

Existing and Proposed Lower Cost Investment Programs for Consideration in *Destination 2040*

The investment programs listed below would support projects that cost less than \$20 million and do not add capacity to the existing transportation network. For each program, MPO staff has listed types of projects that the MPO is already funding through these programs ("existing") and other types of projects that the MPO could fund through these programs ("new" and shaded gray). MPO staff have also proposed a new program (shaded gray) for transit project types that would not be accommodated under existing programs. MPO staff identified these project types based on analysis conducted for the Needs Assessment and on public input. The MPO would highlight this set of project types when identifying project types that municipalities, MassDOT, or other entities could advance to the MPO for consideration.

Policy Question: Does the MPO want to incorporate additional types of projects into existing investment programs and/or add new programs?

Investment Program	Existing/ New	Types of Projects*	Safety	System Preservation	Capacity Management and Mobility	Clean Air/ Sustainable Communities	Transportatio n Equity	Economic Vitality
Intersection Improvements	Existing	Signal improvements (modernize existing signals, add new signals, or implement transit signal priority)	X	X	X	X	X	X
	Existing	Intersection geometry improvements (addition of turning lanes, shortened crossing distances for pedestrians, sidewalk improvements and curb cuts, and striping and lighting for bicyclists)	X	X	X	X	X	X
Complete Streets	Existing	Modernize roadway corridors (continuous sidewalks and bicycle lanes, cycle tracks, and other bicycle facilities, updated signals at multiple intersections along a corridor, or improvements to bridges, drainage, pavement, and roadway geometry)	X	X	X	X	X	X
	New	Construction of dedicated bus lanes and associated roadway improvements			X	X	X	X
	New	Climate resiliency improvements, including stormwater management improvements		X			X	X
Bicycle Network and Pedestrian Connections	Existing	Expansion of bicycle and pedestrian networks, including new off-road bicycle or multi-use paths, improved bicycle and pedestrian crossings, new sidewalks, traffic calming improvements, sidewalk network expansion, and enhanced signage and lighting	X	X	X	X	X	X
Community Transportation/Parking/ Clean Air and Mobility	Existing	Transit Operations: Projects that close gaps in the transit network (first-mile/last-mile shuttles, partnerships with transportation network companies, transit enhancements, and technology updates)			X	X	X	X
	Existing	Parking Management: Additional parking for automobiles and bicycles, and leasing off-site parking near transit stations with shuttles connections			X	X	X	X
	Existing	Bicycle and Pedestrian Improvements: Bicycle and pedestrian improvements for transit access, improvements to non-automotive transportation infrastructure for travelers with mobility impairments, and training and equipment for bicycles on transit			X	X	X	X

Investment Program	Existing/ New	Types of Projects*	Safety	System Preservation	Capacity Management and Mobility	Clean Air/ Sustainable Communities	Transportatio n Equity	Economic Vitality
Community Transportation/Parking/ Clean Air and Mobility	Existing	Education and Wayfinding: Projects could include travel instruction, training on new technologies, signage, and pilot or demonstration projects			X	X	X	X
	New	Connect Elderly Adults with Transportation: Connect elderly adults with transportation options, such as transportation network companies			X	X	X	
Transit Modernization Program	New	Flex MPO discretionary funding to transit modernization projects such as station or facility improvements or climate resiliency projects to improve transit infrastructure	X	X	X	X	X	X

* The MPO will encourage municipalities, MassDOT, and other entities to incorporate climate resiliency into the design of any project submitted to the MPO for consideration, and the MPO will consider climate resiliency as part of project evaluation and selection.

Major Infrastructure Project Type Categories for Consideration in *Destination 2040*

This table outlines project types within the MPO's Major Infrastructure program, which includes any project that costs more than \$20 million and/or adds capacity to the transportation network. Projects that meet one or both of these criteria must be specifically included in an LRTP before they can be programmed in the TIP. MPO staff has listed types of Major Infrastructure projects that the MPO has recently programmed using its Regional Target Funds ("existing") and other types of projects that the MPO could fund ("new" and shaded gray). MPO staff have included the new category for Major Infrastructure project types that is not currently being funded because of the MPO's policy of not funding the high cost projects. MPO staff identified these Major Infrastructure project types based on analysis conducted for the Needs Assessment and on public input. The MPO would highlight this set of project types when identifying project types that municipalities, MassDOT, or other entities could advance to the MPO for consideration.

Policy Questions: When developing *Charting Progress to 2040*, the MPO set a policy of programming no more than 50 percent of funding in each LRTP five-year time band to Major Infrastructure projects. Does the MPO want to affirm this policy for *Destination 2040* or change it? How does the MPO want to consider different Major Infrastructure project types as part of this policy?

Investment Program	Existing/New	Types of Projects*	Safety	System Preservation	Capacity Management and Mobility	Clean Air/Sustainable Communities	Transportation Equity	Economic Vitality
Major Infrastructure	Existing	Transit expansion/modernization , such as funding for rail extensions or facility or station improvements	X	X	X	X	X	X
	Existing	Large Complete Street projects (programmed projects of this scale include Highland Avenue/Needham Street in Newton and Needham, and Melnea Cass Boulevard in Boston)	X	X	X	X	X	X
	New	Interchange modernization (for example, I-95/I-95 Canton, I-95/I-95 Woburn, or the Braintree Split)	X	X	X	X		X

* The MPO will encourage municipalities, MassDOT, and other entities to incorporate climate resiliency into the design of any project submitted to the MPO for consideration, and the MPO will consider climate resiliency as part of project evaluation and selection.

TRANSIT MODERNIZATION PROGRAM

Description

This investment program would fund transit maintenance and modernization projects identified through coordination with the Massachusetts Department of Transportation, the Massachusetts Bay Transportation Authority (MBTA), MetroWest Regional Transit Authority and the Cape Ann Transit Authority. Increasing investments in transit modernization and maintenance projects would allow the Metropolitan Planning Organization (MPO) to use their discretionary funding to augment planned transit improvements throughout the region as well as help the MPO reach their goals established in the Long-Range Transportation Plan (LRTP).

Types of Eligible Projects

Examples of projects that could be funded through this investment program as well as the MPO goals they relate to are summarized below.

- **Accessibility Improvements:** These projects would align with the MPO's Transportation Equity goal and could include support for the MBTA's Plan for Accessible Transit Infrastructure. Eligible projects could include construction or replacement of redundant elevators at MBTA rapid transit or commuter rail stations, installing high-level platforms at presently inaccessible stations, or removing other barriers to accessibility at stations and MBTA and regional transit authority (RTA) bus stops.
- **Station Modernization Improvements:** These projects would align with the MPO's Transportation Equity and System Preservation and Modernization goals. Eligible projects could include system upgrades, customer amenities, or capacity enhancements at existing rapid transit and commuter rail stations.
- **Parking Improvements at Stations:** These projects would align with the MPO's Capacity Management and Mobility goal and support first-mile and last-mile access to transit. Eligible projects could include upgrades at existing parking facilities or new or expanded parking facilities to improve access to MBTA stations.
- **Infrastructure State of Good Repair Projects:** These projects would align with the MPO's System Preservation and Modernization goal. Specific projects could include investments to upgrade track, signals, and power systems to improve service reliability and enhance climate resiliency.
- **Fleet Modernization:** These projects would align with the MPO's System Preservation and Modernization and Clean Air and Sustainable Community

goals. Eligible projects could include planned replacements of RTA buses and MBTA bus and Silver Line fleets to a mix of hybrid and battery electric vehicles, replacement of single-level commuter rail coaches with higher capacity bi-level coaches, and various other upgrades and overhauls to improve service reliability.

- **Bus Maintenance Facilities Upgrades:** These projects would help the MPO achieve its System Preservation and Modernization goals. Projects funded in this category would include the upgrading and replacement of bus maintenance facilities to improve state of good repair, support additional capacity, and accommodate the future fleets.

Takeaways for LRTP Development

- If the MPO decides to adopt this new investment program, we will have to determine what percentage of funding is dedicated to this program and how that impacts the other LRTP investment programs.
- This investment program aligns with state priorities outlined in the *Choices for Stewardship: Recommendations to Meet the Transportation Future*, completed by the Commission on the Future of Transportation in the Commonwealth in December 2018. The report recommendations include modernizing existing state and municipal transit and transportation assets to more effectively and sustainably move more people throughout the Commonwealth by prioritizing investments in public transit.

DEDICATED BUS LANE PROJECTS

Recommendations for Funding under the Long-Range Transportation Plan's Complete Streets Investment Program

Description

The Boston Region Metropolitan Planning Organization (MPO) would coordinate with the Massachusetts Department of Transportation (MassDOT), the Massachusetts Bay Transportation Authority (MBTA), and regional transit authorities (RTAs) in the region to identify opportunities to flex the MPO's discretionary funding to dedicated bus lane projects under the MPO's existing Complete Streets investment program. This program would address capacity management and mobility, clean air, transportation equity, and economic vitality needs in the Boston region.

Types of Eligible Projects

The Dedicated Bus Lane Program would target specific corridors for the establishment of dedicated bus lanes for routes operated by the MBTA and the region's other RTAs. This program could include funding for pilot projects. Examples of recent dedicated bus lane projects in the Boston region that represent the types of projects that could be funded under this program include the following:

- **Arlington (MBTA Routes 77, 79, and 350):** The Town of Arlington collaborated with the MBTA to conduct a one-month dedicated bus lane pilot—between October 2018 and November 2018—on a three-mile stretch of Massachusetts Avenue. Enhancements included transit signal prioritization, bus queue jumping at traffic signals, the relocation of one bus stop, repurposed parking spaces between 6:00 AM and 9:00 AM, and a dedicated bus lane. Arlington plans to make these changes permanent in the summer of 2019.
- **Everett (MBTA Routes 97, 110, and 112):** In collaboration with the MBTA, the City of Everett enhanced a dedicated bus lane that was originally piloted in 2016 on Broadway between Glendale Square and Sweetser Circle on the inbound side of the street. Enhancements include platform-level boarding facilities and transit signal priority during peak hours.
- **Roslindale (Boston) (Ten MBTA Routes):** In 2018, the City of Boston implemented a dedicated bus lane pilot project on Washington Street between Roslindale Village and Forest Hills Station that lasted for four weeks and took place between 5:00 AM and 9:00 AM on weekdays. The dedicated bus lane prioritized the ten MBTA bus routes that travel on Washington Street between Roslindale and Forest Hills Station. The lane was also designed for use by bicyclists. It has since been made permanent.

Cost Information

To estimate costs of funding this program, the MBTA provided MPO staff with the estimated cost per mile for a dedicated bus lane in one direction; the costs would be doubled for projects that install bus lanes in both directions. They are as follows:

- Pavement markings (one lane): \$190,080
- Signage/lane markings: \$20,000
- Signal upgrades (assumes five): \$50,000
- Bus stop relocation (assumes three): \$30,000
- Basic curbing/grading: \$80,000
- Design services: \$55,512
- 20 percent contingency: \$85,118
- **Total estimated construction costs per mile for one side of roadway: \$510,710**

Staff then used this information to analyze the results of a previous MPO study that identified 114 priority corridors for the establishment of dedicated bus lanes. The corridors were identified based on where the installation of dedicated bus lanes would provide the most benefit to bus riders, as measured by the rate of delay that they encounter. To help estimate funding for these proposed projects, staff stratified segments based on ridership and found that there were 22 segments with ridership greater than 1,250 peak period passengers. The 22 segments cover approximately 17 miles of roadway. Staff calculated average segment costs for the length of each priority corridor, as shown in the accompanying table. The analysis demonstrates a method of prioritization based on ridership and rate of delay, and the MPO may choose to use a different method to prioritize bus lane projects. Staff will work with the MBTA and municipalities to prioritize projects that meet demonstrated needs and the MPO's goals and objectives.

The analysis shows that the average cost of installing a dedicated bus lane in one direction on the 22 segments with ridership greater than 1,250 peak period passengers would be \$383,033; the cost to install bus lanes in both directions on these segments would be \$741,873. (Some segments are one-way only.) Costs would vary based on the length of the project; the average length of the routes is 0.75 miles. Ridership is based on the 6:00 AM to 9:00 AM peak travel direction for most segments; in a few cases 3:00 PM to 6:00 PM was used instead, as noted. Note that none of the segments represent entire routes, and most riders begin their trips on preceding segments. Staff calculated the total and average two-way cost for the 22 segments. This resulted in a total cost of \$17,313,069 and an average cost of \$786,958 for existing priorities identified in the MPO study. Based on these estimates, staff recommends that once the goal has been established for the Complete Streets Program for *Destination 2040*, that an additional two percent is added to accommodate dedicated bus lane projects.

Takeaways for Long-Range Transportation Plan Development

- In the last LRTP, *Charting Progress to 2040*, the MPO committed to investing approximately \$936,263,000 over the life of the LRTP toward the Complete Streets investment program, which accounted for about 33 percent of all LRTP funding.
- Of the projects currently programmed in the FFYs 2019–23 TIP, 33 percent of MPO target funds were allocated to Complete Streets projects.
- To accommodate dedicated bus lane projects, MPO staff recommends increasing the Complete Streets investment program goal by two percent or approximately an additional \$15 million in each five-year time band.
- The development of this project category under the Complete Streets investment program aligns with state priorities outlined in the report *Choices for Stewardship: Recommendations to Meet the Transportation Future*, which was completed by the Commission on the Future of Transportation in the Commonwealth in December 2018. The report recommends that MPOs partner with municipalities, RTAs, and MassDOT to prioritize street space for transit, provide signal priority, and improve amenities for riders at bus stops. According to the report, transit is the most important tool to address congestion, and funding dedicated bus lane projects can help the MPO do so.

High-Priority Bus Route Segments with Ridership Over 1,250

Segment Location	Municipality	Segment Length (Miles)	Peak Ridership	AM or PM Peak Ridership	Travel Direction^a	MBTA Bus Routes that Run on Segment^b	Estimated One-way Cost^c	Estimated Two-way Cost^c
Warren Street, from Blue Hill Avenue to Dudley Square	Boston	1.4	3,053	AM	N	14, 19, 23,28, (44)	\$714,994	\$1,429,988
Malcolm X Boulevard, from Roxbury Crossing to Dudley Square	Boston	0.5	2,475	AM	N	15, 23, 28, 44, 45, 66	\$255,355	\$510,710
Washington Street, from Melnea Cass Boulevard to Dudley Station	Boston	0.3	1,994	PM	O	SL4, SL5, 1, (8,9,47)	\$153,213	\$306,426
Huntington Avenue, from Riverway to Fenwood Road	Boston	0.4	1,970	AM	I	39, 66	\$204,284	\$408,568
Ruggles Station to Roxbury Crossing Station	Boston	0.5	1,943	AM	N	15, 22, 23, 28, 44, 45	\$255,355	\$510,710
Dorchester Avenue, from B Street to Broadway	Boston	0.3	1,935	AM	W	(9, 11,47)	\$153,213	\$306,426
West Fourth Street, from Albany Street to Dorchester Avenue	Boston	0.3	1,891	AM	W	9,11,47	\$153,213	\$153,213
Blue Hill Avenue, from Columbia Road to Seaver Street	Boston	0.1	1,873	AM	N	14, 22, 28, 29,45	\$51,071	\$102,142
Washington Street, from Essex Street to Herald Street	Boston	0.4	1,837	AM	I	SL4, SL5, 11	\$204,284	\$408,568
Park Street, from Chelsea to Maverick Station	Chelsea, Boston	1.5	1,816	AM	I	116, 117, (120, 121)	\$766,065	\$1,532,130
Blue Hill Avenue, from American Legion Highway to Columbia Road	Boston	0.4	1,767	AM	N	14, 22, 28, 29	\$204,284	\$408,568
East Berkeley Street, from Albany Street to Washington Street	Boston	0.2	1,684	AM	W	9,11	\$102,142	\$102,142
Mount Auburn Street, from Bennett Alley to Coolidge Street	Cambridge	0.9	1,668	AM	I	71, 73	\$459,639	\$919,278
Hyde Park Avenue at Cummins Highway to Forest Hills	Boston	1.3	1,637	AM	I	32	\$663,923	\$1,327,846
Blue Hill Avenue, from Mattapan to Morton Street	Boston	1.2	1,571	AM	N	28, 29, 31	\$612,852	\$1,225,704
Dudley Street, from Dudley Square to Uphams Corner	Boston	1.1	1,570	AM	W	15, 41, (45)	\$561,781	\$1,123,562
Blue Hill Avenue, from Morton Street to American Legion Highway	Boston	1.0	1,529	AM	N	28, 29, (22)	\$510,710	\$1,021,420
L Street at East Broadway to Summer Street at Drydock Avenue	Boston	0.7	1,445	AM	W	7	\$357,497	\$714,994
Washington Street, from West Boundary Road to Cummins Highway	Boston	1.7	1,403	AM	I	34, 34E, (40, 50)	\$868,207	\$1,736,414
Hyde Park Avenue, from Cleary Square to Cummins Highway	Boston	1.7	1,390	AM	I	32	\$868,207	\$1,736,414
Summer Street at Drydock Avenue to Summer Street at South Station	Boston	1.0	1,309	AM	W	7,14	\$510,710	\$1,021,420
Malden Center to Main Street via Centre Street	Malden	0.3	1,259	AM	I	106, 108, 136, 137, 411, 430	\$153,213	\$306,426
Total for Segments with Ridership of at Least 1,250		17.2					\$8,784,212	\$17,313,069
Average Cost							\$399,282	\$786,958

^a For radial routes with a clear meaning for inbound or outbound, the directions used are I and O. For crosstown routes where the designation of inbound and outbound would be arbitrary, compass directions are used.

^b Bus routes in parentheses run on part of the route segment.

^c Costs are based on estimated MBTA costs of \$510,710 per mile in one direction. The cost for two-way streets is double the cost for one-way streets except for segments on one-way streets.

E = East. I = Inbound. MBTA = Massachusetts Bay Transportation Authority. N = North. O = Outbound. S = South. W = West.

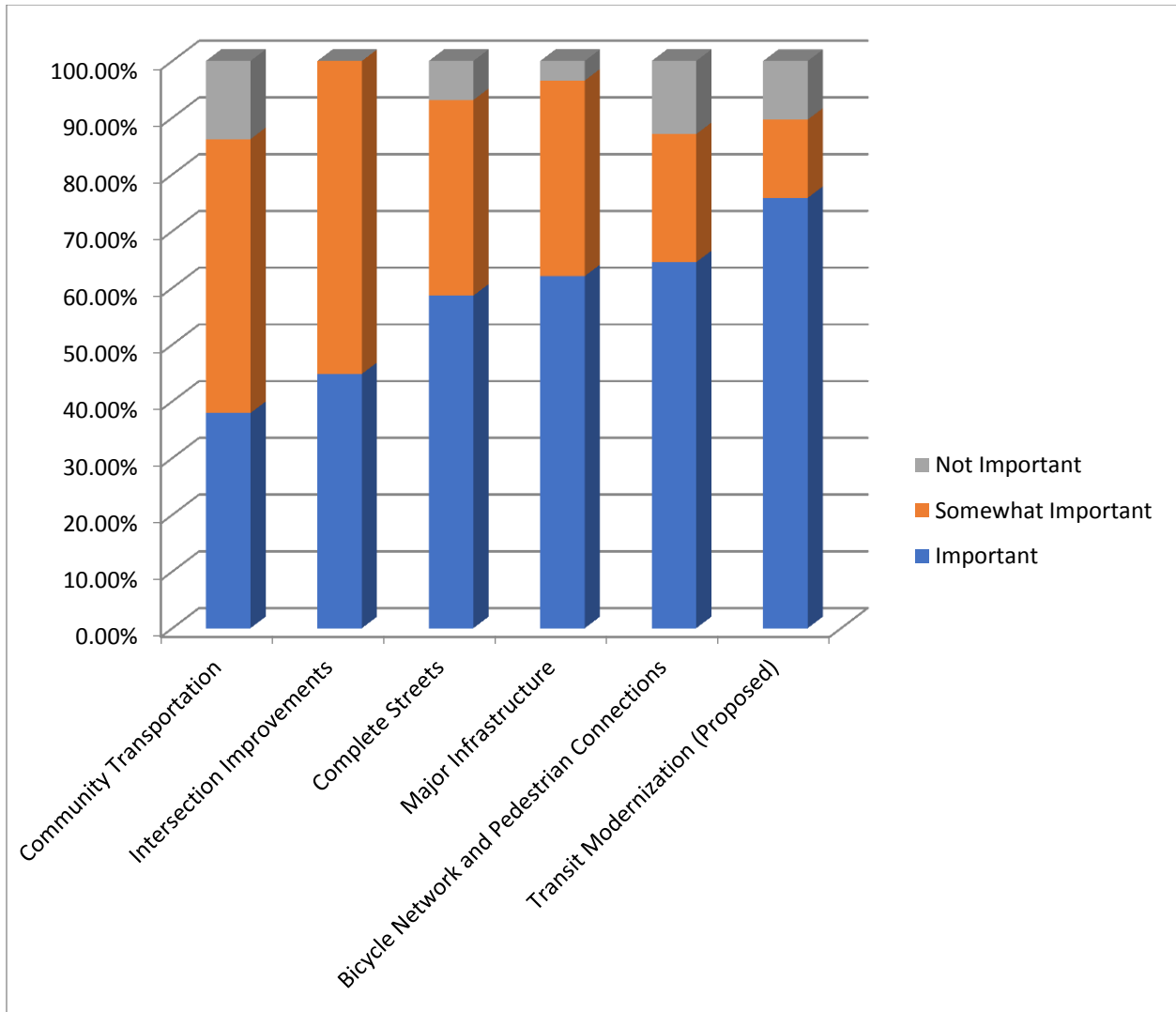
Note: In a previous study conducted by the Central Transportation Planning Staff (CTPS), 105 priority corridors for the establishment of dedicated bus lanes were identified. Staff did not assign relative priority order for the implementation of these corridors. Staff then identified 114 route segments that are within the corridors and prioritized them based on the number of passengers during the peak-period. The list in this table are those route segments that have a peak-period ridership of at least 1,250.

DESTINATION 2040: UNIVERSE OF PROGRAMS SURVEY RESPONSES

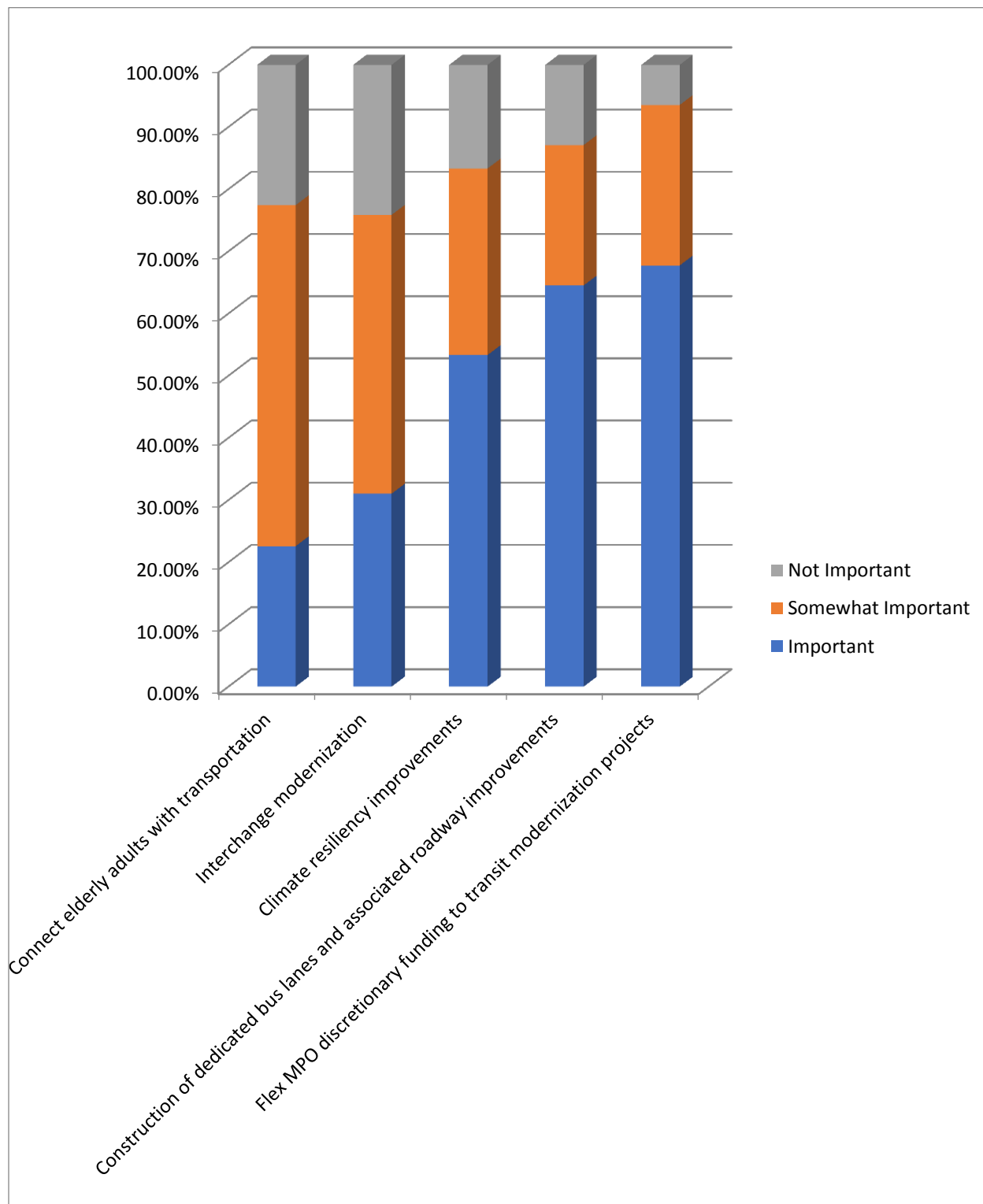
MPO staff created a survey of seven questions designed to gauge respondents' opinions on the content of the Universe of Projects and Programs for *Destination 2040*. The survey was designed to help the MPO understand how well respondents felt the proposed Universe of Projects and Programs accomplishes the MPO's goals and aligns with its vision for *Destination 2040*. MPO staff received 33 completed survey forms to date. The survey is still available online, however the following graphs detail responses for the questions focusing on the Universe of Programs, as of April 24, 2019. The final results for the Universe of Projects will be presented at the May 2, 2019, MPO meeting when the MPO begins the discussion about project selection.

Universe of Programs

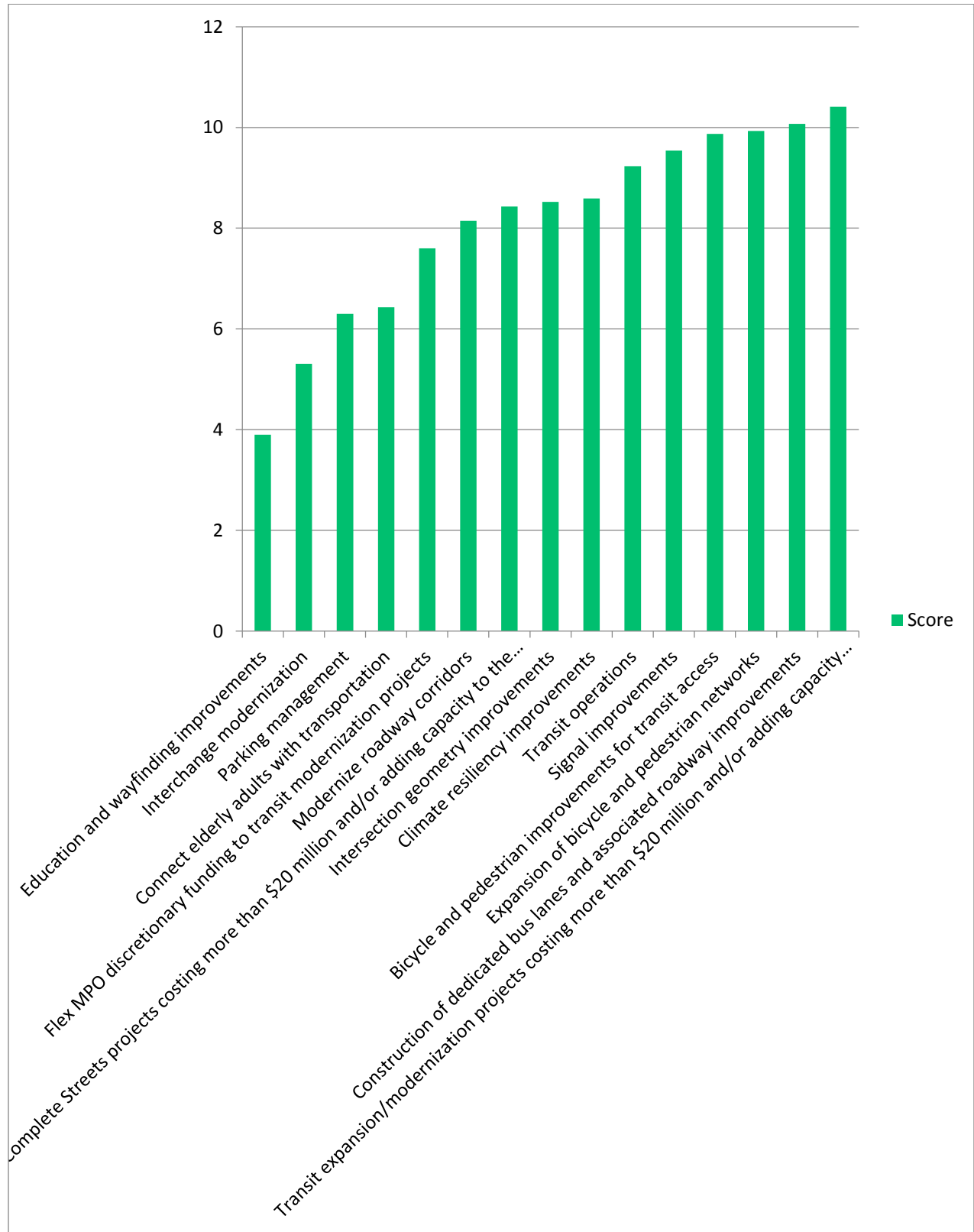
How important are the existing and proposed investment programs to you?



The MPO is considering adding the following proposed project types to those eligible for funding under the existing investment programs. How important are the proposed project types to you?



Please rank all the project types below in order of importance to you.



Additional Feedback

Respondents advocated for the following programs, project types, system-wide improvements, and policy positions.

The majority of respondents advocated for increased transit, Complete Streets, and safe and protected pedestrian and bicycle facilities. Other main concerns included the implementation of Bus Rapid Transit and other bus-priority measures, and climate resiliency. Two respondents advocated for a congestion pricing program. Two respondents advocated for the implementation of a “Regional Rail” vision for the MBTA commuter rail. At least one respondent advocated for each of the following.

- Interchange modernization
- Modernization of Department of Conservation and Recreation-owned corridors
- Better use of curb space
- Increased preparation for emerging technologies like TNCs and AV/CVs
- Increased road capacity and additional overpasses
- The equitable distribution of funding throughout the region and in the Inner Core
- More attention to serving Environmental Justice populations other than seniors.

One respondent felt that the idea of "adding capacity" as a benchmark for LRTP projects is too limited and asked the MPO to consider large-scale maintenance projects that increase throughput and decrease congestion.

One respondent felt that any increase in parking should be paid for by user fees and not through the federal funding process.

One respondent specifically asked for investment in Mattapan/Hyde Park, East Cambridge/East Somerville, and Brighton/Allston to better connect communities to the core of Downtown Boston.