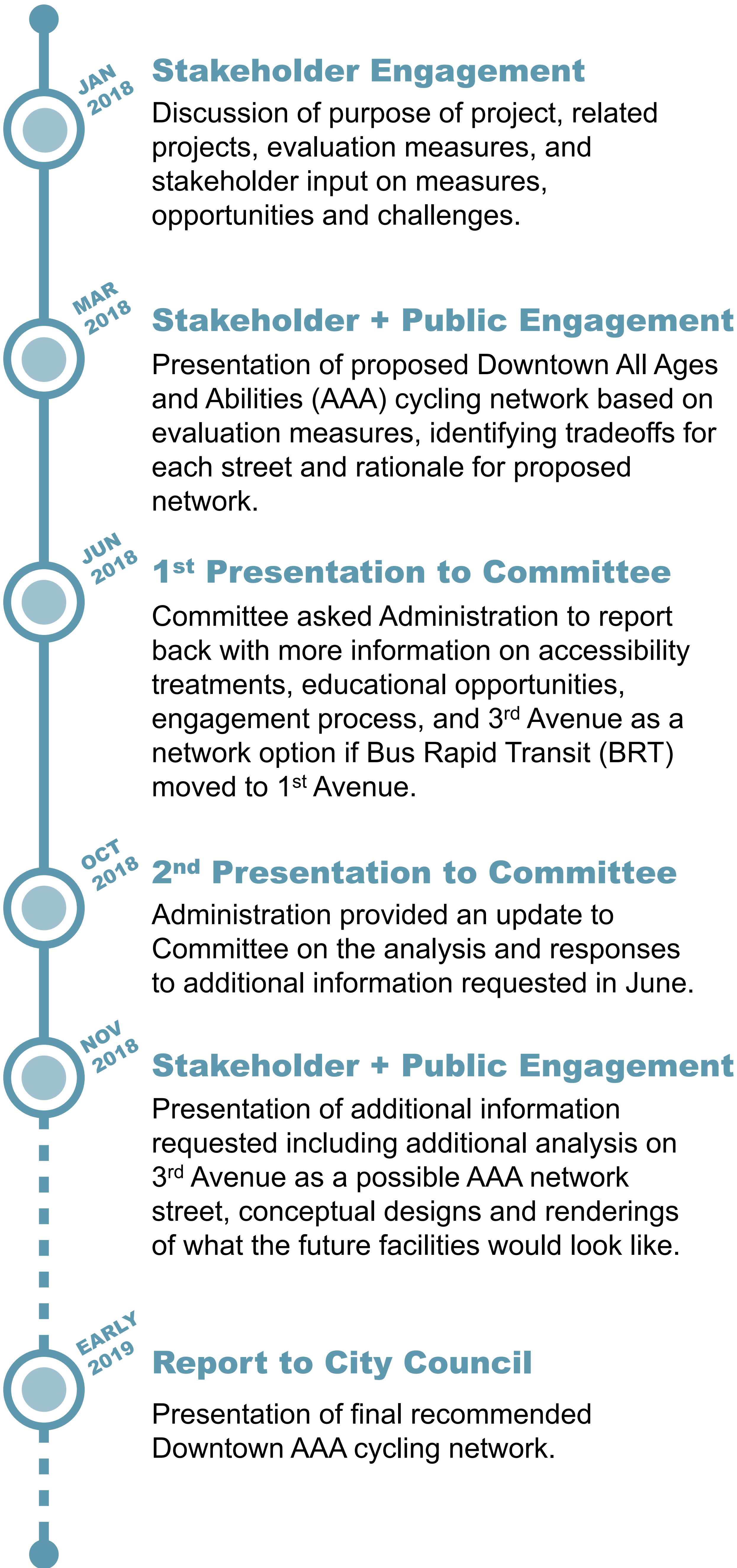


Project Overview


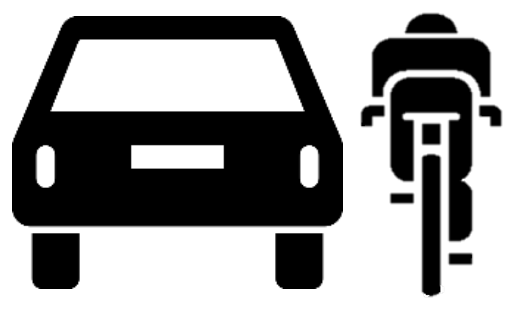

PROJECT TIMELINE

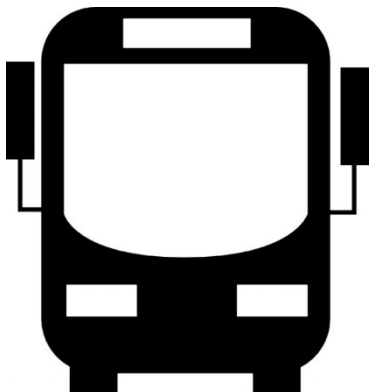

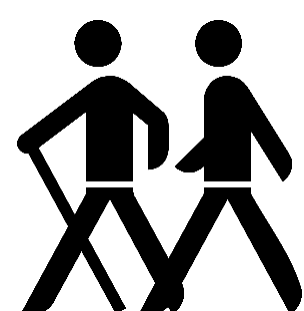


ASSESSMENT PROCESS

Downtown streets support a number of different land uses through a variety of travel modes.

To ensure that the most appropriate streets host AAA facilities, Downtown streets were assessed using several factors:

 Bicycle Network	 Cyclist Safety	 People Driving
<ul style="list-style-type: none">• Connections to surrounding areas, with other cycling facilities, and to key destinations	<ul style="list-style-type: none">• Conflict with motor vehicles• Merit of segregation	<ul style="list-style-type: none">• Automobile travel time• Automobile Level of Service

 Transit	 Business	 People Walking
<ul style="list-style-type: none">• Transit stop conflicts and operations	<ul style="list-style-type: none">• Parking• Street environment	<ul style="list-style-type: none">• Pedestrian improvements• Accessibility

The assessment did not weigh any category above another. It was used to understand the tradeoffs among all road users that could result from the inclusion of an AAA cycling facility.

Detailed results from the analysis are available at saskatoon.ca/cycling

RESULTS OF ASSESSMENT

After reviewing all of the factors and constraints for each street, the following AAA network configuration is proposed:

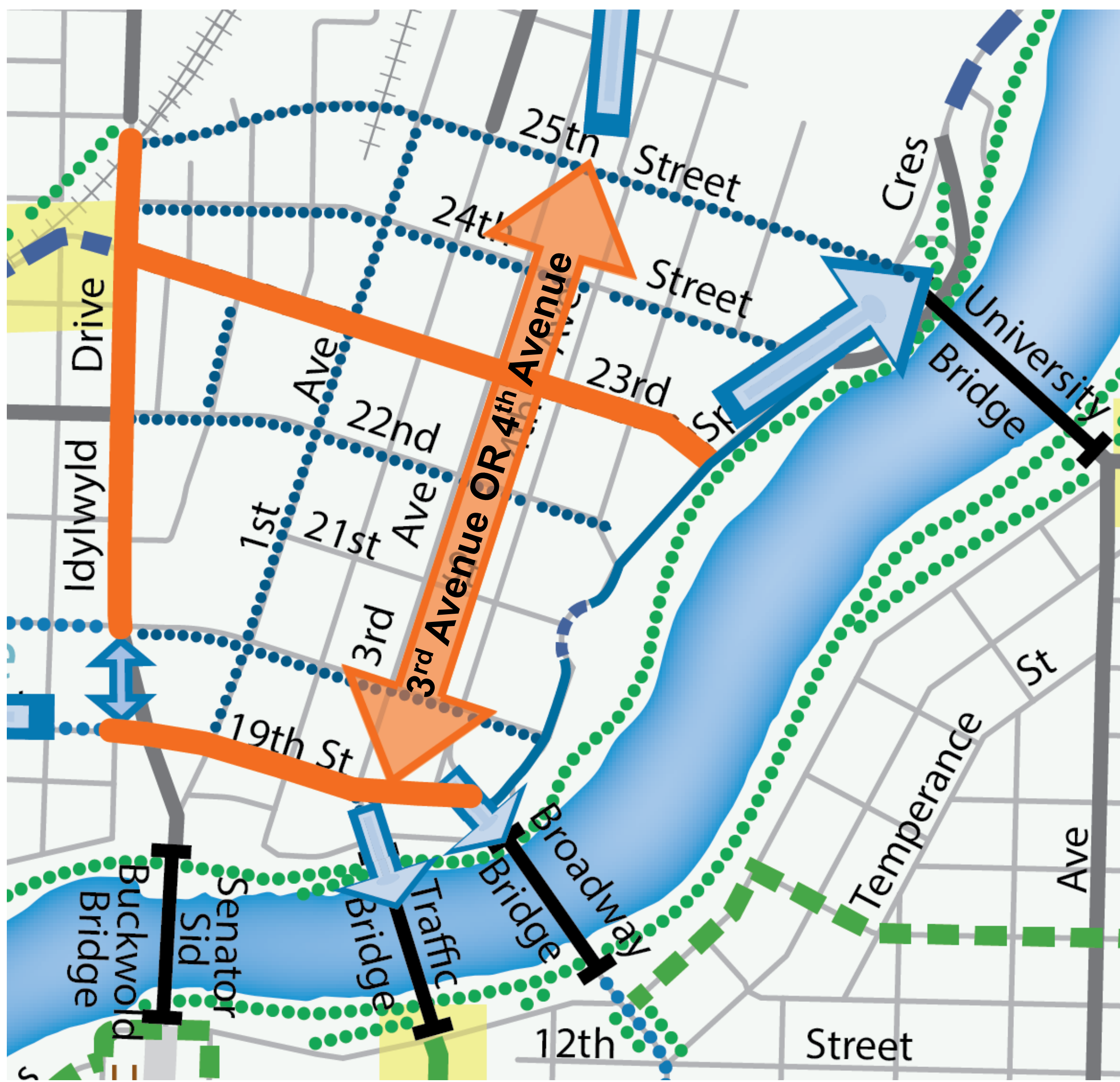
North-South Streets:

- Idylwyld Drive (consistent with Imagine Idylwyld project); and
- 3rd Avenue **OR** 4th Avenue, depending on the location of BRT.

East-West Streets:

- 19th Street and
- 23rd Street.

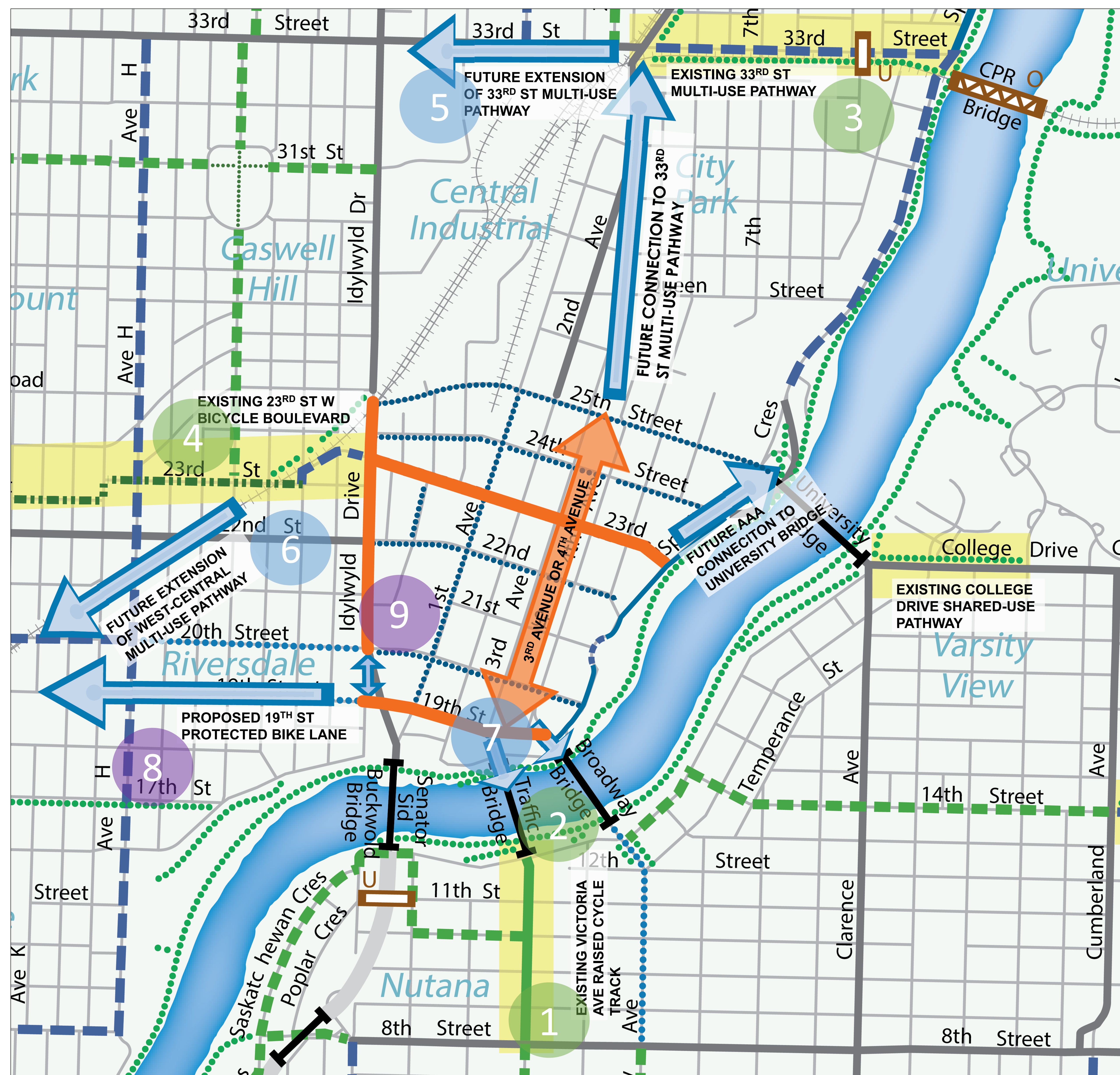
Downtown AAA Cycling Network Map



If 3rd Avenue is the recommended AAA cycling route through Downtown, the existing protected bike lanes on 4th Avenue would be removed.

Developing a Connected Network

Connections to other AAA facilities are important to support the city-wide network. This map shows how the proposed network connects to existing AAA cycling facilities and proposed cycling facilities within and beyond the study area. The map shows a connection is desirable through Downtown on either 3rd Avenue or 4th Avenue.



PROJECTS NEAR/WITHIN STUDY AREA:

Completed AAA projects:

1. Victoria Ave Cycle Track
2. Traffic Bridge Multi-Use Pathways
3. 33rd Street Multi-Use Pathway (Spadina Crescent to 3rd Avenue, and a couple blocks between Idylwyld Drive and 3rd Avenue)
4. 23rd Street Bike Boulevard

















Scheduled for completion in 2019/2020

5. 33rd Street Multi-Use Pathway
6. West-Central Multi-Use Corridor (Avenue D to Avenue W)
7. Intersection improvements to 3rd Avenue/19th Street

Planning/Functional Design Stages

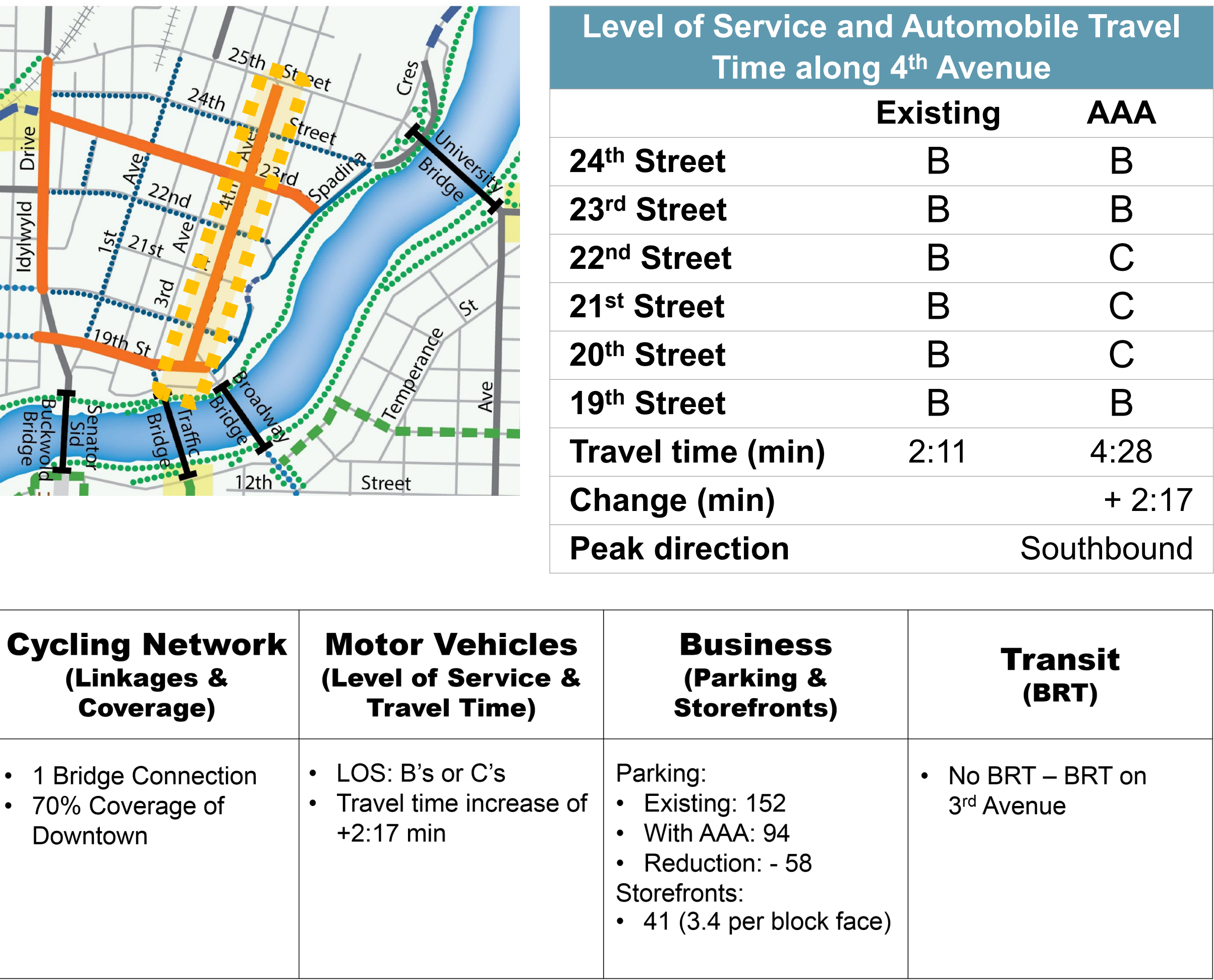
8. 19th Street Protected Bike Lane Plan
9. Idylwyld Drive Corridor Plan, 20th Street to 25th Street

LEGEND

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
|  Proposed AAA Network |  Underpass/Overpass |
|  Shared-Use On-Road Cycling Lane |  Underpass/Overpass with Stairs |
|  Cycle Track |  Bridge |
|  Bike Boulevard |  Railway |
|  Multi-Use Trails or Pathways |  Future AAA Connection |
|  Local Roads |  Existing AAA Connection |
|  Exclusive Bike Lanes | |
|  Sharrows Wide Lane and Narrow Lanes | |
|  On Road, Sharing the Road or Bike Route | |
|  Expert Riders - Street with high speed and high volume of traffic | |

4th Avenue Details

4th Avenue | Overview of Technical Analysis



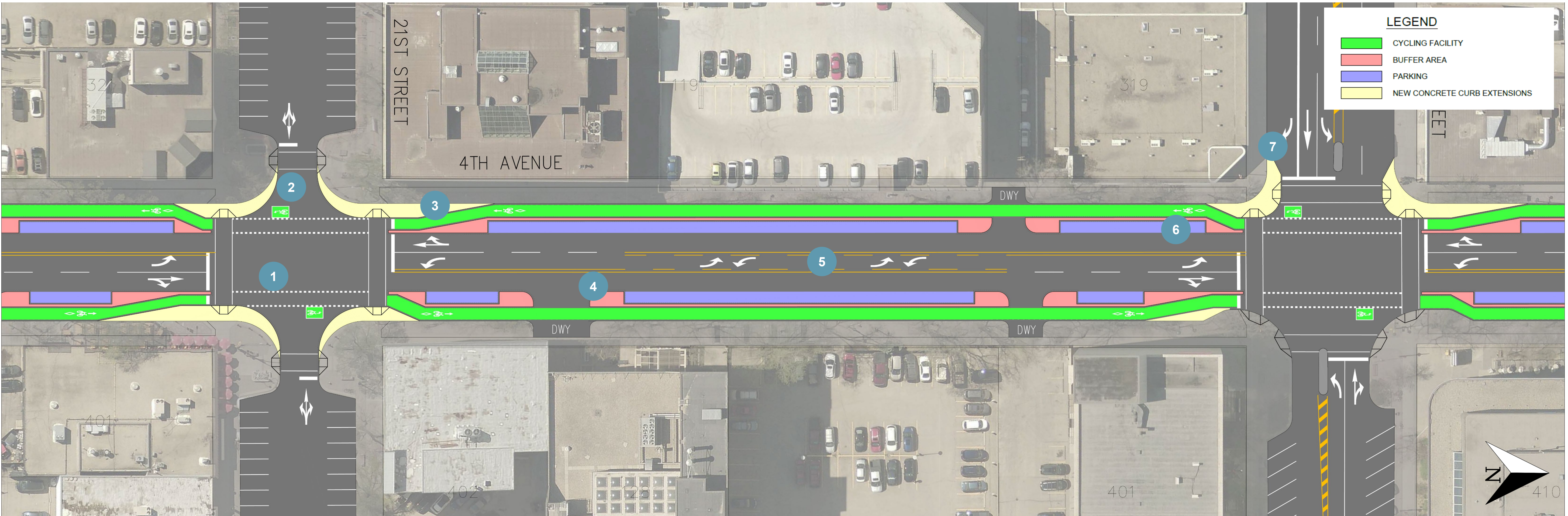
4th Avenue | Mid-Block Conceptual Rendering



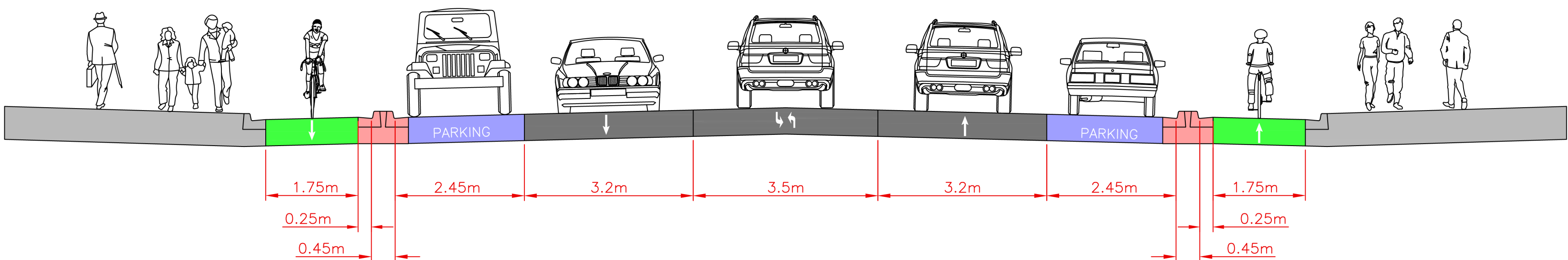
Unidirectional Design Elements

- Crossriders** provide a dedicated space at an intersection for cyclists to legally ride their bicycle through an intersection without dismounting.
- Bike Boxes** improve a cyclist's ability to safely and comfortably make left turns by reducing turning conflicts between cyclists and motor vehicles at signalized intersections.
- Bend-in** shifts the bike lane closer to motorized traffic so motorists and cyclists can see each other better.
- Buffer Areas** separate cyclists from parked vehicles and moving traffic.
- Two-Way Left Turn Lanes** accommodate motor vehicles turning left at driveways and intersections.
- Parking** is provided along the length of the facility, but pulled back from driveways and intersections to improve visibility at conflict points.
- Raised Curb Extensions** reduce the crossing distance for pedestrians.

4th Avenue | Plan View Conceptual Design - 21st Street to 22nd Street



4th Avenue | Typical Cross-Section



3rd Avenue Details

3rd Avenue | Overview of Technical Analysis



Level of Service and Automobile Travel Time along 3 rd Avenue		
	Existing	AAA
24 th Street	B	B
23 rd Street	B	B
22 nd Street	C	C
21 st Street	B	B
20 th Street	B	C
19 th Street	C	C
Travel time (min)	3:08	4:40
Change (min)		+ 1:32
Peak direction	Southbound	

Cycling Network (Linkages & Coverage)	Motor Vehicles (Level of Service & Travel Time)	Business (Parking & Storefronts)	Transit (BRT)
<ul style="list-style-type: none">1 Bridge Connection75% Coverage of Downtown	<ul style="list-style-type: none">LOS: B's or C'sTravel time increase of +1:32 min	<ul style="list-style-type: none">Parking:<ul style="list-style-type: none">Existing: 156With AAA: 102Reduction: - 54Storefronts:<ul style="list-style-type: none">96 (6.8 per block face)	<ul style="list-style-type: none">No BRT – BRT on 1st Avenue

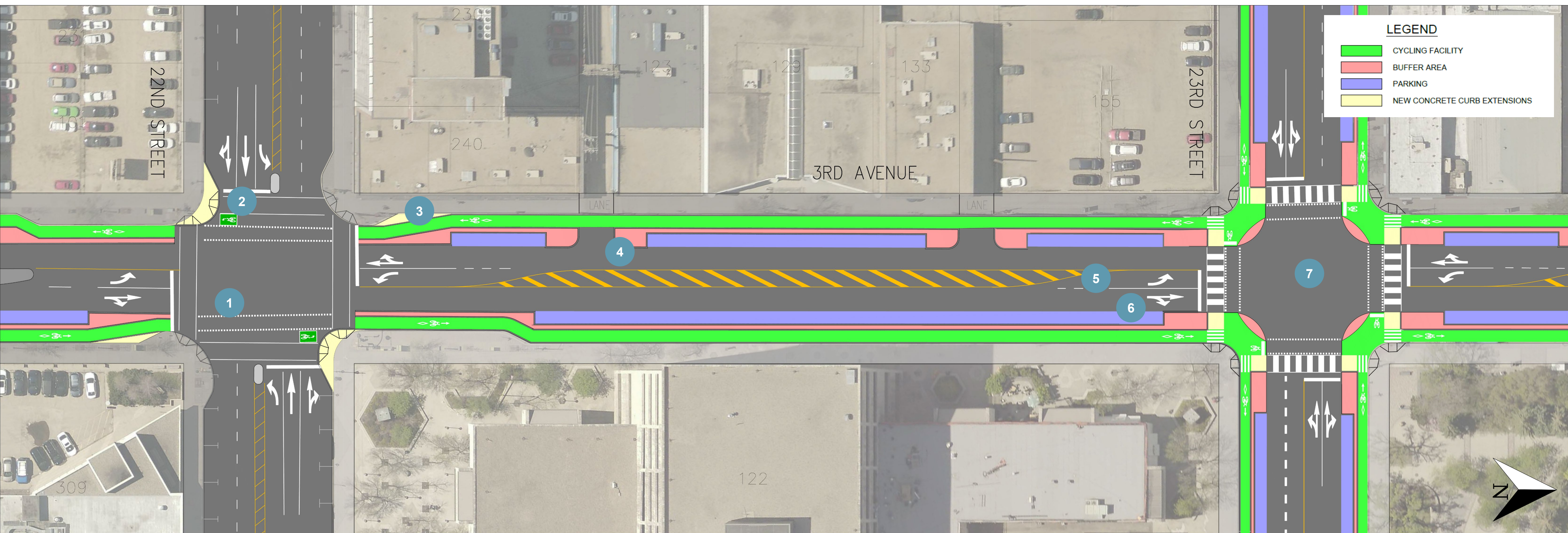
3rd Avenue | Mid-Block Conceptual Rendering



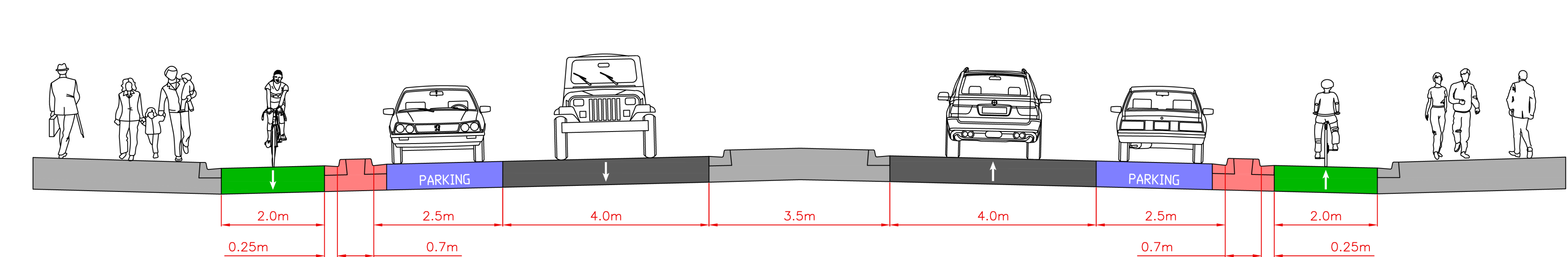
Unidirectional Design Elements

- Crossrides** provide a dedicated space at an intersection for cyclists to legally ride their bicycle through an intersection without dismounting.
- Bike Boxes** improve a cyclist's ability to safely and comfortably make left turns by reducing turning conflicts between cyclists and motor vehicles at signalized intersections.
- Bend-in** shifts the bike lane closer to motorized traffic so motorists and cyclists can see each other better.
- Buffer Areas** separate cyclists from parked vehicles and moving traffic.
- Developed Left Turn Bays** accommodate motor vehicles turning left at intersections. This is consistent with how the traffic lanes are currently configured.
- Parking** is provided along the length of the facility, but pulled back from driveways and intersections to improve visibility at conflict points.
- Protected Intersections** extend the physical barrier of the protected bike lane into the intersection to provide a setback bicycle crossing.

3rd Avenue | Plan View Conceptual Design - 22nd Street to 23rd Street



3rd Avenue | Typical Cross-Section



23rd Street Details

23rd Street | Overview of Technical Analysis

	Level of Service and Automobile Travel Time along 23 rd Street	
	Existing	AAA
Pacific Avenue	A	A
1 st Avenue	B	B
2 nd Avenue	B	B
3 rd Avenue	B	B
4 th Avenue	B	B
Travel time (min)	1:59	2:01
Change (min)		+ 0:02
Peak direction	Eastbound	

**Cycling Network
(Linkages & Coverage)**

- Connects to 23rd Street West Bicycle Boulevard near Idylwyld Drive
- 70% Coverage of Downtown

**Motor Vehicles
(Level of Service & Travel Time)**

- LOS: A's or B's
- Negligible change to travel time

**Business
(Parking & Storefronts)**

Parking:

- Existing: 103
- With AAA: 90*
- Reduction: -13

Storefronts:

- 21 (1.5 per block face)

*parking added in transit terminal

**Transit
(BRT)**

- No BRT - BRT on 1st Avenue or 3rd Avenue
- Current transit terminal on 23rd Street to be removed with implementation of BRT

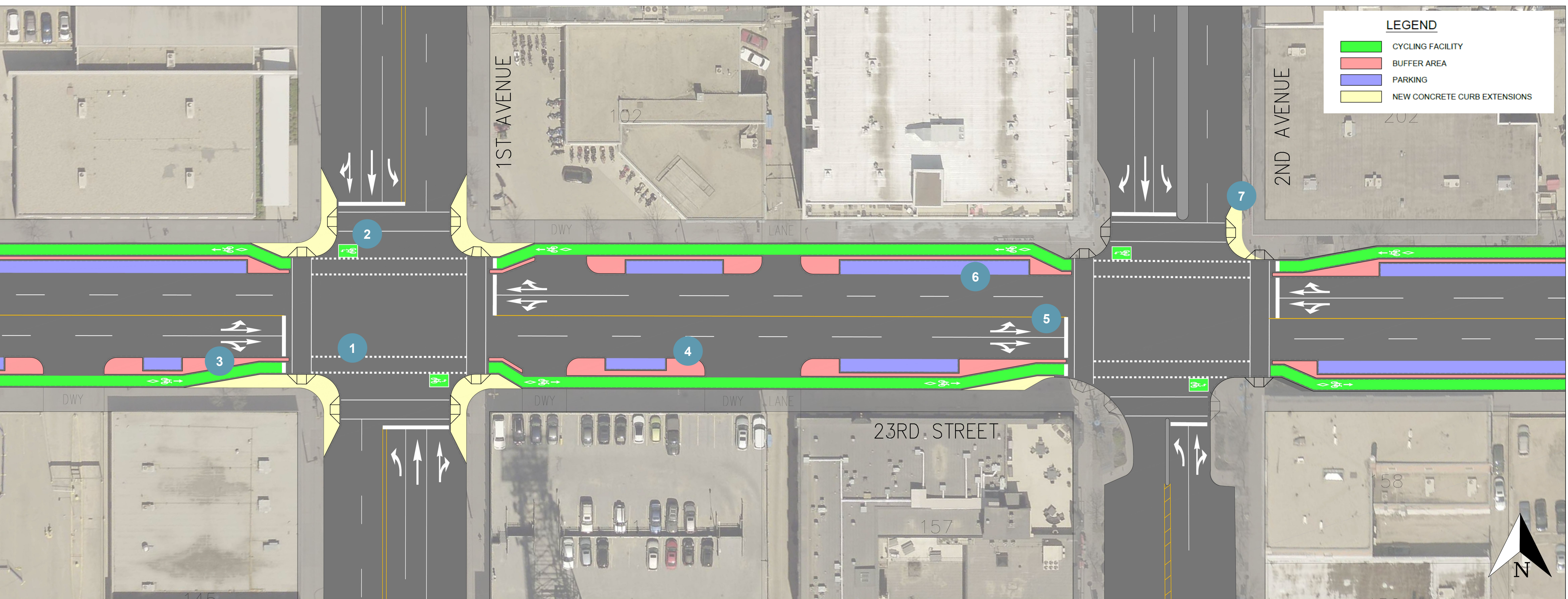
23rd Street | Mid-Block Conceptual Rendering



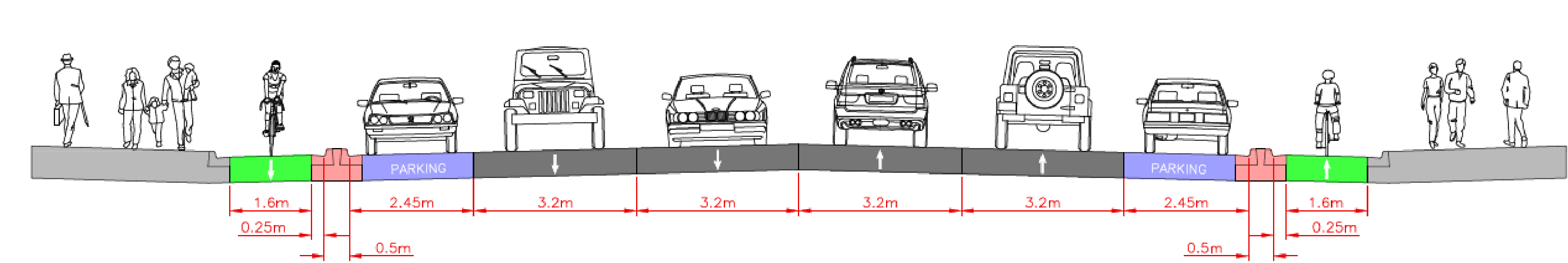
Unidirectional Design Elements

- 1 **Crossrides** provide a dedicated space at an intersection for cyclists to legally ride their bicycle through an intersection without dismounting.
- 2 **Bike Boxes** improve a cyclist's ability to safely and comfortably make left turns by reducing turning conflicts between cyclists and motor vehicles at signalized intersections.
- 3 **Bend-in** shifts the bike lane closer to motorized traffic so motorists and cyclists can see each other better.
- 4 **Buffer Areas** separate cyclists from parked vehicles and moving traffic.
- 5 **Shared Through/Left Turn Lanes** accommodate motor vehicles proceeding straight or turning left at intersections. This is consistent with how the traffic lanes are currently configured.
- 6 **Parking** is provided along the length of the facility, but pulled back from driveways and intersections to improve visibility at conflict points.
- 7 **Raised Curb Extensions** reduce the crossing distance for pedestrians.

23rd Street | Plan View Conceptual Design – 1st Avenue to 2nd Avenue

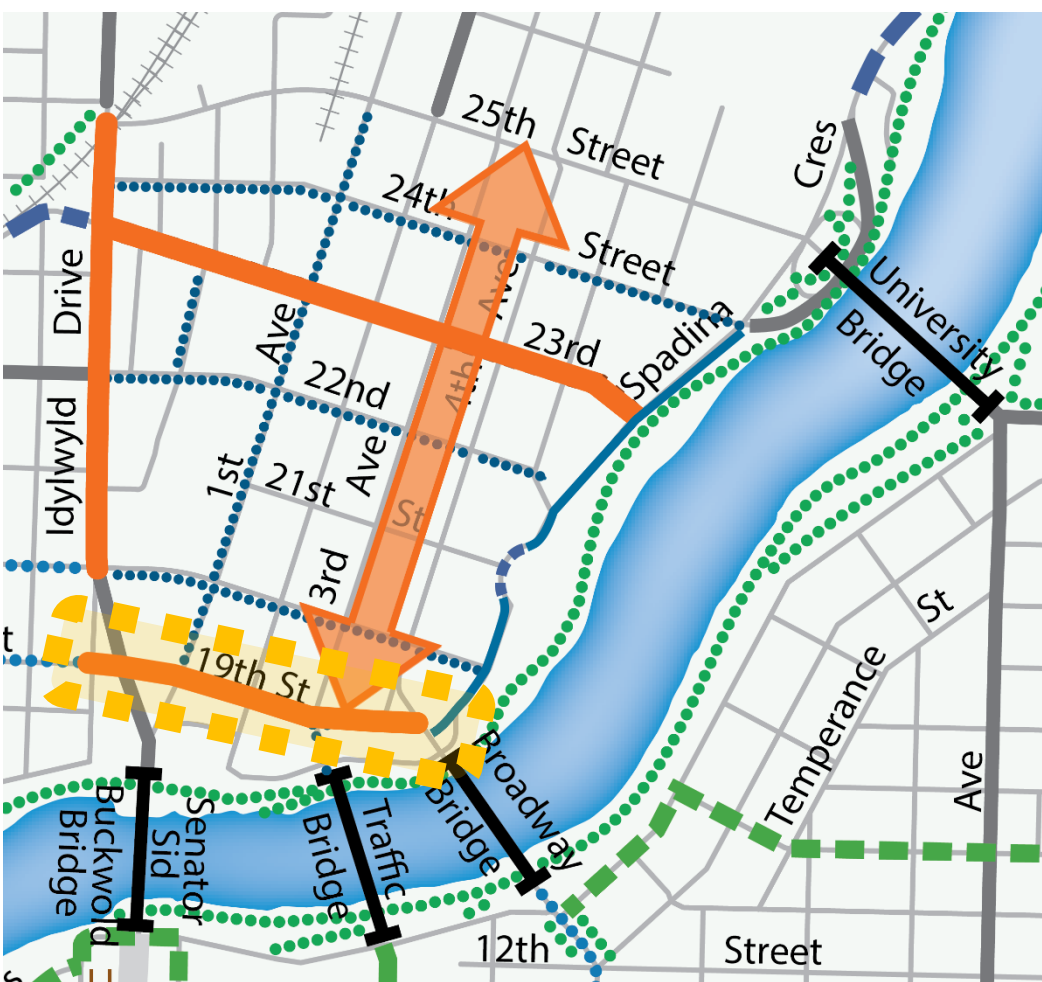


23rd Street | Typical Cross-Section



19th Street Details

19th Street | Overview of Technical Analysis



Level of Service and Automobile Travel Time along 19 th Street		
	Existing	AAA
1 st Avenue	C	C
2 nd Avenue	B	B
3 rd Avenue	C	C
4 th Avenue	B	B
Travel time (min)	1:43	2:35
Change (min)		+ 0:52
Peak direction	Eastbound	

Cycling Network (Linkages & Coverage)	Motor Vehicles (Level of Service & Travel Time)	Business (Parking & Storefronts)	Transit (BRT)
<ul style="list-style-type: none">2 Bridge ConnectionsConnects to proposed Protected Bike Lane from Avenue A to Avenue H35% Coverage of Downtown	<ul style="list-style-type: none">LOS: B's or C'sTravel time increase of +0:52 sec	<ul style="list-style-type: none">Parking:<ul style="list-style-type: none">Existing: 17With AAA: 17Reduction: 0Storefronts:<ul style="list-style-type: none">7 (1.2 per block face)	<ul style="list-style-type: none">Possibility of BRT – to be determined

Bidirectional Design Elements

For these types of facilities, the bicycle lanes run in both directions on the same side of a street. A two-way cycle track is proposed for 19th Street because:

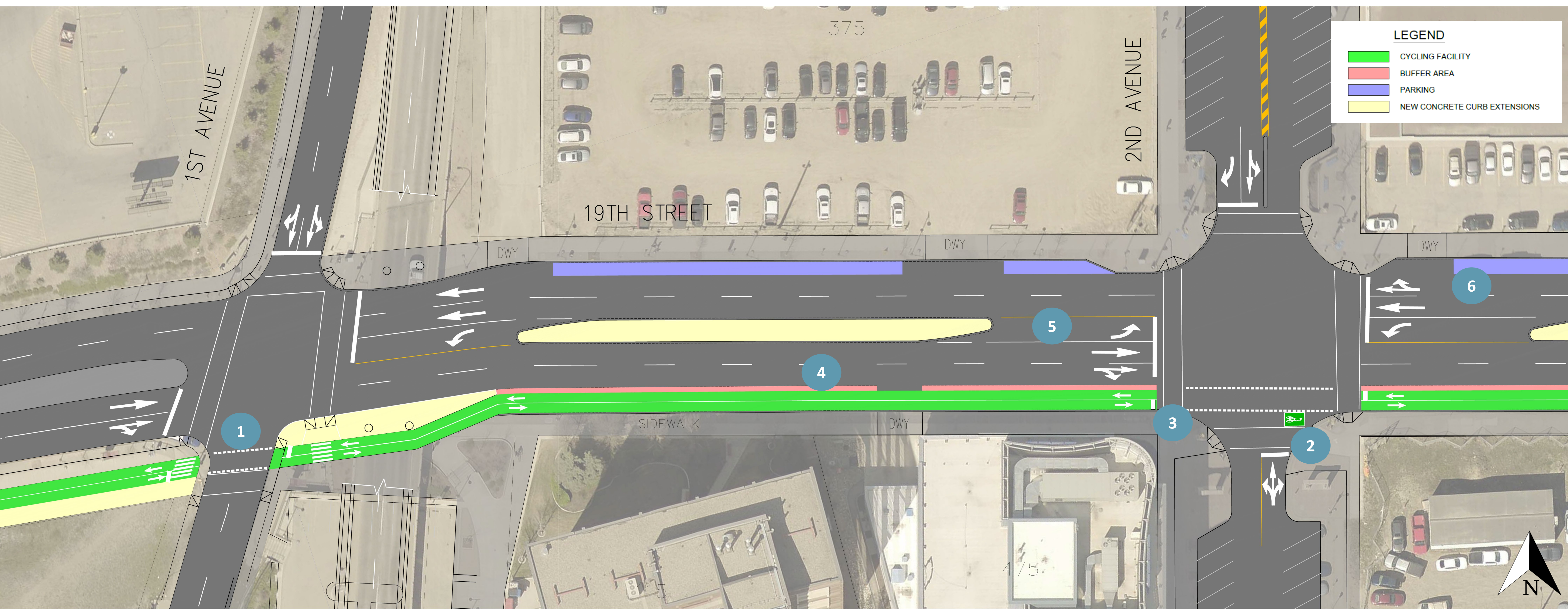
- More cycling connections are on the south side, reducing the need to cross the street.
- Extra pavement width is available by reducing excessive traffic lane widths.
- Space is available on the south side under the Idylwyld Drive and 1st Avenue overpasses to connect with the Farmer's Market.
- Few conflicts on the south side, such as driveways or lanes.
- No impact on current parking supply.
- The intersection of 19th Street and 3rd Avenue is scheduled for signal and intersection reconstruction.

- Crossriders** provide a dedicated space at an intersection for cyclists to legally ride their bicycle through an intersection without dismounting.
- Bike Boxes** improve a cyclist's ability to safely and comfortably make left turns by reducing turning conflicts between cyclists and motor vehicles at signalized intersections.
- Bicycle Traffic Signals** are used to separate cyclists travelling through the intersection from turning motorists.
- Buffer Areas** separate cyclists from moving traffic.
- Developed Left Turn Bays** accommodate vehicles turning left at intersections. This is consistent with how the traffic lanes are currently configured.
- Parking** is unaffected. Additional off-street parking will be provided through the development of Parcel YY in River Landing.

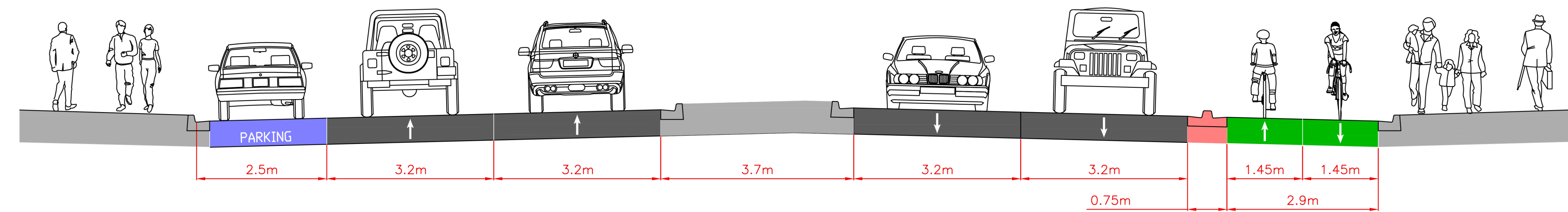
19th Street | Mid-Block Conceptual Rendering



19th Street | Plan View Conceptual Design – 1st Avenue to 2nd Avenue



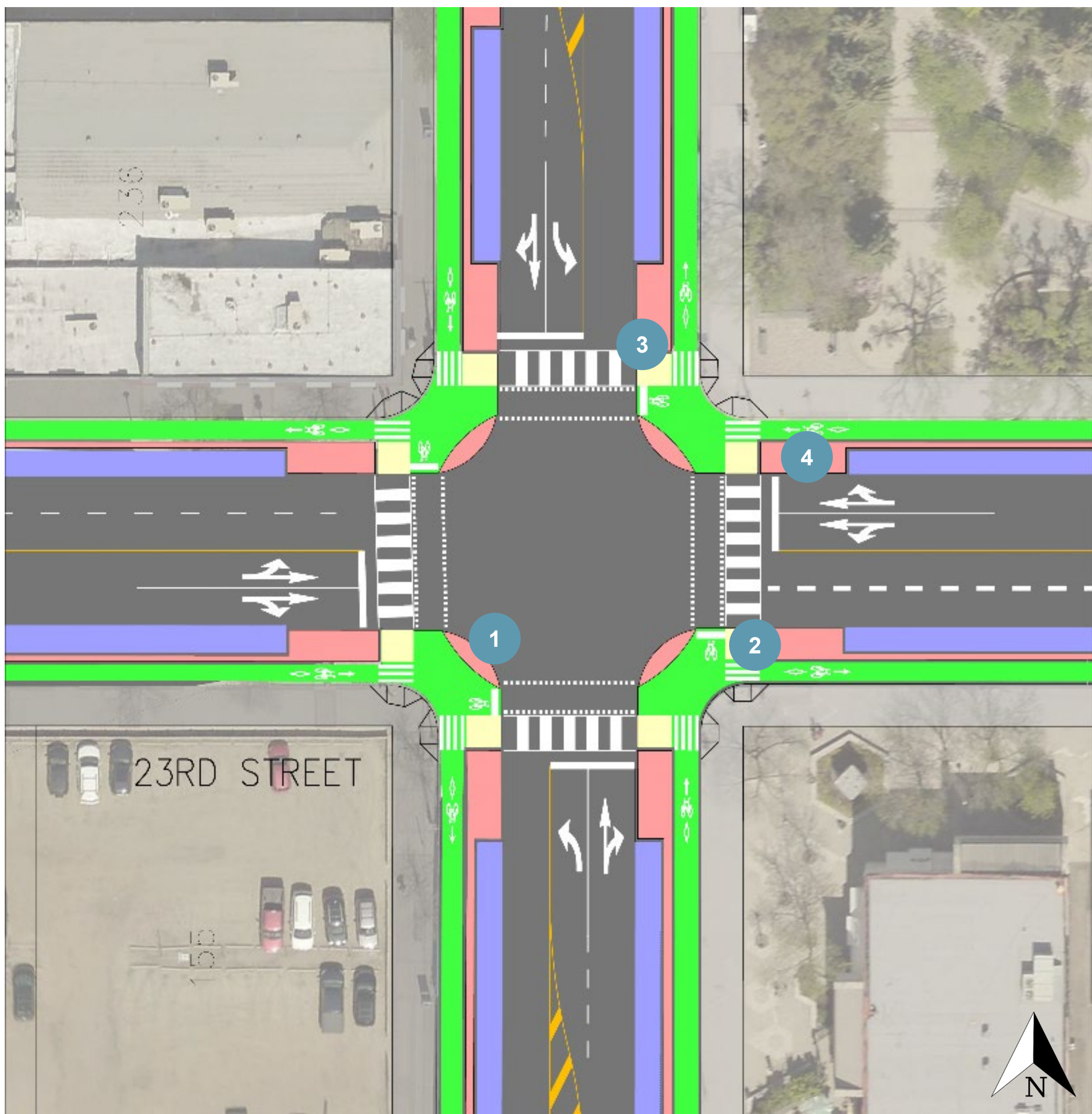
19th Street | Typical Cross-Section



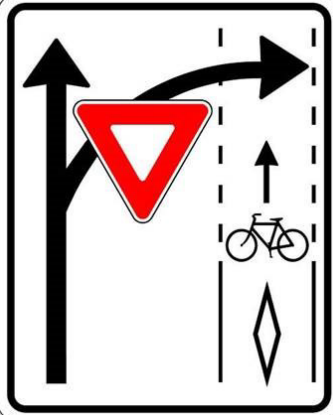
Intersection Design

PROTECTED INTERSECTION

The protected intersection extends the physical barrier of the protected bike lane into the intersection to provide a setback bicycle crossing.

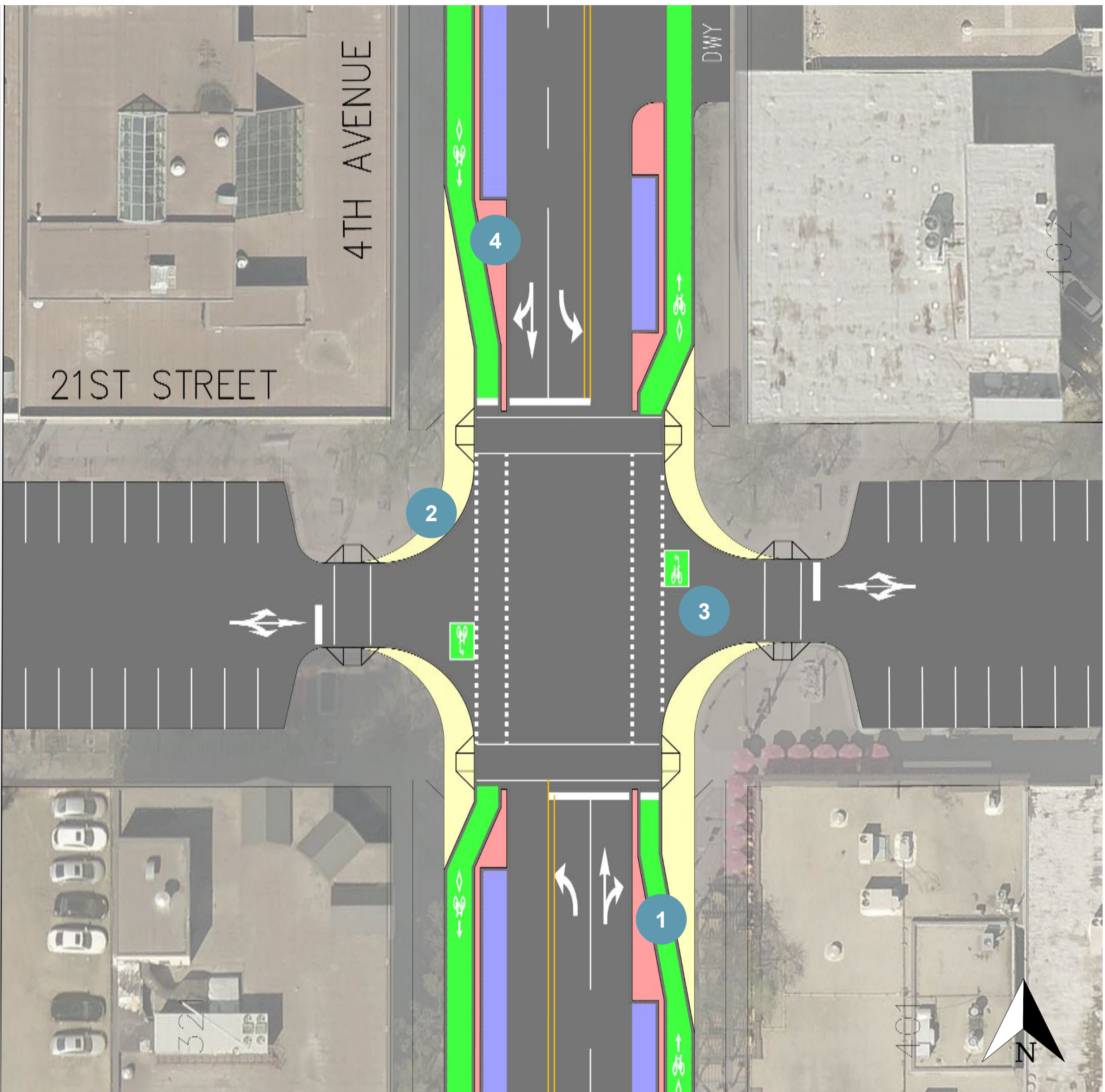


- 1 **Corner Islands** slow motorists turning right around the corner where they yield to cyclists heading through the intersection.
- 2 **Forward Stop Bars** offer a protected place for cyclists to wait when crossing or turning.
- 3 **Pedestrian Islands** reduce the crossing distance for pedestrians.
- 4 **Clear Zones** approaching the intersection could be raised with aesthetic elements while maintaining visibility between pedestrians and motorists.

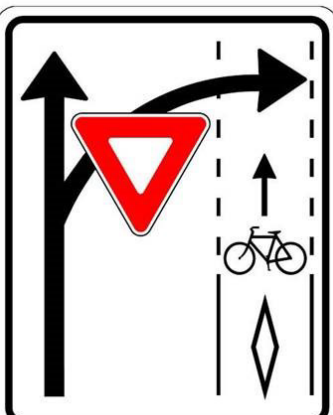
- ✓  **Right-turn yield to cyclists sign** reminds drivers that cyclists have the right-of-way through the intersection and right-turning vehicles must yield.
- ✓ **People cycling and driving follow the same traffic signal** although bicycle-specific signals can be used to manage higher volumes of cyclists.
- ✓ **Intersection** could be elevated and built with textured surfaces and other enhancements.

STANDARD INTERSECTION

The bend-in design position cyclists adjacent to the vehicle lane so that motorists can easily see cyclists before making a right turn.

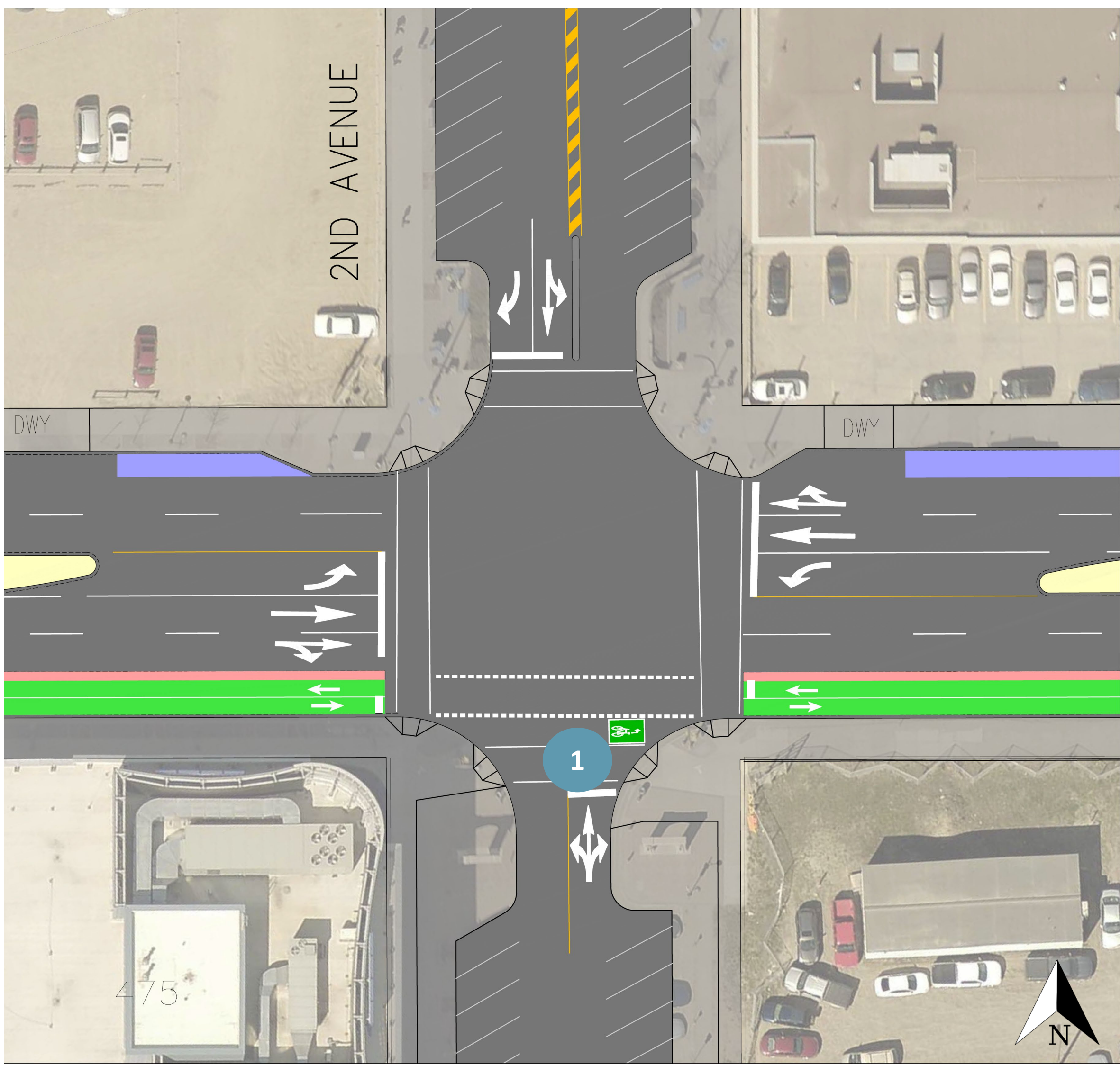


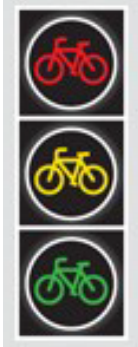
- 1 **Bend-in** shifts the bike lane closer to motorized traffic so motorists and cyclists can see each other better.
- 2 **Raised Curb Extensions** shorten the crossing distance for pedestrians.
- 3 **Bike Boxes** provide a formal queuing space for cyclists making a two-stage left turn.
- 4 **Clear Zones** approaching the intersection could be raised with aesthetic elements while maintaining visibility between cyclists and motorists.

- ✓  **Right-turn yield to cyclists sign** reminds drivers that cyclists have the right-of-way through the intersection and right-turning vehicles must yield.
- ✓ **People cycling and driving follow the same traffic signal.**
- ✓ **Sidewalk widening** provides opportunity for landscaping, snow storage, and amenities.

BI-DIRECTIONAL INTERSECTION

Two-way protected bike lanes completely separate movement of cars and bikes at intersections using bicycle traffic signals. For example, right-turning and left-turning cars have a red light, while cyclists going through receive a green light.


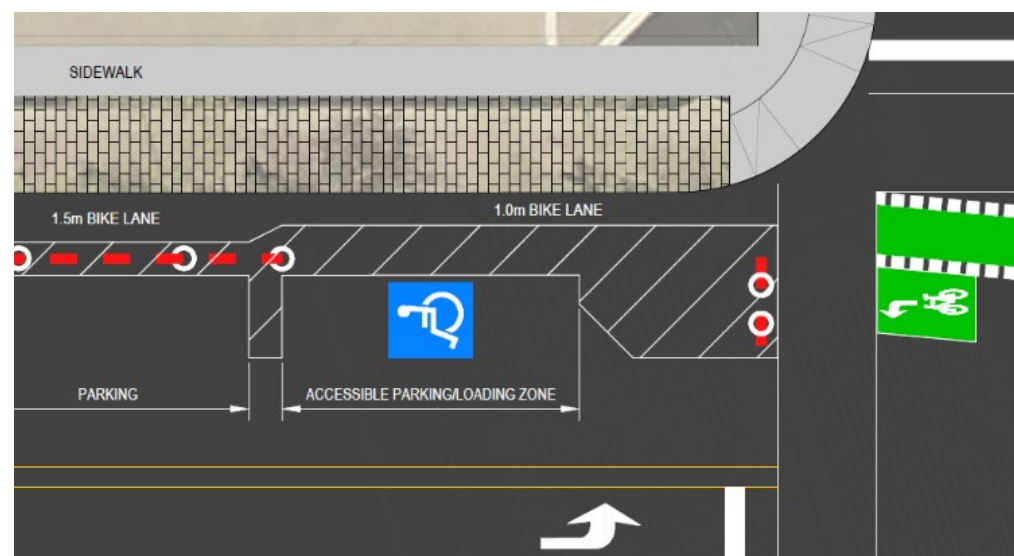
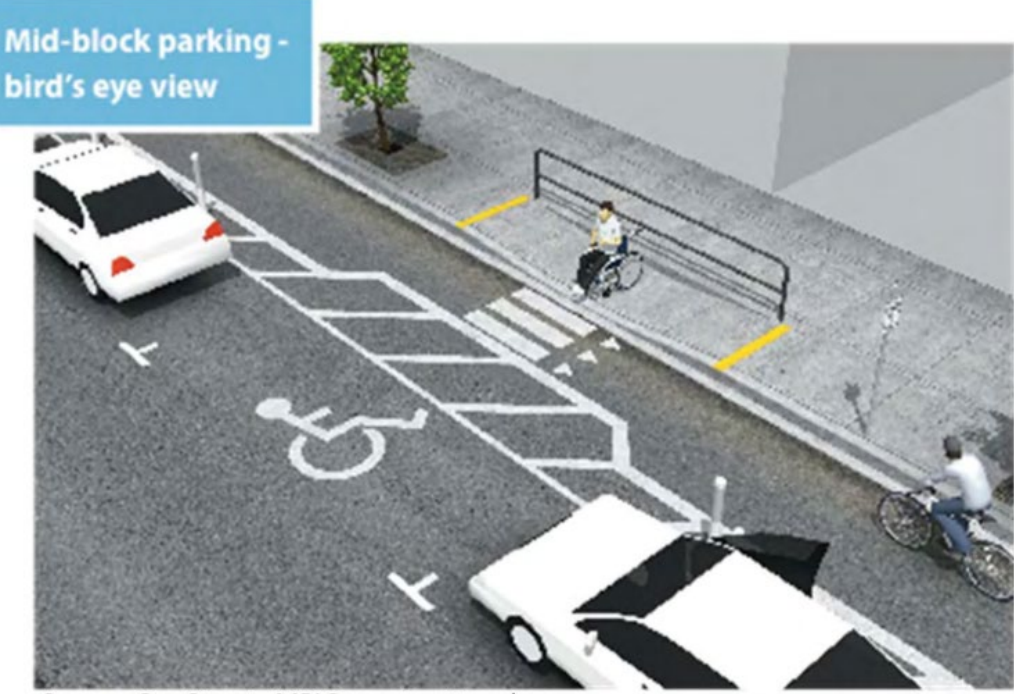
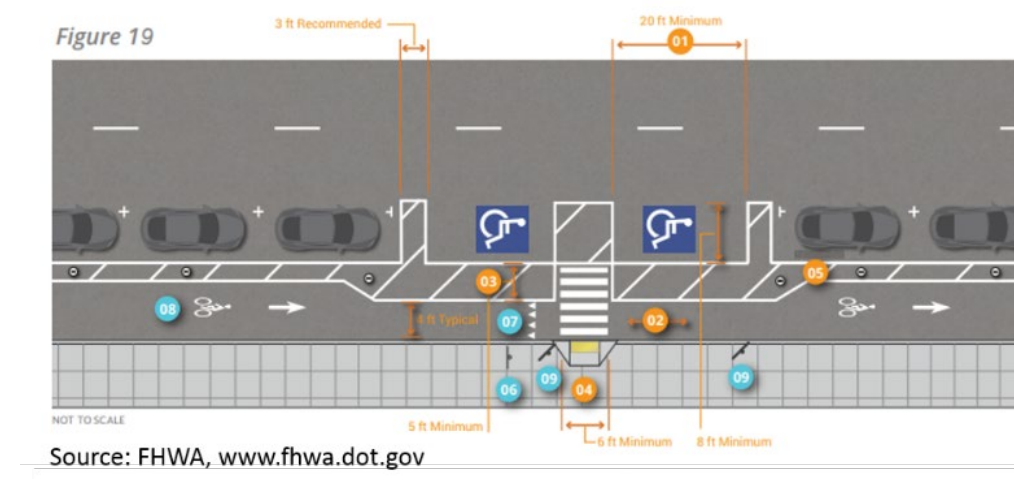
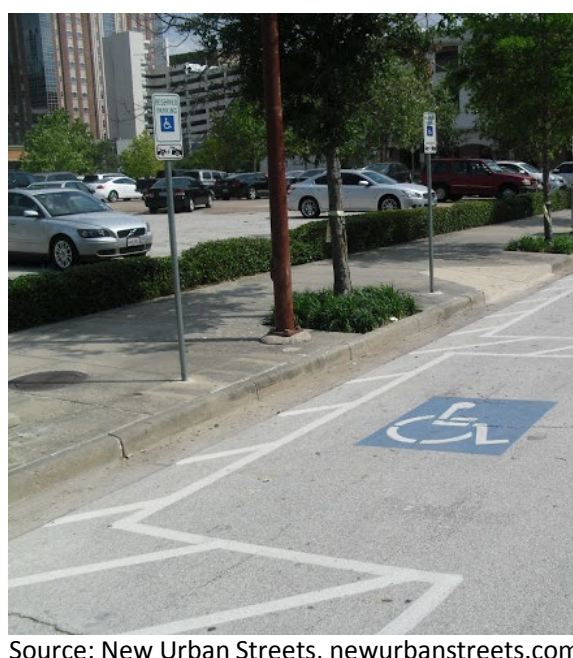
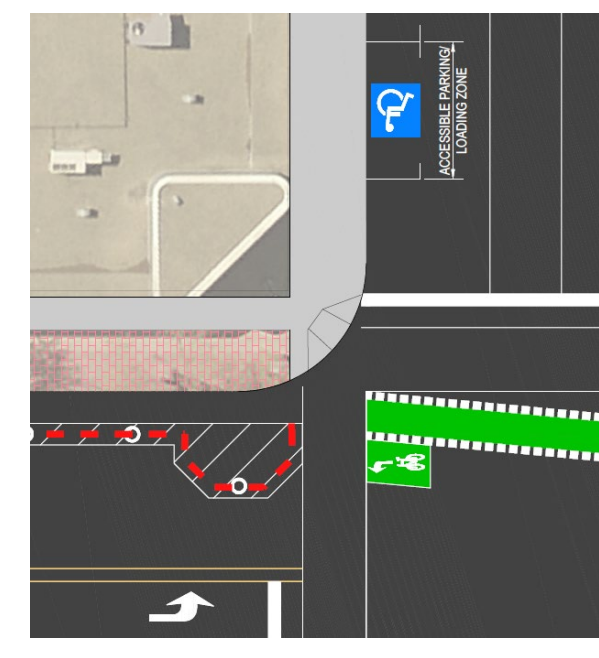
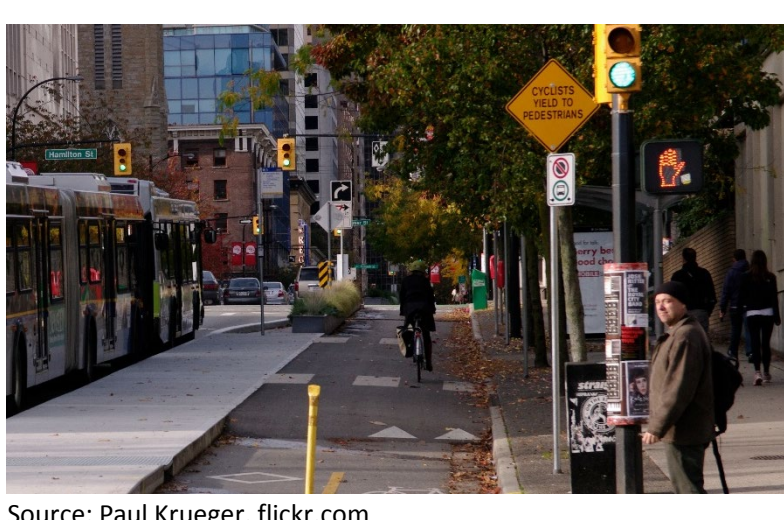
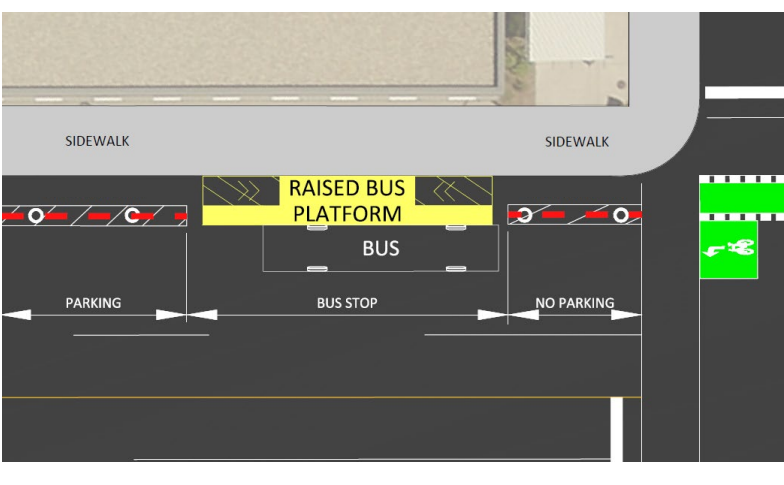


- 1 **Bike Boxes** provide a formal queuing space for cyclists making a two-stage left turn.
- ✓  **Bicycle signals** in coordination with turn arrows for motorists manage conflicts between cyclists and turning motorists.
- ✓ **Bicycle presence** conveyed to the signal by passive bicycle detectors.
- ✓ **Signs and traffic signals** oriented toward cyclists traveling in the contra-flow direction.
- ✓ **Motorists** have a clear view of cyclists in the bike lane travelling in both directions.

Design Elements






ACCESSIBLE PARKING & TRANSIT STOPS

There are many considerations that need to be balanced when designing AAA cycling facilities. Below are a few options for design elements for accessible parking spaces and transit stops near protected bike lanes.

<div>End-Block Parking</div>	<div><p>Source: Our Streets MPLS, ourstreetsmpls.org</p><p>Source: Our Streets MPLS, ourstreetsmpls.org</p></div> <div><ul style="list-style-type: none">• Access to sidewalk via the existing curb ramp• Widened painted buffer to accommodate side-loading vehicles and slow cyclists• Signs and pavement markings to advise cyclists to yield to pedestrians• No posts or other obstructions are placed in the accessible parking space buffer</div>
<div>Mid-Block Parking</div>	<div><p>Source: Our Streets MPLS, ourstreetsmpls.org</p><p>Source: FHWA, www.fhwa.dot.gov</p></div> <div><ul style="list-style-type: none">• An access aisle at street level connects to a pedestrian access route and mid-block curb ramp• Additional space is provided at the front and rear of the parking space to facilitate ease of access• A crosswalk and curb ramp connect the access aisle to the sidewalk• Signs and pavement markings to advise cyclists to yield to pedestrians• No posts or other obstructions are placed in the accessible parking space buffer</div>
<div>Adjacent Block Parking</div>	<div><p>Source: New Urban Streets, newurbanstreets.com</p><p>Source: New Urban Streets, newurbanstreets.com</p></div> <div><ul style="list-style-type: none">• Designate the parking space on the side street nearest to the intersection as an accessible parking space• Designating this space would not require a person using this space to cross the protected bike lane, as the street with the designated accessible parking space would not have an AAA facility on it</div>
<div>Transit Stop</div>	<div><p>Source: Paul Krueger, flickr.com</p><p>Source: Paul Krueger, flickr.com</p></div> <div><ul style="list-style-type: none">• Separates cyclists and buses to improve cyclist comfort and bus operating speeds• A raised platform enables easier, more accessible passenger boarding and alighting• Signs and pavement markings to advise cyclists to yield to pedestrians• Raised crossing to slow cyclists who must yield to pedestrians</div>

TYPES OF SEPARATION

There are several types of separation that can be used in the buffer area between the bike lane and the parking lane or motor vehicle travel lane. Below are a few options for separation types that could be used Downtown.

<div>Flexible Delineator Posts</div>	<div><p>Source: City of Saskatoon</p></div> <div><ul style="list-style-type: none">• Provides guidance for drivers at eye-level• Offers flexibility of placement• Easily replaceable• Less damage to vehicles with large overhangs (delivery trucks etc.)</div>
<div>Bollards</div>	<div><p>Source: LB40 Blog, longbeach40.blogspot.com</p></div> <div><ul style="list-style-type: none">• Rigid barrier• Suitable for slow streets or adjacent to parking</div>
<div>Linear Curb</div>	<div><p>Source: Winnipeg Free Press, winnipegfreepress.com</p></div> <div><ul style="list-style-type: none">• Continuous vertical curb• Adds parking guidance</div>
<div>Raised Median</div>	<div><p>Source: Watt Consulting Group, wattconsultinggroup.com</p></div> <div><ul style="list-style-type: none">• Wider than linear curbs• Adds the ability to install signs in the buffer (widths range from 0.5m to 1.5m)</div>
<div>Planters</div>	<div><p>Source: The Northwest Urbanist, thenorthwesturbanist.com</p></div> <div><ul style="list-style-type: none">• Aesthetic treatment to streetscape• Cannot be continuous if access to parking is required</div>

3rd Avenue or 4th Avenue Comparison

Which route do you prefer? Tell us below!

The recommended Downtown AAA cycling network includes 19th Street, 23rd Street, and either 3rd Avenue OR 4th Avenue. The Imagine Idylwyld project also recommends Idylwyld Drive include AAA cycling facilities through Downtown.

The assessment process determined that either 3rd Avenue or 4th Avenue can accommodate the addition of an AAA cycling facility. The location of the facility is dependent on the final route selection for Bus Rapid Transit, as there is insufficient roadway to accommodate both BRT and AAA facilities on the same street.

If BRT is located on 1st Avenue, the recommended AAA cycling route is 3rd Avenue.
Should BRT be located on 3rd Avenue, the recommended AAA cycling route is 4th Avenue.

Below is a comparison of the analysis for both streets. Indicate your preference for 3rd Avenue or 4th Avenue by placing a dot in the appropriate box.

AAA NETWORK WITH 3rd AVENUE

Cycling Network (Linkages & Coverage)	Motor Vehicles (Level of Service & Travel Time)	Business (Parking & Storefronts)	Transit (BRT)
<ul style="list-style-type: none">1 Bridge Connection75% Coverage of Downtown	<ul style="list-style-type: none">LOS: B's or C'sTravel time increase of +1:32 min	<ul style="list-style-type: none">Parking:<ul style="list-style-type: none">Existing: 156With AAA: 102Reduction: - 54Storefronts:<ul style="list-style-type: none">96 (6.8 per block face)	<ul style="list-style-type: none">No BRT – BRT on 1st Avenue

LOS existing configuration

LOS AAA facility

24th St

23rd St

22nd St

21st St

20th St

19th St

Total corridor travel time
3:08 min | 4:40 min
Change in travel time
1:32 min

AAA NETWORK WITH 4th AVENUE

Cycling Network (Linkages & Coverage)	Motor Vehicles (Level of Service & Travel Time)	Business (Parking & Storefronts)	Transit (BRT)
<ul style="list-style-type: none">1 Bridge Connection70% Coverage of Downtown	<ul style="list-style-type: none">LOS: B's or C'sTravel time increase of +2:17 min	<ul style="list-style-type: none">Parking:<ul style="list-style-type: none">Existing: 152With AAA: 94Reduction: - 58Storefronts:<ul style="list-style-type: none">41 (3.4 per block face)	<ul style="list-style-type: none">No BRT – BRT on 3rd Avenue

LOS existing configuration

LOS AAA facility

24th St

23rd St

22nd St

21st St

20th St

19th St

Total corridor travel time
2:11 min | 4:28 min
Change in travel time
2:17 min

Level of Service

Level of Service	Average Delay per Vehicle (seconds)
A	0 - 10
B	> 10 - 20
C	> 20 - 35
D	> 35 - 55
E	> 55 - 80
F	> 80

Traffic Analysis Assumptions

- Transit Mall on 23rd Street is no longer present. Through traffic movements along 23rd Street have been added.
- Traffic Bridge is open.
- Parcel YY in River Landing is built out (increase in traffic due to development).
- For AAA on 3rd Avenue:** all analyses take into account the changes in travel pattern in the Downtown with Bus Rapid Transit on 1st Avenue.
- For AAA on 4th Avenue:** all analyses take into account the changes in travel pattern in the Downtown with Bus Rapid Transit on 3rd Avenue.

Thank You!

Want to tell us more? Please fill in a comment form or email cycling@saskatoon.ca