Appendix G

Technical Report on Non-motorized Transportation Project Ranking Methodology

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Technical Report on Non-motorized Transportation Project Ranking Methodology

The planning process results in lists of needed projects. Given that funding has been and continues to be scarce, a key question is which of the identified projects would be most beneficial?

The project ranking process consisted of the following steps: identification of relevant criteria; development of a scoring system; and the assignment of weights to the criteria. This process allows the list of pedestrian projects and the list of bicycle projects to be sorted in order of overall utility the project is expected to provide to either pedestrians or bicyclists. The ranking may assist CORE MPO and other agencies in deciding which projects to advance first.

Identification of Scoring Criteria

MPO staff began thinking about the pedestrian and bicycle scoring criteria by considering the question: "What makes one project more beneficial than another project?" The following eight criteria were proposed:

- **Usefulness**: Give points to projects that are likely to see high levels of use, by making improvements near where people live, work, go to school, recreate, etc.

- **Current Discomfort**: Give points to projects that address areas where current conditions are worst.

- **Network Expansion**: Give points to projects that extend the existing network, thus capitalizing on past investments for greater effect.

- **Linkage to Transit Modes**: Give points to projects that provide connections to buses, ferries, etc., as those could help expand the geographic reach of walkers and bicyclists.

- **Lack of Nearby Alternative Routes**: Give points to projects that are located on critical links, where no better, parallel route exists within a feasible distance (e.g. marsh crossings).

- **Crash Reduction Potential**: Give points to projects that address the crash "hot spots" identified in the study of existing conditions.

- **Congestion Reduction Potential**: Give points to projects that are located in congested areas, where travelers might consider alternatives to driving.

- **Public Request**: Give points to projects that address areas mentioned during the plan's participation process.

Scoring and Weighting

Raw Scoring

Once the criteria concepts were identified, it was necessary to select a method to measure and score how well a project meets the criteria and decide whether some of the criteria should be weighted for greater importance. Because pedestrians' needs and bicyclists' needs are not entirely identical, the process was considered separately from each perspective.

After testing several iterations, MPO staff selected the following scoring methods, one for pedestrian projects and one for bicycle projects.

Pedestrian Project Prioritization Criteria (0-42 points)		
CRITERIA	**MEASUREMENT METHOD**	**SCORING**
Potential usefulness	**Concept Max. = 8 points**	
Access to high population areas	Project location in relation to higher density census blocks (population per sq. mile) within the planning area Max. = 2 points	• Not touching on a cluster of high-density census blocks = 0 points • Touching on one or more clusters of high-density census blocks = 2 points
Access to high employment areas or schools	Project location in relation to the top four employment areas in the planning area or to schools Max. = 2 points	• Not touching on any high employment areas or accessing school = 0 points • Touching on one or more high employment areas or accessing school = 2 points
Proximity to area(s) of zero-auto households	Project location in relation to block groups with high percentage of 0-vehicle households Max = 2 points	• Not touching on census block groups in the top two categories for 0-vehicle HHs = 0 points • Touching on census block groups in the top two categories for 0-vehicle HHs = 2 points
Access to paratransit destinations	Project accesses one of top three paratransit destinations, as identified from Teleride staff Max. = 2 points	• Does not improve access to paratransit destinations = 0 points • Improves access to paratransit destinations = 2 points
Current level of discomfort	**Concept Max. = 6 points**	
Motor traffic volume	Adjacent street AADT Max. = 3 points	• AADT < 5,000 = 0 points • AADT 5,000 < 10,000 = 1 points • AADT 10,000 < 20,000 = 2 points • AADT > 20,000 = 3 points
Motor traffic speed	Adjacent street's posted speed Max. = 3 points	• Posted speed ≤ 25 mph = 0 points • Posted speed > 25 ≤ 35 = 1 points • Posted speed > 35 ≤ 45 = 2 points • Posted speed > 45 = 3 points
Pedestrian network expansion	Existence of pedestrian facilities at ends of or along the project segment **Concept Max. = 6 points**	• No connections to an existing facility of at least ¼ mile long = 0 points • One end or one intermediate point connects = 3 points • Both ends or multiple points connect = 6 points
Transit linkage (access to transit stops or station)	Number of bus routes having 1-hr headways or better serving the accessed stops; or express route; or accessing other mode stop/station (e.g. train, boat, air) **Concept Max. = 6 points**	• Does not improve access to routes meeting headway threshold, express route, or any other mode stop = 0 • Improves access to one route meeting headway threshold, express route, or accesses other mode = 3 points • Improves access to two or more routes meeting headway thresholds or express route; or accesses one those bus route plus one other mode stop = 6 points
Lack of alternative routes	Presence of a usable, parallel alternative connection **Concept Max. = 4 points**	• Parallel connection exists within 1/4 mile = 0 points • No parallel connection exists within 1/4 mile = 4 points
Congestion mitigation potential	Located in known, denser congestion area, or facilitates "park once" behavior at congested destinations. **Concept Max. = 4 points**	• Located in non-congested area = 0 point • Located in congested area = 4 points
Crash-reduction potential	Any portion of the project is located in a pedestrian crash cluster area, as identified in the Technical Report on Pedestrian and Bicycle Crashes. **Concept Max. = 4 points**	• Not located in a crash cluster area = 0 points • Touches crash cluster area = 4 points
Specifically mentioned as problem area or desired project in public participation activities	On the list of publicly identified projects **Concept Max. = 4 points**	• Not mentioned in public participation = 0 points • Mentioned in public participation = 4 points

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Bicycle Project Prioritization Criteria (0-42 points)		
CRITERIA	**MEASUREMENT METHOD**	**SCORING**
Potential usefulness	**Concept Max. = 8 points**	
Access to high population areas	Project location in relation to higher density census blocks (population per sq. mile) within the planning area Max. = 2 points	• Not touching on a cluster of high-density census blocks = 0 points • Touching on one or more clusters of high-density census blocks = 2 points
Access to high employment areas or schools	Project location in relation to the top four employment areas in the planning area or to schools Max. = 2 points	• Not touching on any high employment areas or accessing school = 0 points • Touching on one or more high employment areas or accessing school = 2 points
Proximity to area(s) of zero-auto households	Project location in relation to block groups with high percentage of 0-vehicle households Max = 2 points	• Not touching on census block groups in the top two categories for 0-vehicle HHs = 0 points • Touching on census block groups in the top two categories for 0-vehicle HHs = 2 points
Useful to tourists	Project overlaps state bicycle route(s) and/or Coastal Georgia Greenway (CCG) route or is scenic, off-road path Max. = 2 points	• Does not overlap state/regional bike routes or is not scenic, off-road path = 0 points • Overlaps state/regional bike routes or is scenic, off-road path = 2 points
Current condition	Bicycle LOS (on most of the segment) **Concept Max. = 6 points**	• LOS A = 0 points (current condition is bicycle-friendly) • LOS B = 0 points • LOS C = 1 points • LOS D = 2 points • LOS E = 4 points • LOS F = 6 points (current condition is hostile for bicycling) (Note: if the segment is a path or road that does not yet exist, then the score is based on the LOS of whatever route bicyclists must take currently for same end connections.)
Bicycle network expansion	Existence of bicycle facilities at ends of or along the project segment (facilities = dedicated type or shared lanes on signed route with LOS C or higher) **Concept Max. = 6 points**	• No connections to an existing facility of at least ¼ mile long = 0 points • One end or one intermediate point connects = 3 points • Two or more ends or middle points connect = 6 points
Transit linkage (access to transit stops or station)	Number of bus routes having 1-hr headways or better serving the accessed stops; or express route; or accessing other mode stop/station (e.g. train, boat, air) **Concept Max. = 6 points**	• Does not improve access to routes meeting headway threshold, express route, or any other mode stop • Improves access to one route meeting headway threshold, express route, or accesses other mode = 3 points • Improves access to two or more routes meeting headway thresholds or express route; or accesses one those bus route plus one other mode stop = 6 points
Lack of alternative routes	Existence of a usable, parallel alternative connection within ½ mile (usable = better than the route under consideration) **Concept Max. = 4 points**	• Parallel connection exists within 1/2 mile = 0 points • No parallel connection exists within 1/2 mile = 4 points
Congestion mitigation potential	Located in known congestion area, per CMP or other source. **Concept Max. = 4 points**	• Located in non-congested area = 0 point • Located in congested area = 4 points
Crash-reduction potential	Any portion of the project is located in a bicycle crash cluster area, as identified in the Technical Report on Pedestrian and Bicycle Crashes. **Concept Max. = 4 points**	• Not located in a crash cluster area = 0 points • Touches crash cluster area = 4 points
Specifically mentioned as problem or desired project in public participation	On the list of publicly identified projects **Concept Max. = 4 points**	• Not mentioned in public participation = 0 points • Mentioned in public participation = 4 points

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Weights for Criteria

In any ranking process, it is possible that some scoring criteria are more important than others. The raw scoring method attempted to avoid any built-in weighting as much as possible, given the differences among the criteria in the gradations of measurement (all-or-nothing vs. a spectrum of points).

MPO staff sought feedback from the CORE MPO advisory committees (Technical Coordinating Committee, Citizens Advisory Committee, and the Advisory Committee on Accessible Transportation) on how to weight the criteria. The Savannah Bicycle Campaign also had the opportunity to provide input on the weights.

The exercise asked participants to distribute a total of 40 points among the eight criteria according to importance, with the most important criteria getting the most points. (In other words, since there are eight criteria, each criterion starts off with five points, and participants would shift points from one criterion to another to indicate relative importance.)

After tabulating the input from committees and advocates, staff used the results along with professional judgment to determine the criteria weights as shown below, in order of declining importance in each table.

PEDESTRIAN Criteria	Weight
Usefulness (How important is it to build projects that are likely to see high levels of use, by making improvements near where people live, work, go to school, recreate, etc.?)	8
Linkage to Transit Modes (How important is it to provide pedestrian connections to buses, ferries, etc.)	8
Current Discomfort (How important is it to first address the areas where walking or using a wheelchair is the most uncomfortable?)	6
Pedestrian Network Expansion (How important is it to expand and enhance the network by connecting to existing facilities?)	6
Lack of Nearby Alternative Routes (How important is to ensure that pedestrians are not closed off from whole sections of the county by barriers such as a marsh or railroad?)	4
Pedestrian Crash Reduction (How important is it to make improvements in areas that have had higher than usual amount of pedestrian crashes?)	4
Congestion Reduction (How important is it to offer alternatives to driving in the most congested areas?)	2
Public Request (How important is it to focus on the projects that have been mentioned in the participation process?)	2
TOTAL	40

BICYCLE Project Ranking Criteria	Weight
Usefulness (How important is it to build projects that are likely to see high levels of use, by making improvements near where people live, work, go to school, recreate, etc.?)	8
Bicycle Network Expansion (How important is it to expand and enhance the network by connecting to existing facilities?)	8
Current Discomfort (How important is it to first address the areas where bicycling is the most uncomfortable?)	6
Lack of Nearby Alternative Routes (How important is to ensure that bicyclists are not closed off from whole sections of the county by poor accommodation on bridges or other pinch points?)	5
Bicycle Crash Reduction (How important is it to make improvements in areas that have had higher than typical amount of bicycle crashes?)	4
Linkage to Transit Modes (How important is it to provide bicycle connections to buses, ferries, etc.)	3
Congestion Reduction (How important is it to implement bicycle improvements in congested areas in hopes of reducing the number of autos there.)	3
Public Request (How important is it to focus on the projects that have been mentioned in the participation process?)	3
TOTAL	40

Each criterion's weight is used as a multiplier on a given project's raw score for that criterion. The final weighted score can range from 0 to 232 for pedestrian projects and from 0 to 226 for bicycle projects, although a perfect score for either type would be rare. The charts below display the complete scoring process using hypothetical examples. A comparison of the two charts illustrates how any given project would score differently in the pedestrian ranking and in the bicycle ranking, due mostly to the differences in how the criteria are weighted for the two modes.

The Project Lists section of the Non-motorized Transportation Plan includes the tables of actual projects with their weighted scores.

Pedestrian Project Ranking Process Example				
Criteria	Project 1 (most desirable)		Project 2 (less desirable)	
	Raw	Weighted	Raw	Weighted
In area with high pop. density (0, 2)	2	NA	0	NA
In area with high emp. density or near school (0, 2)	2	NA	2	NA
In area with high non-auto households (0,2)	2	NA	0	NA
Accesses one of the top three paratransit destinations (0,2)	2	NA	2	NA
Total Usefulness Score (sum of above) *Weighting factor = 8*	8	**64**	4	**32**
Improves pedestrians' comfort on a hostile segment (0-6) *Weighting factor = 6*	6	**36**	4	**24**
Extends current pedestrian network (0, 3, 6) *Weighting factor = 6*	6	**36**	3	**18**
Links to transit (0, 3, 6) *Weighting factor = 8*	6	**48**	3	**24**
On a segment providing critical link (no alternative route) (0, 4) *Weighting factor = 4*	4	**16**	0	**0**
Improves mode choices in a congested area (0, 4) *Weighting factor = 2*	4	**8**	0	**0**
Addresses a pedestrian crash "hot spot" (0, 4) *Weighting factor = 4*	4	**16**	0	**0**
Mentioned in public comments (0, 4) *Weighting factor = 2*	4	**8**	4	**8**
TOTAL	42	**232**	18	**106**

(Bicycle Project Ranking Process Example is shown on next page.)

Bicycle Project Ranking Process Example				
Criteria	Project 1 (most desirable)		Project 2 (less desirable)	
	Raw	Weighted	Raw	Weighted
In area with high pop. density (0, 2)	2	NA	0	NA
In area with high emp. density or near school (0, 2)	2	NA	2	NA
In area with high non-auto households (0,2)	2	NA	0	NA
Overlaps Coastal GA Greenway, state bike route, or would be a scenic path (promoting tourism/ econ. dev.) (0,2)	2	NA	2	NA
Total Usefulness Score (sum of above) *Weighting factor = 8*	8	**64**	4	**32**
Improves bicyclists' comfort on a hostile segment (0, 1, 2, 4, 6) *Weighting factor = 6*	6	**36**	4	**24**
Extends current bicycle network (0, 3, 6) *Weighting factor = 8*	6	**48**	3	**24**
Links to transit (0, 3, 6) *Weighting factor = 3*	6	**18**	3	**9**
On a segment providing critical link (no alternative route) (0, 4) *Weighting factor = 5*	4	**20**	0	**0**
Improves mode choices in a congested area (0, 4) *Weighting factor = 3*	4	**12**	0	**0**
Addresses a bicycle crash "hot spot" (0, 4) *Weighting factor = 4*	4	**16**	0	**0**
Mentioned in public comments (0, 4) *Weighting factor = 3*	4	**12**	4	**12**
TOTAL	42	**226**	18	**101**

Use of the Ranking Process

The scoring process described above is applied to each identified project in the Non-motorized Transportation Plan, in order to display ranked a list of pedestrian projects and a ranked list of bicycle projects, within the plan document.

The resulting project scores reflect the relative, overall utility of the projects, but other considerations also influence the actual decision to fund a project. Such considerations might include the willingness of local or state agencies to sponsor the project, the eligibility of the project for a particular type of funding, and possible synchronicity with other projects. Therefore the project rankings do not necessarily indicate the order of implementation, but are a starting point for decision-making.