Bicycle Priority Network Analysis and Prioritization

The Priority Bicycle Network is made up of Spoke Routes and Cross-town Routes that provide long, continuous bikeways across the city and connect numerous neighbourhoods to important destinations. Some of the spoke and cross-town routes are or will be on-street bicycle facilities while others are or will be off-street shared use paths. The cross-town and spoke routes were selected based on the destinations served, the current cycling demand, an appropriate spacing between routes (7.5 minutes bicycle ride between routes), ease of all-seasons maintenance, connections to transit facilities (LRT, Transit Centres, and Transit Avenues), and crossings of major geographic barriers such as rail lines, rivers, ravines, and freeways. The spoke routes feed to a Central Area also included in the Bicycle Priority Network.

The Central Area is comprised of numerous routes in the major destination areas of Downtown and Old Strathcona and include many specific work, school, post-secondary, shopping, entertainment, political, recreation, cultural, and social destinations. These areas are currently and will continue to be the highest demand areas for cycling, and therefore, represent high profile cycling routes. Due to the large concentration of destinations within the Central Area, all routes from the Bicycle Transportation Plan bicycle network within the Central Area are also routes on the Priority Bicycle Network. Most of the routes in the Central Area are or will be on-street facilities in the form of bicycle boulevards, bike lanes, buffered bike lanes, and cycle tracks, although some facilities within the river valley and ravines are off-street shared uses paths.

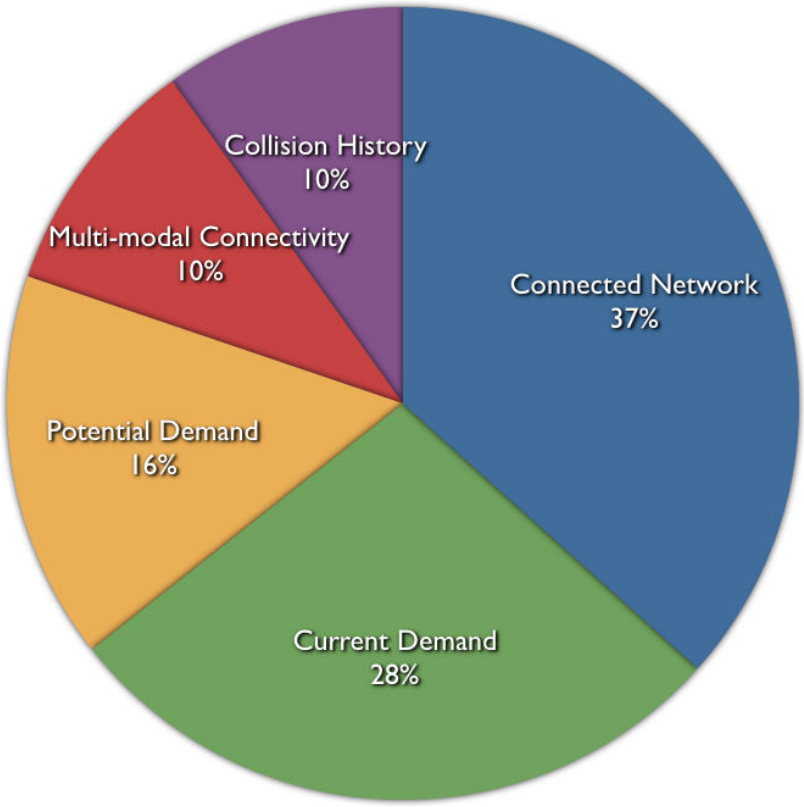
A weighted criteria evaluation framework was used to analyze each missing route or piece of a route identified on the Bicycle Priority Network. The criteria were created with assistance by other sections within the Transportation Planning Branch and represent a synthesis of various dimensions for which a route could be measured. The criteria are as follows:

- Current Demand – How much current cycling demand is served by the route?
- Connected Network – How much does the route provide a connection between existing routes, across a major barrier, or to fill a gap or missing link in the existing network?
- Potential Demand – How much does the route support generating new cyclists?
- Collision History – How many bicycle collisions per year have been reported along the route and parallel routes within the catchment area of the bicycle route?
- Multimodal Connectivity – Does the route provide a connection to transit?

The weighted value for each criterion was then assigned based on the analytical hierarchy method of the software package Expert Choice. This methodology allows content experts

to complete pair-wise comparisons between each pair of variables and determine which variable is more important in achieving a specified purpose or objective and by how much. Following the evaluation of each of the pair-wise comparisons, weightings are calculated based on the collective answers of the content experts. The City of Edmonton has also used this procedure and software package to complete departmental budgeting prioritization exercises and strategic planning.

The purpose that was used to weight the criteria for evaluating the Bicycle Priority Network was to identify the priority routes to be constructed over the next three years that provide the basis for ongoing expansion of the bicycle priority network. Based on this purpose, the weightings for the criteria were determined as illustrated in the figure below. The evaluation for each criterion was based on an impact table that measured the extent to which the route fulfilled the criterion. For each criterion, a score was evaluated on a scale of 0 to 1 based on the impact table. The score from the impact table was then multiplied by the criterion's weighting to arrive at the total score for that criterion. The same was done for all criteria and then the values were summed to determine the overall benefit score for the route. Due to the breadth of the criteria, it can be very difficult for routes to achieve an extremely high benefit score (i.e. score very high on all criteria); therefore, it is important to remember that the prioritization is relative between routes, the routes with higher benefit scores are the higher priority, and there is no benefit score threshold that must be achieved for a route to be constructed.



Bicycle Priority Network Prioritization Criteria and Weighting

The criteria used to prioritize the Bicycle Priority Network all relate to the target market for cycling. Connected Network ensures the route is continuous and will not end abruptly or be fragmented, which provides the Interested but Concerned an assurance that once on a route, that route will continue to a meaningful and obvious destination. Current Demand is important to ensure facilities are located where cyclists are currently traveling which are likely where the Interested but Concerned also want to travel. Current Demand is also important in that having Edmontonians cycling on designated bicycle facilities will strengthen the confidence and level of comfort of the Interested but Concerned in cycling by seeing others doing so. Potential Demand ensures routes provide access to important destinations that can generate cycling trips, in particular, focusing on family-friendly destinations of schools, libraries, recreation facilities, and shopping areas. Multi-modal connectivity is an important consideration to increase the length of a cycling trip and reduce its time by providing connections to transit such that cyclists can board LRT or high frequency bus routes during their trip and travel on the higher speed transit service for some portion of their trip. Finally, collision history is a direct component of safety and the comfort level of cyclists.

Sixty-four routes were evaluated as summarized in table below. The evaluation considered the 23 km of routes to be constructed in 2013 as being completed. This is important to note for the Connected Network score. Due to this criterion and changes in the city that could affect other criteria, the evaluation of benefit scores will be updated annually.

In the table, the yellow highlighted routes are on University of Alberta land and for which collaboration with the University will be critical as these routes will be built by the University as part of their campus plans and for which the City of Edmonton will act as a resource and stakeholder. Routes in blue are routes for which other City of Edmonton projects will design, construct, and fund the bicycle facility or a significant portion of the facility. Finally, routes highlighted in grey represent routes in developing areas of Edmonton that will be designed, funded, and constructed by land developers when they construct the roadway network, and as such, their lengths were not calculated in most cases. The facility types were defined by applying the desirable bicycle facilities for Interested but Concerned cyclists and a preliminary review of the corridors for constraints and facility continuity. Detailed design will be required to confirm the appropriate bicycle facilities based on a thorough review of the corridors.

Prioritization Results of Edmonton Priority Bicycle Network 2013

Route	Length (in km)	Facility Type	Connected Network	Current Demand	Potential Demand	Collision History	Multimodal Connectivity	Overall
Maximum Possible Score	--	--	37%	28%	16%	10%	10%	100%
88 Avenue (Saskatchewan Drive to 116 Street)	1.4	Shared Use Lanes	37%	28%	14%	5%	10%	94%
105 Avenue (121 Street to 95 Street)	2.8	Bicycle Boulevard	37%	17%	16%	10%	10%	90%
102 Avenue (City Centre West LRT Station to 142 Street) & 142 Street (102 Avenue to MacKinnon Ravine)	5.5	Cycle Track	22%	28%	16%	10%	10%	86%
51 Avenue (122 Street to 50 Street)	8.4	SUP & Bike Lanes	22%	28%	13%	10%	8%	81%
U of A South Campus Connections (122 Street to Belgravia Road Bridge)	1.0	SUP	37%	28%	5%	0%	10%	80%
107 Street (River Valley Road to 105 Avenue)	2.7	Buffered Bike Lanes	15%	28%	11%	10%	10%	74%
100 Avenue (104 Street to 121 Street)	2.0	Buffered Bike Lanes	15%	28%	13%	10%	8%	74%
83 Avenue (Mill Creek Ravine to 112 Street)	2.9	Bicycle Boulevard	15%	28%	16%	10%	4%	73%
102 Avenue/102A Avenue (Centre West LRT Station to 96 Street)	1.1	Cycle Track	15%	28%	14%	5%	10%	72%
96 Street/97 Street/102 Street (103A Avenue to 132 Avenue)	2.9	Bicycle Boulevard	22%	17%	16%	10%	2%	67%
NLRT SUP (105 Avenue to NAIT)	2.3	SUP	15%	17%	13%	10%	10%	64%
104 Street (100 Avenue to 105 Avenue)	1.0	Bike Lanes	0%	28%	16%	5%	10%	59%
76 Avenue (100 Street to 103 Street)	0.4	Bridge	22%	28%	6%	0%	2%	59%
96 Street (Grierson Hill to 103A Avenue)	0.5	Bicycle Boulevard	15%	17%	13%	5%	8%	57%
142 Street (Whitemud Drive to 96 Avenue)	2.7	Shared Use Lanes	37%	17%	2%	0%	2%	57%
51 Avenue/53 Avenue (Riverbend Road to 122 Street)	2.7	SUP	22%	28%	5%	0%	2%	57%
106 Avenue (50 Street to 96 Street)	4.5	Buffered Bike Lanes	22%	17%	16%	0%	2%	57%
114 Avenue (178 Street to 121 Street)	6.4	Buffered Bike Lanes	22%	11%	10%	10%	4%	57%
104 Avenue (142 Street to 178 Street)	4.1	Bike Lanes	22%	17%	10%	5%	2%	56%
50 Street (Ada Boulevard to Yellowhead Trail)	1.8	SUP & Bike Lanes	37%	11%	3%	0%	4%	55%
50 Street (Manning Drive to 137 Avenue)	0.8	SUP	37%	0%	8%	0%	10%	55%
84 Avenue (Mill Creek Ravine to 79 Street)	1.5	Bicycle Boulevard	15%	28%	8%	0%	4%	55%
132 Avenue (137 Avenue to NELRT SUP) & Connections along 69 Street, 129 Avenue, and 142 Street	9.6	Buffered Bike Lanes	22%	0%	11%	10%	10%	53%
Blatchford North-South Connection (NAIT Station to 127 Avenue)	2.0	Cycle Track	22%	11%	5%	5%	8%	51%
153 Avenue (82 Street to 113A Street/Castle Downs Road)	3.2	SUP	37%	0%	3%	5%	4%	49%
119 Avenue (NELRT SUP to 106 Street/Blatchford/NAIT)	3.0	Bicycle Boulevard	15%	11%	8%	5%	10%	49%
142 Street (102 Avenue to St. Albert Trail)	4.6	Buffered Bike Lanes	15%	17%	8%	5%	2%	47%
50 Street (153 Avenue to North City Limits)	0.0	SUP	37%	0%	6%	0%	2%	45%
178 Street (69 Avenue to 114 Avenue)	6.8	Buffered Bike Lanes	22%	0%	16%	5%	2%	45%
76 Avenue (79 Street toward Sherwood Park)	6.7	SUP	22%	17%	3%	0%	2%	44%
Blatchford East-West Connection (119 Avenue to 121 Street)	1.7	Cycle Track	15%	11%	8%	0%	10%	44%
82 Street (167 Avenue to North City Limits)	0.0	SUP	37%	0%	5%	0%	2%	44%
142 Street (St. Albert Trail to 137 Avenue)	1.0	SUP	37%	0%	5%	0%	2%	44%
91 Street (23 Avenue to 34 Avenue)	1.5	SUP	37%	0%	5%	0%	2%	44%
NELRT SUP (66 Street through Gorman to Northeast)	0.0	SUP	22%	0%	6%	5%	10%	44%
Lewis Estates Boulevard (Suder Greens Drive to Guardian Road)	0.0	SUP	37%	0%	3%	0%	2%	42%
112 Street (167 Avenue/Castle Downs Road to North City Limits)	0.0	SUP	37%	0%	3%	0%	2%	42%
Parsons Road (Ellerslie Road to 91 Street)	0.6	SUP	37%	0%	3%	0%	2%	42%
153 Avenue (Manning Drive Crossing)	0.6	SUP	37%	0%	3%	0%	2%	42%
82 Street (137 Avenue to 153 Avenue)	1.8	SUP	37%	0%	3%	0%	2%	42%
99 Street/Parsons Road (23 Avenue to 34 Avenue)	1.8	SUP	37%	0%	3%	0%	2%	42%
50 Street (Whitemud Drive to North Saskatchewan River Bridge)	7.8	SUP	22%	11%	6%	0%	2%	42%
Fort Edmonton Bridge Connection (69 Avenue to Fort Edmonton Park Bridge)	2.6	SUP & Bike Lanes	37%	0%	2%	0%	2%	41%
95 Avenue/94B Avenue (Connors Road to 50 Street)	3.7	Bike Lanes	15%	11%	8%	0%	4%	38%
25 Avenue SW (91 Street to James Mowatt Trail)	0.0	SUP	37%	0%	0%	0%	0%	37%
215 Street (Suder Greens Drive to Big Lake)	0.0	SUP	22%	0%	6%	0%	2%	31%
79 Street (76 Avenue to 106 Avenue)	4.1	Bike Lanes	0%	17%	3%	5%	4%	29%
170 Street (114 Avenue to St. Albert)	4.9	SUP	22%	0%	3%	0%	2%	27%
113A Street (127 Avenue to 137 Avenue)	1.6	SUP	15%	0%	8%	0%	4%	27%
51 Avenue/Roper Road (50 Street to East City Limits)	4.8	SUP	22%	0%	2%	0%	2%	26%
141 Street/142 Street/Bulyea Road (Rabbit Hill Road to Fox Drive)	5.0	Bike Lanes & Bridge	22%	0%	2%	0%	2%	26%

Based on the benefit scores of the prioritization, the highest scoring routes that would be funded through the active transportation capital budget or a bicycle facility-specific capital budget are in central areas of Edmonton with numerous destinations and existing cycling demand but also with significant potential for increased future demand. Many of the routes also provide a facility along a corridor with a history of bicycle collisions and many also provide access to major transit facilities. The top 5 routes that Sustainable Transportation will focus on designing, cost estimating, and securing budget for in the next capital budget are the following. It is important to note that these facilities will cost much more than the other routes that have been constructed.

- 102 Avenue – Cycle Track from Downtown to central and mature neighbourhoods west of downtown and connects to a major east-west corridor serving west Edmonton;
- 51 Avenue – Major east-west bikeway providing access to an LRT station and employment areas;
- 107 Street – North-south Downtown bikeway connecting the river valley to Grant MacEwan University via the Provincial Legislature, and other employment, retail, and services;
- 100 Avenue – East-west bikeway through Downtown and Edmonton's highest residential density neighbourhood;
- 83 Avenue – Significant east-west bicycle boulevard with existing high cycling demand that is parallel to a major commercial street and connects central neighbourhoods with University of Alberta;