



Appendix C: Detailed Transportation Recommendations

Recommended Improvements for Main Street, Longmont, CO

October 11, 2019

Introduction

This document summarizes recommended improvements for Main Street in Longmont, Colorado, as well as several other intersections on adjacent parallel streets. The recommended improvements are intended to address safety and improve the user experience for all road users (including drivers, cyclists, and pedestrians), and to remedy any existing deficiencies that may have been found on the roadways.

Contents

1. Categories of improvements, including descriptions of what each category includes
2. Locations where new raised medians are recommended for installation
3. Recommended improvements to intersections

Improvement Categories

Signal: protected left turn phase, flashing yellow arrow (FYA) signal heads, installation of signal head backplate, optimize signal timings to accommodate all modes

Lane: improve signing and striping, provide enhanced wayfinding for pedestrians and bikes as they approach Main Street, tighten turn radii, install medians, create new or extend turn bays, consolidate access points

Ped: improve signage, provide high-visibility crosswalks, reduce crossing distances, disallow right turn on red

Bike: improve signage, provide dedicated bike lanes where feasible, install shared lanes/signs, consider signal prioritization for bikes

New Raised Median Locations

AECOM recommends installing new raised medians at the following locations on Main Street to improve access control and vehicle safety. Note that these medians are not intended to extend through intersections, thereby prohibiting left turns on to or from Main Street or prohibiting side-street through traffic traveling across Main Street.

New Raised Median Locations

1. On Main St from Crisman Dr to 6th Ave
2. On Main St from 3rd Ave to Pike Rd

Intersection Improvements

Main / Ute Hwy (SH 66) ● ● ● ●

AECOM Recommendations:

1. Construct ped walkway on W side of SH287 between SH66 and Park Ridge with development
2. Convert left turns from Main to FYA
3. Extend NB right receiving lane past next downstream access. Alternatively remove receiving lane and convert NB right as an overlap with WB left on green arrow only.
4. Convert WB right to permissive/protected right and remove/repurpose receiving lane
5. Convert EB right to permissive/protected right and remove/repurpose receiving lane
6. Create space for cyclists at intersection including islands

CDOT Top 40 Recommendations:

- Short term: replace missing delineators, raise curb islands (type III yellow), speed monitoring sign on SB approach.
- Long term: improve drainage at raise curb islands, raised crosswalks on right turns

Main / 23rd ● ● ● ●

AECOM Recommendations:

1. Reallocate lane width to provide separate bike lanes for EB, WB approach and connect these lanes to existing bike lanes upstream of intersection on both approaches
2. Install FYA for left turns on Main and allow ped crossings as separate phase from permissive left turn phases
3. Consider eliminating third departing lane on SB Main and installing bulb-outs
4. Consider no turn when peds present for right turn movements
5. Install raised median on SB approach extending north to Crisman Dr, and on NB approach extending south to 21st

CDOT Top 40 Recommendations:

- Short term: leading ped interval phasing, improve and install bike signage

21st / Terry ● ● ● ●

AECOM Recommendations:

1. Reallocate ROW to provide or construct new separated bike lanes EB and WB directions. Also provide bike lanes for north/south connecting link between EB and WB 21st.
2. Install signage and roadway striping for bikes in accordance with EMUC connection
3. Provide high-visibility crosswalks for ped crossings across Terry and across 21st
4. Improve ped crossing across EB and WB 21st at Terry

Main / 21st ● ● ● ●

AECOM Recommendations

1. Eliminate SB free right turn, convert to signal controlled, tighten radius
2. Tighten EB right turn radius
3. Realign ADA ramps for EB approach to cross perpendicular to the street
4. Improve signal head visibility through provision of new backplates
5. Extend WB left turn lane by 150-ft to provide additional vehicle storage and improve traffic operations
6. Extend existing bike lanes to the east from Main to Collyer St in EB and WB direction. Consider eliminating EB right turn lane to accommodate new bike lane extension.

7. Install raised median on SB approach extending north to 23rd, and on NB approach extending south to 19th

CDOT Top 40 Recommendations:

- Short term: install FYA signal heads, replace signal bulbs with LEDs, install signal head backplates
- Long term: replace raised ped islands and install delineators

21st / Collyer ● ●

AECOM Recommendations

1. Eliminate parking on 21st and install bike lanes in EB and WB direction
2. Install high-visibility crosswalks across Collyer and 21st
3. Install advanced signage for bike lanes and ped crossings

Main / 19th ● ● ● ●

AECOM Recommendations:

1. Install bike lane for WB direction
2. Install shared bike lane signage for EB direction
3. Install FYA for NB and SB left turn on Main
4. Install raised median on SB approach extending north to 21st, and on NB approach extending south to 17th. Include mid-block U-turn location along with turn pads to facilitate turn movements.

Main / 17th ● ● ● ● ●

AECOM Recommendations:

1. Install protected left turn phasing and FYA for Main
2. Extend turn bay lengths for EB and WB approaches by 125-ft to provide better vehicle storage
3. Consolidate access openings south of intersection
4. Improve signal head visibility through installation of backplates
5. Install bike lanes between Terry and Collyer Streets in EB and WB directions.
6. Install enhanced ped signage and bike facility signage on all approaches
7. Install raised median on SB approach extending north to 19th, and on NB approach extending south to 15th

Main / 15th ● ● ● ● ●

AECOM Recommendations:

1. Install shared bike signage for EB and WB approaches
2. Install FYA for left turns from Main
3. On EB approach (15th west of Main):
 - a. Remove/prohibit on-street parking on north side of street
 - b. Move double-yellow farther north so traffic entering intersection's EB approach is aligned with new EB left-through lane
4. Install raised median on SB approach extending north to 17th, and on NB approach extending south to Mountain View
5. Look to acquire ROW with future development for SB corner – addresses comments about lane configuration

Mountain View / Terry ● ●

AECOM Recommendations:

1. Provide mid-block bike and ped crossing across Mountain View at Terry

2. Construct EB bike lane on Mountain View
3. Install signage for bikes in EB and WB direction on Mountain View
4. Include high-visibility ped crossing across Terry

Main / Mountain View ● ● ● ●

AECOM Recommendations:

1. Install enhanced bike and ped signage
2. Install FYA and protected left turns for Main
3. Improve signal head visibility through provision of new backplates
4. Install raised median on SB approach extending north to 15th, and on NB approach extending south to 11th
5. Mountain View & Kimbark – need a bike connection east

CDOT Top 40 Recommendations:

- Short term: sidewalk and pavement marking improvements, remove shrubs related to bike crashes, detailed assessment of ROW for installing raised ped island

Mountain View / Emery ● ●

AECOM Recommendations:

1. Include high-visibility ped crossing across Emery
2. Install enhanced bike and ped signage
3. Install bike lane pavement markings as appropriate
4. Consider installing bulb-outs to reduce crossing distance across Emery (similar to Mountain View/Collyer east of this intersection)

Mountain View / Collyer ● ●

AECOM Recommendations:

1. Install high-visibility ped crossing across Collyer on north side of intersection and across Mountain View across west side of intersection
2. Repaint worn crosswalk striping across Collyer on south side of intersection
3. Install enhanced bike and ped signage

Main / 11th ● ● ● ●

AECOM Recommendations:

1. Install protected left turn phasing and FYA for Main
2. Improve signal head visibility through provision of new backplates
3. Restripe EB approach to increase length of left turn lane to accommodate EB left vehicle stacking
4. Consider installing protected left turn phase for EB left vehicles (high PM left turn volume exists)
5. Install raised median on SB approach extending north to Mountain View, and on NB approach extending south to 10th

CDOT Top 40 Recommendations:

- Short term: install signal head backplates, install side-of-pole signal heads

Main / 10th ● ●

AECOM Recommendations:

1. Install high-visibility pedestrian crossings on all approaches
2. Consider installing bulb-outs on 10th, each side of Main, to reduce crossing distance across 10th

3. Install raised median on SB approach extending north to 11th, and on NB approach extending south to 9th

Main / 9th ● ●

AECOM Recommendations:

1. Improve signal head visibility through provision of new backplates
2. Install median on SB approach extending north to 10th
3. Install raised median on SB approach extending north to 10th, and on NB approach extending south to 8th

Main / 8th ●

AECOM Recommendations:

1. Install high-visibility ped crossings on all approaches
2. Consider installing bulb-outs on 8th on both sides of Main to reduce crossing distance across 8th
3. Install raised median on SB approach extending north to 9th, and on NB approach extending south to Longs Peak

Main / Longs Peak ● ●

AECOM Recommendations:

1. Install high visibility ped crossing on EB approach
2. Improve signal head visibility through provision of new backplates
3. Install FYA for left turns from Main
4. Install bulb-out on south side of Longs Peak on west sides of Main to reduce crossing distance across Longs Peak (*note: bulb-out already exists on north side of Longs Peak west of Main*)
5. Consider installing bulb-out on south side of Longs Peak on east side of Main (*note: may require eliminating a parking spot on Longs Peak, bulb-out already exists on north side of Longs Peak east of Main*)
6. Install raised median on SB approach extending north to 8th, and on NB approach extending south to 6th

Main / 6th ● ● ●

AECOM Recommendations:

1. Improve signal head visibility through provision of new backplates
2. Install FYA for left turns from Main
3. Install bulb-out on north side of 6th on east of Main to reduce crossing distance across 6th
4. Consolidate access points immediately north and east of intersection
5. Include pedestrian priority signaling / signal timing
6. Install raised median on SB approach extending north to Longs Peak

Main / 5th ●

AECOM Recommendations:

1. Improve signal head visibility through provision of new backplates

Main / 4th ● ●

AECOM Recommendations:

1. Improve signal head visibility through provision of new backplates
2. Install bike lane sharrows on EB approach. As an alternative, consider bike boulevard or alternate bike routes with wayfinding signage to accommodate these bike movements

Main / 3rd ● ● ●

AECOM Recommendations:

1. Improve signal head visibility through provision of new backplates
2. Install high-visibility ped crossing on SB approach
3. Install bulb-outs on south side of 3rd on both sides of Main to reduce crossing distance across 3rd
4. Install bulb-outs on Main south of 3rd to reduce crossing distance across Main (*note: may require moving bus stop on SB Main, located immediately south of 3rd, farther south*)
5. Install raised median on NB approach extending south to 2nd

Main / 2nd ●

AECOM Recommendations:

1. Install FYA for left turns from Main
2. Install raised median on SB approach extending north to 3rd, and on NB approach extending south to 1st

Main / 1st ● ●

AECOM Recommendations:

1. Improve signal head visibility through provision of backplates
2. Install raised median on SB approach extending north to 2nd, and on NB approach extending south to Boston
3. Optimize pedestrian crossing for the south and north legs of the approach. This could include minimizing crossing distances and pedestrian timing improvements.

Main / Boston ● ● ●

AECOM Recommendations:

1. Install high-visibility ped crossings on EB and WB approaches
2. Install bike lane striping and signage in both directions on west side of intersection
3. Install raised median on SB approach extending north to 1st, and on NB approach extending south to Boston

Main / Delaware ● ●

AECOM Recommendations:

1. Install bulb-outs on Delaware to reduce crossing distance across Delaware
2. Install high visibility ped crossing on Delaware
3. Install stop bar and double-yellow striping on Delaware
4. Install raised median on SB approach extending north to Boston, and on NB approach extending south to Ken Pratt

Main / Ken Pratt (SH 119) ● ● ●

AECOM Recommendations:

1. Install raised median on SB approach extending north to Delaware, and on NB approach extending south to Jersey/Emery
2. Review signal timing for bicyclists and pedestrians. Optimize crossing distances for both and include additional signage for these modes.

Fox Tuttle Recommendations: *

1. Create new EB through-right lane on south side of Ken Pratt between Pratt Parkway and Main St, and add NB right overlap signal phase (*requires reducing raised ped island, uses existing NB right receiving lane as new EB through receiving lane*)
2. Convert existing SB right lane to SB through-right (*requires reducing size of raised ped islands, uses existing EB right receiving lane as new SB through receiving lane, eliminates existing exclusive SB right lane*)
3. Convert existing WB right lane to WB through-right (*requires reducing size of raised ped islands, uses existing SB right receiving lane as new WB through receiving lane, eliminates existing exclusive WB right lane*)
4. Consider converting existing NB right lane to NB through-right, building new exclusive NB right turn lane, and building new third receiving lane for NB traffic on east side of Main between Ken Pratt and St Vrain Creek bridge (bridge is already 3 lanes)

Note: other recommendations were made by study, but these are considered most reasonable options from cost/benefit point of view that will allow for acceptable long-term LOS

* Recommendations from "Main Street & Ken Pratt Boulevard Intersection Improvements" report dated June 2012.

Main / Jersey/Emery ● ●

AECOM Recommendations:

1. Install high-visibility ped crossings on EB and WB approaches
2. Install stop bars on EB and WB approaches
3. Install bulb-outs on Jersey on both sides of Main to reduce crossing distance across Jersey
4. Install raised median on SB approach extending north to Ken Pratt, and on NB approach extending south to Missouri/Quail

CDOT Top 40 Recommendations:

- Short term: short-term access restriction to 3/4 movement using raised curb islands on side-street approaches (recommended by Longmont Safety Study)
- Long term: monitor intersection to determine if right-in-right-out intersection is appropriate and prioritize east leg if necessary (recommended by Longmont Safety Study)

Main / Missouri/Quail ●

AECOM Recommendations:

1. Install raised median on SB approach extending north to Jersey/Emery, and on NB approach extending south to Quebec

Main / Quebec ● ● ●

AECOM Recommendations:

1. Install high visibility crosswalks across Quebec Street approaches
2. Improve ADA ramps at all 4 corners of the intersection
3. Remove the third southbound lane departing the intersection and extend curb to minimize crossing width
4. Optimize lane width for the right departing lane in the northbound direction. Utilize this right of way to provide better buffer for the bike lane
5. Install green bike tracks across the intersection to connect the bike lane offset north and south of the intersection
6. Install raised median on NB approach extending south to Pike
7. Look at adjusting bike lane configuration

8. Optimize eastbound/westbound pedestrian crossings, including pedestrian timing improvements

Main / Pike ●

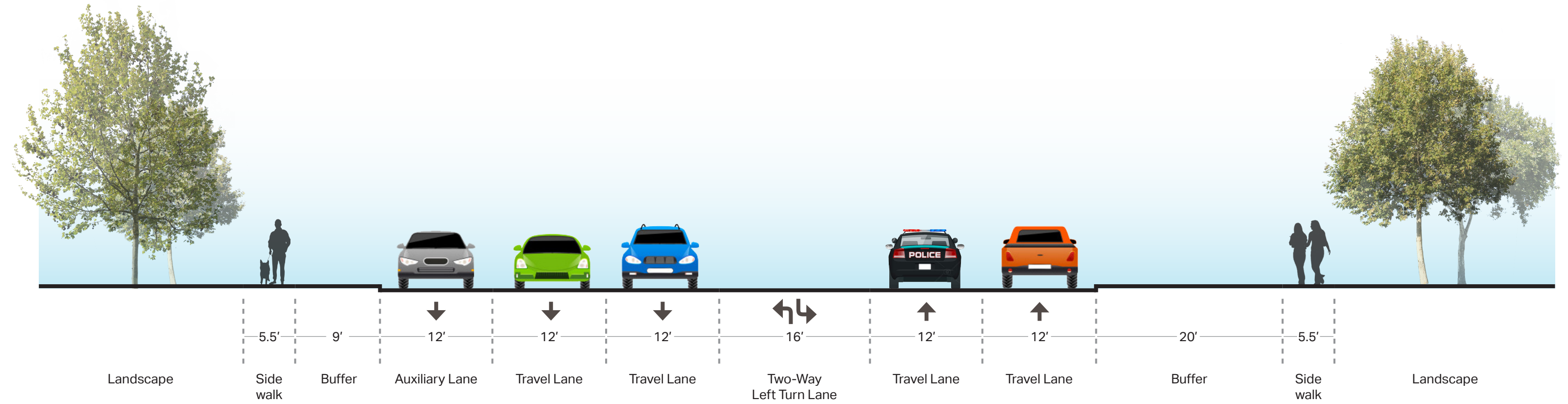
AECOM Recommendations:

1. Improve signal head visibility through provision of backplates
2. Add second left turn lane
3. Consider implementing permanent radar display
4. Enhance ped/transit connections on SE corner

MAIN STREET TYPICAL SECTIONS IN NORTH MAIN

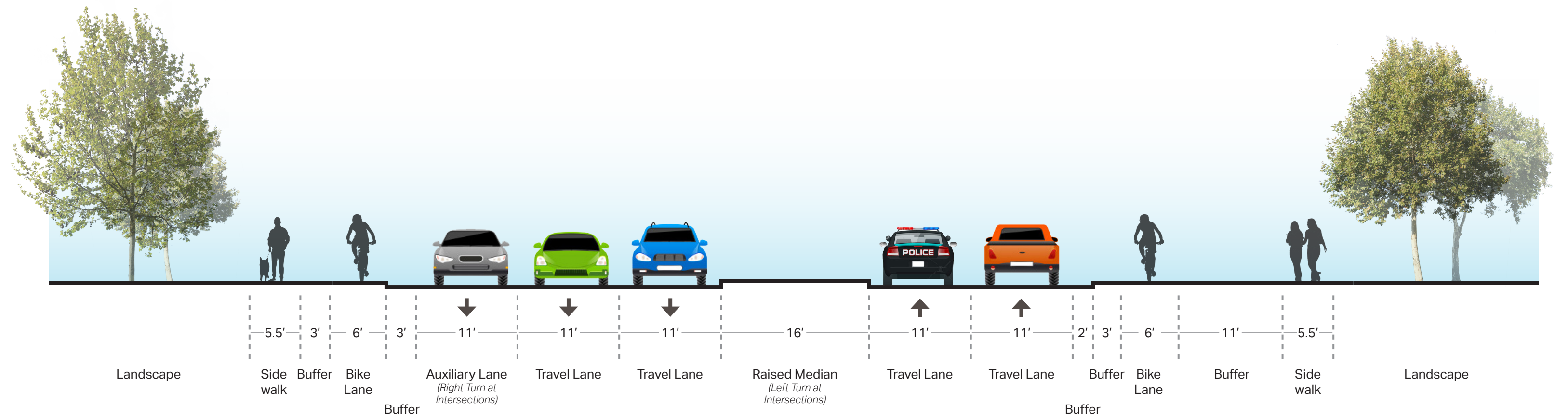
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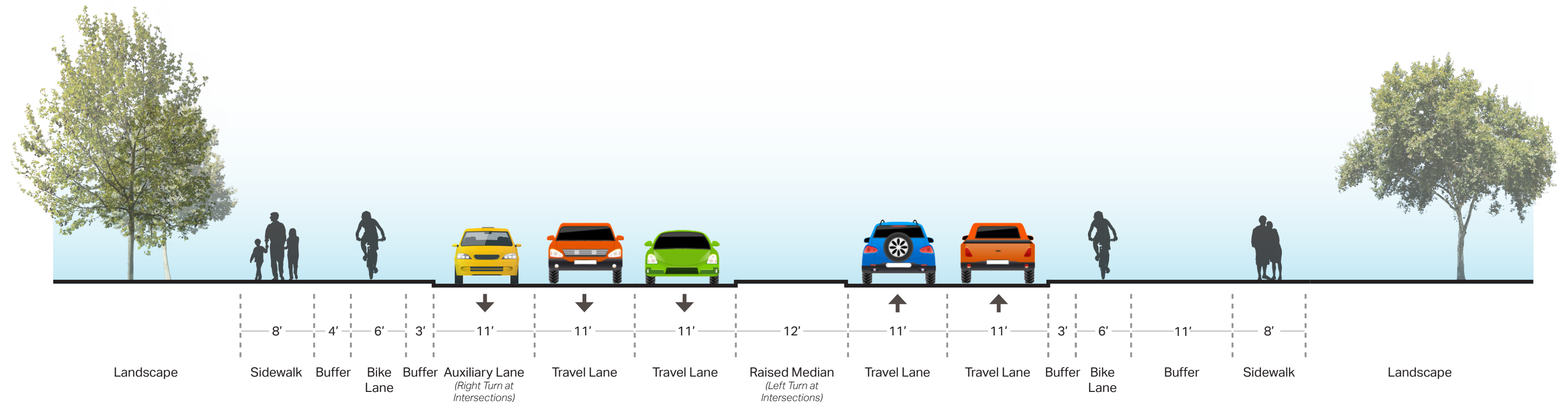
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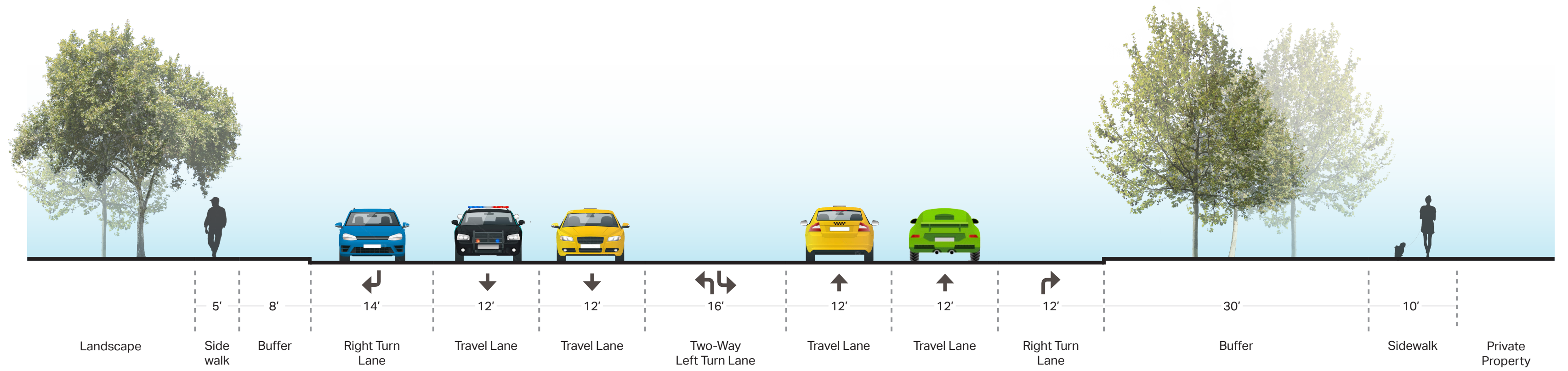
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MAIN STREET TYPICAL SECTIONS IN NORTH MAIN

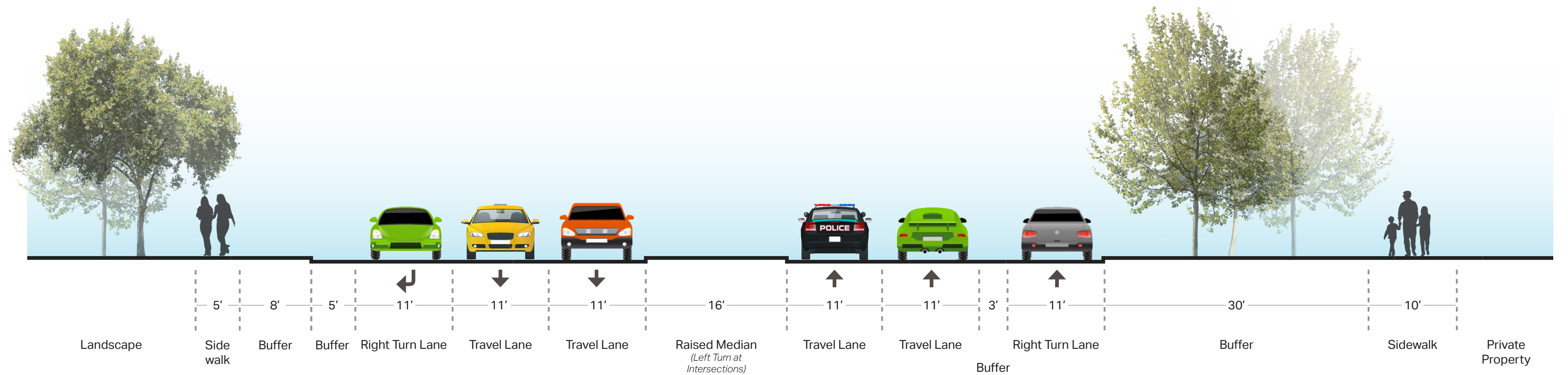
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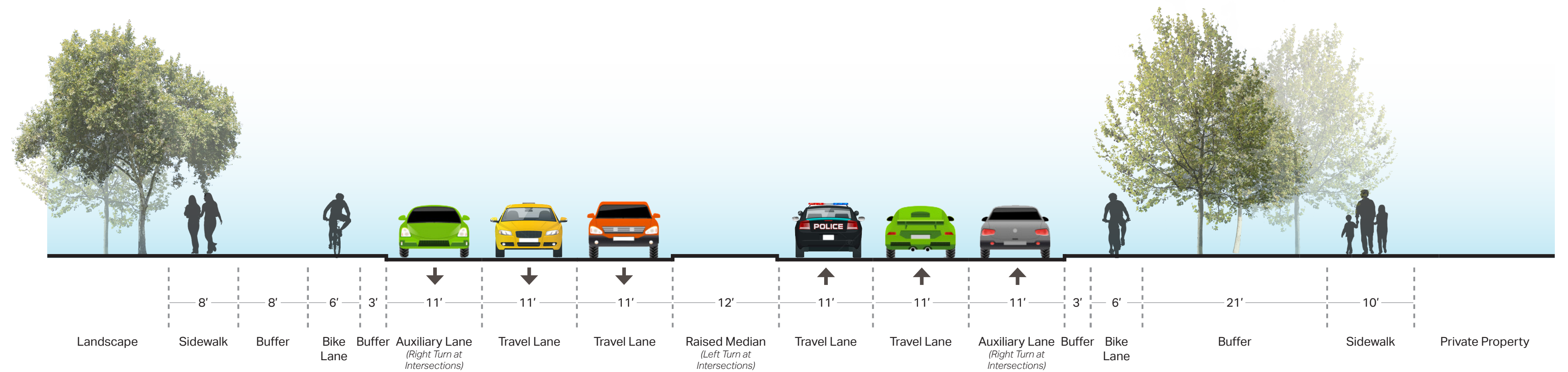
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ULTIMATE - 17TH TO 21ST

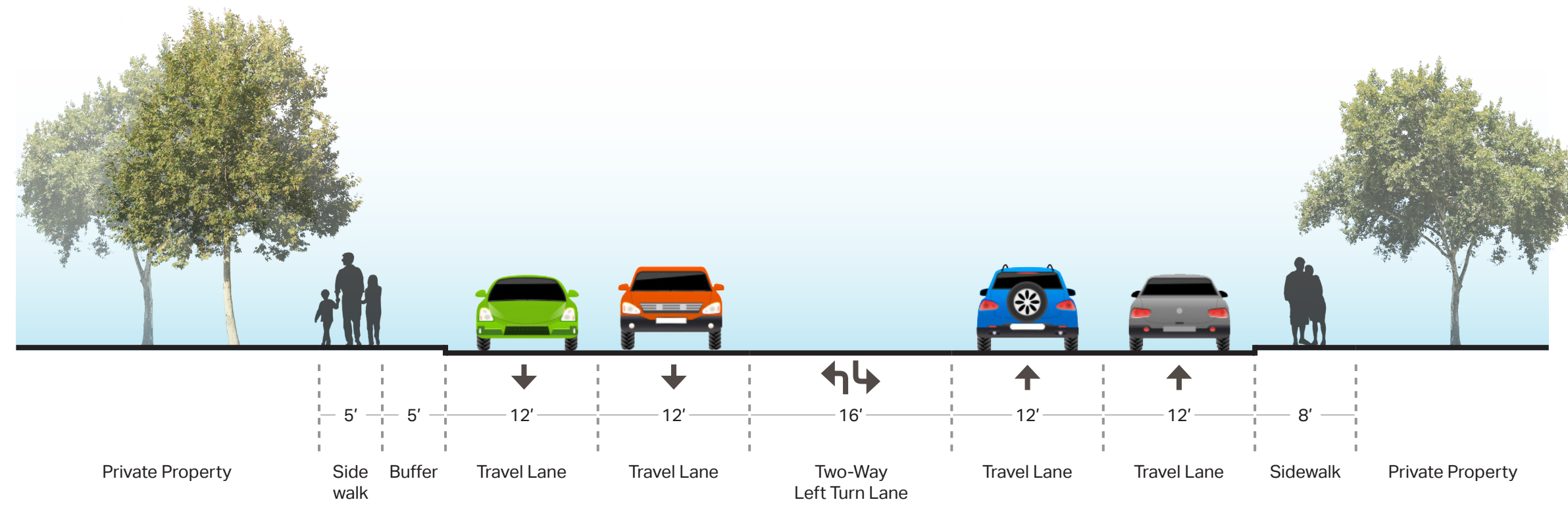
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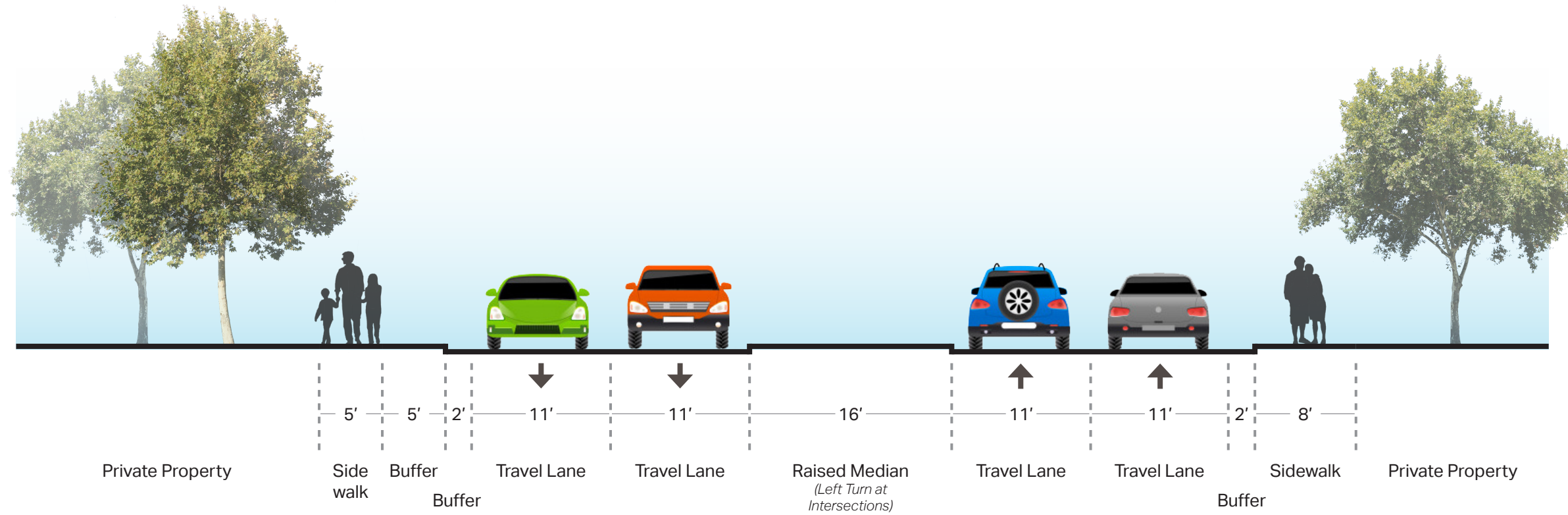
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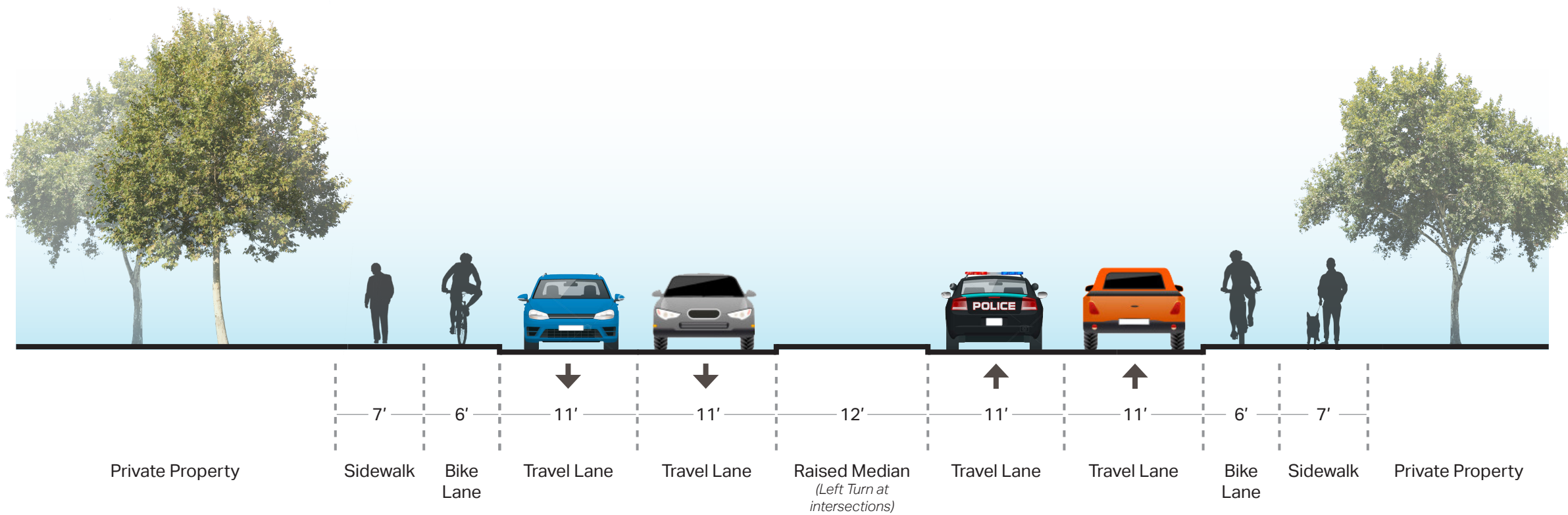
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ULTIMATE - 11TH TO 17TH

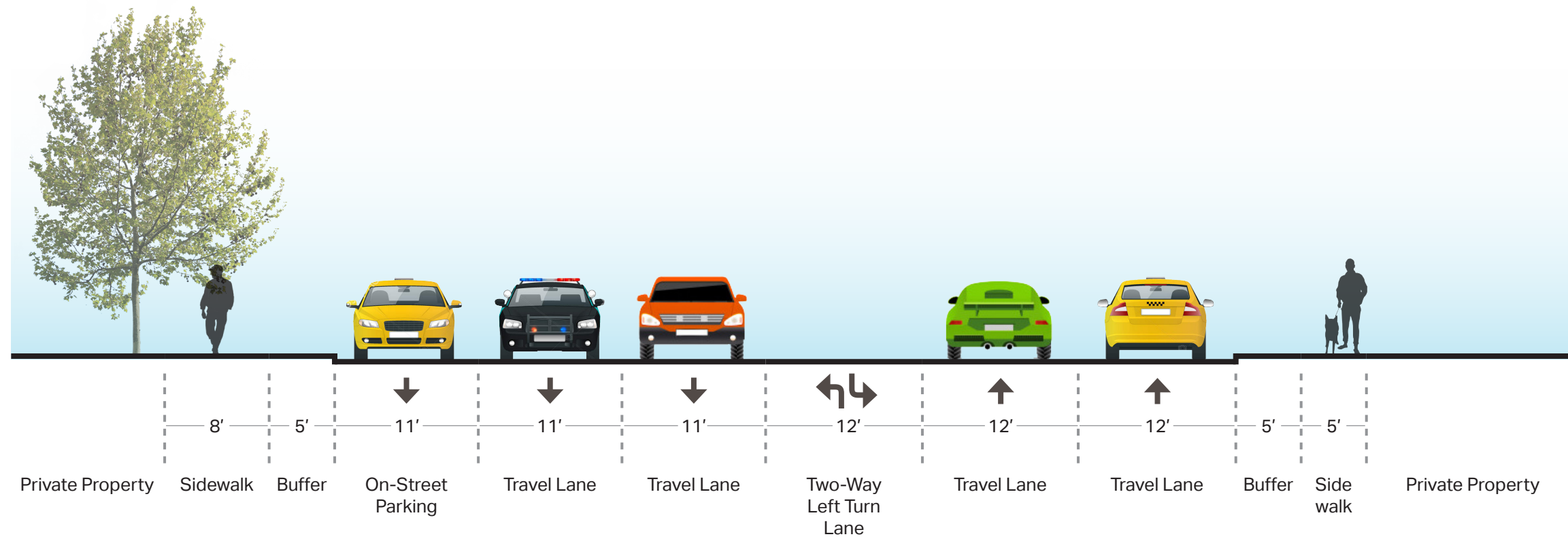
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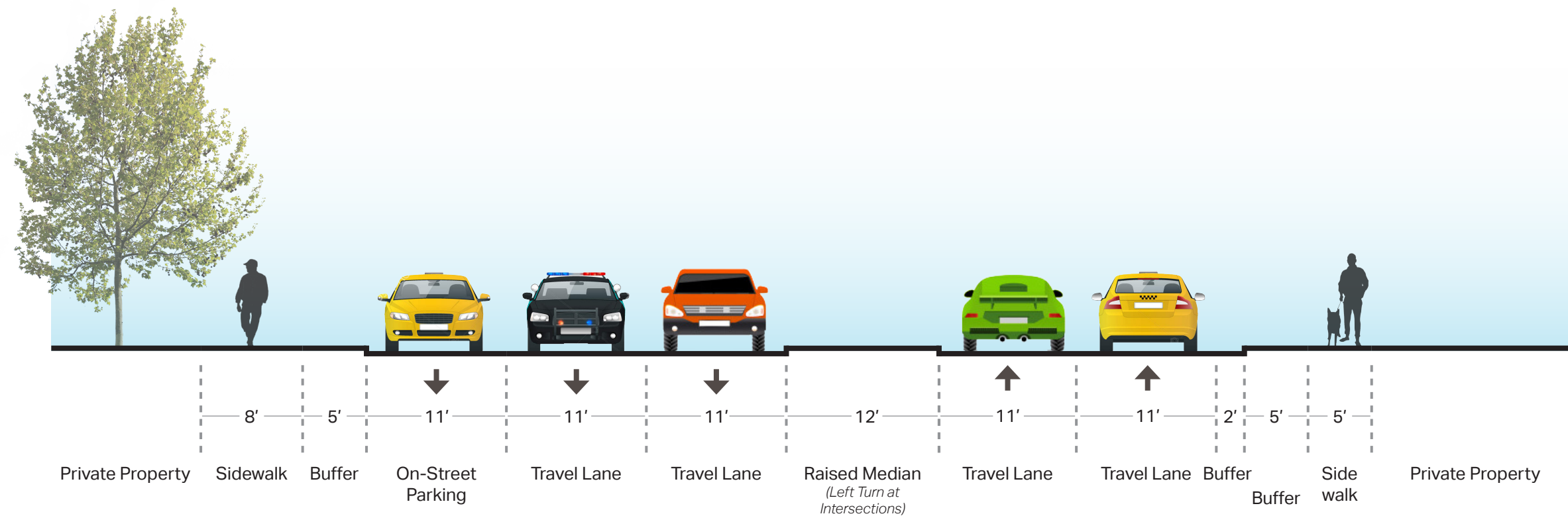
EXISTING - 9TH TO 11TH

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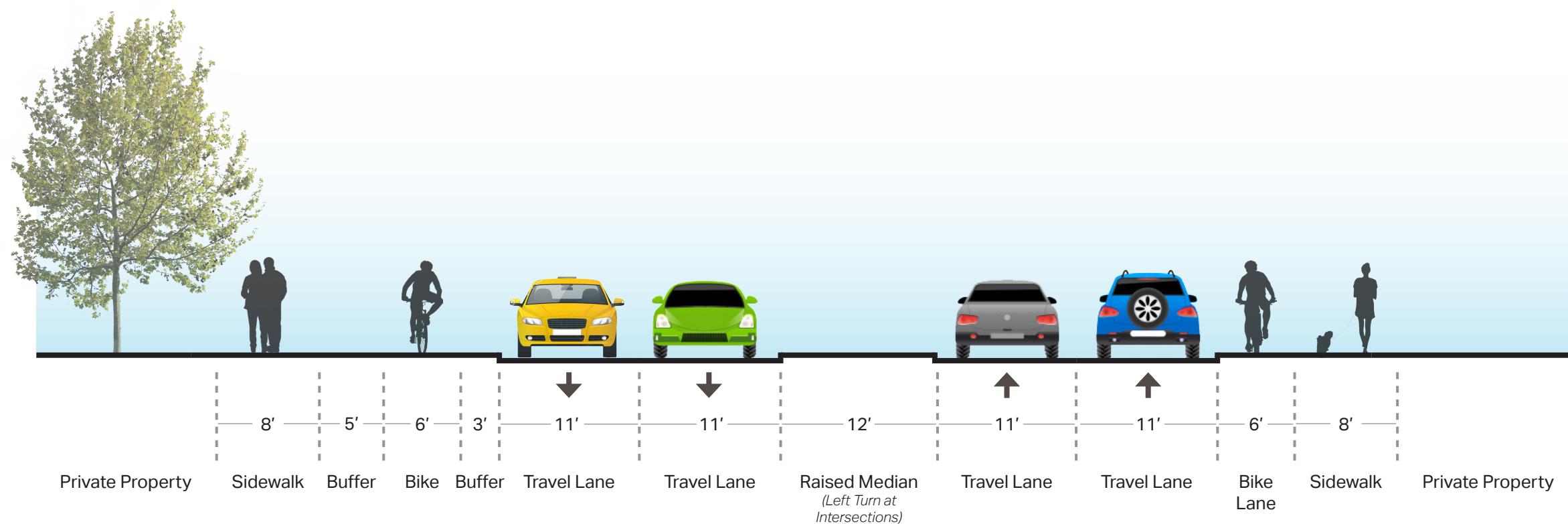
INTERIM - 9TH TO 11TH

(VIEW LOOKING NORTH)



ULTIMATE - 9TH TO 11TH

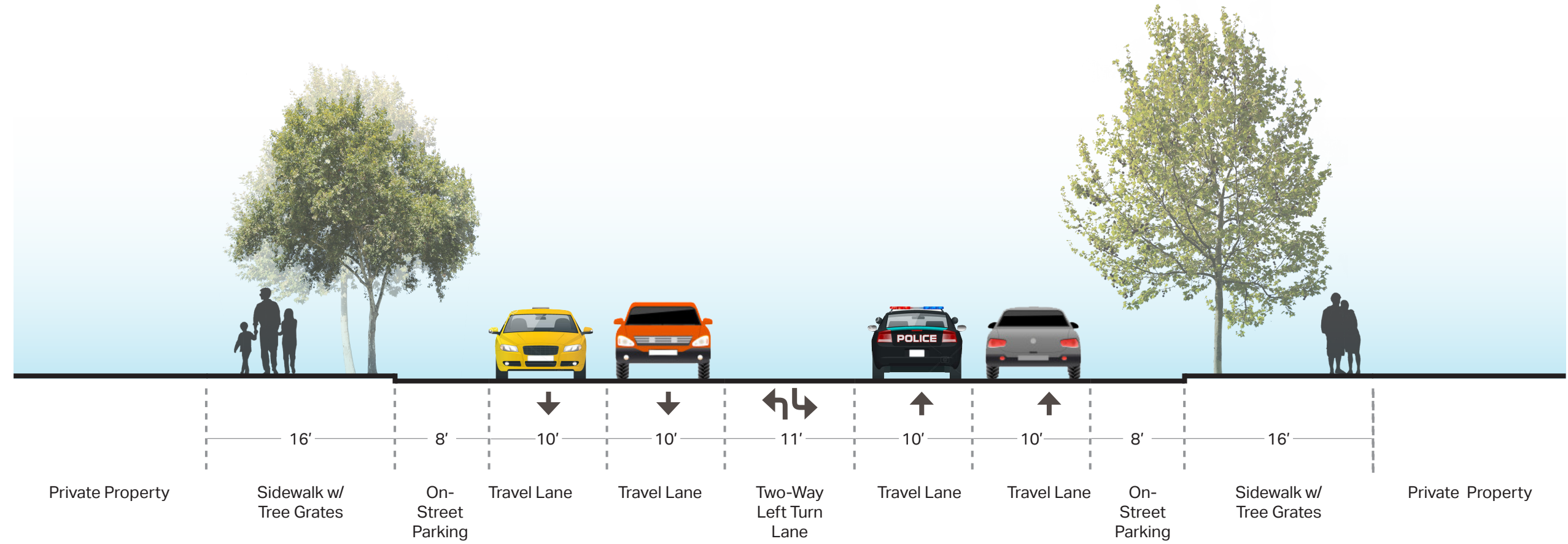
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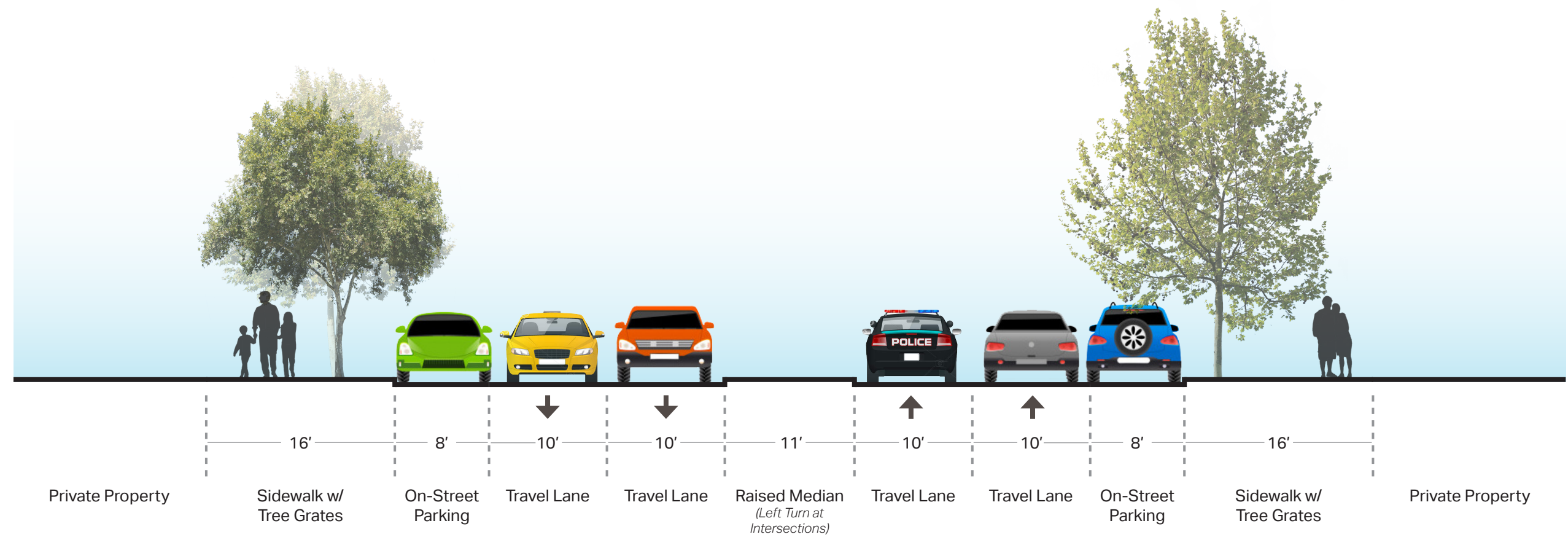
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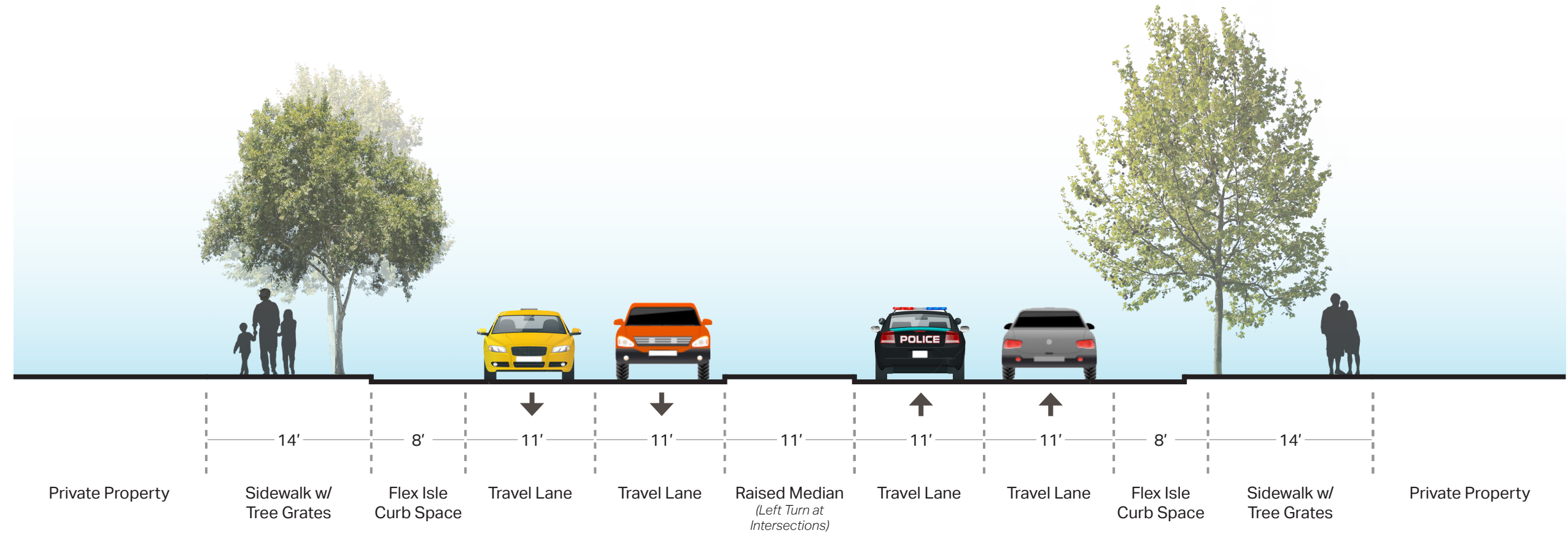
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ULTIMATE - 2ND TO 9TH

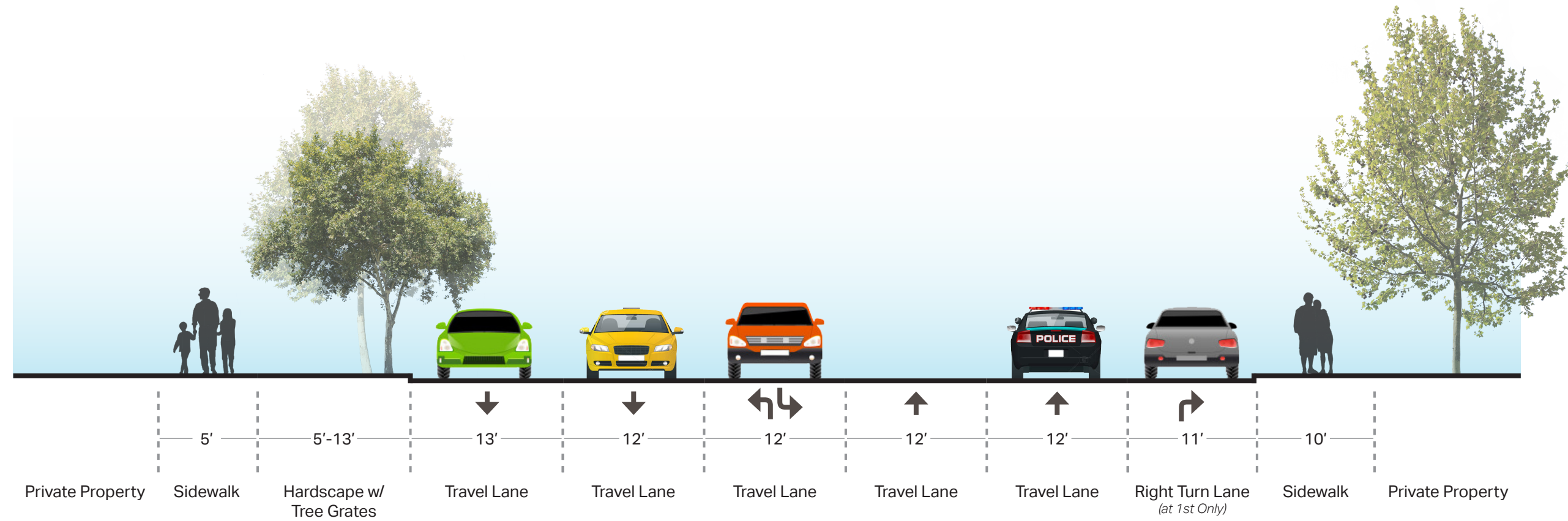
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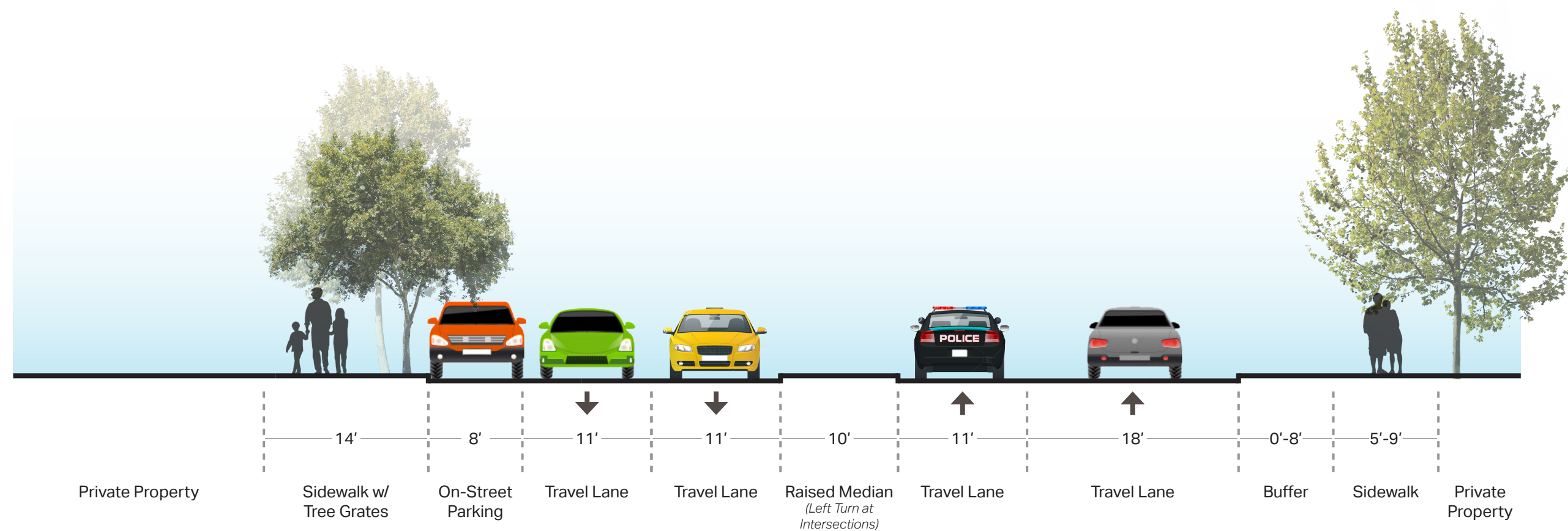
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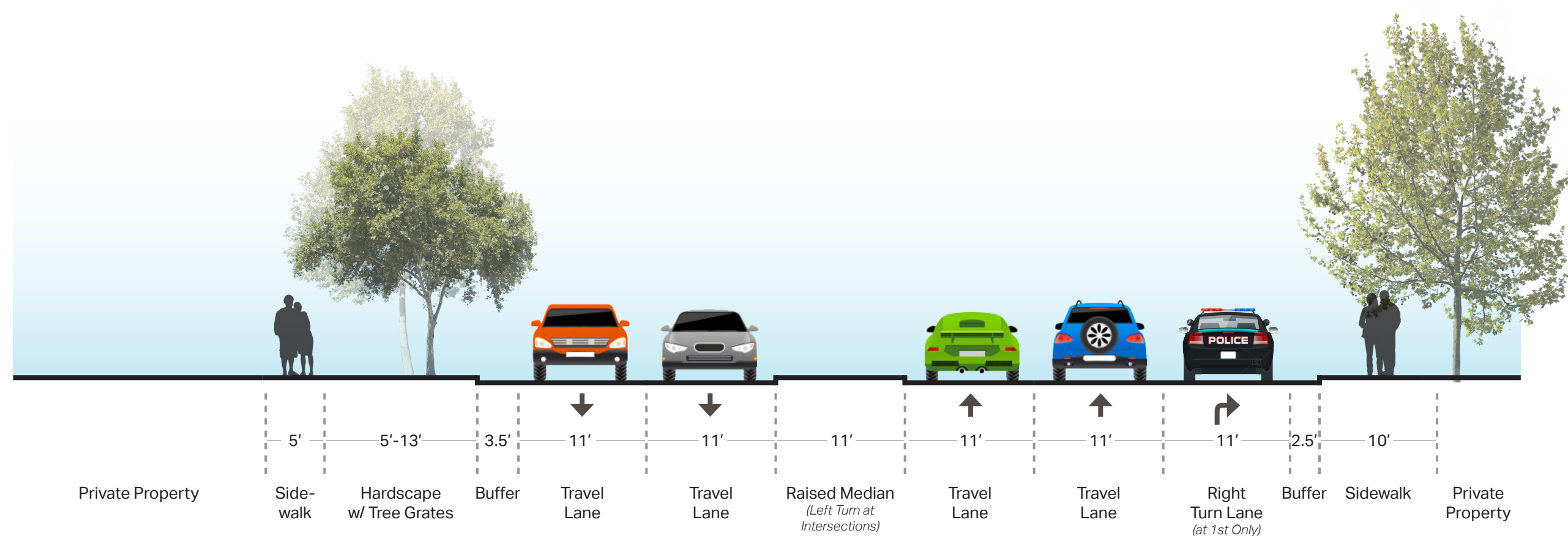
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INTERIM - BOSTON TO 1ST

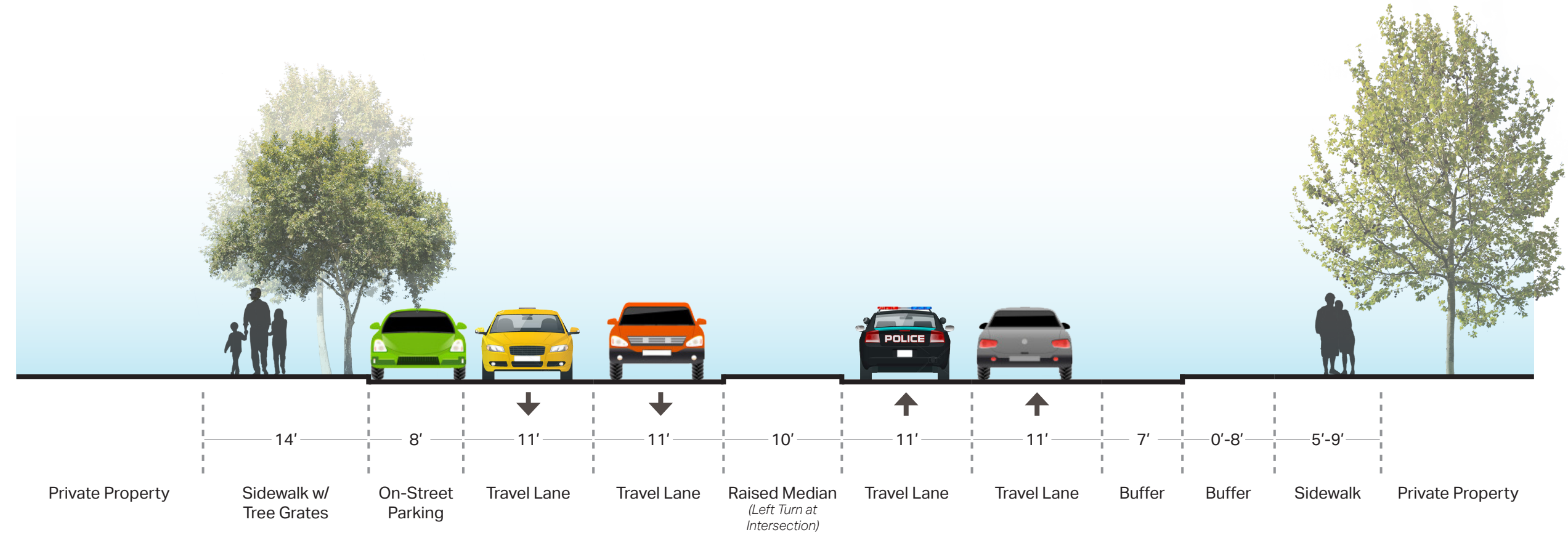
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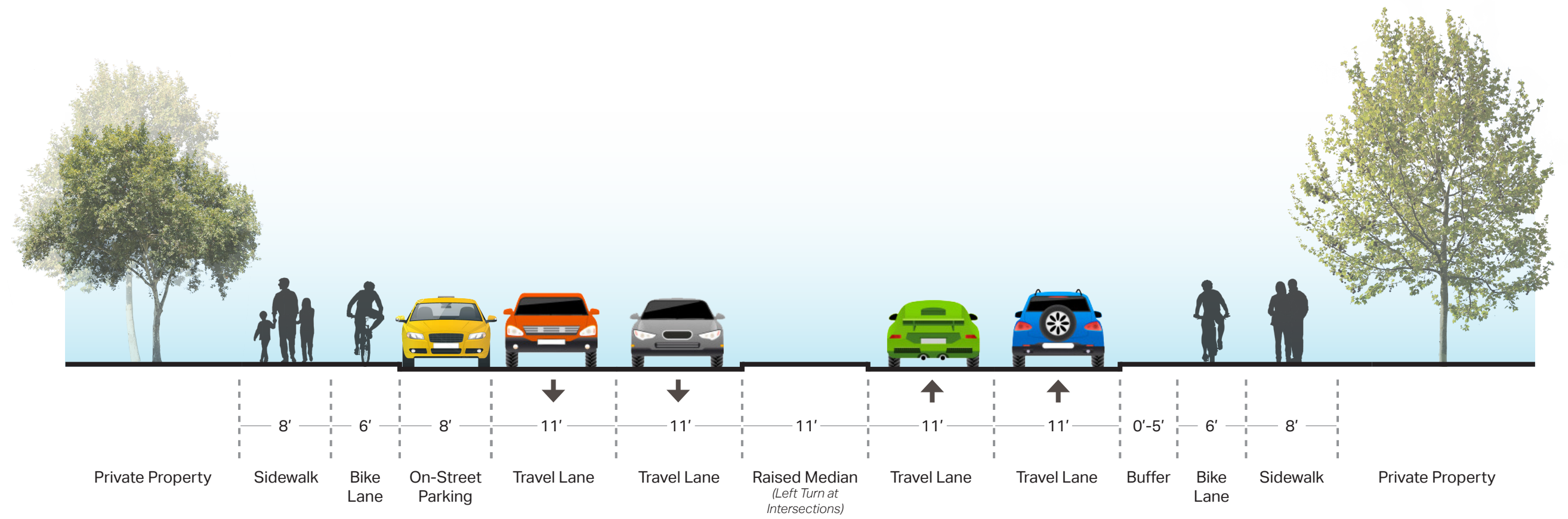
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ULTIMATE - BOSTON TO 2ND

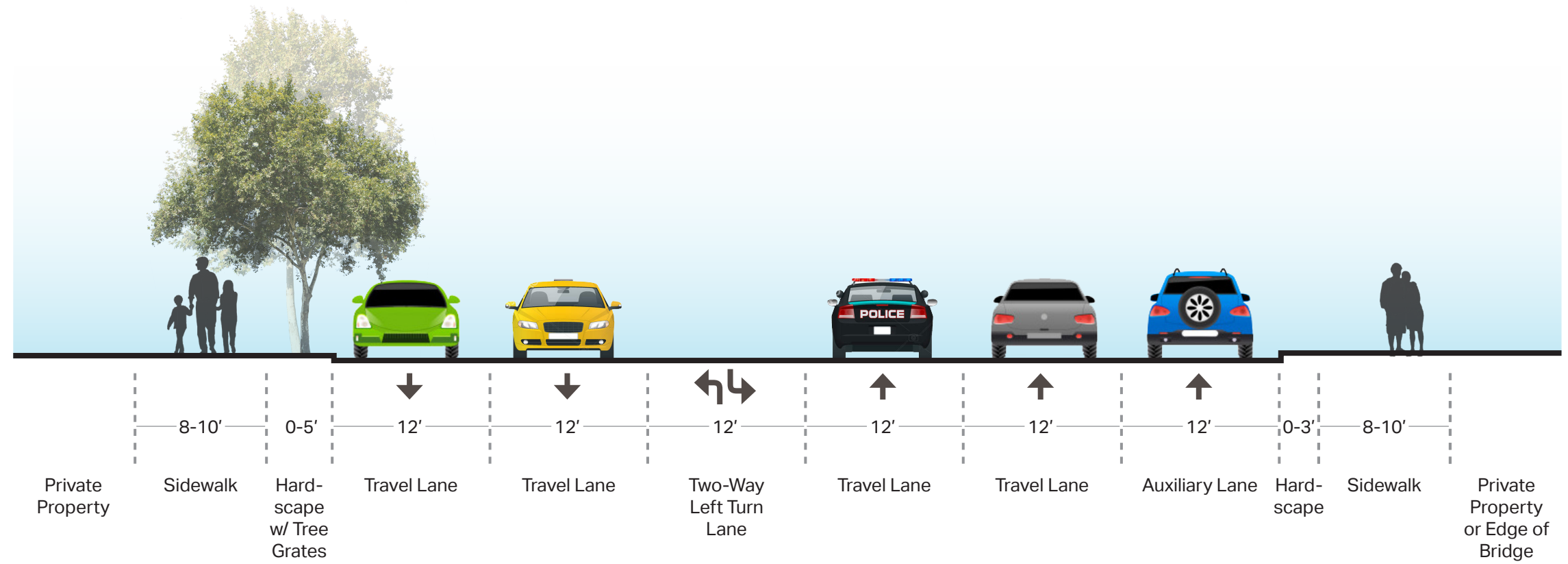
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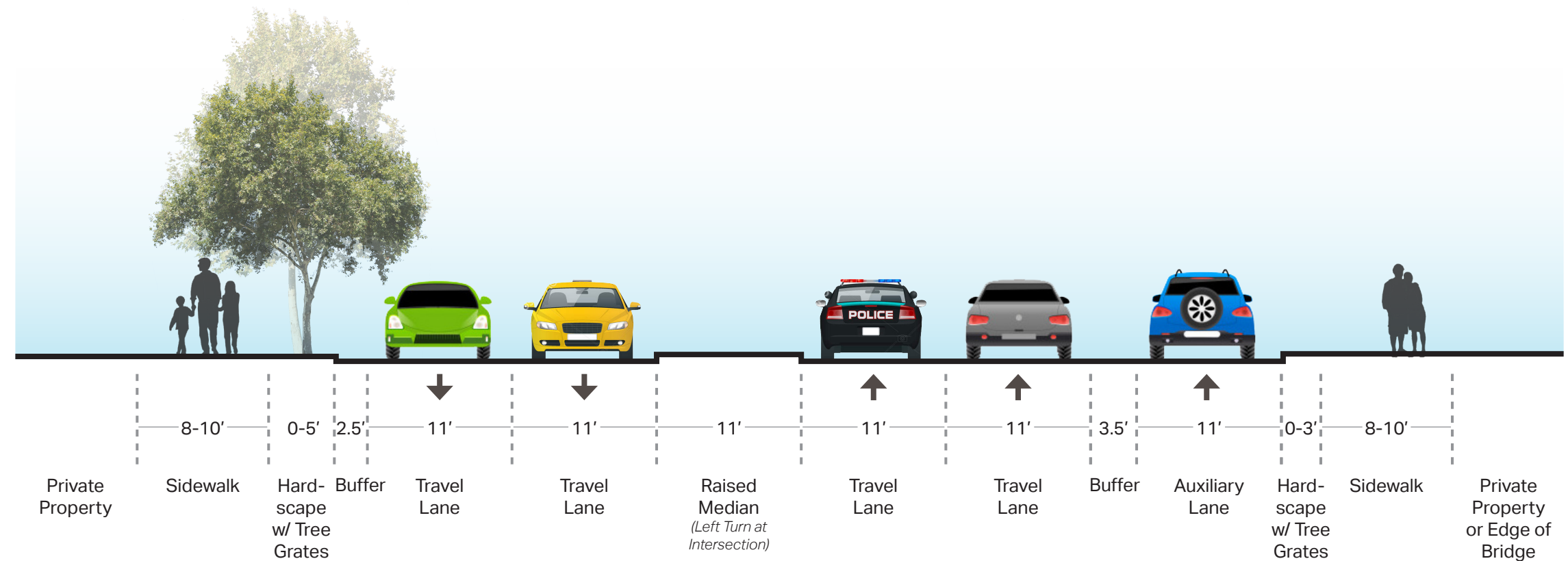
EXISTING - DELAWARE TO BOSTON

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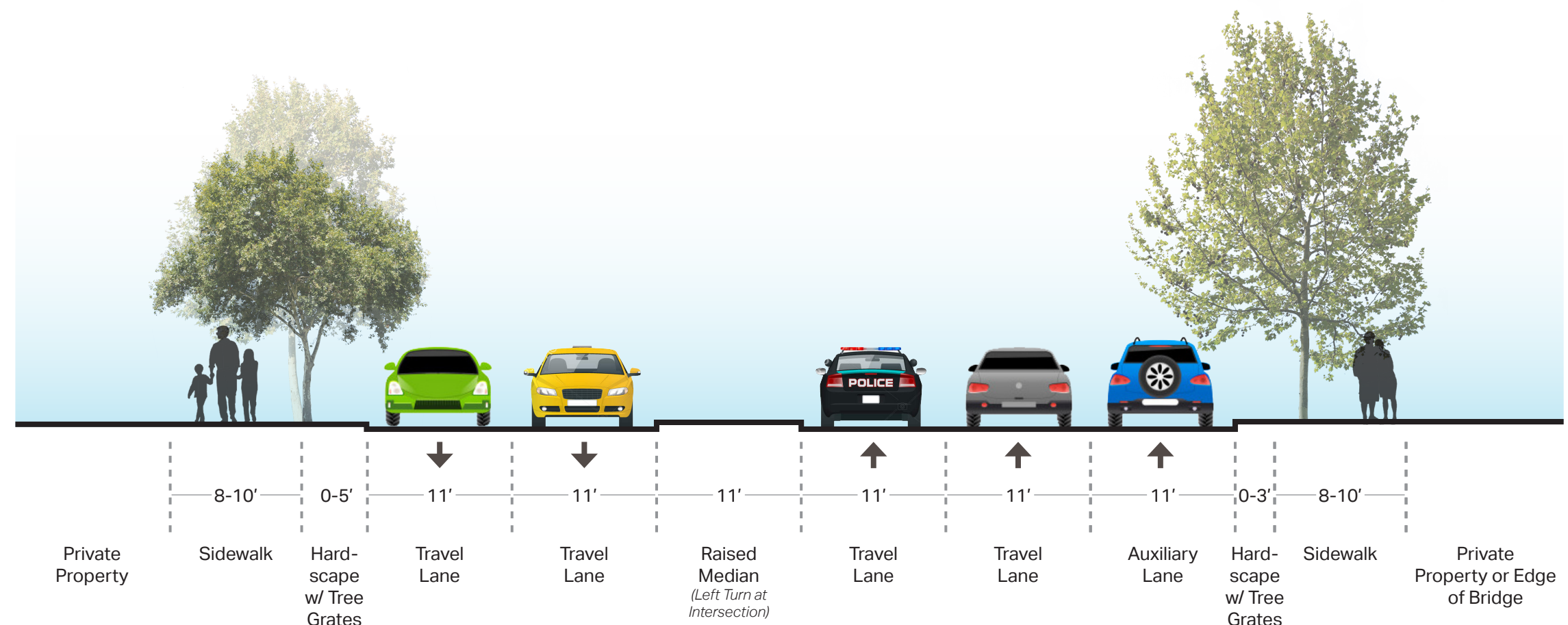
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ULTIMATE - DELAWARE TO BOSTON

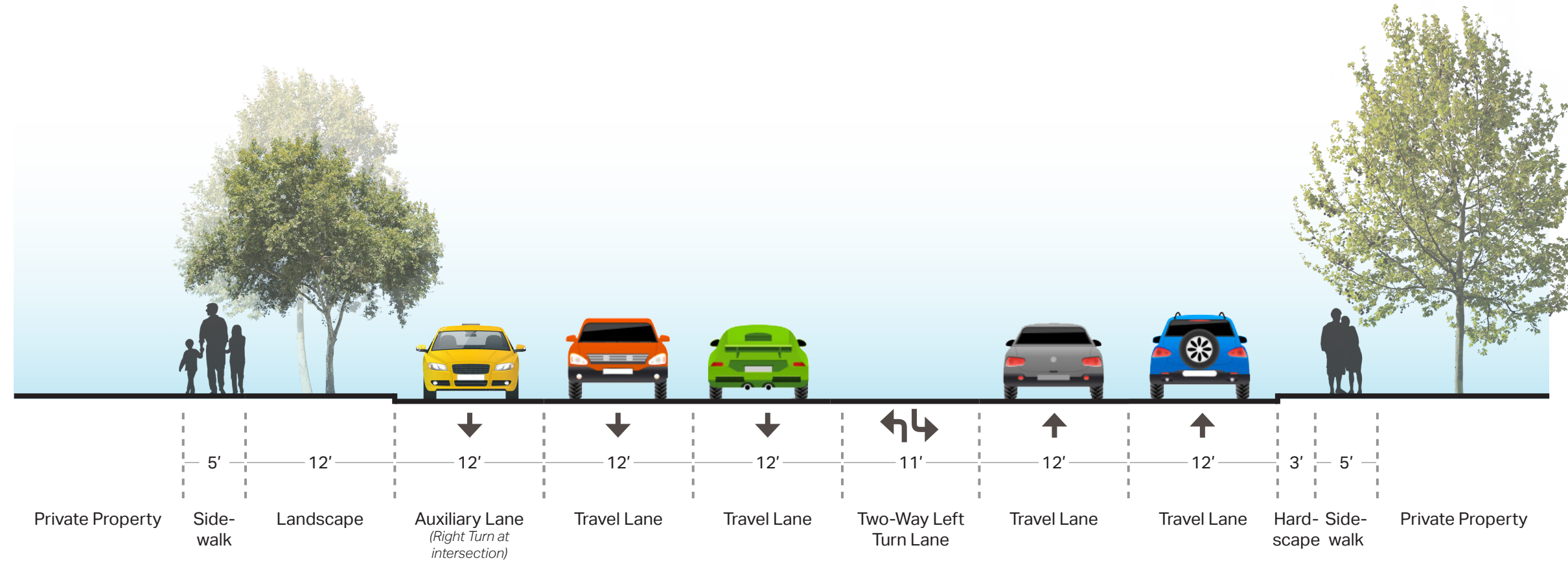
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MAIN STREET TYPICAL SECTIONS IN DOWNTOWN

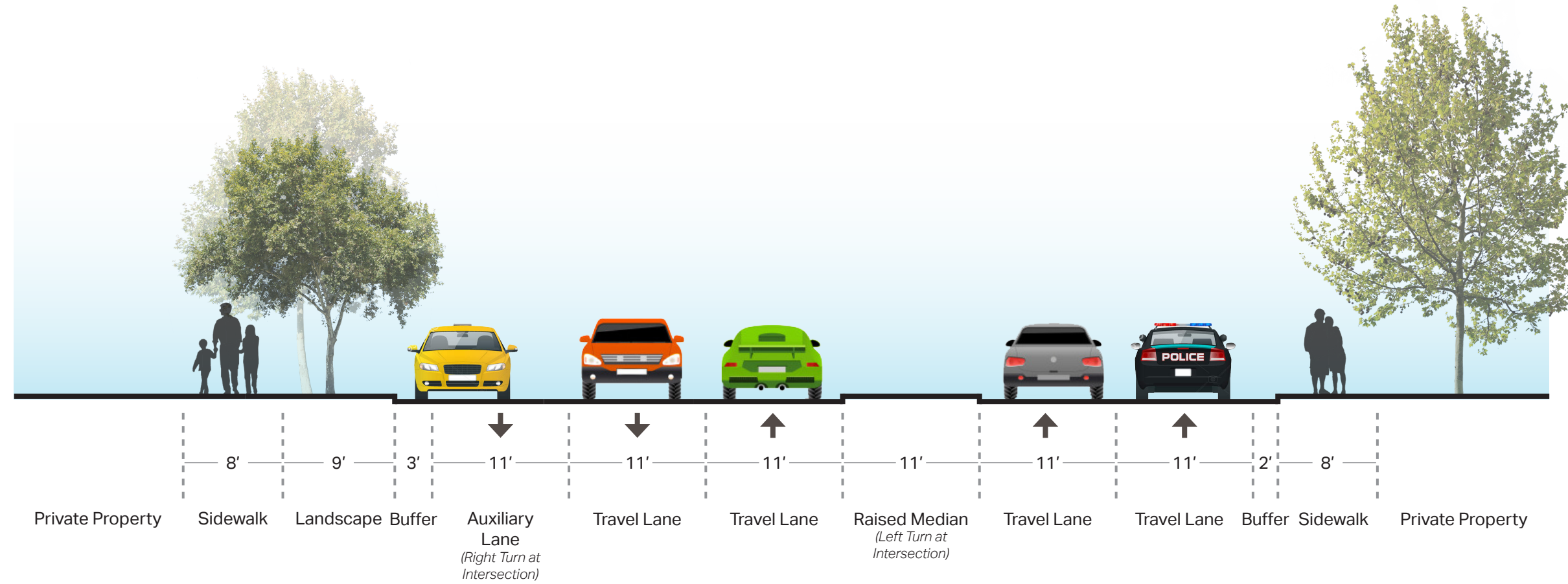
EXISTING - KEN PRATT TO DELAWARE

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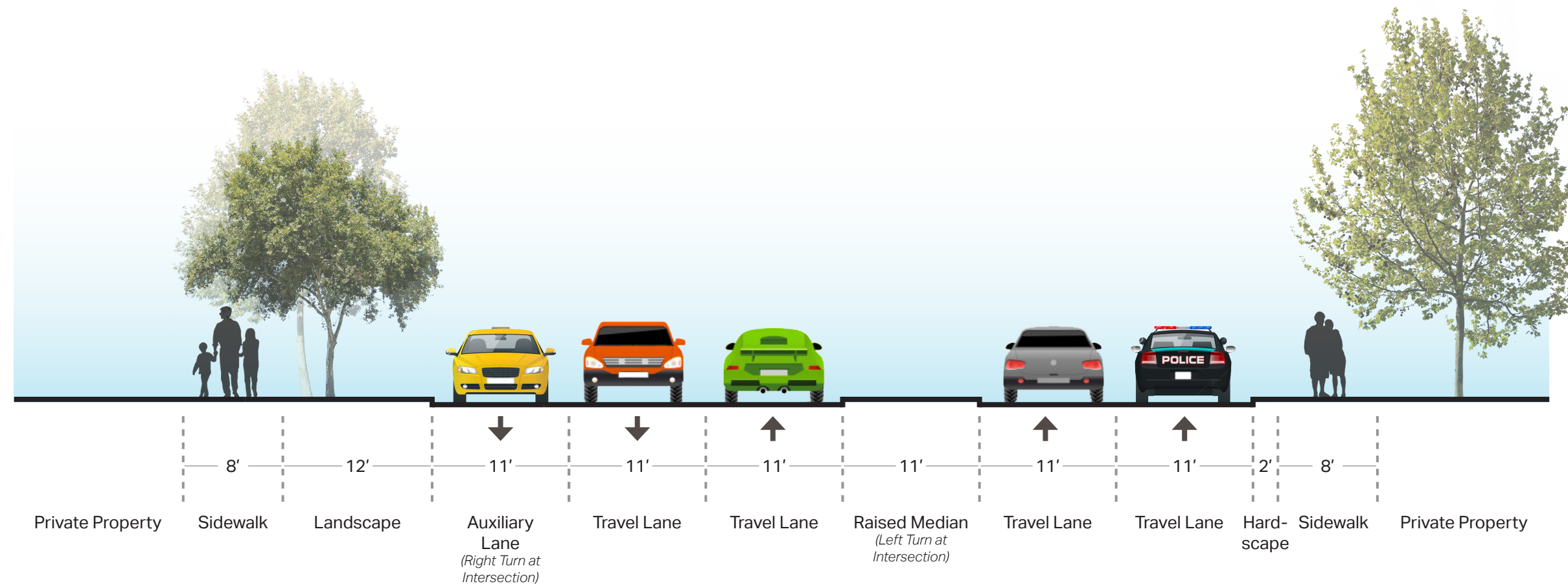
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ULTIMATE - KEN PRATT TO DELAWARE

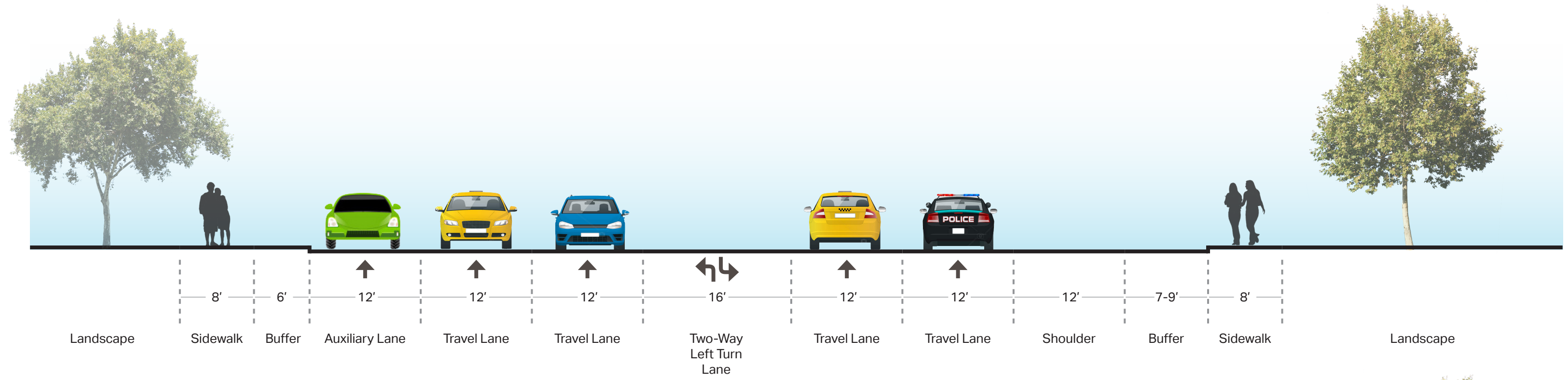
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MAIN STREET TYPICAL SECTIONS IN SOUTH MAIN

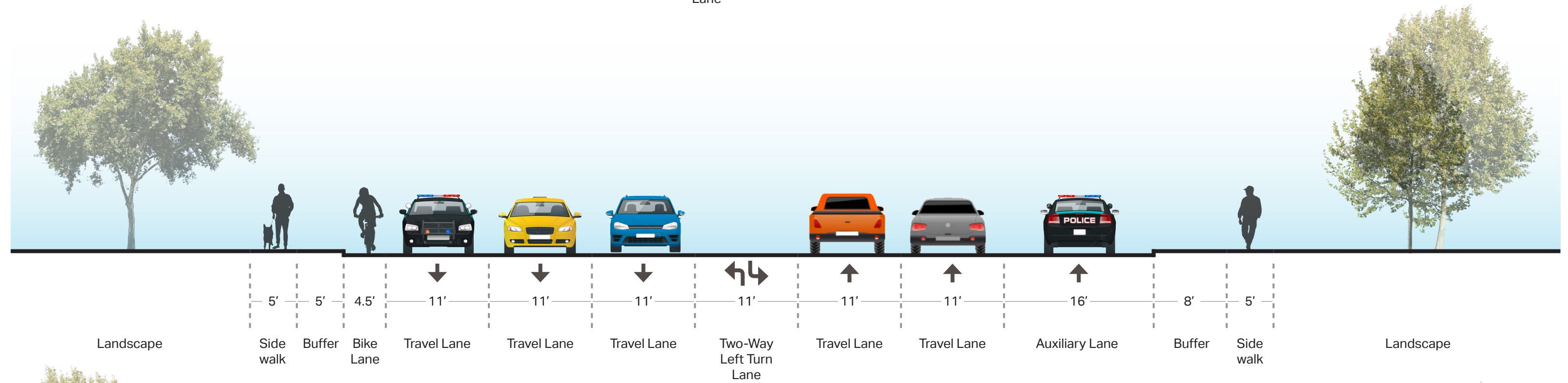
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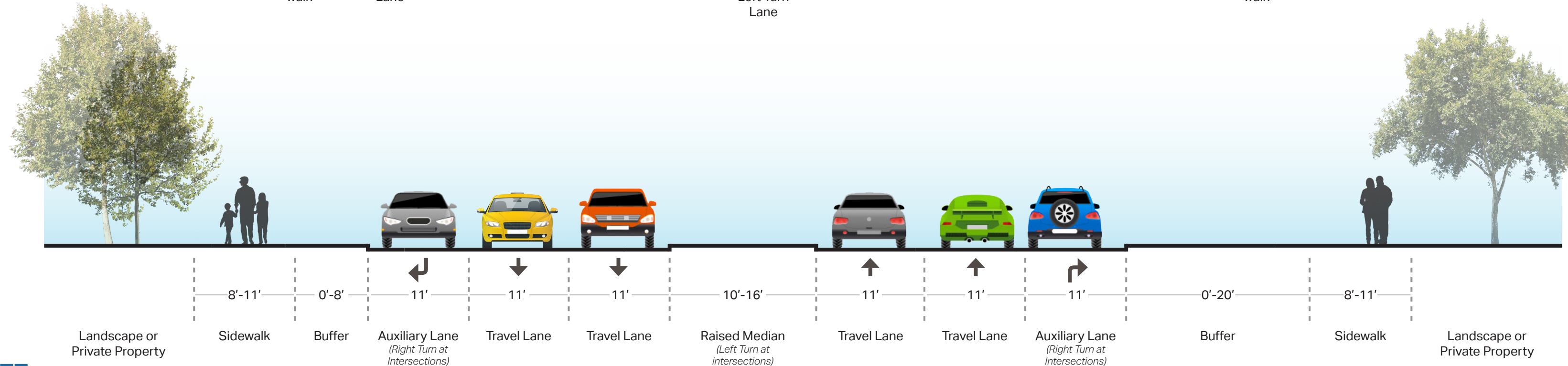
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(VIEW LOOKING NORTH)



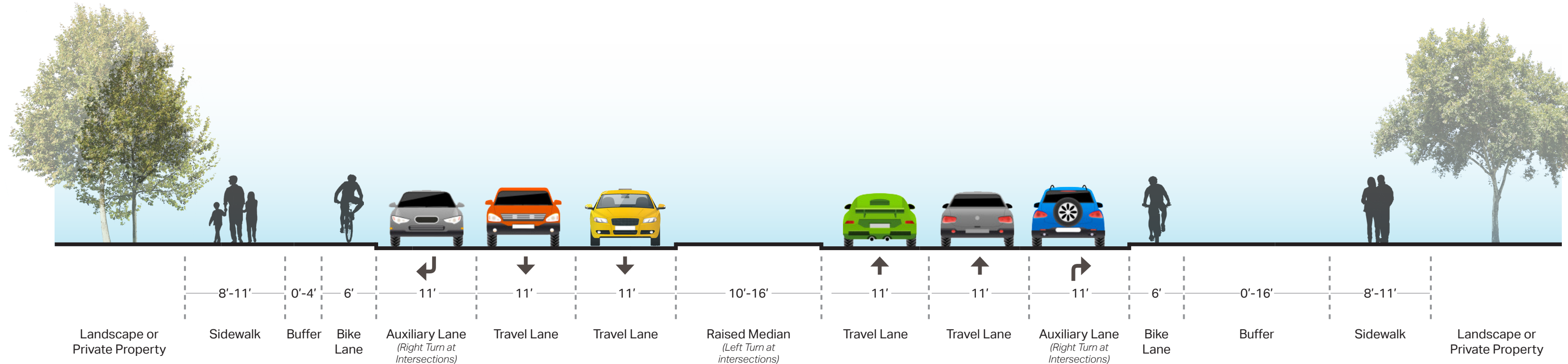
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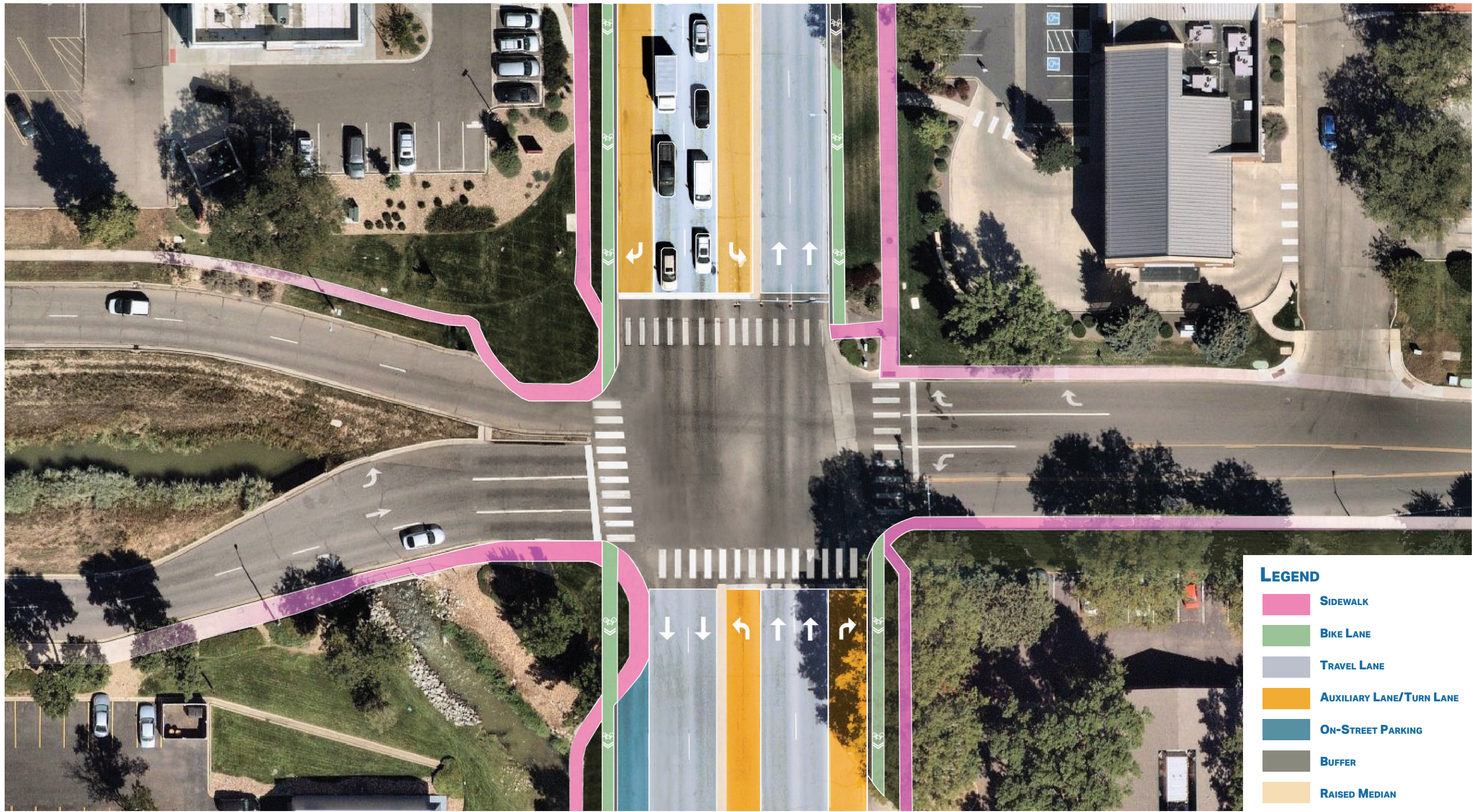
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ULTIMATE AND INTERIM - PLATEAU TO KEN PRATT

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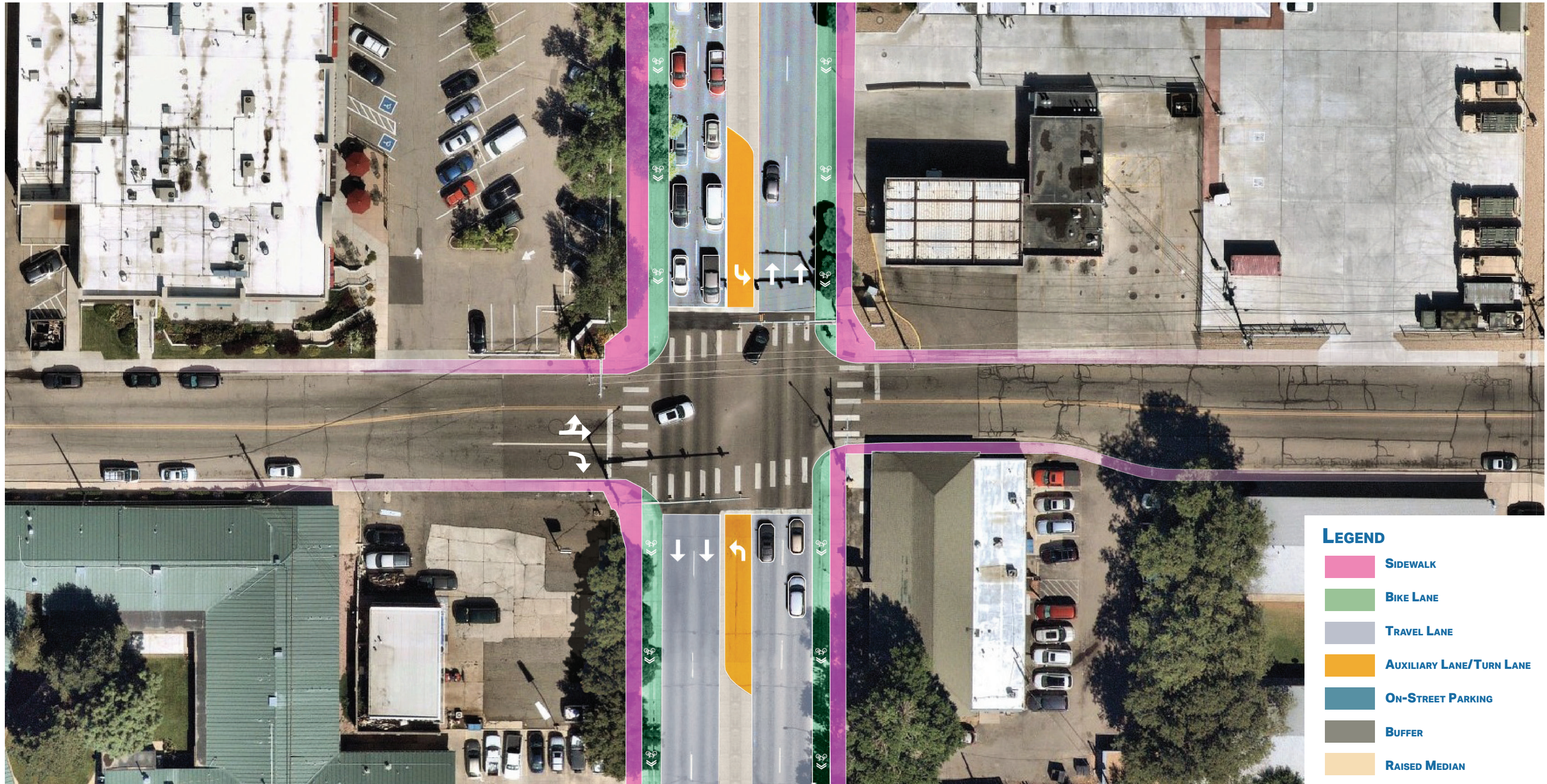
LEGEND

█	SIDEWALK
█	BIKE LANE
█	TRAVEL LANE
█	AUXILIARY LANE/TURN LANE
█	ON-STREET PARKING
█	BUFFER
█	RAISED MEDIAN

NOTE: COLORS ARE FOR DIAGRAMMATIC PURPOSES ONLY.

MAIN STREET ULTIMATE INTERSECTION CONFIGURATION DIAGRAM

MAIN STREET AND 21ST AVENUE



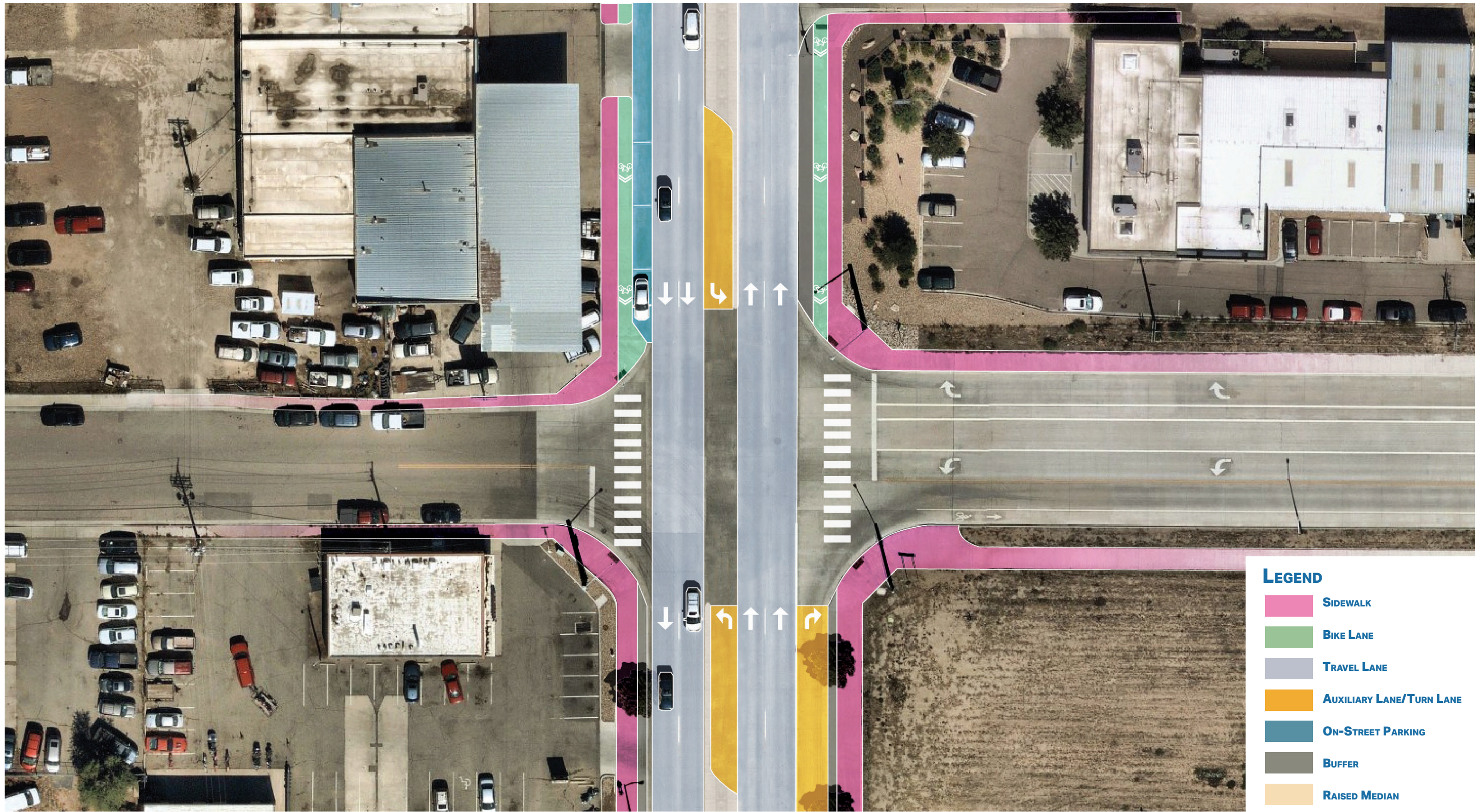
LEGEND

- SIDEWALK
- BIKE LANE
- TRAVEL LANE
- AUXILIARY LANE/TURN LANE
- ON-STREET PARKING
- BUFFER
- RAISED MEDIAN

NOTE: COLORS ARE FOR DIAGRAMMATIC PURPOSES ONLY.

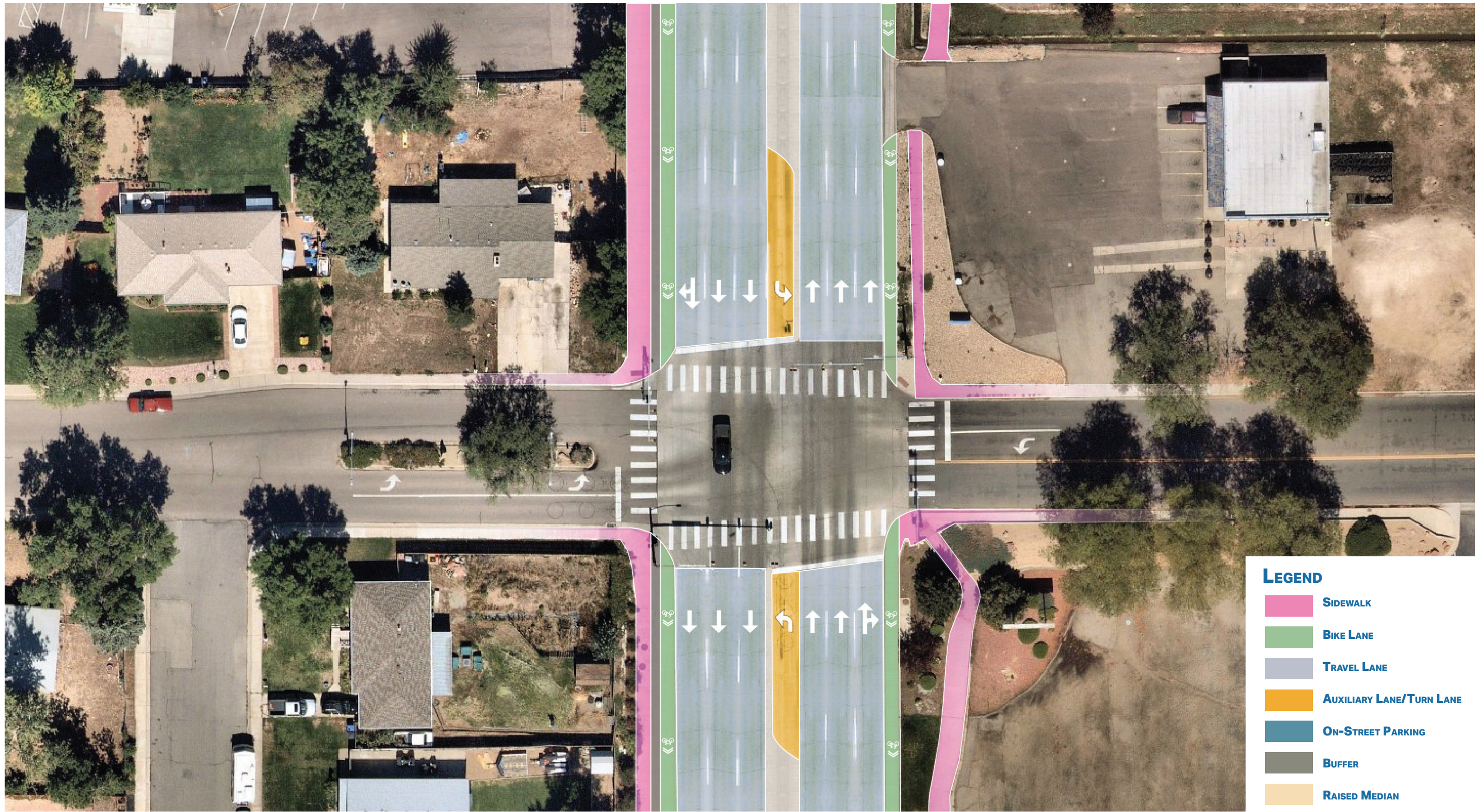
MAIN STREET ULTIMATE INTERSECTION CONFIGURATION DIAGRAM

MAIN STREET AND 15TH AVENUE



MAIN STREET ULTIMATE INTERSECTION CONFIGURATION DIAGRAM

MAIN STREET AND BOSTON AVENUE



LEGEND

- SIDEWALK
- BIKE LANE
- TRAVEL LANE
- AUXILIARY LANE/TURN LANE
- ON-STREET PARKING
- BUFFER
- RAISED MEDIAN

NOTE: COLORS ARE FOR DIAGRAMMATIC PURPOSES ONLY.

MAIN STREET ULTIMATE INTERSECTION CONFIGURATION DIAGRAM

MAIN STREET AND QUEBEC AVENUE