Topeka Bikeways Circulation Study (Phase V)

January 2024

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Acronyms

AADT – Average Annual Daily Traffic

AASHTO – American Association of State Highway and Transportation Officials

CSAC – Complete Streets Advisory Committee

PHB – Pedestrian Hybrid Beacon

ROW – Right-of-Way

SBL – Separated Bike Lane

SUP – Shared Use Path. Used synonymously with sidepath in this document.

Introduction

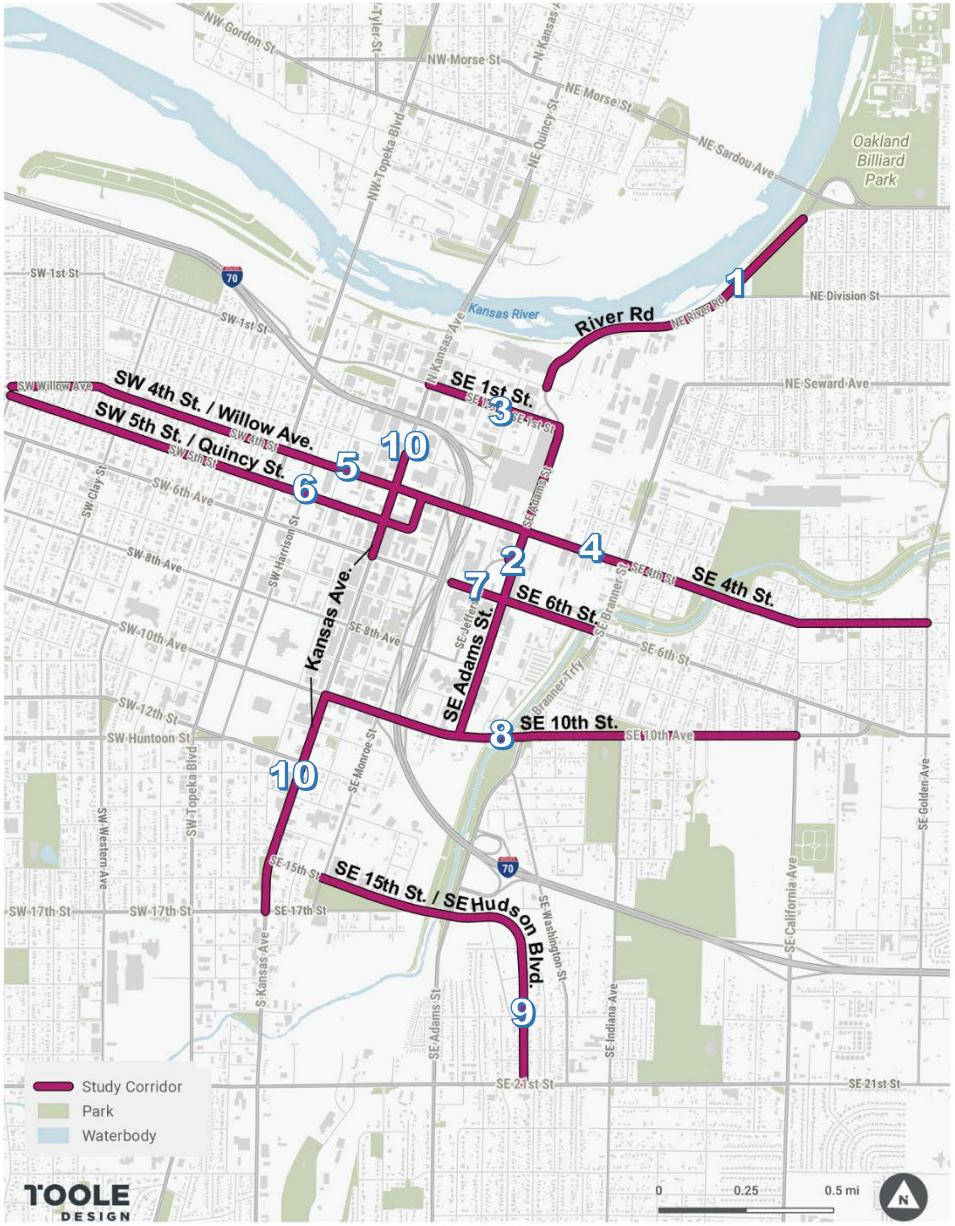
The purpose of the Topeka Bikeways Circulation Study is to advance the network recommendations of the 2012 Bikeways Master Plan and 2020 Fast-Track Bike Plan by developing high-level concept designs for ten roadway corridors identified for the next phase of implementation (Phase V). The concepts show how each roadway could be reconfigured to accommodate safe and comfortable bicycle travel. The concepts are intended to help jump-start these priority bikeway projects and leverage potential grant funding.

The ten Phase V corridors are located within and adjacent to Downtown Topeka and are listed in Table 1 and shown in Figure 1.

Table 1. Study Corridors

Corridor	Extents
1 - NE River Rd	NE Crane St to NE Emmett St
2 - SE Adams St	SE 10th Ave to SE 1st St
3 - SE 1st St	Kansas Ave to Jefferson Trfy
4 - SE 4th St	NE Golden Ave to Kansas Ave
5 - SW 4th St	Washburn Ave to Kansas Ave
6 - SW 5th St	Washburn Ave to SE 4th St
7 - SE 6th St	SE Madison St to SE Branner St
8 - SE 10th St	S Kansas Ave to SE California Ave
9 - SE 15th St / SE Hudson Blvd	SE Monroe St to Maryland Ave to SE 21st St
10 - Kansas Ave	3rd St to 6th St and 10th Ave to 17th St

Figure 1. Study Corridors



Study Process

The study development process started with a review of related plans and projects that influence or impact the corridors including the 2012 and 2020 bikeways plans, the Complete Streets Policy and Design Guidelines, and the Polk Quincy Viaduct plans. An assessment of existing conditions of the corridors was completed to understand existing roadway configurations, traffic volumes, posted speed limits, on-street parking, bikeways connections, pedestrian connections, transit services and amenities, crash patterns, and corridor level vehicular capacity. The purpose of the review and assessment was to help identify the most appropriate bikeway facility considering both safety and feasibility. A complete overview of the existing conditions analysis is provided in a memo in Appendix B.

The study corridors were divided into segments, with break points located where the existing roadway configuration changes. A draft bikeway facility type was selected for each segment of each study corridor, considering the factors identified in the Appendix B: Existing Conditions Memorandum. Design concept illustrations were developed to show the existing roadway configuration and the proposed roadway configuration. The proposed concepts included the recommended bikeway and documented the rationale for the proposed reconfiguration. The concepts were presented to the Complete Streets Advisory Committee (CSAC) and the public for review and comment. For a detailed engagement summary, see Appendix C. The proposed concepts were finalized, and preliminary opinions of probable cost were developed for each concept.

Design Concepts

The concepts were developed with the Fast-Track Bike Plan vision in mind: *Topeka will be a place where people of all ages, abilities, and backgrounds have safe, comfortable, and convenient opportunities to bike for transportation and recreation.*

As much as practical, concepts were developed to minimize the need to move curbs and acquire additional right-of-way to be cost effective and allow for quick implementation. The focus was on providing bikeways with pavement markings, signage, and utilizing pavement (e.g., shared use paths and sidewalks) between the curb and the property line. There are locations where the recommended concept leaves existing travel lanes (drive lanes) that are wider than 11 feet. These wider lanes are not consistent with a Complete Streets approach; however, these lanes were not reconfigured to minimize the need to move curbs. As a best practice, drive lanes of 10 feet should be used in locations where the legal speed is 35 mph or less and the truck and bus volumes are relatively low. The ultimate design of the street should be consistent with a Complete Streets approach as specified in the city's Complete Streets Design Guidelines.

Concept forms were developed for each of the study corridors. Each concept form includes an overview map of the corridor that identifies each segment, planning considerations, existing and proposed typical cross-sections for each corridor segment, design recommendations, design rationale, alternatives considered, needs for additional study, and cost estimates. The concept forms are intended to be used for multiple purposes including applying for grant funding, communication of design intent, and documentation of major design considerations.

The concept forms are presented in Appendix A, in the order shown below:

- SE Adams St from SE 10th Ave to SE 1st St (page A-1)
- SE 1st St from Kansas Ave to Jefferson Trfy (page A-8)
- SE 4th St from NE Golden Ave to Kansas Ave (page A-12)
- SW 4th St from Washburn Ave to Kansas Ave (page A-21)

- SW 5th St from Washburn Ave to SE 4th St (page A-29)
- SE 6th St from SE Madison St to SE Branner St (page A-37)
- SE 10th St from S Kansas Ave to SE California Ave (page A-44)
- SE 15th St / SE Hudson Blvd from SE Monroe St to Maryland Ave to SE 21st St (page A-52)
- Kansas Ave from 3rd St to 6th St and 10th Ave to 17th St (page A-62)

River Road

River Rd from NE Crane St to NE Emmett St was assessed to determine how a bikeway could be included along the corridor. Major challenges were identified that would impact implementation schedule and cost. The design team looked at options for alternative bikeway routes from Downtown Topeka to Santa Fe Park; however, the community desires the connection via River Rd. There is also a study under development to look at improving access to the Kansas River and possible changes to land use and development along the river.

The major challenges to developing bikeways along the existing River Rd corridor include the following:

- River Rd is located on a United States Army Corp of Engineers (USACE) owned levee. Improvements will need to be coordinated with the USACE, which will add time to the design and construction process, delaying implementation.
- There is an existing BNSF railroad bridge that extends over River Rd, with bridge piers located within the area of the roadway. Any improvements will need to be coordinated with, and approved by, the railroad.
- The Polk Quincy Viaduct Project is a major highway project that realigns I-70 through Topeka. River Rd is being considered as a detour route during construction, which is expected to begin in 2025 and last 3 years. It is not desirable to have River Rd under construction when it is being used as a detour route.
- There are existing guardrails along portions of the River Rd corridor. These are the jurisdiction of the city and could be removed or relocated if additional resources are allocated for the River Rd project.
- Based upon the parcel data from the Shawnee County Appraiser's Office, existing right-of-way is limited. In addition, there are steep slopes adjacent to the roadway. Adding a bikeway along this corridor will likely require additional right-of-way (or access granted) and construction of retaining walls.

For these reasons, a concept form was not developed for River Rd; however, this Plan identifies a proposed concept for providing a bikeway along the River Rd corridor.

The proposed concept is to construct a 12-foot-wide shared use path along the south / east side of River Rd from NE Crane St to NE Emmett St. This route a vital transportation connection from Downtown Topeka to Santa Fe Park and the Oakland neighborhood. The shared use path is also anticipated to be part of a long-term recreational trail corridor along the river. The wide shared use path is intended to allow side-by-side walking or riding and mitigate safety and discomfort issues between people riding bicycles and people walking.

The map (Figure 2) shows the location of the River Rd corridor extending from NE Crane St to NE Emmett St. The existing right-of-way width varies greatly along the corridor. Existing and proposed cross-sections were developed for the constrained section under the railroad bridge (Figure 3).

Figure 2. River Road Corridor

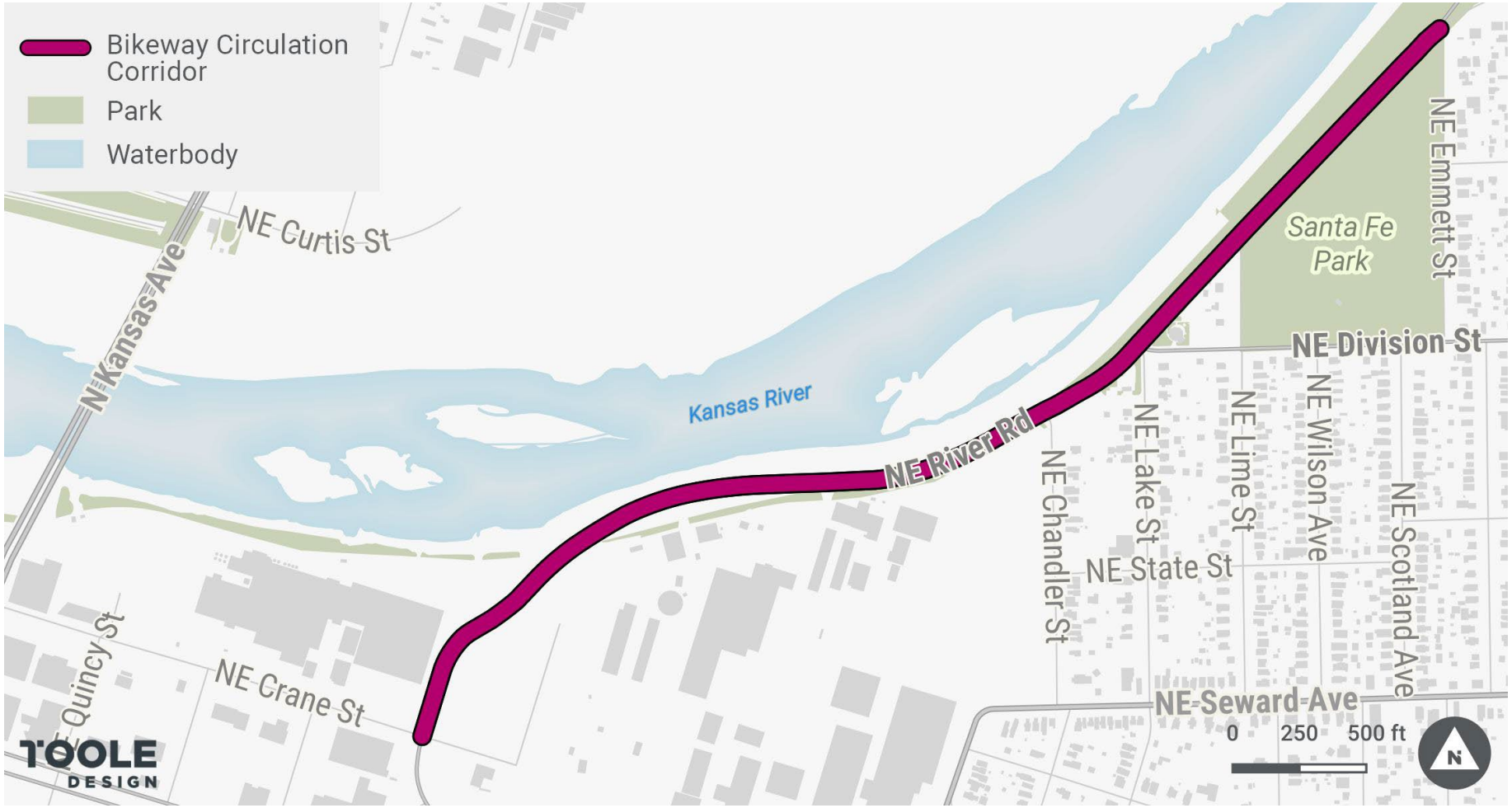
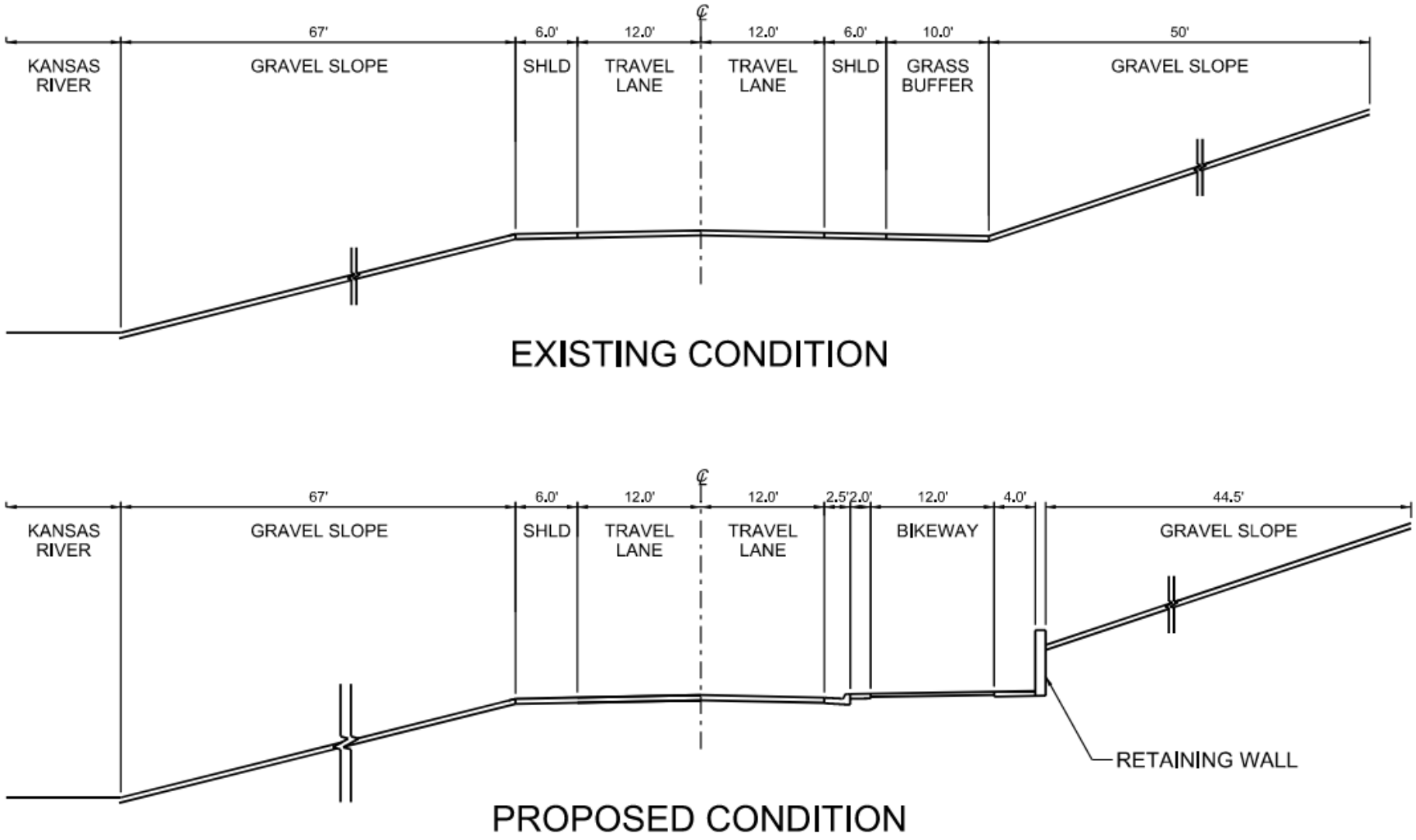


Figure 3: River Road Long-Term Concept Option



Appendix A: Concepts Forms

SE ADAMS STREET

From SE 10th Avenue to SE 1st Street

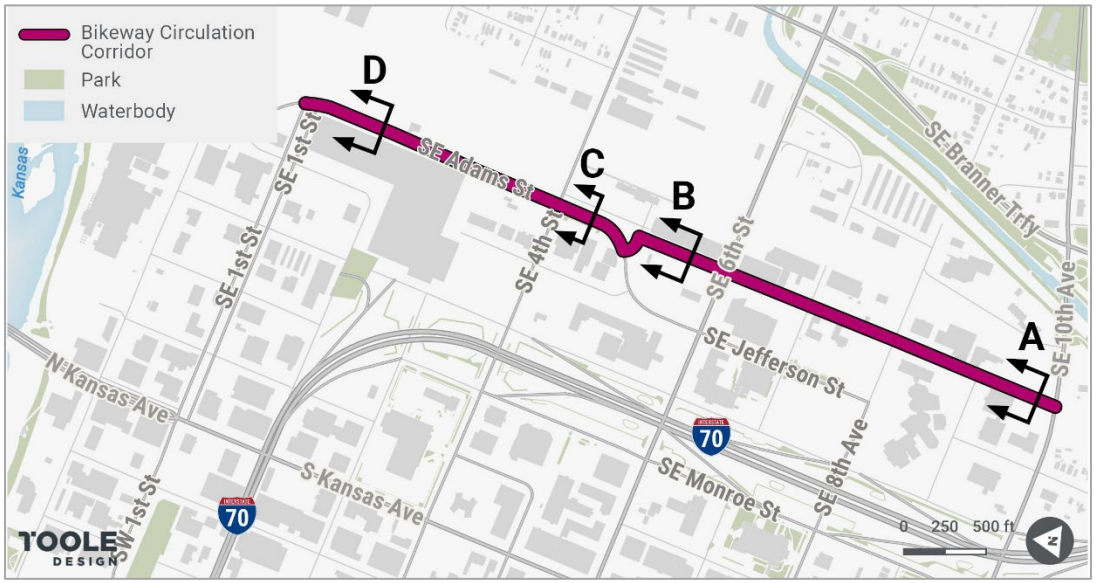


Figure 1. SE Adams Street Corridor Map

New Bike Network Miles: 0.91

Questions? https://topekampo.org/

PLANNING CONSIDERATIONS	
Posted Speed Limit	30 mph
Connectivity to existing bikeways	N/A
Bikeway Rationale	Access to AMTRAK Station
Major Barriers (constrained bridges or underpasses, freeway ramps)	Underpass (SE 6th Street)
Elements of Construction	Paint, flex posts, crossing signal, curb reconstruction, traffic calming
On-Street Parking	N/A
Transit	Route 7 AMTRAK Station

These preliminary concepts are for planning purposes only. Field verification, site condition assessments, engineering analysis, and design are necessary prior to implementing recommendations.

SE ADAMS STREET

From SE 10th Avenue to SE 1st Street

TYPICAL CROSS-SECTIONS

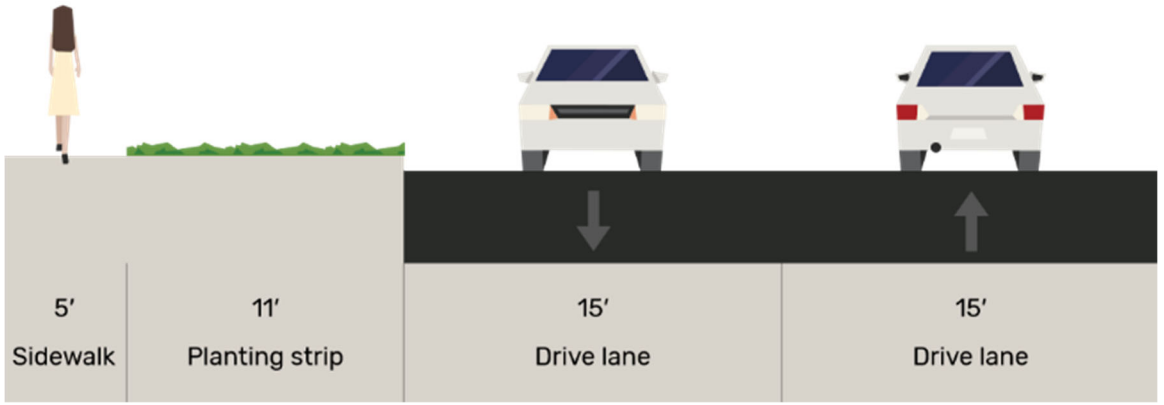


Figure 2. Section A (SE 10th Ave to SE 7th St) – Existing (30' traveled way)

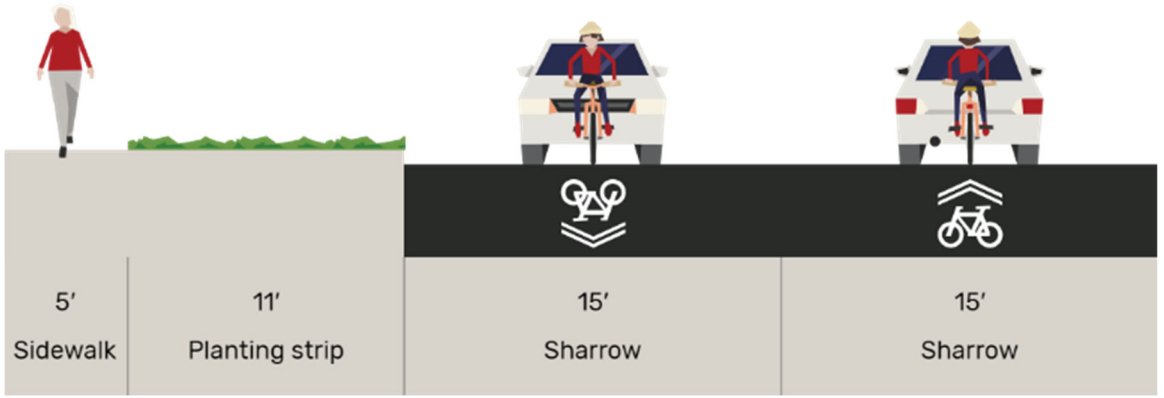


Figure 3. Section A (SE 10th Ave to SE 7th St) – Proposed (30' traveled way) *

SE ADAMS STREET

From SE 10th Avenue to SE 1st Street

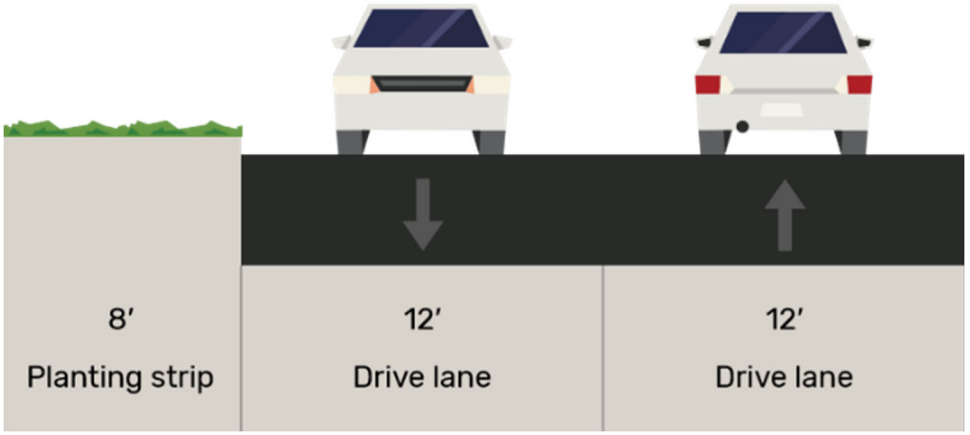


Figure 4. Section B (SE 7th St to SE 5th St) – Existing (24’ traveled way)

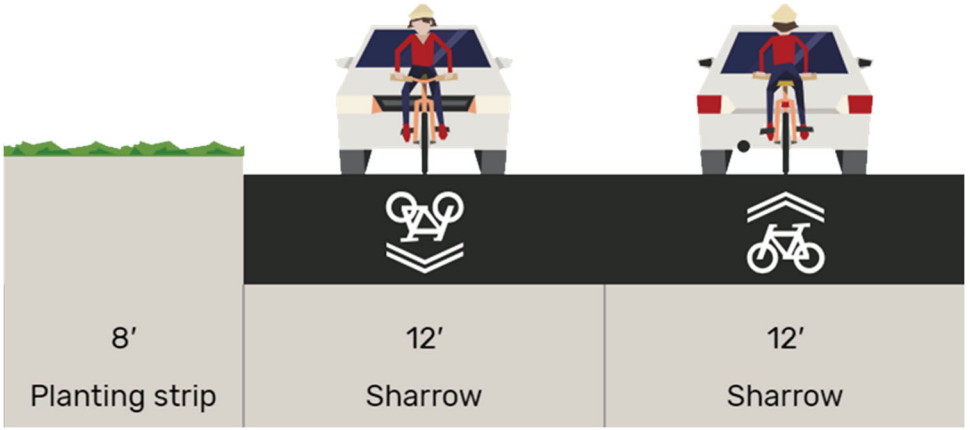


Figure 5. Section B (SE 7th St to SE 5th St) – Proposed (24’ traveled way)

SE ADAMS STREET

From SE 10th Avenue to SE 1st Street

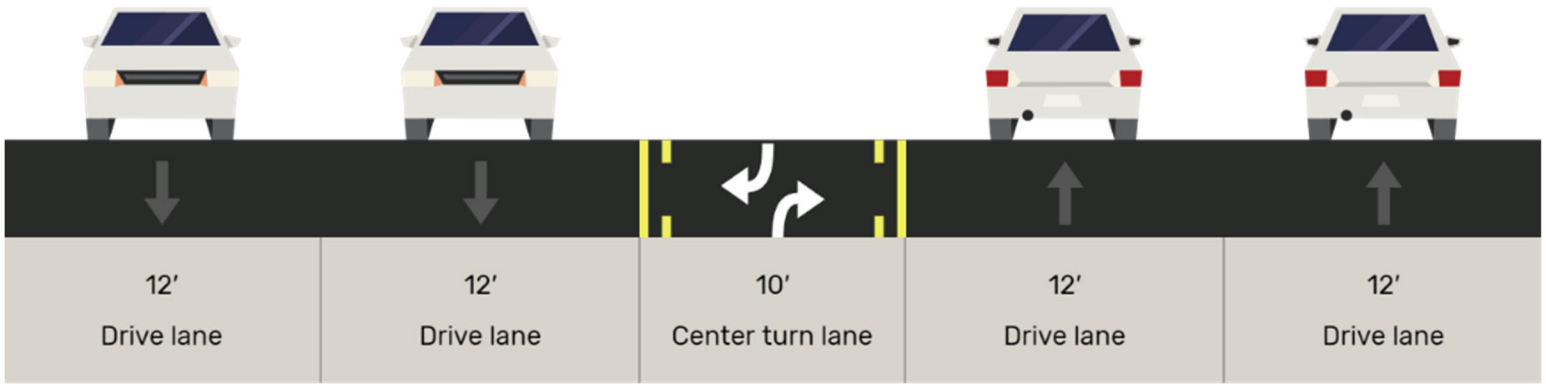


Figure 6. Section C (SE 5th Street to SE Jefferson Street) – Existing (58' curb to curb)

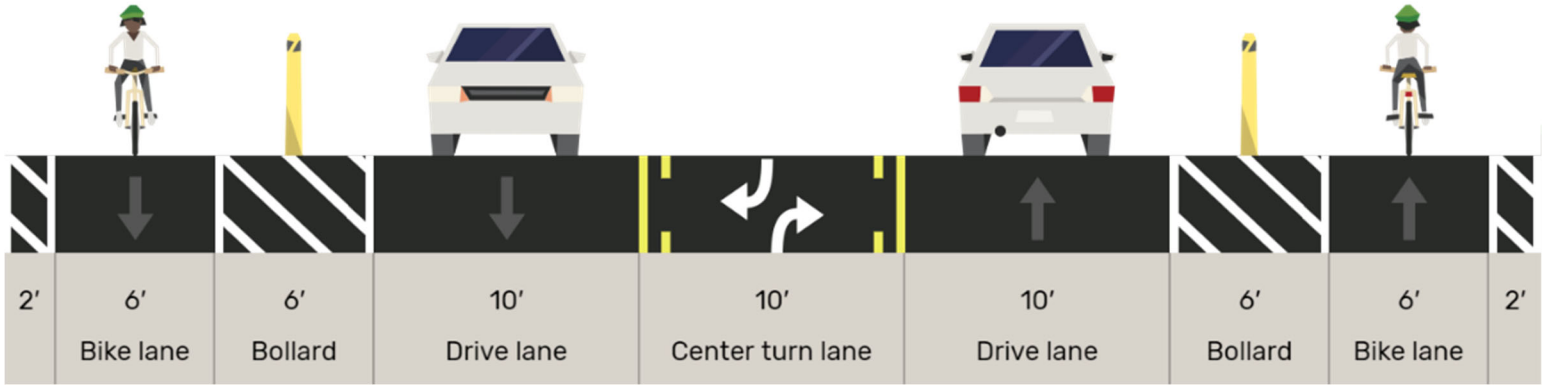


Figure 7. Section C (SE 5th Street to SE Jefferson Street) – Proposed (58' curb to curb) *

* If the existing gutter is to remain, this not considered a part of the functional bikeway width.

SE ADAMS STREET

From SE 10th Avenue to SE 1st Street

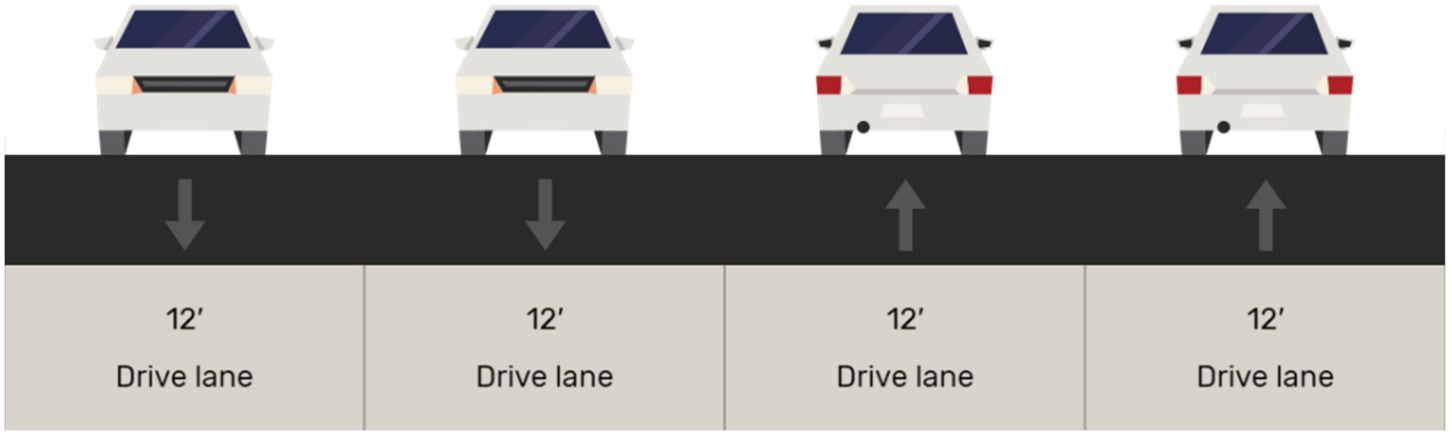


Figure 8. Section D (SE Jefferson Street to SE 1st Street) – Existing (48' curb to curb)

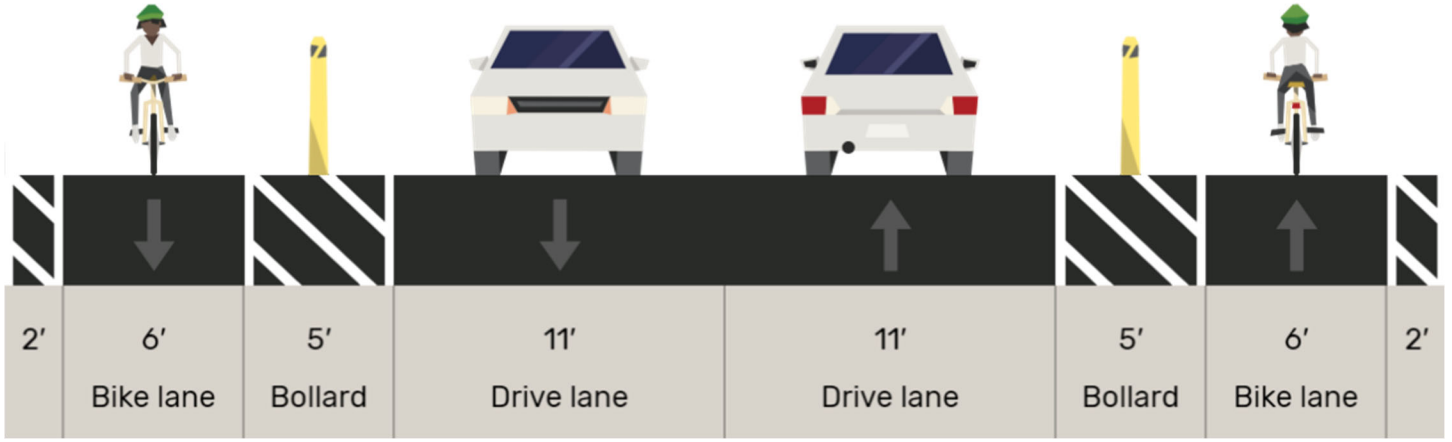


Figure 9. Section D (SE Jefferson Street to SE 1st Street) – Proposed (48' curb to curb) *

* If the existing gutter is to remain, this not considered a part of the functional bikeway width.

SE ADAMS STREET

From SE 10th Avenue to SE 1st Street

Design Recommendations

Recommendations

- Section A & B: A traffic calmed (curb extensions, medians, etc.) shared street is proposed. To meet the all ages and abilities goal, a speed limit reduction to 20 or 25mph should be pursued. If the lower limit and operating speeds cannot be achieved, the bikeway may not serve all ages and abilities. The brick condition should also be evaluated and reset where possible to provide a smooth riding surface.
- Sections C and D: One-way separated bike lanes pair to provide access to both sides of the street.
- Intersections:
  - At 4th Street, a high comfort crossing such as a Pedestrian Hybrid Beacon (PHB) should be considered. Refer to the FHWA STEPS guide for crossing treatment selection.

Rationale

- **Speed and AADT**
  - At a posted speed limit of 30 mph and with an AADT less than 3,000 veh/day (AADT data was only available from 5th to 1st St), buffered bike lanes may be an appropriate design option. However, the share of heavy vehicles should be evaluated to determine if a SUP or other separated facility should be considered.
- **One-Way vs. Two-way Separated Bike Lane**
  - North of 4th Street, one-way separated bike lane (SBL) is recommended for Sections C and D. However, in order to ensure bicyclist safety and comfort, the curb should be reconstructed and driveway entrances/exits should be formalized north of 4th Street where the curb is less defined and there are likely to be more conflicts with trucks entering and exiting the roadway. A one-way SBL on both sides of the street will provide access to destinations to both sides of the street and provide expected operations at intersections.
- **Removing and/or Reconfiguring lanes**
  - As per the Topeka Complete Streets Guidelines, 12-foot lanes are preferred for industrial roadways, although 11 foot lanes are also appropriate.
  - Topeka's Complete Streets Guidelines state "Four-lane streets with volumes less than 15,000 vehicles per day generally are good candidates for four-to three-lane conversions." This is based on FHWA's Road Diet Guidance. The existing four and five lane segments (Sections C and D) have excess capacity. Two or three lanes, as proposed, will be adequate to handle the existing and projected volumes for SE Adams Street.

SE ADAMS STREET

From SE 10th Avenue to SE 1st Street

- **Other Considerations**
  - From SE 10th Avenue to SE 5th Street, where the roadway width is constrained to about 24 feet, there is insufficient space to provide a separated facility within the roadway. Options include reducing the speeds and volumes within the street to create a comfortable shared street option or to widen the west side of the street sidewalk to 11 feet to accommodate bicyclists on a shared use path. CSAC opted to pursue a shared street option including a speed limit reduction to meet the all ages and abilities goals.
  - The parking area on the east side of SE Adams Street (between SE 8th Avenue and SE 9th Street) would not be affected but given the increase in bicyclists, reverse in angled parking should be considered to improve visibility and safety.

Alternatives Considered

- A SUP was proposed for Sections A & B, but changed to a shared street with a speed limit reduction at the direction of CSAC.

Needs for Additional Study

- N/A

Cost Estimate*	**$618,800**

Cost estimate is an opinion of probable cost. Opinions of probable cost were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 30% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2023 dollars and were assigned based on historical cost data from KDOT bid histories assuming a representative half mile project length. Cost opinions do not include easement and right-of-way acquisition; permitting, inspection, or construction management; geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance. A cost range has been assigned to certain general categories such as utility relocations; however, these costs can vary widely depending on the exact details and nature of the work. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

SE 1ST STREET

From Kansas Avenue to Jefferson Trafficway

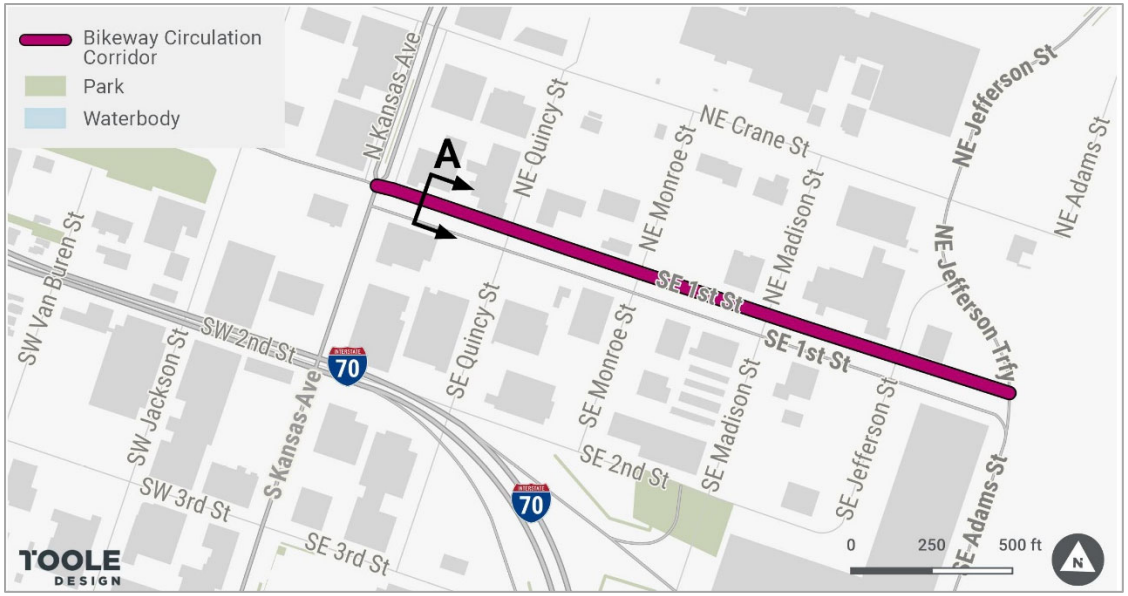


Figure 1. SE 1st Street Corridor Map

New Bike Network Miles: 0.39

Questions? https://topekampo.org/

PLANNING CONSIDERATIONS	
Posted Speed Limit	30 mph
Connectivity to existing bikeways	Sharrows on Kansas Ave south of SE 1st St
Bikeway Rationale	Identified as a part of the Spine and Fast Track Network in Topeka's Bikeway Plan
Major Barriers (constrained bridges or underpasses, freeway ramps)	None
Elements of Construction	TBD
On-Street Parking	Limited Unmarked Parallel Parking
Transit	None

These preliminary concepts are for planning purposes only. Field verification, site condition assessments, engineering analysis, and design are necessary prior to implementing recommendations.

SE 1ST STREET

From Kansas Avenue to Jefferson Trafficway

TYPICAL CROSS-SECTIONS

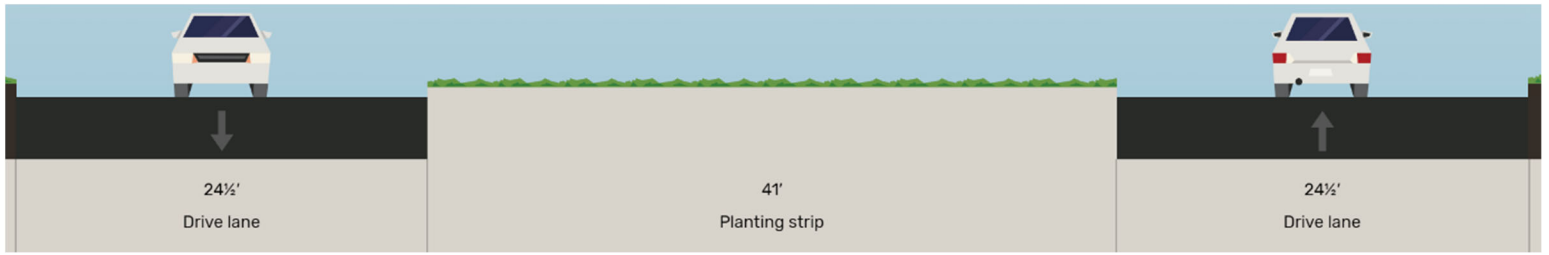


Figure 2. Section A – Existing (24.5' curb to curb - each side)

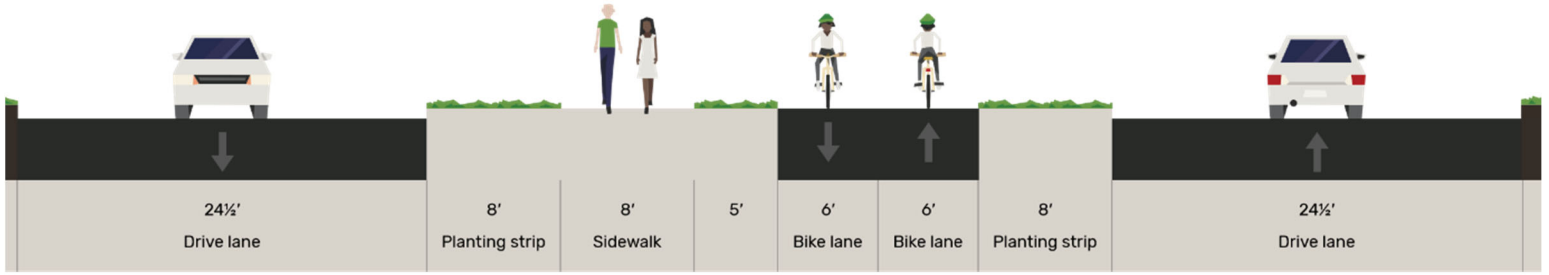


Figure 3. Section A– Preferred – Median Walkway & Bikeway (24.5' curb to curb - each side) *

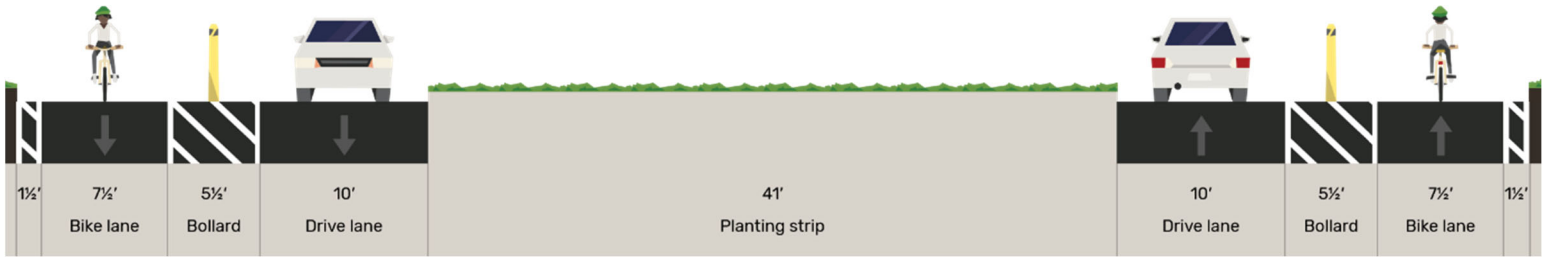


Figure 4. Section A – Alternative – One-way SBL (24.5' curb to curb - each side)

*Narrowing drive lanes to less 11 feet or less would be more consistent with the City's Complete Streets Design Guidelines.

SE 1ST STREET

From Kansas Avenue to Jefferson Trafficway

Design Recommendations

Recommendations

- Section A: The CSAC's preferred design is to place pedestrian and bicycle facilities in the existing median, however, the railroad still maintains ownership of this land. If the railroad is not open to the proposed solution, an alternative proposal has been provided. If a bikeway is to be implemented in the short-term, the alternative concept is likely the only option.
- Intersections
    - Some additional traffic control may be needed depending on the alternative selected. Center median bicycle and pedestrian facilities can be challenging at intersections and often have increased costs related to intersection improvements.

Rationale

- **Speed and AADT**
    - At 30 mph with an AADT less than 3,000 vehicles per day, bike lanes (Buffer Preferred) may be appropriate. Given the available roadway width, ROW width, and this streets' inclusion as a part of the bikeway spine network, a SBL is feasible and will provide increase comfort on the core network.
- **One-Way vs. Two-way Separated Bike Lane**
    - While one-way separated bicycle lanes are preferrable in many instances as they provide access to both sides of the street and movements at intersections are more expected, a two-way facility in the center median is recommended here as it reduces the number of crossings (driveways) and provides a planted buffer which could include shade trees.
- **Removing and/or Reconfiguring lanes**
    - Narrowing travel lanes – The AASHTO Green Book provides flexibility in in travel lane width and allows lanes to be as narrow as 10 feet in a variety of contexts. Topeka's Complete Street Guidelines encourage 10-11ft lanes on arterial and collector streets as the provide many safety benefits for all users.
- **Removing and/or Reconfiguring parking**
    - Based upon the land uses along the corridor and the prevalence of off-street parking, the on-street parking may be underutilized. If on-street parking is underutilized, it can be removed to accommodate a high comfort bikeway and possibly address the gap in the sidewalk network.
- **Other Considerations:**
    - (Driveway considerations)

SE 1ST STREET

From Kansas Avenue to Jefferson Trafficway

Alternatives Considered

- An alternative to convert one side of the median to a two-way street and the other side to a bicycle and pedestrian only space was considered; however, driveways create a challenge to this alternative. CSAC preferred the median or one-way SBL, so this alternative was removed.

Needs for Additional Study

- Right of Way acquisition or easements for the median
- On-street parking utilization

Cost Estimate*	$917,917

Cost estimate is an opinion of probable cost. Opinions of probable cost were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 30% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2023 dollars and were assigned based on historical cost data from KDOT bid histories assuming a representative half mile project length. Cost opinions do not include easement and right-of-way acquisition; permitting, inspection, or construction management; geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance. A cost range has been assigned to certain general categories such as utility relocations; however, these costs can vary widely depending on the exact details and nature of the work. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

SE 4TH STREET

From Kansas Avenue to NE Golden Avenue

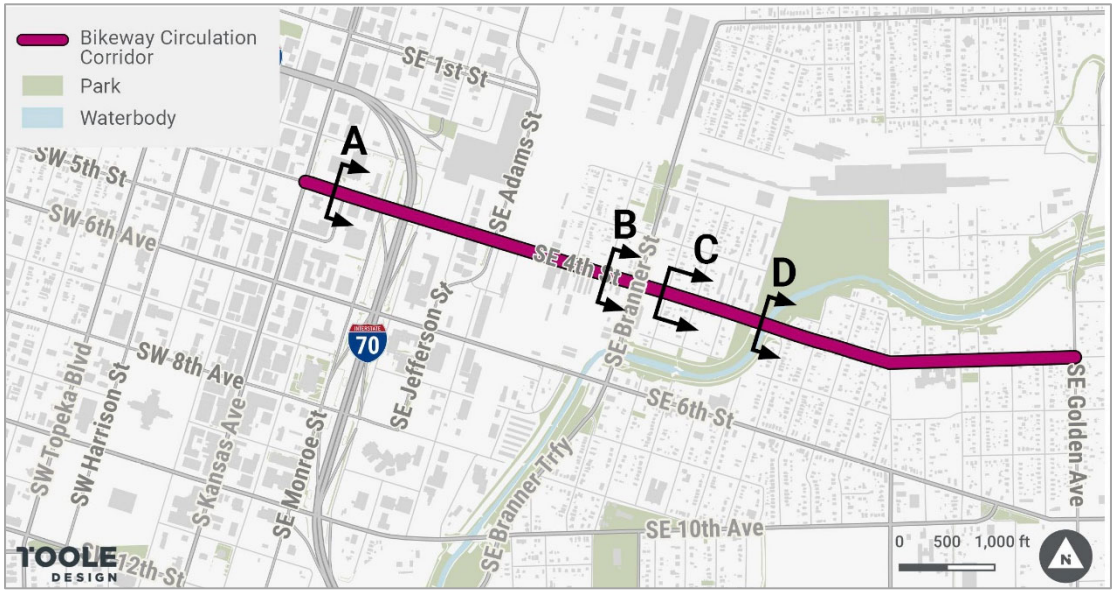


Figure 1. SE 4th Street Corridor Map

New Bike Network Miles: 1.55

Questions? https://topekampo.org/

PLANNING CONSIDERATIONS	
Posted Speed Limit	30 mph
Connectivity to existing bikeways	Shunga Trail (multiple connection points), and sharrows on Kansas Ave and Golden Ave.
Bikeway Rationale	Identified as a part of the Bikeway Spine Network in the Fast Track Plan. Creates a connections between downtown businesses, residents, schools, trails, and parks.
Major Barriers (constrained bridges or underpasses, freeway ramps)	Shunganunga Creek Bridge
Elements of Construction	Paint, new dedicated SUP, bicycle ramps, bridge reconstruction, and potential dedicated bicycle signals
On-Street Parking	Parallel parking (unmarked in some areas)
Transit	None

These preliminary concepts are for planning purposes only. Field verification, site condition assessments, engineering analysis, and design are necessary prior to implementing recommendations.

SE 4TH STREET

From Kansas Avenue to NE Golden Avenue

TYPICAL CROSS-SECTIONS

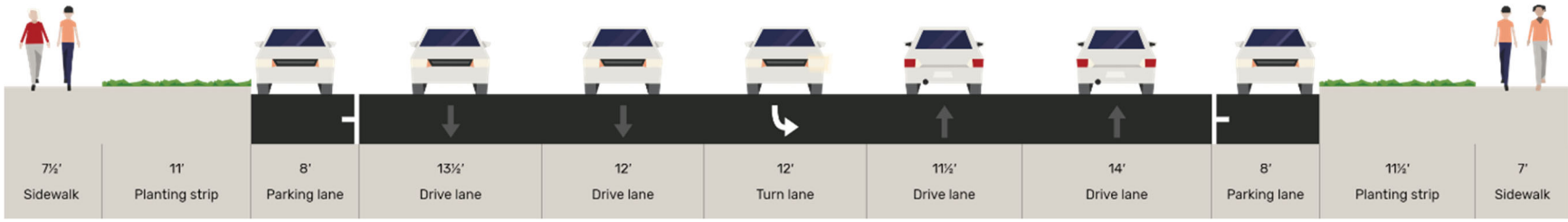


Figure 2. Section A (Kansas Ave to Adams St) – Existing (79' curb to curb)

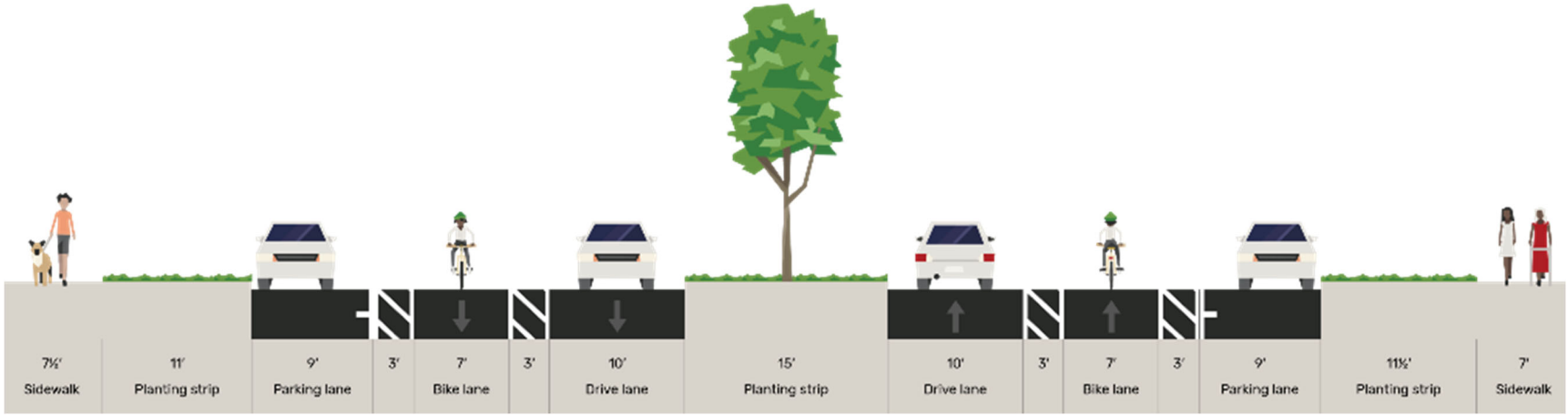


Figure 3. Section A (Kansas Ave to Adams St) – Proposed (79' curb to curb) *

*Planting strip would be used for turn lanes at intersections. The parking lane could be reduced to 8' and additional buffer could be allocated between the bike lane and the drive lane. Consideration should be given to the location and dimensions of the existing bulb-outs. Consideration should also be given to parking-protected bicycle lanes to provide additional comfort for bicyclists.

SE 4TH STREET

From Kansas Avenue to NE Golden Avenue

Figure 4. 3D Rendering of Section A near Monroe St

SE 4TH STREET

From Kansas Avenue to NE Golden Avenue

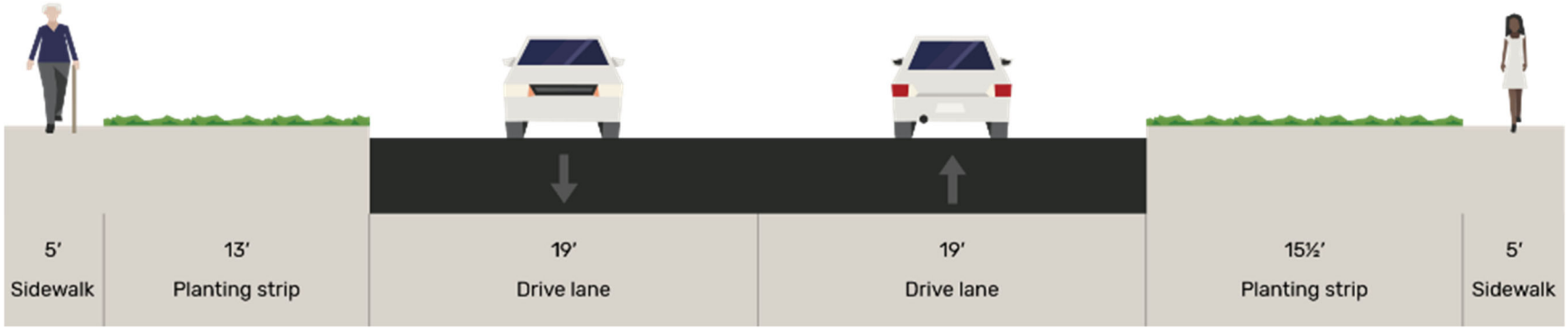


Figure 5. Section B (Adams St to Branner St) – Existing (38' curb to curb)

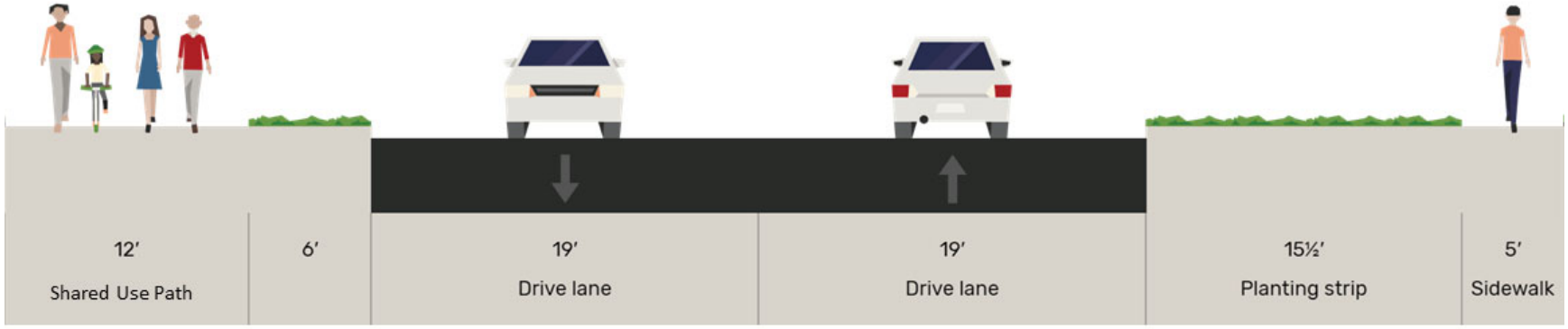


Figure 6. Section B (Adams St to Branner St) – Proposed (38' curb to curb) *

*Drive lanes greater than 11 feet wide are not consistent with a Complete Streets approach to street design. Drive lanes greater than 11 feet wide, and where truck and bus volumes are relatively low, should be considered for lane width reductions.

SE 4TH STREET

From Kansas Avenue to NE Golden Avenue

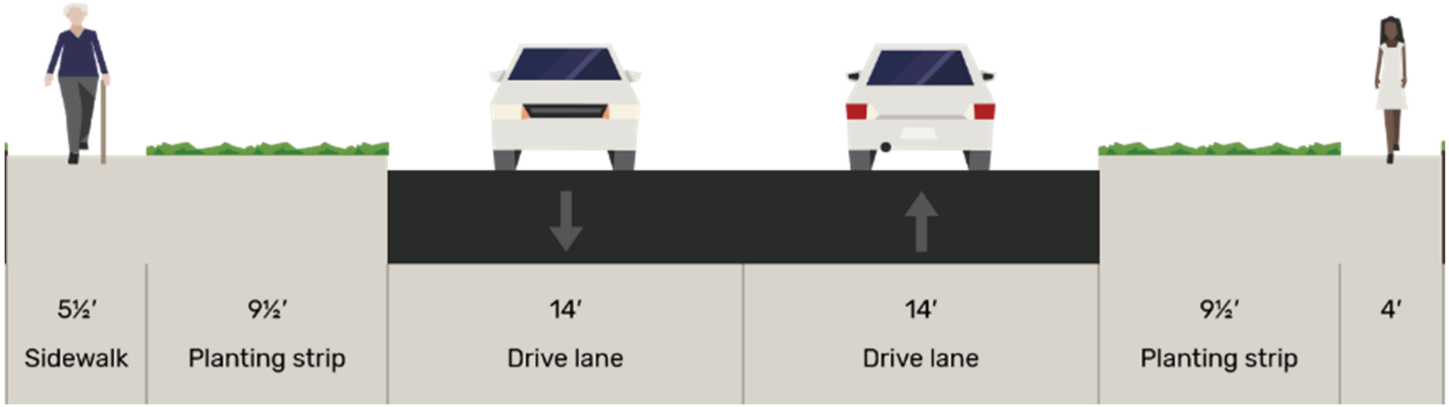


Figure 7. Section C (Branner St to Golden Ave) – Existing (28’ curb to curb)

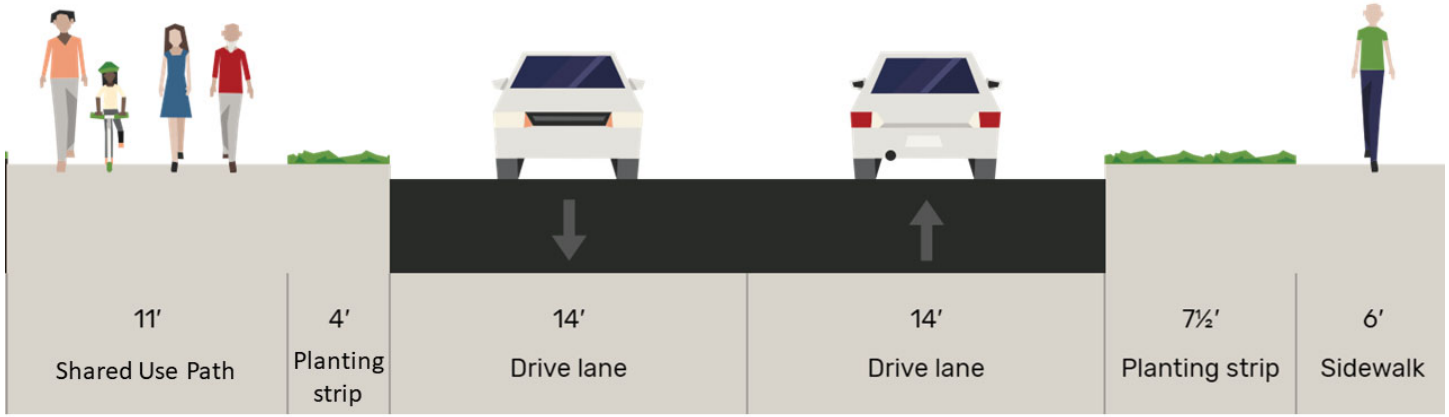


Figure 8. Section C (Branner St to Golden Ave) – Proposed (28’ curb to curb)

SE 4TH STREET

From Kansas Avenue to NE Golden Avenue

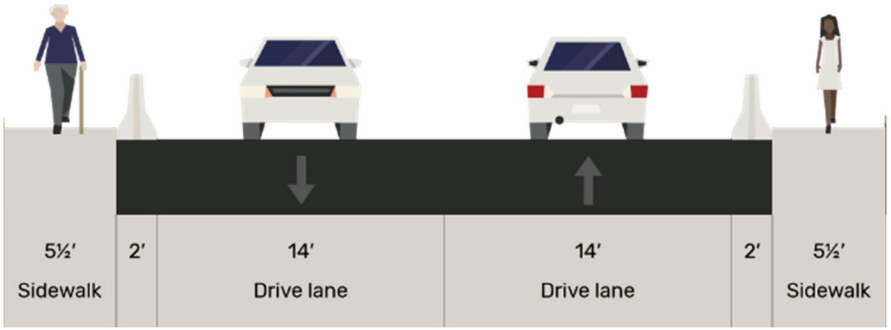


Figure 9. Section D (SE 4th St Shunganunga Creek Bridge) – Existing (39' Wide Bridge Deck)

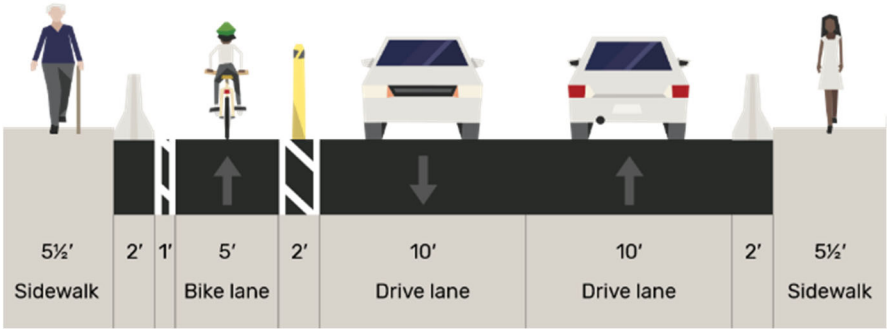


Figure 10. Section D (SE 4th St Shunganunga Creek Bridge) – Interim (39' Wide Bridge Deck) * **

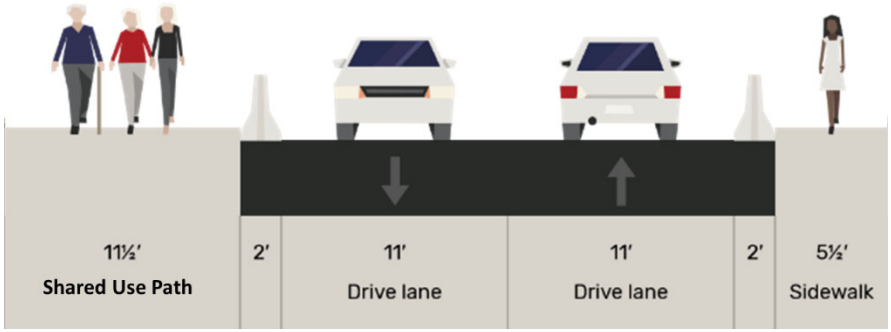


Figure 11. Section D (SE 4th St Shunganunga Creek Bridge) – Proposed (39' Wide Bridge Deck)

*Eastbound bicyclists would use contraflow SBL. Westbound bicyclist would use the sidewalk. Signs to dismount for the bridge could be considered.

** This concept should not be considered permanent.

SE 4TH STREET

From Kansas Avenue to NE Golden Avenue

Design Recommendations

Recommendations

- Section A: Buffered bicycle lanes are recommended with a buffer between both the on street parking and the travel lanes. In addition, a median should be provided where possible to reduce overall street width and reduce vehicles speeds to improve safety for all modes.
- Section B & C: A SUP along the north side of SE 4th Street is recommended. From Branner Ave to Golden Ave, there is not enough existing pavement to provide bicycle facilities on most blocks. While the SUP does not provide direct access to both sides of the roadway, it does provide a direct connection to each of the Shunga Trail connections.
- Section D: The existing bridge is not wide enough to accommodate bicycle lanes and the existing two-lane roadway. The overall width of the bridge deck may provide enough space to continue the SUP with redecking of the bridge (but without widening). An interim solution has been shown if the bridge work cannot occur with the bikeway implementation.
- Intersections & Crossings
    - Traffic control and bikeway transitions at Adams Street will be needed
    - Where the SUP is proposed, crossings should be provided to provide safe and comfortable connections to the side streets.

Rationale

- **Speed and AADT**
    - With a posted speed of 30mph and existing roadway volume of 3,850 veh/day from Kansas Avenue to Adams Street, the Topeka Complete Streets Manual recommends a buffered bike lane. No volume data was provided from Adams Street to Golden Ave. Given the speed, a buffered bikeway is the minimum facility necessary to accommodate all ages and abilities.
- **One-Way vs. Two-way Bikeway Facilities**
    - Bike lanes are preferrable from Kansas Avenue to Adams Ave as they allow full access to both sides of street, have a lower crash risk than a two-way SBL or SUPs, and may use existing signals depending on the turning volumes.
    - A SUP is preferrable from Adams Ave to Branner. Given the land use, not many bicycle trips are expected to terminate along this section and therefore the access to the south side of the street is not a significant concern. In addition, it allows for preferred widths instead of constrained widths as a one-way SBL pair.

- **Removing and/or Reconfiguring lanes**
  - Narrowing travel lanes – The AASHTO Green Book provides flexibility in in travel lane width and allows lanes to be as narrow as 10 feet in a variety of contexts. Topeka's Complete Street Guidelines encourage 10-11ft lanes on arterial and collector streets as the provide many safety benefits for all users.
  - Topeka's Complete Streets Guidelines state "Four-lane streets with volumes less than 15,000 vehicles per day generally are good candidates for four-to three-lane conversions." Based on FHWA's Road Diet Guidance. This is applicable to SE 4th Street from Kansas Avenue to SE Adams Street.
- **Removing and/or Reconfiguring parking**
  - Where present (e.g., Section A), the existing parallel parking can be shifted in to provide parking protected bike lanes. Compared to conventional bicycle lanes, parking protected bicycle lanes can decrease the risk of a bicyclist being "doored" by a motorist opening a car door or being struck by a motorist entering or exiting a parking space.
- **Other Considerations**
  - The overall roadway width on the western edge of the corridor may be intimidating to many riders if only a bicycle lane or buffered bicycle lane is provided. By providing a SBL, this can address some of the discomfort that a wide roadway can cause.
  - Even with the low AADT, many of the two-lane sections of 4th Street are wider than necessary which can lead to higher speeds discouraging IBC riders from sharing the roadway with automobiles. Providing buffered bicycle lanes (or some type of physically separated facility) will be necessary to meet the needs of all ages and abilities.

Alternatives Consider

- For Section A, one-way SBLs were proposed, but removed at the direction of CSAC to provide buffered bicycle lanes instead. Given the width of the roadway and potential growth of bicycling in Topeka, the widths shown for the parking, buffers, and bicycle lanes are sufficient to be converted into a parking protected SBLs in the future if needed. Therefore the median and travel lanes may be adjusted, but the parking, bicycle lanes, and buffers overall widths should be preserved to allow the city flexibility to adjust its bikeway network as it grows.
- From Adams Street to Branner, a two-way SBL was proposed as there is not sufficient width for one-way SBLs and this treatment would be a lower cost implementation than a SUP. At the direction of CSAC, a SUP has been proposed instead of the two-way SBL as the preferred facility.

SE 4TH STREET

From Kansas Avenue to NE Golden Avenue

- From Branner Street to Golden Avenue, the roadway could also be widened to provide enough space for buffered bicycle lanes instead of providing a SUP. Widening the roadway has drainage and intersection cost implications that may be reduced or avoided. In addition the SUP will improve the pedestrian facilities and be more comfortable for school age children walking or bicycling to schools in the area.

Needs for Additional Study

- Turning volumes should be reviewed to determine the recommend type of bicycle signal phasing.
- The proposed bridge section is conceptual and will require a structural review to determine if shifting the barrier, shifting the traffic load, and increasing the assumed pedestrian and bicycle load is feasible. Alternatively, a bicycle/pedestrian bridge may be considered.

Cost Estimate*	**$2,948,348**

Cost estimate is an opinion of probable cost. Opinions of probable cost were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 30% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2023 dollars and were assigned based on historical cost data from KDOT bid histories assuming a representative half mile project length. Cost opinions do not include easement and right-of-way acquisition; permitting, inspection, or construction management; geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance. A cost range has been assigned to certain general categories such as utility relocations; however, these costs can vary widely depending on the exact details and nature of the work. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

SW 4TH STREET/WILLOW AVENUE

From Washburn Avenue to Kansas Avenue

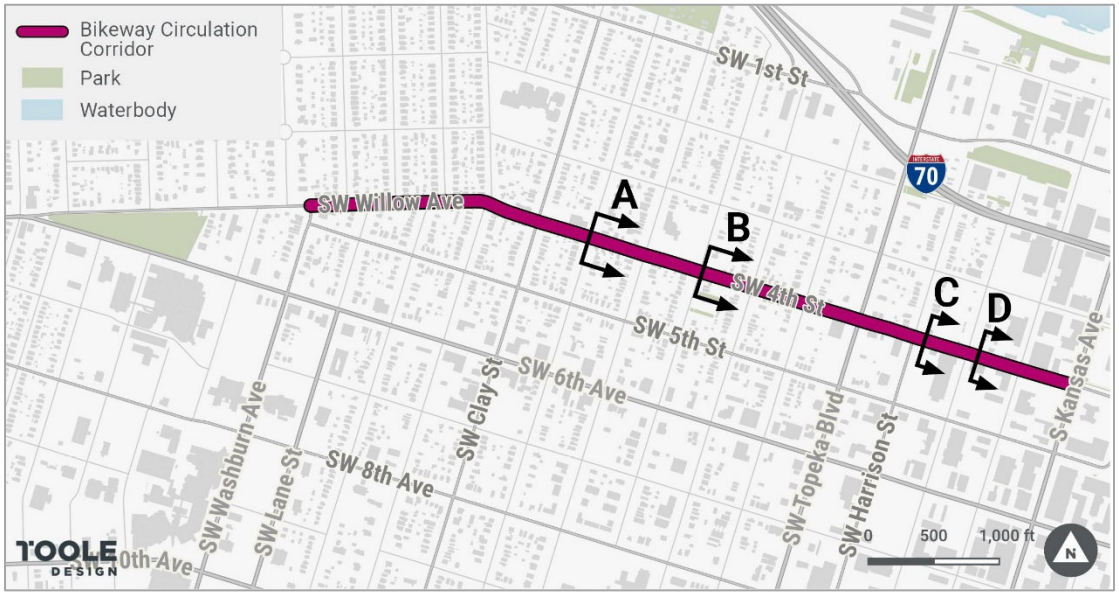


Figure 1. SW 4th Street Corridor Map

New Bike Network Miles: 1.15

Questions? https://topekampo.org/

PLANNING CONSIDERATIONS	
Posted Speed Limit	30 mph
Connectivity to existing bikeways	Sharrows on Kansas Ave and along SW 4th Street west of Topeka Blvd
Bikeway Rationale	Identified as a part of the Bikeway Spine Network in the Fast Track Plan. Connects residents to the business district.
Major Barriers (constrained bridges or underpasses, freeway ramps)	None
Elements of Construction	Paint, flexposts, and curbstops
On-Street Parking	Parallel (Varies), Angled Parking One-Side from Jackson to Kansas
Transit	None

These preliminary concepts are for planning purposes only. Field verification, site condition assessments, engineering analysis, and design are necessary prior to implementing recommendations.

SW 4TH STREET/WILLOW AVENUE

From Washburn Avenue to Kansas Avenue

TYPICAL CROSS-SECTIONS

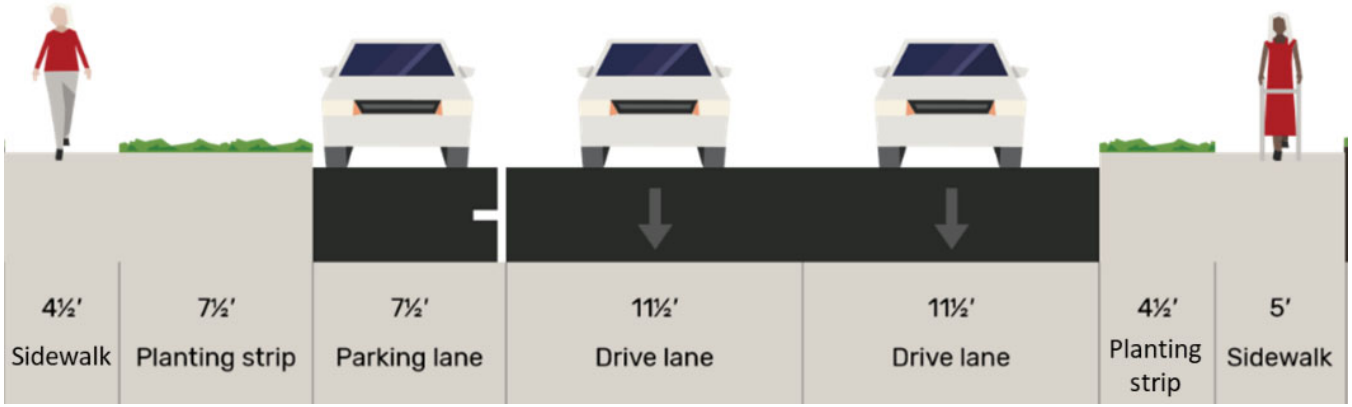


Figure 2. Section A (Washburn Ave to Western Ave)– Existing (30.5' curb to curb)

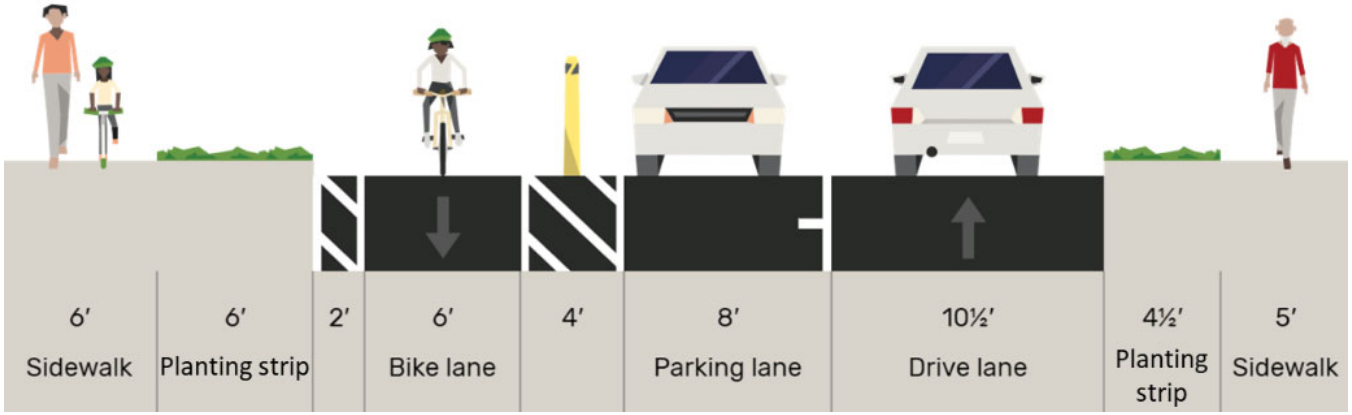


Figure 3. Section A (Washburn Ave to Western Ave) – Proposed (30.5' curb to curb) *

* If the existing gutter is to remain, this not considered a part of the functional bikeway width.

SW 4TH STREET/WILLOW AVENUE

From Washburn Avenue to Kansas Avenue

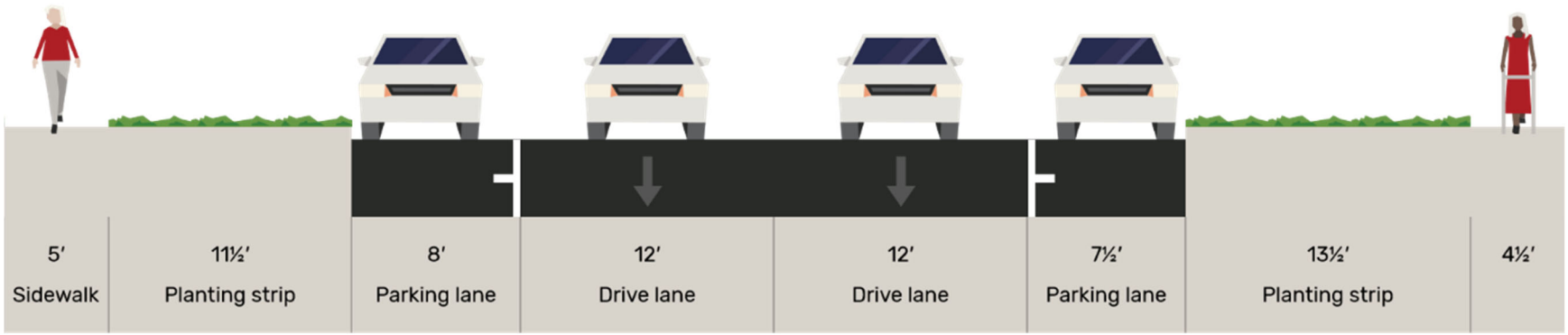
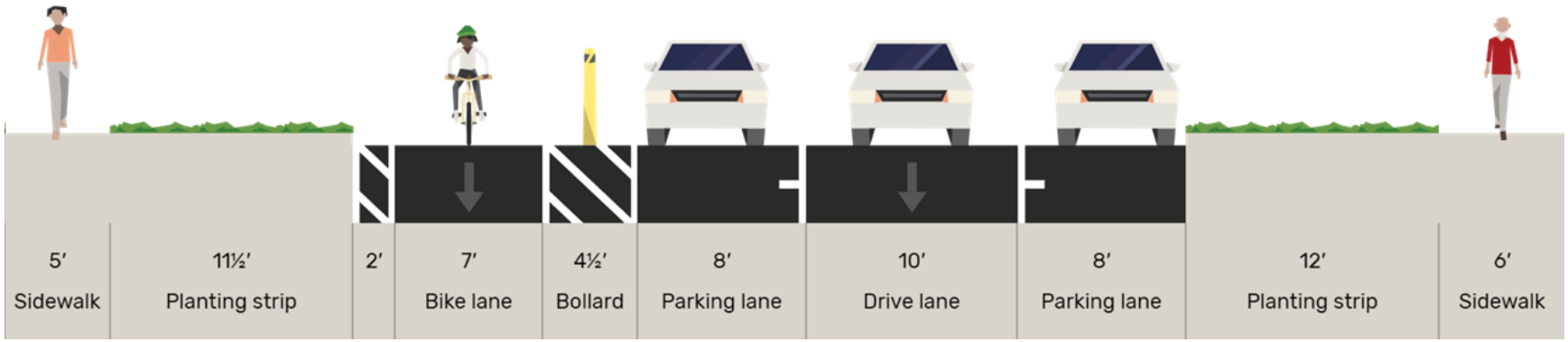


Figure 4. Section B (Western Ave to Topeka Blvd) – Existing (39.5’ curb to curb)



39.5’ curb to curb*

Figure 5. Section B (Western Ave to Topeka Blvd) – Proposed (39.5’ curb to curb) *

* If the existing gutter is to remain, this not considered a part of the functional bikeway width.

SW 4TH STREET/WILLOW AVENUE

From Washburn Avenue to Kansas Avenue

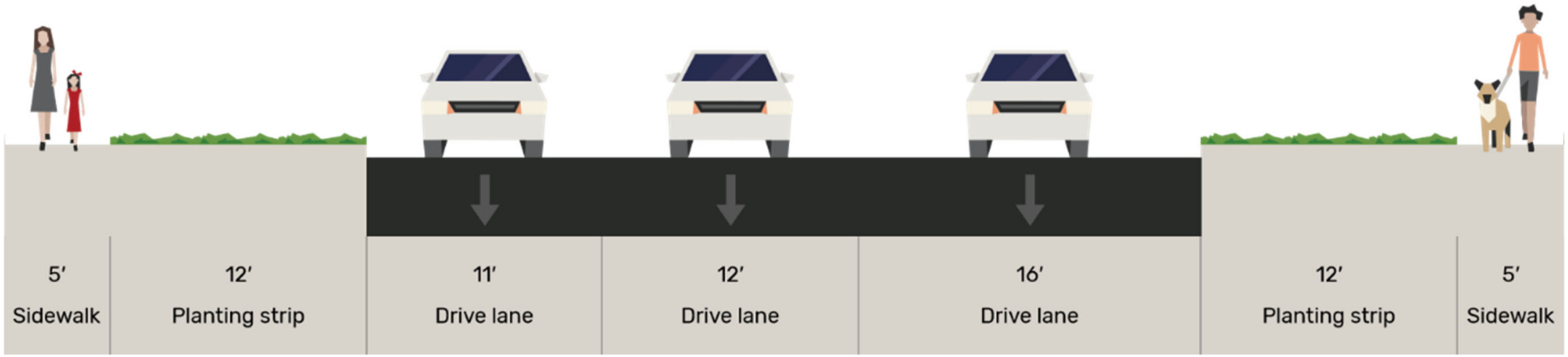


Figure 6. Section C (Topeka Blvd to Van Buren St) – Existing (39’ curb to curb)

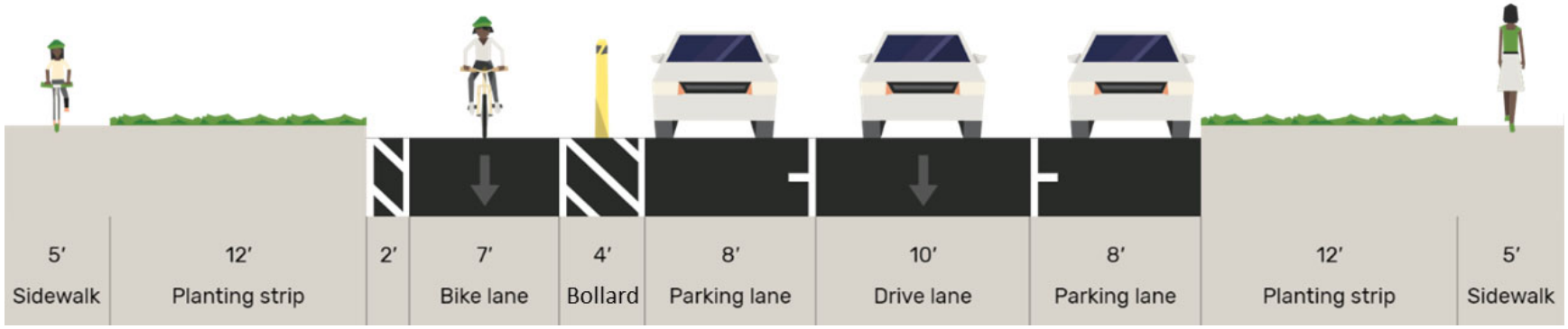


Figure 7. Section C (Topeka Blvd to Van Buren St) – Proposed (39’ curb to curb)

SW 4TH STREET/WILLOW AVENUE

From Washburn Avenue to Kansas Avenue

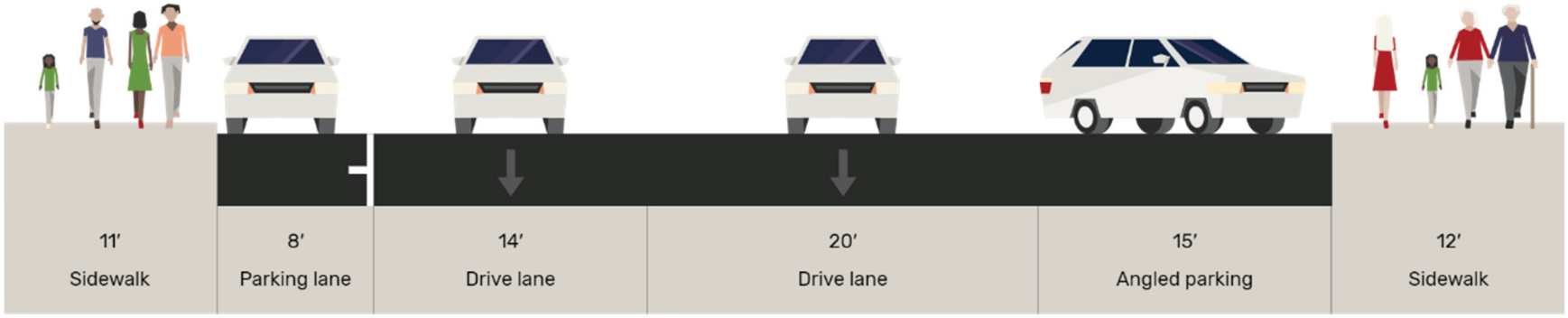


Figure 8. Section D (Van Buren St to Kansas Ave) – Existing (57’ curb to curb)

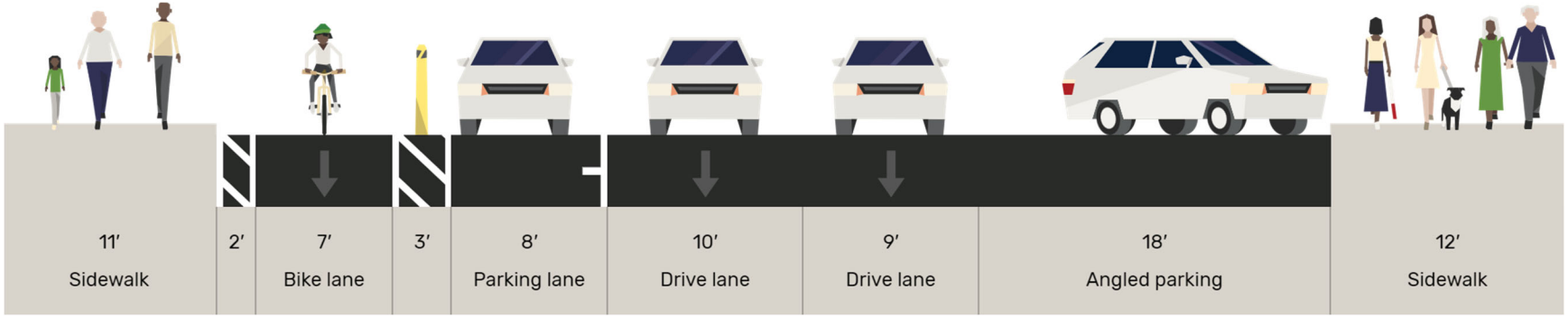


Figure 9. Section D (Van Buren St to Kansas Ave) – Proposed (57’ curb to curb)

SW 4TH STREET/WILLOW AVENUE

From Washburn Avenue to Kansas Avenue

Design Recommendations

Recommendations

- Section A-D: One one-way separated bicycle lane in the same direciton as the motor vehicle travel lane is proposed for the one-way pairs SW 4th & SW 5th. One-way pair bicycle facilities can experience wrong way riding. The bicycle lane should be kept as wide as possible to allow for safe passing if wrong way riding does occur.
- Intersections
    - One-way streets often experience higher speeds. Care should be taken at intersections and other conflict points to slow drivers before crossing the bikeway.

Rationale

- **Speed and AADT**
    - At 30 mph with an AADT from 3,000 – 6,000 veh/day, painted buffered bike lanes may be appropriate, however a SBL is feasible and will provide increased comfort on the Spine Network.
- **One-Way vs. Two-way Protected Bike Lane**
    - For Sections A & B, a one-way SBL pair cannot be provided within the current curb to curb width. A two-way SBL is preferred to provide bi-directional travel, however it does limit access to the other side of street and can have a higher crash risk that should be mitigated as much as possible through geometric and signal phasing designs. At CSAC's direction, a one-way SBL will be provided on one side of the street.
    - For Sections C & D, a one-way SBL pair is feasible and would provide full access to both sides of street and has a lower crash risk. Additional signal equipment may be needed given that the street is currently one-way. At CSAC's direction, one one-way SBL is recommended though instead of a one-way SBL pair.
- **Removing and/or Reconfiguring lanes**
    - Narrowing travel lanes – The AASHTO Green Book provides flexibility in in travel lane width and allows lanes to be as narrow as 10 feet in a variety of contexts. Topeka's Complete Street Guidelines encourage 10-11ft lanes on arterial and collector streets as the provide many safety benefits for all users.
    - One-way streets – These streets were often originally designed to operate as a two-way street before being converted to a one-way. In some cases, there is excess capacity that offers opportunities for high-comfort bikeways. This was found to be the case for SW 4th Street with AADT volumes ranging from 4,967 veh/day from Washburn Ave to Topeka Blvd and 2,635 veh/day from Topeka Blvd to Kansas Avenue. By right sizing the roadway capacity, safety issues prevalent in overbuilt roadways may be mitigated and high-quality bikeways can be provided.

- **Removing and/or Reconfiguring parking**
  - If on-street parking is underutilized on one side, it may be appropriate to remove it to fit a high-comfort bike facility.
  - Compared with bicycle lanes adjacent to on street parking lanes, parking protected bike lanes decrease the risk of a bicyclist being "doored" by a motorist opening a car door or being struck by a motorist entering or exiting a parking space.
  - Consider converting the head-in angled parking to reverse angled. Note that head-in angled parking should never be placed behind a conventional bicycle lane.
- **Other Considerations:**
  - SW 5th Street and 4th Street are a one-way pair. Because bicyclists need to expend considerably more energy than a motorist, providing only one-way SBL on each roadway (no bidirectional travel) could suppress bicycling due to the out of direction travel needed and there may be an increase of wrong way riding. Both 5th and 4th Street have constrained sections on the western edge of the study areas. The constrained section for 4th is shorter and because 4th provides a more direction connection, if this street is reconstructed in the future, it may be possible to widen this roadway to allow for bi-directional travel. While bidirectional travel should still be considered on 5th Street, we believe it may be a lower priority than 4th Street. Both should be monitored after the implementation of the one one-way SBL's implemented on each street to determine if bi-directional facilities should be considered as a next step.

Alternatives Considered

- The following was originally proposed, but at the direction of CSAC was reduced to a one-way SBL on 4th & 5th only in the direction of travel.
  - Section A: Replace the curb and gutter with straight curb and widen to increase the ridable surface to provide a SBL and preferred widths for the through lane and parking lane. Consider reducing the speed limit (20mph preferred, 25mph maximum) given the proposed cross section, land use context, and to improve the safety and comfort for all modes.
  - Section B-D: A two-way SBL is proposed to accommodate bi-directional travel.
- From Washburn to Topeka Blvd, a one-way bikeway with one through lane and one flex through lane/off peak parking lane was reviewed. Based on the existing and projected volumes, we do not expect a second through lane to be needed and bicyclists may still choose to ride the wrong way as one-way streets have a higher impact on bicyclists overall travel time.
- One-way SBL pairs may be feasible if straight curb instead of curb and gutter was constructed along the street.

SW 4TH STREET/WILLOW AVENUE

From Washburn Avenue to Kansas Avenue

Needs for Additional Study

- Turning volumes should be reviewed to determine the recommend type of bicycle signal phasing.
- In locations where only one through lane is provided, the City should work with the fire department to ensure that they're comfortable with deploying fire equipment along these streets. The bikeway may be used for fire access, and buffer materials can be selected to allow for the range of potential emergency access needs.
- If the removal of parking is needed in lieu of lane reduction and there is a concern, a parking study may be performed.

Cost Estimate*	$942,331

Cost estimate is an opinion of probable cost. Opinions of probable cost were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 30% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2023 dollars and were assigned based on historical cost data from KDOT bid histories assuming a representative half mile project length. Cost opinions do not include easement and right-of-way acquisition; permitting, inspection, or construction management; geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance. A cost range has been assigned to certain general categories such as utility relocations; however, these costs can vary widely depending on the exact details and nature of the work. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

SW 5TH STREET/QUINCY STREET

From Washburn Avenue to SE 4th Street

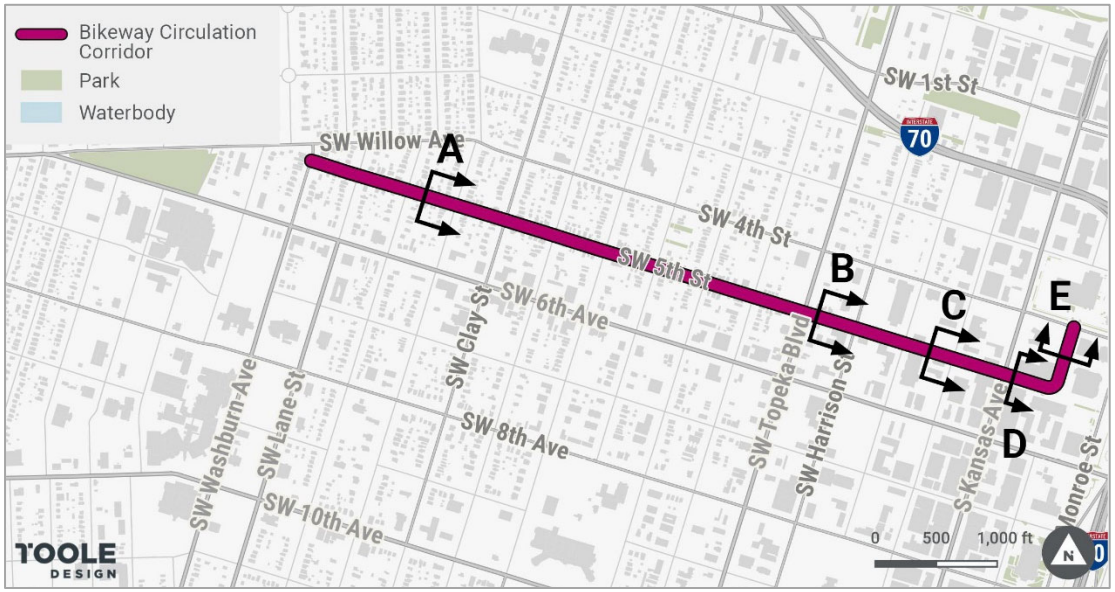


Figure 1. SW 5th Street Corridor Map

New Bike Network Miles: 1.30

Questions? https://topekampo.org/

PLANNING CONSIDERATIONS	
Posted Speed Limit	30 MPH
Connectivity to existing bikeways	Sharrows on Kansas Ave
Bikeway Rationale	Identified as a part of the Bikeway Spine Network in the Fast Track Plan. Connects residents to the business district.
Major Barriers (constrained bridges or underpasses, freeway ramps)	None
Elements of Construction	Paint, flexposts, curbstops, and curb adjustments at intersections
On-Street Parking	Parallel Marked (Varies on one vs both sides), Angle east of Kansas Ave
Transit	None

These preliminary concepts are for planning purposes only. Field verification, site condition assessments, engineering analysis, and design are necessary prior to implementing recommendations.

SW 5TH STREET/QUINCY STREET

From Washburn Avenue to SE 4th Street

TYPICAL CROSS-SECTIONS

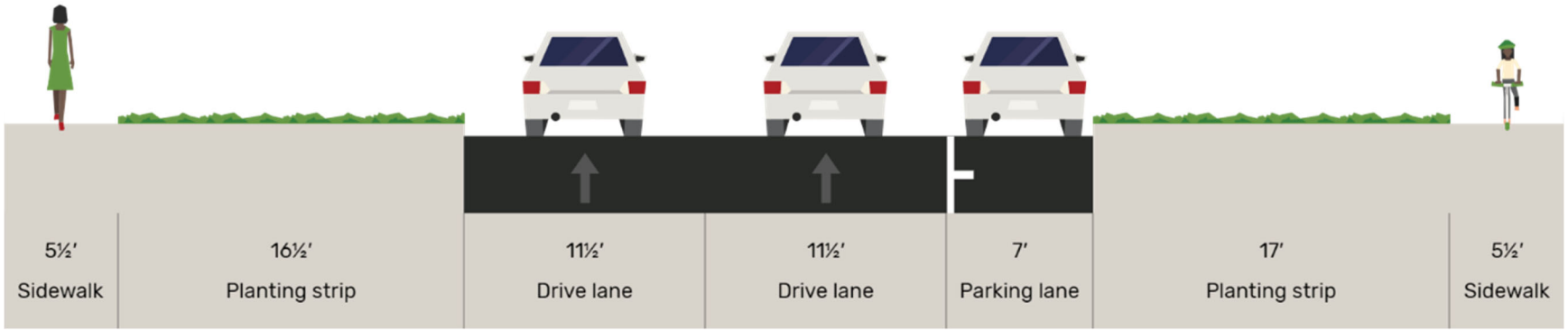


Figure 2. Section A (Washburn Avenue to Topeka Blvd) – Existing (30’ curb to curb)

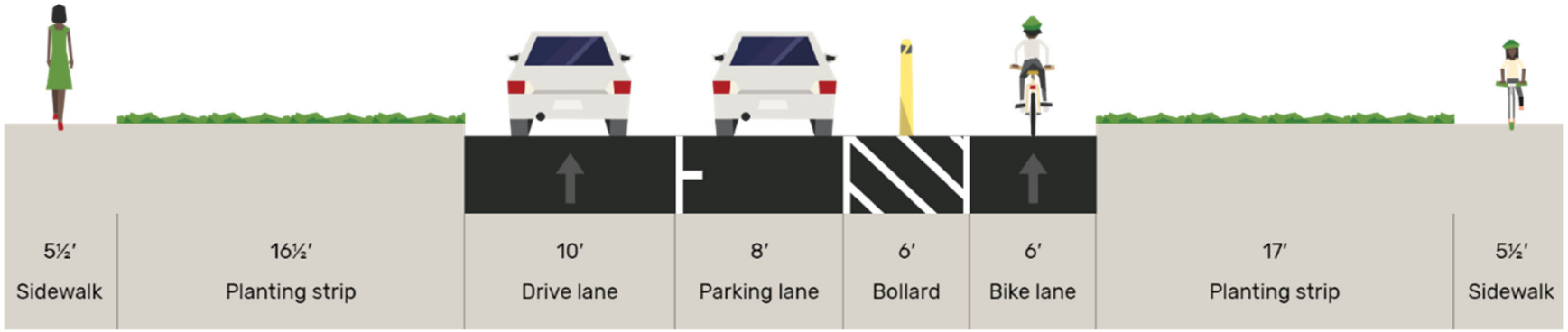


Figure 3. Section A (Washburn Avenue to Topeka Blvd) – Proposed (30’ curb to curb) *

* If the existing gutter is to remain, this not considered a part of the functional bikeway width.

SW 5TH STREET/QUINCY STREET

From Washburn Avenue to SE 4th Street

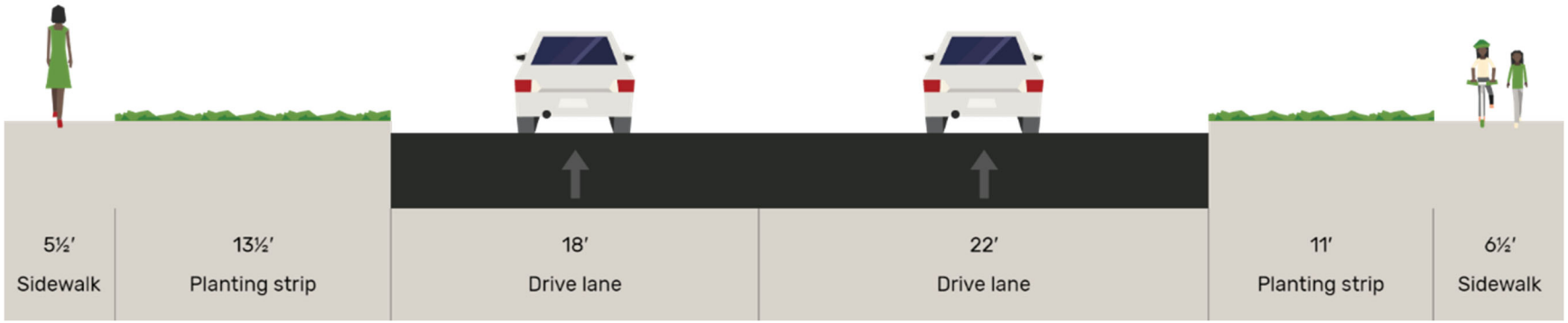


Figure 4. Section B (Topeka Blvd to Jackson St) – Existing (40’ curb to curb)

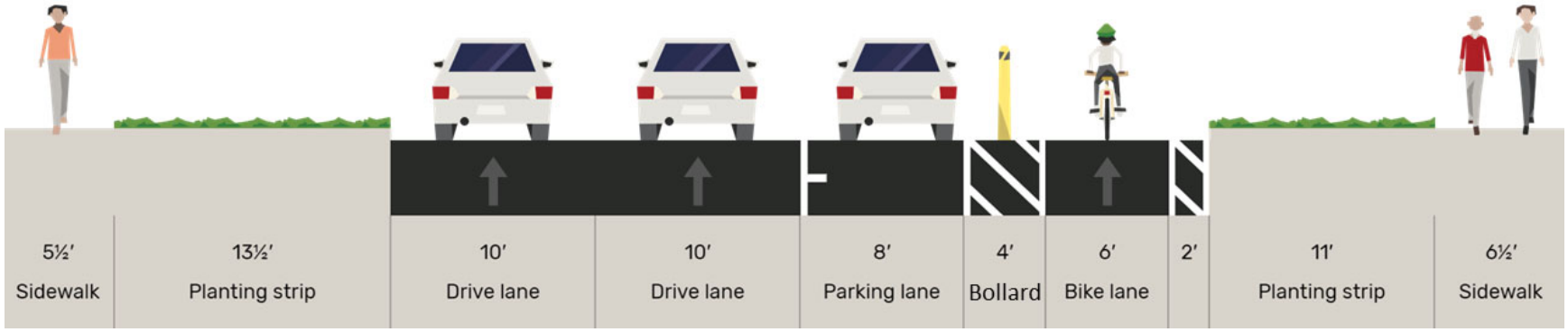


Figure 5. Section B (Topeka Blvd to Jackson St) – Proposed (40’ curb to curb)

* If the existing gutter is to remain, this not considered a part of the functional bikeway width.

SW 5TH STREET/QUINCY STREET

From Washburn Avenue to SE 4th Street

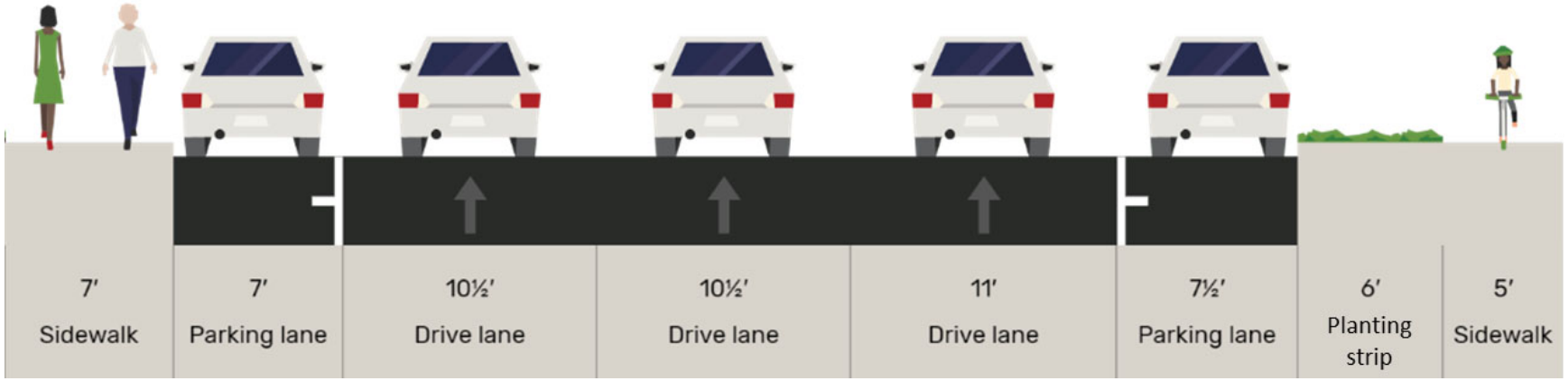


Figure 6. Section C (Jackson St to Kansas Ave) – Existing (46.5’ curb to curb)

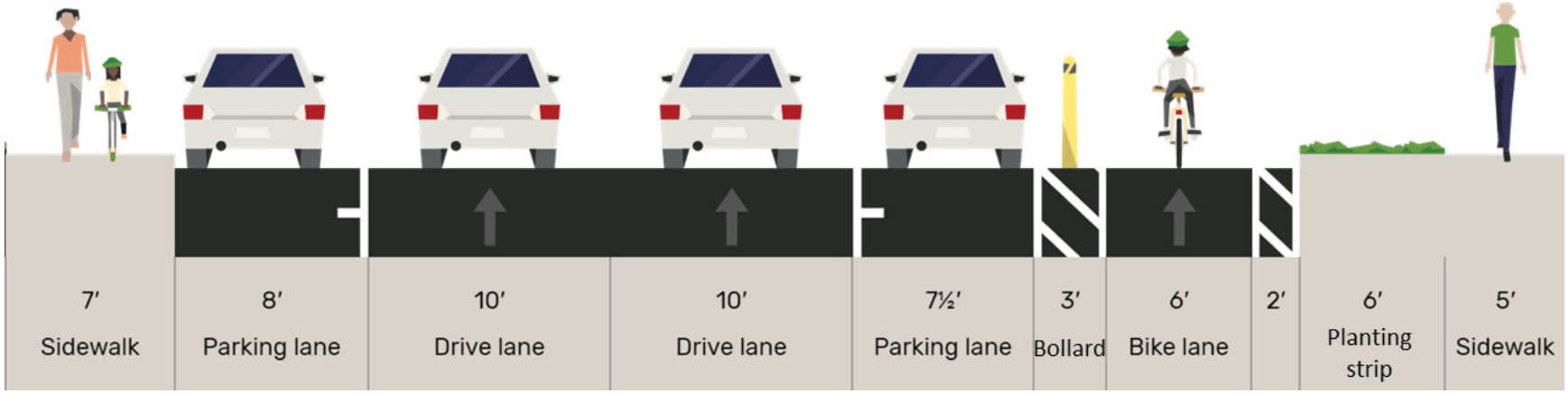


Figure 7. Section C (Jackson St to Kansas Ave) – Proposed (46.5’ curb to curb) *

* If the existing gutter is to remain, this not considered a part of the functional bikeway width.

SW 5TH STREET/QUINCY STREET

From Washburn Avenue to SE 4th Street

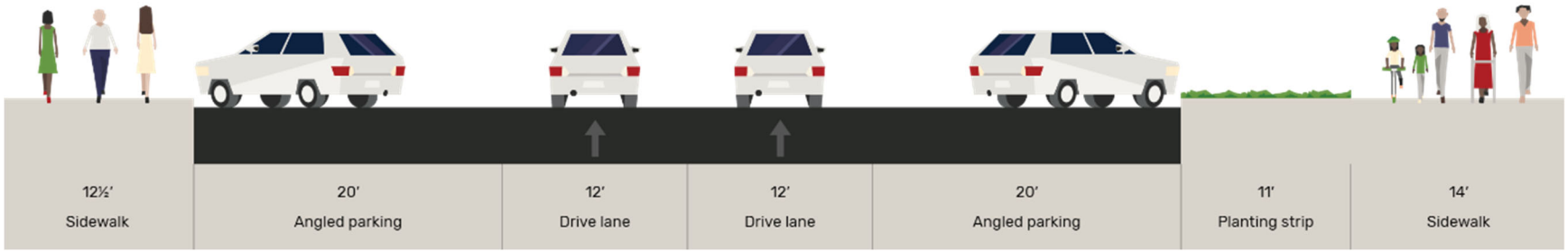


Figure 8. Section D (Kansas Ave to 4th Street) – Existing (64' curb to curb)

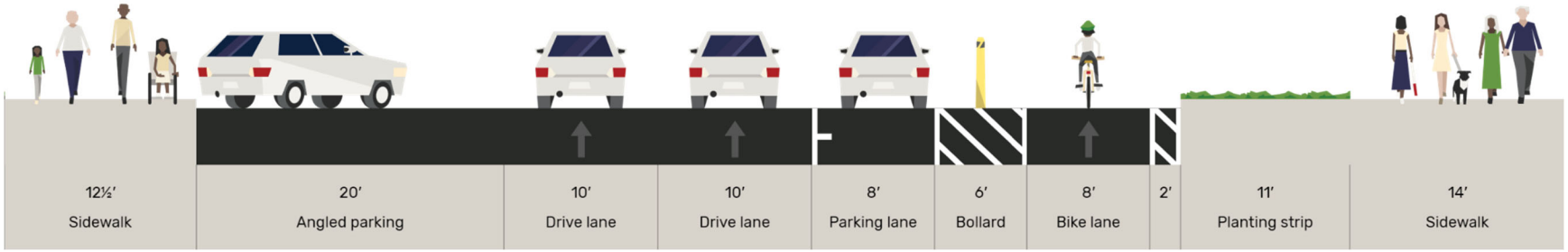


Figure 9. Section D (Kansas Ave to 4th Street) – Proposed (64' curb to curb) *

* If the existing gutter is to remain, this not considered a part of the functional bikeway width.

SW 5TH STREET/QUINCY STREET

From Washburn Avenue to SE 4th Street

Design Recommendations

Recommendations

- A one-way parking protected SBL is proposed for entire study area.
- Intersections:
  - At some intersections, the curb extensions may need to be reworked to provide a continuous bikeway.

Rationale

- **Speed and AADT**
  - No AADT was available for SW 5th Street, but it was assumed that volumes would be similar to SW 4th Street as they together serve as a one-way pair. At 30 mph with an assumed AADT from 3,000 – 6,000 veh/day, buffered bike lanes may be appropriate, however a SBL is feasible and will provide increase comfort on the Spine Network.
- **One-Way vs. Two-way Protected Bike Lane**
  - A one-way SBL pair could not be maintained throughout the corridor and changing facility types multiple times can degrades the overall facility comfort. A two-way SBL is preferred over one-way SBL pairs to provide bi-directional travel, however it does limit access to other side of street and can have a higher crash risk that should be mitigated as much as possible through geometric and signal phasing designs. At CSAC's direction, one one-way SBL was included along 4th & 5th in the same direction as the motor vehicle travel lane.
- **Removing and/or Reconfiguring lanes**
  - Narrowing travel lanes – The AASHTO Green Book provides flexibility in in travel lane width and allows lanes to be as narrow as 10 feet in a variety of contexts. Topeka's Complete Street Guidelines encourage 10-11ft lanes on arterial and collector streets as the provide many safety benefits for all users.
  - One-way streets – These streets were often originally designed to operate as a two-way street before being converted to a one-way. In some cases, there is excess capacity that offer opportunities for high-comfort bikeways. Because it was assumed that the volumes for SW 5th Street are similar to SW 4th Street, similar assumptions for lane reductions were made throughout the corridor.
- **Removing and/or Reconfiguring parking**
  - If on-street parking is underutilized on one side it may be appropriate to remove it to fit a high-comfort bike facility. Compared with bicycle lanes adjacent to on street parking lanes, parking protected bike lanes decrease the risk of a bicyclist being "doored" by a motorist opening a car door or being struck by a motorist entering or exiting a parking space. The proposed facility will shift parking in to provide a parking protected facility which reduces the risk of dooring, maintains the existing parking, and provides a more comfortable bikeway facility.

SW 5TH STREET/QUINCY STREET

From Washburn Avenue to SE 4th Street

- Converting diagonal parking to parallel parking on 5th Street/Quincy Street between Kansas Avenue and 4th Street – Converting diagonal on-street parking to parallel parking would provide roadway space for a high-comfort bikeway. Diagonal parking could be maintained on both sides if only one through lane is needed. Otherwise, it is recommended that the diagonal parking be converted to parallel parking along the south/east sides of the street to accommodate the preferred bikeway.

- **Other Considerations:**
  - SW 5th Street and 4th Street are a one-way pair. Because bicyclists need to expend considerably more energy than a motorist, providing only one-way SBL on each roadway (no bidirectional travel) could suppress bicycling due to the out of direction travel needed and there may be an increase of wrong way riding. This should be monitored a two-way facility be considered based on the results of monitoring.

Alternatives Considered

- One-way SBL pairs may be feasible if straight curb instead of curb and gutter was constructed along the street.
- The following alternative was presented to CSAC: Both 5th and 4th Street have constrained sections on the western edge of the study areas. The constrained section for 4th is shorter and because 4th provides a more direction connection, we recommend focusing funding efforts to widen this roadway to allow for bi-directional travel. While bidirectional travel should still be considered on 5th street, we believe it may be a lower priority than 4th street and therefore interim treatments can be considered until funding is available to provide a SUP.
  - Sections A:
    - Interim Option: Provide a contraflow bike lane and shared lane. Reduce the speed limit (20mph preferred, 25mph max) given the shared lane environment.
    - Proposed: Provide a SUP to accommodate bi-directional travel
  - Section B-E: A two-way SBL is proposed to accommodate bi-directional travel. Providing only one-way bicycle lanes may result in wrong way riding. Where present, consider converting diagonal parking to reverse in parking which may improve overall safety and operations.

CSAC's direction was to provide only one SBL on SW 4th and SW 5th in the same direction as the general purpose lanes today.

SW 5TH STREET/QUINCY STREET

From Washburn Avenue to SE 4th Street

Needs for Additional Study

- Turning volumes should be reviewed to determine the recommended type of bicycle signal phasing.
- In locations where only one through lane is provided, the City should work with the fire department to ensure that they're comfortable with deploying fire equipment along these streets. The bikeway may be used for fire access, and buffer materials can be selected to allow for the range of potential emergency access needs.
- If the removal of parking is of concern, a parking study may be performed.

Cost Estimate*	$299,117

Cost estimate is an opinion of probable cost. Opinions of probable cost were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 30% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2023 dollars and were assigned based on historical cost data from KDOT bid histories assuming a representative half mile project length. Cost opinions do not include easement and right-of-way acquisition; permitting, inspection, or construction management; geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance. A cost range has been assigned to certain general categories such as utility relocations; however, these costs can vary widely depending on the exact details and nature of the work. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

SE 6TH STREET

From SE Madison Street to SE Branner Street

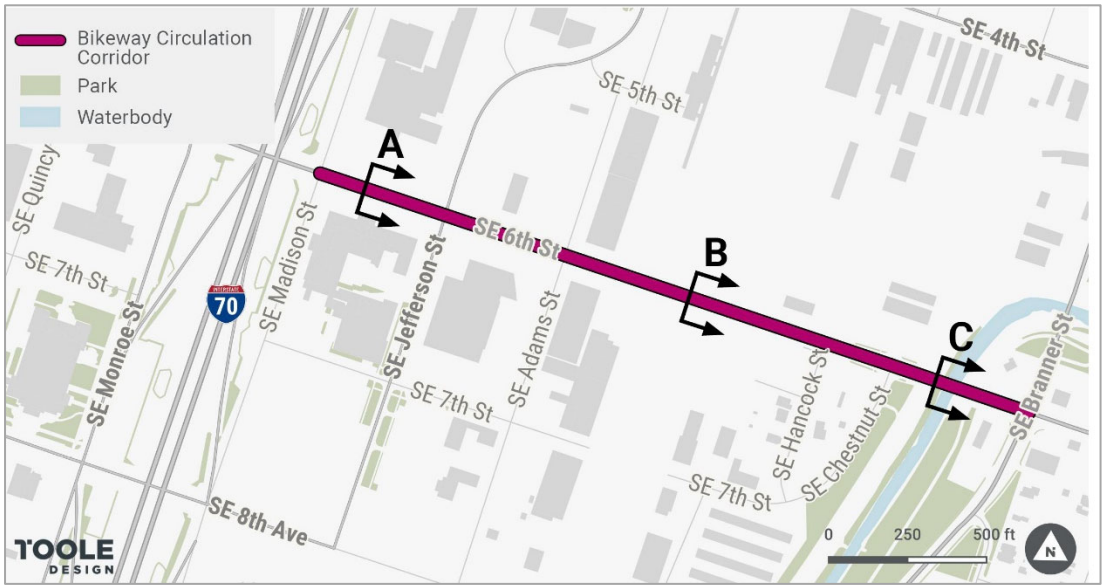


Figure 1. SE 6th Street Corridor Map

New Bike Network Miles: 0.45

Questions? https://topekampo.org/

PLANNING CONSIDERATIONS	
Posted Speed Limit	30 MPH
Connectivity to existing bikeways	Shunga Trail and sharrows west on SE 6th St
Bikeway Rationale	Connection between the Shunga Trail & Topeka Business District. 6th Street is identified as a part of the Spine Bikeway Network
Major Barriers (constrained bridges or underpasses, freeway ramps)	Existing Bridge
Elements of Construction	Paint, flexposts, curbstops, and floating bus stops as needed
On-Street Parking	None
Transit	Routes 1, 3, & 4

These preliminary concepts are for planning purposes only. Field verification, site condition assessments, engineering analysis, and design are necessary prior to implementing recommendations.

SE 6TH STREET

From SE Madison Street to SE Branner Street

TYPICAL CROSS-SECTIONS

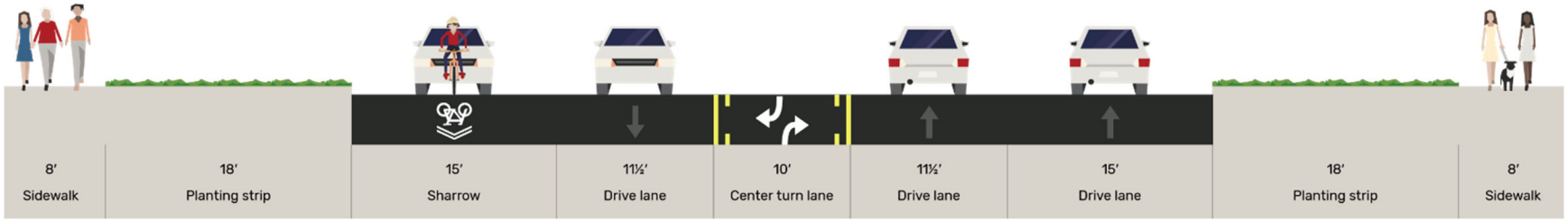


Figure 2. Section A (SE Madison Street to SE Jefferson Street) – Existing (63' curb to curb)

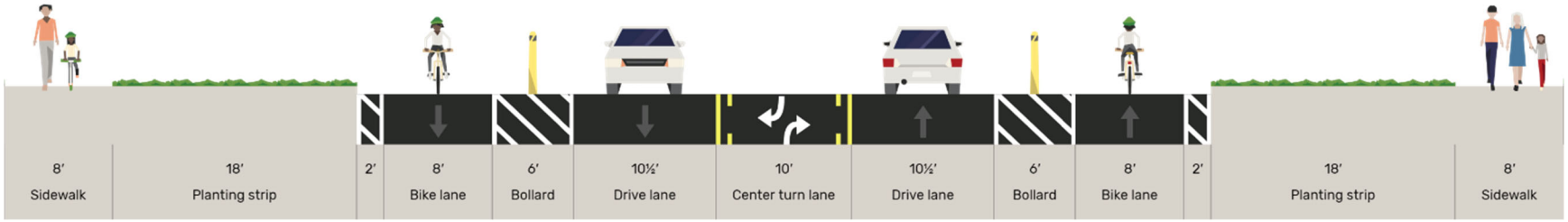


Figure 3. Section A (SE Madison Street to SE Jefferson Street) – Proposed (63' curb to curb) *

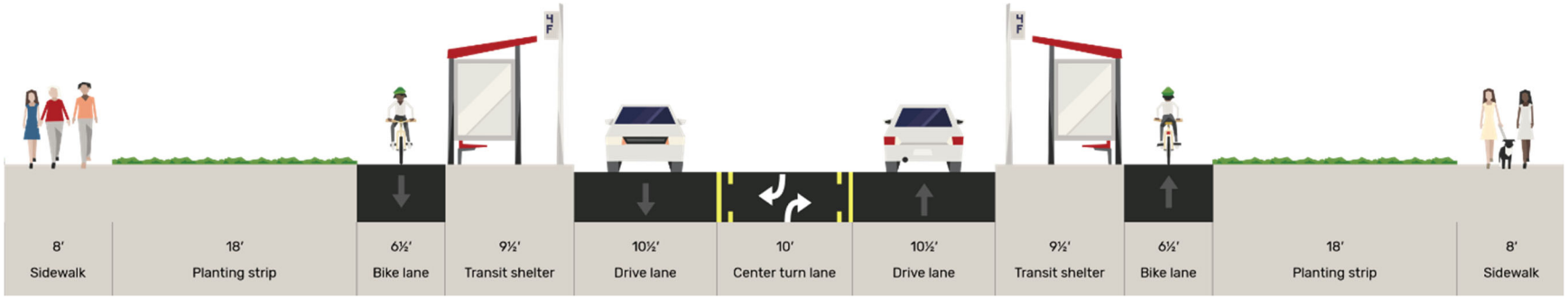


Figure 4. Section A (SE Madison Street to SE Jefferson Street) – Proposed (at Bus Stop) (31' curb to curb)

* If the existing gutter is to remain, this not considered a part of the functional bikeway width.

SE 6TH STREET

From SE Madison Street to SE Branner Street

Figure 5. 3D Rendering of Section A near Madison Street

SE 6TH STREET

From SE Madison Street to SE Branner Street

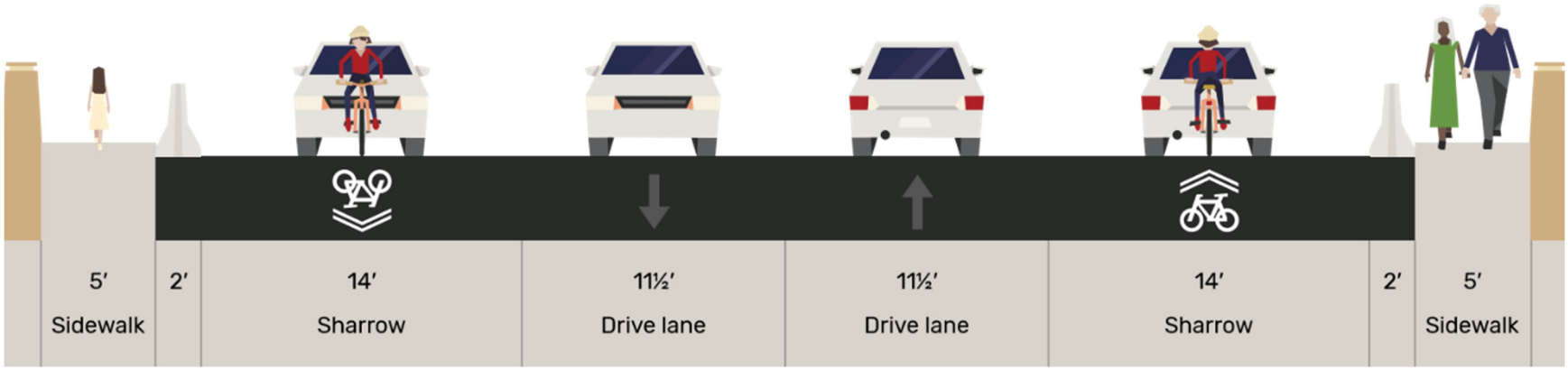


Figure 6. Section B (Jefferson to Chestnut) – Existing (51’ curb to curb)

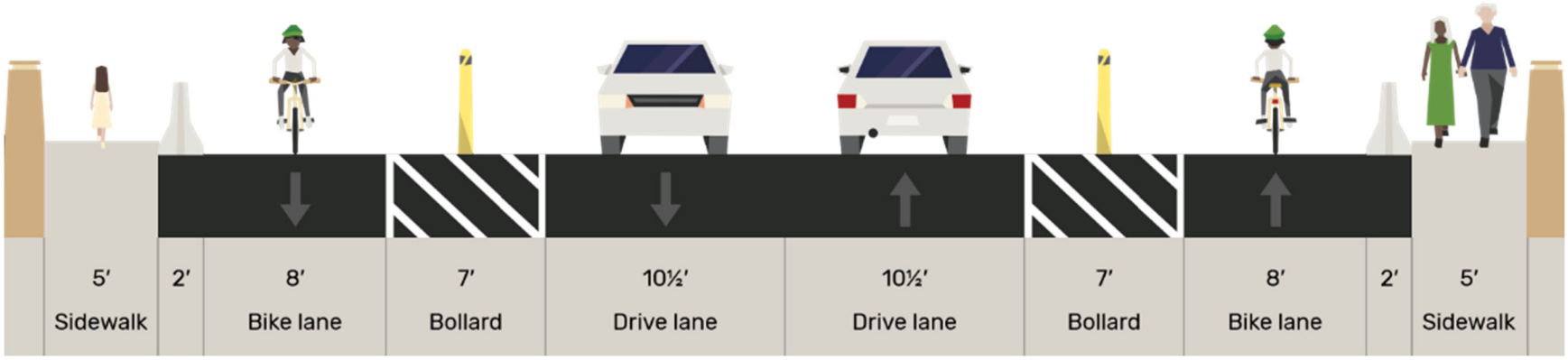


Figure 7. Section B (Jefferson to Chestnut) – Proposed (51’ curb to curb)

SE 6TH STREET

From SE Madison Street to SE Branner Street

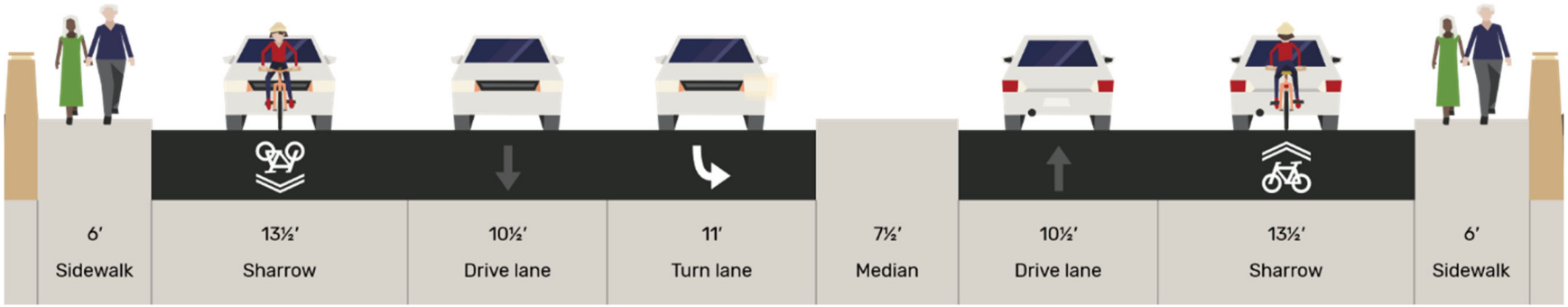


Figure 8. Section C (Chestnut to Branner) – Existing (66 ½' curb to curb)

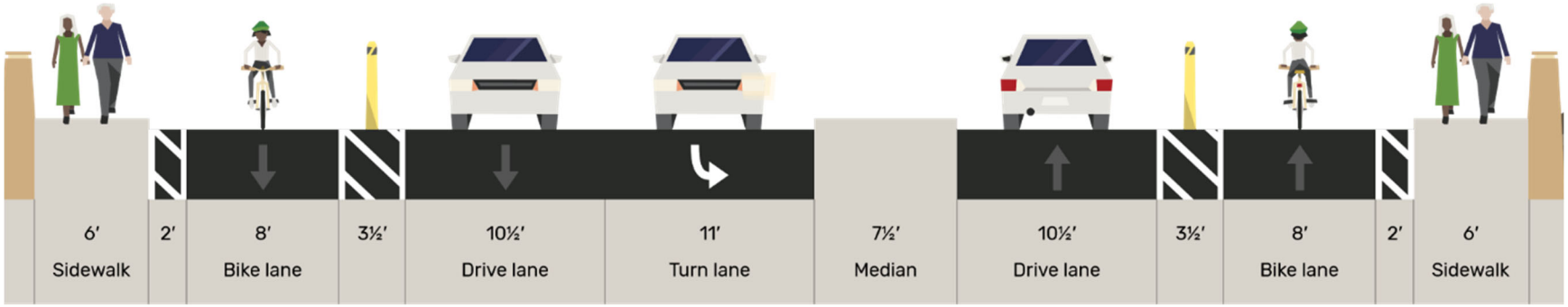


Figure 9. Section C (Chestnut to Branner) – Proposed (66 ½' curb to curb)

* If the existing gutter is to remain, this not considered a part of the functional bikeway width.

SE 6TH STREET

From SE Madison Street to SE Branner Street

Design Recommendations

Recommendations

- Separated bike lane with flex posts. Consider using concrete barriers in the buffer along the bridge (Sections B & C).
- Consider conflict markings and two-stage left turn boxes at intersections.

Rationale

- **Speed and AADT**
  - At 30 mph with an AADT greater than 6,000 veh/day, separated bike lanes or a shared use path would both be appropriate. Given the constrained width on the bridge, separated bike lanes are a more feasible design option. Separated bike lanes will also easily tie into the existing SE 6th Street bike lanes east of SE Chandler Street. Separated bike lanes accommodate the interested but concerned user and would make it easier for those coming from the west to access the Shunga Trail.
- **One-Way vs. Two-way Protected Bike Lane**
  - A one-way separated bike lane (SBL) pair provides bicyclists with access to both sides of the street. This configuration more easily ties into the bike lanes east of SE Chandler Street and may also be more intuitive to people biking. Bicyclists may use existing signals. A bike phase could be considered as well.
- **Removing and/or Reconfiguring lanes**
  - The AASHTO Green Book provides flexibility in in travel lane width and allows lanes to be as narrow as 10 feet in a variety of contexts. Topeka's Complete Street Guidelines encourage 10-11ft lanes on arterial and collector streets as they provide many safety benefits for all users.
  - Topeka's Complete Streets Guidelines state "Four-lane streets with volumes less than 15,000 vehicles per day generally are good candidates for four-to three-lane conversions." This is based on FHWA's Road Diet Guidance.
    - A two-way center left turn lane is not recommended for the section from Jefferson Street to Chestnut Street as there are no destinations for people to access by turning left.

SE 6TH STREET

From SE Madison Street to SE Branner Street

- **Other Considerations**
  - A wide buffer can increase comfort for bicyclists and provide separation from fast-moving traffic. At intersections, wide buffers improve sightlines and make it easier for drivers to see bicyclists and yield to them when necessary.
  - Floating bus stops should be implemented at existing transit stops. The bike lane can be narrowed behind the bus stop and ramped up to sidewalk level to encourage bicyclists to slow down and yield to pedestrians and transit riders. The forthcoming AASHTO Bike Design Guide includes guidance for transit stop and bikeway guidance. Existing guidance is provided in the AC Transit Multimodal Corridor Guidelines (https://www.actransit.org/website/uploads/AC_Transit_Multimodal_Corridor_Guidelines_Final.pdf).

Alternatives Considered

- None

Needs for Additional Study

- None

Cost Estimate*	**$177,450**

Cost estimate is an opinion of probable cost. Opinions of probable cost were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 30% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2023 dollars and were assigned based on historical cost data from KDOT bid histories assuming a representative half mile project length. Cost opinions do not include easement and right-of-way acquisition; permitting, inspection, or construction management; geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance. A cost range has been assigned to certain general categories such as utility relocations; however, these costs can vary widely depending on the exact details and nature of the work. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

SE 10TH STREET

From S Kansas Avenue to SE California Avenue

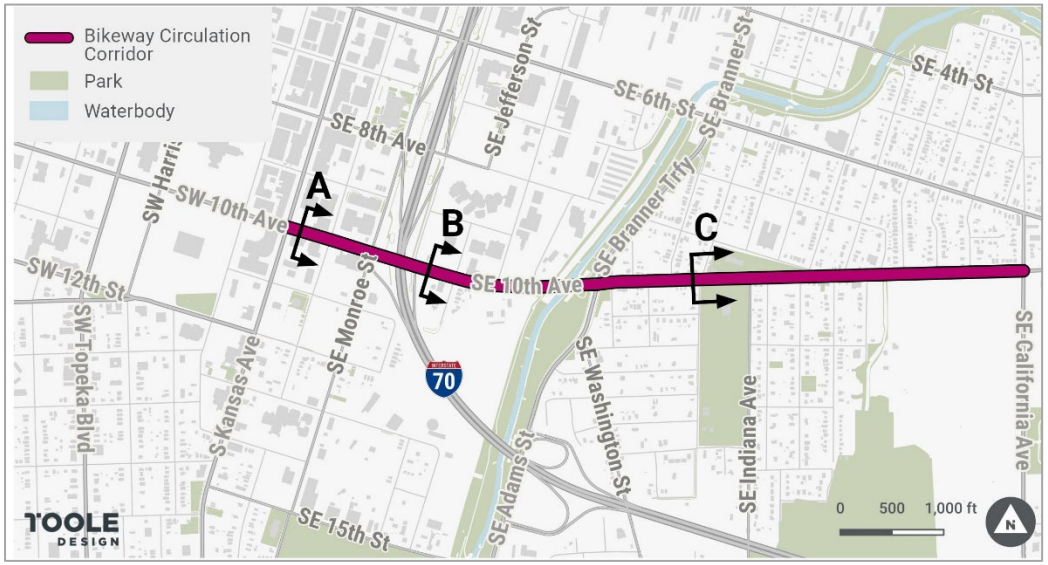


Figure 1. SE 10th Street Corridor Map

New Bike Network Miles: 1.36

Questions? https://topekampo.org/

PLANNING CONSIDERATIONS	
Posted Speed Limit	30mph
Connectivity to existing bikeways	Shunga Trail
Bikeway Rationale	Western portion of the corridor is part of the Spine Bikeway Network. The entire corridor is on the Vision Bikeway Network.
Major Barriers (constrained bridges or underpasses, freeway ramps)	From Branner Tfwy to California Ave, the existing pavement is too narrow to accommodate the preferred facility.
Elements of Construction	Paint, flexposts, curbstops, floating bus stops, new dedicated shared use path, and partial roadway reconstruction
On-Street Parking	Angled Parking from Kansas Ave to Quincy St
Transit	Route 4 (# Bus Stops)

These preliminary concepts are for planning purposes only. Field verification, site condition assessments, engineering analysis, and design are necessary prior to implementing recommendations.

SE 10TH STREET

From S Kansas Avenue to SE California Avenue

TYPICAL CROSS-SECTIONS

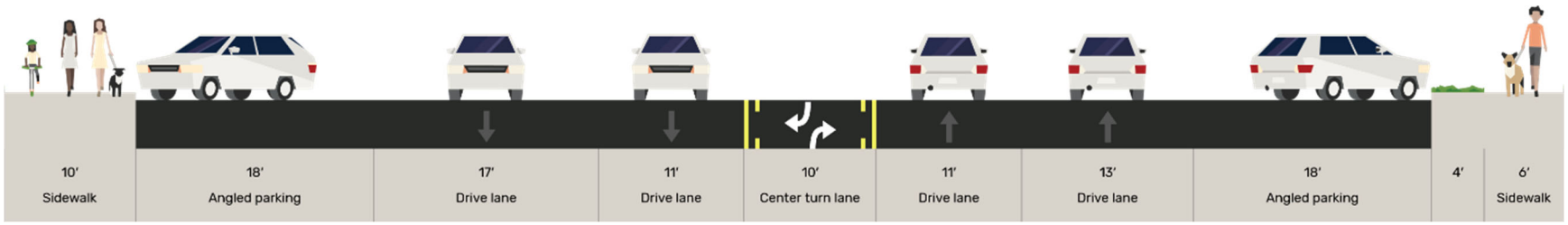


Figure 2. Section A (Kansas Ave to Quincy St) – Existing (98' curb to curb)

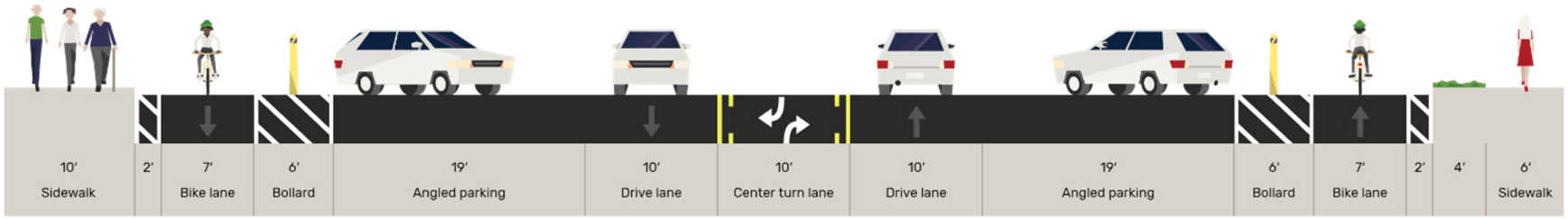


Figure 3. Section A (Kansas Ave to Quincy St) – Proposed (98' curb to curb) *

* If the existing gutter is to remain, this not considered a part of the functional bikeway width.

SE 10TH STREET

From S Kansas Avenue to SE California Avenue

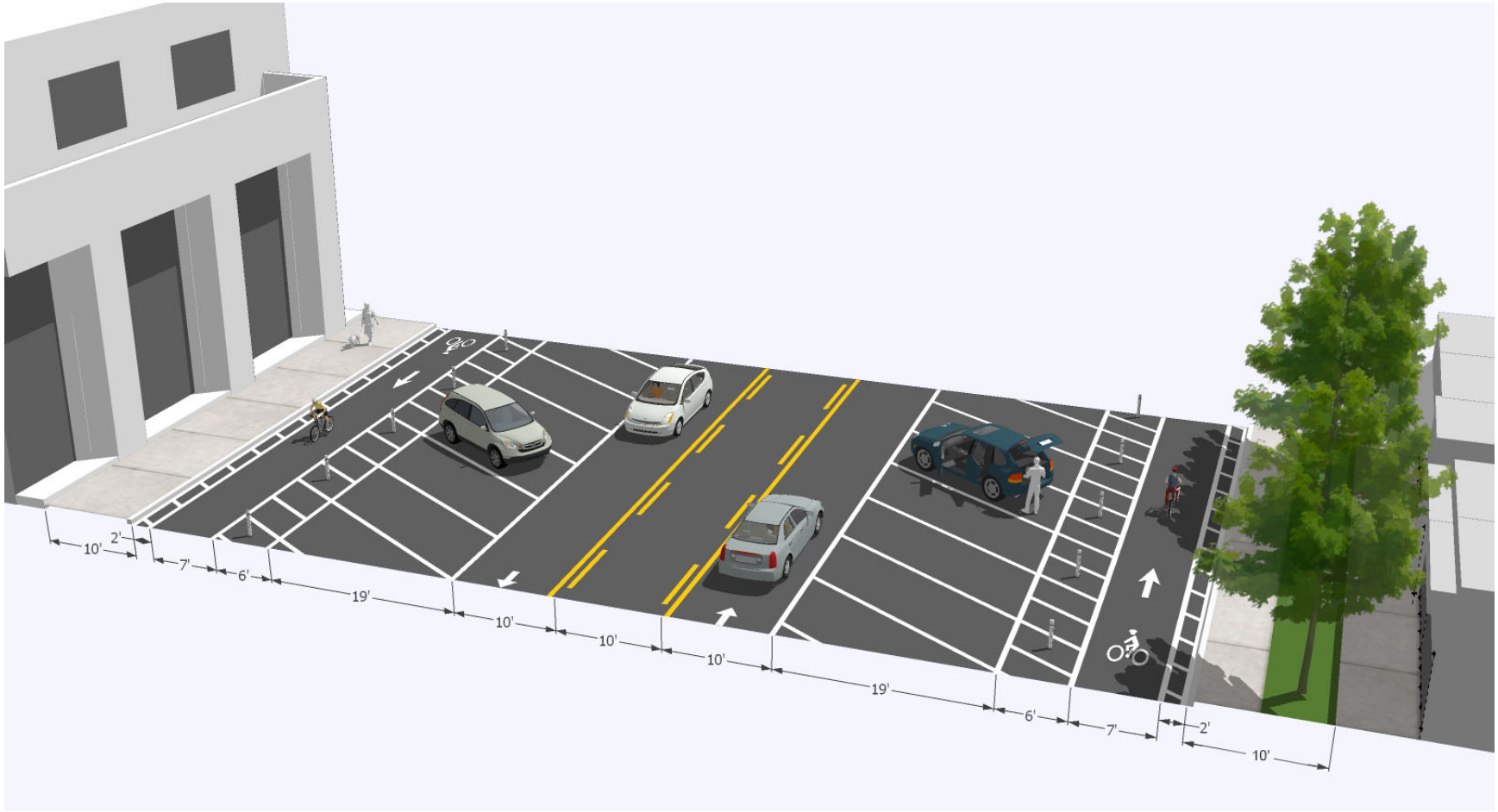


Figure 4. 3D Rendering of Section A near Quincy Street

SE 10TH STREET

From S Kansas Avenue to SE California Avenue

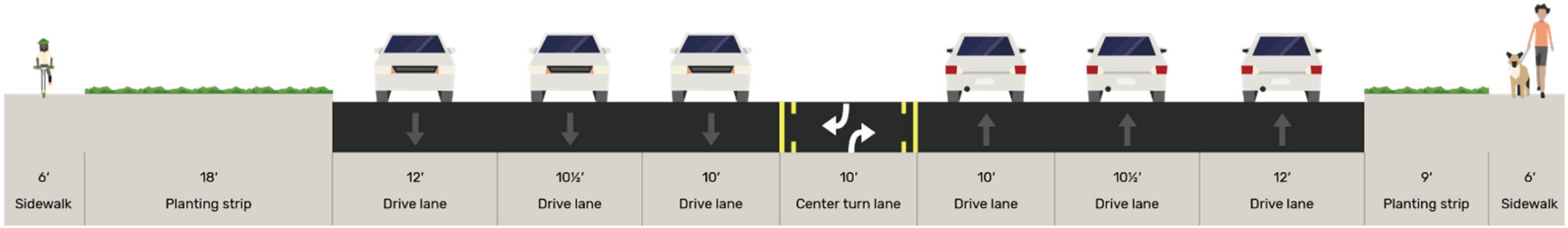


Figure 5. Section B (Quincy St to Se Jefferson St)– Existing (75' curb to curb)

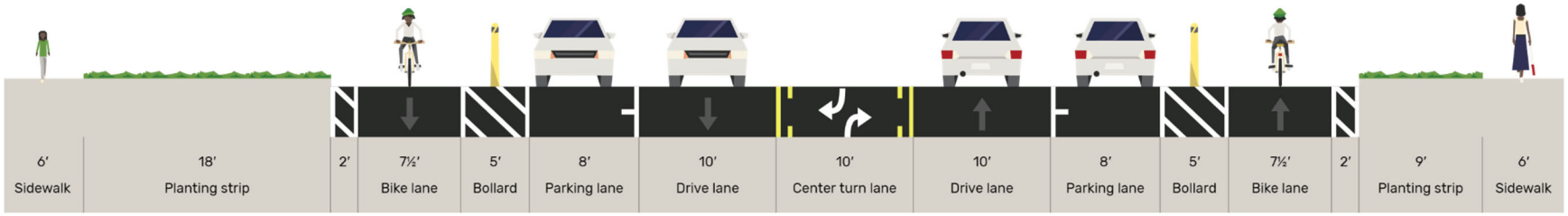


Figure 6. Section B (Quincy St to Se Jefferson St)– Proposed (75' curb to curb) *

* If the existing gutter is to remain, this not considered a part of the functional bikeway width.

SE 10TH STREET

From S Kansas Avenue to SE California Avenue

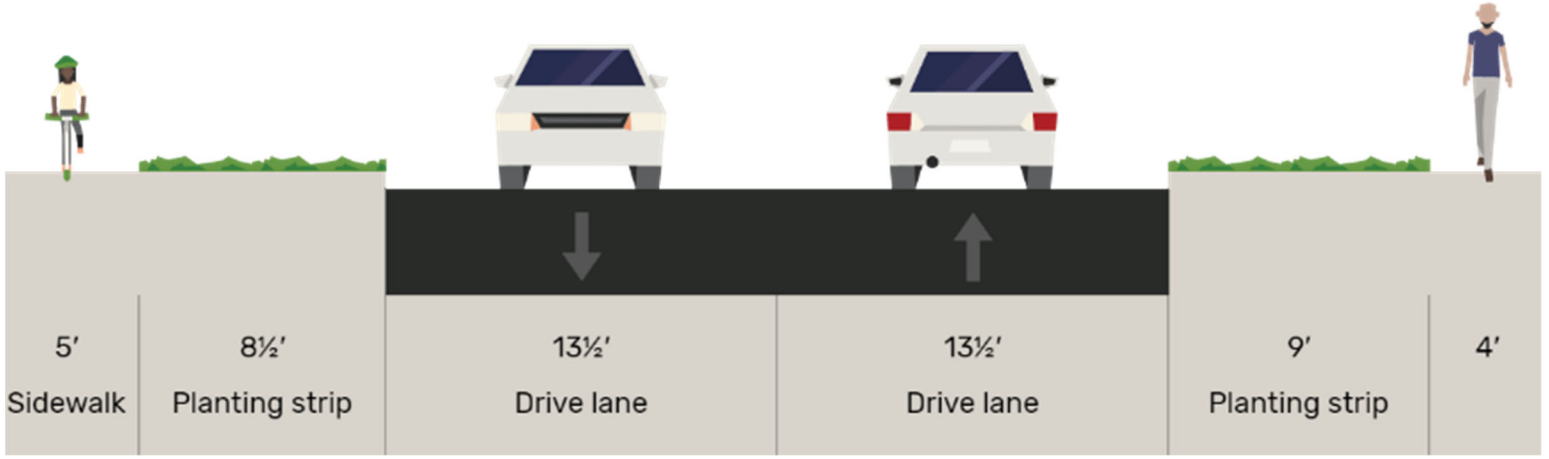


Figure 7. Section C (Branner Trafficway to California Ave) – Existing (26-30’ curb to curb)

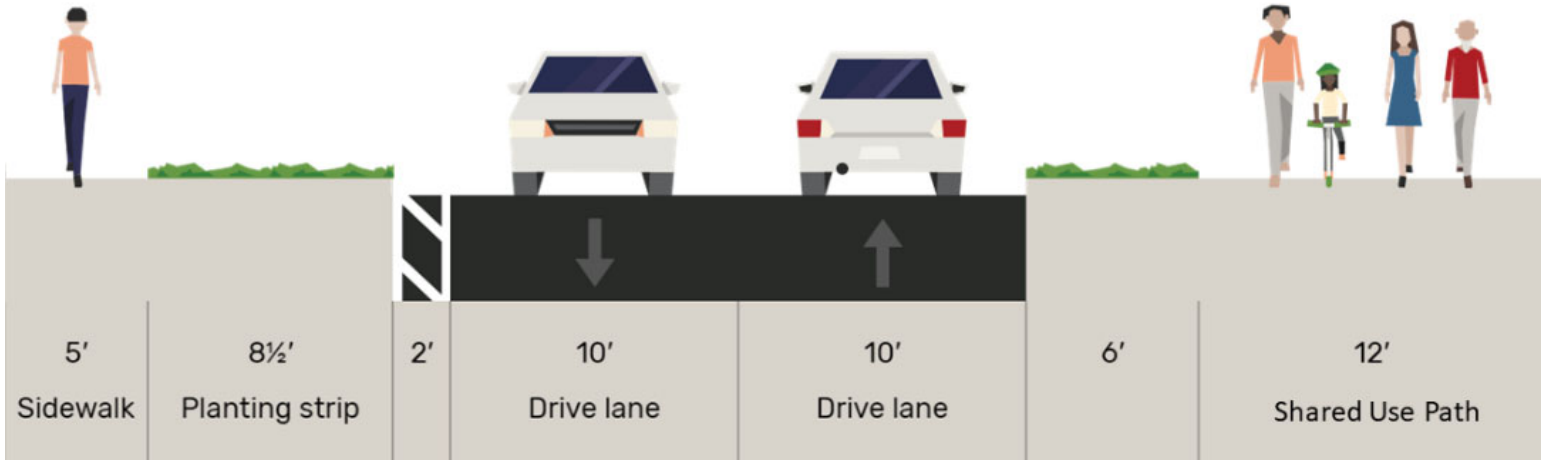


Figure 8. Section C (Branner Trafficway to California Ave) – Proposed (22’ curb to curb) * **

* If the existing gutter is to remain, this not considered a part of the functional bikeway width.

** Assumes the right gutter would be removed to narrow the pavement and widen the buffer. To keep cost lower, it is assumed the left gutter would remain.

SE 10TH STREET

From S Kansas Avenue to SE California Avenue

Design Recommendations

Recommendations

- Section A & B: One-way parking protected SBLs. Additional excess roadway capacity could be used provide on street parking, green space, or a dedicated bus lane.
- Section C: Shared use path on the south side of the roadway with increased buffer space provided by narrowing the roadway. Additional midblock crossings are likely needed to facilitate bicyclists accessing the SUP to/from cross streets to the north side of 10th Street.
- Intersections
  - Branner Twfy – Provide a comfortable transition between the facility types

Rationale

- **Speed and AADT**
  - With a posted speed of 30mph and existing volumes from 4,068 to 13,483 veh/day (projected volumes from 6,279 to 16,659 veh/day) the recommended bikeway is a SBL or SUP to provide a safe and comfortable bikeway for all ages and abilities.
- **One-Way vs. Two-way Protected Bike Lane**
  - A one-way SBL pair is preferred as it provides full access both sides of street, has a lower crash risk, and may use existing signal depending on the turning volumes. This facility type is feasible for Sections A-B.
  - A SUP is a separated facility that can be used by pedestrians and bicyclists. While it is recommended for roadways with higher speeds and volumes, it does not provide access to both sides of the street and it can have a higher crash risk that a one-way SBL pair.
- **Removing and/or Reconfiguring lanes**
  - Narrowing travel lanes – The AASHTO Green Book provides flexibility in in travel lane width and allows lanes to be as narrow as 10 feet in a variety of contexts. Topeka's Complete Street Guidelines encourage 10-11ft lanes on arterial and collector streets as the provide many safety benefits for all users.
  - Topeka's Complete Streets Guidelines state "Four-lane streets with volumes less than 15,000 vehicles per day generally are good candidates for four-to three-lane conversions." Based on FHWA's Road Diet Guidance. This is applicable to 10th Street from Kansas Ave to Adams St/Branner Tfwy.

- **Removing and/or Reconfiguring parking**
  - Compared to conventional bicycle lanes, parking protected bike lanes decrease the risk of a bicyclist being "doored" by a motorist opening a car door or being struck by a motorist entering or exiting a parking space.
  - From Kansas Ave to Quincy St – reverse in angled parking is preferred for all streets.
- **Other Considerations** (Pulled from FHWA Bikeway Selection Guide: Assessing and Refining the Desired Bikeway Type Pages – 24 – 26)
  - CSAC has indicated that this is a key connection to East Topeka. The committee anticipates a high need for access to a variety of transportation modes in the area so that residents can reach other resources in East Topeka and outside of it.
  - The wide roadway may be intimidating to many riders if only a bicycle lane or buffered bicycle lane is provided. A SBL will provide additional comfort for bicyclists.

Alternatives Considered

- For Section A: Angled parking could likely be maintained (replacing the proposed parallel parking / dedicated bus lane).
- For Section C: The existing sidewalk can be widened to provide a shared use path without reducing the existing roadway width. Trees and landscaping should be considered in the buffer to increase the comfort of bicyclists and pedestrians.

Needs for Additional Study

- The dedicated bus lane should be coordinated with the local transit agency. If a dedicated bus lane is not needed at this time, additional strategies for reducing the excess roadway width should be explored. Maintaining excess roadway width can impact overall roadway safety.
- Turning volumes should be reviewed to determine the recommend type of bicycle signal phasing.
- The City should work with the fire department to finalize the roadway cross sections to ensure adequate maneuvering room for emergency vehicles.

SE 10TH STREET

From S Kansas Avenue to SE California Avenue

Cost Estimate*	$3,151,759

Cost estimate is an opinion of probable cost. Opinions of probable cost were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 30% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2023 dollars and were assigned based on historical cost data from KDOT bid histories assuming a representative half mile project length. Cost opinions do not include easement and right-of-way acquisition; permitting, inspection, or construction management; geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance. A cost range has been assigned to certain general categories such as utility relocations; however, these costs can vary widely depending on the exact details and nature of the work. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

SE 15TH STREET / SE HUDSON BLVD

From SE Monroe Street to Maryland Avenue to SE 21st Street

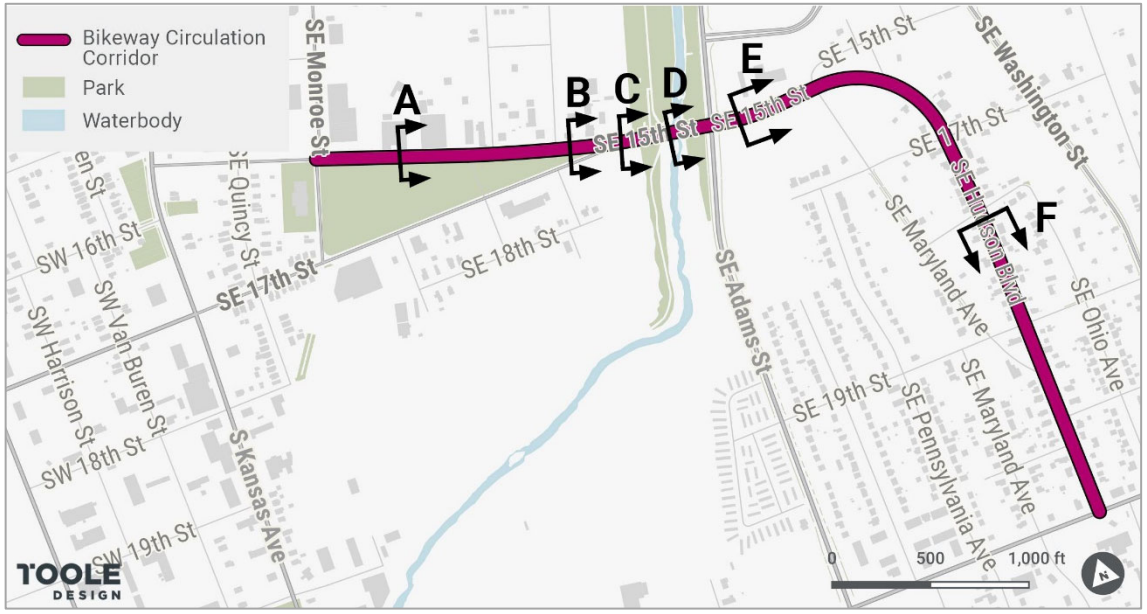


Figure 1. SE 15th Street Corridor Map

New Bike Network Miles: 1.00

Questions? https://topekampo.org/

PLANNING CONSIDERATIONS	
Posted Speed Limit	30 mph
Connectivity to existing bikeways	Landon Nature Trail & Shunga Trail
Bikeway Rationale	Identified as a part of the Bikeway Spine Network in the Fast Track Plan. Connects residents to regional trails and cultural sites.
Major Barriers (constrained bridges or underpasses, freeway ramps)	Railroad Overpass and existing bridge
Elements of Construction	New dedicated SUP path, limited roadway reconstruction, paint, flexposts, and barriers
On-Street Parking	Yield Street for Hudson Blvd
Transit	None

These preliminary concepts are for planning purposes only. Field verification, site condition assessments, engineering analysis, and design are necessary prior to implementing recommendations.

SE 15TH STREET / SE HUDSON BLVD

From SE Monroe Street to Maryland Avenue to SE 21st Street

TYPICAL CROSS-SECTIONS

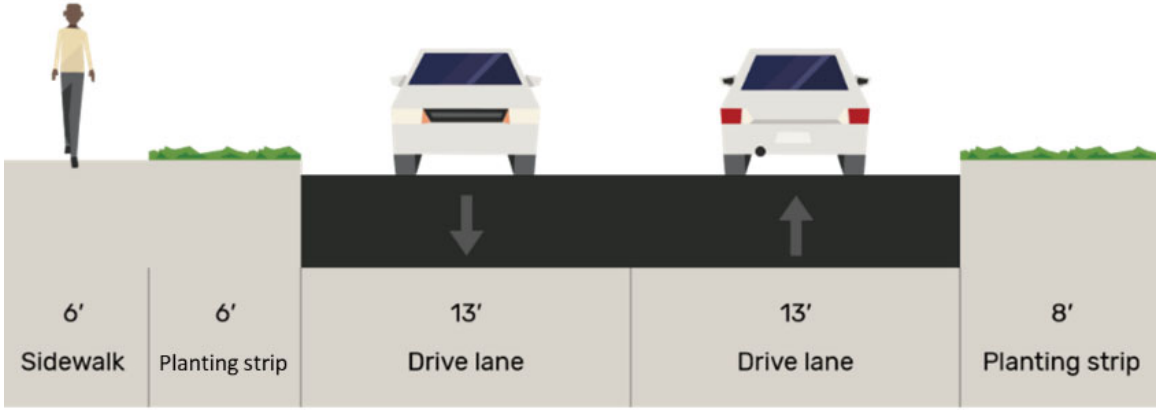


Figure 2. Section A (Monroe St to Madison St) – Existing (26' curb to curb)

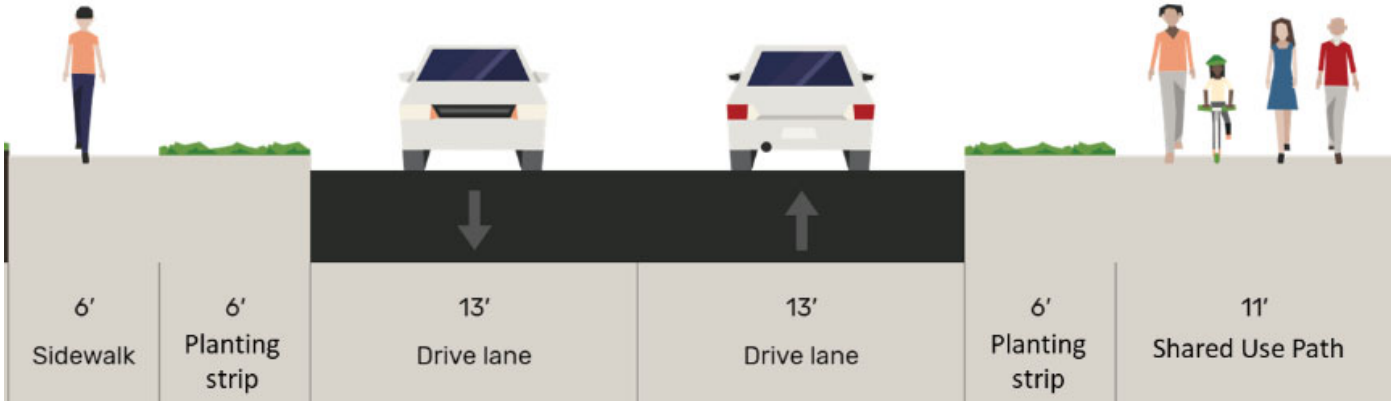


Figure 3. Section A (Monroe St to Madison St) – Proposed (26' curb to curb) *

*Assumes sufficient space for additional shared use path along the south side of SE 15th Street at Cushinberry Park

SE 15TH STREET / SE HUDSON BLVD

From SE Monroe Street to Maryland Avenue to SE 21st Street

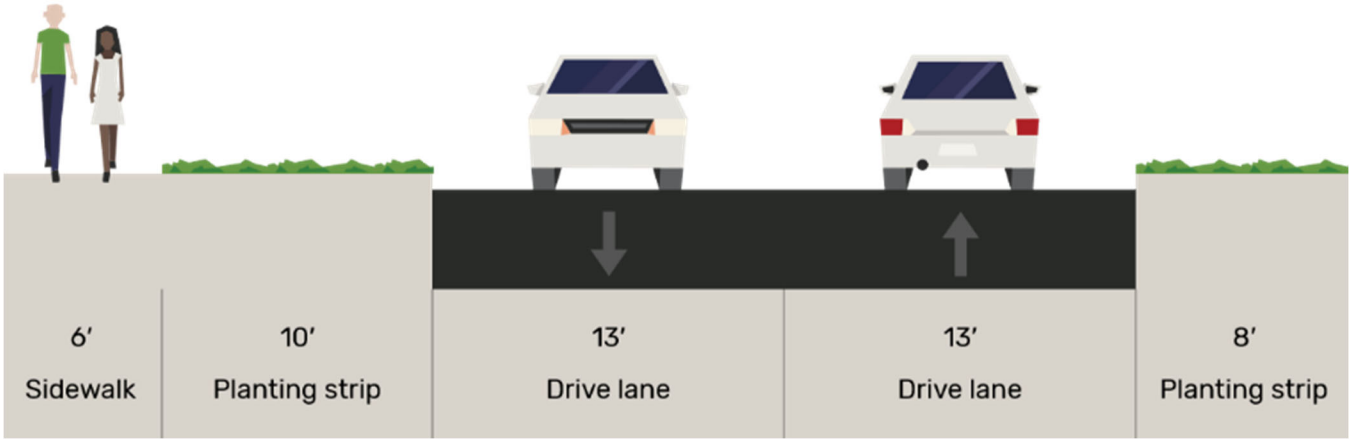


Figure 4. Section B (SE Madison St to Bridge) – Existing (26’ curb to curb)

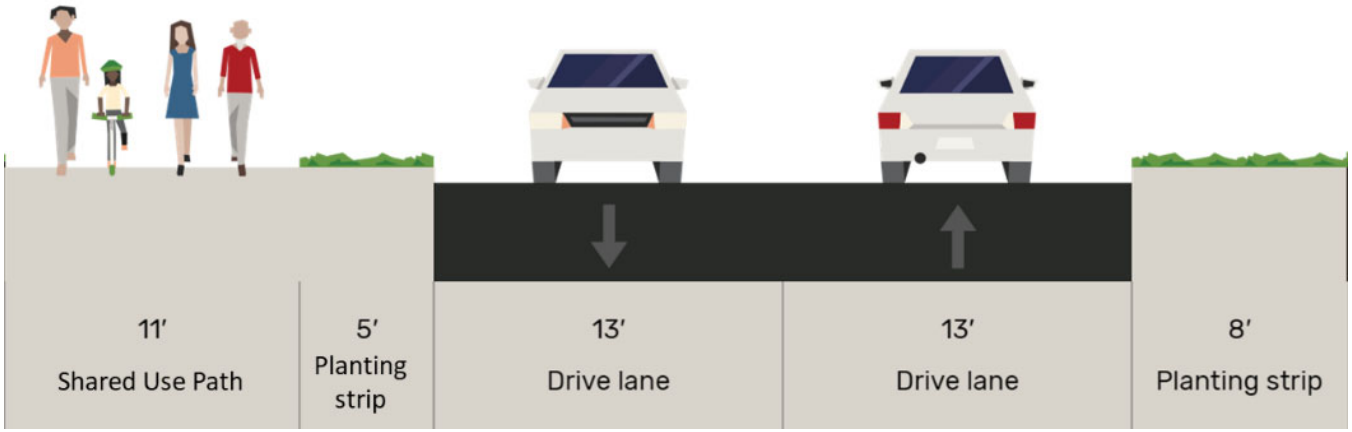


Figure 5. Section B (SE Madison St to Bridge) – Proposed (26’ curb to curb)

SE 15TH STREET / SE HUDSON BLVD

From SE Monroe Street to Maryland Avenue to SE 21st Street

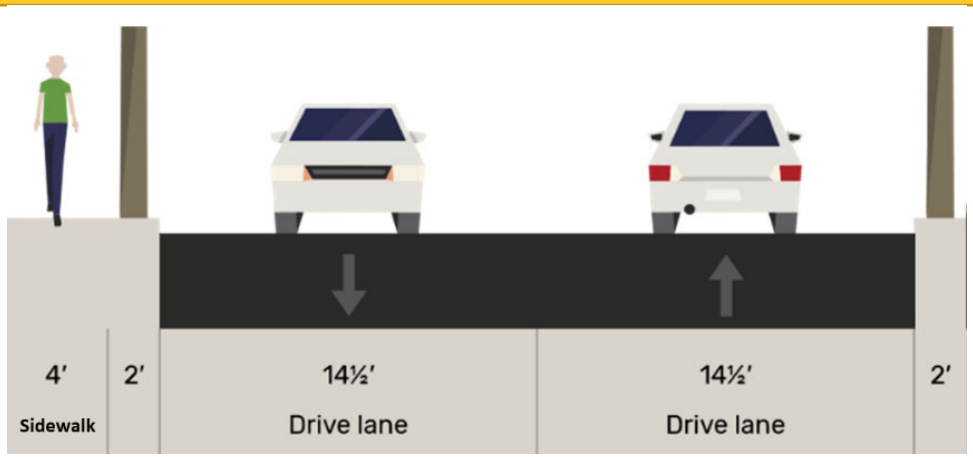


Figure 6. Section C (Railroad Overpass) – Existing (29' curb to curb)

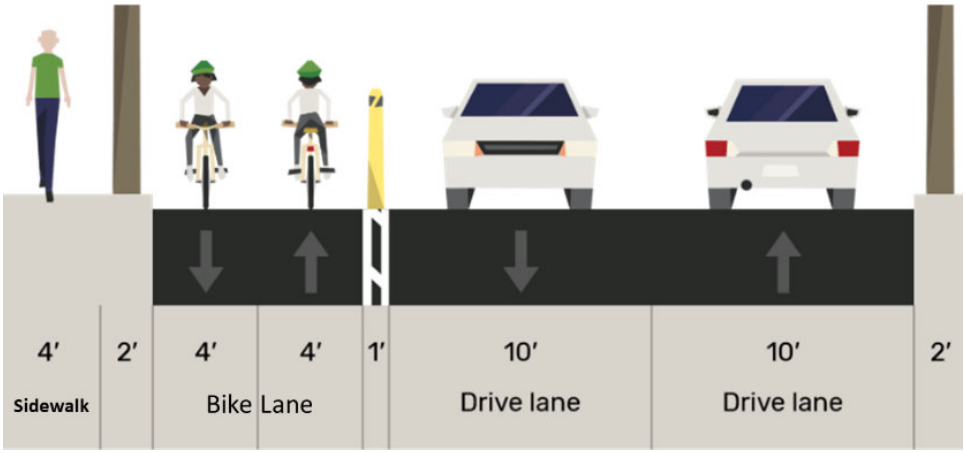


Figure 7. Section C (Railroad Overpass) – Proposed (29' curb to curb)

SE 15TH STREET / SE HUDSON BLVD

From SE Monroe Street to Maryland Avenue to SE 21st Street

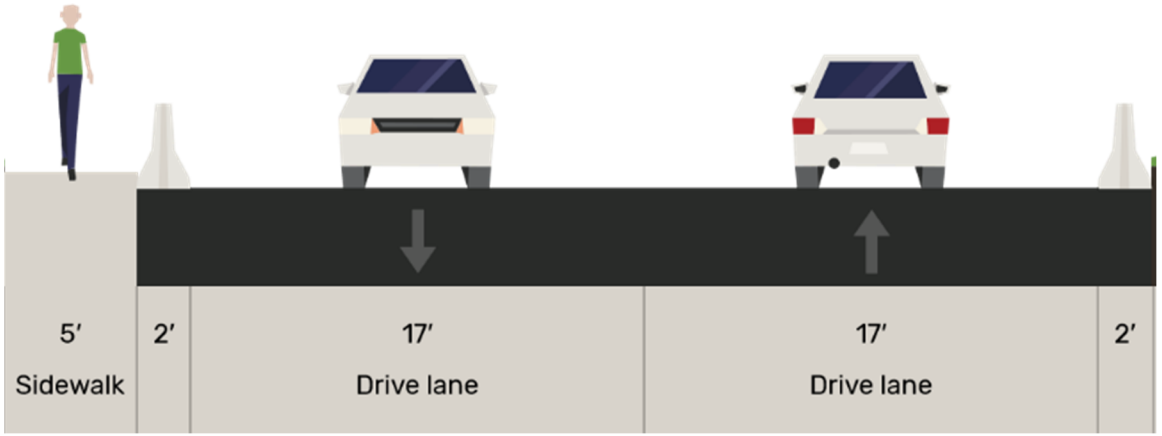


Figure 8. Section D (15th Street Bridge) – Existing (34’ barrier to barrier)

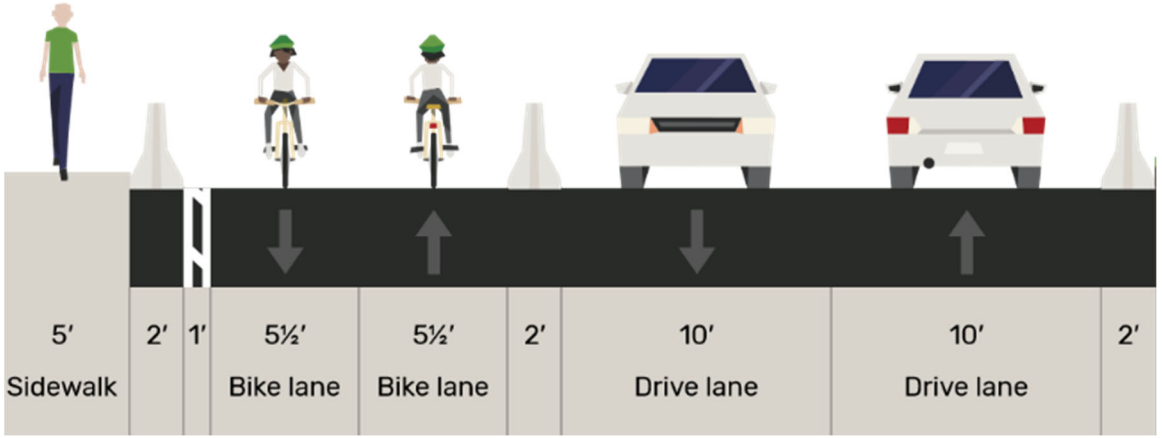


Figure 9. Section D (15th Street Bridge) – Proposed (34’ barrier to barrier)

SE 15TH STREET / SE HUDSON BLVD

From SE Monroe Street to Maryland Avenue to SE 21st Street

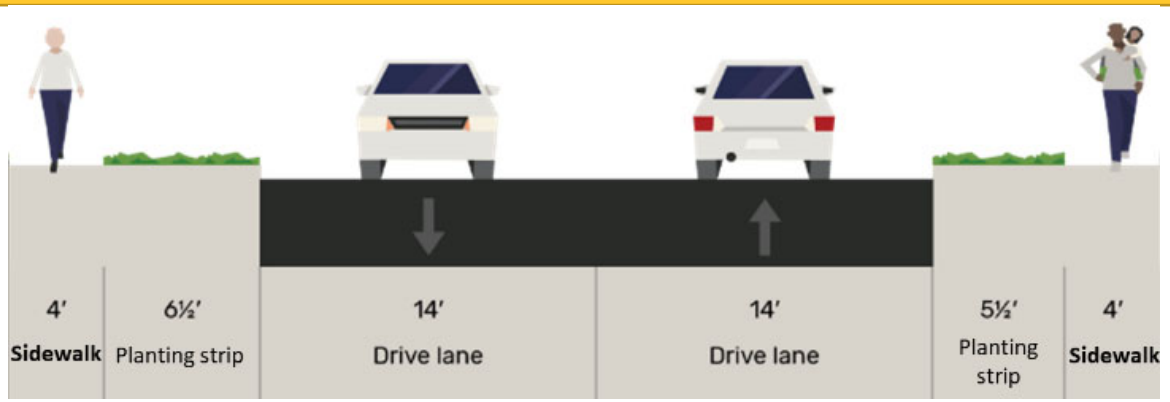


Figure 10. Section E (SE Adams St to SE 17th St) – Existing (28' curb to curb)

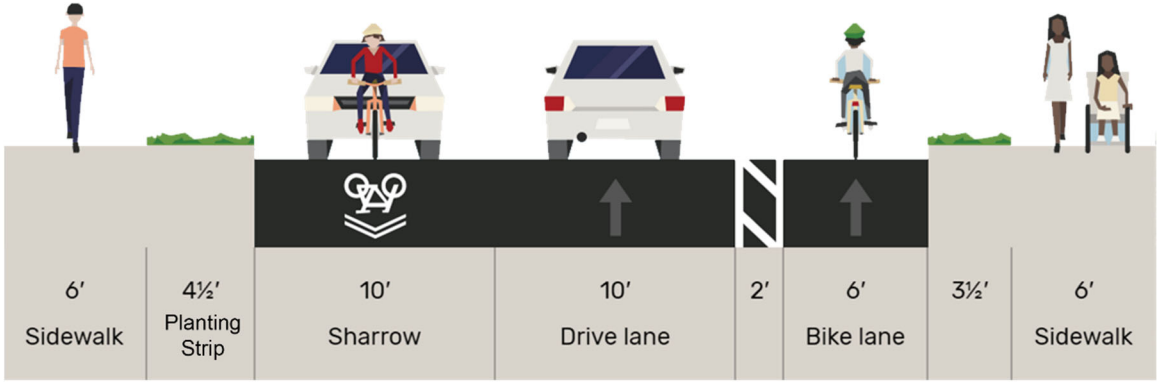


Figure 11. Section E (SE Adams St to SE 17th St) – Proposed (28' curb to curb)

SE 15TH STREET / SE HUDSON BLVD

From SE Monroe Street to Maryland Avenue to SE 21st Street

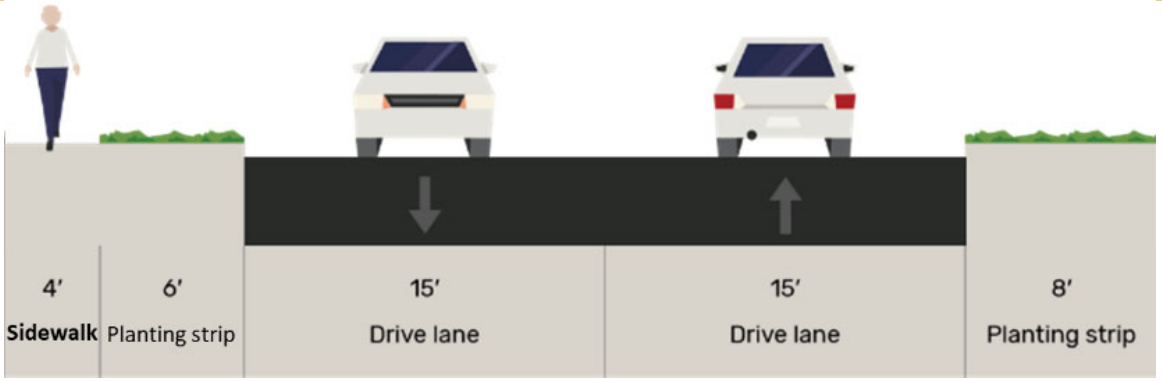


Figure 12. Section F (SE 17th St to SE 21st St) – Existing (30’ curb to curb)

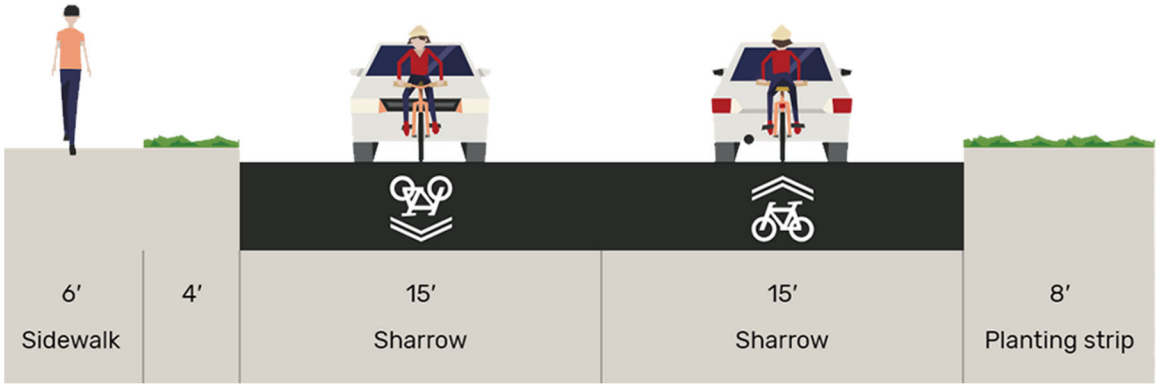


Figure 13. Section F (SE 17th St to SE 21st St) – Proposed (30’ curb to curb)

SE 15TH STREET / SE HUDSON BLVD

From SE Monroe Street to Maryland Avenue to SE 21st Street

Design Recommendations

Recommendations

- Section A & B: Provide a SUP along the south side of 15th Street unless ROW is limited as the proximity to the park and lack of driveway crossings will improve comfort and access to the Landon Nature Trail. This will also address a sidewalk gap along this side of the roadway. The path should cross to the north side of 15th Street after Madison so that path users can access the Shunga Trail entry point located northwest of the bridge.
- Section C & D: A two-way SBL (11 ft preferred with 1-2ft shy space from continuous vertical elements, 8 ft width may be used in constrained conditions for short distances and may be necessary at the railroad overpass). Reconstruct the pavement as needed to create a full bikeable and drivable surface (e.g., no gutters within the operating areas). For the buffer, Qwick Kurb or a similar product is preferred to improve the comfort in this constrained condition. It may be feasible to also narrow the lane widths to 9.5ft depending on site conditions and with the proper traffic control.
- Section E: Traffic data should be collected for along this segment to confirm on-street bicycle facilities are appropriate. If conditions are appropriate or can be achieved through traffic calming, provide a traffic calmed (e.g., curb extensions) shared street in the westbound/northbound direction and a bike lane in the eastbound/southbound direction as a climbing lane. To meet the all ages and abilities goal, a speed limit reduction to 20 or 25mph should be pursued. If the lower limit and operating speeds cannot be achieved, the bikeway may not serve all ages and abilities.
- Section F: Traffic data should be collected along this segment to confirm on-street bicycle facilities are appropriate. If conditions are appropriate or can be achieved through traffic calming, create a bicycle boulevard using traffic calming elements to keep speeds and volumes low (See Topeka Complete Streets Design Guidelines or Table 6-1 of the ODOT MDG), signing, and markings. Reduce speeds to 20 or 25mph to meet the all ages and abilities goal. If the lower limit and operating speeds cannot be achieved, the bikeway may not serve all ages and abilities.
- Transitions
    - Bicyclist will need to transition from the path to on-street bikeway or shared street at the 15th/17th Street junction. Although transitions are not ideal, they are necessary due to the highly constrained corridor. **It is critical to properly design transitions** between facility types and to different sides of the street.

Rationale

- **Speed and AADT**
    - The posted speed limit is 30mph and there are 6,973 vehicles/day (Monroe to Maryland). Based on this, a separated bicycle lane or SUP is the recommended facility.

- **One-Way vs. Two-way Protected Bike Lane**
  - Given the limited roadway width and ROW, a sidepath was selected to provide bi-directional bikeway travel. While a SUP does not provide direct access to both sides of the street, the recommendations for placement and crossings provide access to key bikeway connections.
- **Removing and/or Reconfiguring lanes**
  - Minimal adjustments are proposed; however, many sections of the roadway are wider than necessary and allow for higher speeds. The AASHTO Green Book provides flexibility in in travel lane width and allows lanes to be as narrow as 10 feet in a variety of contexts. Topeka's Complete Street Guidelines encourage 10-11ft lanes on arterial and collector streets as the provide many safety benefits for all users. The additional space could be used to provide medians to encourage lowers speeds and create safer crossings for people walking and bicycling.
- **Removing and/or Reconfiguring parking**
  - ALT - Hudson Blvd is a yield street, allowing parking along both sides. Given the density of homes and availability of driveways and garages, the parking is likely underutilized along this street. Yield Streets can be effective at keeping speeds and volumes low and creating a street environment where the IBC bicyclist may feel comfortable sharing the roadway. However, if parking is underutilized, the yield street may not be creating this environment. Traffic calming elements can be added to address speeds and volumes and create a bicycle boulevard.

Alternatives Considered

- For Section A, adding the SUP to the north side of the roadway was also considered. This would eliminate the need to cross the path near the 15th/17th Street junction. However, a new crossing would need to be placed at the Landon Nature Trail. The trade offs between these crossing locations, available right of way, opportunity to address a sidewalk gap with a SUP, and general comfort of the SUP, could be explored further during preliminary engineering.

SE 15TH STREET / SE HUDSON BLVD

From SE Monroe Street to Maryland Avenue to SE 21st Street

Needs for Additional Study

- Turning volumes should be reviewed to determine the recommended type of bicycle signal phasing.
- Traffic data should be collected for Hudson Blvd to confirm the shared street will be appropriate for the traffic volumes, speeds, and mix of vehicle types.

Cost Estimate*	$1,820,676

Cost estimate is an opinion of probable cost. Opinions of probable cost were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 30% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2023 dollars and were assigned based on historical cost data from KDOT bid histories assuming a representative half mile project length. Cost opinions do not include easement and right-of-way acquisition; permitting, inspection, or construction management; geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance. A cost range has been assigned to certain general categories such as utility relocations; however, these costs can vary widely depending on the exact details and nature of the work. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

KANSAS AVENUE

From 3rd Street to 6th Street and 10th Avenue to 17th Street

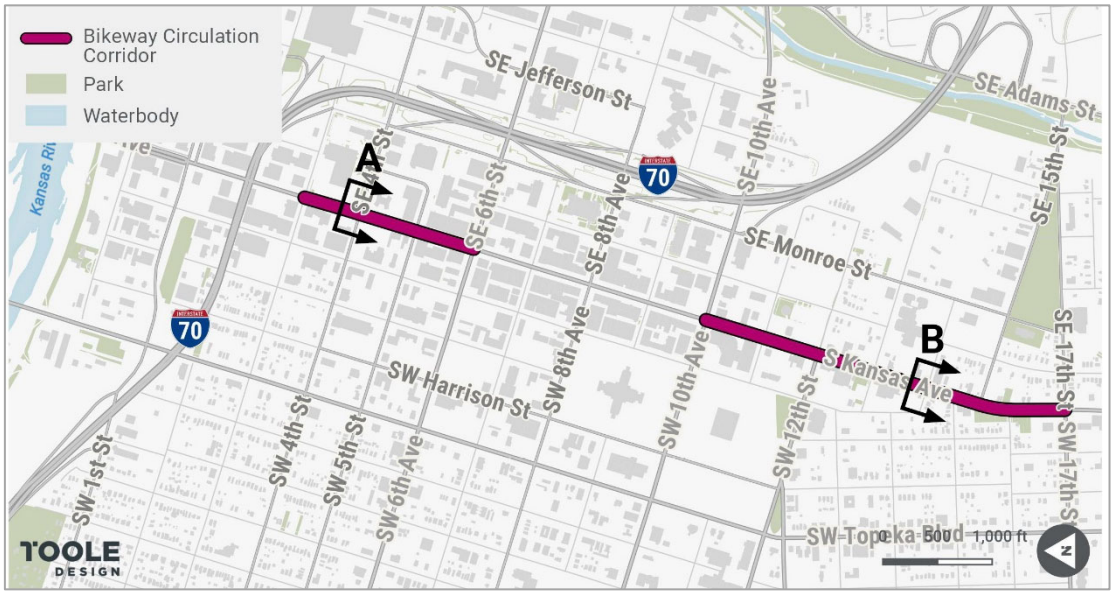


Figure 1. Kansas Avenue Corridor Map

New Bike Network Miles: 1.06

Questions? https://topekampo.org/

PLANNING CONSIDERATIONS	
Posted Speed Limit	20MPH (4th-12th), 30MPH (3rd- 4th, 12th-17th)
Connectivity to existing bikeways	Existing sharrows on Kansas Ave north of SE 10th Ave and SE 6th Ave
Bikeway Rationale	Identified as a part of the Bikeway Spine Network in the Fast Track Plan. Connects to and provides direct access to primary business district
Major Barriers (constrained bridges or underpasses, freeway ramps)	N/A
Elements of Construction	Partial reconstruction (3rd – 6th, 10th – 13th), Curbing or paint/flexposts possible for 13th to 17th
On-Street Parking	Head-in Angled Parking (3rd to13th)
Transit	Routes 5, 21, and 29

These preliminary concepts are for planning purposes only. Field verification, site condition assessments, engineering analysis, and design are necessary prior to implementing recommendations.

KANSAS AVENUE

From 3rd Street to 6th Street and 10th Avenue to 17th Street

TYPICAL CROSS-SECTIONS

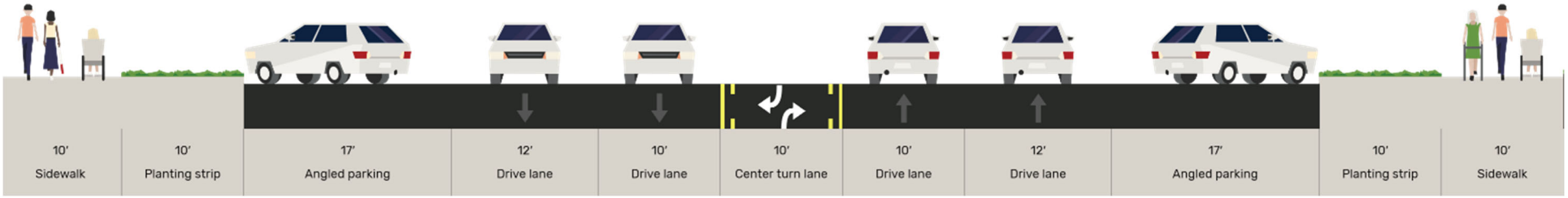


Figure 2. Section A (3rd to 6th, 10th to 13th) – Existing (88' curb to curb)

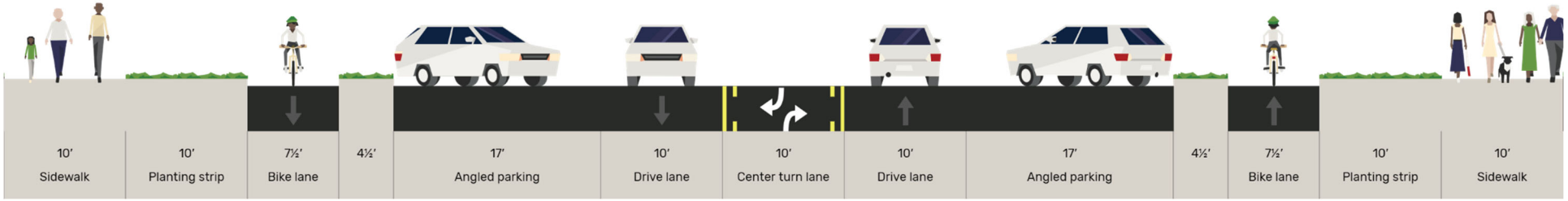


Figure 3. Section A (3rd to 6th, 10th to 13th) – Proposed (88' curb to curb)

KANSAS AVENUE

From 3rd Street to 6th Street and 10th Avenue to 17th Street

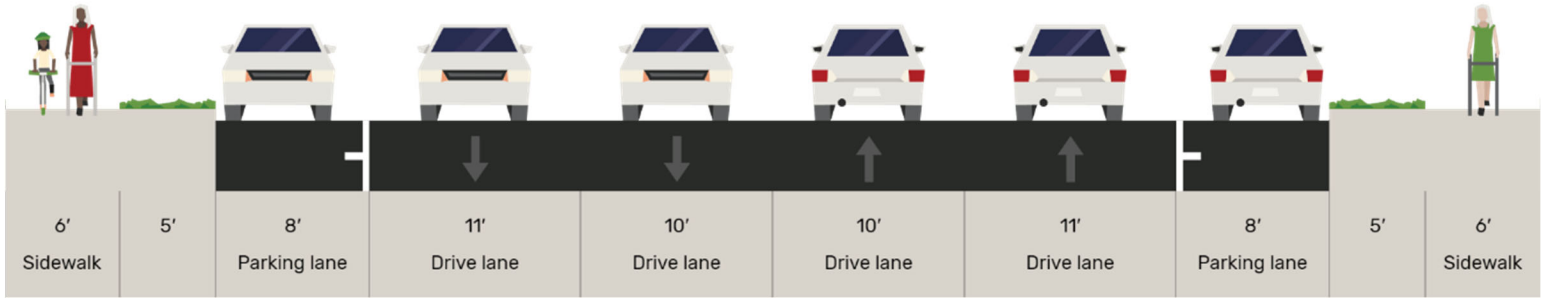


Figure 4. Section B (13th to 17th) – Existing (58' curb to curb)

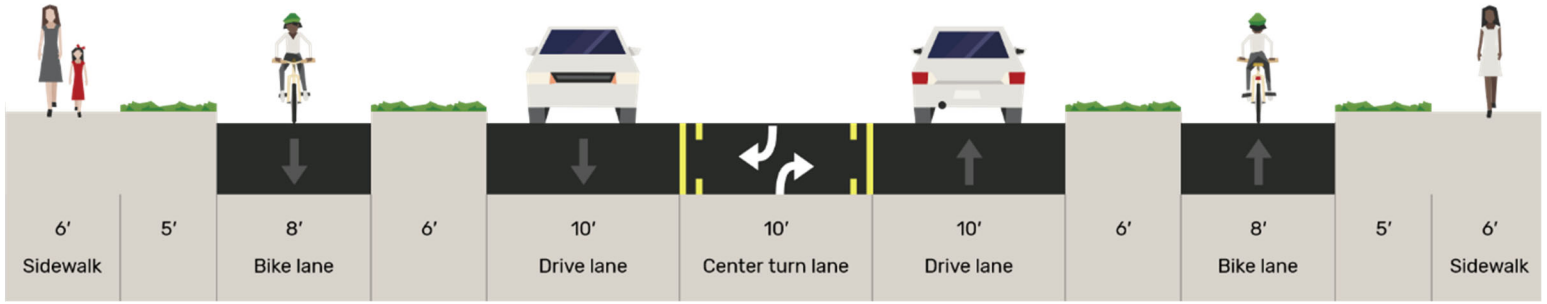


Figure 5. Section B (13th – 17th) – Proposed (58' curb to curb)

KANSAS AVENUE

From 3rd Street to 6th Street and 10th Avenue to 17th Street

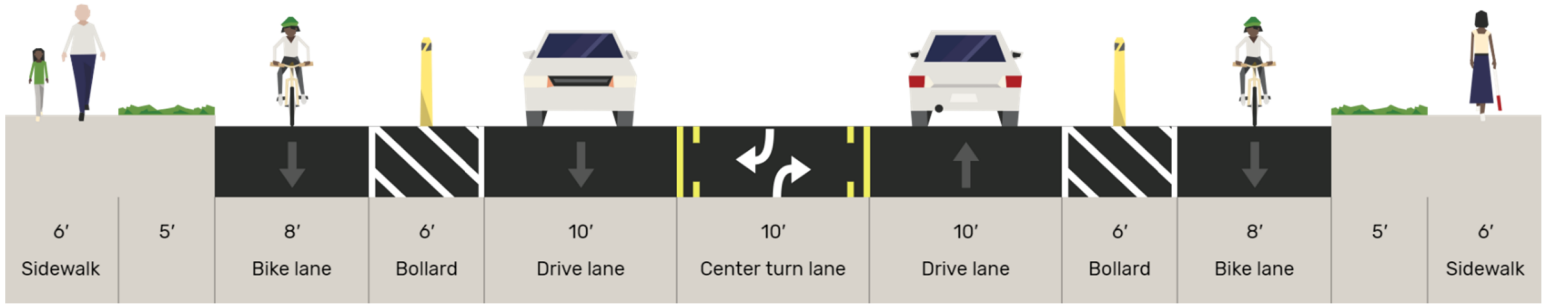


Figure 6. Section B (13th – 17th) – Interim/ Low-Cost Installation Alternative (58’ curb to curb) *

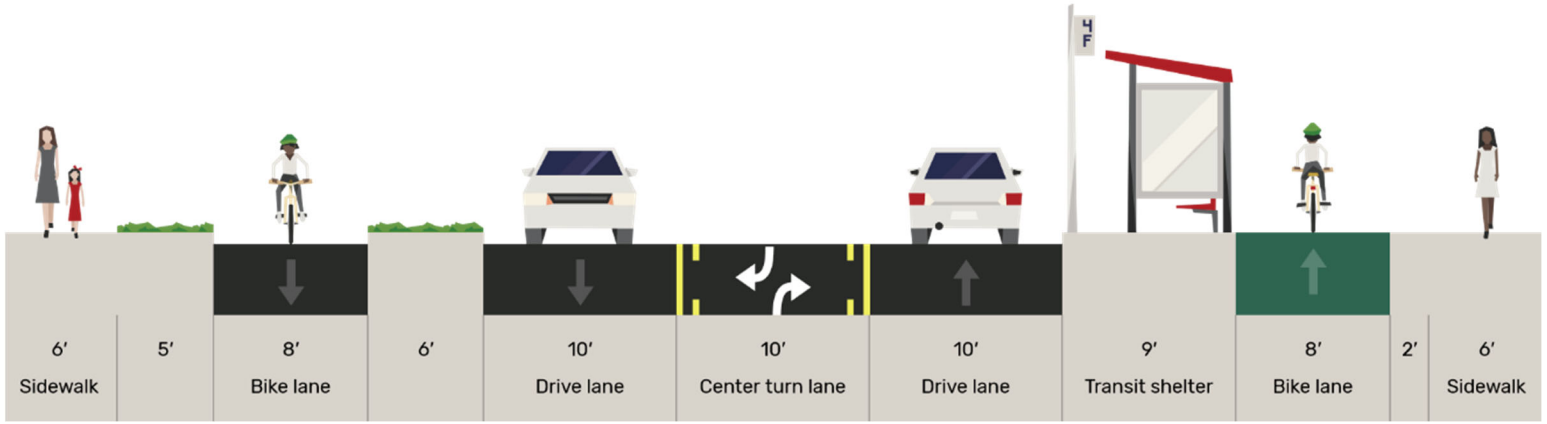


Figure 7. Section B (13th – 17th) - Proposed with Floating Bus Stop Condition (44’ curb to curb) *

* If the existing gutter is to remain, this is not considered a part of the functional bikeway width. The median or planting strips may be reduced to provide the appropriate bikeway width. At intersections where space is likely most constrained, the bike lane may be reduced to 7’ to ensure sufficient buffer.

KANSAS AVENUE

From 3rd Street to 6th Street and 10th Avenue to 17th Street

Design Recommendations

Recommendations

- Section A: Current and future volumes suggest that a three-lane roadway is likely appropriate for Kansas Avenue. The angled parking may be maintained but should be shifted toward the centerline to provide a separated bike lane near the existing curb. Consider reverse in angled parking and medians/pedestrian refuge islands where the TWLTL or turn lanes are not needed throughout the corridor.
- Kansas Avenue from 6th Street to 10th Street: To create an all ages and abilities network, it is important that the network be connected and that transitions between facility types be safe and comfortable. If the proposed bikeway sections are not continued in this area, the wider sidewalks should become a SUP and bicyclists should be transitioned to and from the SBL and SUPs.
- Section B: Current and future volumes suggest that a three-lane roadway is likely appropriate for Kansas Avenue. Reconfigure the roadway to provide a separated bike lane with floating bus stops. Consider medians/pedestrian refuge islands where the TWLTL or turn lanes are not needed throughout the corridor.
- Intersections
    - Depending on the turning volumes, full or partially protected bicycle phasing may be recommended.
    - Transitions will be needed at 6th and 10th Avenue where the bikeway transitions from the SBL to a SUP or other.
    - Protected intersections are recommended, particularly to facilitate transitions between other bikeways such as the SUPs along 12th Street.

Rationale

- **Speed and AADT**
    - 3rd – 6th Street: The AADT for Kansas Ave is 11,000-14,000 and is expected to decline by 2045 to 8,000 to 10,500 vehicles per day. The posted speed is 20mph. Based on the traffic volumes (>6,000K), a separated bike lane is recommended.
    - 10th Avenue – 17th Street: From 10th Street to 13th Street, the motor vehicle volumes are 16,500 veh/day and a modest increase to 17,300 is expected by 2045. The AADT was not available for the southern end of the corridor, but it was assumed that traffic volumes would be similar. The posted speed changes from 20mph to 30mph when crossing 13th Street heading south. Based on the traffic volumes (>6,000K), a separated bike lane is recommended.

KANSAS AVENUE

From 3rd Street to 6th Street and 10th Avenue to 17th Street

- **One-Way vs. Two-way Protected Bike Lane**
  - One-way SBL pair is recommended as it provides full access to both sides of street, lowers crash risk, may use existing signal unless bicycle phase is needed, and is feasible given the existing right of way and roadway width.
- **Removing and/or Reconfiguring lanes**
  - Narrowing travel lanes – The AASHTO Green Book provides flexibility in in travel lane width and allows lanes to be as narrow as 10 feet in a variety of contexts. Topeka's Complete Street Guidelines encourage 10-11ft lanes on arterial and collector streets as the provide many safety benefits for all users.
  - Topeka's Complete Streets Guidelines state "Four-lane streets with volumes less than 15,000 vehicles per day generally are good candidates for four-to three-lane conversions." Based on FHWA's Road Diet Guidance. This is applicable to Kansas Avenue from 3rd Street to 6th Street.
  - Topeka's Complete Streets guidelines state "Four-lane streets with volumes between 15,000 to 20,000 vehicles per day may be good candidates for four- to three-lane conversions. A traffic analysis is needed to determine feasibility." Based on FHWA's Road Diet Guidance. This is applicable from 10th Street to 17th Street.
- **Removing and/or Reconfiguring parking**
  - While not essential to the proposed bikeway implementation, reversed in angled parking can be safer for motorists as it improves their visibility when exiting their parking space. Adding bicycle lanes behind head-in parking is not recommended due to safety concerns.
- **Other Considerations**
  - Transit considerations: Floating bus stops should be configured to give pedestrians priority when crossing the separated bike lane. The forthcoming AASHTO Bike Design Guide includes guidance for transit stop and bikeway guidance. Existing guidance is provided in the AC Transit Multimodal Corridor Guidelines (https://www.actransit.org/website/uploads/AC_Transit_Multimodal_Corridor_Guidelines_Final.pdf).

Alternatives Considered

- A two-way SBL or SUP was not proposed as there is sufficient available space and two-way SBL has drawbacks such as limiting access to the other side of the street, higher crash risk, and typically requires additional signal equipment and signal reconfiguration.

KANSAS AVENUE

From 3rd Street to 6th Street and 10th Avenue to 17th Street

Needs for Additional Study
• Based on the City's complete street policy, the Kansas Avenue from10th Street to 17th Street is likely a candidate for a road diet, but additional traffic analysis may be needed. • Turning volumes should be reviewed to determine the recommend type of bicycle signal phasing.

Cost Estimate*	$3,165,214

Cost estimate is an opinion of probable cost. Opinions of probable cost were developed by identifying major pay items and establishing rough quantities to determine a rough order of magnitude cost. Additional pay items have been assigned approximate lump sum prices based on a percentage of the anticipated construction cost. Planning-level cost opinions include a 30% contingency to cover items that are undefined or are typically unknown early in the planning phase of a project. Unit costs are based on 2023 dollars and were assigned based on historical cost data from KDOT bid histories assuming a representative half mile project length. Cost opinions do not include easement and right-of-way acquisition; permitting, inspection, or construction management; geotechnical investigation, environmental documentation, special site remediation, escalation, or the cost for ongoing maintenance. A cost range has been assigned to certain general categories such as utility relocations; however, these costs can vary widely depending on the exact details and nature of the work. The overall cost opinions are intended to be general and used only for planning purposes. Toole Design Group, LLC makes no guarantees or warranties regarding the cost estimate herein. Construction costs will vary based on the ultimate project scope, actual site conditions and constraints, schedule, and economic conditions at the time of construction.

Appendix B: Existing Conditions Memo

TOOLE DESIGN

KANSAS CITY, MO

816.301.6510 X164
TOOLEDESIGN.COM

MEMORANDUM

To:	Carlton Scroggins
Organization:	Metropolitan Topeka Planning Organization
From:	Barbara Mosier and Mitch Coffman, Toole Design
Project:	Topeka Bikeways Circulation Study
Re:	**Existing Conditions Memorandum**

This memorandum documents the existing conditions and initial analyses conducted for the Topeka Bikeways Circulation Study to evaluate the designated corridors for bikeway feasibility and conceptual design.

1 Project Goals

This study seeks to advance the Topeka Bikeways Master and Fast-Track Plans, recommending complete street options for the Phase V study roadway segments. This memo provides existing conditions background for the study area roadways for the purpose of identifying the most appropriate bikeways infrastructure considering both safety and feasibility.

The study is the first phase in a broader Bikeways Circulation Study and will culminate in conceptual designs and high-level cost estimates. This study will continue the work of the city of Topeka and the MTPO in alignment with the Bikeways Master Plan and Complete Streets Policy.

2 Study Area

The study area consists of the segments listed in Table 2-1 and as shown in **Error! Reference source not found.**.

Table 2-1 - Study Corridor Segments

Location	From	To
NE River Road	NE Crane Street	NE Emmett Street
SE Adams Street	SE 10th Avenue	SE 5th Street
SE Adams Street	SE 5th Street	SE 1st Street
SE 1st Street	Jefferson Trafficway	Kansas Avenue
SE 4th Street	Kansas Avenue	NE Golden Avenue
SW 4th Street	Washburn Avenue	Topeka Boulevard
SW 4th Street	Topeka Boulevard	Kansas Avenue
SW 5th Street	Washburn Avenue	Topeka Boulevard
SW 5th Street	Topeka Boulevard	4th Street
SE 6th Street	Madison Avenue	NE Branner Street
SE 10th Street	S Kansas Avenue	SE California Avenue

SE 15th Street	SE Monroe Street	E&S to SE 21st Street
Kansas Avenue	10th Avenue	17th Street
Kansas Avenue	6th Avenue	4th Street
Kansas Avenue	4th Street	3rd Street

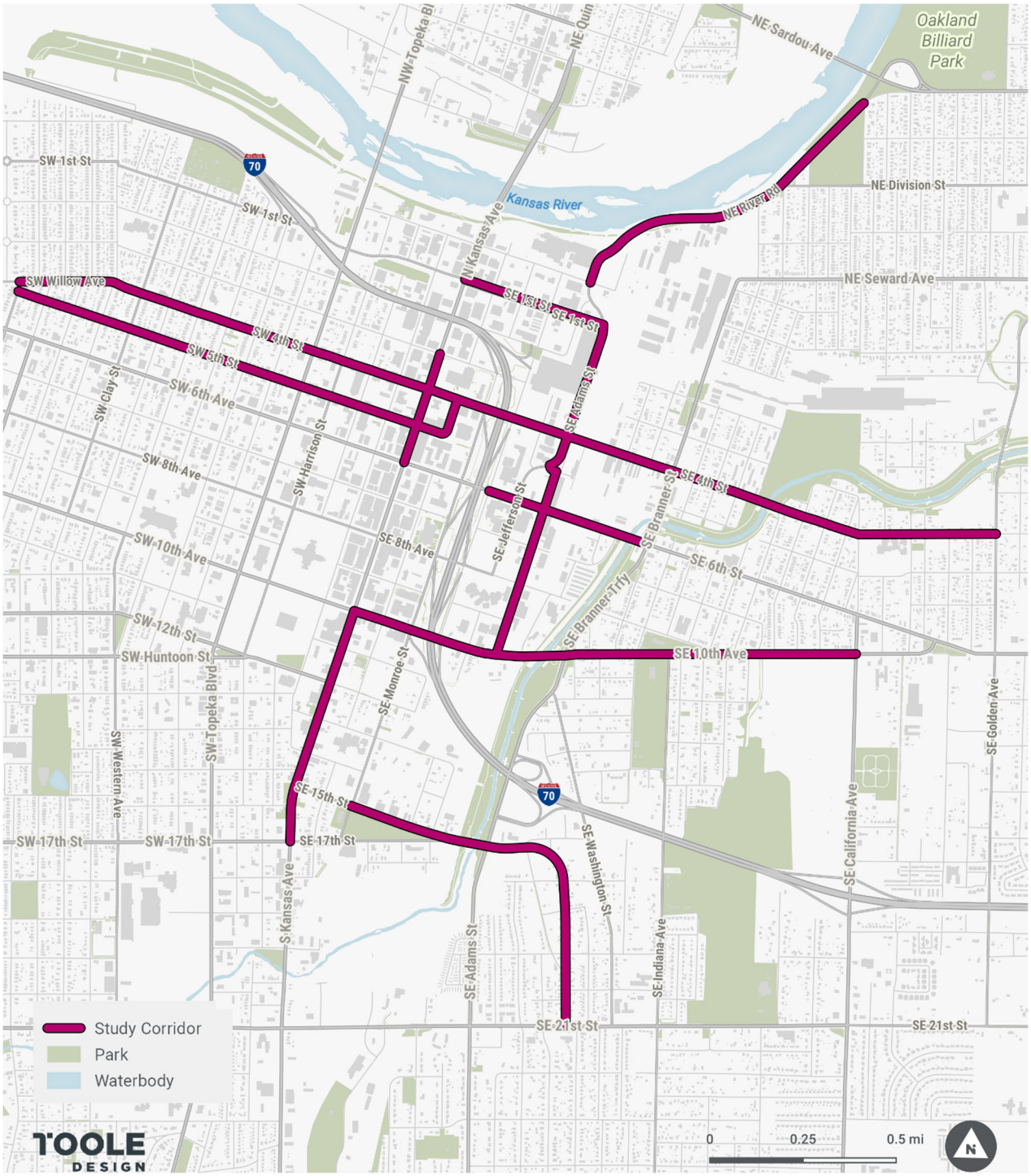


Figure 2-1: Study Corridor Segments

2.1 Prior City Plans

The project team reviewed two existing plans from the City of Topeka and the MTPO related to the study corridor segments. Plans are summarized below.

2.1.1 Fast-Track - 2020 Bikeways Master Plan Update

In 2020, an action plan and supplement to the 2012 Bikeways Master Plan was published, which identified a Fast-Track Priority Network as well as a Vision Network. The vision network is a long-term vision for bicycling routes in Topeka, while the Fast-Track Bike Network is a subset of projects that are recommended for short-term implementation to provide high quality facilities.

Of the study corridors included in this report, River Road, 1st Street, 6th Street, and 4th and 5th Streets between Washburn Avenue and Topeka Boulevard are included in the Fast-Track Network.

2.1.2 Topeka Pedestrian Master Plan

The Topeka Pedestrian Master plan was published in 2016 which sought to plan for a complete pedestrian network, identifying priority projects and maintenance shortfalls throughout the city. The Neighborhood focus areas of Downtown and East Topeka South overlap with several of the study corridors in this study, and are identified as missing sections of sidewalk, requiring sidewalk maintenance, and/or needing crosswalk improvements.

3 Transportation Elements Inventory and Review

To understand the existing conditions on the circulation study segments, the project team conducted an inventory of transportation elements on the corridor and a review of the facilities and services provided on the corridor as well as travel and safety data. This information is summarized in the text and maps below.

3.1 Cross Sections and Facility Descriptions

Throughout the study corridor, the study corridors vary between one travel lane in each direction, with no median or shoulders, to wide roadways with two to three vehicular travel lanes in each direction. The posted speed limit on each study corridors is 20 to 35 miles per hour. The details of each segment of each study corridor, are described in each section below. The existing facility characteristics were obtained from GIS data as provided by the city and the MTPO, and confirmed through aerial photography and Google Streetview review.

3.1.1 Parking

Parking lanes are provided along some of the study corridors, with a mix of parallel and angle parking, as well as parking restriction. Parking lane details and regulations are given in Table 3-1.

Table 3-1: Parking Lanes

Location	From	To	Parking
NE River Road	NE Crane Street	NE Emmett Street	None
SE Adams Street	SE 10th Avenue	SE 5th Street	None
SE Adams Street	SE 5th Street	SE 1st Street	None
SE 1st Street	Jefferson Trafficway	Kansas Avenue	Parallel Unmarked, Prohibited in some Blocks
SE 4th Street	Kansas Avenue	NE Golden Avenue	Unmarked
SW 4th Street	Washburn Avenue	Topeka Boulevard	Marked 7-8’ Lane, North Side only west of Western

SW 4th Street	Topeka Boulevard	Kansas Avenue	Parallel Unmarked, Angle btw Jackson and Kansas
SW 5th Street	Washburn Avenue	Topeka Boulevard	Marked 7-8' Lane, South Side only
SW 5th Street	Topeka Boulevard	4th Street	Parallel Marked, Angle east of Kansas
SE 6th Street	Madison Avenue	NE Branner Street	None
SE 10th Street	S Kansas Avenue	SE California Avenue	Angled for one block east of Kansas Avenue
SE 15th Street	SE Monroe Street	E&S to SE 21st Street	None west of Maryland, Unmarked East of Maryland
Kansas Avenue	10th Avenue	17th Street	None south of 11th, Angle Parking btw 11th and 10th
Kansas Avenue	6th Avenue	4th Street	Angle Parking
Kansas Avenue	4th Street	3rd Street	Angle Parking

3.1.2 Bicycle Facilities

None of the study corridors currently have dedicated bicycle facilities, though several, including 5th Street and 4th Street west of Topeka Boulevard have sharrows. The table below identifies existing crossing and connecting dedicated bicycle facilities for each study corridor.

Table 2-2 - Existing Connecting Bicycle Facilities

Location	From	To	Connecting/Crossing Bicycle Facility
NE River Road	NE Crane Street	NE Emmett Street	Santa Fe Park Trails
SE Adams Street	SE 10th Avenue	SE 5th Street	None Existing
SE Adams Street	SE 5th Street	SE 1st Street	None Existing
SE 1st Street	Jefferson Trafficway	Kansas Avenue	None Existing
SE 4th Street	Kansas Avenue	NE Golden Avenue	Shunga Trail
SW 4th Street	Washburn Avenue	Topeka Boulevard	Broadmoor Ave (Sharrows)
SW 4th Street	Topeka Boulevard	Kansas Avenue	None Existing
SW 5th Street	Washburn Avenue	Topeka Boulevard	None Existing
SW 5th Street	Topeka Boulevard	4th Street	None Existing
SE 6th Street	Madison Avenue	NE Branner Street	Shunga Trail
SE 10th Street	S Kansas Avenue	SE California Avenue	Shunga Trail
SE 15th Street	SE Monroe Street	E&S to SE 21st Street	Landon Nature Trail, Shunga Trail
Kansas Avenue	10th Avenue	17th Street	None Existing
Kansas Avenue	6th Avenue	4th Street	6th Avenue (Sharrows)
Kansas Avenue	4th Street	3rd Street	None Existing

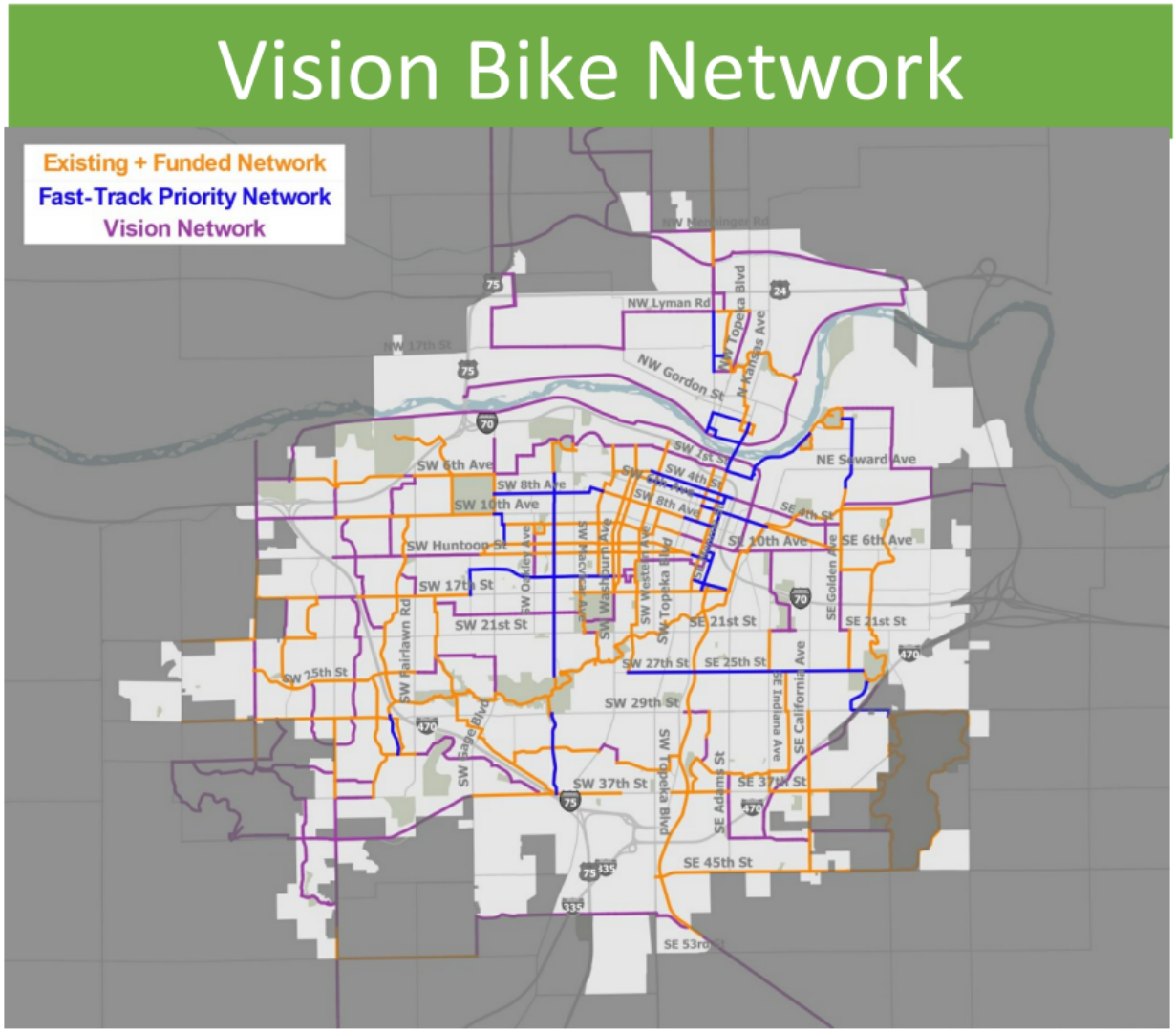


Figure 3-1: Vision Bike Network Map from 2020 Fast-Track Plan (Source: Topeka Fast Track Plan)

3.1.3 Pedestrian Facilities

Within the study area, there are a mix of pedestrian facilities along the study corridors. Some roadways, such as Kansas Avenue, have continuous sidewalks on each side with connections into adjacent neighborhoods. Others such as NE River Road, have no sidewalks or other parallel pedestrian facilities. Sidewalks for each segment are summarized in Table 3-3.

Table 3-3: Sidewalk Inventory

Location	From	To	Sidewalk
NE River Road	NE Crane Street	NE Emmett Street	None
SE Adams Street	SE 10th Avenue	SE 5th Street	Variable West Side Sidewalk South of 8th, Discontinuous North of 8th
SE Adams Street	SE 5th Street	SE 1st Street	None
SE 1st Street	Jefferson Trafficway	Kansas Avenue	None
SE 4th Street	Kansas Avenue	NE Golden Avenue	6-8' sidewalk with variable buffer, no sidewalk over railroad tracks or on north side approaching Golden Ave.
SW 4th Street	Washburn Avenue	Topeka Boulevard	Continuous ~6' Sidewalk with 4-15' buffers on North and South
SW 4th Street	Topeka Boulevard	Kansas Avenue	Continuous ~6' Sidewalk with on North and South, buffers reduce toward Kanas Ave
SW 5th Street	Washburn Avenue	Topeka Boulevard	Continuous ~6' Sidewalk with 15' buffers on North and South
SW 5th Street	Topeka Boulevard	4th Street	Continuous ~6' Sidewalk with on North and South, buffers reduce toward Kanas Ave
SE 6th Street	Madison Avenue	NE Branner Street	6-8' sidewalk with 18-20' buffer west of Jefferson, 5-6' walkway over rail bridge with Jersey barrier
SE 10th Street	S Kansas Avenue	SE California Avenue	Variable sidewalk and buffer width, no sidewalk provided along Topeka Cemetery
SE 15th Street	SE Monroe Street	E&S to SE 21st Street	Variable width sidewalk on north/east side only
Kansas Avenue	10th Avenue	17th Street	~6' sidewalk and variable buffer from 17th to 11th, up to 20' between 11th and 10th
Kansas Avenue	6th Avenue	4th Street	15' sidewalks
Kansas Avenue	4th Street	3rd Street	20' sidewalks

3.1.4 Transit

There are several Topeka Metro routes that run along portions of the study corridors. These routes per corridor are summarized on

Table 3-4. Stops vary between location sign only to a full shelter stop with a trash can and bike rack, see Figures 3-2 to 3-4 for example conditions.

The following study segments have no Topeka Metro transit service:

- NE River Road
- SE Adams Street – Provides access to the Topeka Amtrak Station
- SE 1st Street
- SE and SW 4th Street
- SW 5th Street
- SE 15th Street

Table 3-4: Transit Routes and Headways by Segment

Study Corridor/Location	Route	Schedule	Headway
SE 6th Street	1 - Oakland	6 AM-7PM Weekday, 8 AM-6 PM Saturday	1 Hour
	3 – East 6th	6 AM-6:40PM Weekday, 8 AM-6 PM Saturday	30 min
	4 - California	6 AM-7PM Weekday, 8 AM-6 PM Saturday	30 min-1 hour
SE 10th Street	4-California	6 AM-7PM Weekday, 8 AM-6 PM Saturday	30 min-1 hour
Kansas Avenue	5 - Indiana	6:15 AM-6PM Weekday, 8:15 AM-6 PM Saturday	1 Hour
	21 – West 21st	6:15 AM-6:40PM Weekday, 8:15 AM-6 PM Saturday	1 Hour
	29 – West 29th	6 AM-7PM Weekday, 8 AM-6 PM Saturday	1 Hour

Figure 3-2: Bus stop on northbound Kansas Avenue at SE 14th Street with typical location sign and no additional amenities. (Source: Google).

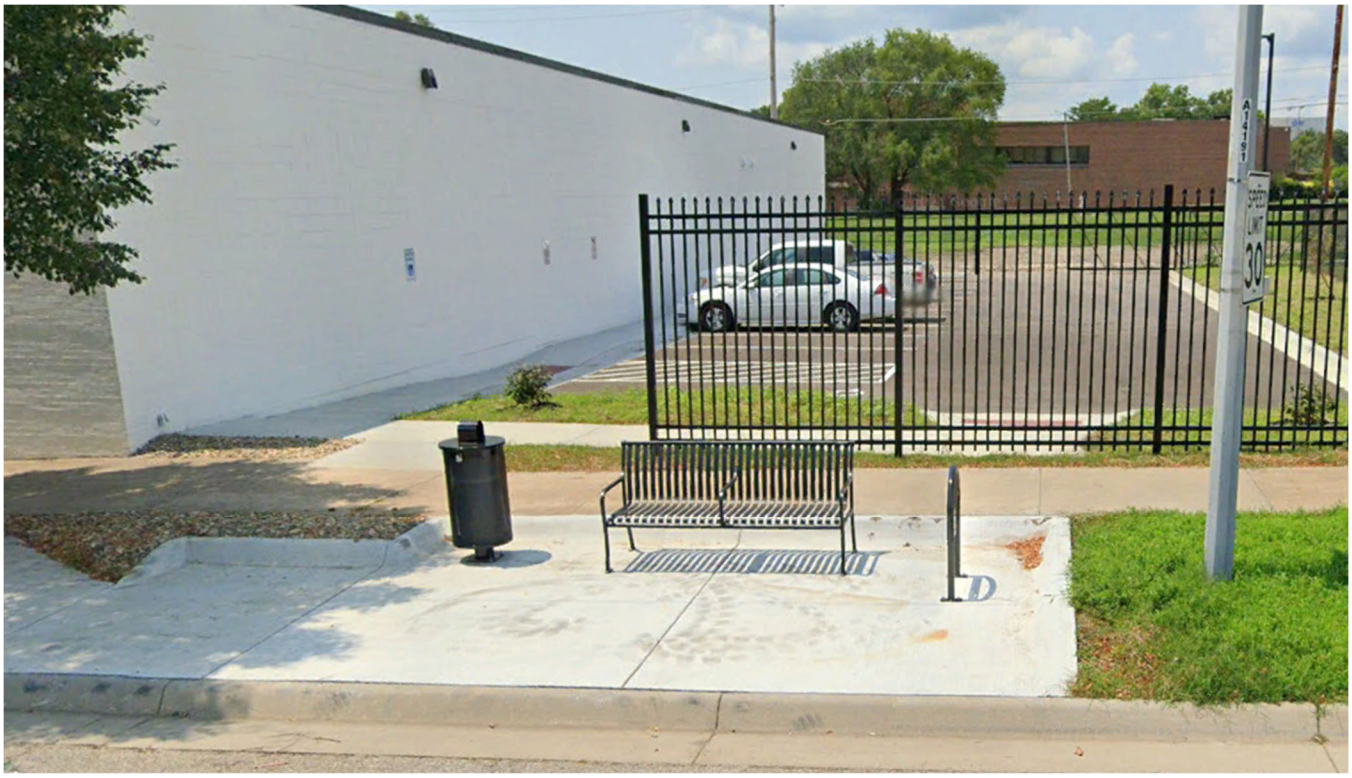


Figure 3-3: Bus Stop on Southbound Kansas Avenue at 12th Street showing trash can, bench and bike rack amenities located at some stops. (Source: Google)

Figure 3-4: Bus Stop on Westbound 6th at Jefferson showing shelter (Source: Google)

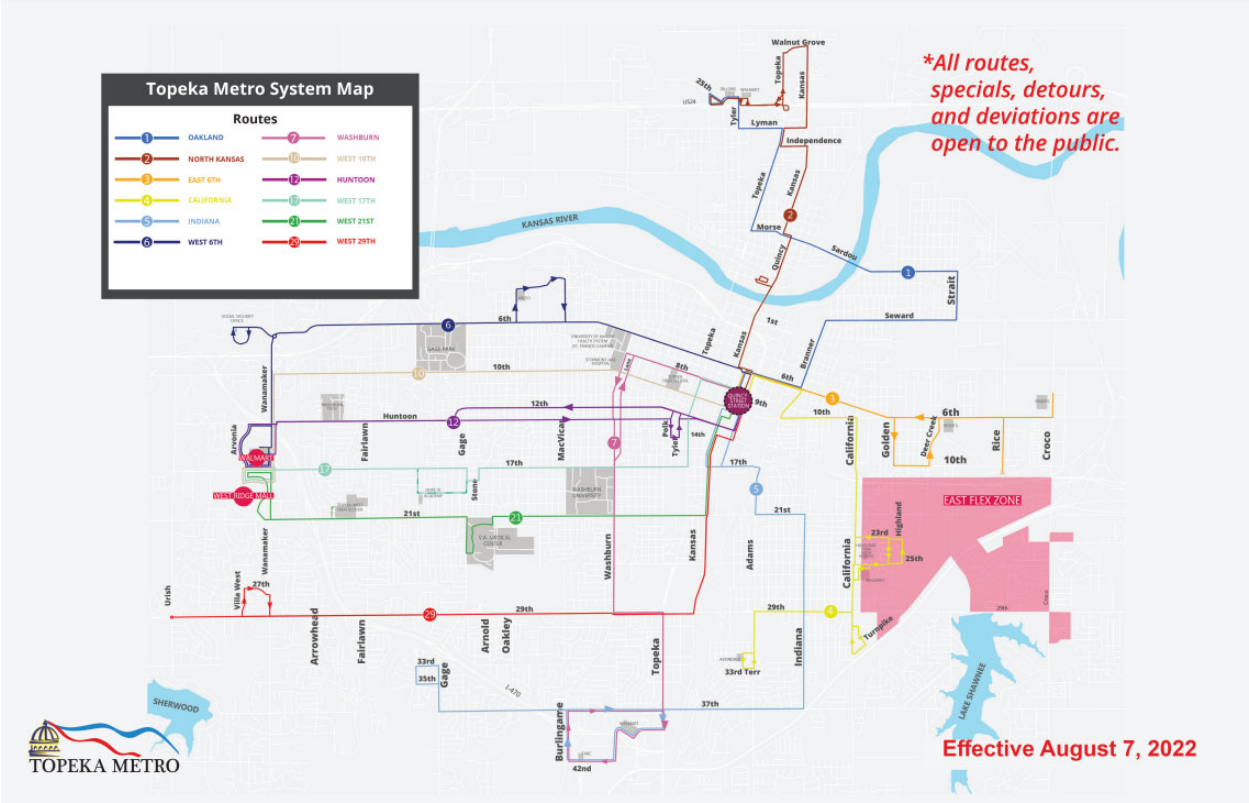


Figure 3-5: Transit Network Map (Source: topekametro.org)

3.2 Motor Vehicle Volumes and Speeds

Daily volume data was gathered from the regional model data, for both baseline existing conditions and 2045 future volumes. The average baseline volumes for each study segment are summarized in Table 3-5. As shown in the Table, the percent change for future projections over baseline vary significantly. Some segments are forecast for as much as a 40% reduction in AADT volumes, and others forecast for a nearly 50% increase. Though there is a wide range of the percentage change, the overall volumes are relatively low, so a small change in the absolute value results in greater percent difference. The model output did not include information for Adams Street between 10th and 5th or for 5th Street. For the purposes of this study, the volumes forecast for parallel sections of 4th Street were assumed as a reasonable baseline for 5th Street since 5th provides the counterflow movement for the one-way section of 4th Street. 4th Street is more connected through the network than 5th Street and is likely to have higher vehicular volumes, so this assumption is fairly conservative.

The posted speed limits on the study corridors vary between 20 and 35 mph. The posted speed limit, as noted in provided GIS data and desk review of online imagery is summarized for each corridor in Table 3-5.

Speeds along a corridor increase both the likelihood and severity of crashes. The faster a driver is traveling, the less they can see at any one time (e.g., to notice and begin to slow for a crossing pedestrian) and the greater the distance required to stop. Pedestrians and bicyclists are particularly vulnerable in the event of a crash with a motor vehicle. The severity of a pedestrian injury in the event of a crash is directly related to the speed of the vehicle at the point of impact. For example, a pedestrian who is hit by a motor vehicle traveling at 20 mph has a 13% likelihood of fatality or severe injury, whereas a pedestrian hit by a motor vehicle traveling at 30 mph has a 41% likelihood of fatality or severe injury, see Figure 3-6.

Table 3-5: Speed and Volume Data Summary

Location	From	To	Posted Speed Limit	Baseline AADT	2045 AADT
NE River Road	NE Crane Street	NE Emmett Street	30 mph 35 mph at Emmett	4,013	4,625
SE Adams Street	SE 10th Avenue	SE 5th Street	30 mph	N/A	N/A
SE Adams Street	SE 5th Street	SE 1st Street	30 mph	2,587	1,748
SE 1st Street	Jefferson Trafficway	Kansas Avenue	30 mph	2,277	3,043
SE 4th Street	Kansas Avenue	NE Golden Avenue	30 mph	3,850	3,125
SW 4th Street	Washburn Avenue	Topeka Boulevard	30 mph	4,967	5,189
SW 4th Street	Topeka Boulevard	Kansas Avenue	30 mph	2,635	1,554
SW 5th Street	Washburn Avenue	Topeka Boulevard	30 mph	4,967	5,189
SW 5th Street	Topeka Boulevard	4th Street	30 mph	2635	1554
SE 6th Street	Madison Avenue	NE Branner Street	30 mph	11,252	11,621
SE 10th Street	S Kansas Avenue	Madison Street	30 mph	13,483	16,659
	Madison Street	Branner Trafficway		7,683	9,816
	Branner Trafficway	SE California Avenue		4,068	6,279
SE 15th Street	SE Monroe Street	E&S to SE 21st Street	30 mph	6,973	7,896
Kansas Avenue	10th Avenue	17th Street	20 mph from 10^{th} to 11^{th} 30 mph 11^{th} to 17th	16,499	17,324
Kansas Avenue	6th Avenue	4th Street	20 mph	11,314	10,509
Kansas Avenue	4th Street	3rd Street	20 mph	14,091	7,962

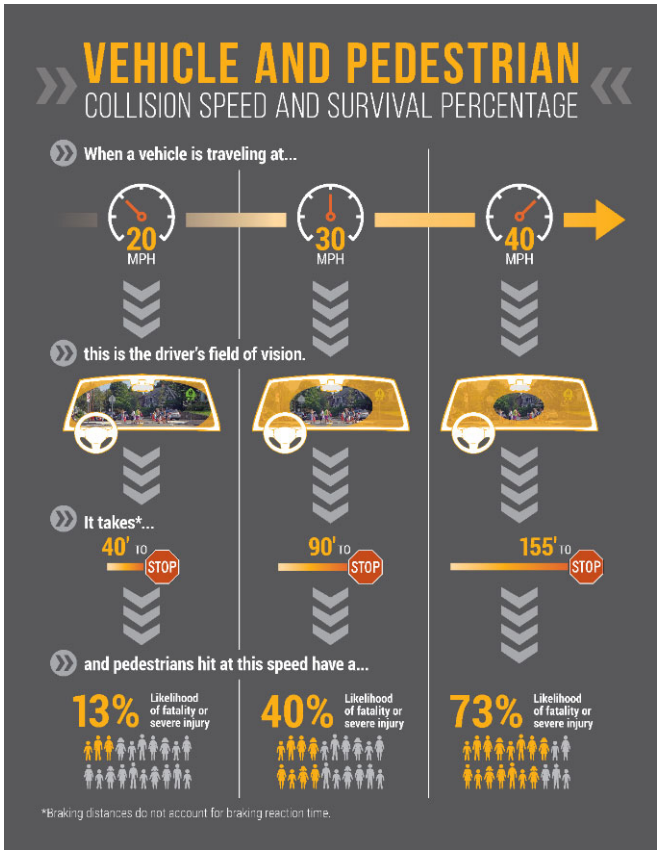


Figure 3-6: Safe Speeds[1]

3.3 Crash Data

Toole Design reviewed crash data to understand crash trends and crash severity on the study corridors. Crash data is susceptible to under reporting of non-motor vehicle crashes and near misses. For this reason, we recommend that crash data be viewed holistically in combination with other indicators of road safety, such as roadways speeds and expected crash severity.

Using data as provided from the KDOT data portal, pedestrian and bicycle crashes reported within Topeka within a six-year window (2017-2022) were selected for analysis. There were a total of 375 reported pedestrian and bicycle crashes within the city on the study corridors; of which 23 occurred on this report's study corridors. Nine pedestrian crashes and 14 bicycle crashes were reported on the study corridor segments, with the highest number of crashes on Kansas Avenue between 3rd and 4th Avenue, with five bicycle crashes. The NE River Road, SE Adams Street and SE 1st Street study segments had no reported pedestrian or bicycle crashes in this data set. The overall city crash data shows a peak of 89 crashes in 2018 with a strong decline to 47 in 2020 and a slight upward trend since 2020.

[1] Tefft, B.C. "Impact Speed and a Pedestrian's Risk of Severe Injury or Death." Accident Analysis and Prevention, Vol. 50, 2013, pp. 71-878
AASHTO A Policy on Geometric Design of Highways and Streets (Green Book, 2011 edition)

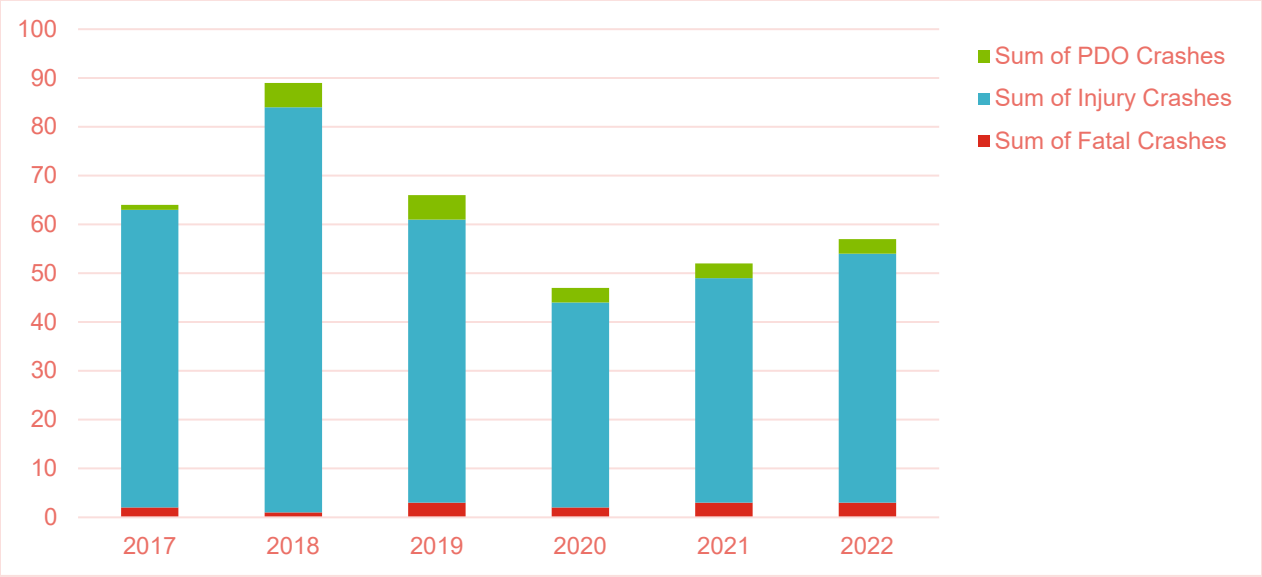


Figure 3-7 - City-Wide Pedestrian and Bicycle Crashes by Year and Severity

The vast majority of city-wide pedestrian and bicycle crashes are injury crashes; however, 14 fatal crashes were reported in this time frame, with two fatal bicycle crashes on the study segments. Both fatal crashes within the study segments took place on 4th Street, at the intersections of Kansas Avenue and Taylor Avenue. Though these crash counts are too low to draw statistical conclusions, it does indicate that bicycle safety on 4th Avenue warrants special attention. Additional crash information such as the direction of vehicular movement or other details that may shed light on the specific crash type was not available from the KDOT database.

Table 3-6: Study Area Crashes by Severity and Mode

Crash Severity	Bicycle Crashes	Pedestrian Crashes	All Crashes (2016-20)
Fatality	2	0	2
Injury	9	9	18
Property Damage Only	3	0	3
Total Crashes	14	9	23

City-wide pedestrian and bicycle crashes are more common in warmer months with a peak in August and September, consistent with higher levels of bicycle and pedestrian travel in more clement weather; however, a substantial number of crashes do still occur during the colder winter months.

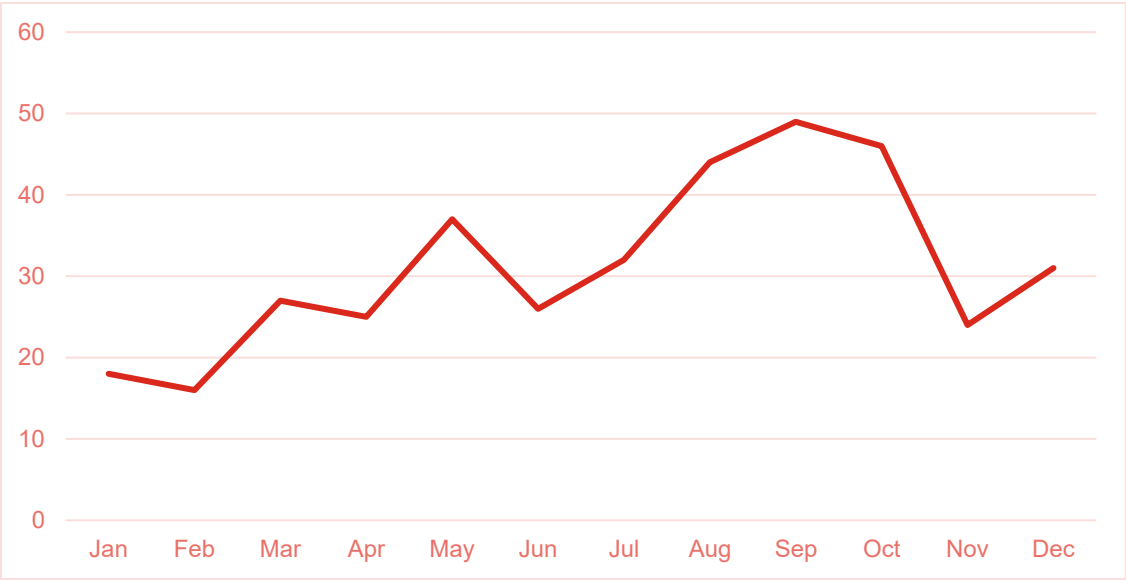


Figure 3-8 – City-Wide Pedestrian and Bicycle Crashes per Month (2017-2022)

Within the study corridor, 22 out of the 23 pedestrian and bicycle crashes occurred in clear weather with no adverse conditions, indicating that poor operating conditions due to weather was not a significant factor in the general crash patterns. Similarly, 19 out of 23 study corridor pedestrian and bicycle crashes occurred in daylight, indicating that poor lighting is not a major factor in the existing crash patterns. Particularly with a small sample size, these results may simply indicate than most pedestrian and bicyclists choose to travel in daylight hours in clear weather. Additional lighting and improved pavement condition may still be indicated along the study roadways based on other factors.

Table 3-7: Study Area Crashes by Light Condition and Mode

Crash Severity	Bicycle Crashes	Pedestrian Crashes	Combined Ped/Bike Crashes
Dark – Street Lights On	2	1	3
Daylight	11	8	19
Dusk	1	0	1
Total Crashes	14	9	23

Locations of pedestrian and bicycle crashes city wide, as well as the study area corridors, are shown in the crash heat maps below. As shown on the heat maps, many of the ped/bike hot spots are located outside this project study corridors, but Kansas Avenue north of SW 4th Street has a significant cyclist crash hot spot and SE 15th Street in the vicinity of SE Adams Street is a less notable pedestrian crash concentration. There are five crashes on Kanas Road between 3rd and 4th Streets, one of which is the fatality discussed above. There are two pedestrian crashes reported on SE 15th Street at Adams, both of which were injury crashes.

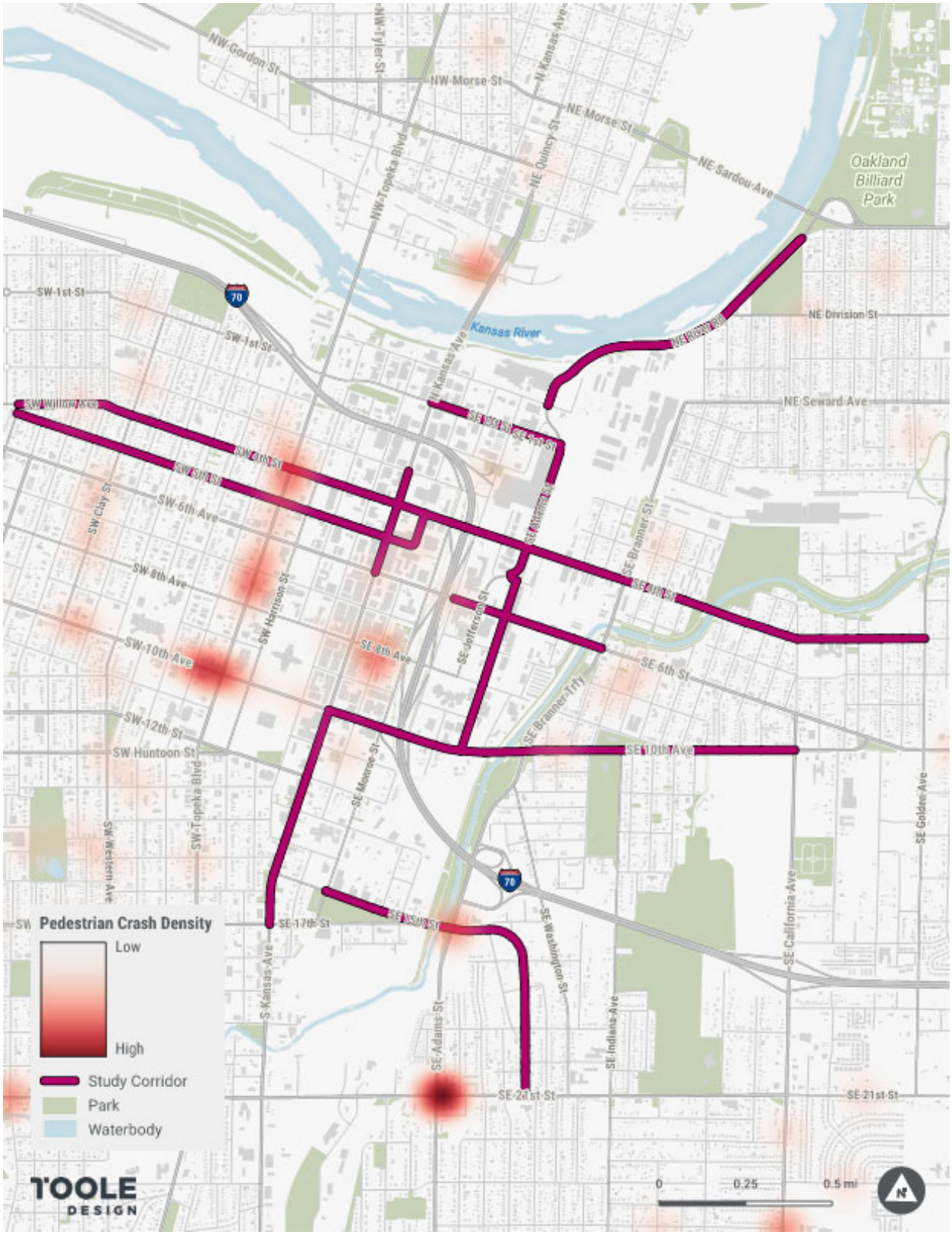


Figure 3-9: Heat Map of Pedestrian Crashes (2017-2022)

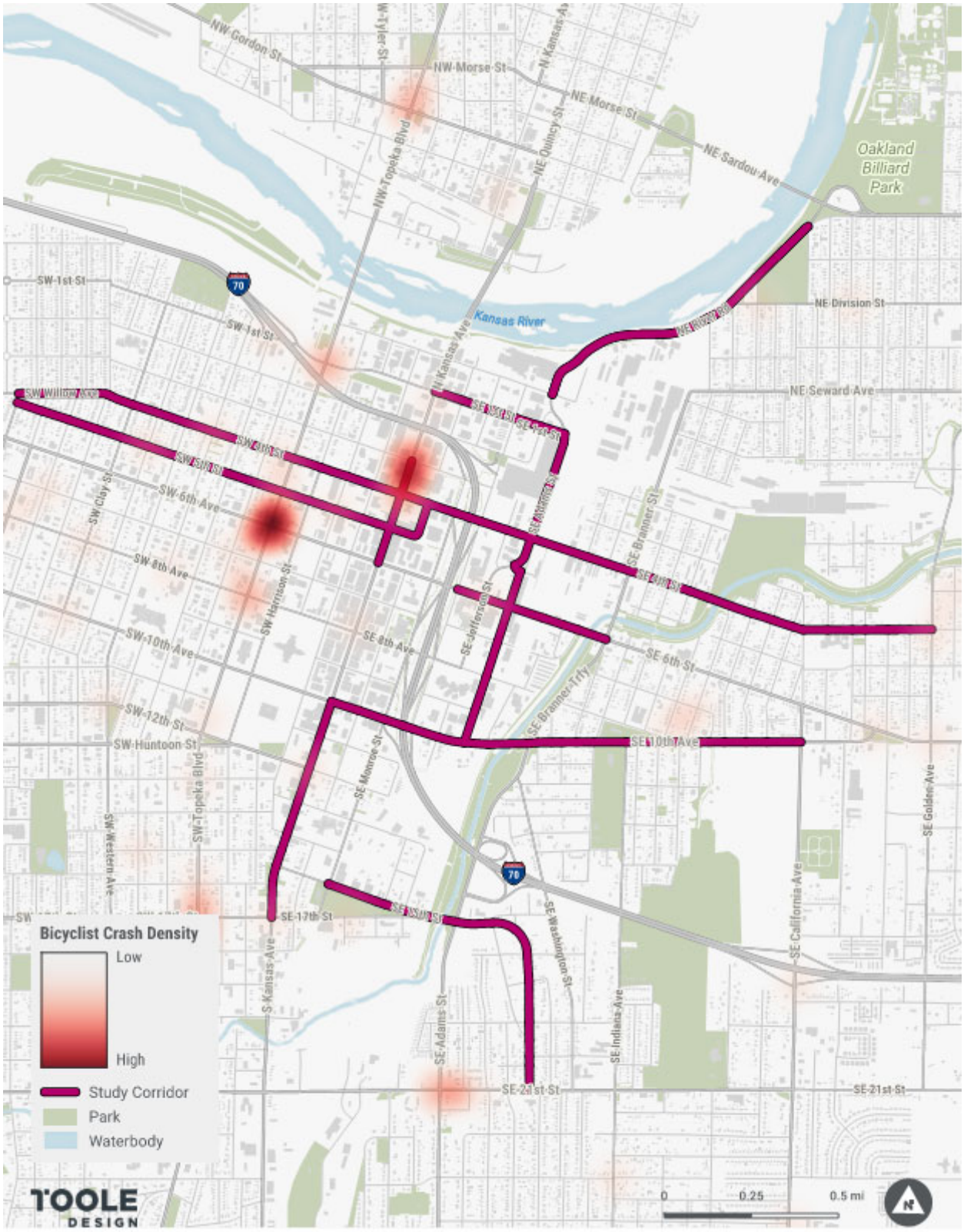


Figure 3-10: Map of Bicycle Crashes (2017-2022)

4 Corridor Level Vehicular Capacity

To evaluate the potential multimodal transportation improvements that will be considered along the study corridors the planning level vehicular capacity for each corridor is evaluated under the existing conditions and projected 2045 conditions. The projected 2045 is based on the regional model future corridor level AADT volumes on each study corridor. The existing and projected AADT volumes have been evaluated against the conceptual capacity of the existing roadway cross section based on Highway Capacity Manual (HCM) procedures and generalized lookup tables for Level of Service D and E thresholds assuming a 50% green time.

Level of Service is a measure that is based primarily on perception of delay, which is the average amount of time, in seconds, that a vehicle takes to pass through a facility beyond what would be experienced in a free-flow condition. One weakness of using vehicular level of service as a primary measure of traffic operations is that the use of a letter grade scale implies that “A” is the best condition. LOS A, B, or C means that there is excess vehicle capacity, which can have negative consequences like speeding, endangering people walking or biking. There are no national standards for LOS, and cities or states have discretion to adopt LOS targets that reflect their unique constraints and their tolerance for traffic congestion. As stated in the HCM, “the existence of a LOS F condition does not, by itself indicate that action must be taken to correct the condition” if other goals of the project are being met. Level of Service also should not be considered in a vacuum since it is just a single performance measure of a single mode of travel. Considering LOS as just one factor among many is also supported by the HCM, which states “Neither LOS nor another single performance measure tells the full story of roadway performance. Depending on the particulars of a given analysis…. other performance measures may be just as or even more important to consider.”

The summary Table 4-1 below indicates whether a given corridor currently operates or is projected to operate at LOS A-C, D, E or F under existing and future volume scenarios with the current vehicular lane capacity. In locations with two or more vehicular lanes in a given direction where the roadway is projected to operate at LOS D or better, the projected operations with removal of one vehicular through lane in each direction is also tested and shown in the table.

Table 4-1: Overall Existing Conditions Intersection Motor Vehicle Capacity Results

Location	From	To	Existing Through Lanes	One Way	Existing LOS	2045 LOS	Reduced Lanes LOS
NE River Road	NE Crane Street	NE Emmett Street	2	No	A-C	A-C	N/A
SE Adams Street	SE 10th Avenue	SE 5th Street	2	No	N/A	N/A	N/A
SE Adams Street	SE 5th Street	SE 1st Street	4	No	A-C	A-C	N/A
SE 1st Street	Jefferson Trafficway	Kansas Avenue	2	No	A-C	A-C	N/A
SE 4th Street	Kansas Avenue	Adams	6	No	A-C	A-C	A-C
	Adams	NE Golden Avenue	2	No	A-C	A-C	N/A
SW 4th Street	Washburn Avenue	Topeka Boulevard	2	Yes	A-C	A-C	A-C
SW 4th Street	Topeka Boulevard	Kansas Avenue	2	Yes	A-C	A-C	A-C
SW 5th Street	Washburn Avenue	Topeka Boulevard	2	Yes	A-C	A-C	A-C
SW 5th Street	Topeka Boulevard	4th Street	2	Yes	A-C	A-C	A-C
SE 6th Street	Madison Avenue	NE Branner Street	4	No	A-C	A-C	A-C
SE 10th Street	S Kansas Avenue	Madison Street	6	No	A-C	A-C	A-C
	Madison Street	Branner Trafficway	4	No	A-C	A-C	A-C
	Branner Trafficway	SE California Avenue	2	No	A-C	D	N/A
SE 15th Street	SE Monroe Street	E&S to SE 21st Street	2	No	E	F	N/A
Kansas Avenue	10th Avenue	17th Street	4	No	A-C	A-C	A-C
Kansas Avenue	6th Avenue	4th Street	4	No	A-C	A-C	A-C
Kansas Avenue	4th Street	3rd Street	4	No	A-C	A-C	A-C

***Note – 2045 volumes were not available for the study corridor sections of 5th Street, but have been extrapolated based on adjacent roadways with similar cross sections.**

Appendix C: Engagement Summary

Engagement Summary

Draft concepts for the 10 corridors were developed by the consultant team based upon existing conditions, planned conditions, City goals, and engineering judgement. The draft concepts were presented to the Complete Streets Advisory Committee (CSAC) for review and discussion on May 18, June 15, and July 20, 2023. In addition, email comments on draft concepts were also provided by CSAC members. Draft concepts were revised based upon CSAC input.

The draft concepts were then presented to the public for review and input. The consultant team coordinated a pop-up meeting during Oktoberfest on October 7, 2023, on behalf of the Metropolitan Topeka Planning Organization. The event was held from 10 a.m. to 1:30 p.m. at 528 SE Adams Street in Topeka, Kansas. The consultant team interacted with 71 people during the event. Each reviewed a map of the corridors (see Figure 1) as well as the existing and proposed typical sections for each of the corridors (see Figure 2). Participants used a combination of star stickers, post-it notes, and markers to record comments. In general, meeting participants were supportive of the proposed improvements, especially if they were to be accompanied by street and pedestrian improvements.

Of the 71 people who participated in the meeting, the consultant team tallied a total of 50 star stickers among support of specific corridors, most favored typical sections, and support for the plan in general:

- General support of the ten corridor options (17 stickers)
  - » Most support include River Road (3 stickers), SE 10th Street (3 stickers), and SE 4th Street (3 stickers)
- Favored concept sections (10 stickers)
  - » Favorite section was SE 4th Street Section A (5 stickers)
- Support of plan in general (23 stickers)

The street sections with the most support included protected and designated bike lanes and those with trees and new green space. Participants expressed concerns about the condition of certain downtown roads, such as SE Adams Street where the Topeka Vendors Market event is held. Some said they would rather have roads fixed than bikeways installed on failing road surfaces. Of the 71 people who participated in the pop-up, roughly half lived in or around the circulation plan's focus area. The other half lived outside the extents of the circulation plan's focus area. Two or three specifically stated that they bicycle downtown.

Figure 1: Public Engagement Board - Corridor Map

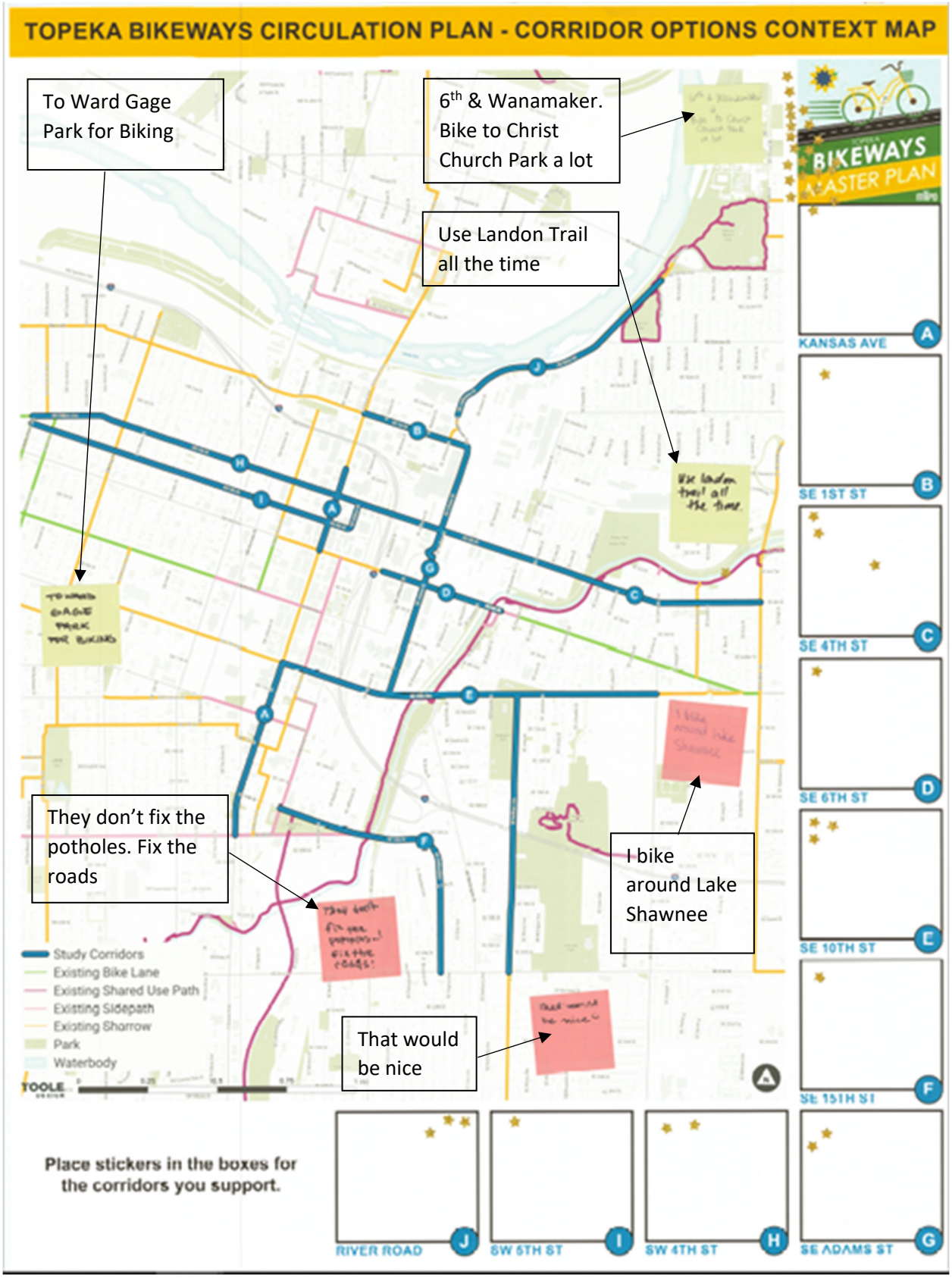
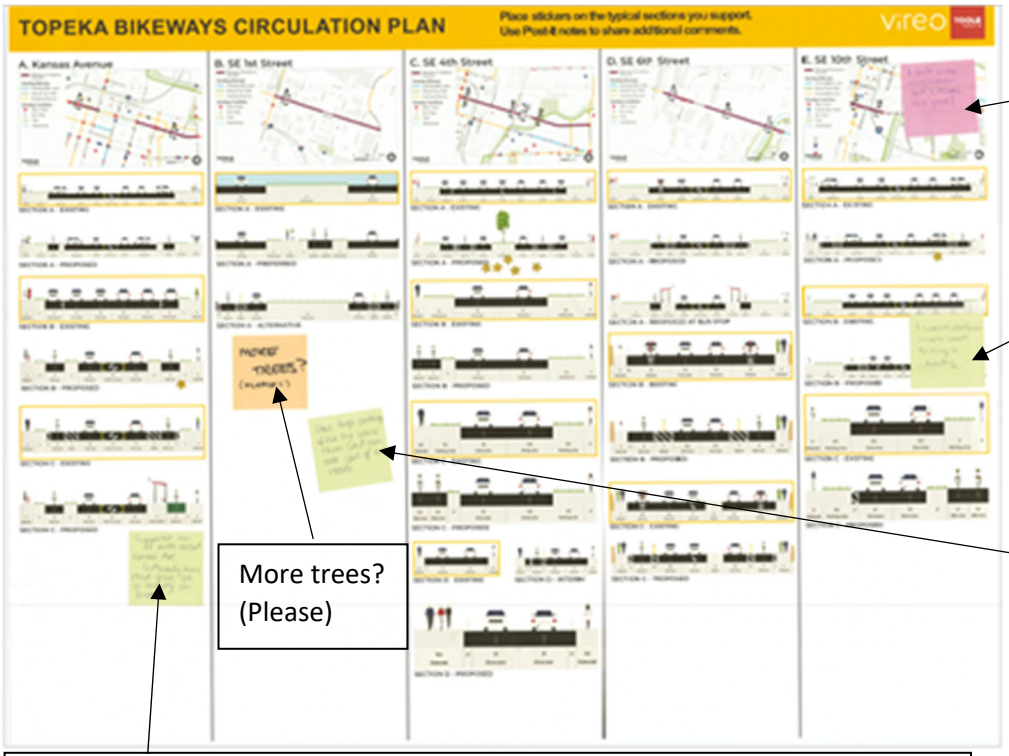


Figure 2: Public Engagement Board - Typical Sections



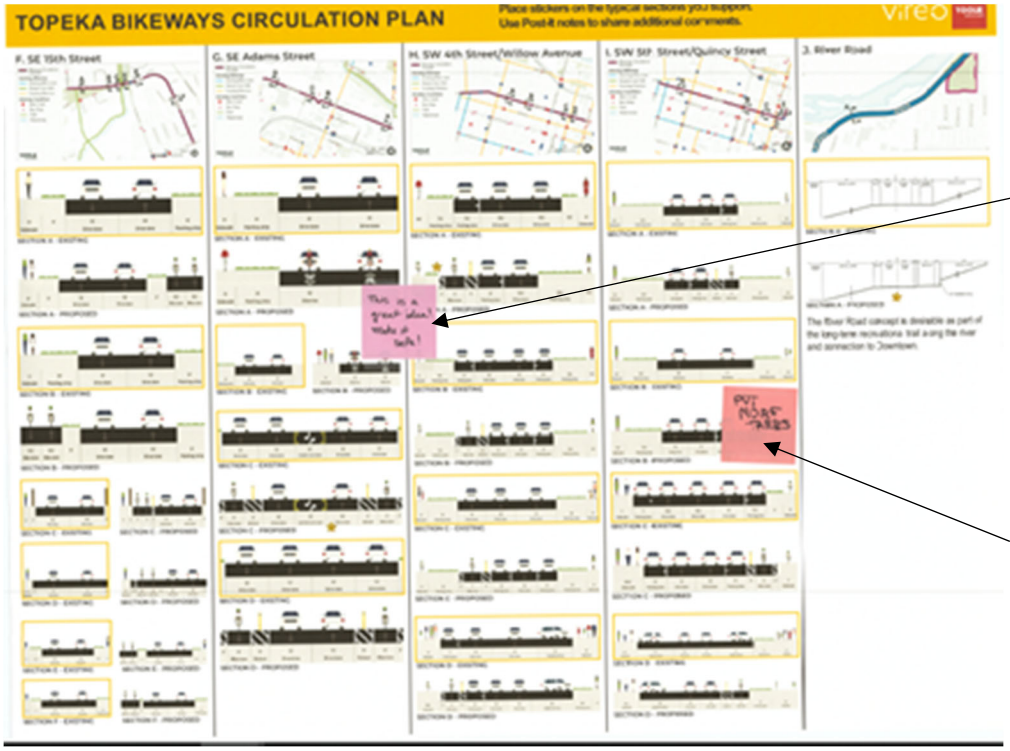
I don't bike anymore, but I think it's good.

I support whatever people want. Biking is healthy.

Have large pathways. No one uses them. Can't even take care of our roads.

More trees? (Please)

Supportive for all routes except Kansas Ave. Already busy road – gives lots of anxiety on bridge.



This is a great idea! Make it safe.

Put more trees