental Sustainability Benefits Assumptions and Sources.....	10
Table 11: Environmental Sustainability Benefits, 2018 Dollars	10
Table 12: Residual Value Estimation of Benefits, Millions of 2018 Dollars	10
Table 13: Benefit Cost Analysis Results, Millions of 2018 Dollars.....	12
Table 14: Sensitivity Analysis	13

1 Introduction

A benefit-cost analysis (BCA) was conducted for the Multimodal Transit Transfer Center (MTTC) for submission to the U.S. Department of Transportation (USDOT) as a requirement of the grant application for the BUILD 2020 program. The following section describes the BCA framework, evaluation metrics, and report contents.

1.1 BCA Framework

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.² 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.

1.2 Report Contents

Section 2 of this Appendix contains a description of the Project elements, information on the general assumptions made in the analysis, and a description of the No-Build Case compared to the Build Case. Section 3 provides a summary of the anticipated Project costs. Section 4 reviews the expected economic benefits the Project would generate, including a review of the assumptions and methodology used to calculate the benefits. Section 5 reports the high-level results of the BCA, while Section 6 illustrates the results of a sensitivity analysis of key assumptions.

² U.S. Department of Transportation. Benefit-Cost Analysis Guidance for Discretionary Grant Programs. January 2020.

2 Project Overview

2.1 Description

A benefit-cost analysis (BCA) was conducted for the MTTC for submission to the U.S. Department of Transportation (USDOT) as a requirement of a discretionary grant application for the BUILD 2020 program. The analysis was conducted in accordance with the benefit-cost methodology as outlined by USDOT in the 2020 Benefit-Cost Analysis Guidance. The period of analysis corresponds to 33 years and includes 3 years of design and construction and 30 years of benefits after operations begin in 2023.

The project, located in Lancaster County in downtown Lincoln, Nebraska, will build a multimodal transportation center at the corner of Ninth and M Streets. This facility will provide indoor waiting areas, restrooms, and bicycle storage to passengers. It will also allow StarTran to establish administrative offices on site.

The current primary transfer location in downtown Lincoln, is an on-street transfer point at the corner of 11th and N Streets, has suffered from traffic congestion, pedestrian circulation issues, and design challenges that delay bus trips by forcing operators to wait for the bus in front of them to depart. The location is undersized and is not conducive to the safe and timely transfer of passengers between bus lines.

As a hub and spoke system, the transportation center is an integral replacement to the insufficient on-street transfer point at 11th and N Street. StarTran's ridership has grown steadily since 2011, owing to continued infill and fringe development in Lincoln that has expanded employment opportunities in all areas of the city³. Additionally, the University of Nebraska partners with StarTran to provide campus service with several routes.

The transportation center will allow StarTran to expand on recent service enhancements implemented from its 2016 Transit Development Plan⁴. This plan reconfigured the majority of routes in the system, decreased headways and expanded operating hours for several key routes, and reconfigured interlined routes to maximize on-time performance. This increased StarTran's viability as a commute option for all hours of the day. Additionally, StarTran eliminated flag stops in favor of only picking up passengers at designated stops in 2016, which improved on-time performance and safety for drivers and customers.

The transportation center will reduce bus passengers' travel times, encouraging additional transit trips due to the added safety of a dedicated, off-street facility. As a "pulse operations" facility, the transportation center will increase the efficiency of coordinated transfers of reduced duration. The transportation center will offer seating, protection from weather elements, and relief to bus operators.

In addition to promoting StarTran use due to enhanced wayfinding and system-wide efficiencies, the transportation center presents numerous additional benefits to the city of Lincoln. The facility will encourage economic development in the vicinity, including mixed-used and transit-oriented development (TOD).

The facility will accommodate a suite of mobility services, including, but not limited to buses, pedestrians, cyclists, electric scooters, transportation network companies (i.e. Uber/Lyft), and inter-city buses. Eventually, it would be conducive to bus rapid transit and autonomous vehicles. This will promote a network of non-automotive transportation in Lincoln, expanding access to employment, social and recreational opportunities to a broader swath of the regional population of all ages and abilities.

³ City of Lincoln. April 2016. Transit Development Plan Study, Final Report.

<https://lincoln.ne.gov/city/ltu/startran/tdp/pdf/tdp-final-report.pdf?april2016>

⁴ City of Lincoln. April 2016. Transit Development Plan Study. <https://lincoln.ne.gov/city/ltu/startran/tdp/>

Transfer centers have been successfully implemented in several peer Midwestern cities, including Springfield, Missouri, and Des Moines and Sioux Falls, Iowa, allowing their bus networks to initiate efficient “pulse operations” with safer, element-protected transfer areas, while adding additional community benefits such as new businesses, park-and-ride spaces and bicycle facilities.

2.2 General Assumptions

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-94.⁵

2.3 No-Build Case and Build Case

For the purposes of this BCA, the No-Build Case assumes that none of the proposed transfer station improvements described in Section 2.1 would be completed, and that the existing conditions of the StarTran network would remain in their current form.

The proposed project represents the Build Case.

⁵ White House Office of Management and Budget, [Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs](#) (October 29, 1992).

3 Project Costs

3.1 Capital 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 1 presents cost information by type of expense and year of expenditure.

Table 1: 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

3.2 Operating and Maintenance Costs

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 2. 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 2: 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

4 Project Benefits

The Project generates 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 in the sub-sections that follow, and the assumptions used to calculate the monetary values of the benefits are also described. Non-quantifiable benefits are also described qualitatively.

The first portion of this section discusses the assumptions around travel demand under both the No-Build case and the Build alternative. The section then reviews the project's quantitative and qualitative benefits, and the assumptions behind them.

4.1 Demand Projections

To estimate the primary population anticipated to benefit from the Project, the analysis relies on StarTran ridership data for the weekday morning peak, weekday off-peak, and Saturday ridership in the September 2019 service period.⁶ Only those routes that will use the transfer center are included in the estimate. Furthermore, this ridership is adjusted based on share of riders estimated to transfer between routes – assumed to be 19.8 percent based on a 2014 StarTran study.⁷

Additionally, historical growth, as determined from StarTran's reporting to the National Transit Dataset, is used to estimate future baseline growth in system ridership. All assumptions used in the ridership project calculations are shown below in Table 3, while Table 4 shows the projected number of passengers that will benefit from the Project.

Table 3: Ridership Projection Assumptions and Sources

Variable	Unit	Value	Source
Annual Unlinked Bus Trips, 2013	Trips/Year	2,189,078	National Transit Dataset, 2013
Annual Unlinked Bus Trips, 2018	Trips/Year	2,395,752	National Transit Dataset, 2018
Compound Annual Growth in Trips	Percent	1.82%	WSP Calculations, 2020
Daily Trips on MTTC Routes, Weekdays	Trips/Day	7,340	StarTran, APC-Generated Ridership Analysis, Sept. 2019
Daily Trips on MTTC Routes, Saturdays	Trips/Day	2,412	StarTran, APC-Generated Ridership Analysis, Sept. 2019
Weekdays of Service (Excluding Six Holidays)	Days	254	Assumption
Weekend Days of Service (Saturday)	Days	52.5	Assumption
Share of Trips Transferring	%	19.8%	"StarTransfers," 2014
Time Elasticity of Demand	Factor	-0.129	Victoria Transport Policy Institute, 2019

⁶ StarTran. APC-Generated Ridership Analysis, September 1-31, 2019. Received October 14, 2019.

⁷ StarTransfers, 2014, A comprehensive look at the where, how and why of transfers related to 31-day pass users at the 11th and N Gold's Building downtown transfer site.

In addition to the baseline ridership growth anticipated, the Project is expected to attract new riders to the system due to the shorter transfer times and the amenities at the MTTC. The attraction of new riders is calculated using estimates of the time elasticity of demand associated with a reduction of bus travel time.⁸ Based on the elasticity of -.129 and an estimated change in total travel time of between 15 and 17 percent (reflecting off-peak/Saturday compared to peak), Build ridership is estimated to be approximately 2% higher than Baseline ridership. Table 4 shows the additional annual transfers anticipated under the Build scenario, which total approximately 360,000 new trips over the 30-year operations period.

Table 4: Ridership Projections

	2020	2023	2032	2042	2052	30-Year Total
Existing Transfers - AM Peak	244,312	257,901	303,374	363,362	435,212	10,920,115
Existing Transfers - Weekday	131,553	138,870	163,355	195,656	234,345	5,880,062
Existing Transfers - Saturday	25,529	26,949	31,701	37,969	45,477	1,141,092
Existing Transfers - Total	401,394	423,720	498,430	596,987	715,033	17,941,269
New Transfers - AM Peak	-	5,805	6,829	8,179	9,796	229,006
New Transfers - Weekday Off-peak	-	2,764	3,251	3,894	4,664	109,025
New Transfers - Saturday	-	543	639	766	917	21,437
New Transfers - Total	-	9,112	10,719	12,839	15,377	359,469

SOURCE: WSP, 2020

These trips are assumed to reflect shifts from automobile travel. Based on 2019 StarTran data, the average trip length per transferring rider is 6.46 miles on weekdays, and 7.13 miles on weekends. This length is multiplied by the number of new transfers shown in Table 4 and divided by average vehicle occupancy to calculate the change in vehicle miles of travel. These assumptions are shown in Table 5, and annual VMT reduction estimates are shown in Table 6.

Table 5: VMT Reduction Assumptions and Sources

Variable	Unit	Value	Source
Average Trip Length, Weekday	Miles	6.46	StarTran, APC-Generated Ridership Analysis, Sept. 2019
Average Trip Length, Saturday	Miles	7.13	StarTran, APC-Generated Ridership Analysis, Sept. 2019
Vehicle Occupancy, Weekday Peak	Occupants per vehicle	1.48	USDOT BCA Guidance, 2020
Vehicle Occupancy, Weekday Off-peak	Occupants per vehicle	1.58	USDOT BCA Guidance, 2020
Vehicle Occupancy, Weekend	Occupants per vehicle	2.02	USDOT BCA Guidance, 2020

Table 6: VMT Reduction Projections

	2020	2023	2032	2042	2052	30-Year Total
VMT Reduction - AM Peak	-	55,539	65,331	78,249	93,722	2,190,903
VMT Reduction - Weekday Off-peak	-	28,227	33,204	39,770	47,634	1,113,522
VMT Reduction - Saturday	-	7,825	9,205	11,025	13,206	308,701
VMT Reduction - Total	-	91,591	107,741	129,045	154,562	3,613,126

SOURCE: WSP, 2020

⁸ Victoria Transport Policy Institute, Understanding Transport Demands and Elasticities, 2019, Table 31 Travel Time Elasticities and Cross Elasticities, citing Dowling Asso. 2005, <https://www.vtpi.org/elasticities.pdf>

The annual ridership and VMT projections are utilized to calculate several benefits in this report.

4.2 Economic Competitiveness

This Project would contribute to increasing the economic competitiveness of Lincoln and the United States through improvements in the mobility of people in the study area. Two types of societal benefits are measured in the assessment of economic competitiveness: travel time savings and vehicle operating cost savings.

4.2.1 Travel Time Savings

As described in the Project Description, StarTran’s current scheduling and infrastructure at the 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 7. Per-trip savings are multiplied by the estimated number of baseline transferring passengers, shown above in Table 4, to estimate the total hours of travel time saved each year. In total, the project will save 1.8 million hours of travel time over the 30-year operations period.

Table 7: 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 8).

Table 8: 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

4.2.2 Vehicle Operating Cost Savings

The MTTC is expected to attract new transit riders to the system because of the transit system efficiencies and improved personal safety associated with the new facility. Those who shift travel mode from personal automobile (single occupant vehicle) to transit will reduce their personal vehicle operating costs. Vehicle operating cost savings are calculated by multiplying the reduction in vehicle miles traveled (shown above in Table 6) by operating costs per mile.

Average automobile operating costs per mile are assumed to be \$0.41 (2018 \$) per mile for light duty vehicles in accordance with USDOT’s 2020 BCA Guidance.

Total operating cost savings in the Build scenario over the analysis period are estimated at \$460,000 in present value, as shown in Table 9.

Table 9: Vehicle Operating Cost Savings Benefits, Millions of 2018 Dollars

Benefit	Project Opening Year		Project Lifecycle	
	Undiscounted	Discounted (7%)	Undiscounted	Discounted (7%)
Vehicle O&M Costs - Auto	\$0.04	\$0.03	\$1.48	\$0.46

SOURCE: WSP, 2020

4.3 Environmental Sustainability

The Project will generate environmental sustainability benefits related to reduction in air pollution associated with a reduction in Vehicle Miles Travelled (VMT) from passengers shifting from automobile trips to bus. This will result in lower fuel consumption and a reduction in the release of pollutants. For this analysis, six forms of emissions were identified, measured and monetized, including: nitrous oxide (NOx), particulate matter (PM2.5 and PM10), sulfur dioxide (SO₂), volatile organic compounds (VOC), and carbon dioxide (CO₂).

The emissions analysis follows a similar methodology as the vehicle operating cost savings, using avoided automobile VMT and per-mile emission rates to calculate the change in emissions under the Build scenario, relative to the No-Build scenario. The reduction in emissions between the two alternatives is then multiplied by the value of emissions reductions provided by USDOT.

The assumptions used in the estimation of environmental sustainability benefits are presented in Table 10.

Table 10: Environmental Sustainability Benefits Assumptions and Sources

Variable	Unit	Value	Source
Cost of NOx	2018\$ per short ton	\$8,600	US DOT, BCA Guidance 2020
Cost of PM	2018\$ per short ton	\$387,300	US DOT, BCA Guidance 2020
Cost of SO ₂	2018\$ per short ton	\$50,100	US DOT, BCA Guidance 2020
Cost of VOC	2018\$ per short ton	\$2,100	US DOT, BCA Guidance 2020
Cost of CO ₂	2018\$ per metric ton	\$1 through 2035, \$2 thereafter	US DOT, BCA Guidance 2020
Emissions per VMT	Metric tons of emissions per VMT	Varies by year, fuel type, and emission type	MOVES 2014b

Over the 20-year analysis period, the Project will result in nearly 747 fewer tons of emissions than under the No-Build alternative, valued at \$283 discounted 2018 dollars. Table 11 shows the amount and value of emissions savings as a result of the Project.

Table 11: Environmental Sustainability Benefits, 2018 Dollars

Benefit	Undiscounted	Discounted (7%)
CO ₂ Emissions Reduction	\$692.99	\$282.62
NOx Emissions Reduction	\$2,831.47	\$971.65
SOx Emissions Reduction	\$3,199.27	\$1,097.88
PM Emissions Reduction	\$31.40	\$12.23
VOC Emissions Reduction	\$1,208.89	\$337.02
Total Emissions Reduction	\$7,964.01	\$2,701.40

SOURCE: WSP, 2020

4.4 Residual Value

In addition, as the Project’s useful life exceeds the analysis period, a “residual value” is calculated to represent the remaining value of the Project at the end of the analysis period. The capital cost of construction, excluding design and land costs, is estimated to be \$10.2 million in 2018 dollars. This value is assumed to depreciate linearly over 40 years, such that at the end of the analysis, \$2.6 million remains as undiscounted value. When discounted using a 7 percent rate, this equates to \$274,270 in present value, as shown in Table 12.

Table 12: Residual Value Estimation of Benefits, Millions of 2018 Dollars

Benefit	Final Analysis Year	
	Undiscounted	Discounted (7%)
Residual Value	\$2.56	\$0.27

SOURCE: WSP, 2020

4.5 Safety

The transportation center is expected to promote customer safety while transferring between StarTran routes, by creating an indoor waiting area for transfer passengers, opposed to an informal, on-street transfer point. Additionally, the design of bus bays for pulse operations will enable safer operation of buses in and out of the facility, as it will add lanes to allow drivers to avoid incidents where drivers cannot navigate around other buses.

However, these benefits are difficult to quantify, and therefore have not been included in the benefit-cost analysis.

4.6 Quality of Life

The Project will create several non-quantifiable quality of life benefits:

- Improve safety, comfort, and convenience of StarTran passengers
- Improve StarTran’s operational efficiency and reliability, making it a more enticing and useful service for Lincoln residents
- Establish a vibrant and modern facility that encourages StarTran ridership, as well as economic development in the surrounding vicinity, such as mixed-used development and other transit-oriented development (TOD) projects.
- Promote a network of non-automobile transportation in Lincoln (including buses, pedestrians, cyclists, electric scooters, and more), thereby expanding access to employment, social and recreational opportunities to a broader swath of the regional population of all ages and abilities.

5 Summary of Results

5.1 Evaluation Measures

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.

5.2 BCA Results

Table 13 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 13: 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

6 Sensitivity Analysis

This analysis relies on many assumptions that, while based on the best available knowledge, are uncertain. This sensitivity analysis evaluates the impact of adjusting key assumptions on the BCR and NPV. As Table 14 demonstrates, even if all key assumptions are adjusted at the same time, the Project's benefits still exceed the costs.

Table 14: Sensitivity Analysis

Changes	BCR	NPV
No Change to Assumptions	1.7	\$7.0
Travel Time Savings Decreases by 10%	1.5	\$5.3
Base Ridership Decreases by 10%	1.5	\$5.3
No New Transfer Trips (Elasticity = 0)	1.7	\$6.6
No Residual Value (MTTC Fully Depreciates by 2052)	1.7	\$6.7
Capital Costs Increase by 25%	1.1	\$2.0
O&M Costs Increase by 25%	1.7	\$6.9
All Adjustments Combined	1.0	\$0.5



Prepared for StarTran and the City of Lincoln in partnership with:

