CITY OF AUSTIN PUBLIC WORKS

SAFE ROUTES TO SCHOOL

INFRASTRUCTURE REPORT

CITY COUNCIL DISTRICT 8

austin MOTION 2016 MOBILITY BOND

ACKNOWLEDGMENTS

December 2019

This report is made possible through the Austin 2016 Mobility Bond. For more information, please contact:

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The consultant team was led by Toole Design Group with support from Asakura Robinson, Dunaway|UDG, GGE Consulting, and Adisa Communications.

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City Council District 8

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ABOUT THIS PROJECT

PURPOSE / BACKGROUND

In November 2016, Austin voters approved the 2016 Mobility Bond which provided $27.5 million for Safe Routes to School improvements. The funding will be equally allocated for school access-related projects in Austin's ten City Council districts.

To identify projects, the City of Austin hired consultants to evaluate and prioritize improvements to streets, trails, intersections and sidewalks around 137 elementary and middle schools in the City. The City also conducted a robust public engagement effort to inform recommendations, as described later in this report. The project is taking place over two years and was divided into phases based on the school calendar, with two to three council districts in each phase.

- **Phase 1: Fall 2017** – Council Districts 1 and 10, 28 schools
- **Phase 2: Spring 2018** – Council Districts 2, 8 and 9, 40 schools
- **Phase 3: Fall 2018** – Council Districts 3, 5 and 7, 36 schools
- **Phase 4: Spring 2019** – Council Districts 4 and 6, 33 schools

This report explains the process used to develop the recommendations for schools in City Council District 8, and presents a prioritized list of projects. It also presents a map and matrix showing all the recommendations made for each school. Recommended improvements aim to address identified safety or access issues for students walking and biking to school. **Ideas presented in this document are planning-level concepts: many projects will require further feasibility study and engineering evaluation before they can be implemented. In some locations, alternate approaches to address the issue may prove more feasible or more cost effective. Specific infrastructure treatments are defined and explained in the Austin SRTS Engineering Toolkit (Appendix A).**

SCHOOL AUDITS

School audits in District 8 took place the week of March 19, 2018. Audit teams were led by a team of transportation planners and designers, as well as City of Austin staff from the Departments of Public Works and Transportation, and school representatives. School representatives typically included the principal or a designee and 1-2 parent representatives.

Most audits took place in the early morning, with a brief introductory meeting followed by an observation of school arrival. After the school bell rang, the team reconvened to

Walk Audit at Clayton Elementary School

Walk Audit at Mills Elementary School

debrief and discuss next steps. Following the summary meeting, the consultants and City staff completed the assessment of walking and biking infrastructure around the school, focusing on a half-mile radius for pedestrian facility recommendations and up to a two-mile radius for bicycle facilities. The recommendations were reviewed by City staff for consistency with other planning efforts prior to prioritization.

PUBLIC ENGAGEMENT

In addition to participating in the school audits, members of the public were invited to provide input via an online map and public open houses. Flyers explaining the project and promoting these opportunities were developed in English and Spanish, distributed to school contacts, and published on the City's website and social media channels.

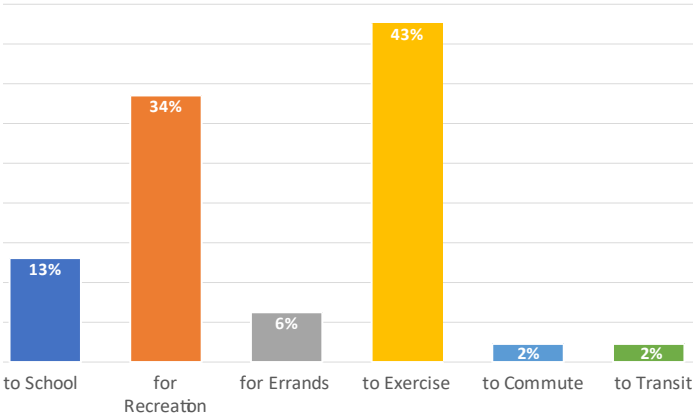
ONLINE INTERACTIVE MAP

The project team used an online interactive map to gather input from the community on the barriers to walking and biking to school. English and Spanish language versions of the online map went live in November 2017. Users could access the maps via links on the City's Safe Routes to School website. Using lines and points, map users were asked to identify barriers, routes their family currently bikes or walks, and difficult routes for biking and walking.

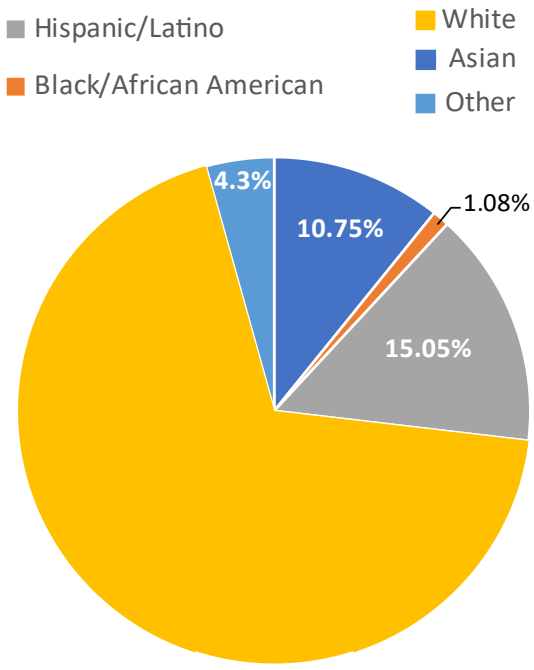
Summary of Responses

Before adding their comments to the map, users were asked to complete a short survey to help understand their background, walking and bicycling habits, and place of residence. The following is a summary of demographic characteristics from respondents from District 8, as well as a map that shows the concentrations of comments made on the map.

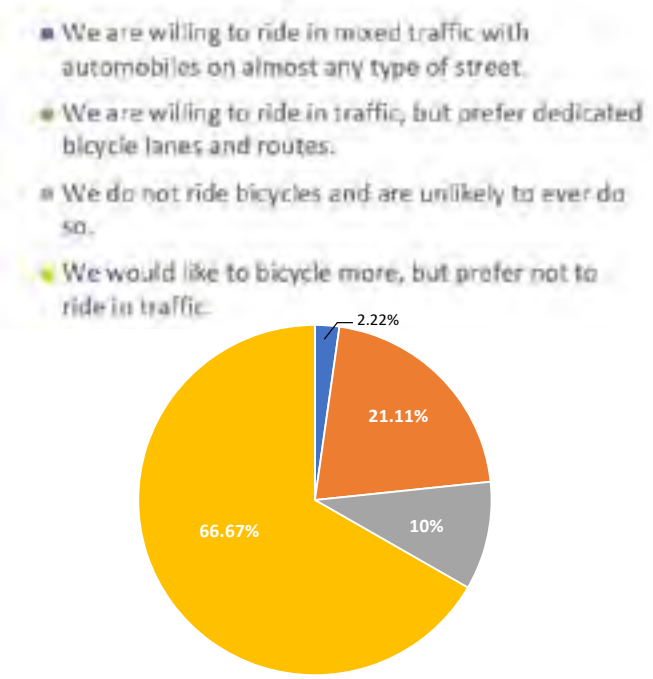
Walking Habits



Demographics



Bicycle Habits



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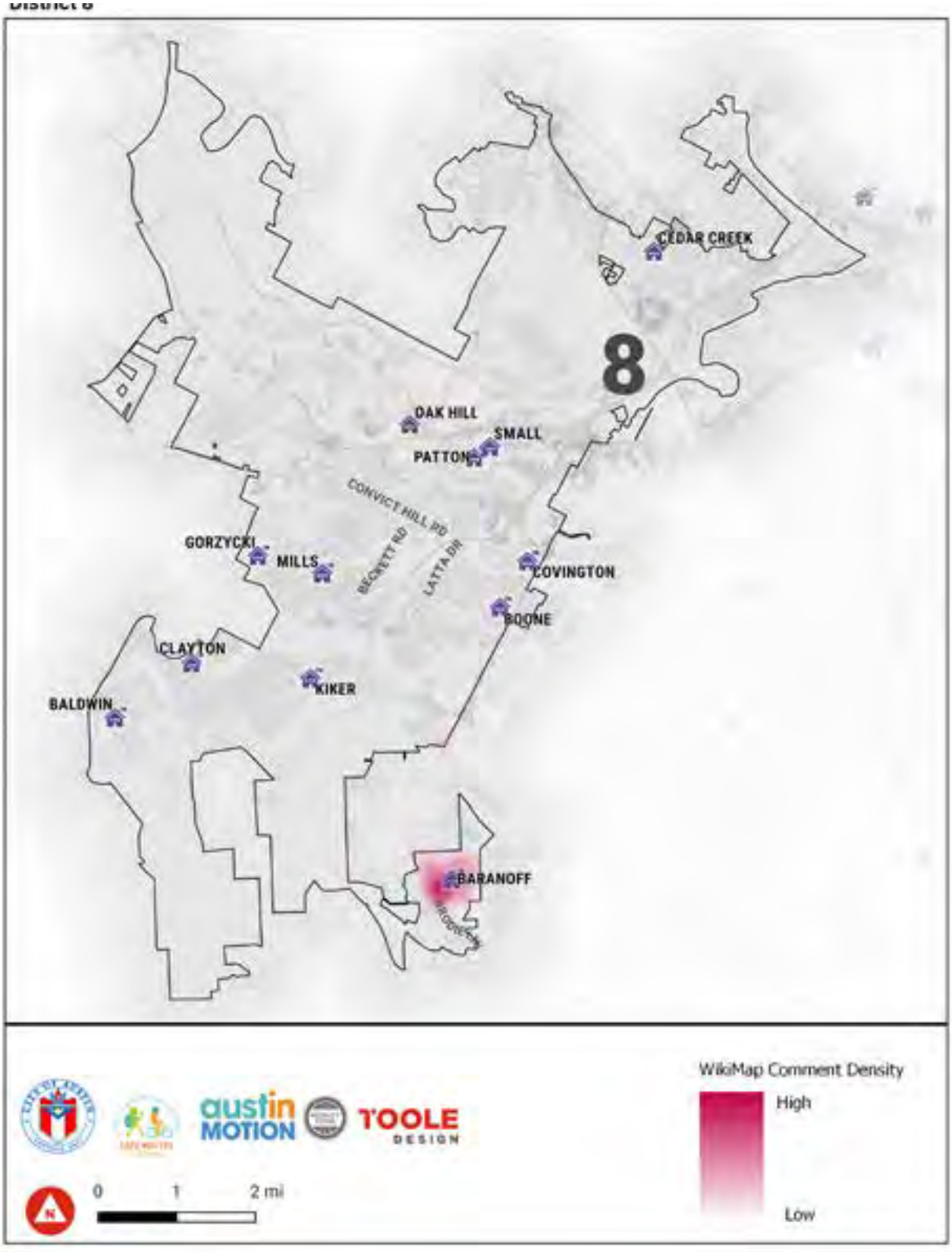
Survey Responses from Online Map Respondents, District 8



Heatmap of Online Map Comments, District 8

OPEN HOUSE

The Open House for District 8 was held at Small Middle School from 4:00 to 7:00 PM on Tuesday, May 1, 2018. The meeting was promoted through various City email listserves, posters at schools, press releases, and the City website. School principals were also informed of the Open House and asked to forward invitations to members of the school community.

At the Open House, tables were set up with maps of each school in District 8, and consultants and city staff were available to discuss concerns and recommendations. Comments received at the Open House were added to the online map and incorporated into the infrastructure recommendations.

PRIORITIZATION

Information from the school audits, online map and open houses was combined to create a list of recommended projects around each school. Then, the projects were scored using a three-step process to create a prioritized list for each council district.

Step 1: Prioritize recommendations based on potential benefit.

To calculate the potential benefit, each project was evaluated on four factors: Stakeholder Input, Safety, Demand and Equity. Using available data, the following scoring system was used to calculate a Benefit Score for each proposed project.

35%: Demand
(Schools within ¼ mile, Potential students served)
+
30%: Safety
(Crash data, Street type, Engineering judgment)
+
20%: Equity
(Free & reduced lunch rate, Poverty rate)
+
15%: Stakeholder Input
(Public comments from Open Houses and WikiMap)
=
100%: Final Benefit Score

Step 2: Adjust for existing conditions.

To further prioritize projects that would create new facilities and close gaps in the existing bicycle and pedestrian networks, the Benefit Score was divided in half for recommendations that improve existing facilities (as opposed to creating new connections/facilities).

Step 3: Calculate cost benefit score.

Planning-level cost estimates for each project were developed based on bid tabulations maintained by the City of Austin. The benefit score was divided by the estimated project cost, and results were sorted into five categories to represent Cost:Benefit - very high, high, med, low, very low.

Cost opinions are order-of-magnitude, planning-level estimates based on local bid tabulations for similar project types. Planning-level cost estimates do not take into

Open House at Small Middle School

Open House at Small Middle School

consideration localized specifics of each project such as right-of-way acquisition, significant utility relocation, etc. They are useful for aggregate-level budget planning, but individual project cost estimates will change as projects advance through further study and design.

After further feasibility study and engineering evaluation, final project cost estimates will change before they can be implemented. In some locations, alternate approaches to address the issue may prove more feasible or more cost effective.

PRIORITIZATION SUMMARY

There are a total of 334 recommended projects in City Council District 8 with a total estimated cost of $73.7 million. (Costs for projects located outside the City are not included in this figure.) The combined costs for all projects in each Overall Benefit category are shown in the table below.

Costs are planning-level estimates that will be refined as projects advance through further study and design. They can be used to evaluate the order-of-magnitude of needs at an aggregate level.

Overall Benefit Category	Combined Project Costs
1 - Very High	$7,300,000
2 - High	$31,100,000
3 - Medium	$18,800,000
4 - Low	$12,000,000
5 - Very Low	$4,500,000
District 8 Total	**$73,700,000**

NEXT STEPS

Both Overall Benefit and Estimated Cost:Benefit will be used to prioritize improvements. However, to use the Safe Routes to School's limited resources most effectively, the program is also considering other factors to determine which projects will move forward as well as project implementation order. These factors include final cost estimates, feasibility, leveraging / cost-sharing opportunities, and more.

Generally, projects will be selected for implementation using the following guiding principles:

1) Implement Projects that have a High/Very High Overall Benefit or a High/Very High Estimated Cost:Benefit,
2) Make meaningful improvements for walking and bicycling near as many schools as possible,
3) For 2016 bond funding, per council direction, balance funding equally per council district,
4) Other available sources of funding will be leveraged to implement additional projects.

The City of Austin has already started examining the feasibility of recommendations and, in some cases, has initiated design/construction for certain projects. Go to AustinTexas.gov/SafeRoutes to learn more and get updates about upcoming Safe Routes to School projects in each City Council District.

CITY COUNCIL DISTRICT 8

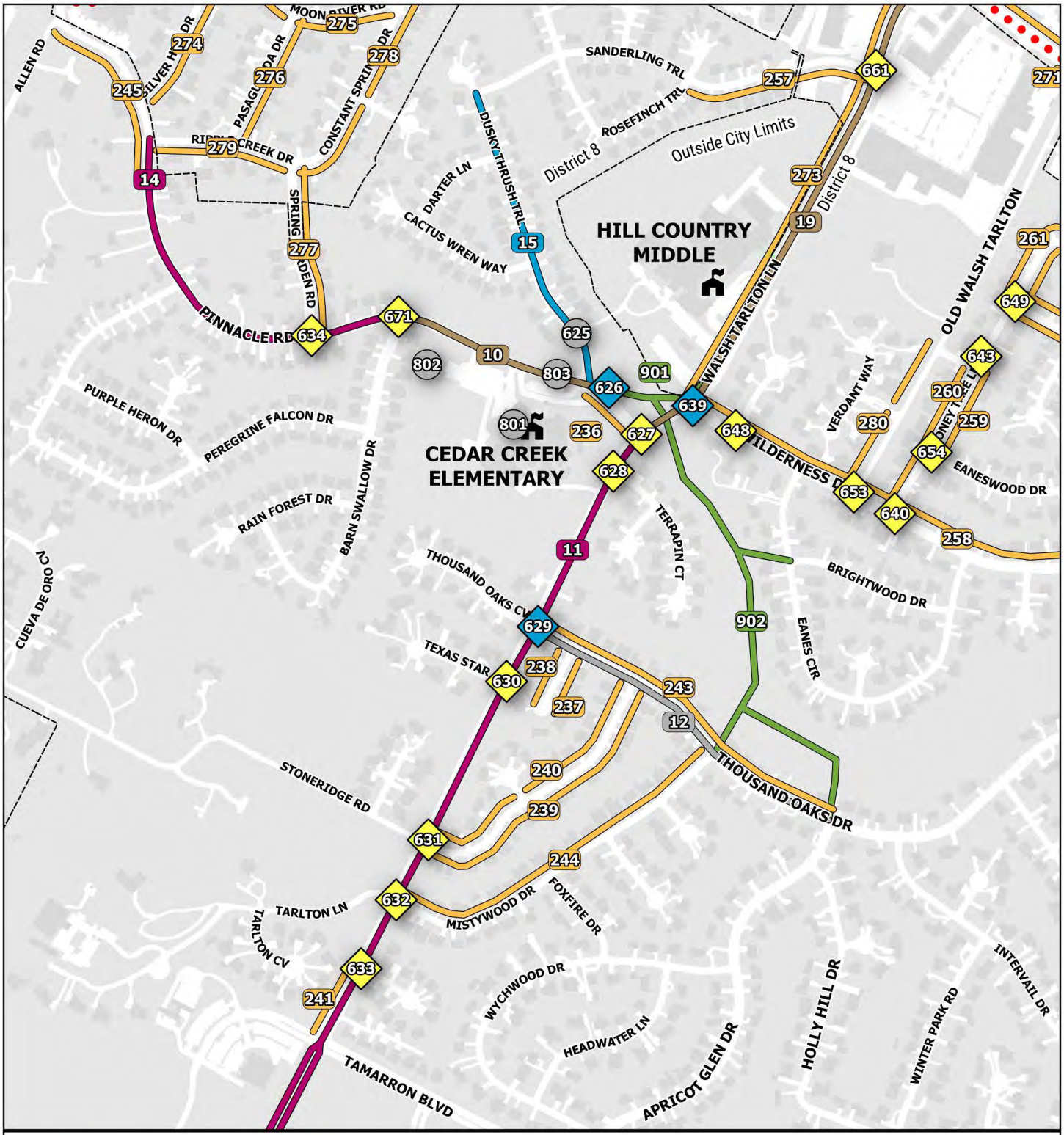
RECOMMENDED SAFE ROUTES TO SCHOOL PROJECTS

The following pages present maps of all recommendations, followed by detailed tables that include the Benefit and Cost: Benefit category for each project. Each recommendation has a unique identification number, which can be cross-referenced between the maps and the tables. The unique project ID is a combination of the school group code (e.g., 1C) and the project number shown on the map (e.g., 001).

Please note: Maps may include project recommendations located in nearby City Council Districts. However, tables within this report only list recommended projects for this district. Go to AustinTexas.gov/SafeRoutesProjects to learn more about citywide project recommendations.

Ideas presented in this document are planning-level concepts: many projects will require further feasibility study and engineering evaluation before they can be implemented. In some locations, alternate approaches to address the issue may prove more feasible or more cost effective.

MAP 2B: CEDAR CREEK ELEMENTARY (EANES ISD)



CITY OF AUSTIN
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2016 MOBILITY BOND

SAFE ROUTES TO SCHOOL

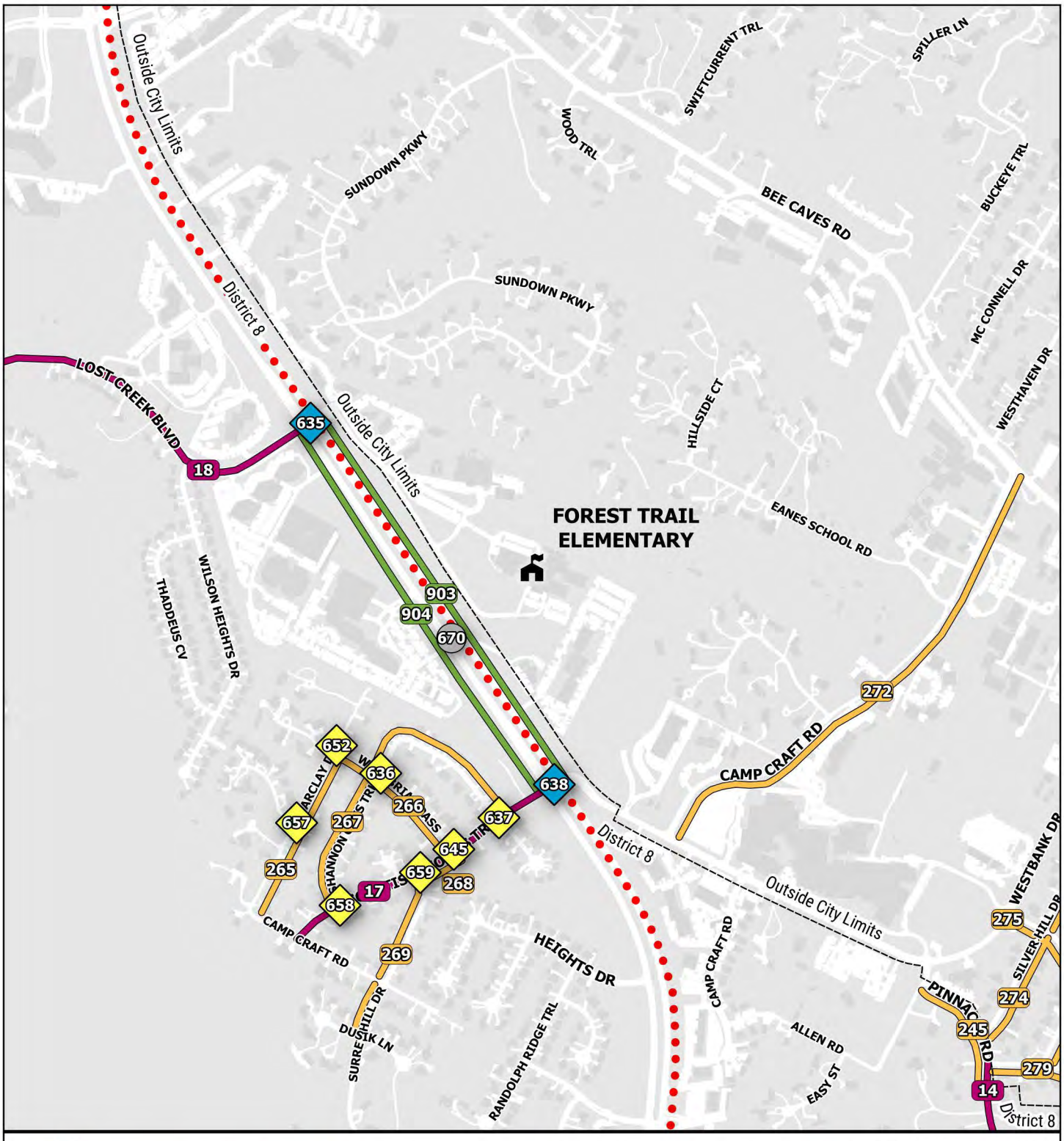
TOOLE DESIGN

0 500 1000 1500 ft

- Off-Street Trail
- Bike Lane / Buffered Bike Lane / Protected Bike Lane
- Sidepath
- Neighborhood Bikeway / Traffic Calming
- New / Improved Sidewalk
- Other linear recommendation
- Traffic Control / Intersection Reconfiguration
- Ramp / Curb Extension / Crosswalk
- Over / Underpass
- Other Spot Recommendation
- Existing Trail
- School Boundary
- Council District Boundary

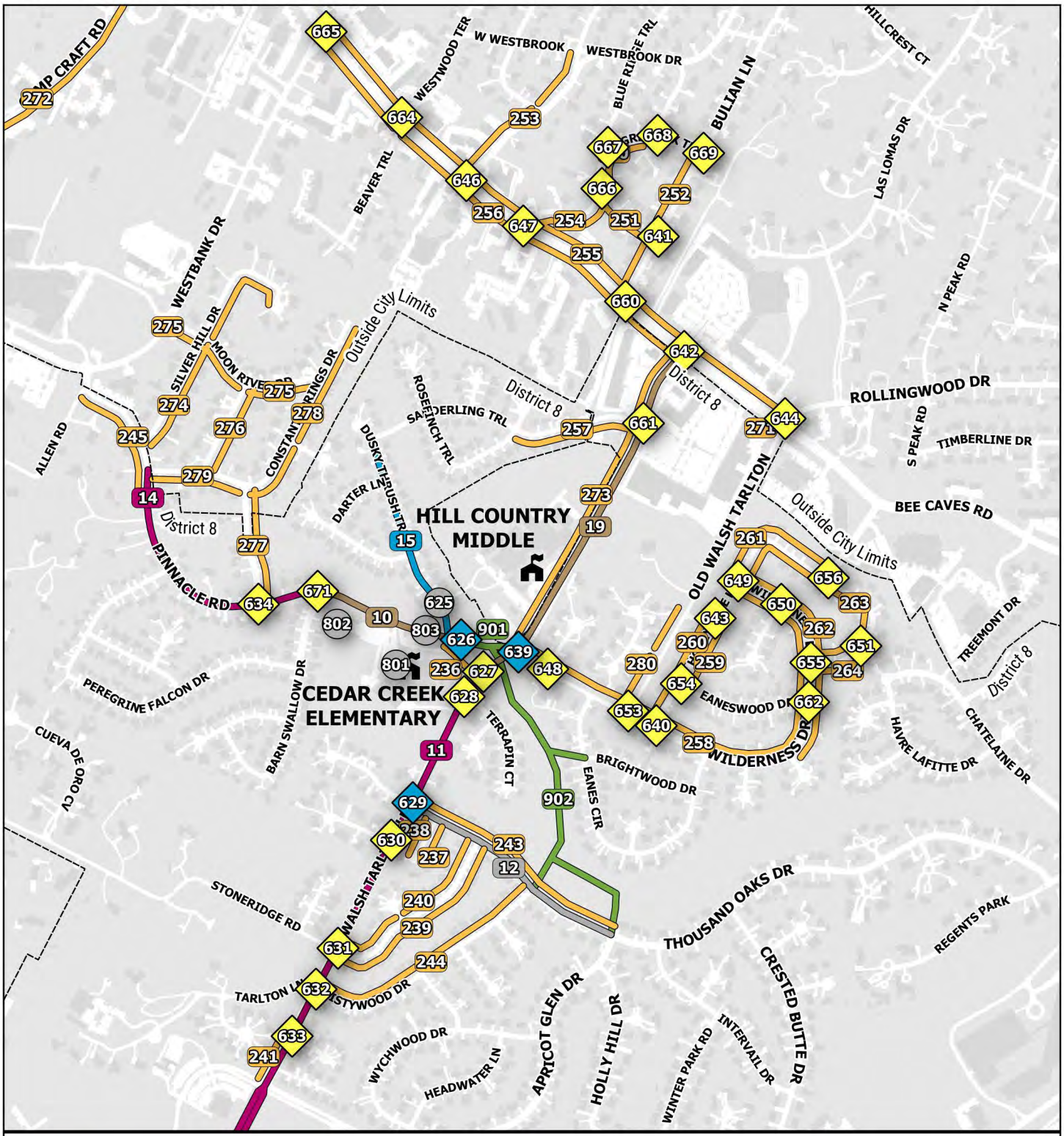
SCHOOL GROUP 2B

MAP 2B: FOREST TRAIL ELEMENTARY (EANES ISD)



Note: Although these schools fall outside of the City of Austin, they were included because a significant portion of the student population lives within city limits. Bond funds will only be spent on projects within the City of Austin.

MAP 2B: HILL COUNTRY MIDDLE (EANES ISD)



Note: Although these schools fall outside of the City of Austin, they were included because a significant portion of the student population lives within city limits. Bond funds will only be spent on projects within the City of Austin.

Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2B - 010	CEDAR CREEK, HILL COUNTRY	PINNACLE RD	No bike facility	Add sidepath - PINNACLE RD from DUSKY THRUSH TRL to BARN SWALLOW DR	3 - Medium	5 - Very Low
2B - 011*	FOREST TRAIL	WALSH TARLTON LN	No bike facility, Vehicle encroachment in bike lane	Protected Bike Lane - WALSH TARLTON LN from WILDERNESS DR to S CAPITAL OF TEXAS HWY NB	1 - Very High	4 - Low
2B - 012	HILL COUNTRY, CEDAR CREEK	THOUSAND OAKS DR	Excessive vehicle speeds	Add chicanes - THOUSAND OAKS DR from THOUSAND OAKS CV to APRICOT GLEN DR Add speed cushions - THOUSAND OAKS DR from THOUSAND OAKS CV to APRICOT GLEN DR	4 - Low	2 - High
2B - 014*	HILL COUNTRY, CEDAR CREEK	PINNACLE RD	No bike facility	Protected Bike Lane - PINNACLE RD from BARN SWALLOW DR to RIPPLE CREEK DR	3 - Medium	3 - Medium
2B - 015	CEDAR CREEK, HILL COUNTRY	DUSKY THRUSH TRL	No bike facility	Neighborhood Bikeway - DUSKY THRUSH TRL from PINNACLE RD to SANDERLING TRL	3 - Medium	2 - High
2B - 017*	FOREST TRAIL	SCOTTISH WOODS TRL	Desired bike route, No bike facility	Add protected bike lane - SCOTTISH WOODS TRL from S CAPITAL OF TEXAS HWY SB to CAMP CRAFT RD ~ +	3 - Medium	3 - Medium
2B - 018*	FOREST TRAIL	LOST CREEK BLVD	Desired bike route, No bike facility	Add sidepath - LOST CREEK BLVD from ARRONIMINK CIR to MAUNA KEA DR , Add protected bike lane - LOST CREEK BLVD from ARRONIMINK CIR to S CAPITAL OF TEXAS HWY NB +	2 - High	5 - Very Low
2B - 019*	HILL COUNTRY, CEDAR CREEK	WALSH TARLTON LN	No bike facility	Add sidepath - WALSH TARLTON LN from BEE CAVES RD to PINNACLE RD	3 - Medium	5 - Very Low

* Indicates projects located outside or partially outside of the City of Austin limits and may not be eligible for Safe Routes to School funding.

Cost:Benefit rankings are preliminary, high-level estimates to identify cost-effective options to address safety concerns. Preliminary rankings are developed using planning-level costs for projects of this nature. Individual cost estimates will change as projects advance. See pages 4-5 of this report for more information.

Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2B - 236	CEDAR CREEK, HILL COUNTRY	PINNACLE RD	Narrow sidewalk	Widen existing sidewalk - PINNACLE RD from WALSH TARLTON LN to DUSKY THRUSH TRL	5 - Very Low	4 - Low
2B - 237	CEDAR CREEK, HILL COUNTRY	THOUSAND OAKS CIR	Missing sidewalk	Construct new sidewalk - THOUSAND OAKS CIR from THOUSAND OAKS DR to Near 1707 THOUSAND OAKS CIR	5 - Very Low	4 - Low
2B - 238	CEDAR CREEK, HILL COUNTRY	THOUSAND OAKS CIR	Missing sidewalk	Construct new sidewalk - THOUSAND OAKS CIR from Near 1706 THOUSAND OAKS CIR to THOUSAND OAKS DR	5 - Very Low	4 - Low
2B - 239	CEDAR CREEK, HILL COUNTRY	STONERIDGE RD	Missing sidewalk	Construct new sidewalk - STONERIDGE RD from WALSH TARLTON LN to THOUSAND OAKS DR	4 - Low	5 - Very Low
2B - 240	CEDAR CREEK, HILL COUNTRY	STONERIDGE RD	Missing sidewalk	Construct new sidewalk - STONERIDGE RD from WALSH TARLTON LN to THOUSAND OAKS DR	4 - Low	5 - Very Low
2B - 241	CEDAR CREEK	WALSH TARLTON LN	Missing sidewalk	Construct new sidewalk - WALSH TARLTON LN from WATKINS WAY to TWINBERRY CV	4 - Low	3 - Medium
2B - 243	CEDAR CREEK, HILL COUNTRY	THOUSAND OAKS DR	Missing sidewalk	Construct new sidewalk - THOUSAND OAKS DR from WALSH TARLTON LN to APRICOT GLEN DR	4 - Low	4 - Low
2B - 244	HILL COUNTRY, CEDAR CREEK	MISTYWOOD DR	Missing sidewalk	Construct new sidewalk - MISTYWOOD DR from TARLTON LN to MISTYGLEN CIR Construct new sidewalk - MISTYWOOD DR from MISTYGLEN CIR to THOUSAND OAKS DR	4 - Low	5 - Very Low
2B - 245*	CEDAR CREEK, HILL COUNTRY	PINNACLE RD	Missing sidewalk	Construct new sidewalk - PINNACLE RD from 3607 PINNACLE RD to ALLEN RD	4 - Low	4 - Low

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Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2B - 250*	HILL COUNTRY	BLUE RIDGE TRL	Missing sidewalk	Construct new sidewalk - BLUE RIDGE TRL from ROCK PARK DR to GREY FOX TRL , Construct new sidewalk - GREY FOX TRL from BLUE RIDGE TRL to HALF MOON CV	5 - Very Low	5 - Very Low
2B - 251*	HILL COUNTRY	ROCK PARK DR	Missing sidewalk	Construct new sidewalk - ROCK PARK DR from BULIAN LN to BLUE RIDGE TRL	5 - Very Low	5 - Very Low
2B - 252*	HILL COUNTRY	BULIAN LN	Missing sidewalk	Construct new sidewalk - BULIAN LN from GREY FOX TRL to BEE CAVES RD	5 - Very Low	5 - Very Low
2B - 253*	HILL COUNTRY	WESTBROOK DR	Missing sidewalk	Construct new sidewalk - WESTBROOK DR from BEE CAVES RD to W WESTBROOK	5 - Very Low	5 - Very Low
2B - 254*	HILL COUNTRY	BLUE RIDGE TRL	Missing sidewalk	Construct new sidewalk - BLUE RIDGE TRL from BEE CAVES RD to ROCK PARK DR	5 - Very Low	5 - Very Low
2B - 255*	HILL COUNTRY	BEE CAVES RD	Missing sidewalk	Construct new sidewalk - BEE CAVES RD from OLD WALSH TARLTON to WESTBANK DR	4 - Low	5 - Very Low
2B - 256*	HILL COUNTRY, CEDAR CREEK	BEE CAVES RD	Missing sidewalk	Construct new sidewalk - BEE CAVES RD from WALSH TARLTON LN to WESTBANK DR	4 - Low	5 - Very Low
2B - 257*	HILL COUNTRY, CEDAR CREEK	SANDERLING TRL	Missing sidewalk	Construct new sidewalk - SANDERLING TRL from WALSH TARLTON LN to ROSEFINCH TRL	5 - Very Low	5 - Very Low
2B - 258	HILL COUNTRY, CEDAR CREEK	WILDERNESS DR	Missing sidewalk	Construct new sidewalk - WILDERNESS DR from WALSH TARLTON LN to Near 1208 WILDERNESS DR	3 - Medium	5 - Very Low
2B - 259	HILL COUNTRY, CEDAR CREEK	HONEY TREE LN	Missing sidewalk	Construct new sidewalk - HONEY TREE LN from EANES XING to EANESWOOD DR	5 - Very Low	4 - Low
2B - 260	HILL COUNTRY, CEDAR CREEK	HONEY TREE LN	Missing sidewalk	Construct new sidewalk - HONEY TREE LN from EANES XING to WILDERNESS DR	5 - Very Low	4 - Low
2B - 261	HILL COUNTRY, CEDAR CREEK	HONEY TREE LN	Missing sidewalk	Construct new sidewalk - HONEY TREE LN from BEECAVE WOODS DR to WILDERNESS DR	5 - Very Low	5 - Very Low
2B - 262	HILL COUNTRY, CEDAR CREEK	WILDERNESS DR	Missing sidewalk	Construct new sidewalk - WILDERNESS DR from CHICORY CV to HONEY TREE LN	5 - Very Low	5 - Very Low

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Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2B - 263	HILL COUNTRY, CEDAR CREEK	HONEY TREE LN	Missing sidewalk	Construct new sidewalk - HONEY TREE LN from WILDERNESS DR to Near 3009 HONEY TREE LN	5 - Very Low	5 - Very Low
2B - 264	HILL COUNTRY, CEDAR CREEK	HONEY TREE LN	Missing sidewalk	Construct new sidewalk - HONEY TREE LN from WILDERNESS DR to HAVEN SPRING DR	5 - Very Low	5 - Very Low
2B - 265	FOREST TRAIL	BARCLAY DR	Missing sidewalk	Construct new sidewalk - BARCLAY DR from CAMP CRAFT RD to WILD BRIAR PASS	5 - Very Low	5 - Very Low
2B - 266	FOREST TRAIL	WILD BRIAR PASS	Missing sidewalk	Construct new sidewalk - WILD BRIAR PASS from SCOTTISH WOODS TRL to BARCLAY DR	5 - Very Low	5 - Very Low
2B - 267	FOREST TRAIL	SHANNON OAKS TRL	Missing sidewalk	Construct new sidewalk - SHANNON OAKS TRL from SCOTTISH WOODS TRL to SCOTTISH WOODS TRL	5 - Very Low	5 - Very Low
2B - 268	FOREST TRAIL	SCOTTISH WOODS TRL	Missing sidewalk	Construct new sidewalk - SCOTTISH WOODS TRL from WILD BRIAR PASS to SURREY HILL DR	5 - Very Low	4 - Low
2B - 269	FOREST TRAIL	SURREY HILL DR	Missing sidewalk	Construct new sidewalk - SURREY HILL DR from DUSIK LN to SCOTTISH WOODS TRL	5 - Very Low	5 - Very Low
2B - 270*	None (nearest school: Forest Trail)	SERVICE DRIVE FOR VALLEY VIEW/FOREST TRAIL	Missing sidewalk	New sidewalk along school driveway from LOST CREEK BLVD to end	4 - Low	5 - Very Low
2B - 271*	HILL COUNTRY	BEE CAVES RD	Missing sidewalk	Construct new sidewalk - BEE CAVES RD from OLD WALSH TARLTON to Near 3201 BEE CAVES RD	4 - Low	3 - Medium
2B - 272*	None (nearest school: Hill Country Middle)	CAMP CRAFT RD	Missing sidewalk	Construct new sidewalk - CAMP CRAFT RD from BEE CAVES RD to WESTBANK DR	4 - Low	5 - Very Low

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2B - 273*	HILL COUNTRY, CEDAR CREEK	WALSH TARLTON LN	Missing sidewalk	Construct new sidewalk - WALSH TARLTON LN from WILDERNESS DR to BEE CAVES RD	3 - Medium	5 - Very Low
2B - 274*	HILL COUNTRY, CEDAR CREEK	SILVER HILL DR	Missing sidewalk	Construct new sidewalk - SILVER HILL DR from SILVER HILL CIR to PINNACLE RD , Construct new sidewalk - SILVER HILL CIR from SILVER HILL DR to Near 3605 SILVER HILL CIR	5 - Very Low	5 - Very Low
2B - 275*	HILL COUNTRY, CEDAR CREEK	MOON RIVER RD	Missing sidewalk	Construct new sidewalk - MOON RIVER RD from WESTBANK DR to CONSTANT SPRINGS DR	5 - Very Low	5 - Very Low
2B - 276*	HILL COUNTRY, CEDAR CREEK	PASAGUARDA DR	Missing sidewalk	Construct new sidewalk - PASAGUARDA DR from RIPPLE CREEK DR to MOON RIVER RD	5 - Very Low	5 - Very Low
2B - 277*	HILL COUNTRY, CEDAR CREEK	SPRING GARDEN RD	Missing sidewalk	Construct new sidewalk - SPRING GARDEN RD from CONSTANT SPRINGS DR to PINNACLE RD	4 - Low	4 - Low
2B - 278*	HILL COUNTRY, CEDAR CREEK	CONSTANT SPRINGS DR	Missing sidewalk	Construct new sidewalk - CONSTANT SPRINGS DR from Near 1101 CONSTANT SPRINGS DR to RIPPLE CREEK DR	5 - Very Low	5 - Very Low
2B - 279*	HILL COUNTRY, CEDAR CREEK	RIPPLE CREEK DR	Missing sidewalk	Construct new sidewalk - RIPPLE CREEK DR from PINNACLE RD to SPRING GARDEN RD	5 - Very Low	5 - Very Low
2B - 280	HILL COUNTRY, CEDAR CREEK	OLD WALSH TARLTON	Missing sidewalk	Construct new sidewalk - OLD WALSH TARLTON from WILDERNESS DR to EANES XING	4 - Low	4 - Low
2B - 625	CEDAR CREEK, HILL COUNTRY	Midblock - DUSKY THRUSH TRL	Poor sightlines	Tighten curb radii, Harden centerline +	4 - Low	3 - Medium

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Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2B - 626	HILL COUNTRY, CEDAR CREEK	DUSKY THRUSH TRL / PINNACLE RD	Missing curb ramps, No lighting, Non-compliant curb ramps	Add lighting , Add Rapid Flashing Beacon on Pinnacle Road , Add new curb ramp [2] , Replace existing curb ramp [2]	3 - Medium	2 - High
2B - 627	HILL COUNTRY, CEDAR CREEK	PINNACLE RD / WALSH TARLTON LN	Missing curb ramps,Non-compliant curb ramps,Non-ADA push buttons, Too small area for waiting	Tighten curb radii Replace existing curb ramps [3] Widen sidewalk +	2 - High	3 - Medium
2B - 628	CEDAR CREEK, HILL COUNTRY	TERRAPIN CT / WALSH TARLTON LN	Difficult crossing	Install high visibility crosswalk (1) across Terrapin Court Install high visibility crosswalk [1] across Walsh Tarlton +	3 - Medium	1 - Very High
2B - 629	HILL COUNTRY, CEDAR CREEK	THOUSAND OAKS CV / THOUSAND OAKS DR / WALSH TARLTON LN	Difficult crossing	Install high visibility crosswalk [1] across Walsh Tarlton Install Pedestrian Hybrid Beacon Install refuge island +	3 - Medium	2 - High

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Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2B - 630	CEDAR CREEK, HILL COUNTRY	TEXAS STAR LN / WALSH TARLTON LN	Difficult crossing	Install high visibility crosswalk (1) across Texas Star Lane Install high visibility crosswalk [1] across Walsh Tarlton +	5 - Very Low	3 - Medium
2B - 631	CEDAR CREEK	STONERIDGE RD / WALSH TARLTON LN	Difficult crossing	Install high visibility crosswalk [1] across Walsh Tarlton Install Rapid Flash Beacon +	4 - Low	3 - Medium
2B - 632	CEDAR CREEK	MISTYWOOD DR / TARLTON LN / WALSH TARLTON LN	Difficult crossing	Install high visibility crosswalk [1] across Walsh Tarlton Install high visibility crosswalks (2) across Mistywood Drive and Tarlton Lane +	4 - Low	2 - High
2B - 633	CEDAR CREEK	TWINBERRY CV / WALSH TARLTON LN	Difficult crossing	Install high visibility crosswalk (1) across Twinberry Cove Install high visibility crosswalk [1] across Walsh Tarlton +	4 - Low	2 - High
2B - 634	CEDAR CREEK, HILL COUNTRY	PINNACLE RD / SPRING GARDEN RD	difficult crossing	Add curb extensions Install traffic signal	4 - Low	5 - Very Low

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2B - 635*	FOREST TRAIL	LOST CREEK BLVD / S CAPITAL OF TEXAS HWY NB / S CAPITAL OF TEXAS HWY SB	Difficult crossing, High speed crossing, Long crossing distance, Missing curb ramps, Non-ADA push buttons, No pedestrian signals	Add median refuge island on 360 capital of texas highway , Add new curb ramp [3] , Install high visibility crosswalk [2] across lost creek blvd and 360 capital of texas highway , Install/update pedestrian push buttons [1]	2 - High	2 - High
2B - 636	FOREST TRAIL	SHANNON OAKS TRL / WILD BRIAR PASS	Missing curb ramps, Non-compliant curb ramps	Add new curb ramp [2] , Replace existing curb ramp [2]	5 - Very Low	4 - Low
2B - 637	FOREST TRAIL	SCOTTISH WOODS TRL / SHANNON OAKS TRL	Non-compliant curb ramps	Replace existing curb ramp [2]	5 - Very Low	5 - Very Low

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2B - 638*	FOREST TRAIL	S CAPITAL OF TEXAS HWY NB / S CAPITAL OF TEXAS HWY SB / SCOTTISH WOODS TRL / WESTBANK DR	Difficult crossing, High speed crossing, Long crossing distance, Missing curb ramps, Non-ADA push buttons, No pedestrian signals	Add median refuge island on 360 capital high way , Add new curb ramp [3] , Eliminate slip lane [1] , Install high visibility crosswalk [2] across scottish woods trail and 360 capital highway , Install/update pedestrian push buttons [1]	4 - Low	4 - Low
2B - 639	HILL COUNTRY, CEDAR CREEK	WALSH TARLTON LN / WILDERNESS DR	Difficult crossing, High speed crossing, Missing curb ramps, No pedestrian signals, Poor sightlines	Add new curb ramp [2] , Install high visibility crosswalk [1] across Walsh Tarlton Ln , Install Pedestrian Hybrid Beacon	2 - High	2 - High
2B - 640	HILL COUNTRY, CEDAR CREEK	HONEY TREE LN / WILDERNESS DR	Missing curb ramps	Add new curb ramp [2]	4 - Low	2 - High
2B - 641*	HILL COUNTRY	BULIAN LN / ROCK PARK DR	Missing curb ramps	Add new curb ramp [2]	5 - Very Low	4 - Low

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2B - 642*	HILL COUNTRY, CEDAR CREEK	BEE CAVES RD / WALSH TARLTON LN	Faded crosswalk markings, High speed crossing, Long crossing distance, Non-ADA push buttons, Non-compliant curb ramps	Add guardrail over culvert , Adjust signal timing , Repaint crosswalk markings [4] across Bee Caves Rd and Walsh Tarlton Ln , Replace existing curb ramp [4]	3 - Medium	2 - High
2B - 643	HILL COUNTRY, CEDAR CREEK	EANES XING / HONEY TREE LN	Missing curb ramps, Non-compliant curb ramps	Add new curb ramp [1] , Replace existing curb ramp [1]	4 - Low	2 - High
2B - 644*	HILL COUNTRY	BEE CAVES RD / OLD WALSH TARLTON / ROLLINGWOOD DR	Missing curb ramps	Add new curb ramp [1]	4 - Low	2 - High
2B - 645	FOREST TRAIL	SCOTTISH WOODS TRL / WILD BRIAR PASS	Non-compliant curb ramps	Replace existing curb ramp [2]	5 - Very Low	5 - Very Low
2B - 646*	HILL COUNTRY	BEE CAVES RD / WESTBROOK DR	Missing curb ramps	Add new curb ramp [2] , Eliminate slip lane [1] , Install high visibility crosswalk [1] across Westbrook Dr	5 - Very Low	5 - Very Low

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2B - 647*	HILL COUNTRY	BEE CAVES RD / BLUE RIDGE TRL	Missing curb ramps	Add new curb ramp [2]	5 - Very Low	3 - Medium
2B - 648	HILL COUNTRY, CEDAR CREEK	BRIANS MEADOW CV / WILDERNESS DR	Missing curb ramps	Add new curb ramp [2]	3 - Medium	1 - Very High
2B - 649	HILL COUNTRY, CEDAR CREEK	HONEY TREE LN / WILDERNESS DR	Non-compliant curb ramps	Replace existing curb ramp [2]	5 - Very Low	5 - Very Low
2B - 650	HILL COUNTRY, CEDAR CREEK	WILDERNESS CV / WILDERNESS DR	Missing curb ramps	Add new curb ramp [2]	5 - Very Low	4 - Low
2B - 651	HILL COUNTRY	HAVEN SPRING DR / HONEY TREE LN	Missing curb ramps, Non-compliant curb ramps	Add new curb ramp [1] , Replace existing curb ramp [1]	5 - Very Low	4 - Low
2B - 652	FOREST TRAIL	BARCLAY DR / WILD BRIAR PASS	Missing curb ramps	Add new curb ramp [2]	5 - Very Low	4 - Low
2B - 653	HILL COUNTRY, CEDAR CREEK	OLD WALSH TARLTON / WILDERNESS DR	Missing curb ramps	Add new curb ramp [2]	4 - Low	2 - High

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2B - 654	HILL COUNTRY, CEDAR CREEK	EANESWOOD DR / HONEY TREE LN	Non-compliant curb ramps	Replace existing curb ramp [2]	5 - Very Low	4 - Low
2B - 655	HILL COUNTRY, CEDAR CREEK	HONEY TREE LN / WILDERNESS DR	Missing curb ramps, Non-compliant curb ramps	Add new curb ramp [1] , Replace existing curb ramp [1]	5 - Very Low	4 - Low
2B - 656	HILL COUNTRY	BEECAVE WOODS DR / HONEY TREE LN	Non-compliant curb ramps	Replace existing curb ramp [2]	5 - Very Low	5 - Very Low
2B - 657	FOREST TRAIL	BARCLAY DR / BARCLAY HEIGHTS CT	Missing curb ramps	Add new curb ramp [2]	5 - Very Low	4 - Low
2B - 658	FOREST TRAIL	SCOTTISH WOODS TRL / SHANNON OAKS TRL	Non-compliant curb ramps	Replace existing curb ramp [2]	5 - Very Low	5 - Very Low
2B - 659	FOREST TRAIL	SCOTTISH WOODS TRL / SURREY HILL DR	Non-compliant curb ramps	Replace existing curb ramp [2]	5 - Very Low	5 - Very Low

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2B - 660*	HILL COUNTRY	BEE CAVES RD / BULIAN LN	Missing curb ramps	Add new curb ramp [2] , Install high visibility crosswalk [1] across Bulian Ln	4 - Low	3 - Medium
2B - 661	HILL COUNTRY, CEDAR CREEK	SANDERLIN G TRL / WALSH TARLTON LN	Non-compliant curb ramps	Replace existing curb ramp [2]	5 - Very Low	3 - Medium
2B - 662	HILL COUNTRY, CEDAR CREEK	EANESWOO D DR / WILDERNES S DR	Missing curb ramps	Add new curb ramp [2]	5 - Very Low	3 - Medium
2B - 663*	None (nearest school: Forest Trail)	LOST CREEK BLVD	Non-compliant curb ramps	Replace existing curb ramp [2]	5 - Very Low	4 - Low
2B - 664*	None (nearest school: Hill Country)	Midblock - BEE CAVES RD	Missing curb ramps	Add new curb ramp [2] , Eliminate slip lane [2] , Install high visibility crosswalk [1] across Westbrook Terrace	5 - Very Low	5 - Very Low
2B - 665*	None (nearest school: Hill Country)	BEE CAVES RD	Missing curb ramps	Add new curb ramp [2]	4 - Low	3 - Medium
2B - 666*	HILL COUNTRY	BLUE RIDGE TRL / ROCK PARK DR	Missing curb ramps	Add new curb ramp [2]	5 - Very Low	4 - Low
2B - 667*	None (nearest school: Hill Country)	BLUE RIDGE TRL	Missing curb ramps	Add new curb ramp [1]	5 - Very Low	4 - Low

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2B - 668*	None (nearest school: Hill Country)	GREY FOX TRL / STONEWALL LN	Missing curb ramps	Add new curb ramp [2]	5 - Very Low	4 - Low
2B - 669*	None (nearest school: Hill Country)	BULIAN LN / GREY FOX TRL	Missing curb ramps	Add new curb ramp [2]	5 - Very Low	4 - Low
2B - 670*	FOREST TRAIL	Midblock - S CAPITAL OF TEXAS HWY SB	High speed crossing, Long crossing distance	Construct overpass	4 - Low	5 - Very Low
2B - 671	HILL COUNTRY, CEDAR CREEK	BARN SWALLOW DR / PINNACLE RD	Difficult crossing	Add curb extensions [2] on Barn Swallow	4 - Low	3 - Medium
2B - 801	HILL COUNTRY, CEDAR CREEK	Near 3301 PINNACLE RD	No curb ramp on path	Install curb ramp (1)	3 - Medium	2 - High
2B - 802	HILL COUNTRY, CEDAR CREEK	Near 1503 BARN SWALLOW DR	Confirm ownership of pathway	Confirm ownership of pathway	4 - Low	3 - Medium
2B - 803	HILL COUNTRY, CEDAR CREEK	Near 1318 DUSKY THRUSH TRL	Existing signage blocking school zone sign	Move signs	5 - Very Low	3 - Medium

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2B - 901	HILL COUNTRY, CEDAR CREEK	North of Pinnacle Road to the east side of Walsh Tarlton	No trail connection	Construct new trail	2 - High	4 - Low
2B - 902	HILL COUNTRY, CEDAR CREEK	Walsh Tarlton LN to Thousand Oaks Drive	No trail connection	Construct new trail	2 - High	5 - Very Low
2B - 903*	HILL COUNTRY, FOREST TRAIL	Near 1301 CAPITAL OF TEXAS HWY	No trail connection	Construct new shared use path	2 - High	5 - Very Low
2B - 904*	FOREST TRAIL	Near 1040 CAPITAL OF TEXAS HWY	No trail connection	Construct new shared use path	2 - High	5 - Very Low

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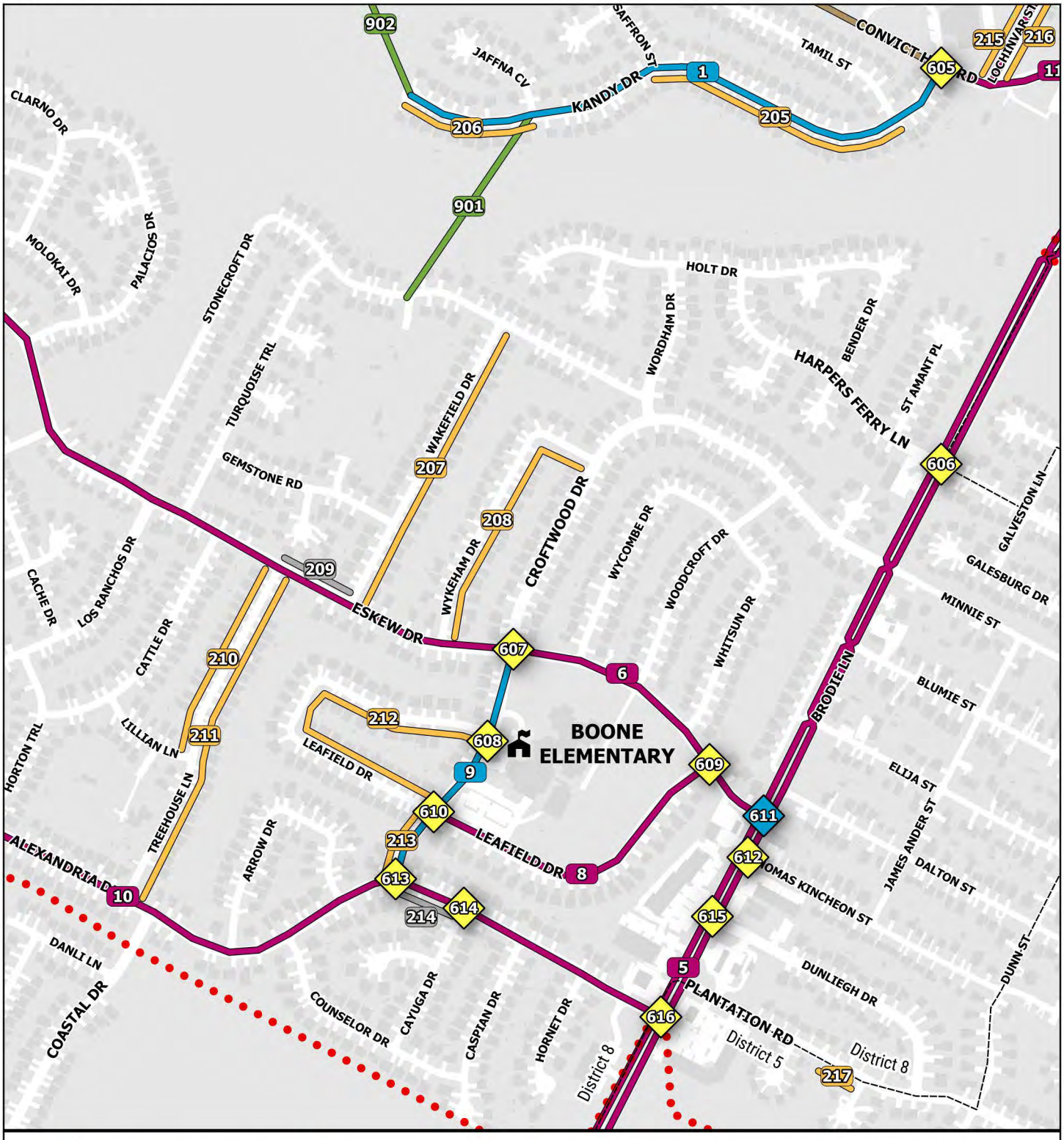
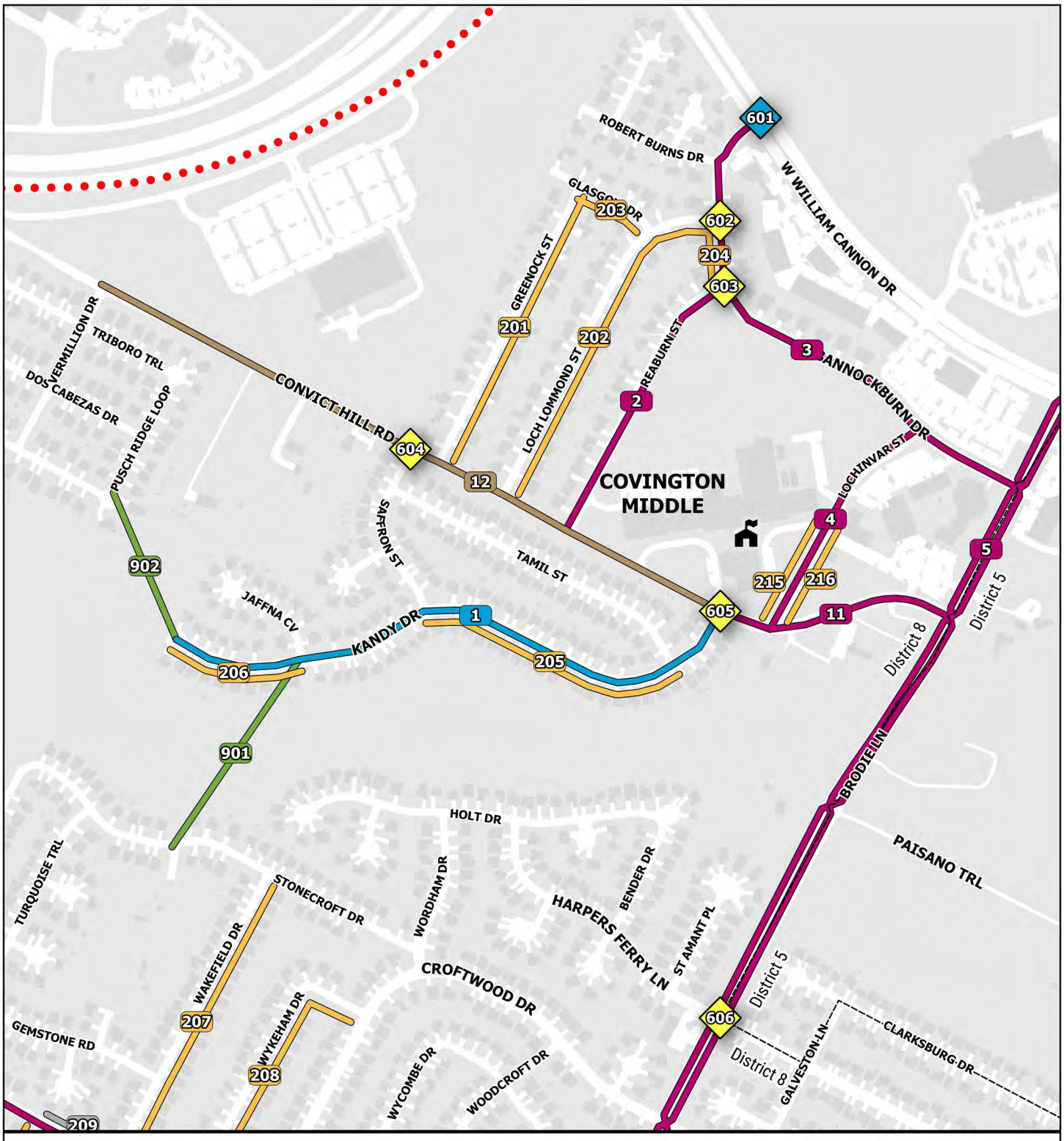
MAP 2F: BOONE ELEMENTARY



MAP 2F: COVINGTON MIDDLE



CITY OF AUSTIN FOUNDED 1839

CITY OF AUSTIN PUBLIC WORKS SAFE ROUTES TO SCHOOL

CITY OF AUSTIN austin MOTION 2016 MOBILITY BOND

TOOLE DESIGN

0 500 1000 1500 ft

- Off-Street Trail
- Bike Lane / Buffered Bike Lane / Protected Bike Lane
- Sidepath
- Neighborhood Bikeway / Traffic Calming
- New / Improved Sidewalk
- Other linear recommendation
- Traffic Control / Intersection Reconfiguration
- Ramp / Curb Extension / Crosswalk
- Over / Underpass
- Other Spot Recommendation
- Existing Trail
- School Boundary
- Council District Boundary

Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2F - 001	BOONE, COVINGTON	KANDY DR	Desired bike route, No bike facility	Neighborhood Bikeway - KANDY DR from Near 4019 KANDY DR to CONVICT HILL RD	1 - Very High	1 - Very High
2F - 002	COVINGTON, BOONE	REABURN ST	Desired bike route, No bike facility, Wide ROW	Protected Bike Lane - REABURN ST from CONVICT HILL RD to BANNOCKBURN DR ~	1 - Very High	2 - High
2F - 003	BOONE, COVINGTON	BANNOCKBURN DR	Desired bike route, Excessive vehicle speeds, No bike facility, Wide ROW	Protected Bike Lane - BANNOCKBURN DR from BRODIE LN to W WILLIAM CANNON DR ~	1 - Very High	2 - High
2F - 004	BOONE, COVINGTON	LOCHINVAR ST	Desired bike route, Excessive vehicle speeds, No bike facility, Wide ROW	Protected Bike Lane - LOCHINVAR ST from CONVICT HILL RD to BANNOCKBURN DR ~	1 - Very High	1 - Very High
2F - 005	COVINGTON, COWAN, BOONE	BRODIE LN	Desired bike route, Excessive vehicle speeds, No bike facility, Parking in bike lane, Wide ROW	Protected Bike Lane - BRODIE LN from ALLEGRO LUGAR to DAVIS LN	1 - Very High	5 - Very Low
2F - 006	COVINGTON, BOONE	ESKEW DR	Desired bike route, Excessive vehicle speeds, No bike facility, Wide ROW	Bike Lane - ESKEW DR from COPANO DR to BRODIE LN ~	1 - Very High	3 - Medium

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2F - 007	COWAN, BOONE, COVINGTON	COPANO DR	No bike facility	Neighborhood Bikeway - COPANO DR from DAVIS LN to LATTA DR Add speed cushions - COPANO DR from DAVIS LN to LATTA DR	2 - High	4 - Low
2F - 008	COVINGTON, BOONE	LEAFIELD DR	Desired bike route, No bike facility, Wide ROW	Protected Bike Lane - LEAFIELD DR from CROFTWOOD DR to ESKEW DR ~	2 - High	2 - High
2F - 009	COVINGTON, BOONE	CROFTWOOD DR	Desired bike route, Excessive vehicle speeds, No bike facility	Add speed cushions - CROFTWOOD DR from ALEXANDRIA DR to ESKEW DR Neighborhood Bikeway - CROFTWOOD DR from ALEXANDRIA DR to ESKEW DR	2 - High	2 - High
2F - 010	COVINGTON, BOONE	ALEXANDRIA DR	Desired bike route, Excessive vehicle speeds, No bike facility	Bike Lane - ALEXANDRIA DR from BRODIE LN to COPANO DR Protected Bike Lane - ALEXANDRIA DR from COUNSELOR DR to ARROW DR ~	2 - High	3 - Medium
2F - 011	BOONE, COVINGTON	CONVICT HILL RD	No bike facility	Protected Bike Lane - CONVICT HILL RD from KANDY DR to BRODIE LN	1 - Very High	1 - Very High
2F - 012	BOONE, COVINGTON	CONVICT HILL RD	No bike facility	Sidepath - CONVICT HILL RD from KANDY DR to VERMILLION DR	1 - Very High	5 - Very Low
2F - 013	COVINGTON, BOONE	COPANO CT	Desired bike route	Neighborhood Bikeway - COPANO CT from 4601 COPANO CT to COPANO DR	4 - Low	3 - Medium
2F - 201	COVINGTON	GREENOCK ST	Missing sidewalk	Construct new sidewalk - GREENOCK ST from GLASGOW DR to CONVICT HILL RD	4 - Low	5 - Very Low
2F - 202	COVINGTON	LOCH LOMMOND ST	Missing sidewalk	Construct new sidewalk - LOCH LOMMOND ST from BANNOCKBURN DR to CONVICT HILL RD	4 - Low	4 - Low

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2F - 203	COVINGTON	GLASGOW DR	Missing sidewalk	Construct new sidewalk - GLASGOW DR from LOCH LOMMOND ST to GREENOCK ST	4 - Low	3 - Medium
2F - 204	COVINGTON	BANNOCKBURN DR	Missing sidewalk	Construct new sidewalk - BANNOCKBURN DR from REABURN ST to LOCH LOMMOND ST	1 - Very High	1 - Very High
2F - 205	COVINGTON	KANDY DR	Missing sidewalk	Construct new sidewalk - KANDY DR from TAMIL ST to SAFFRON ST	1 - Very High	3 - Medium
2F - 206	BOONE, COVINGTON	KANDY DR	Missing sidewalk	Construct new sidewalk - KANDY DR from JAFFNA CV to Near 4019 KANDY DR	4 - Low	4 - Low
2F - 207	COVINGTON, BOONE	WAKEFIELD DR	Missing sidewalk	Construct new sidewalk - WAKEFIELD DR from STONECROFT DR to ESKEW DR	4 - Low	4 - Low
2F - 208	COVINGTON, BOONE	WYKEHAM DR	Missing sidewalk	Construct new sidewalk - WYKEHAM DR from CROFTWOOD DR to ESKEW DR	4 - Low	5 - Very Low
2F - 209	BOONE	ESKEW DR	Temporary obstruction (ex. vegetation)	Fix sidewalk obstructions - ESKEW DR from TREEHOUSE LN to WAKEFIELD DR	5 - Very Low	3 - Medium
2F - 210	BOONE	TREEHOUSE LN	Missing sidewalk	Construct new sidewalk - TREEHOUSE LN from LILLIAN LN to ESKEW DR	4 - Low	4 - Low
2F - 211	BOONE	TREEHOUSE LN	Missing sidewalk	Construct new sidewalk - TREEHOUSE LN from ESKEW DR to ALEXANDRIA DR	3 - Medium	4 - Low
2F - 212	BOONE	LEAFIELD DR	Missing sidewalk	Construct new sidewalk - LEAFIELD DR from Near 8100 CROFTWOOD DR to Near 3800 LEAFIELD DR	3 - Medium	4 - Low
2F - 213	BOONE	CROFTWOOD DR	Narrow sidewalk, Poor condition	Widen existing sidewalk - CROFTWOOD DR from ALEXANDRIA DR to LEAFIELD DR Repair existing sidewalk - CROFTWOOD DR from ALEXANDRIA DR to LEAFIELD DR	5 - Very Low	4 - Low

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2F - 214	BOONE	ALEXANDRIA DR	Narrow sidewalk, Temporary obstruction (ex. vegetation)	Fix sidewalk obstructions - ALEXANDRIA DR from CAYUGA DR to CROFTWOOD DR	5 - Very Low	4 - Low
2F - 215	COVINGTON	LOCHINVAR ST	Missing sidewalk	Construct new sidewalk - LOCHINVAR ST from CONVICT HILL RD to COVINGTON MIDDLE SCHOOL DROPOFF ENTRANCE ON LOCHINVAR ST	2 - High	2 - High
2F - 216	COVINGTON	LOCHINVAR ST	Missing sidewalk	Construct new sidewalk - LOCHINVAR ST from CONVICT HILL RD to BANNOCKBURN CHURCH PARKING LOT ENTRANCE ON LOCHINVAR ST	2 - High	2 - High
2F - 601	COVINGTON	BANNOCKBURN DR / W WILLIAM CANNON DR	Difficult crossing, Missing curb ramps	Install high visibility crosswalk [1] across Bannockburn Dr , Install Pedestrian Hybrid Beacon [1] in William Cannon Dr, Replace existing curb ramp	4 - Low	4 - Low
2F - 602	COVINGTON	BANNOCKBURN DR / LOCH LOMMOND ST	Missing curb ramps	Install 2 curb ramps	3 - Medium	2 - High
2F - 603	COVINGTON	BANNOCKBURN DR / REABURN ST	Missing curb ramps,Difficult crossing	Install 2 curb ramps Install high visibility crosswalk [2] across Bannockburn	1 - Very High	1 - Very High

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2F - 604	COVINGTON	CONVICT HILL RD / SAFFRON ST	Missing curb ramps,Difficult crossing,High speed crossing	Install 2 curb ramps Install high visibility crosswalk [1] across Convict Hill +	3 - Medium	1 - Very High
2F - 605	COVINGTON	CONVICT HILL RD / KANDY DR	Missing curb ramps,High speed crossing,Long crossing distance,Wide curb radii	Install 2 curb extensions on Convict Hill Replace existing curb ramp Tighten curb radii +	1 - Very High	1 - Very High
2F - 606	BOONE, COVINGTON	BRODIE LN / HARPERS FERRY LN	Faded crosswalk markings	Repaint crosswalk markings [4] across Harpers Ferry Ln and Brodie Ln	1 - Very High	1 - Very High
2F - 607	BOONE	CROFTWOOD DR / ESKEW DR	High speed crossing,Non-compliant curb ramps	Install 2 curb extensions on on Croftwood. No curb extensions into Eskew Dr because of proposed bike lanes.	2 - High	1 - Very High
2F - 608	BOONE	CROFTWOOD DR	Difficult crossing, High speed crossing, Long crossing distance	Add curb extensions [2] on Croftwood Dr +	2 - High	1 - Very High
2F - 609	BOONE	ESKEW DR / LEAFIELD DR	Difficult crossing	Install high visibility crosswalk [1] across Eskew	2 - High	1 - Very High

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2F - 610	BOONE	CROFTWOOD DR / LEAFIELD DR	Difficult crossing,Missing curb ramps,High speed crossing,Long crossing distance,Non-compliant curb ramps,Faded crosswalk markings	Install 4 curb extensions on Croftwood and Leafield Install high visibility crosswalk [1] across Leafield +	2 - High	3 - Medium
2F - 611	BOONE	BRODIE LN / ESKEW DR	Faded crosswalk markings, High speed crossing, Long crossing distance	Install high visibility crosswalk [1] across Brodie , Replace existing curb ramp , Upgrade traffic signal to allow a croswalk on the north side of the intersection	2 - High	1 - Very High
2F - 612	BOONE	BRODIE LN / THOMAS KINCHEON ST	Difficult crossing	Install high visibility crosswalk [1] across Thomas Kincheon	2 - High	1 - Very High
2F - 613	BOONE	ALEXANDRIA DR / CROFTWOOD DR	High speed crossing,Long crossing distance	Install 2 curb extensions on Alexandria Install Rapid Flash Beacon +	3 - Medium	3 - Medium
2F - 614	BOONE	ALEXANDRIA DR / CAYUGA DR	Difficult crossing	Install high visibility crosswalk [1] across Cayuga	3 - Medium	1 - Very High

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Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2F - 615	BOONE	BRODIE LN / DUNLIEGH DR	Difficult crossing	Install high visibility crosswalk [1] across Dunleigh	2 - High	1 - Very High
2F - 616	None (nearest school: Boone)	ALEXANDRIA DR / BRODIE LN	Difficult crossing,Non-compliant curb ramps,High speed crossing,Long crossing distance	Install high visibility crosswalk [1] across Alexandria +	3 - Medium	1 - Very High
2F - 801	None (nearest school: Boone)	Near 7808 COPANO DR	Vehicle speeding observed	Add neighborhood traffic circle	4 - Low	3 - Medium
2F - 802	None (nearest school: Boone)	Near 7808 COPANO DR	Excessive vehicle speeds	Add neighborhood traffic circle	4 - Low	3 - Medium
2F - 901	BOONE, COVINGTON	between Kandy Dr and Stonecroft Dr	No trail connection	Construct new trail	1 - Very High	4 - Low
2F - 902	COVINGTON, BOONE	between Pusch Ridge Loop and Kandy Dr	No trail connection	Construct new trail	2 - High	4 - Low

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Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2F - 903	BOONE, COVINGTON	Between Longview Rd, Finch Trl & Jorwoods Dr	No trail connection	Construct new trail	2 - High	5 - Very Low
2F - 904	SUNSET VALLEY, COVINGTON	Between Hays Hill Dr and Harleyhill Dr	No trail connection	Construct new trail	3 - Medium	3 - Medium

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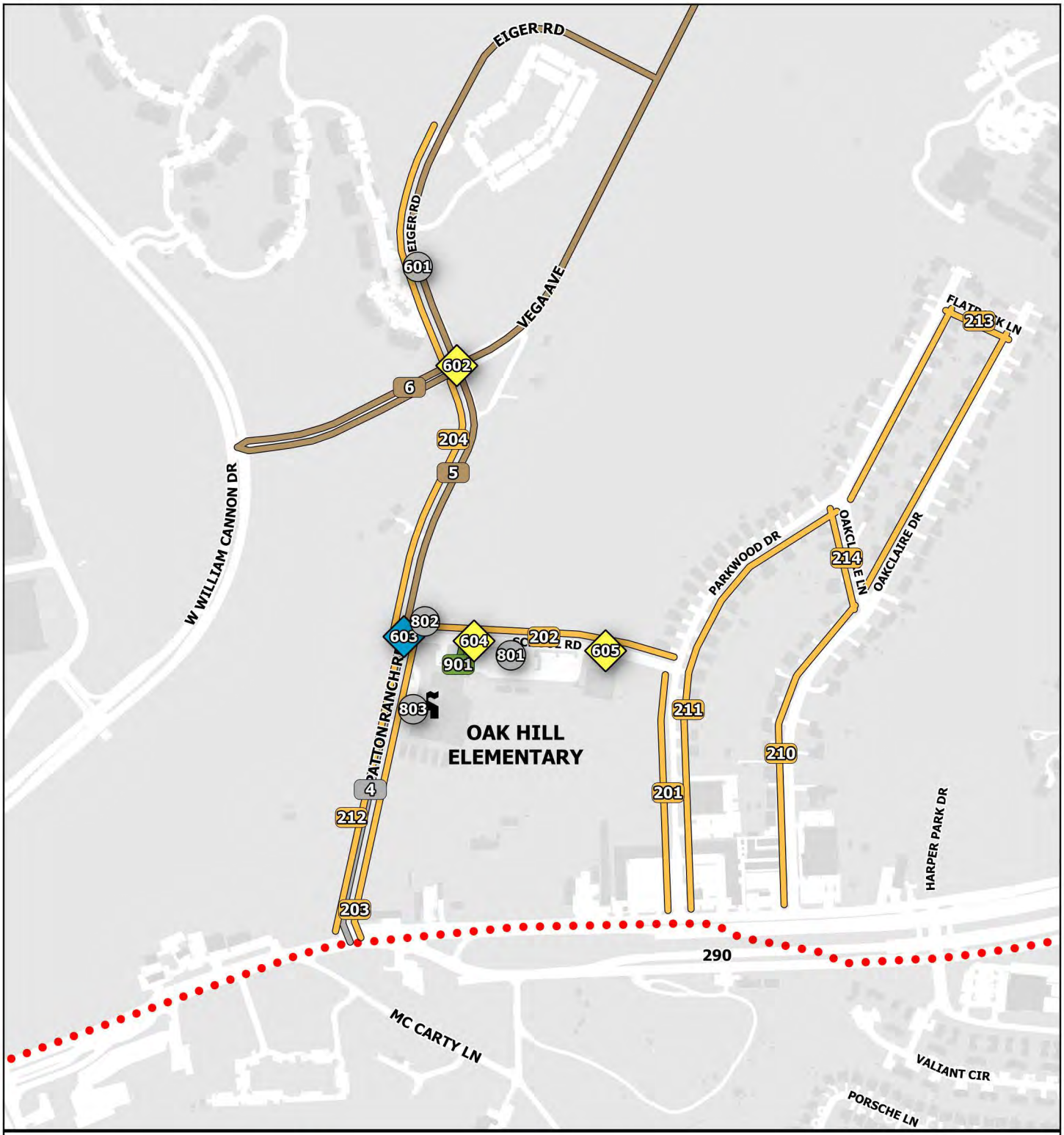
MAP 2G: OAK HILL ELEMENTARY



CITY OF AUSTIN
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2016 MOBILITY BOND

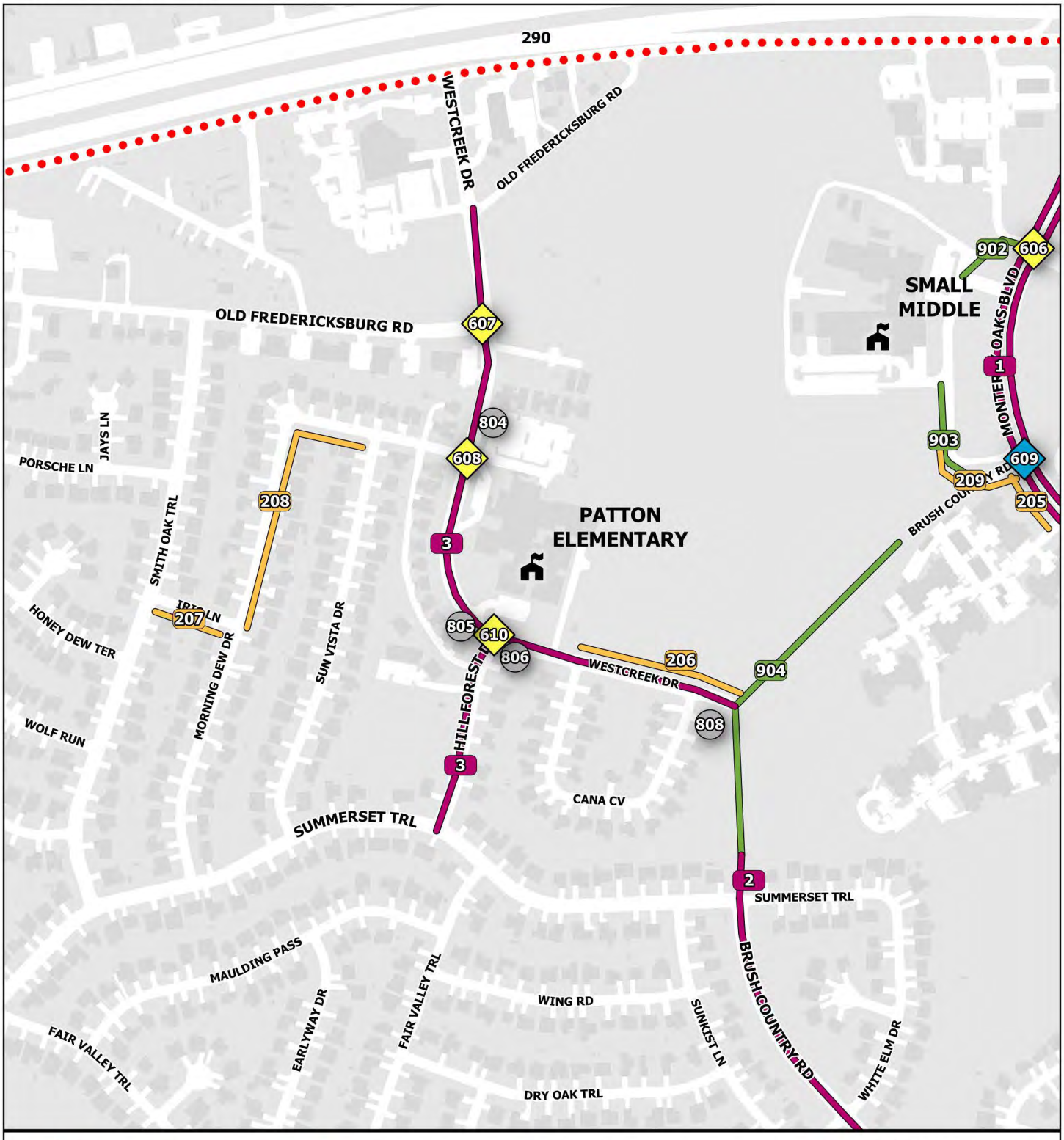
SAFE ROUTES TO SCHOOL

TOOLE DESIGN

0 500 1000 1500 ft

- Off-Street Trail
- Bike Lane / Buffered Bike Lane / Protected Bike Lane
- Sidepath
- Neighborhood Bikeway / Traffic Calming
- New / Improved Sidewalk
- Other linear recommendation
- Traffic Control / Intersection Reconfiguration
- Ramp / Curb Extension / Crosswalk
- Over / Underpass
- Other Spot Recommendation
- Existing Trail
- School Boundary
- Council District Boundary

MAP 2G: PATTON ELEMENTARY



CITY OF AUSTIN
austin MOTION
2016 MOBILITY BOND

SAFE ROUTES TO SCHOOL

TOOLE DESIGN

0 400 800 1200 ft

- Off-Street Trail
- Bike Lane / Buffered Bike Lane / Protected Bike Lane
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- New / Improved Sidewalk
- Other linear recommendation

- Traffic Control / Intersection Reconfiguration
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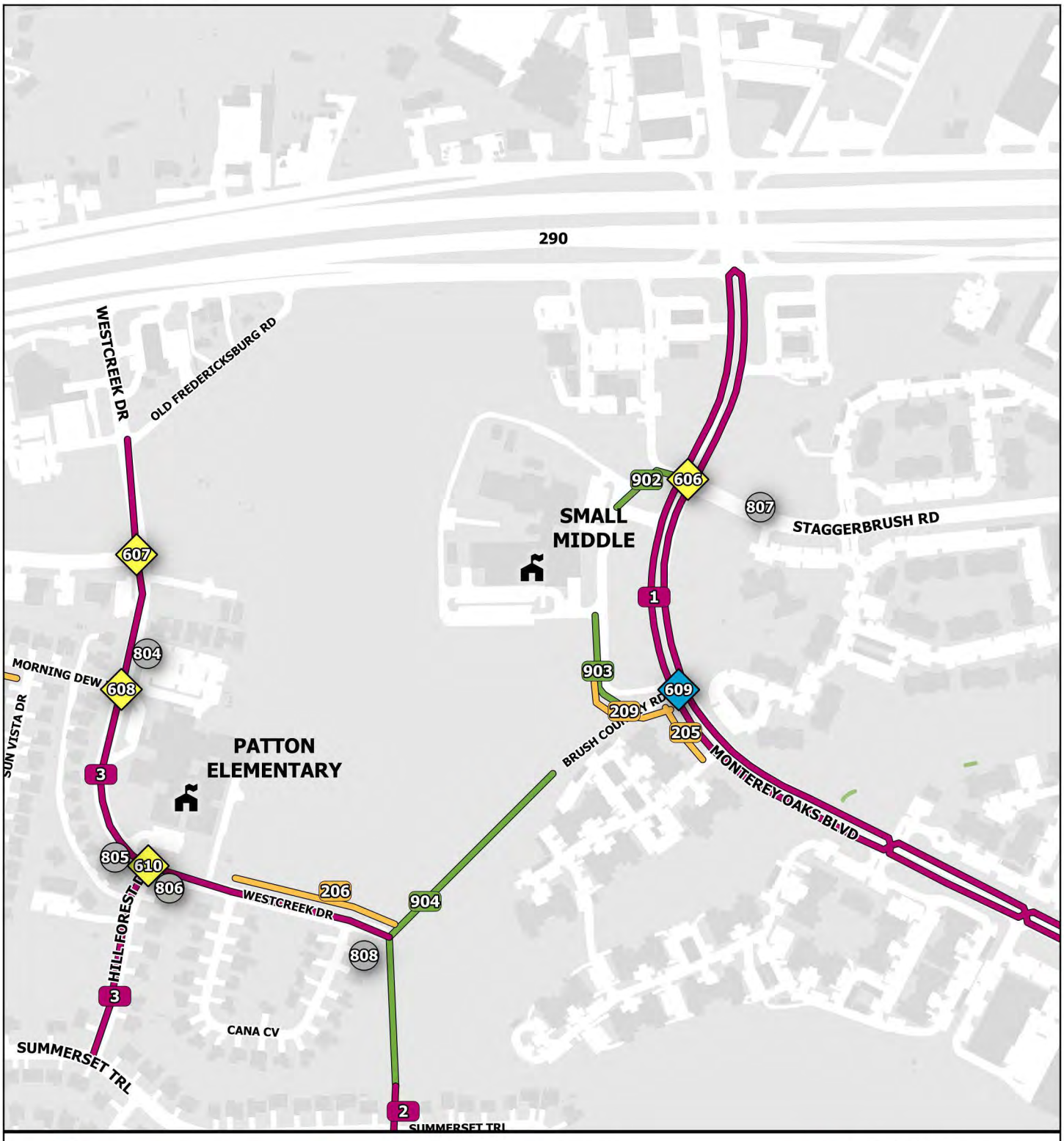
- Over / Underpass
- Other Spot Recommendation

- Existing Trail
- School Boundary
- Council District Boundary

MAP 2G: SMALL MIDDLE



Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2G - 001	OAK HILL, PATTON, SMALL	MONTEREY OAKS BLVD	Desired bike route, Excessive vehicle speeds, No bike facility, Wide ROW	Protected bike lane - MONTEREY OAKS BLVD from MOPAC SERVICE RD to W US 290 HWY SVRD EB; Lane reconfiguration (changing number of lanes) - MONTEREY OAKS BLVD from Near 4201 MONTEREY OAKS BLVD to Near 4912 MONTEREY OAKS BLVD	1 - Very High	5 - Very Low
2G - 002	PATTON, SMALL	BRUSH COUNTRY RD	No bike facility	Protected Bike Lane - BRUSH COUNTRY RD from W WILLIAM CANNON DR to Summerset Trail	2 - High	3 - Medium
2G - 003	PATTON, SMALL	WESTCREEK DR	Left turning vehicles cause bottlenecks	Harden centerline - WESTCREEK DR from MORNING DEW DR to HILL FOREST DR , Add protected bike lane - HILL FOREST DR from SUMMERSET TRL to WESTCREEK DR , Add School Zone Sign with flashers - HILL FOREST DR from SUMMERSET TRL to WESTCREEK DR , Lane diet (changing lane widths) - WESTCREEK DR from OLD FREDERICKSBURG RD to HILL FOREST DR , Add protected bike lane - WESTCREEK DR from OLD FREDERICKSBURG RD to Near 4901 CANA CV ~	1 - Very High	3 - Medium
2G - 004	OAK HILL	PATTON RANCH RD	Excessive vehicle speeds	Add School Zone Sign with flashers - PATTON RANCH RD from W US 290 HWY to SCHOOL RD Add speed cushions - PATTON RANCH RD from W US 290 HWY to SCHOOL RD	2 - High	1 - Very High

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2G - 005	OAK HILL, SMALL	PATTON RANCH RD	Desired bike route, Excessive vehicle speeds, No bike facility	Sidepath - PATTON RANCH RD from SCHOOL RD to VEGA AVE (east side)	2 - High	5 - Very Low
2G - 006	OAK HILL, SMALL	VEGA AVE	No bike facility	Sidepath - VEGA AVE from SOUTHWEST PKWY to W WILLIAM CANNON DR	2 - High	5 - Very Low
2G - 007	SMALL, OAK HILL	SOUTHWEST PKWY	No bike facility	Sidepath- SOUTHWEST PKWY from VEGA AVE to MISSION OAKS	2 - High	5 - Very Low
2G - 008*	OAK HILL	FOSTER RANCH RD	No bike facility	Sidepath - FOSTER RANCH RD from SOUTHWEST PKWY to TRAVIS GREEN LN	2 - High	5 - Very Low
2G - 201	OAK HILL	PARKWOOD DR	Missing sidewalk	Construct new sidewalk - PARKWOOD DR from W US 290 HWY SVRD WB to SCHOOL RD	4 - Low	4 - Low
2G - 202	OAK HILL	SCHOOL RD	Missing sidewalk	Construct new sidewalk - SCHOOL RD from PATTON RANCH RD to PARKWOOD DR	1 - Very High	3 - Medium
2G - 203	OAK HILL	PATTON RANCH RD	Missing sidewalk	Construct new sidewalk - PATTON RANCH RD from SCHOOL RD to W US 290 HWY (east side)	2 - High	3 - Medium
2G - 204	OAK HILL	PATTON RANCH RD	Missing sidewalk	Construct new sidewalk - EIGER RD from VEGA AVE to Near 5525 EIGER RD (west side) Construct new sidewalk - PATTON RANCH RD from SCHOOL RD to VEGA AVE (west side)	2 - High	4 - Low
2G - 205	SMALL, PATTON	MONTEREY OAKS BLVD	Missing sidewalk	Construct new sidewalk - MONTEREY OAKS BLVD from driveway for The Park at Monterey Oaks to BRUSH COUNTRY RD	5 - Very Low	3 - Medium
2G - 206	PATTON, SMALL	WESTCREEK DR	Missing sidewalk	Construct new sidewalk - WESTCREEK DR from CANA CV to end of road	1 - Very High	2 - High
2G - 207	SMALL, PATTON	IRIS LN	Missing sidewalk	Construct new sidewalk - IRIS LN from MORNING DEW DR to SMITH OAK TRL	4 - Low	3 - Medium

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2G - 208	SMALL, PATTON	MORNING DEW DR	Missing sidewalk	Construct new sidewalk - MORNING DEW DR from SUN VISTA DR to IRIS LN	5 - Very Low	5 - Very Low
2G - 209	PATTON, SMALL	BRUSH COUNTRY RD	Missing sidewalk	Construct new sidewalk - BRUSH COUNTRY RD from MONTEREY OAKS BLVD to existing sidewalk along school drive	3 - Medium	2 - High
2G - 210	OAK HILL	OAKCLAIRE DR	Missing sidewalk	Construct new sidewalk - OAKCLAIRE DR from FLATROCK LN to W US 290 HWY SVRD WB	5 - Very Low	5 - Very Low
2G - 211	OAK HILL	PARKWOOD DR	Missing sidewalk	Construct new sidewalk - PARKWOOD DR from FLATROCK LN to W US 290 HWY SVRD WB	4 - Low	5 - Very Low
2G - 212	OAK HILL	PATTON RANCH RD	Missing sidewalk	Construct new sidewalk - PATTON RANCH RD from US 290 to SCHOOL RD (west side)	2 - High	3 - Medium
2G - 213	None (nearest school: Oak Hill, Small)	FLATROCK LN	Missing sidewalk	Construct new sidewalk - FLATROCK LN from OAKCLAIRE DR to PARKWOOD DR	5 - Very Low	5 - Very Low
2G - 214	OAK HILL	OAKCLAIRE LN	Missing sidewalk	Construct new sidewalk - OAKCLAIRE LN from OAKCLAIRE DR to PARKWOOD DR	5 - Very Low	5 - Very Low
2G - 601	OAK HILL	Midblock - EIGER RD	Missing connection from Latana Ridge to Eiger	Install trail +	3 - Medium	2 - High

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2G - 602	OAK HILL	EIGER RD / PATTON RANCH RD / VEGA AVE	Difficult crossing	Add curb extensions Install 2 curb extensions on Vega and Patton Ranch Install 2 curb ramps Install high visibility crosswalk [1] across Vega Install/update pedestrian push buttons +	2 - High	2 - High
2G - 603	OAK HILL	PATTON RANCH RD / SCHOOL RD	Lack of traffic control on Patton Ranch created backup for turning vehicles	Install stop sign	1 - Very High	1 - Very High
2G - 604	OAK HILL	Midblock - SCHOOL RD	Difficult crossing	Add curb extensions Install 2 curb ramps Install high visibility crosswalk [2] across School Road Install Rapid Flash Beacon +	1 - Very High	2 - High

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2G - 605	OAK HILL	Midblock - SCHOOL RD	Difficult crossing	Add curb extensions Install 2 curb ramps Install high visibility crosswalk [1] across School Road Install Pedestrian Hybrid Beacon Install/update pedestrian push buttons +	3 - Medium	4 - Low
2G - 606	PATTON, SMALL	MONTEREY OAKS BLVD / STAGGERBRUSH RD	High speed crossing,Long crossing distance, High speed crossing; Long crossing distance; Cars occasionally block crosswalk southbound when dropping off in morning	Add curb extensions Install Rapid Flash Beacon; Install "Do-not-block-crosswalk" sign and markings	3 - Medium	3 - Medium
2G - 607	SMALL, PATTON	OLD FREDERICKSBURG RD / WESTCREEK DR	Non-compliant curb ramps,Faded crosswalk markings,Long crossing distance,Wide curb radii	Install 2 curb extensions on Old Fredericksburg Road Repaint crosswalk markings [2] across West Creek Drive and Old Fredericksburg Road Replace existing curb ramp +	2 - High	2 - High

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2G - 608	SMALL, PATTON	MORNING DEW DR / WESTCREEK DR	Non-compliant curb ramps,Wide curb radii, Vehicles park near crosswalks and ignore parking restrictions. No lanes/signs/markings at driveway exit.	Install 2 curb extensions on Morning View Drive Replace existing curb ramp Stripe and sign lanes to formalize vehicle movements at driveway exit Tighten curb radii +	1 - Very High	2 - High
2G - 609	SMALL, PATTON	BRUSH COUNTRY RD / MONTEREY OAKS BLVD	Missing curb ramps,High speed crossing,Long crossing distance, Missing curb ramps,High speed crossing,Long crossing distance, High volume of left turns out of school driveway creating conflicts with pedestrians crossing Monterey Oaks.	Install 2 curb ramps Install traffic controls to prohibit left turns out of school driveway Left turn restriction from driveway	2 - High	1 - Very High

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2G - 610	SMALL, PATTON	HILL FOREST DR / WESTCREEK DR	Non-compliant curb ramps,Long crossing distance,Wide curb radii	Install 2 curb extensions on Hill Forest Drive Replace existing curb ramp +	2 - High	2 - High
2G - 611	None (nearest school: Patton, Small)	BRUSH COUNTRY RD / W WILLIAM CANNON DR	long crossing distance, high speed crossing	Add median refuge island on W William Cannon Dr	2 - High	1 - Very High
2G - 612	None (nearest school: Patton, Small)	BRUSH COUNTRY RD / ONE OAK RD	high speed crossing	Add signage	5 - Very Low	4 - Low
2G - 613	None (nearest school: Oak Hill)	SOUTHWEST PKWY / FOSTER RANCH	Wide crossing and high speed traffic	Add curb ramps (2), Add high visibility crosswalk (4), Tighten curb radii (2)	2 - High	2 - High
2G - 801	OAK HILL	Near 6101 PATTON RANCH RD	Parking lot design creates confusion/conflicts	Study and redesign parking lot ~	3 - Medium	1 - Very High
2G - 802	OAK HILL	Near 5900 PATTON RANCH RD	Brush blocking sight lines	Remove brush / Trim vegetation	5 - Very Low	4 - Low
2G - 803	OAK HILL	Near 6101 PATTON RANCH RD	No bike racks	Add bike parking	5 - Very Low	3 - Medium

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2G - 804	SMALL, PATTON	Near 5913 WESTCREEK DR	Parking lot backs up onto roadway, making roadway crossings difficult	Reconfigure parking lot	2 - High	1 - Very High
2G - 805	SMALL, PATTON	Near 6020 WESTCREEK DR	School zone end sign here is located too close to school	Move sign to Hill Forest Drive midblock to the south	5 - Very Low	4 - Low
2G - 806	SMALL, PATTON	Near 6101 HILL FOREST DR	School zone end sign is obstructed by vegetation	Add bike parking Prune vegetation	5 - Very Low	4 - Low
2G - 807	SMALL, PATTON	Near 4800 STAGGERBRUSH RD	No school zone signage	Install new school zone sign and beacon	5 - Very Low	4 - Low
2G - 808	SMALL, PATTON	Near 4901 CANA CV	Roadway is underutilized for queuing drop-off traffic	Designate park and walk site - WESTCREEK DR from CANA CV to 6030 WESTCREEK DR ~	4 - Low	2 - High
2G - 901	SMALL, OAK HILL	From School RD to school entrance	Difficult crossing from school road through parking to entrance	Construct new trail	1 - Very High	1 - Very High
2G - 902	SMALL, PATTON	Connection from Staggerbrush Rd to Small MS	Lack of connectivity	Construct new trail	2 - High	2 - High

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Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2G - 903	SMALL, PATTON	Small MS to Brush County Rd townhomes; and from Staggerbrush Rd to Small MS	No trail connection	Construct new trail	2 - High	4 - Low
2G - 904	SMALL, PATTON	Connection between Summerset Trl, Westcreek Dr, and townhomes east of Patton ES	No trail connection	Construct new trail	2 - High	5 - Very Low
2G - 905	SMALL, PATTON	McCarty to Fairvalley	No trail connection	Construct new trail	4 - Low	5 - Very Low

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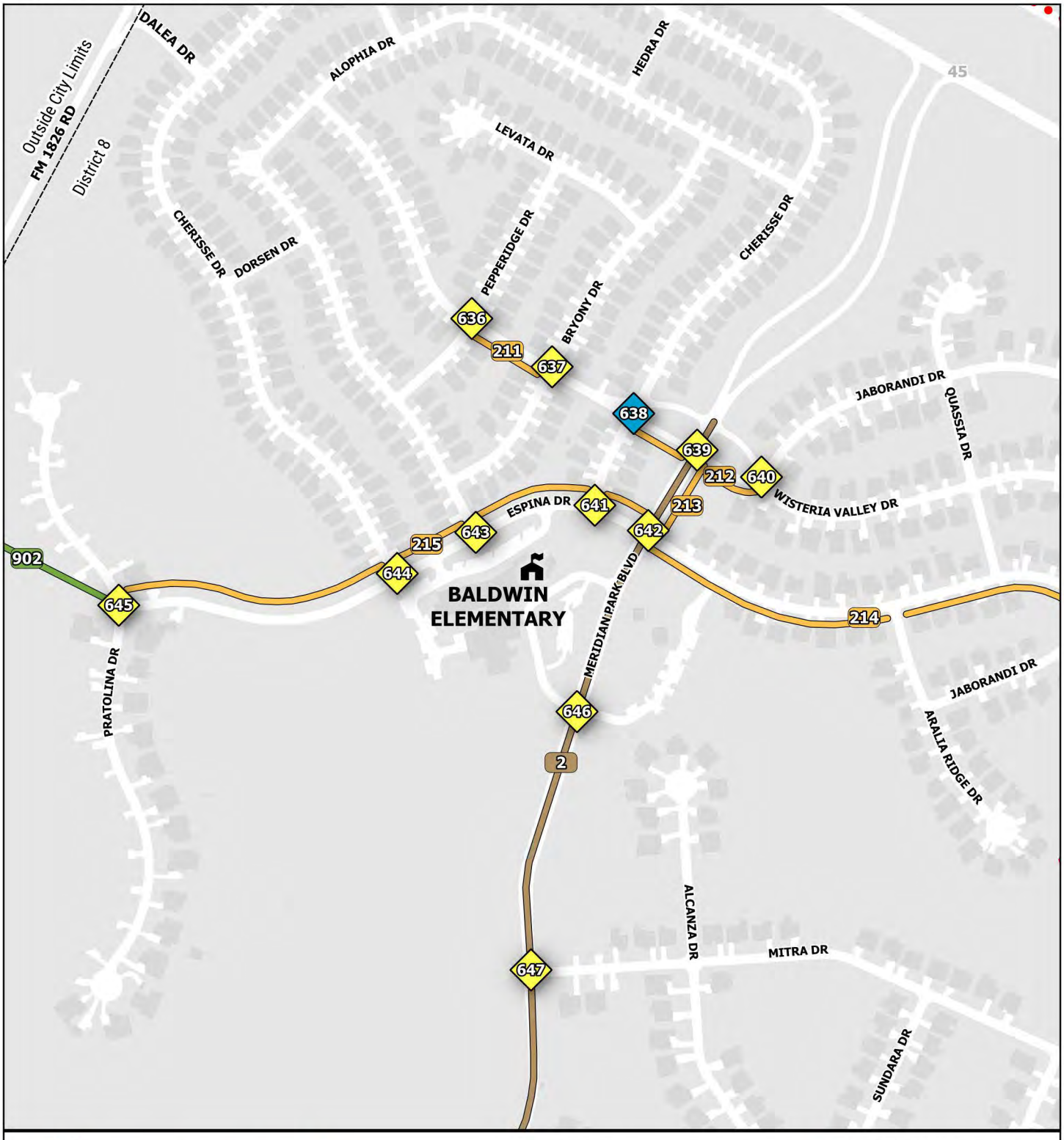
MAP 2H: BALDWIN ELEMENTARY



CITY OF AUSTIN
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2016 MOBILITY BOND

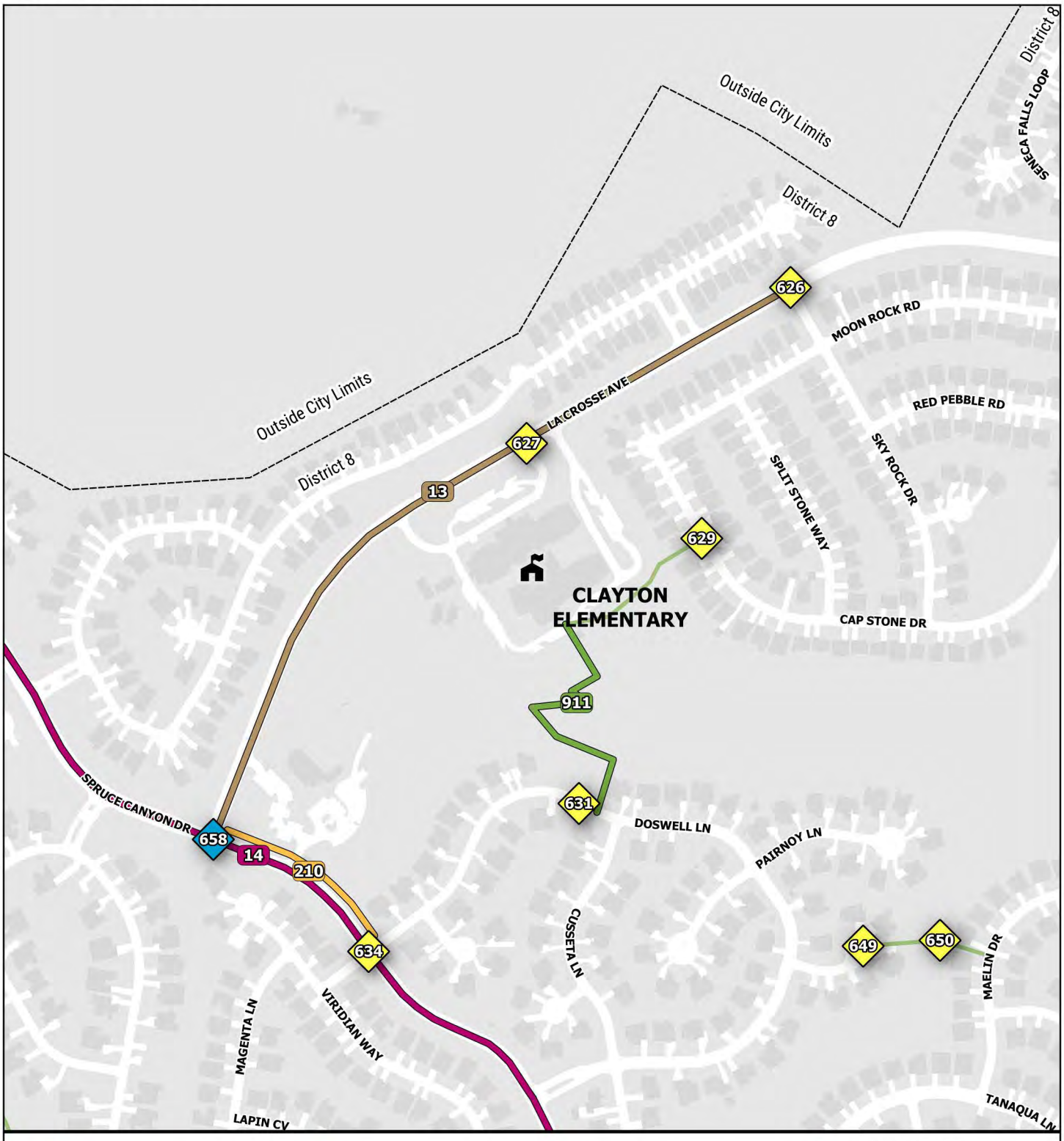
SAFE ROUTES TO SCHOOL

TOOLE DESIGN

0 400 800 1200 ft

- Off-Street Trail
- Bike Lane / Buffered Bike Lane / Protected Bike Lane
- Sidepath
- Neighborhood Bikeway / Traffic Calming
- New / Improved Sidewalk
- Other linear recommendation
- Traffic Control / Intersection Reconfiguration
- Ramp / Curb Extension / Crosswalk
- Over / Underpass
- Other Spot Recommendation
- Existing Trail
- School Boundary
- Council District Boundary

MAP 2H: CLAYTON ELEMENTARY



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2016 MOBILITY BOND

SAFE ROUTES TO SCHOOL

TOOLE DESIGN

0 400 800 1200 ft

- Off-Street Trail
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MAP 2H: GORZYCKI MIDDLE

CITY OF AUSTIN
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0 400 800 1200 ft

- Off-Street Trail
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- Other linear recommendation
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- Over / Underpass
- Other Spot Recommendation
- Existing Trail
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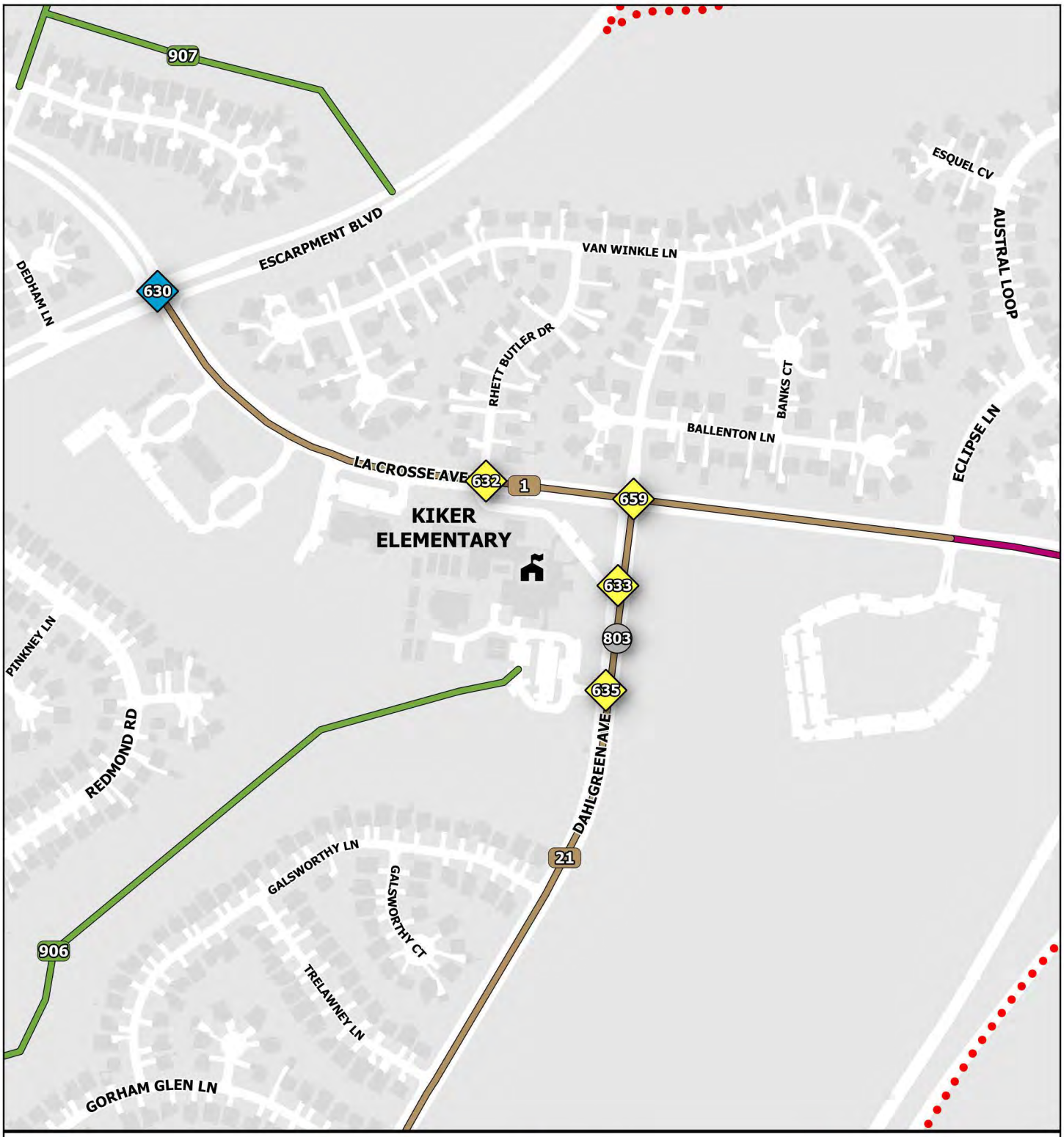
MAP 2H: KIKER ELEMENTARY



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2016 MOBILITY BOND

SAFE ROUTES TO SCHOOL

TOOLE DESIGN

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- Other Spot Recommendation
- Existing Trail
- School Boundary
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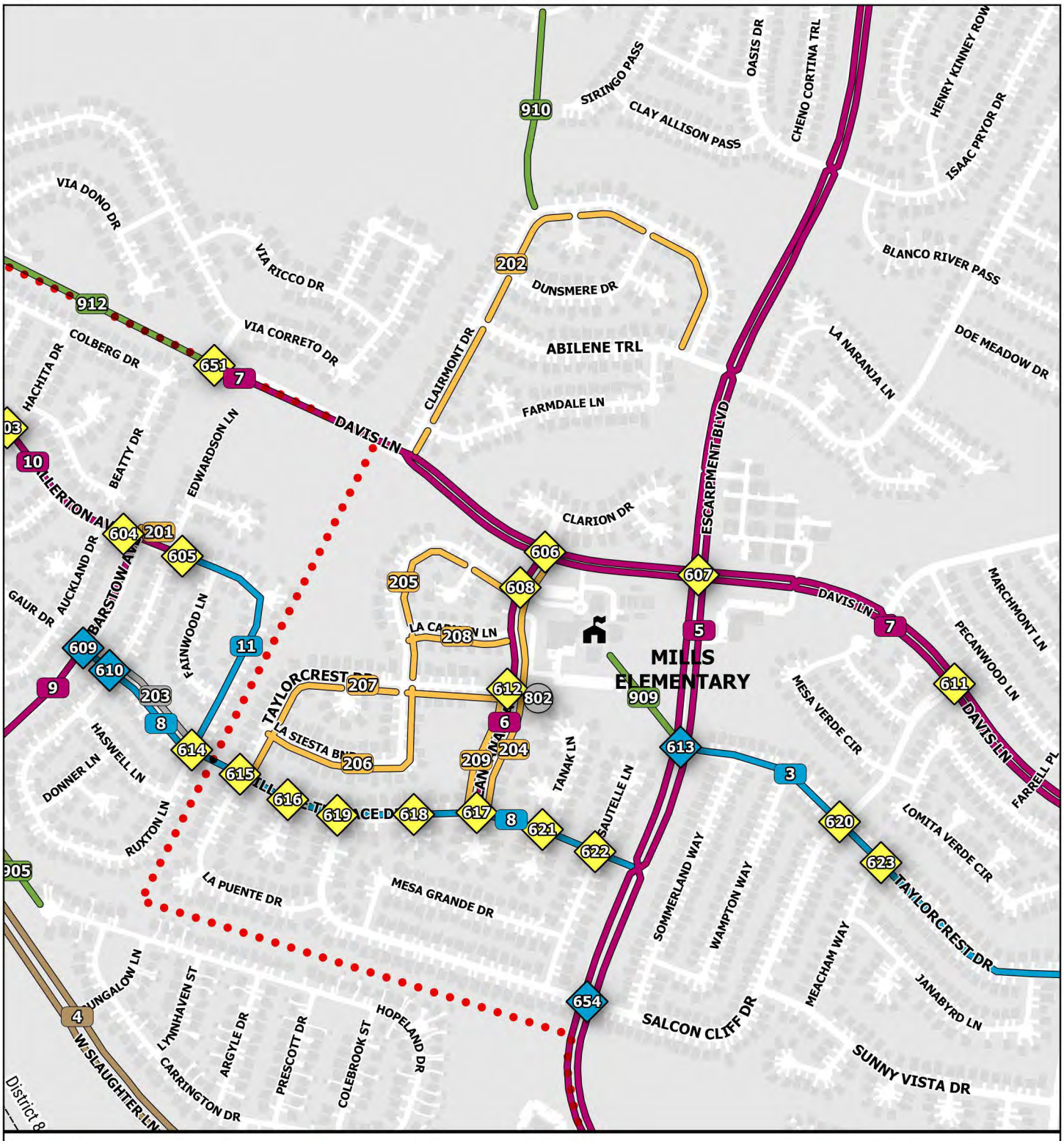
MAP 2H: MILLS ELEMENTARY



Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2H - 001	KIKER, GORZYCKI	LA CROSSE AVE	Long crossing distance, traffic congestion, wide curb radii	Sidepath - LA CROSSE AVE from ESCARPMENT BLVD to DAHLGREEN AVE center turn lane" - LA CROSSE AVE from ESCARPMENT BLVD to ECLIPSE LN "2 travel lanes - LA CROSSE AVE from ESCARPMENT BLVD to ECLIPSE LN Lane diet (changing lane widths) - LA CROSSE AVE from ESCARPMENT BLVD to ECLIPSE LN	2 - High	5 - Very Low
2H - 002	BALDWIN	MERIDIAN PARK BLVD	Desired bike route, Excessive vehicle speeds, No bike facility, Wide ROW	Sidepath - MERIDIAN PARK BLVD from MITRA DR to WISTERIA VALLEY DR Add chicanes - MERIDIAN PARK BLVD from Near 7540 WISTERIA VALLEY DR to Near 7540 WISTERIA VALLEY DR Add median - MERIDIAN PARK BLVD from Near 7540 WISTERIA VALLEY DR to Near 7540 WISTERIA VALLEY DR +	3 - Medium	5 - Very Low
2H - 003	GORZYCKI, MILLS	TAYLORCREST DR	Desired bike route, Excessive vehicle speeds, No bike facility, Wide ROW	Add speed cushions - TAYLORCREST DR from ESCARPMENT BLVD to BECKETT RD Neighborhood Bikeway - TAYLORCREST DR from ESCARPMENT BLVD to BECKETT RD ~	2 - High	2 - High

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2H - 004*	GORZYCKI, KIKER	W SLAUGHTER LN	Desired bike route, Excessive vehicle speeds, No bike facility, Wide ROW	Sidepath - W SLAUGHTER LN from FM 1826 RD to ESCARPMENT BLVD	2 - High	5 - Very Low
2H - 005	MILLS, GORZYCKI	ESCARPMENT BLVD	Excessive vehicle speeds, Wide ROW	Protected Bike Lane - ESCARPMENT BLVD from OASIS DR to W SLAUGHTER LN	2 - High	5 - Very Low
2H - 006	MILLS, GORZYCKI	LANTANA WAY	Desired bike route, Excessive vehicle speeds, No bike facility, Wide ROW	Bike Lane - LANTANA WAY from HILLSIDE TERRACE DR to DAVIS LN ~	2 - High	2 - High
2H - 007	MILLS, GORZYCKI	DAVIS LN	Desired bike route, Excessive vehicle speeds, No bike facility	Add School Zone Sign with flashers - DAVIS LN from CLAIRMONT DR to ESCARPMENT BLVD Add Dynamic Speed Display Device - DAVIS LN Protected Bike Lane - DAVIS LN from BARSTOW DR to LA CRESADA DR	1 - Very High	5 - Very Low
2H - 008	MILLS, KIKER, GORZYCKI	HILLSIDE TERRACE DR	Desired bike route, Excessive vehicle speeds, No bike facility, Wide ROW	Neighborhood Bikeway - HILLSIDE TERRACE DR from BARSTOW AVE to ESCARPMENT BLVD Add speed cushions - HILLSIDE TERRACE DR from BARSTOW AVE to ESCARPMENT BLVD	2 - High	3 - Medium
2H - 009	GORZYCKI, KIKER	BARSTOW AVE	Desired bike route, No bike facility, Wide ROW	Buffered Bike Lane - BARSTOW AVE from W SLAUGHTER LN to RUXTON LN ~	4 - Low	4 - Low

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2H - 010	GORZYCKI, KIKER	ALLERTON AVE	Desired bike route, No bike facility, Wide ROW	Protected Bike Lane - ALLERTON AVE from Near 7105 ALLERTON AVE to RUXTON LN Protected Bike Lane - RUXTON LN from ALLERTON AVE to EDWARDSON LN ~	1 - Very High	2 - High
2H - 011	KIKER, GORZYCKI	RUXTON LN	Desired bike route, No bike facility, Wide ROW	Add speed cushions - RUXTON LN from EDWARDSON LN to HILLSIDE TERRACE DR Neighborhood Bikeway - RUXTON LN from EDWARDSON LN to HILLSIDE TERRACE DR	2 - High	2 - High
2H - 012*	GORZYCKI	FM 1826 RD	Desired bike route, Excessive vehicle speeds, No bike facility, Wide ROW	Sidepath - FM 1826 RD from TWILIGHT MESA DR to GALLANT FOX RD	3 - Medium	5 - Very Low
2H - 013	CLAYTON, GORZYCKI	LA CROSSE AVE	No bike facility	Sidepath - LA CROSSE AVE from SPRUCE CANYON DR to SKY ROCK DR	3 - Medium	5 - Very Low
2H - 014	CLAYTON, GORZYCKI	SPRUCE CANYON DR	No bike facility	Protected Bike Lane - SPRUCE CANYON DR from FANECA DR to TANAQUA LN	3 - Medium	5 - Very Low
2H - 016*	BALDWIN	APPALOOSA RUN	No bike facility	Sidepath - APPALOOSA RUN from FM 1826 RD to JESS DR	4 - Low	5 - Very Low
2H - 017*	GORZYCKI	GRANADA HILLS DR	No sidewalks	Sidepath - GRANADA HILLS DR from end of road to LA TOSCA DR	4 - Low	5 - Very Low
2H - 018*	GORZYCKI	ESPANOLA TRL	No sidewalks	Sidepath - ESPANOLA TRL from GRANADA HILLS DR to LA FAUNA PATH - ESPANOLA TRL from GRANADA HILLS DR to LA FAUNA PATH	4 - Low	5 - Very Low

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2H - 019*	GORZYCKI	EL REY BLVD	No sidewalks	Sidepath - EL REY BLVD from SAN DIEGO RD to W US 290 HWY Sidepath - ADOBE TRL from GRANADA HILLS DR to GALLANT FOX RD	3 - Medium	5 - Very Low
2H - 020*	GORZYCKI, MILLS	GALLANT FOX RD	No sidewalks	Sidepath - GALLANT FOX RD from FM 1826 to FM 1826	3 - Medium	5 - Very Low
2H - 021	KIKER, GORZYCKI	DAHLGREEN AVE	No bike facility, traffic congestion - all the way south to Gorham Glen Ln, traffic congestion all the way south to Gorham Glen Ln	Sidepath - DAHLGREEN AVE from GORHAM GLEN LN to LA CROSSE AVE	3 - Medium	5 - Very Low
2H - 022	KIKER, GORZYCKI	LA CROSSE AVE	Long crossing distance, wide curb radii	Protected Bike Lane - LA CROSSE AVE from ECLIPSE LN to SUNDROP VALLEY DR	3 - Medium	3 - Medium
2H - 201	GORZYCKI	RUXTON LN	Missing sidewalk	Construct new sidewalk - RUXTON LN from ALLERTON AVE to EDWARDSON LN	4 - Low	2 - High
2H - 202	MILLS	CLAIRMONT DR	Missing sidewalk	Construct new sidewalk - CLAIRMONT DR from ABILENE TRL to DAVIS LN	4 - Low	5 - Very Low
2H - 203	GORZYCKI	HILLSIDE TERRACE DR	Missing sidewalk	Construct sidewalk (Fill in gap) - HILLSIDE TERRACE DR from EDWARDSON LN to RUXTON LN	5 - Very Low	4 - Low

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2H - 204	MILLS	LANTANA WAY	Narrow sidewalk	Widen existing sidewalk - LANTANA WAY from TAYLORCREST DR to HILLSIDE TERRACE DR Widen existing sidewalk - LANTANA WAY from DAVIS LN to TAYLORCREST DR	5 - Very Low	5 - Very Low
2H - 205	MILLS	LA SIESTA BND	Missing sidewalk	Construct new sidewalk - LA SIESTA BND from TAYLORCREST DR to LANTANA WAY	4 - Low	4 - Low
2H - 206	MILLS	LA SIESTA BND	Missing sidewalk	Construct new sidewalk - LA SIESTA BND from Near 9100 LA SIESTA BND to Near 9241 LA SIESTA BND	5 - Very Low	5 - Very Low
2H - 207	MILLS	TAYLORCREST DR	Missing sidewalk	Construct new sidewalk - TAYLORCREST DR from LANTANA WAY to HILLSIDE TERRACE DR	3 - Medium	4 - Low
2H - 208	MILLS	LA CARMAN LN	Missing sidewalk	Construct new sidewalk - LA CARMAN LN from LANTANA WAY to LA SIESTA BND	5 - Very Low	4 - Low
2H - 209	MILLS	LANTANA WAY	Missing sidewalk	Construct new sidewalk - LANTANA WAY from HILLSIDE TERRACE DR to TAYLORCREST DR	4 - Low	4 - Low
2H - 210	CLAYTON	SPRUCE CANYON DR	Poor condition	Repair existing sidewalk - SPRUCE CANYON DR from LA CROSSE AVE to DOSWELL LN	5 - Very Low	5 - Very Low
2H - 211	BALDWIN	WISTERIA VALLEY DR	Missing sidewalk	Construct new sidewalk - WISTERIA VALLEY DR from BRYONY DR to PEPPERIDGE DR	5 - Very Low	4 - Low
2H - 212	BALDWIN	WISTERIA VALLEY DR	Missing sidewalk	Construct new sidewalk - WISTERIA VALLEY DR from JABORANDI DR to CHERISSE DR	5 - Very Low	4 - Low
2H - 213	BALDWIN	MERIDIAN PARK BLVD	Missing sidewalk	Construct new sidewalk - MERIDIAN PARK BLVD from WISTERIA VALLEY DR to ESPINA DR	4 - Low	3 - Medium
2H - 214	BALDWIN	ESPINA DR	Missing sidewalk	Construct new sidewalk - ESPINA DR from MERIDIAN PARK BLVD to JABORANDI DR	5 - Very Low	5 - Very Low

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2H - 215	BALDWIN	ESPINA DR	Missing sidewalk	Construct new sidewalk - ESPINA DR from PRATOLINA DR to MERIDIAN PARK BLVD	3 - Medium	4 - Low
2H - 217*	GORZYCKI	TWILIGHT SHADOW DR	Missing sidewalk	Construct new sidewalk - TWILIGHT SHADOW DR from FM 1826 RD to BUENA SUERTE DR , Construct new sidewalk - BUENA SUERTE DR from TWILIGHT SHADOW DR to property line (midblock on Buena Suerte Dr)	5 - Very Low	5 - Very Low
2H - 601*	GORZYCKI	FM 1826 RD / W SLAUGHTER LN	Faded crosswalk markings,High speed crossing, Short crossing signal length	Add a Yield to pedestrian sign on the corner of W Slaughter Ln where cars are turning right to 1826; extend the pedestrian signal crossing time. Increase pedestrian crossing time Install high visibility crosswalk [1] across 1826	3 - Medium	5 - Very Low
2H - 602	GORZYCKI	ALLERTON AVE / COLBERG DR	Difficult crossing	Install high visibility crosswalk [4] across Colberg Dr and Allerton Ave	3 - Medium	1 - Very High
2H - 603	GORZYCKI	ALLERTON AVE / HACHITA DR	Difficult crossing	Install high visibility crosswalk [1] across Allerton and Hachita Dr	3 - Medium	1 - Very High
2H - 604	GORZYCKI	ALLERTON AVE / BARSTOW AVE / RUXTON LN	Difficult crossing,Missing curb ramps	Install 1 curb ramp Install high visibility crosswalk [1] across Barstow and Ruxton	3 - Medium	1 - Very High

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2H - 605	GORZYCKI	EDWARDSON LN / RUXTON LN	Missing curb ramps,Non-compliant curb ramps,Difficult crossing	Install 1 curb ramp Install high visibility crosswalk [1] across Edwardson ln	3 - Medium	1 - Very High
2H - 606	MILLS	DAVIS LN / LANTANA WAY	Non-compliant curb ramps,Difficult crossing,Faded crosswalk markings,High speed crossing,Long crossing distance	Install high visibility crosswalk [1] across Davis Install Rapid Flash Beacon Replace existing curb ramp	3 - Medium	2 - High
2H - 607	MILLS	DAVIS LN / ESCARPMENT BLVD	Faded crosswalk markings,High speed crossing,Long crossing distance,Wide curb radii	Add no right turn on red signs before intersection. Install high visibility crosswalk [4] across Escarpment and Davis Tighten curb radii	1 - Very High	2 - High
2H - 608	MILLS	LANTANA WAY / LA SIESTA BND	Non-compliant curb ramps	Add curb extensions Replace existing curb ramp +	3 - Medium	3 - Medium

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2H - 609	GORZYCKI	BARSTOW AVE / HILLSIDE TERRACE DR	Missing curb ramps,Difficult crossing,Non-compliant curb ramps,High speed crossing,Long crossing distance	Add median refuge island on Barstow Install 2 curb ramps Install high visibility crosswalk [3] across Barstow and Hillside Terrace Replace existing curb ramp	5 - Very Low	5 - Very Low
2H - 610	GORZYCKI	EDWARDSON LN / HILLSIDE TERRACE DR	Difficult crossing	Add median refuge island on Hillside Terrace Install high visibility crosswalk [4] across Hillside terrace and Edwardson ln	4 - Low	3 - Medium
2H - 611	MILLS	DAVIS LN / SALCON CLIFF DR	Difficult crossing	Install high visibility crosswalk [1] across Davis and Salcon Cliff	4 - Low	2 - High
2H - 612	MILLS	LANTANA WAY / TAYLORCREST DR	Difficult crossing	Add curb extensions Install high visibility crosswalk [1] across Lantana Way	3 - Medium	3 - Medium

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2H - 613	MILLS	ESCARPMENT BLVD / TAYLORCREST DR	Difficult crossing,No pedestrian signals,Non-ADA push buttons,Poor sightlines,High speed crossing,Long crossing distance	Add median refuge island on Escarpment Install high visibility crosswalk [1] across Escarpment Install Pedestrian Hybrid Beacon	3 - Medium	3 - Medium
2H - 614	None (nearest school: Gorzycki)	HILLSIDE TERRACE DR / RUXTON LN	Missing curb ramps,Difficult crossing	Install high visibility crosswalk [3] across Ruxton and hillside terrace dr	3 - Medium	1 - Very High
2H - 615	MILLS	HILLSIDE TERRACE DR / LA PUENTE DR / TAYLORCREST DR	Difficult crossing	Install high visibility crosswalk [4] across La puente dr/Taylorcrest and Hillside Terrace	3 - Medium	2 - High
2H - 616	MILLS	HILLSIDE TERRACE DR / LE CONTE CV	Difficult crossing	Install high visibility crosswalk [1] across Le Conte Cove	4 - Low	2 - High

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2H - 617	MILLS	HILLSIDE TERRACE DR / LANTANA WAY	Missing curb ramps,Difficult crossing	Install 2 curb ramps Install high visibility crosswalk [1] across Lantana way and Hillside Terrace Dr	3 - Medium	2 - High
2H - 618	MILLS	HILLSIDE TERRACE DR / PIZARRO CV	Difficult crossing	Install high visibility crosswalk [2] across Pizarro Cove	3 - Medium	1 - Very High
2H - 619	MILLS	HILLSIDE TERRACE DR / SALCON CLIFF DR	Difficult crossing	Install high visibility crosswalk [1] across Salcon Cliff	4 - Low	2 - High
2H - 620	MILLS	SALCON CLIFF DR / TAYLORCREST DR	Difficult crossing,High speed crossing, Missing stop signs	Install high visibility crosswalk [4] across Salcon and Taylorcrest	3 - Medium	2 - High
2H - 621	MILLS	HILLSIDE TERRACE CV / HILLSIDE TERRACE DR / TANAK LN	Missing curb ramps,Difficult crossing	Install 2 curb ramps Install high visibility crosswalk [4] across Tanak Ln	3 - Medium	2 - High

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2H - 622	MILLS	HILLSIDE TERRACE DR / SAUTELLE LN	Missing curb ramps,Difficult crossing	Install 2 curb ramps Install high visibility crosswalk [2] across Sautellen Ln	4 - Low	2 - High
2H - 623	MILLS	MEACHAM WAY / TAYLORCREST DR	Difficult crossing	Install high visibility crosswalk [1] across Meacham	4 - Low	2 - High
2H - 624	CLAYTON	CAP STONE DR / LA CROSSE AVE / SENECA FALLS DR	Difficult crossing	Install 4 curb ramps Install high visibility crosswalk [1] across La Crosse	4 - Low	2 - High
2H - 625	CLAYTON	HANSA DR / LA CROSSE AVE	Difficult crossing	Add median refuge island on Lacrosse Ave , Install high visibility crosswalk [1] across La Crosse	4 - Low	3 - Medium
2H - 626	CLAYTON	LA CROSSE AVE / SKY ROCK DR	Difficult crossing	Install high visibility crosswalk [1] across La Crosse	5 - Very Low	3 - Medium
2H - 627	CLAYTON	LA CROSSE AVE	Difficult crossing, Poor sightlines	Add lighting , Install high visibility crosswalk [1] across Driveway , Install Rapid Flashing Beacon	3 - Medium	2 - High
2H - 628	None (nearest school: Kiker)	Midblock - FOX CREEK DR	Difficult crossing	Install high visibility crosswalk [1] across La Crosse	3 - Medium	2 - High

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2H - 629	CLAYTON	Midblock - CAP STONE DR	Difficult crossing	Install high visibility crosswalk [1] across Cap Stone Dr	4 - Low	2 - High
2H - 630	KIKER	ESCARPMENT BLVD / LA CROSSE AVE	Difficult crossing,No lighting	Add lighting Install high visibility crosswalk [4] across Escarpment Add median refuge island (4)	1 - Very High	2 - High
2H - 631	CLAYTON	Midblock - DOSWELL LN	Difficult crossing	Install curb ramps (4) Add curb extensions (4) Install high visibility crosswalk [1] across Doswell	4 - Low	3 - Medium
2H - 632	KIKER	LA CROSSE AVE / RHETT BUTLER DR	Difficult crossing	Add curb extensions [2] on La Crosse Ave , Add new curb ramp [4] , Install high visibility crosswalk [1] across La Crosse , Install Rapid Flashing Beacon [1]	3 - Medium	2 - High
2H - 633	KIKER	Midblock - DAHLGREEN AVE	Missing/non-compliant curb ramps,Difficult crossing,Poor sightlines,No lighting	Add lighting Install 4 curb ramps Install high visibility crosswalk [1] across Dahlgreen Ave Install Rapid Flash Beacon +	2 - High	1 - Very High

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2H - 634	CLAYTON	DOSWELL LN / SPRUCE CANYON DR	Difficult crossing	Install 2 curb ramps Install high visibility crosswalk [2] across Spruce canyon	3 - Medium	2 - High
2H - 635	KIKER	Midblock - DAHLGREEN AVE	Missing/non-compliant curb ramps,Difficult crossing,Poor sightlines,No lighting	Add lighting Install 4 curb ramps Install high visibility crosswalk [1] across Dahlgreen Ave Install Rapid Flash Beacon	2 - High	1 - Very High
2H - 636	BALDWIN	PEPPERIDGE DR / WISTERIA VALLEY DR	Missing curb ramps	Install 4 curb ramps +	5 - Very Low	3 - Medium
2H - 637	BALDWIN	BRYONY DR / WISTERIA VALLEY DR	Missing curb ramps	Install 4 curb ramps +	4 - Low	3 - Medium
2H - 638	BALDWIN	CHERISSE DR / WISTERIA VALLEY DR	Missing curb ramps,Difficult crossing,Long crossing distance,Wide curb radii	Install high visibility crosswalk [4] across Cerisse and wisteria Intersection reconfiguration +	4 - Low	5 - Very Low

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2H - 639	BALDWIN	MERIDIAN PARK BLVD / WISTERIA VALLEY DR	Missing curb ramps	Install 4 curb ramps +	5 - Very Low	3 - Medium
2H - 640	BALDWIN	JABORANDI DR / WISTERIA VALLEY DR	Difficult crossing	Install high visibility crosswalk [1] across Wisteria	5 - Very Low	3 - Medium
2H - 641	BALDWIN	CHERISSE DR / ESPINA DR	Difficult crossing	Install 3 curb ramps	3 - Medium	2 - High
2H - 642	BALDWIN	ESPINA DR / MERIDIAN PARK BLVD	Missing curb ramps,Difficult crossing,Wide curb radii	Install 2 curb extensions on Espina and Meridien Install 2 curb ramps Install high visibility crosswalk [2] across Espina and Meridien Tighten curb radii +	2 - High	2 - High
2H - 643	BALDWIN	ALOPHIA DR / ESPINA DR	Difficult crossing	Install 3 curb ramps Install high visibility crosswalk [3] across Espina and also Alophia	3 - Medium	2 - High
2H - 644	BALDWIN	CHERISSE DR / ESPINA DR	Difficult crossing	Install 3 curb ramps Install high visibility crosswalk [1] across Cherisse	3 - Medium	2 - High
2H - 645	BALDWIN	ESPINA DR / PRATOLINA DR	Difficult crossing	Install 3 curb ramps Install high visibility crosswalk [1] across Espina	4 - Low	3 - Medium

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2H - 646	BALDWIN	Midblock - MERIDIAN PARK BLVD	Poor sightlines,High speed crossing	Add curb extensions Install high visibility crosswalk [1] across Meridian +	2 - High	2 - High
2H - 647	BALDWIN	MERIDIAN PARK BLVD / MITRA DR	Difficult crossing	Install high visibility crosswalk [1] across Meridian +	4 - Low	2 - High
2H - 648*	BALDWIN	APPALOOSA RUN / FM 1826 RD	Difficult crossing	Install Pedestrian Hybrid Beacon	4 - Low	4 - Low
2H - 649	CLAYTON	SIERRA RIDGE CT	Missing curb ramps	Install 1 curb ramp	5 - Very Low	4 - Low
2H - 650	CLAYTON	Midblock - MAELIN DR	Missing curb ramps	Install 1 curb ramp	4 - Low	2 - High
2H - 651	GORZYCKI	BARSTOW DR / DAVIS LN	Missing curb ramps	Install 1 curb ramp	4 - Low	2 - High
2H - 652*	GORZYCKI	FM 1826 RD / GALLANT FOX RD	High speed crossing	Install Pedestrian Hybrid Beacon	4 - Low	4 - Low
2H - 653	GORZYCKI	Midblock - W SLAUGHTER LN	High speed crossing	Install Pedestrian Hybrid Beacon	2 - High	3 - Medium

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2H - 654	MILLS	ESCARPMENT BLVD / SALCON CLIFF DR	High speed crossing; wide crossing distance	Install Pedestrian Hybrid Beacon	3 - Medium	3 - Medium
2H - 655	None (nearest school: Kiker)	VINEMONT DR / W SLAUGHTER LN	High speed crossing	Install Pedestrian Hybrid Beacon	2 - High	3 - Medium
2H - 656	KIKER	LA CROSSE AVE / S MOPAC EXPY NB	Intersection reconfiguration	Install Pedestrian Hybrid Beacon Protected intersection	3 - Medium	5 - Very Low
2H - 657	KIKER	LA CROSSE AVE / S MOPAC EXPY SB	Intersection reconfiguration	Install Pedestrian Hybrid Beacon Protected intersection	3 - Medium	5 - Very Low
2H - 658	CLAYTON	LA CROSSE AVE / SPRUCE CANYON DR	Long crossing distance	Add median refuge island on Spruce Canyon	3 - Medium	2 - High
2H - 659	KIKER	DAHLGREEN AVE / LA CROSSE AVE	Long crossing distance, wide curb radii	Install 3 curb extensions on Dahlgreen	3 - Medium	3 - Medium
2H - 660	KIKER	LA CROSSE AVE / WALPOLE LN	Difficult intersection	Install high visibility crosswalk	3 - Medium	2 - High

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2H - 802	MILLS	Near 9001 LANTANA WAY	Obstructed school sign	Improve sign	4 - Low	2 - High
2H - 803	KIKER	Near 10409 DAHLGREEN AVE	Parents make mid-block u-turns creating conflicts with pedestrians	Install U turn btw Rhett Butler and Staff lot along Dahgreen south of the new midblock crossing.	3 - Medium	2 - High
2H - 901	KIKER, GORZYCKI	Davis to Allertown Ave	No trail connection	Construct new trail	2 - High	4 - Low
2H - 902*	BALDWIN	between Appaloosa Run and Pratolina	No trail connection	Construct new trail	3 - Medium	5 - Very Low
2H - 903	CLAYTON	between Hollister Dr and Canfield Dr	No trail connection	Construct new trail	3 - Medium	5 - Very Low
2H - 904*	KIKER, GORZYCKI	Between gallant fox and gorzycki driveway	No trail connection	Construct new trail	2 - High	5 - Very Low
2H - 905	KIKER, GORZYCKI	Between Hopeland Dr and Melava	No trail connection	Construct new trail	2 - High	4 - Low

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Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2H - 906	KIKER, GORZYCKI	Kiker ES to Escarpment and Backbay Ln	No trail connection	Construct new trail	2 - High	5 - Very Low
2H - 907	KIKER, GORZYCKI	Escarpment to Vinemont	No trail connection	Construct new trail	2 - High	5 - Very Low
2H - 908	KIKER	from South Bay Ln to Dahlgreen Ave	No trail connection	Construct new trail	4 - Low	5 - Very Low
2H - 909	GORZYCKI, MILLS	Between Taylorcrest and Mills Elementary	No trail connection	Construct new trail	3 - Medium	4 - Low
2H - 910	GORZYCKI, MILLS	between Clairmont Drive and Hot Springs Drive	No trail connection	Construct new trail	4 - Low	5 - Very Low
2H - 911	CLAYTON, GORZYCKI	Near 7400 DOSWELL LN	Existing trail in disrepair.	Repair trail; add new lighting	5 - Very Low	5 - Very Low
2H - 912	GORZYCKI, MILLS	Near DAVIS LN / BARSTOW AVE	No trail connection	Construct new trail	3 - Medium	5 - Very Low

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MAP 2J: BARANOFF ELEMENTARY

CITY OF AUSTIN
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austin MOTION
2016 MOBILITY BOND

TOOLE DESIGN

0 700 1400 2100 ft

- Off-Street Trail
- Bike Lane / Buffered Bike Lane / Protected Bike Lane
- Sidepath
- Neighborhood Bikeway / Traffic Calming
- New / Improved Sidewalk
- Other linear recommendation
- Traffic Control / Intersection Reconfiguration
- Ramp / Curb Extension / Crosswalk
- Over / Underpass
- Other Spot Recommendation
- Existing Trail
- School Boundary
- Council District Boundary

Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2J - 001	BARANOFF	BUCKINGHAM GATE RD	Confusing turn movements, erratic driving mostly be parents to bypass stacked carsa nd/or queue jumping by driving on the wrong side of the street., Excessive vehicle speeds, No lane markings, Traffic back up and chaotic turning movements	Protected Bike Lane - BUCKINGHAM GATE RD from GATLING GUN LN to BATTLE BRIDGE DR Lane diet (changing lane widths) - BUCKINGHAM GATE RD from GATLING GUN LN to BATTLE BRIDGE DR No parking - BUCKINGHAM GATE RD from GATLING GUN LN to BATTLE BRIDGE DR ~	1 - Very High	1 - Very High
2J - 002*	BARANOFF	GATLING GUN LN	Excessive vehicle speeds, No bike facility, Wide ROW	Road diet (changing number of lanes) - GATLING GUN LN from SESBANIA DR to BRODIE LN Buffered Bike Lane - GATLING GUN LN from SESBANIA DR to BRODIE LN Buffered bike lanes - GATLING GUN LN from WARWICK WAY to ARROYO BLANCO CV ~	1 - Very High	5 - Very Low
2J - 003	BARANOFF	TABOR OAKS DR	Add bike facility, No bike facility	Sidepath - TABOR OAKS DR from CAVERN MIST LN to MOSSBACK LN	5 - Very Low	5 - Very Low

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Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2J - 004	BARANOFF	FRATE BARKER RD	No bike facility	Protected Bike Lane - FRATE BARKER RD from BRODIE LN to BUCKINGHAM GATE RD	3 - Medium	3 - Medium
2J - 005*	BARANOFF	GREEN EMERALD TER	No bike facility	Sidepath - GREEN EMERALD TER from LOST OASIS HOLW to BRODIE LN Sidepath - ACCOMAC DR from BRODIE LN to GUN FIGHT LN	3 - Medium	5 - Very Low
2J - 201	BARANOFF	TABOR OAKS DR	Missing sidewalk	Construct new sidewalk - TABOR OAKS DR from MOSSBACK LN to CAVERN MIST LN	5 - Very Low	5 - Very Low
2J - 202	BARANOFF	BRODIE LN	Missing sidewalk	Construct sidepath - BRODIE LN from GREEN EMERALD TERR to GATTLING GUN RD	3 - Medium	3 - Medium
2J - 203	BARANOFF	FRATE BARKER RD	Missing sidewalk	Construct new sidewalk - FRATE BARKER RD from RESERVE CREEK DR to MARCUS ABRAMS BLVD	4 - Low	5 - Very Low
2J - 601	BARANOFF	GATLING GUN LN / WARWICK WAY	Difficult crossing	Add signage Install high visibility crosswalk [3] across Warwick Way Repaint crosswalk markings [3] across Warwick Way	2 - High	1 - Very High
2J - 602	BARANOFF	BUCKINGHAM GATE RD / GATLING GUN LN	Faded crosswalk markings	Add median refuge island on Gatling Gun Ln Repaint crosswalk markings [1] across Buckingham Gate Road	2 - High	1 - Very High

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Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2J - 603	BARANOFF	BRODIE LN / GATLING GUN LN	Missing curb ramps,Non-compliant curb ramps,Difficult crossing,Faded crosswalk markings,Non-ADA push buttons,High speed crossing,No lighting	Add lighting Install 4 curb ramps Install high visibility crosswalk [4] across Gatling Gun and Brodie - all 4 legs Install/update pedestrian push buttons Install/update pedestrian signal heads +	1 - Very High	1 - Very High
2J - 604	BARANOFF	EMERALD OAKS DR / GATLING GUN LN	Difficult crossing	Install high visibility crosswalk [2] across Gatling Gun	4 - Low	2 - High
2J - 605	BARANOFF	BRODIE LN / FRATE BARKER RD	Missing curb ramps,Difficult crossing,High speed crossing,No lighting	Add lighting Install high visibility crosswalk [1] across Brodie Install/update pedestrian signal heads	2 - High	1 - Very High
2J - 606	BARANOFF	Midblock - FRATE BARKER RD	gabardine development have a difficult crossing to cross frate barker	Install Pedestrian Hybrid Beacon	4 - Low	4 - Low

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Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2J - 607	BARANOFF	SUDBURY CV / WARWICK WAY	Limited visibility	Restrict on street parking more so that traffic exiting Warwick can see better and move out at a better rate. ~	2 - High	1 - Very High
2J - 608	BARANOFF	BUCKINGHAM GATE RD	Difficult crossing	Add curb extensions at school driveway	2 - High	1 - Very High
2J - 901	BARANOFF	Alsatia Dr to Arroyo Blanco Dr	No trail connection	Construct new trail	3 - Medium	5 - Very Low
2J - 902	BARANOFF	Emerald Oaks Dr to Mossback Ln	No trail connection	Construct new trail	3 - Medium	5 - Very Low
2J - 903	BARANOFF	From Winding Brook to Battle Bridge to Tubling Creek	No trail connection	Construct new trail	2 - High	4 - Low

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Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
2J - 904	BARANOFF	From Barbera Pass to Vintage Stave to Buckingham Gate intersection	No trail connection	Construct new trail	3 - Medium	5 - Very Low
2J - 905	BARANOFF	From Bear Springs Trail to Hopsack Mills Rd	No trail connection	Construct new trail	3 - Medium	3 - Medium

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Project ID	Project w/in 1/2 mi (ped) or 2 mi (bike) and attendance boundary of:	Location	Issue	Recommendation + parking removal required private property acquisition required	Overall Benefit Category	Estimated Cost:Benefit Category
3B - 008	COVINGTON, COWAN	DAVIS LN	No bike facility	Add protected bike lane - DAVIS LN from S MOPAC EXPY SVRD NB to DEER LN , Add protected bike lane - DEER LN from DAVIS LN to DAVIS LN , Add protected bike lane - DAVIS LN from DEER LN to BRODIE LN	2 - High	5 - Very Low

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CITY OF AUSTIN PUBLIC WORKS

SAFE ROUTES TO SCHOOL

APPENDIX A: ENGINEERING TOOLKIT

ENGINEERING TOOLKIT

INTRODUCTION

This Toolkit was developed in support of the City of Austin Safe Routes to School (SRTS). It presents the most common engineering treatments used to improve pedestrian and bicyclist safety, with a focus on supporting healthy, safe, and active travel to school. The Toolkit can be used by consultants, City staff, and the public in ongoing discussions about traffic safety and school access.

While this Toolkit represents common engineering solutions that can be used, it is not an exhaustive list of every design solution that may be applicable in a school environment. Solutions to specific local challenges must be evaluated by City staff through field work and, when appropriate, engineering studies and/or public engagement. All projects will be designed using applicable City, State and Federal design manuals and guidelines.

CITY OF AUSTIN PUBLIC WORKS
SAFE ROUTES TO SCHOOL

ENGINEERING TOOLKIT

The Toolkit is organized into four sections: Crossing Treatments, Street Treatments, Traffic Calming and Other. The page number for each treatment in the Toolkit is shown below.

CROSSING TREATMENTS

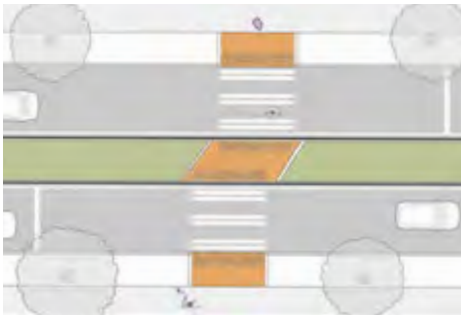
STREET TREATMENTS

TRAFFIC CALMING

OTHER

REFUGE ISLANDS

Refuge islands (also called pedestrian refuges or center islands) are delineated or raised areas in the middle of the street at intersections or mid-block crossings that provide a designated place for people walking and biking to wait for an opportunity to cross the other half of the street.



Typical crossing island

Landscaping beautifies the refuge island

Refuge islands also help people on bicycles cross the street

What is the purpose of a refuge island?

- Makes the crossing more visible to people driving.
- Allows people to cross the street in two stages, making it easier to find gaps in traffic by only having to cross one direction of travel at a time.
- Reduces the amount of time a person crossing the street is exposed to traffic by providing a designated place to wait in the middle of the crossing.
- Makes the street easier to cross for kids, older adults, people with disabilities, and others who may need more time to cross or have more difficulty judging gaps in traffic.
- Reduces speeding as drivers approach the crossing through visual narrowing of the travel lane.

How does COA decide where to install a refuge island?

- Refuge islands may be an effective crossing treatment in situations where it is difficult to cross the street due to long crossing distances or few gaps in traffic.
- There must be adequate width (6-ft minimum) in the middle of the road to install the refuge island. Generally, streets with a two-way center turn lane or few or no left turns by people driving provide opportunities to install a refuge island.
- We also consider including additional safety improvements like crossing beacons along with the refuge island to make the crossing even more visible to people driving. Any added vegetation should be low-lying as to not affect sight distance.
- At crossings frequently used by people on bikes, such as Neighborhood Bikeway crossings, we consider creating individual crossings that separate people biking and people walking.

How much does a refuge island cost?

$$-$$$: A small asphalt or concrete refuge island can be fairly inexpensive, typically in the range of $10K to $20K to install. Lower cost materials such as flexible posts can also be used to delineate the refuge island in certain situations. Larger projects that include landscaping and drainage structures can increase construction and maintenance costs.

How long does it take to install a refuge island?

1-2 years or less: A simple project can be designed in six months and constructed easily by City crews. More time is required to design larger refuge islands or refuge islands at busy intersections. COA may use contractors to install these types of projects instead of City crews, which can add more time.

References and Resources

Pedestrian Crossing Guidelines for Texas

Pedestrian Safety Guide and Countermeasure Selection System (PEDSAFE): Refuge islands

NACTO Urban Bikeway Design Guide: Median Refuge Island

FHWA Proven Safety Countermeasures: Medians and Pedestrian Refuge islands

Example in Austin

Mueller Boulevard and Aldrich Street

CURB EXTENSIONS

Curb extensions are created by extending the curb line into the roadway at a corner or mid-block. They shorten the distance for people walking across the street and improve visibility between people walking and driving. By visually and physically narrowing the roadway, curb extensions also help reduce speeding.

Mid-block curb extension

Easy-to-install materials such as paint, turtle bumps, and flex posts may be used to create curb extensions

Curb extensions may provide space for landscaping

What is the purpose of a curb extension?

- Improves safety by reducing the distance and time required to cross the street.
- Improves visibility between people driving and people walking across the street.
- Provides additional space in constrained locations for installing curb ramps.
- Improves safety at corners by slowing turning motorists through a tighter turning radius.
- Prevents people from parking too close to a crosswalk or from blocking a curb ramp or crosswalk.
- Provides space for seating, public art, bike racks, rain gardens or other public amenities.

How does COA decide where to install a curb extension?

- We consider installing curb extensions at locations that would benefit from improved visibility between people walking and driving, such as at school crosswalks.
- Curb extensions can be installed:
  - at most locations with a legal crosswalk, whether marked or unmarked, provided there is adequate width,
  - on streets with all day on-street parking, and
  - at locations where they do not extend into travel lanes or bike lanes. Before considering installing a curb extension, we check the Austin Bicycle Master Plan to make sure that a new curb extension would not prevent installation of a bike lane in the future.

How much does a curb extension cost?

$$-$$$: Curb extensions typically involve roadway and sidewalk removal and may require replacement / relocation of stormwater drainage inlets. Installing curb extensions as part of larger capital projects such as street repaving, or when using low cost materials such as paint and pre-fabricated platforms (a.k.a. turtle bumps), costs can be reduced.

How long does it take to install a curb extension?

1-2 years: Typically design is completed in 6-12 months and construction is completed by a contractor the following year.

References and Resources

Austin Street Design Guide (DRAFT)
Pedestrian Crossing Guidelines for Texas
Pedestrian Safety Guide and Countermeasure Selection System: Curb Extensions
NACTO Urban Street Design Guide: Curb Extensions
AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities, 2015

Examples in Austin

Aldrich Street and McBee Street
6th Street and Waller Street

CURB RAMPS

Curb ramps are sloped areas located at intersection corners and crossings that connect the street to the sidewalk. They create a barrier-free environment for everyone when crossing streets that have curbs and sidewalks.

Curbs limit universal accessibility and are barriers for transitioning from the sidewalk to the street

A sidewalk retrofitted with a curb ramp and a tactile warning strip

Each corner should have two curb ramps, one for each crossing

What is the purpose of a curb ramp?

- Provides a comfortable transition from the street to the sidewalk for all people, including people with disabilities, kids on bikes, and caretakers pushing strollers.

How does COA decide where to install a new curb ramp?

- To the extent that resources are available, new curb ramp installations are coordinated with sidewalk rehabilitation and applicable street alterations. In addition to street maintenance resurfacing projects performed by Public Works, many other City Departments resurface the streets, which also requires coordinated curb ramp installations.
- We use the City's Sidewalk Master Plan and ADA Transition Plan to select and prioritize curb ramp retrofits. Schools are included as a major component in the Sidewalk Master Plan prioritization model.
- Residents can request curb ramps through the city's 3-1-1 system.

How much does a new curb ramp cost?

$-$$: The Federal Americans with Disabilities Act (ADA) lays out very specific requirements for how curb ramps must be constructed, including level landings and gentle grades. Curb ramps built by COA are built per City Standards, which comply with ADA. When standards are not applicable, curb ramps are field-engineered to follow ADA requirements.

How long does it take to install a curb ramp?

Varies: If a curb ramp is a small scale, stand-alone project, it can be completed within several months. If it is part of a larger resurfacing or reconstruction project, it can take a year or more.

Additional information

The City of Austin has a curb ramp program that routinely installs or upgrades curb ramps throughout the city. Residents can request curb ramps through the city's 3-1-1 system.

References and Resources

2016 Sidewalk Master Plan & ADA Transition Plan

United States Access Board Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG)

MARKED CROSSWALKS

Crosswalks exist at every intersection, whether marked or unmarked. Marked crosswalks are used to raise driver awareness of people crossing the street and to direct people who are walking to the best place to cross the street.

Marked crosswalk at an intersection

Raised crosswalks slow down people driving

Advanced stop bars increase visibility of people crossing the street

Raised Crosswalks

Benefits:

- **Raised crosswalks keep the crosswalk at the same height as the sidewalk.**
- **They act as a speed table and slow people driving as they approach the crosswalk.**
- **They also make people walking more visible to people driving.**

Design Considerations:

- **Raised crosswalks may require modifications to stormwater drainage structures in the street, increasing construction costs.**
- **COA ensures that emergency vehicles and buses aren't affected by a raised crosswalk.**

Example in Austin

Simond Avenue and Aldrich Street

Raised Intersections

- **Raised intersections slow people driving and encourage them to yield to people walking across the street.**
- **Raised intersections can be installed in neighborhood intersections to make the public space more comfortable and inviting for people to walk and bike.**

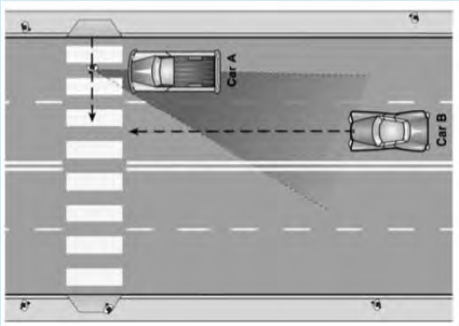
What is the purpose of a marked crosswalk?

- Direct school kids who are walking to the best place to cross the street.
- Indicate the walking route to school.
- People driving are made more aware of where to expect school kids to cross the street.

How does COA decide where to mark a crosswalk?

- Crosswalks will always be marked at signals or PHBs, and at intersections in the Central Business District.
- Crosswalks will typically be marked at stop-controlled locations if there is high vehicular volume, and will be marked if feasible at uncontrolled locations if they satisfy the criteria outlined on this page.
- We consider the following factors when deciding whether to mark a crosswalk at uncontrolled locations:
  - Average hourly traffic over 300 vehicles per hour in any hour
  - Adequate stopping or sight distance
  - More than 20 pedestrian crossings in any one hour of the day, or more than 10 children or elderly persons in any one hour
  - There is no existing marked crosswalk with 300-ft of the location in question
  - The crosswalk is located on a trail, shared-use path, designated safe route to school, or provides direct access to a transit stop, or other pedestrian destinations
  - The crosswalk is located on a High or Very High score on the Pedestrian Safety Priority Network, as determined by the Pedestrian Safety Action Plan
  - Presence of curb ramps
  - Presence of lighting

MARKED CROSSWALKS



Multiple Threat

A multiple threat is a situation where a driver in one lane (car A) stops for a person crossing the street, but the driver in the next lane (car B) doesn't see the person and doesn't stop. If we mark a crosswalk on streets with multiple traffic lanes or high traffic volumes, we consider installing additional safety improvements like crossing beacons, pedestrian signals, refuge islands, curb extensions, or advanced stop lines to minimize the multiple threat.

- Other things we consider include:
  - The total distance a person walking would have to cross. If there is more than one lane of traffic in each direction, then we consider adding additional features to supplement the crosswalk and minimize the potential multiple threat. These treatments could include elements like crossing beacons, pedestrian signals, refuge islands, curb extensions, or advanced stop lines.
  - Volume and speed of people driving. If the street is very busy and speeds are high, then we consider adding additional features to supplement the marked crosswalk.
- If we mark a new crosswalk, we may also install crosswalk signs. If it's a crosswalk mostly used by kids, then we make it a school crosswalk with school crosswalk signs. Otherwise, we use regular crosswalk signs. Flexible in-street bollards may also be used to draw additional attention to the crossing.
- We use a very durable, reflective material to mark crosswalks. Over time, the crosswalk markings may need to be refreshed. We prioritize crosswalk maintenance based on the condition of all the crosswalks in the city. If you're concerned about the condition of a crosswalk, submit a 3-1-1 request.

How long does it take to install a marked crosswalk?

Varies. In some cases, it can take 1-2 months or less to install a new marked crosswalk. If we need to install new curb ramps or other safety improvements in addition to the marked crosswalk, then it can take 1-2 years or longer to complete the work.

How much does a new marked crosswalk cost?

$: If a potential new marked crosswalk location does not require any additional safety treatments, then marking the crosswalk is relatively inexpensive and straightforward.

$$: If we need to install other safety improvements, the cost can be higher.

References and Resources

Pedestrian Crossing Guidelines for Texas

Pedestrian Safety Guide and Countermeasure Selection System: Marked Crosswalks and Enhancements

Pedestrian Safety Guide and Countermeasure Selection System: Raised Pedestrian Crossings

City of Austin Crossing Guidelines and Crossing Decision Tree

RECTANGULAR RAPID FLASHING BEACONS

Rectangular Rapid Flashing Beacons (RRFB) are pedestrian-activated flashing lights on the side of the street that make a crosswalk more visible to people driving and alert them to the presence of a person trying to cross the street.

RRFB with passive detection

RRFB with push button at a school crosswalk

RRFB at a neighborhood bikeway crossing

What is the purpose of a RRFB?

- Makes the presence of a person trying to cross the street known to people driving, since they only flash when someone pushes the button or activates an automatic sensor.
- Studies have shown that people driving are more likely to stop for people trying to cross the street when they activate a rectangular rapid flashing beacon. The highly visible flash of RRFBs is very eye-catching to motorists.

When would COA install a RRFB?

- The Federal Highway Administration (FHWA) provides warrants and guidance for the installation of RRFBs. For more information, see https://mutcd.fhwa.dot.gov/resources/interim_approval/ialistreq.htm#ia11
- COA considers the volume and speed of traffic on the street as well as the total distance a person walking or biking has to cross.
- RRFBs can be installed at crosswalks that have other safety improvements, like a crossing island.

How much does a RRFB cost?

$$: RRFBs are a relatively inexpensive way to improve safety for people crossing the street. The cost to install RRFBs can increase if the crossing doesn't already have a marked crosswalk with curb ramps that meet Federal Americans with Disabilities Act requirements.

How long does it take to install a RRFB?

Varies. If the existing crossing already has marked crosswalks and curb ramps that meet ADA requirements, RRFB can be installed in a few months. If other improvements are needed at the location, it may take 1-2 years.

References and Resources

Interim Approval for Optional Use of RRFBs (FHWA)

Pedestrian Safety Guide and Countermeasure Selection System: RRFB

FHWA Intersection Safety Technologies

PEDESTRIAN HYBRID BEACONS

Pedestrian Hybrid Beacons (PHB) are pedestrian-activated traffic control devices which help pedestrians safely cross major roadways where there is no traffic signal. PHBs are also known as High Intensity Activated Crosswalks, or HAWK signals.

Pedestrian hybrid beacon

Pedestrian hybrid beacon on a divided roadway

Pedestrian hybrid beacon on a downtown street

What is the purpose of a PHB?

- Makes the presence of a person trying to cross the street known to people driving, since the beacon is only activated when someone pushes the button.
- The beacon consists of two red lights above a single yellow light. The beacon head is "dark," or unilluminated, until a pedestrian activates the device. The pedestrian pushes a button that activates the beacon. After displaying brief flashing and then steady yellow intervals, the device displays a steady red indication to drivers and a "WALK" indication to pedestrians, allowing them to cross while traffic is stopped.
- The solid red signal face on a PHB has the same meaning as and should be treated like a traffic signal showing a red light. Once the red light starts flashing it should be treated like a stop sign, where the driver is to stop and make sure it is clear before proceeding.

When does COA install a PHB?

- The City follows the Texas Manual on Uniform Traffic Control Devices guidelines and warrants when studying a location for a PHB.
- We use data to understand the volume and speed of people driving on the street as well as the number of traffic lanes a person has to cross.
- We consider the safety history of the crossing in addition to environmental and community issues at a given location.
- PHB must be located more than 300-ft from existing signals.
- PHB should be reserved for roads with at least three travel lanes.
- PHB can be installed at crosswalks that have other safety improvements, like a crossing island.

How much does a PHB cost?

$$$$: Relatively expensive due to electrical components that often require temporarily removing sidewalk to access underground electrical lines and the reconstruction of any sidewalk removed during construction. The cost can range from $75,000 to $150,000.

How long does it take to install a PHB?

1-2 years: Traffic studies and signal design must be completed before installation can begin

References and Resources

City of Austin: Pedestrian Hybrid Beacons

Pedestrian Safety Guide and Countermeasure Selection System: Pedestrian Hybrid Beacon

FHWA Intersection Safety Technologies

Texas Manual on Uniform Traffic Control Devices: Chapter 4

Examples in Austin

Guadalupe Street and 31st Street

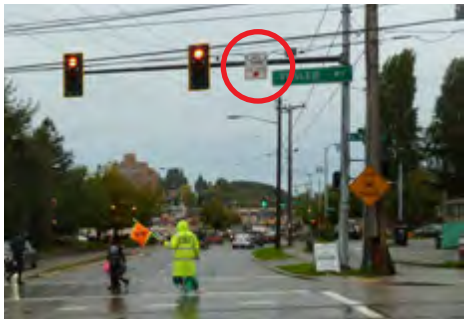
Mairo Street and S 1st Street

TRAFFIC SIGNALS

Traffic signals coordinate the flow of traffic at intersections, including people driving, walking, and biking.

Bicycle signal detection


Reflective back plate makes the signal more visible


"No Turn on Red" sign

What is the purpose of a traffic signal?

- Controls the flow of traffic and provides coordinated movement of people driving, walking, and biking.
- Provides a safer, more comfortable environment for people walking and biking to cross the street or streets with high traffic volumes or speeds. People driving have to completely stop at red signals when it's the pedestrian's or bicyclist's turn to cross the street.
- When there is a steady stream of traffic, it can be difficult for people walking or biking to find a gap in traffic to cross the street. Traffic signals create gaps in traffic that allow people biking or walking to cross the street.

How does COA decide where to install a traffic signal?

- We use the Texas Manual on Uniform Traffic Control Devices (TMUTCD) to determine if the safety and traffic flow at an intersection would be improved by installing a new traffic signal. The TMUTCD outlines minimum thresholds for vehicle and pedestrian traffic and collisions that should be considered before installing a traffic signal.
- We conduct a traffic engineering study to determine if a location meets the TMUTCD thresholds, further analyze traffic patterns, and conclude whether a new signal would improve safety or the flow of traffic.
- At some intersections near schools, we can adjust the signal timing and flashing pattern during school arrival and dismissal hours to create fewer conflicts between people walking and people driving.
- Providing a dedicated phase for people to cross the street followed by a separate phase for left turning vehicles reduces potential conflicts between pedestrians and motorists. By prohibiting left turns during the WALK phase, pedestrians in the crosswalk do not have to worry about turning motorists yielding to them.
- At some intersections, including some locations in downtown, people driving aren't allowed to make a right turn when the traffic signal is red. This design makes it safer for people walking across the street by reducing the number of potential conflicts with people turning right on red.
- Traffic signals are more convenient for people walking when the WALK sign is displayed automatically when it's their turn to cross the street, a strategy referred to as automatic recall. Signals in areas of Austin with high pedestrian volumes are programed to show the walk signal automatically. In situations with very low pedestrian volumes, this design may not be appropriate, so many traffic signals have push buttons for people to activate the WALK phase.
- At intersections that are frequently used by people on bikes, COA has installed equipment to detect when a bicyclist is present. This equipment tells the signal to give the bicyclist a green light. This detection can be in the pavement or on the signal pole/arm. COA has recently installed bike signals at 12 intersections throughout the city.

TRAFFIC SIGNALS

How much does a traffic signal cost?

$$$$: Installing a new traffic signal is a very costly safety improvement. When possible, we try to find more cost-effective safety improvements that achieve the same safety objectives so that we achieve more with limited city resources.

How long does it take to install a traffic signal?

2-4 years: We construct a limited number of new signals per year because they are so costly. They take a long time to design and construct because they are complex systems.

4+ years: If the new signal is on a state route, then the City coordinates with the Texas Department of Transportation, which adds time to the process.

Pedestrian Countdown Signals and Leading Pedestrian Intervals (LPI)

A pedestrian countdown signal shows the number of seconds remaining before the WALK phase is over. This feature helps people walking know how much time they have remaining to cross the street and can help reduce the number of people in the crosswalk near the end of the WALK phase. It's safest for people walking to be out of the crosswalk when the signal turns green for people driving in the opposite direction.

A Leading Pedestrian Interval (LPI) gives people walking the WALK indication 3-5 seconds before people driving in the same direction get a green signal. Because people walking are already in the crosswalk when people driving begin to turn left or right, people driving are more likely to yield to people walking.

What is the purpose of an LPI?

- The LPI signal timing technique allows pedestrians to establish themselves in the intersection in front of turning vehicles, increasing visibility between all modes.

How does COA decide where to implement an LPI?

- The LPI can be used at intersections with high volumes of pedestrians and conflicting turning vehicles and at locations with a large population of elderly or school children who tend to walk more slowly.
- The LPI should be at least three seconds to allow pedestrians to cross at least one lane of traffic to establish their position ahead of turning traffic.

How much do LPIs cost?

$: An LPI is typically added where there is already a signal, so the cost is minimal.

How long does it take to install an LPI?

A few months. An LPI is typically added where there is already a signal, so this reflects the time to redesign the signal cycle and time for a technician to adjust it at the control center or in the field.

With a Leading Pedestrian Interval, motorists have a red signal for the first 3-5 seconds of the WALK phase.

References and Resources

City of Austin: Traffic Signals

Texas Manual on Uniform Traffic Control Devices, Part 4

Pedestrian Safety Guide and Countermeasure Selection System: **Traffic Signals**

Federal Highway Administration Proven Safety Countermeasures

Bike Signal Examples in Austin

4th Street and Red River Street

Rio Grande Street and W 24th Street

North Lamar Boulevard and Morrow Street

STOP SIGNS

Stop signs are a traffic control device used at intersections with three or more approaches, and where application of the normal right-of-way rule would not be expected to provide reasonable compliance with the law.

Stop sign with stop line at an all-way stop

Stop sign oriented to traffic crossing a neighborhood bikeway

Stop sign at intersection between a neighborhood street and a busier street

What is the purpose of a stop sign?

- Controls traffic movements between people driving, walking, and biking by assigning right of way at an intersection.
- May be used to control one direction of traffic while allowing the other direction to flow freely or can be used to control all directions of traffic.

How does COA decide where to install a stop sign?

- We use the Texas Manual on Uniform Traffic Control Devices (TMUTCD) to determine if the safety of an intersection would be improved by controlling one or more directions of traffic with a stop sign. The TMUTCD outlines certain minimum thresholds of motorist, pedestrian, and bicyclist traffic and collisions that should be considered before installing a stop sign.
- If the volumes of people driving, walking, and biking at each direction of the intersection are approximately equal and meet the minimum thresholds, we will consider installing stop signs for all directions of travel.
- If the volumes of people driving, walking, and biking from each direction are unequal, the street with the lower volume of people traveling should be stop-controlled unless there are reasons to provide an advantage to one direction of travel (e.g. neighborhood bikeways).
- Other things we consider include:
  - direction of school walking routes,
  - visibility and sight distance on different sides of the intersection, and
  - providing advantage to one direction of travel over another, e.g. neighborhood bikeway or major trail connection.
- Stop signs may be accompanied by stop lines, which indicate to people driving where to stop their car before the intersection.

How much does a stop sign cost?

$: Stops signs are a relatively low-cost and effective way of controlling traffic at intersections.

How long does it take to install a stop sign?

<1 year: If we determine that an intersection should have one or more new stop signs, they can be installed relatively quickly.

References and Resources

Texas Manual for Uniform Traffic Control Devices
AASHTO Guide for the Development of Bicycle Facilities

SIDEWALKS

Sidewalks are the building blocks of the pedestrian network. There are currently more than 2,400 miles of sidewalks in Austin, yet many areas in the city do not have sidewalks at all. Sidewalks provide the greatest benefit to people when they are wide enough for two people to walk side-by-side, maintained in good condition with few bumps or cracks, kept clear of debris and overgrowing plants, and built with curbs.

Severe cracking creates uneven and hazardous walking surfaces

New sidewalk remains level across driveway

Alternative sidewalk design

What is the purpose of a sidewalk?

- Improves safety and comfort of people walking by separating pedestrians from people moving faster on bikes or in cars.
- Provides a dedicated space away from car traffic for children to walk, play, and learn to ride a bike.

How does COA decide where to build a new sidewalk?

- The City's Sidewalk Master Plan and ADA Transition Plan Update provides an objective mechanism for prioritizing new sidewalk construction and existing sidewalk repair and rehabilitation projects.
- Developers often have to build new sidewalks or repair existing sidewalks with new development.
- Sidewalk prioritization is determined by the following criteria:
  - Where people need and want to walk, not only today but in the future
  - Equity factors, like where people with lower incomes or low-car households live
  - Whether adjacent streets provide comfortable, continuous sidewalks
  - The number of students served
- We prioritize providing a sidewalk on at least one side of residential streets. School routes may be locations where sidewalks should be installed on both sides of residential streets to provide for direct access from homes to school, as well as to areas used for off-site drop-off and pick-up.
- Along existing sidewalks, we look for opportunities to remove barriers such as light poles or other obstructions, aiming to maintain a 4-ft clear zone. We also look for opportunities to limit or narrow driveways (a.k.a. curb cuts), which can create conflicts between people walking and people driving.

How much does a new sidewalk cost?

$$-$$$$: Building new sidewalks can be an expensive and challenging engineering project. We often must coordinate with nearby property owners. In addition, driveways connecting to private property may need to be redesigned and rebuilt, encroachments of private property onto public property removed, and new stormwater infrastructure constructed.

How long does it take to get a new sidewalk installed?

1-2 Years: Design and outreach must be completed before construction can begin.

Additional Information

When building conventional sidewalks is not feasible, other strategies may be considered for creating safer walking routes to school, such as Shared Streets, reallocating road space to create dedicated walking space, and alternative surfacing materials.

References and Resources

2016 Sidewalk Master Plan & ADA Transition Plan Update

United States Access Board Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG)

LIGHTING

Lighting is an essential element in street design. It is used to increase visibility and safety for people walking, biking, and driving at night and during dawn/twilight hours. Guidelines for placement, size, and wattage of lighting is a key element of creating pedestrian-friendly streets.

Well-lit crossing at night

Pedestrian scale lighting along a shared use path

Cobra style lights illuminate the street, but not the pedestrian realm

What is the purpose of lighting?

- Increases visibility and feelings of safety on a street, at an intersection/crosswalk, in a neighborhood, or along a trail.
- Creates a welcoming public realm and promotes active transportation options at nightime and winter when daylight hours are shorter.
- Highlights certain locations and elements in a neighborhood as focal points or landmarks which provides wayfinding support.
- Can have a traffic calming effect when pedestrian scale lighting is used.

How does COA decide where to install a lighting element?

- COA follows lighting recommendations included in the Illuminating Engineering Society Of North America, Roadway Lighting. Any applications are to meet or exceed these recommendations.
- We aim to create uniformity of lighting on the street by using lower fixture heights and greater fixture density.
- We place lighting fixtures in a way that minimizes clutter and takes other streetscape elements into consideration. To acheive these goals COA has identified the following guidelines:
  - Pedestrian lighting is placed at a 12-ft mounting height
  - Placed at 88-ft on center from each other
  - We use subject lighting, which is directional and can be aimed at important crossings (such as primary school crossings)
- In addition to these guidelines, lighting should be studied on a case by case basis starting with a photometric analysis, and designed to match the character of the surrounding area.

How much does lighting cost?

$$: Lighting costs can vary depending on the type of fixtures and poles. COA specifies the types of fixtures to be used along public streets and bike paths.

How long does it take to install lighting?

Few months to 1 year: This can vary depending on whether the installation is part of a larger streetscape project.

BIKE FACILITIES

Bike facilities are routes or road design features made for people on bikes. On-street bike facilities include bike lanes, buffered bike lanes, protected bike lanes, and intersection treatments such as protected intersection designs or green pavement markings.

Protected two-way bike lane

Bike markings

Bike box

What is the purpose of a bike facility?

- Encourages more people to feel comfortable riding a bike to different locations, including to school.
- Provides safety and predictability by separating people biking from people driving.
- Makes biking a viable transportation option with many benefits including avoiding traffic congestion, reducing parking costs, decreasing the time spent commuting, and helping reduce emissions that contribute to climate change.
- Providing safe and comfortable ways for children to bicycle to school is important because it extends the distance that a child can realistically arrive to school using active transportation. While a typical walk-shed is only 1/2 mile around a school, a bike-shed can be up to 2 miles or more, depending on the student's age.

How does COA decide where to install a bike facility?

- The Austin Bicycle Master Plan and implementation planning prioritizes the locations where bikeways are built every year. Current funding levels, traffic and safety data, and leveraging opportunities are all considered to decide when and where bike facilities are built.
- The Austin Bicycle Master Plan's main network recommendations are based on a street's speed, volume, and connectivity. The bicycle plan also recommends bicycle facility connections to local destinations, including schools, that are outside of the main network but important due to both the traffic intensity during pick-up and drop-off and safety needs of kids.
- Bike lanes that are more separated from car traffic, like protected bike lanes with additional intersection treatments, are more appropriate and comfortable for kids biking to school.

How much does a bike facility cost?

$-$$$$: The cost of a bike facility depends on the type. Simpler projects cost much less than protected bike lanes.

How long does it take to install a bike facility?

Varies: Installing a bike facility depends significantly on the length of the route and scope of the project. Timelines typically range from eight months to a year for the planning, design, and construction phases, but can take longer, especially if there are changes to parking and a public process must be initiated. In addition, many projects include a data collection period up to one year after installation to evaluate the performance of the facility.

Examples in Austin

Berkman Drive

4th Street and Red River Street

References and Resources

City of Austin Bicycle Master Plan

NACTO Urban Bikeway Design Guide

AASHTO Guide for the Development of Bicycle Facilities, 2012

BIKESAFE Bicycle Countermeasure Selection System

NCHRP Guidelines for Analysis of Investments in Bicycle Facilities

BIKE LANES

A bike lane is defined as a portion of the roadway that has been designated by striping, signage, and pavement markings for exclusive use by bicyclists.

What is the purpose of a bike lane?

- Enable bicyclists to ride at their preferred speed without interference from traffic.
- Facilitate more predictable behavior and interactions between bicyclists and motorists.

How does COA decide where to install a bike lane?

- The installation of a bike lane requires an analysis of traffic volumes and speeds, as well as motorist behaviors.
- Bike lanes are typically found on both sides of a two-way street and one side of a one-way street.
- Bike lanes typically run in the same direction as traffic; sometimes they are installed in a “contra-flow” direction on low-traffic one-way corridors when it is necessary to maintain bicycle connectivity.
- Bike lanes should facilitate access to schools, public transportation, shopping centers, parks, and residential areas.
- Bike lanes are best suited for roadways with:
  - Speeds less than 30 mph and traffic volumes of 3,000 – 9,999 vehicles per day, or
  - Speeds of 31-40 mph and traffic volumes less than 3,000 vehicles per day. At higher speeds and volumes, protected bicycle lanes are preferred.
- On streets with constrained street widths or right-of-ways bicycle lanes may be installed outside of these recommendations
- In Austin, the minimum bike lane width is 5-ft. The preferred bike lane width is wider and can be 6-ft to 8-ft. If there is space to provide a bicycle lane greater than 7-ft, consider a buffered bicycle lane or a protected bicycle lane.
- Other factors affecting the placement of a bike lane include on-street parking, parking frequency, delivery activity, multiple travel lanes, transit service, and route continuity such as completing gaps in off-street urban trails.
- We also consider buffered bike lanes in locations where greater separation is desired between people driving and biking. Buffers consist of diagonal pavement markings that are at least 2-ft wide, located between the travel lane and bike lane.

How much do bike lanes cost?

$: Implementation of bike lanes can take place as part of roadway restriping projects. Roadway repaving is typically not required unless current conditions do not allow for easy bicycling.

How long do they take to install?

>1 year: Installation of bike lanes requires analysis of existing traffic conditions and identification of how the bike lane will augment and improve the existing or future bicycle network. Design of bike lanes typically takes 6 months to a year, followed by implementation.

PROTECTED BIKE LANES

A protected bike lane is an exclusive bicycle facility that provides a greater level of separation and comfort for bike riders, compared to a conventional bike lane. A protected bike lane includes physical, vertical separation from motor vehicle traffic. This physical separation may be in the form of a flex post, bollard, or curb. In situations where on-street parking is allowed, separated bike lanes are sometimes located on the curb side of parking.

What is the purpose of a protected bike lane?

- Provide a higher level of comfort and safety for users due to the physical separation.
- Attract users of all ages and abilities.
- Data from surveys suggest that if the City of Austin were able to implement an all ages and abilities bicycle network with facilities such as separated bike lanes, then 55 to 60% of the population say they would feel safe enough to bicycle on the roadways.

How does COA decide where to implement a protected bike lane?

- Protected bike lanes require more on-street right-of-way width than conventional bike lanes
- Protected bike lanes are generally recommended for roadways with:
  - Average daily traffic volumes of 10,000+
  - 41-50 mph and average daily traffic volumes of 3,000-9,999+
  - Over 50 mph and average daily traffic volumes of less than 3,000
- Protected bike lanes may be considered below these threshold levels as a treatment along bicycle routes to school since young children may need more separation than adults to feel comfortable bicycling on the street.
- Other factors affecting the placement of a protected bike lane include curbside activity, on-street double parking, parking frequency, delivery activity, multiple travel lanes, transit service, and route continuity such as completing gaps in off-street urban trails.
- Generally, the preferred clear width of a one-way protected bike lane is 7-ft, not including the width of physical separation. For a two-way facility, the typical clear width is 10-ft.

How much does a protected bike lane cost?

$$-$$$: Costs can vary. Protected bike lanes can be implemented as part of routine resurfacing projects using low-cost materials, or as part of reconstruction projects using curbing and grade separation.

How long does a protected bike lane take to install?

1-3 years. Like conventional bike lanes, separated bike lanes require traffic analysis and identification of any spatial constraints. Depending on the separation type and material chosen, design of separated bike lanes can take 6 to 18 months, followed by implementation.

NEIGHBORHOOD BIKEWAYS

Neighborhood Bikeways are streets that have slow speeds and low volumes of people driving, in order for people of all ages and abilities to feel comfortable biking on the street.

Residential streets are great for Neighborhood Bikeways

Neighborhood Bikeway

Intersection design is an important consideration at arterial street crossings

What is the purpose of a Neighborhood Bikeway?

- Encourages more people to walk and bike by keeping car volumes and speeds low and by providing high quality crossing treatments at busy streets.
- Provides safer, more comfortable routes to school for kids on foot or on bikes.
- Provides better connections for all ages and abilities to bike to other places in their neighborhood, like parks, libraries, and community centers.

How does COA decide where to install a Neighborhood Bikeway?

- The Austin Bicycle Master Plan prioritizes the general location where Neighborhood Bikeways are built. Current funding levels, traffic and safety data, and leveraging opportunities are all considered when deciding where Neighborhood Bikeways are implemented.
- Some elements we consider when selecting a specific route include:
  - Residential streets that connect people to neighborhood destinations such as schools, parks, shops and restaurants, among others,
  - Streets with low volumes of people driving and slow speeds. An ideal street for a Neighborhood Bikeway has fewer than 1,500 cars per day and speeds close to 20 MPH,
  - Relatively flat streets that are comfortable for people to walk or bike,
  - How to make the most of existing infrastructure to help people cross busy streets, such as traffic signals at busy intersections, and
  - New safety improvements at intersections of busy streets, such as refuge islands and crossing beacons.
- Typical elements of a Neighborhood Bikeway may include:
  - Speed limit of 20 MPH,
  - Signs and pavement markings to help people find their way,
  - Some combination of curb extensions, crossing beacons, crosswalks, refuge islands, or traffic signals at busy intersections,
  - Traffic diversion or channelization,
  - Right of way priority.

NEIGHBORHOOD BIKEWAYS

Refuge islands help Neighborhood Bikeway users cross busier streets

Signage and pavement markings help direct Neighborhood Bikeway users to destinations

How much does a Neighborhood Bikeway cost?

$-$$$: The cost to build a new Neighborhood Bikeway can vary based on how much work needs to be done to make crossings of busy streets safer.

How long does it take to install a Neighborhood Bikeway?

>1 year: Once a new Neighborhood Bikeway project has been funded, it can take one to two years to install. During the early phases of a Neighborhood Bikeway project, we collect and analyze traffic data to understand existing conditions. We gather public feedback through community outreach, which helps us select the most promising route. Once a route is chosen, the design phase and some pre-construction work may occur. Every Neighborhood Bikeway design is unique depending on local characteristics.

References and Resources

Austin Bicycle Master Plan
Local Area Traffic Management Program
NACTO Urban Bikeway Design Guide

SCHOOL ZONES

School Zones are designated on the immediate blocks around a school with reduced speed limits and pedestrian crossing signage to facilitate safer crossings for children walking and biking to school.

Trained crossing guards improve school zone safety


School crossing sign


In road signage reinforces pedestrian priority at school crossings

What is the purpose of a school zone?

- The best way to achieve a safe and low-stress school zone is through the uniform application of policies, practices, and standards developed through engineering judgement or studies.

What treatments define a school zone?

- Flashing school zone signs are used to reduce speed limits during school arrival and dismissal hours.
- School crossing signs should be used on key crossings located within the school zone. Other enhanced crossing treatments may be appropriate, depending on the volumes of pedestrian and motor vehicle traffic.
- Signs may include School Crossing, Speed Limit, School Bus Stop.
- Beacons may be used to supplement signage.

What other treatments should also be considered to improve safety in a school zone?

- Adequate sidewalks and crosswalk markings.
- Crossing guards with proper equipment and training.
- Traffic control devices including pedestrian activated signals.

How does COA decide where to implement a school zone?

- The beginning point of a reduced school speed limit zone should be at least 200-ft in advance of the school grounds, a school crossing, or other school related activities; however, this 200-ft distance should be increased if the reduced school speed limit is 30 mph or higher.
- Signage and pavement markings are not frequently used on neighborhood streets, though we consider the speed of traffic and anticipated number of students walking along the route. This also applies if the approach is a state highway or major arterial.
- Additional information on school zone signage and markings can be found in Part 7 of the TMUTCD.

How much do school zone improvements cost?

$: Pavement markings and signage are relatively inexpensive. Costs increase if sidewalk construction, road alterations, and traffic signals are also needed.

References and Resources

Texas MUTCD Traffic Control for School Areas
New Jersey School Zone Design Guide
Arizona Traffic Safety for School Zones Manual

DYNAMIC SPEED DISPLAY DEVICES

Dynamic Speed Display Devices (DSDD), also known as speed feedback signs, use radar to detect and display the speed of people driving. These signs help slow down people driving by reminding them of their speed compared to the posted speed limit.

Speed feedback sign displays a driver's speed compared to the speed limit

Solar-powered speed radar sign

Speed feedback signs may also flash a "slow down" message

What is the purpose of a dynamic speed display device?

- Raises awareness of the speed a person is driving and encourages them to slow down if they are driving above the speed limit.

How does COA decide where to install a dynamic speed display device?

- The city uses the following criteria when installing a DSDD:
  - The street must be owned and maintained by the City of Austin,
  - The street must provide access to abutting residential properties and/or places of community interest such as parks, libraries, community centers, educational institutions, etc.
  - The street must be a residential street or a minor collector street with no more than one moving lane of traffic in each direction,
  - The street must have a speed limit of 35 miles per hour or less, and
  - The DSDD cannot be installed in a school zone.

How much does a dynamic speed display device sign cost?

$-$$: Both portable and fixed-location DSDD units are available. Portable units are typically placed at a location on a roadway for a relatively short time period and then relocated to a different location. Fixed-location units are used for the long-term display of vehicle speeds at a given location.

How long does it take to install a dynamic speed display device?

The Austin Transportation Department has a Rotating DSDD Pilot Program with six portable DSDD units. Each DSDD unit is left in place for four weeks at a time, during which it collects real-time data on vehicular speeds and volumes. The locations for DSDD are determined on a first-come, first-serve basis based on citizen requests.

References and Resources

ATD Rotating DSDD Pilot Program

Example in Austin

Guadalupe Street and 23rd Street

LANE RECONFIGURATION

On multi-lane streets, a lane reconfiguration can improve safety for all roadway users. Modification of on-street parking can also give flexibility to constrained streets. Depending on the needs of the street, which are determined by careful analysis and a strong public process, general purpose lanes, parking or turn lanes may be repurposed for other uses such as wider sidewalks, street trees, bike lanes, or more efficient transit.

Street before lane reconfiguration

Street after lane reconfiguration

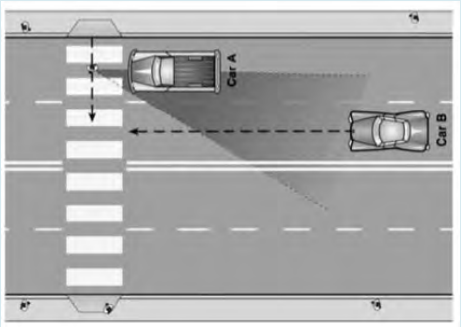
Street after lane reconfiguration

What is the purpose of a lane reconfiguration?

- Makes it easier and safer for people to cross busy streets by reducing the number of traffic lanes a person has to cross. When people cross streets with more than one lane in each direction they encounter a 'multiple threat.'
- Reallocate space on the street to widen sidewalks, plant street trees, add curb extensions, or install protected bike lanes.
- Slows people driving, which makes the street safer for everyone. When there's one lane in each direction, a person driving can only go as fast as the person in front of them.
- Makes it safer for people driving to make a left turn when a center turn lane is added, and a single lane of traffic helps manage drivers cutting in and out of lanes, which helps reduce collisions.
- Narrowing the width of travel lanes can also slow people driving and create space on the street to make it safer and more comfortable for people walking and biking.

How does COA decide where to do a lane reconfiguration?

- When a street is being resurfaced or reconstructed, there is an opportunity to change the configuration of lanes on the street. COA evaluates traffic conditions and crash records to identify whether a road or lane diet is needed and if parking can be modified.
- Streets that are good candidates for lane reconfigurations typically have lower volumes than would be expected for a street with the existing configuration. A lane reconfiguration may be considered for streets with under 25,000 vehicles per day.
- For all lane reconfiguration projects, the flow of traffic is carefully analyzed to make sure a lane reduction wouldn't cause back-ups at traffic signals, and public process is conducted to discuss tradeoffs with the public.
- For parking lane reconfigurations, parking use and supply is carefully studied and inform the proposed designs that are vetted through a public process before moving forward.



Multiple Threat

A multiple threat is a situation where a driver in one lane (car A) stops for a person crossing the street, but the driver in the next lane (car B) doesn't see the person and doesn't stop. If we mark a crosswalk across more than two lanes of traffic, we consider installing additional safety improvements like crossing beacons, pedestrian signals, refuge islands, curb extensions, or advanced stop lines to minimize the multiple threat.

LANE RECONFIGURATION

A three-lane to two-lane reconfiguration

Lane reconfiguration

Center turn lane narrowed to provide space for bike lanes

How much does a lane reconfiguration cost?

$-$$$$: The cost of a lane reconfiguration is highly variable; it may involve removing the lane lines from the street and repainting new lane lines, which is often done at night or on weekends to minimize traffic disruptions. When a lane reduction is done as part of a larger project to resurface or reconstruct a street, it can be accomplished for relatively low costs.

How long does it take to do a lane reduction?

>1 year: We generally host one or two open houses to gather community input and influence design decisions in the first year, and construction typically follows the year after.

References and Resources

Austin Street Design Guide (DRAFT)

Redesigning the Street: A Report on Right Sizing Projects in Austin, TX 1999-2014

Pedestrian Safety Guide and Countermeasure Selection System: Lane Reduction (Road Diet)

FHWA Proven Safety Countermeasures: Road Diet (Roadway Reconfiguration

Examples in Austin

Duval Road from West Cow Path to Aspendale

Shoal Creek Blvd from Steck to 183

51st Street from Berkman to Manor

SPEED CUSHIONS

Speed cushions are traffic calming features that encourage people driving to slow down. Speed cushions are raised areas that extend across the street with wheel cutouts to allow large vehicles, like buses or emergency vehicles, to pass through unaffected.

Speed cushion

Speed cushions allow for larger vehicles such as fire trucks to pass through unimpeded

Speed cushions installed on hills may include a cut for downhill bicyclists

What is the purpose of speed cushions?

- Slow people driving to make streets safer and more comfortable for people walking and biking.
- Speed cushions are usually installed on neighborhood streets.

How does COA decide where to install speed cushions?

- Any request for speed cushions has to go through the Local Area Traffic Management (LATM) program which is a request-based program that installs speed mitigating devices, such as speed cushions, on neighborhood streets.
- ATD ranks requests based on speed data, neighborhood support, and geometric and environmental factors.
- Once accepted into the program, the request competes for funding with all other LATM requests.
- Speed cushions may also be funded through SRTS if identified in the SRTS Infrastructure Plan.

How much does a speed cushion cost?

$: Speed humps and cushions are a low-cost way to slow people driving.

How long does it take to install a speed cushion?

1-2 years: Priority streets with high speeds are usually identified one year and construction happens the next year.

References and Resources

Local Area Traffic Management Program

Examples can be found throughout Austin

TRAFFIC CIRCLES

Traffic circles guide motor vehicles through an intersection in one direction around a central island. They are usually installed at intersections of neighborhood streets. Traffic circles are very effective at slowing people driving and reducing collisions. When installed in a series along a corridor, they are even more effective at reducing motor vehicle speeds along the length of the corridor.

The horizontal deflection of chicanes and traffic circles force drivers to slow down

Traffic circles create more comfortable conditions for people walking and biking

Traffic circle at a school crossing

What is the purpose of a traffic circle?

- Slows people driving and reduces the likelihood of collisions to make neighborhood streets safer and more comfortable for people walking, biking, and driving.
- Provides an opportunity to beautify a neighborhood street by adding trees, plants, and flowers.

How does COA decide where to install a traffic circle?

- COA is currently working with the Austin Fire Department to address their concerns about neighborhood traffic circles. The use of this treatment will be carefully reviewed.
- COA uses data to understand the volume and speeds of people driving on a street and how many collisions have happened at that location in recent years.
- We may consider installing a traffic circle at intersections that have had five or more collisions in the past three years.
- Before we design and construct a traffic circle, we identify neighbors who will volunteer to maintain the plants in the traffic circle.

How much does a traffic circle cost?

$$-$$$: Traffic circles are lower in cost to install if no other curbline changes in the intersection are needed. If curbs must be adjusted, and there are changes to drainage structures and curb ramps, the cost will be higher.

How long does it take to install a traffic circle?

1-2 years: Priority intersections are usually identified one year and construction happens the next year.

References and Resources

Local Area Traffic Management Program

Examples can be found throughout Austin

Rio Grande Street and 8th Street

Rainey Street and River Street

URBAN TRAILS

Urban trails, also known as a shared or multi-use paths, create active transportation corridors that provide expanded travel choices. Urban trails can be built independent from the road network or alongside a roadway where traffic volumes and speeds are too high, or where there is not sufficient space for bicycle lanes in the existing street space.

Urban trail in Alexandria, VA

Urban trail in San Antonio, TX

Lance Armstrong Bikeway, Austin, TX

What is the purpose of an urban trail?

- Serves both transportation and recreation users,
- Can accommodate two-way pedestrian and bicycle use,
- May include connections to the on-street bicycle and sidewalk network
- Should be aesthetically appealing and feel safe to use, and
- May provide opportunities for economic development along the trail corridor.

How does COA decide where to install an urban trail?

- Prioritization criteria based on proximity to destinations, residential populations, connectivity, and community support all contribute to the trail-siting process.
- We look for potential integration of trails in proposed development projects, as well as outreach and education opportunities for local bicycle, pedestrian, and environmental advocacy groups.
- We recommend a 12 ft-wide hard surface path, but may need to narrow the trail under constrained circumstances. In areas where a higher volume of both pedestrians and bicyclists are anticipated, we consider providing separate facilities or a wider path (up to 18-ft) with designated space for each mode.
- **Sometimes, we will work with private property owners to install a new gate between a neighborhood/apartment complex and a public street, particularly if that connection would shorten the route for people walking to school or similar destinations. This new connection eliminates a barrier and serves as a type of urban trail, linking homes with public streets, sidewalks, and local destinations.**

How much does an urban trail cost?

$$$: Costs for urban trails vary, but are typically among the most expensive types of bicycle and pedestrian facilities. Components of urban trail design and construction include:

- Right-of-way
- Surface material
- Lighting
- Landscaping
- Terrain grading
- Retaining walls
- Pavement markings
- Fencing/rails
- Multi-use bridges
- Maps and signage
- Trail furniture

How long does it take to install an urban trail?

Varies. Planning, public input, design, engineering, and construction are all components of the installation process. Many urban trails will take 5 to 10 years to be fully implemented. However, shorter segments that close gaps in the network or eliminate barriers can often be installed in a shorter timeframe.

References and Resources

City of Austin Bicycle Master Plan
Austin Urban Trails Master Plan
NACTO Urban Bikeway Design Guide

BICYCLE PARKING

Bicycle parking can be a single rack or a group of racks and can be installed on school grounds, on the sidewalk, or in the street.

Bike racks on the sidewalk

Bike corral

Covered bike parking

What is the purpose of bicycle parking near schools?

- Gives students and school staff a place to secure their bike during the day while they're at school.
- Encourages students and school staff to ride their bikes to school.
- When located near the main entrance, bike parking makes it inviting for people who get to school by bike.
- Sends the message that the school encourages bicycling.

How does COA decide where to install bike parking?

- We want to make sure that every school has enough bike parking to meet the day-to-day needs of students and staff.
- When deciding where to install bike racks, COA considers locations where the racks are:
  - noticeable immediately when arriving at school,
  - visible from nearby windows and the street to make sure bikes are secure,
  - sheltered from the elements, and
  - publicly accessible.
- We install bike racks that allow one or both wheels to be locked to prevent bikes from falling down and that can fit different types and sizes of bicycles, like small children's bikes or long family bikes.

How much does bike parking cost?

$: Bike parking is relatively inexpensive.

Bike corrals

Sometimes the best place to install bike parking is on the street. A bike corral can be installed in place of on-street parking and can provide parking for 6 to 12 bikes in place of one car.

A corral can also be placed in locations where parking isn't allowed, like 30 feet from an intersection or marked crosswalk. This helps make the crosswalk safer by ensuring no one parks their car illegally and blocks visibility of the crosswalk or intersection, while also adding parking spaces for people on bikes.

How long does it take to install bike parking?

< 1 year: We can generally install new bike parking at a school in less than one year.

Examples in Austin

Highland Park Elementary School

Adam L Chapa Sr Street at E Cesar Chavez Street

References and Resources

Austin Bicycle Master Plan

Safe Routes to School National Partnership

Association of Pedestrian and Bicycle Professionals: Bicycle Parking Guidelines

CITY OF AUSTIN PUBLIC WORKS

SAFE ROUTES
TO SCHOOL

austintexas.gov/saferoutes