Policy Area	Policy Statement	Recommended Strategies and Actions	Reason for Inclusion
Coordination	Establish effective coordination processes and partnerships to advance bicycle and pedestrian projects.	Establish protocols and procedures for internal coordination of bicycle and pedestrian project design and implementation as part of City projects and new development.	Interviews
Coordination		Establish protocols and procedures for coordination of bicycle and pedestrian projects with external agency stakeholders, such as Caltrans, ACFD, DUSD, and adjacent jurisdictions. Utilize existing regional channels such as the Tri-Valley Transportation Council to coordinate bicycle and pedestrian improvement projects that abut or intersect jurisdictional boundaries.	Interviews, Best Practices
Coordination		Designate a City staff person and work with DUSD to designate a district staff person that is responsible for coordination between on issues related to school connectivity and Safe Routes to School.	Interviews
Coordination		Develop a coordination protocol between the City and DUSD to jointly identify and fulfill school crossing guard needs.	Interviews
Data Collection	Routinely collect trip and facility information to track trends, evaluate projects, and prioritize investments.	Develop an inventory of pedestrian- and bicycle-oriented lighting along trails and identify locations for additional lighting.	Interviews, Streetscape Master Plan Lighting Recommendations
Data Collection		Develop data collection plan and standard operating procedures for collection of speed survey data, especially along high-injury segments and other priority locations such as streets near schools. Develop and maintain a spatial database of speed survey data.	Interviews
Data Collection		Develop and maintain a spatial database of bicycle and pedestrian counts.	Interviews
Data Collection		Develop data collection plan and standard operating procedures for collection of bicycle and pedestrian counts, especially at activity centers and other priority locations such as streets near schools.	Interviews
Data Collection		Require pedestrian and bicycle counts as part of the traffic impact analysis that is required of development projects.	Interviews
Data Collection		Develop and maintain a spatial database of bicycle facilities and amenities, including bike parking and fix-it stations.	Interviews
Design	Go beyond minimum design standards. Incorporate safe walking and biking facilities into transportation projects.	Review and update engineering and design guidance to go beyond minimum standards.	Interviews
Design		Implement Climate Action Plan 2030 Measure SM-7: Develop a Built Environment that Prioritizes Active Mobility and supporting actions that improve the pedestrian experience and create a built environment that prioritizes active mobility.	CAP 2030
Design		Establish a list of approved traffic calming strategies and devices to be considered with restriping and other roadway improvement projects.	Interviews
Design		Require new infrastructure projects to adhere to the Engineering and Design Guidelines established by this plan. Implement design review process that ensures compliance with Engineering and Design Guidelines, including for construction work zones.	Interviews
Design		Update site access design standards for new development to include bicycle and pedestrian considerations.	Interviews
Design		Develop decision-making guidance and a process for determining appropriate crossing and intersection treatments	Interviews
Design		Establish, update, and implement maintenance policies and standards for bicycle and pedestrian facilities on City right-of-way. Review the existing Class I Facility Maintenance Plan (2015) and develop a standard maintenance plan for bicycle facilities of all types in the City which accounts for factors such as paint maintenance and sweeping protocols.	Interviews
Emerging Technologies	Leverage emerging transportation technologies to support travel by sustainable modes.	Develop policy for development of emerging technology, or micromobility, pilot. Topics to consider include: general provisions, operations, equipment and safety, parking and street design, equity, communications and community engagement, data, and metrics. Consistent with Strategy 3 - Sustainable Mobility and Land Use in the Climate Action Plan 2030, the City will work with micromobility and last mile transportation providers to allow the use of scooters and bike share programs in specific locations within Dublin.	Best Practices, CAP 2030
Emerging Technologies		Monitor and evaluate the development of emerging transportation technologies (such as bikeshare, scootershare, and electric bikes) on walking and biking in Dublin.	Best Practices
Emerging Technologies		Develop policy or ordinance on Non-Motorized Trail Use and conduct public safety, education and outreach campaign to raise awareness on path etiquette.	Best Practices
Funding and Implementation	Increase investment in walking and biking infrastructure and supporting programs. Identify and allocate resources to implement Plan recommendations.	Incorporate proposed bicycle and pedestrian network into the development review processes to facilitate the Plan's implementation. Develop clear direction for City staff and the development community for implementing bicycle and pedestrian projects.	Interviews, Downtown Dublin Specific Plan Guiding Principles
Funding and Implementation		Develop a list of potential grant and alternative funding strategies.	Best Practices, Downtown Dublin Specific Plan Guiding Principles
Funding and Implementation		Add priority bicycle and pedestrian projects to the Capital Improvement Program.	Best Practices

Policy Area	Policy Statement	Recommended Strategies and Actions	Reason for Inclusion
Funding and Implementation		Ensure that bicycle and pedestrian improvements continue to be included in street rehabilitation and modification projects, such as resurfacing or lane reconfiguration.	Best Practices
Funding and Implementation		Utilize the strategies detailed in the Engineering and Design Guidelines for rapid network implementation and interim design treatments.	Interviews, Dublin Boulevard Study
Funding and Implementation		Hire sufficient dedicated bicycle and pedestrian staff to meet the League of American Bicyclist's Bronze Standard (at least one full time dedicated staff person per 100,000 population).	Interviews
Promotion and Encouragement	Encourage and promote increased use of sustainable travel modes, especially walking and biking.	Coordinate with government and nonprofit health agencies to promote walking and biking through education and social media campaigns.	Pedestrian Safety Assessment (2014)
Promotion and Encouragement		Create a citywide bike network and amenities map	Best Practices
Promotion and Encouragement		Coordinate with local walking and biking organizations to create supporting programs and events, such as an Open Streets or Slow Streets program.	Best Practices
Promotion and Encouragement		Continue to partner with Alameda County Transportation Commission to deliver Safe Routes to School assessments and programs	Best Practices
Promotion and Encouragement		Encourage businesses to be recognized as Bicycle Friendly Businesses through the League of American Bicyclists	Best Practices
Promotion and Encouragement		Provide fix-it stations at community centers and public parks	Best Practices
Supporting Infrastructure	Provide supporting infrastructure and amenities to make walking and biking convenient and comfortable.	Within Downtown, implement Guidelines 4.5.2 Bike Racks from the Downtown Dublin Streetscape Master Plan and install shamrock-shaped racks of varied colors.	
Supporting Infrastructure		Where short-term and long-term bike parking is recommended, require bike parking to be designed to accommodate various types of bicycles such as e-bikes, folding bikes, and cruiser bikes. Implement guidance included in the Engineering and Design Guidelines to this plan.	Interviews, Downtown Dublin Specific Plan Development Standards
Supporting Infrastructure		Amend the Parks and Recreation Master Plan to require bike parking at trail heads and parks.	Interviews, Downtown Dublin Specific Plan Mobility Plan
Supporting Infrastructure		Develop bicycle and pedestrian wayfinding style and implementation standards. Coordinate with Public Art Program and Downtown Dublin Streetscape Master Plan.	Interviews, Downtown Specific Plan Pedestrian Circulation Standards
Transportation Demand Management	Implement strategies to reduce vehicle travel.	Develop and implement a citywide TDM program to support provision of additional transportation options and incentives to choose sustainable modes and supplement the infrastructure improvements identified in this plan. Consistent with Measure 3: Develop a Transportation Demand Management Plan within Strategy 3: Sustainable Mobility and Land Use Measure in the Climate Action Plan 2030, the City will develop a comprehensive TDM Plan for the City of Dublin. The TDM Plan will identify strategies to help facilitate the move from single-occupancy vehicles to less carbon intensive transportation modes, like walking and biking.	Interviews, CAP 2030
Transportation Demand Management		Consistent with Climate Action Plan 2030 Measure 4: Develop a Citywide Parking Management Plan within Strategy 3: Sustainable Mobility and Land Use Measure, the City will develop a comprehensive parking management plan that will specify parking requirements and pricing that supports multimodal transportation and a reduction in vehicle miles traveled.	CAP 2030
Transportation Demand Management		Conduct a travel survey and an inventory of TDM in coordination with Dublin businesses.	Interviews
Transportation Demand Management		Develop guidance for planning staff on requirements for new development, including TDM plans, provision of bicycle parking, and policy strategies such as density bonus for parking reductions and parking strategies including shared parking and parking pricing.	Interviews, Downtown Dublin Specific Plan Development Standards
Transportation Demand Management		Implement Measure ML-2: Reduce Municipal Employee Commute GHG Emissions and supporting actions from the Climate Action Plan 2030. Achieve GHG emissions reduction and mobility goals by incentivizing municipal employee alternative transportation use as well as electric vehicle use.	CAP 2030

Legend

Schools

School Prioritization Score

- 0
- 1
- 2
- 3
- 4
- 5
- 6

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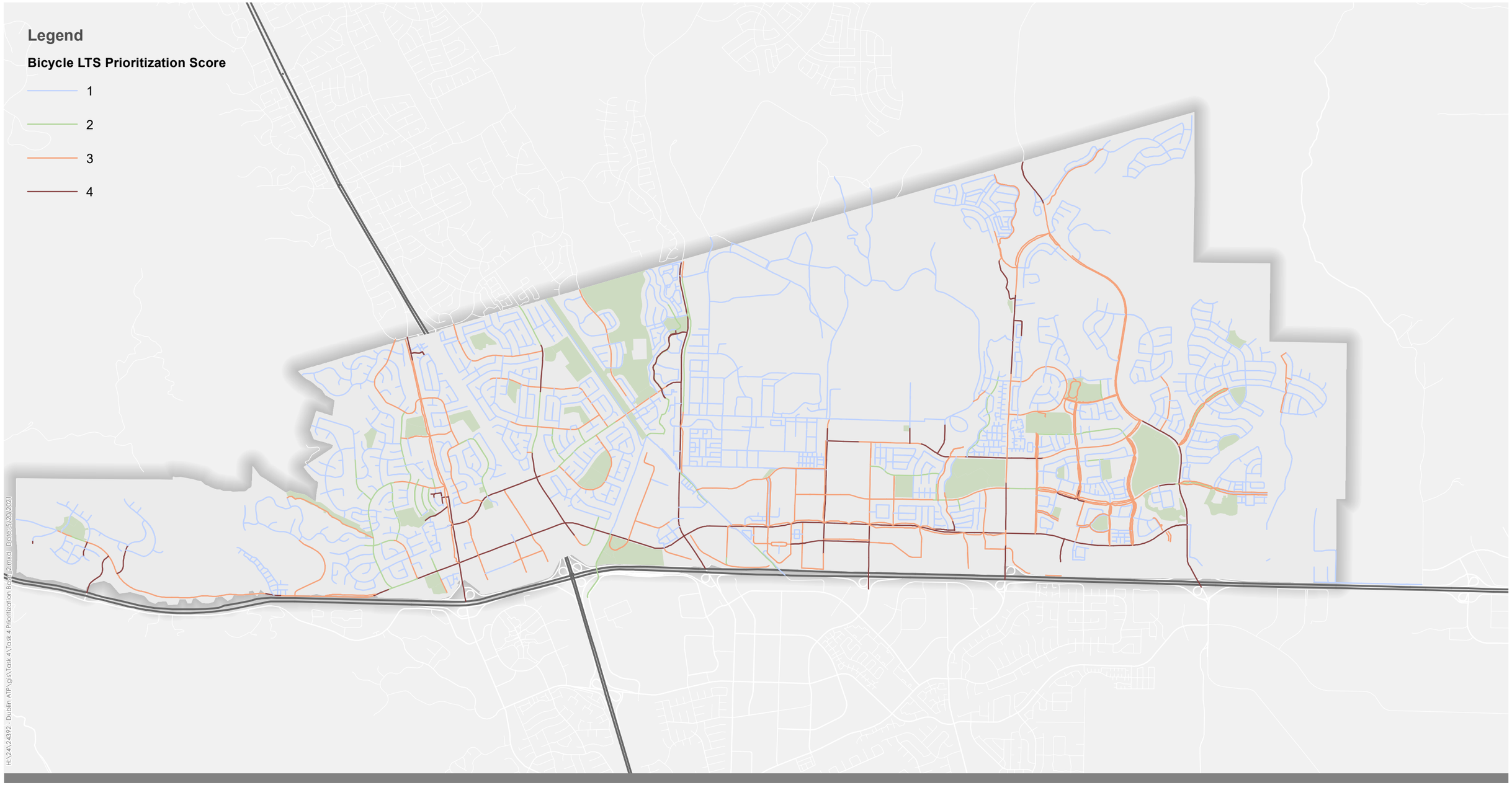
0 2,730 Feet

DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES

Prioritization: Schools Within 1 Mile
Dublin, California



DUBLIN
CALIFORNIA

KITTELSON & ASSOCIATES

Figure 1

Prioritization: Bicycle Level of Traffic Stress
Dublin, California

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MEMORANDUM

Date: May 20, 2021 Project #: 24392

To: Sai Midididdi, TE
City of Dublin

From: Amanda Leahy, AICP; Mike Alston, RSP, Camilla Dartnell

Project: Dublin Bicycle and Pedestrian Master Plan

Subject: Draft Prioritization Framework

INTRODUCTION

The City of Dublin Bicycle and Pedestrian Master Plan Update (Plan) will provide recommendations and an implementation framework to support the maintenance and improvement of bicycle and pedestrian infrastructure, policies, and programs in the City. Planned infrastructure improvements should connect users with key destinations – schools, transit connections, parks, trails, and commercial destinations including job centers—within the City and in adjacent jurisdictions. A spatial evaluation and prioritization of roads and paths in the City can determine which can provide the greatest potential benefit to help meet Plan goals.

This memorandum outlines the process for this prioritization. This memorandum includes the following sections:

- Prioritization Process
- Proposed Factors and Variables
- Public Input
- Factor Weights
- Criteria Scaling
- Criteria Methodology

The process outlined in this memorandum will produce evaluation scores for roadway segments for each variable identified. The factor weights outlined in this memorandum will then be applied and each segment will receive one combined evaluation score, allowing for comparison of every roadway and path segment in the City.

The evaluation scores will provide an understanding of the priority of each segment based on the selected factors but will not consider feasibility or constructability. During post processing, the team will identify general trends in the prioritization scores and consider context to "smooth" the results into project corridors. Feasibility and constructability will be considered in subsequent Tasks 4.2, *Identify Network Recommendations* and 4.4, *Develop Implementation Plan,* during the project creation process.

PRIORITIZATION PROCESS

The proposed evaluation process is informed by the framework from NCHRP Report 803: ActiveTrans Priority Tool[1] (APT), the result of a national research effort. The APT methodology was based on an extensive review of existing prioritization processes being used by agencies across the country at the state, regional, and local level. It uses a standard set of terms and definitions to describe the different steps in the process. The following definitions apply within the APT:

- **Factors** are the categories used to express community or agency values considered in the prioritization process and contain groups of variables with similar characteristics. The APT has selected nine primary factors commonly used by agencies across the country that are particularly suited for prioritization of active transportation needs.
- **Weights** are the numbers used to indicate the relative importance of different factors based on community or agency values. In order to increase transparency and legibility in the weighting step, weights are applied to factors, not to variables (which are often much more technical in nature).
- **Variables** are characteristics of roadways, households, neighborhood areas, and other features that can be measured, organized under each factor. The terms *variables* and *evaluation criteria* may be used interchangeably.
- **Scaling** is the process of making two variables comparable to one another (e.g., number of collisions versus population density.)

The APT outlines the 10-step process (described below) in two phases:

- **Scoping**, (steps 1-6) in which the prioritization purpose is established, factors and variables are selected, and data resources are assessed; and
- **Prioritization,** (steps 7-10) in which data is organized, scaling is applied, and prioritization scores are calculated.

[1] Lagerwey, Peter A., et al. *Pedestrian and Bicycle Transportation Along Existing Roads—ActiveTrans Priority Tool Guidebook*. NCHRP Report 803. Project No. 07-17. 2015. Available online at http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_803.pdf

The process is often iterative, as agencies may find a need to substitute variables if they find a lack of data availability.

The Steps are listed in Table 1.

Table 1: Prioritization Steps

Phase	Step
Scoping	Step 1: Define Purpose
	Step 2: Select Factors
	Step 3: Establish Weights
	Step 4: Select Variables
	Step 5: Assess Data Availability
	Step 6: Assess Technical Resources
Prioritization	Step 7: Set up Prioritization Tool
	Step 8: Input Data
	Step 9: Scale the Variables
	Step 10: Calculate Priority Scores

Source: NCHRP Report 803

Although all steps in this 10-step process will be performed, this memorandum focuses on **Step 2: Selecting Factors**, **Step 3: Establishing Weights**, **Step 4: Selecting Variables**, and **Step 9: Scaling the Variables.**

The team has already completed **Step 1: Define Purpose** through plan scoping, and the team has completed **Step 5: Assess Data Availability** and **Step 6: Assess Resources** through other plan development efforts so far. The recommended factors and variables have been chosen with consideration of available data and resources. **Steps 7, 8, and 10** are straightforward spreadsheet exercises that implement the decisions documented in this memorandum in the spreadsheet.

Step 1: Define Purpose

An agency first determines the purpose of the prioritization. In this step, an agency selects the mode they would like to prioritize; decides whether they are prioritizing specific projects, generalized needs, or something between the two; and defines the extent and number of the improvement locations.

For the Plan, the process will be applied separately for bicycle and pedestrian modes along roadway segments and off-street segments like paths. Paths will be included in both bicycle and pedestrian modes. The process prioritizes generalized needs, which will result in each segment receiving its own score. The team will use that score to inform selection of corridors for improvement during post processing.

Step 2: Select Factors

An agency next selects the factors to be used in prioritization that align with their goals for the prioritization process. The factors included in the APT are as follows:

1. Stakeholder input;
2. Costs and/or legal constraints;
3. Opportunities;
4. Safety;
5. Existing conditions;
6. Demand;
7. Connectivity;
8. Equity; and
9. Compliance with standards/plans.

Agencies can select anywhere from one to nine factors in their prioritization. Depending on their prioritization purpose, some factors may be less relevant or not relevant.

This evaluation will utilize a subset of the APT factors. Recommended factors are included in Table 2 of this document.

Step 3: Establish Weights

Each factor is weighted on a scale of 1 to 10 to indicate its relative importance to other factors. The selected weights are ultimately used in calculating the prioritization score. Agencies can revisit the weights at any point in the process.

For this plan, weights are recommended to be established through a process of input from the project management team, Technical Advisory Committee, and stakeholders.

Step 4: Select Variables

For each selected factor, agencies can select one or more variables. Each selected factor must have at least one variable by which it is measured. Using multiple variables will decrease the relative impact of each variable for that factor in the prioritization process unless the factor weighting is also increased.

This memorandum recommends variables in Table 2 of this document.

Step 5: Assess Data Availability

The availability of data is a critical consideration in determining what variables to include in a prioritization exercise, and data availability varies substantially across cities, towns, counties, MPOs, and state DOTs.

Through the variable selection process and methodology creation, the team simultaneously performed step 5, assessing data availability, to ensure each criterion could be evaluated as proposed.

Step 6: Assess Technical Resources

Agencies assess their existing technical resources and capabilities to determine if existing resources are sufficient, or if new resources will be needed to complete their intended prioritization with the selected variables. In step 6, agencies also select their technological platform for performing the calculations – using the APT spreadsheet tool, a different spreadsheet, a GIS database, manual tabulation, or other method(s).

The Plan's process will use the APT spreadsheet tool, informed by GIS-based calculations for each evaluation criterion.

Step 7: Set up Prioritization Tool

Having established the purpose, factors, variables and required data, the next step is to set up a tool to implement the prioritization method.

The Plan will use the APT pre-programmed spreadsheet tool, with separate versions for each mode.[2] The raw version of the spreadsheet will be provided with this memorandum.

[2] The spreadsheet tool is available online at http://www.trb.org/Publications/Blurbs/172459.aspx.

Step 8: Input Data

Next, agencies input data into the prioritization tool. Depending on the variables, agencies may need to do additional calculations or assessments outside the prioritization spreadsheet tool to calculate or measure the correct value for each improvement location.

The Plan's process will conduct a GIS-based spatial analysis to calculate values for each variable prior to inputting the data into the spreadsheet tool.

Step 9: Scale the Variables

Scaling involves selecting a common numeric scale and adjusting raw values to fit the common scale. Scaling should not be confused with weighting. Scaling is a more objective, technical function, while weighting is based on community/agency values. Scaling is necessary so that variables have a comparable impact on the prioritization score in the absence of weighting. Different scaling methods, such as proportional and rank order, can produce different results. Scaling methods should be chosen carefully depending on the distribution and range of the data points.

The proposed scaling method for each variable will ultimately depend on the variable's range of calculated values, but an initial recommendation is provided for each variable in this document.

Step 10: Calculate Priority Scores

Finally, agencies sum the weighted values for each factor to derive a total score for each segment. The segments can then be ranked based on the prioritization score. In some cases, agencies may wish to revisit factors, variables, and/or weighting, and make adjustments to their prioritization based on additional input or evolving prioritization purposes.

Although all steps in this 10-step process will be performed through the development of this Plan, this memorandum focuses on selecting factors, selecting variables, establishing weights, and scaling the variables. Through the variable selection process and methodology creation, the team simultaneously performed step 5, assessing data availability, to ensure each criterion could be evaluated as proposed.

PROPOSED FACTORS AND VARIABLES

To select prioritization factors and variables, the team reviewed NCHRP Report 803 and this Plan's goals. Table 2Table 2: Proposed Prioritization Factors and provides a summary of the selected factors and criteria, includes brief notes, and indicates to which mode each criterion can be applied.

Table 2: Proposed Prioritization Factors and Variables

Factor	Variable	Notes	Pedestrian	Bicycle
Safety	High-Injury Corridors	This criterion will prioritize locations based on network screening analysis of bicycle- and pedestrian-related collisions. The network screening was conducted in Task 2 of the project. This variable aligns with the goal *enhance safety.*	X	X
Social Equity	Youth population and senior population	Use variables from Census data at the block group level as indicators. This variable aligns with the goals *improve connectivity* and *enhance accessibility*.	X	X
Connectivity	Demand Analysis	Identify top bicycle or pedestrian infrastructure elements that would unlock latent demand (results of demand analysis). This variable aligns with the goal *improve connectivity.*	X	X
	Proximity to Schools	Identify roadways within 1 mile of schools to provide increased opportunities to bike and walk to school. This variable aligns with the goal *improve connectivity.*	X	X
Quality of Service	Bicycle Level of Traffic Stress	Prioritize locations based on the presence of existing high-stress riding facilities. This variable aligns with the goal *increase walking and biking.*		X
	Sidewalk gaps	Identify locations with sidewalk gaps that may create barriers for those walking. This variable aligns with the goal *improve connectivity.*	X	
Major Barriers	Freeway crossings	Prioritize improving safety and quality of service for ramp terminal intersection and freeway crossings. This variable aligns with the goal *improve connectivity.*	X	X
Consistency with Past Planning	Previously identified projects	Prioritize pedestrian and bicycle projects that were identified in the previous plan. This variable aligns with the goal *prioritize investments.*	X	X

PUBLIC INPUT

Understanding and addressing the needs and concerns of the public is a key step in creating a successful plan representative of the needs and values of the community. The nature of the public feedback requires qualitative integration into the project. After the quantitative analysis is complete through the application of the evaluation criteria identified above, the team will perform a "smoothing" process to identify the overall future walking and biking corridors that form the basis for project identification. During this process, the team will refer to the public input and the quantitative evaluation in determining which areas are priority corridors and where those corridors start and end.

FACTOR WEIGHTS

Factor weights allow different factors to be given different emphasis in the prioritization process. Factors that are deemed to be more important may be given higher weight than other factors to create this emphasis in the scoring process. Scaled variable scores are averaged for each factor and multiplied by the factor weight to get the final prioritization score for each segment.

For this plan, weights are recommended to be established through a process of input from the Technical Advisory Committee and the public. Input received from each group will be averaged to get a recommended set of weights for each group (Project Management Team, Technical Advisory Committee, and the public). These will then be averaged to determine the overall final weighting to be applied.

Table 3: Example Factor Weights

Factor	Variables	Equal Weights	Other Options
Safety	High-Injury Corridors	10	Averaged weights from Project Management Team, Technical Advisory Committee, and the public
Social Equity	Youth and senior populations	10	
Connectivity	Demand Analysis	10	
	Proximity to Schools	10	
Quality of Service	Bicycle Level of Traffic Stress	10	
	Sidewalk Gaps		
Major Barriers	Freeway crossings	10	
Consistency with Past Planning	Previously identified projects	10	

SCALING

NCHRP Report 803 provides guidance on adjusting raw values for a given variable (criterion) to fit a common scale. There are multiple ways to adjust the values to fit the scale, depending on the distribution of the data and relative importance of the values. NCHRP Report 803 distinguishes the adjustment methods based on their appropriateness for addressing outliers. Two primary methods will be used in this project to adjust raw values to fit the selected common scale of 0 to 10. Each is described below. Scaling should be refined when evaluation scores are received depending on the range of scores, but a preliminary recommendation for scoring each criterion is included in the Proposed Methodologies section of this document.

Each scaling mechanism has an associated inverse scaling mechanism, where the same scoring method is applied but the scaling considers lower scores as having a higher scaled value. An example of when this may be applied is when a roadway segment near an essential destination should be prioritized over one far from an essential destination, and the evaluation is being performed based on distance to the destination. An inverse scaling mechanism can be used to provide higher scaled values to those with shorter distances and lower raw input values than those farther away.

Proportionate and Inverse Proportionate Scaling

- Appropriate for data without outliers.
- Raw values are adjusted proportionately to fit the common scale.
- The highest value in the common scale is assigned to the highest raw value and the lowest value in the common scale is assigned to the lowest raw value. The raw values in between are scaled proportionately based on their relationship to the highest and lowest raw values.
- $Y = (X - MIN)/(MAX - MIN) \times S$, where Y is the scaled value, X is the raw value, MIN is the minimum raw value, MAX is the maximum raw value, and S is the scale.
- Zero values may be excluded and assigned a value of zero or included in the calculation and scaled.

Rank Order Scaling and Inverse Rank Order Scaling

- Appropriate for data with outliers.
- Raw values are ranked and then scaled proportionately to fit the selected scale.
- Zero values may be excluded and assigned a value of zero or included in the calculation and scaled.
- Example from NCHRP 803:

Table 29. Example of rank scaling.

Raw Value	Rank	Scaled Value
0	1	0
0	1	0
0	1	0
0	1	0
5	2	2
7	3	4
9	4	6
10	5	8
32	6	10

Note: In this example, the minimum raw value is 0 and the maximum raw value is 32. 32 is also an outlier, since it is more than three times larger than the next highest raw value. To address this, the values are ranked from low to high (i.e. the lowest value gets a rank of 1, next lowest value gets a rank of 2, and so on). The ranked values are then scaled proportionately.

Quantile Scaling and Inverse Quantile Scaling

- Appropriate for data with outliers.
- Raw values are grouped into equal groups with the same number of values and then those groups, or quantiles, are scaled proportionately to fit the selected scale

Non-Linear Scaling and Inverse Non-Linear Scaling

- Not appropriate for data with outliers.
- Appropriate when the importance of raw numeric values increases in a non-linear fashion

PROPOSED METHODOLOGIES

This section provides details and outlines the methodologies and recommended scaling for applying each evaluation criterion.

Safety: High-Injury Corridors

Variable	High-Injury Corridors
Factor	Safety
Description	The team conducted a collision analysis in Task 3 of this plan production to identify the high injury network based on collision history and trends. The team evaluated bicycle and pedestrian involved crash data from 2014 through 2019 on public streets within the city, excluding freeways, using an Equivalent Property Damage Only (EPDO) analysis. This EPDO analysis considered fatal and severe injury collisions to be worth 10 equivalent PDOs, moderate and minor injury collisions to be worth 5 equivalent PDOs, and PDO collisions to be worth 1 equivalent PDO. The team then selected approximately the top 10 percent of roadways to be included in the high injury network as high injury corridors.
Data Needs	Bicycle and pedestrian high injury network results
Same method for pedestrian and bicycle?	The same methodology will be used for the bicycle and pedestrian analysis, but due to different pedestrian and bicycle equivalent PDO scores, results for each mode may be different.
Proposed Methodology	The EPDO analysis scores will be applied to each roadway segment in the City. For paths that intersect roadways, each path will be given the score equivalent to the intersecting roadway, for a half mile segments around the intersection.
Limitations	Bicycle and pedestrian crashes may be lower or not reported on shared use paths. The methodology applies the intersecting roadway score to the segments on the path within one half mile of the intersection to try to account for this and the crashes that may occur at the intersection of the path and road, but for path segments not near an intersection, the maximum score a path can receive is lower than the maximum score for roadway segments.
Recommended Scaling	Proportionate

Social Equity: Youth and Senior Population

Variable	Youth and Senior Populations
Factor	Social Equity
Description	This criterion identifies areas with higher concentrations of youth and senior populations, designed to help prioritize improvements on highway segments that serve areas with populations with higher propensity to bike and walk and of greater need for comfortable infrastructure.
Data Needs	Most recent available American Community Survey data at the block group level for the following attributes: ▪ Elderly populations (65 and older) ▪ Youth populations (under 18)
Same method for pedestrian and bicycle?	The same methodology will be used for the bicycle and pedestrian analysis, and because the data used will not vary by mode, the results of this criterion will be the same for each mode.
Proposed Methodology	This criterion will be calculated at the census block group level as the sum of people 65 and older and 17 and younger divided by total block group population. The equation used to develop the segment score is shown below: $$Youth\ and\ senior\ populations = \frac{(Eld + Yth)}{Pop}$$ where: Eld = # of residents over 65 Yth = # of residents under 18 Pop = Total population
Limitations	This criterion does not include other available indicators of transportation disadvantage, including but not limited to income or poverty status, disability status, English proficiency, car ownership, or race. Through the demographic analysis conducted in Task 3 and subsequent discussion with the City, it was determined that such trends do not show substantial spatial variation within the City, so they are not incorporated into this prioritization.
Recommended Scaling	Proportionate

Connectivity: Demand Analysis

Variable	Demand Analysis
Factor	Connectivity
Description	The team performed a demand analysis in Task 3 of Plan production. This demand analysis identifies baseline levels of walking and biking around existing activity nodes and assesses latent bicycle and pedestrian demand that could be realized through the Plan.
Data Needs	Task 3 Demand Analysis results
Same method for pedestrian and bicycle?	The same methodology will be used for the bicycle and pedestrian analysis, but due to different pedestrian and bicycle demand scores, results for each mode may be different.
Proposed Methodology	The team will conduct a work session with the City to consider the results of the demand analysis and determine the most high-leverage segments or intersections to improve to provide better connectivity. Segments identified as priority demand segments will receive 1 point, while all other segments will receive 0 points.
Limitations	Simplifying the results of the demand analysis can allow for an easy to understand application, but it does not differentiate between areas that provide moderate but different levels of connectivity.
Recommended Scaling	Proportionate (binary)

Connectivity: Proximity to Schools

Variable	Proximity to Schools
Factor	Connectivity
Description	Schools are an essential destination and are especially important for providing low stress biking and walking facilities. School districts are generally determined by location, increasing the opportunity for many students to bike and walk to school, but because most students are youth, they require less stressful facilities to bike and walk safely and comfortably.
Data Needs	School locations
Same method for pedestrian and bicycle?	The same methodology will be used for the bicycle and pedestrian analysis, and because the data used will not vary by mode, the results of this criterion will be the same for each mode.
Proposed Methodology	The team will create a 1-mile buffer around each school. Segments within the buffer will receive 1 point, while all other segments will receive 0 points. Segments may receive more than 1 point if they are within 1 mile of multiple schools
Limitations	This will prioritize all schools equally; smaller schools that may have less walking and biking demand will receive the same priority as schools with more students.
Recommended Scaling	Proportionate (binary)

Quality of Service: Bicycle Level of Traffic Stress

Variable	Bicycle Level of Traffic Stress
Factor	Quality of Service
Description	Level of Traffic Stress (LTS) is a measure originally developed at the Mineta Transportation Institute to estimate the level of stress a bicyclist may feel while riding along a particular roadway. In general, higher vehicle speeds, higher vehicle volumes, and lower levels of separation between bicyclists and vehicles lead to higher levels of traffic stress. In Task 3 of this Plan production, the team performed an on-street LTS analysis for the City and a corresponding path LTS evaluation to provide scores for off-street segments.
Data Needs	Task 3 LTS analysis results
Same method for pedestrian and bicycle?	This criterion only applies to the bicycling mode.
Proposed Methodology	Low stress facilities (LTS 1 and 2) will receive 0 points, and high stress facilities (LTS 3 and 4) will receive 1 point.
Limitations	Level of traffic stress has been emerging as an analysis approach and metric that is widely applicable, intuitive, and easy to understand. It can also help inform the type of design that will provide "low-stress" facilities that are attractive to all users. However, some risk factors that may affect bicyclist comfort are not included in the Level of Traffic Stress assessment (e.g., driveway density and presence of signals).
Recommended Scaling	Proportionate (binary)

Quality of Service: Sidewalk Gaps

Variable	Sidewalk Gaps
Factor	Quality of Service
Description	Existing sidewalk gaps can create barriers to walking. If people walking do not know to expect a sidewalk gap, they may choose to walk that route and need to cross to avoid the sidewalk gap or may choose to walk in the road. Both of these options increase their exposure to motor vehicles. Others may plan their trip to avoid the sidewalk gap, which can add time and distance to the trip and in some circumstances may encourage the individual to take a different mode or not take the trip. Identifying and prioritizing locations where there are sidewalk gaps can lead to improvements in these locations, which can ultimately increase the safety and comfort for pedestrians.
Data Needs	Geolocated sidewalk gap data
Same method for pedestrian and bicycle?	This criterion only applies to the pedestrian mode.
Proposed Methodology	Locations with no sidewalk gap will receive 0 points, while locations with a sidewalk gap will receive 1 point.
Limitations	Pedestrian safety and comfort can be affected by other characteristics not captured in this variable, like presence of a barrier, type of barrier, presence of street trees, speeds, number of lanes, and sidewalk width.
Recommended Scaling	Proportionate (binary)

Major Barriers: Freeway Crossings

Variable	Freeway Crossings
Factor	Major Barriers
Description	Freeway ramps and crossings can create barriers for people biking and walking. Sometimes the crossing infrastructure over or under freeways is uncomfortable to bike and walk on, and intersections with freeway ramps may include high motor vehicle design speeds and volumes. This criterion will prioritize improving safety and quality of service for ramp terminal intersection and freeway crossings.
Data Needs	Locations of ramp terminals
Same method for pedestrian and bicycle?	The same methodology will be used for the bicycle and pedestrian analysis, and because the data used will not vary by mode, the results of this criterion will be the same for each mode.
Proposed Methodology	Segments within 250 feet of a ramp terminal will receive a score of 1 and all other segments will receive a score of 0.
Limitations	This evaluation may not include all major barriers to biking and walking in the City, which may also include short segments of bridge, guardrail, or poor roadway or sidewalk conditions.
Recommended Scaling	Proportionate (binary)

Consistency with Past Planning: Previously Identified Projects

Variable	Previously Identified Projects
Factor	Consistency with Past Planning
Description	This criterion will prioritize locations identified as needing improvements through the 2014 Dublin Bicycle and Pedestrian Master Plan. The Plan included a ranking of priority projects. Those are as follows: - Tier Zero: Designed and planned, under-construction, scheduled, - Tier One: Highest priority projects for grant funding with initial feasibility analysis and concept development in the Plan update - Tier Two: High priority projects for grant funding that may require additional feasibility analysis - Tier Three: All other projects Those project tiers were based on feasibility of project delivery rather than project need.
Data Needs	Spatial priority project data from the 2014 Dublin Bicycle and Pedestrian Master Plan
Same method for pedestrian and bicycle?	The same methodology will be used for pedestrian and bicycle modes. Many projects include both bicycle and pedestrian improvements.
Proposed Methodology	Locations where there is a project and it has not yet been implemented will receive 1 point, while all other segments receive 0 points.
Limitations	Because the 2014 Dublin Bicycle and Pedestrian Master Plan did not consider project need in the tiering process, all projects will be scored the same.
Recommended Scaling	Proportionate (binary)