



# CITY OF NORTH SALT LAKE

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## CITY COUNCIL MEETING NOTICE & AGENDA January 21, 2020

Posted January 16, 2020

Notice is given that the North Salt Lake City Council will hold a regular meeting on **JANUARY 21, 2020** at City Hall, 10 East Center Street, North Salt Lake, Utah. A work session will be held at 6:00 pm in the Council Conference Room followed by the regular session at 7:00 pm in the Council Chambers. Some members may participate electronically. The following items of business will be discussed; the order of business may be changed as time permits.

### WORK SESSION –6:00 p.m.

1. Legislative Discussion – Senator Todd Weiler
2. Approve City Council Minutes of January 7, 2020
3. Action Items
4. Council Reports
5. Adjourn

### REGULAR SESSION - 7:00 p.m.

1. Introduction by Mayor Len Arave
2. Invocation and Pledge of Allegiance ~ Council Member Ryan Mumford
3. Citizen Comment
4. Discussion of Legacy Parkway citizen concerns by Save Legacy Parkway.
5. Submittal of the Fiscal Year 2019 Audit by Ryan Child and Nicole Nelson, Child Richards CPAs & Advisors.
6. Consideration of Mayor Arave's Appointment to the North Salt Lake Planning Commission.
7. Consideration of **Ordinance 2020-03**: An ordinance amending the General Plan to include an Active Transportation Plan as part of the Transportation Element.
8. Possible closed session to discuss the purchase, exchange, sale, or lease of real property.
9. Consideration of an agreement with Kimball Investments for the purchase of real property.
10. Mayor's Report
11. City Attorney Report
12. City Manager Report
13. Adjourn

**CLOSED SESSION**

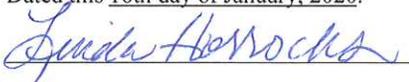
1. Possible closed session for the purpose of discussing pending or reasonably imminent litigation; to discuss the character professional competence, or physical or mental health of an individual; to discuss collective bargaining; or to discuss the purchase, exchange, sale, or lease of real property. *Utah Code 52-4-205*

The public is invited to attend all City Council meetings. If you need special accommodations to participate in the City Council meeting, please call the City office at 801-335-8709. Please provide at least 24 hours' notice for adequate arrangements to be made.

Notice of Posting:

I, the duly appointed City Recorder for the City of North Salt Lake, hereby certify that the foregoing agenda was posted on the Utah Public Notice website, at city hall, and sent to the required newspapers this 16th day of January, 2020.

Dated this 16th day of January, 2020.





1 CITY OF NORTH SALT LAKE  
2 CITY COUNCIL MEETING-RECEPTION  
3 JANUARY 7, 2020

4  
5 **DRAFT**  
6

7 Mayor Arave called the meeting to order at 6:08 p.m.

8  
9 PRESENT: Mayor Len Arave  
10 Council Member Brian Horrocks  
11 Council Member Stan Porter  
12 Council Member Ryan Mumford  
13 Council Member Lisa Watts Baskin  
14 Council Member Natalie Gordon  
15

16 STAFF PRESENT: Ken Leetham, City Manager; Paul Ottoson, City Engineer; David Frandsen,  
17 Public Works Director; Janice Larsen, Finance Director; Craig Black, Police Chief; David  
18 Church, City Attorney; Brent Moyes, Golf Course Director; Sherrie Llewelyn, Community  
19 Development Director; Linda Horrocks, City Recorder; Marty Peterson, Emergency  
20 Preparedness Manager; Andrea Bradford, Minutes Secretary.  
21

22 1. RECEPTION AND WELCOME OF NEWLY ELECTED OFFICIALS  
23

24 Mayor Arave thanked James Hood for his service on the City Council over the last four years.  
25 He expressed appreciation for his time spent with the Youth Council.  
26

27 James Hood thanked the Council Members and staff. He said it had been a pleasure to serve and  
28 be the voice for the citizens of the City. Mr. Hood specifically thanked Ken Leetham, Paul  
29 Ottoson, Chief Black, and David Frandsen for helping him to understand how the City worked  
30 and for their service.  
31

32 2. SWEARING-IN OF NEWLY ELECTED OFFICIALS  
33

34 At 6:18 p.m. Mayor Arave performed the swearing in of Brian Horrocks, Stan Porter, and  
35 Natalie Gordon to the City Council.  
36

37 The Council then moved to the council conference room to begin the work session.

CITY OF NORTH SALT LAKE  
CITY COUNCIL MEETING-WORK SESSION  
JANUARY 7, 2020

**DRAFT**

Mayor Arave called the meeting to order at 6:34 p.m.

PRESENT: Mayor Len Arave  
Council Member Brian Horrocks  
Council Member Stan Porter  
Council Member Ryan Mumford  
Council Member Lisa Watts Baskin  
Council Member Natalie Gordon

STAFF PRESENT: Ken Leetham, City Manager; Paul Ottoson, City Engineer; David Frandsen, Public Works Director; Janice Larsen, Finance Director; Craig Black, Police Chief; David Church, City Attorney; Brent Moyes, Golf Course Director; Sherrie Llewelyn, Community Development Director; Linda Horrocks, City Recorder; Marty Peterson, Emergency Preparedness Manager; Andrea Bradford, Minutes Secretary.

OTHERS PRESENT: Melissa Ballard, Utah House of Representatives; Garrett Seely, Red Pine Investments.

1. TRANSPORTATION DISCUSSION AND LEGISLATIVE UPDATE-  
REPRESENTATIVE MELISSA BALLARD

Representative Melissa Ballard started the discussion with transportation issues and the interchange between Interstate-15 (I-15) and Interstate 215 (I-215). She said that while there are potential plans for this interchange, the timeframe was dependent on the Transportation Commissioners. Rep. Ballard asked the City Council how important this was to the City and if there was an interest in performing an environmental study for this project, which would cost approximately \$1.2 billion. She said the City should decide if this was a priority as this would determine what developed in the area.

The City Council and Rep. Ballard discussed potential access solutions for North Salt Lake and Woods Cross related to the interchange, the rebuild of I-15, a bridge over the 1100 North rail tracks, Legacy Highway, and feasibility and environmental studies.

Mayor Arave asked about the process and how the City could get involved in the reconstruction/reconfiguration of I-15. He said the priorities for the City were a bridge over the 1100 North railroad tracks and on/off ramps for Eagle Gate Drive. Rep. Ballard said the

80 reconstruction would include adding a middle lane to I-15, on/off ramps, and redoing major  
81 intersections. She said the City should reach out to the Davis County Transportation Committee  
82 and the Commissioners.

83  
84 Melissa Ballard then provided an update on the Salt Lake City inland port. She said that there  
85 was a push to use hydrogen for backup generators, truck fleets, and freight switchers as hydrogen  
86 had zero emissions. The number one complaint from companies interested in coming to Utah  
87 was a carbon footprint on their building, so the vision for the inland port would be clean energy.  
88 She also said residents had complaints about air quality and noise which would be reduced with  
89 the use of hydrogen. Rep. Ballard then commented that the inland port was not confined to the  
90 airport and had authority everywhere in Utah. Their goal was to put hydrogen refueling stations  
91 throughout the State to fuel their fleets.

92  
93 Mayor Arave stated that he did not want the inland port to be able to say they had more authority  
94 in the City that superseded the City Council. He also said the biggest issue was the potential for  
95 additional heavy truck traffic on Center Street with no tax revenue. Melissa Ballard said that this  
96 was a big reason for the City to push for the environmental study.

97  
98 Council Member Horrocks commented that a lot of the freight would come in to the inland port  
99 on trucks and go out on rails. He said if the inland port did not happen the truck traffic would  
100 skyrocket. Melissa Ballard replied that there needed to be incentives for good air quality. She  
101 said that it was important to communicate and work as a team.

102  
103 2. ADJOURN

104  
105 Mayor Arave adjourned the meeting at 7:05 p.m. to begin the regular session.

CITY OF NORTH SALT LAKE  
CITY COUNCIL MEETING-REGULAR SESSION  
JANUARY 7, 2020

**DRAFT**

Mayor Arave called the meeting to order at 7:15 p.m. Alex Lucero offered the invocation and Council Member Lisa Baskin led those present in the Pledge of Allegiance.

PRESENT: Mayor Len Arave  
Council Member Brian Horrocks  
Council Member Stan Porter  
Council Member Ryan Mumford  
Council Member Lisa Watts Baskin  
Council Member Natalie Gordon

STAFF PRESENT: Ken Leetham, City Manager; Paul Ottoson, City Engineer; David Frandsen, Public Works Director; Janice Larsen, Finance Director; Craig Black, Police Chief; David Church, City Attorney; Brent Moyes, Golf Course Director; Sherrie Llewelyn, Community Development Director; Linda Horrocks, City Recorder; Marty Peterson, Emergency Preparedness Manager; Andrea Bradford, Minutes Secretary.

OTHERS PRESENT: MaryKay Porter, Dee Lalliss, John Allen, Sheryl Allen, Conrad Jacobson, Cassandra Shuler, residents; Garrett Seely, Red Pine Investments; Pastor Alex Lucero, Abundant Life Church; Russ Tolbert; Paul Poteet, Liberation Development.

1. CITIZEN COMMENT

Alex Lucero, Abundant Life Church, reported that the Life Market, which offered food donations to the community, was able to serve 50 families and was doing well. He thanked the City Council for their support and the stores that donated.

2. CITY COUNCIL MOTION TO SELECT MAYOR PRO TEMPORE FOR 2020

**Council Member Mumford moved to appoint Lisa Baskin as mayor pro tempore for 2020. Council Member Porter seconded the motion. The motion was approved by Council Members Horrocks, Porter, Mumford, Baskin and Gordon.**

3. CONSIDERATION OF RESOLUTION 2020-01R: A RESOLUTION APPROVING THE 2020 MEETING SCHEDULES FOR CITY COUNCIL AND PLANNING COMMISSION

148 Council Member Baskin commented that there seemed to be a big gap in between the November  
149 and December City Council meetings as the proposed meeting dates were November 17<sup>th</sup> and  
150 December 15<sup>th</sup>. She asked why a meeting was not scheduled for December 3<sup>rd</sup>. Mayor Arave  
151 replied that the Christmas party was scheduled for December 3<sup>rd</sup>.

152  
153 Council Member Baskin suggested that the City Council could still advertise and hold a meeting  
154 on December 3<sup>rd</sup> if necessary.

155  
156 **Council Member Horrocks moved to approve Resolution 2020-01R: a resolution**  
157 **designating the 2020 public meeting schedule as presented. Council Member Baskin**  
158 **seconded the motion. The motion was approved by Council Members Horrocks, Porter,**  
159 **Mumford, Baskin and Gordon.**

160  
161 4. CONSIDERATION OF CITY COUNCIL APPOINTMENT TO THE PARKS, TRAILS,  
162 ARTS AND RECREATION ADVISORY BOARD

163  
164 Council Member Gordon recommended Ron Gordon for the appointment to this board as he had  
165 previously helped with City events and was looking for an opportunity to be involved. She said  
166 he was a former City Council member as well.

167  
168 **Council Member Gordon moved to appoint Ron Gordon to the Parks, Trails, Arts and**  
169 **Recreation Advisory Board. Council Member Mumford seconded the motion. The motion**  
170 **was approved by Council Members Horrocks, Porter, Mumford, Baskin and Gordon.**

171  
172 5. CONSIDERATION OF ORDINANCE 2020-01: AN ORDINANCE REZONING  
173 PROPERTY LOCATED AT 877 NORTH CUTLER DRIVE FROM GENERAL  
174 COMMERCIAL (CG) TO P DISTRICT AND APPROVING A DEVELOPMENT  
175 AGREEMENT (2020-01A) FOR WELLINGTON PLACE PUD, RED PINE  
176 INVESTMENTS, GARRET SEELY, APPLICANT

177  
178 Sherrie Llewelyn reported that the existing zoning for the property was General Commercial  
179 (CG) with a request to rezone to a Planned (P) District. The adjacent parcels are zoned P District.  
180 This property was owned by Leo Thurston and used for asphalt truck storage. Red Pine Land,  
181 LLC has purchased the property with the proposal to build 23 single family lots similar in size to  
182 Stonehaven PUD.

183  
184 Soil studies conducted on the site indicated isolated lead contamination likely from automobile  
185 battery waste. Staff consulted with the State as well as geotechnical engineers who recommended  
186 that the soil be removed. The contaminated soil has been removed and additional testing has  
187 been requested to verify all contaminated soil has been removed from the site.

188 The Planning Commission held a public hearing on the zone change and general development  
189 plan on June 11, 2019. The City Council approved the general development plan on June 18,

190 2019. The Planning Commission then reviewed the proposed development agreement,  
191 preliminary plan and final plat and made a favorable recommendation to the City Council on  
192 July 23, 2019.

193  
194 Mayor Arave asked if this development would have a sidewalk and park strip. Sherrie Llewelyn  
195 replied that there would be a sidewalk and park strip along Cutler Drive.

196  
197 Council Member Porter asked if there were locations for snow storage on the site. Sherrie  
198 Llewelyn replied that she believed there would be snow easements at the end of the  
199 hammerheads.

200  
201 Council Member Baskin commented that there had been a request for one of the hammerhead  
202 streets to become a through street. Sherrie Llewelyn replied that Stonehaven PUD HOA would  
203 not grant an easement for the through street. She said that in the future the Planning Commission  
204 would request easements be granted when a development abutted a vacant property.

205  
206 Council Member Horrocks asked about the square footage and pricing for the proposed homes.  
207 Garrett Seely, Red Pine Investments, replied that they would be 1,400 to 1,800 square feet with  
208 two-car garages. He said these homes would have three to four bedrooms and the price range  
209 was in the mid-\$300,000.

210  
211 Council Member Gordon asked if an easement should be required at the south end of the  
212 hammerhead to potentially extend into the parking lot for the adjacent apartment building.  
213 Sherrie Llewelyn replied that the City Council could request it but felt that it would not be used  
214 as the lifespan of apartments was long.

215  
216 David Church commented that if this was a public road the City could request to preserve an  
217 easement but as it was a private road they did not need an easement.

218  
219 Council Member Porter asked if the agreement could include a requirement for snow stacking.  
220 Sherrie Llewelyn recommended that this be added as part of the final plat.

221  
222 Council Member Baskin thanked the developer for building single family homes in this area.

223  
224 Council Member Mumford asked about the proposed eight-foot fencing. Garrett Seely replied  
225 that the eight-foot fencing would block the tanker trucks as well as matching the existing  
226 fencing.

227  
228 Council Member Baskin asked for confirmation that there would not be any sidewalks on  
229 Wellington Avenue. Sherrie Llewelyn confirmed that this was correct. Mrs. Llewelyn said that  
230 she had drafted a change to the PUD ordinances to require sidewalks.

231

232 **Council Member Porter moved that the City Council adopt Ordinance 2020-01 approving**  
233 **the rezone request from General Commercial to P District for Wellington Place located at**  
234 **877 North Cutler Drive along with the proposed development agreement with the following**  
235 **findings and conditions:**

236  
237 **Findings:**

- 238
- 239 **1) The proposed P district can be substantially completed within two (2) years of the**  
240 **establishment of the P District.**
  - 241 **2) The development contains one phase that can exist as an independent unit capable**  
242 **of creating an environment of sustained desirability and stability; and that the uses**  
243 **proposed will not be detrimental to present and potential surrounding uses, but will**  
244 **have a beneficial effect which could not be achieved under other zoning districts.**
  - 245 **3) The proposed increased density will not generate traffic in such amounts as to**  
246 **overload the street network outside the P district.**
  - 247 **4) The area surrounding said development can be planned and zoned in coordination**  
248 **and substantial compatibility with the proposed development.**
  - 249 **5) Any exception from standard ordinance requirements is warranted by the design**  
250 **incorporated into the final plan.**
  - 251 **6) The P district is in conformance with the city general land use plan.**
  - 252 **7) Existing or proposed utility services are adequate for the population and use**  
253 **densities proposed.**

254  
255 **Condition:**

- 256
- 257 **1) Confirmation of the removal of all lead contaminated soils to the satisfaction of the**  
258 **City Engineer.**

259  
260 **Council Member Horrocks seconded the motion. The motion was approved by Council**  
261 **Members Horrocks, Porter, Mumford, Baskin and Gordon.**

262  
263 **6. CONSIDERATION OF A PRELIMINARY PLAN AND FINAL PLAT FOR**  
264 **WELLINGTON PLACE PUD LOCATED AT 877 NORTH CUTLER DRIVE, RED**  
265 **PINE INVESTMENTS, GARRETT SEELY, APPLICANT**

266  
267 Sherrie Llewelyn reported that this was the preliminary plan and final plat for Wellington Place  
268 PUD. The Planning Commission made a favorable recommendation with the condition that  
269 confirmation be obtained of the removal of all lead contaminated soils to the satisfaction of the  
270 City Engineer.

271

272 **Council Member Baskin moved that the City Council approve the preliminary plan and**  
273 **final plat for Wellington Place PUD located at 877 North Cutler Drive with the following**  
274 **condition:**

275  
276 **1) Confirmation of the removal of all lead contaminated soils to the satisfaction of the**  
277 **City Engineer.**

278  
279 Sherrie Llewelyn commented that there was a snow storage easement at the end of the  
280 hammerhead road currently on the plat.

281  
282 **Council Member Porter seconded the motion. The motion was approved by Council**  
283 **Members Horrocks, Porter, Mumford, Baskin and Gordon.**

284  
285 7. CONSIDERATION OF A REQUEST FOR A ROAD CUT, PRIOR TO THE  
286 EXPIRATION OF THE THREE YEAR CONSTRUCTION PROHIBITION FROM  
287 AUGUST 18, 2020 TO MAY 25, 2020, LIBERATION DEVELOPMENT, MIKE  
288 WATSON, APPLICANT

289  
290 Sherrie Llewelyn reported that this application from Liberation Development was for the  
291 Arrowhead Twin Home PUD project. She explained per City Code section 7-5B-2 that road  
292 excavations were prohibited for five years following completion of new streets and three years  
293 following the resurfacing of streets. She said 350 North was resurfaced on August 18, 2017. The  
294 developer has filed a request to start May 25, 2020. Staff verified that the last day of school was  
295 May 28, 2020 and the start date was August 25, 2020. The Development Review Committee  
296 (DRC) reviewed and recommended an allowance for an early road cut beginning July 18, 2020  
297 to ensure that the construction was completed prior to the beginning of the 2020 school year.

298  
299 Paul Poteet, Liberation Development, commented that they requested May 25, 2020 or any time  
300 in June to ensure adequate time to complete the roadwork before school began in August.

301  
302 Council Member Porter said that Bountiful City allowed early road cuts but required a more  
303 stringent fill with an overlay. Paul Ottoson replied that he was not sure what Bountiful requested  
304 but could research this. He said the City could require a flowable fill and slurry seal.

305  
306 Council Members agreed that the City should require a better road patch.

307  
308 Ken Leetham asked if there was any type of warranty against settlement on road cuts. Paul  
309 Ottoson replied that there was a one-year warranty.

310  
311 Council Member Gordon said that the motion from the City Council meeting on November 19,  
312 2019 said the street cuts could occur on July 1, 2020. Sherrie Llewelyn said that the correct date  
313 was August 18<sup>th</sup> and that the draft minutes had July 1, 2020 highlighted as the estimated date.

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**Council Member Porter moved that the City Council approve the request to modify the excavation restriction period on 350 North Street for the installation of infrastructure connections to the Arrowhead PUD and allow an excavation permit beginning no earlier than May 29, 2020 with the addition of requirements from the City Engineer. Council Member Horrocks seconded the motion.**

The Council had a discussion about the potential excavation permit date including July 18<sup>th</sup> or June 1<sup>st</sup>, the type of fill for the patch, and the requirements for early excavation including an improved patch.

Paul Ottoson recommended that the best patch option would be flowable fill and a slurry seal to prevent water infiltration, as well as T cut.

**Council Member Porter amended his motion to allow an excavation permit beginning no earlier than June 1, 2020. Council Member Horrocks seconded the amended motion. The motion was approved by Council Members Horrocks, Porter, Mumford, Baskin and Gordon.**

David Church said that all City specifications were being updated. He suggested that the road cut restriction timeframe remain and to incorporate more stringent requirements for any exceptions.

8. CONSIDERATION OF ORDINANCE 2020-02: AN ORDINANCE AMENDING TITLE 6 OF THE CITY CODE PERTAINING TO ON-STREET PARKING REGULATIONS AND CLARIFYING WHO CAN SERVE AS AN APPEAL AUTHORITY FOR PARKING ENFORCEMENT MATTERS

Ken Leetham reported that generally most appeals were not handled by City employees; however, a regular City employee would be able to provide the convenience of an appeal for parking enforcement matters during regular business hours. He stated that Spencer Quain could be trained to handle these types of violations.

David Church commented that the appeal authority could be a City employee. He said the administrative law judges that administrated appeals were employees of the State. The City ordinance was written so that it would not be an employee but the Council could reconsider this. He said that for parking it would make sense to have an employee available for residents to contest their citation as it was cost effective and convenient.

Council Member Mumford suggested that the City could even allow residents to call in and contest the ticket. Ken Leetham replied that the current ordinance was very formal and in the future a change could be made to include more convenience options.

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David Church also said that economically it would make sense for an employee to be able to handle these tickets. He also said the ordinance allowed for residents to appeal the finding of the appeal authority.

Council Member Baskin commented that she was an administrative law judge for four agencies so she was familiar with what this entailed. She said that the current ordinance sets forth the criteria and procedures for administrative law hearings. Council Member Baskin said it would be more efficient for City staff but an administrative law judge would have to be trained to do certain things such as administering an oath, etc. She said that one problem was the hint of a potential conflict of interest and that a disqualification could be made based on bias, prejudice, etc.

David Church said that if a resident wanted to object that the administrative law judge was biased then they could wait for the outside administrative law judge. He said the convenience was for residents to be able to come in and meet with an employee rather than waiting for the outside judge.

Mayor Arave asked about the amount of the citations. Ken Leetham replied that the citations were approximately \$20, \$40 or \$60.

Council Member Baskin said there was an appearance of a conflict of interest. She explained that as an administrative law judge she did not interact with those mayors or city managers. If an employee was the judge then there was a concern that they reported to a mayor or city manager. She also said this was a new program so it was better to utilize the administrative law judge to see how inconvenient it might be.

Council Member Porter said that he agreed with Ken Leetham that it would be more convenient to have City staff provide that service; however, he could also see the potential for bias. He said that the resident should be given the opportunity to have the option to choose the in-house appeal authority or not.

Ken Leetham clarified that the proposed change would not prevent the current appeal authority from being the administrative law judge.

Council Member Baskin said that the language which would be removed from the ordinance stated that “the administrative law judge administrative should not be a member of the police department or city staff employed in other administrative or regular positions.” She said this was originally included so as to not put an employee in a difficult position.

**Council Member Horrocks moved the City Council adopt the proposed Ordinance 2020-02: an ordinance amending the City’s parking ordinance to allow a City employee to be the**

398 **Administrative Law Judge for violations of the City’s parking ordinance. Council Member**  
399 **Mumford seconded the motion. The motion was approved by Council Members Horrocks,**  
400 **Porter, Mumford and Gordon. Council Member Baskin voted in opposition to the motion.**

401

402 9. APPROVE CITY COUNCIL MINUTES

403

404 The City Council minutes of November 19, 2019 were reviewed and amended. **Council**  
405 **Member Porter moved to approve the City Council meeting minutes of November 19, 2019**  
406 **as amended. Council Member Hood seconded the motion. The motion was approved by**  
407 **Council Members Horrocks, Porter, Mumford, Baskin and Gordon.**

408

409 10. ACTION ITEMS

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411 The action items list was reviewed. Completed items were removed from the list.

412

413 11. CITY COUNCIL REPORTS

414

415 Council Member Gordon reported that she met with the Youth City Council (YCC) and said they  
416 were preparing for training at Utah State. She also said the YCC would be filling Easter eggs for  
417 the City egg hunt and also participating in the Super Bowl of Caring food drive.

418

419 Council Member Mumford reported that he received complaints about the sewer treatment plant  
420 smell and asked what could be done. Mayor Arave said he had received an email regarding the  
421 different solutions from the sewer district.

422

423 Ken Leetham also said it seemed like weather had a lot to do with the smell and that a contractor  
424 would be working on redirecting the smell.

425

426 Council Member Mumford addressed the issue of the summer recreation program and the  
427 potential for hosting a pickleball league. He said this idea would be presented to the City Council  
428 and asked the Council members to think about what services the City should provide and the  
429 scheduling of City-owned fields/courts.

430

431 Council Member Porter reported that the Uniting Neighbors meeting would be held on January  
432 8<sup>th</sup> at 7 p.m. He also said there was a need for a community garden coordinator.

433 Council Member Porter asked if the City Council and Youth City Council would be attending the  
434 2020 Local Officials Day at the Legislature. Council Member Gordon said the Youth City  
435 Council would not be attending this year.

436

437 Council Member Horrocks reported that the Eagleridge Tennis Club was for sale.

438

439 Council Member Baskin reported on an article about the Legacy Parkway, in the Salt Lake  
440 Tribune, written by a Woods Cross resident on the Scenic Byway Committee. She also said that  
441 several individuals who help facilitate the Senior Lunch Bunch would be recognized at a future  
442 meeting.

443

444 Council Member Baskin commented that she had received correspondence from Scott Zeidler,  
445 with the State Division of Forestry, regarding the City's tree ordinance. She said people have  
446 been showing interest in what the City has done.

447

#### 448 12. MAYOR'S REPORT

449

450 Mayor Arave reported that the South Davis Recreation District was working on a long term  
451 master plan and another survey would be sent out. He said the residents were contributing  
452 approximately \$50 through taxes and should receive benefit from the SDRD services.

453

454 Mayor Arave then reported that the Sewer District hoped to start selling gas to British Petroleum  
455 within the next week.

456

#### 457 13. CITY ATTORNEY'S REPORT

458

459 David Church had nothing to report.

460

#### 461 14. CITY MANAGER'S REPORT

462

463 Ken Leetham reported that so far the golf course advisory committee had six meetings and  
464 would meet again the following Thursday to prepare a recommendation for the City Council on  
465 the future operation of the course. The committee has reviewed financial data, modeling, and  
466 forecasting. They have also heard several presentations from GreatLife, Utah and City staff on  
467 increasing revenue, pricing, management and different strategies. The committee will make a  
468 recommendation to the Council to either turn operations over to GreatLife, or to continue with  
469 City management, but with better financial modeling.

470

471 Mayor Arave said the City Council did not have the experience to manage the golf course. He  
472 said the golf committee was reviewing other alternatives such as different oversight structures  
473 and staffing, etc.

474

475 Council Member Gordon asked if the golf course had to break even or if the City could continue  
476 to subsidize it. Mayor Arave replied that the focus was to stem the bleeding as there was a very  
477 quick downturn in the course.

478

479 Ken Leetham then reported that the personnel policy had a limit on the accumulation of vacation  
480 and holiday hours. He said that due to staffing hours in the police department that there were

481 some leave balances. Ken Leetham said he had a written request prepared by Chief Black that  
482 detailed these balances. He said as these employees were not able to take leave that he did not  
483 want to take away these vacation hours. This vacation accrual balance also applied to the Chief  
484 who had 160 unused hours in excess of the limit for department heads, which was 340 hours.

485  
486 Council Member Baskin asked that a copy of the written request from Chief Black be provided  
487 to the City Council.

488  
489 Ken Leetham clarified that notice had been given to employees in other departments that they  
490 would lose their leave if they did not use it by the end of the year.

491

492 15. ADJOURN INTO CLOSED SESSION

493

494 **At 8:50 p.m. Council Member Horrocks moved to go into closed session to discuss pending**  
495 **or reasonably imminent litigation. Council Member Mumford seconded the motion. The**  
496 **motion was approved by Council Members Horrocks, Porter, Mumford, Baskin and**  
497 **Gordon.**

498

499 16. RECONVENE

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501 **At 9:10 p.m. Council Member Mumford moved to go out of closed session and into the**  
502 **regular session. Council Member Porter seconded the motion. The motion was approved by**  
503 **Council Members Horrocks, Porter, Mumford, Baskin and Gordon.**

504

505 17. ADJOURN

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507 Mayor Arave adjourned the meeting at 9:10 p.m.

508

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512

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Mayor

---

City Recorder

## Action Items for January 21, 2020

Item	Staff	Description
<b>New</b>		
1	Ken Paul	Staff to reach out to Region One about getting involved with proposed reconstruction of I-15 in Davis County.
2	Paul David	Staff to review and update standards/specifications related to road cuts (better requirements including slurry seal, etc.)
<b>Current</b>		
1	Ken	Follow up with Ron Jibson per his pickleball group on proposal from Utah Athletic Center.
2	Sherrie	Get number for Jeremy Holt at LDS Hospital from Mayor re: partnering with NSL on mental illness outreach. Also, the Council discussed the possibility of staff preparing outreach/educational information in the newsletter and on the City's website some sources of help for suicide and mental illness. Council also discussed working with LDS Hospital, League of Cities and Towns, creating a citizen committee/group, hosting an educational class, and preparing a packet related to mental illness
3	Ken	Update ordinance 2014-01/new resolution to be prepared per Mayor, CM Mumford, Ken Leetham and Alisa VanLangeveld. <i>Will be on Jan 21<sup>st</sup> agenda</i>
4	Ken/Linda	Recognition for Judy Naranjo for her service to the City through the senior lunch bunch activities. <i>Lisa Baskin contacting Judy to coordinate a convenient time</i>
5	Ken/ETS	Staff to prepare a report on cyber security and how the City is preventing this. <i>Ken is discussing options with ETS</i>
6	Ken	Staff would prepare a proposal related to small insurance claims and a fund to pay for these types of items in-house rather than submitting them through insurance.
7	Ken Janice David	Look at level of service for soccer/football games at City parks by comparing incoming funds and cost of water plus contractor to mow grass. CM Mumford requested that staff review the contract (football) to see how much they are paying versus cost of services before games this Saturday. <i>Cost analysis will be prepared and shared with the Council on January 21<sup>st</sup>.</i>
8	Linda	Digital PDF of new resident information packet on the website with link on social media – <i>Linda is working on new packet.</i>
9	Paul Sherrie Ken	Staff to review what stipulations were placed on the road south of Eaglegate roundabout (Eaglewood Village proposal with Brighton Homes) and the potential to vacate that road. <i>Staff currently researching existing regulations and contracts on this matter. Sherrie has contacted UDOT.</i>
10	David Ken	Staff to work with Woods Cross to improve their dog park and discuss potential for a new dog park in the area. <i>City Staff is reviewing other communities' dog parks and preparing a recommendation for the City Council. Woods Cross City has tentatively indicated a willingness to participate.</i>
11	Ken Craig	Staff to work on emergency preparedness reporting and coordination with Davis County rather than NSL – and whether it should be organized and run by South Davis Fire. <i>Staff is working with surrounding communities and Fire District to evaluate staffing needs and possible employee sharing</i>
12	Paul David Ken	Various assignments related to water and water planning including: collection of water usage data by area, analysis and recommendation related to water conservation rate structure, and long-range planning for water needs. <i>Staff met with Weber Basin Water Conservancy District and requested their assistance with a water rights application for re-use water and to evaluate the City's report on water usage, source, storage and distribution.</i>
13	David, Ken	Staff to follow-up on adding trees to park strips on Fox Hollow at roundabout. <i>Ken will report.</i>
14	Linda Ken	CM Porter asked for recognition/formalization of the City's History Committee on a future agenda. <i>Staff reviewing history committees of other cities and will draft resolution.</i>
15	Linda	Staff to arrange a tour of Wasatch Resource Recovery Plant for interested City Council members and staff. <i>Schedule with Matt Myers (Wait until plant is fully operational.)</i>
16	Ken	Staff to report back on the progress of mining on Monte Thomas parcel. <i>Ken had a phone call with David Church and Jody Burnett on this matter. More research will be required and staff will continue</i>

		<i>to work to understand the impacts of HB288, Critical Infrastructure bill (gravel and mining operations).</i>
17	Paul David Sherrie	Staff to prepare options for repair/replacement of Eaglewood Village dock. Also look at placing trees around the pond or adding this area to Arbor Day. <i>Draft concept plan was presented to Parks and Arts Board. Concept plan was cost prohibitive - will look at a simpler design.</i>
18	Ken Sherrie Janice	<p><u>Items for staff to do related to proposed Kimball property development:</u></p> <p>a. potential for a moratorium to adopt architectural standards for the area and work with developer on type of architecture <i>Development will be a P-District and we will require building standards and address sign standards in the development agreement</i></p> <p>b. work with Ball and Kelly families on potential purchasing properties (before July) and/or cleaning up streetscapes</p> <p>c. determine value generated by CDA and potential to increase percentage and length of time?</p> <p>d. work with developer on zoning for the area including talking about potential for provisions to minimize trucking operations (?)-<i>will be addressed in development agreement</i></p> <p>e. setup Council tour of White Mountain development in Draper-<i>completed</i></p>
19	Ken	Staff to contact SDRC director for details about a possible South Davis Rec Center facility in NSL and will perform a review of possible uses of CDA funds for property acquisition. <i>Ken had a meeting with Director and is looking at 10 acres of property west of Redwood Road.</i>



## CITY OF NORTH SALT LAKE

---

10 East Center Street  
North Salt Lake, Utah 84054  
(801) 335-8700  
(801) 335-8719 Fax

Len Arave  
Mayor

Ken Leetham  
City Manager

### MEMORANDUM

**TO:** Honorable Mayor and City Council

**FROM:** Ken Leetham, City Manager

**DATE:** January 21, 2020

**SUBJECT:** Discussion of Legacy Parkway citizen concerns

---

#### **BACKGROUND**

As the Council knows, there is a group or movement entitled, "Save Legacy Parkway" which has been active in several efforts to preserve the essential character of Legacy Parkway prior to the recent changes to it. Those efforts have included keeping the truck ban in place, maintaining the speed limit at 55 mph, reducing noise, improving air quality and increasing safety for all users of the corridor, including residents living near the Parkway. Many of those efforts have had limited success though the speed limit was held to 65 mph and not 70 mph as was planned prior to all of the cities' collective efforts to keep speeds low.

Save Legacy Parkway recently announced to the public that citizens should attend all of the city council meetings for cities along the corridor so that local governments would know that there is community support and momentum for implementing mitigating strategies for some of the problems that have occurred since the truck ban has been lifted and the speed limit has increased.

I recently sent the Council an email with an update of the social media posts and written materials that have been created on this subject. I have also spoken with Angie Keeton who is the founder of Save Legacy Parkway and the author of some of the related social media posts. She will be prepared at the meeting to make a short presentation. I also told her that the City would prepare some information, particularly related to her talking points, which we can also share with the public after she makes her presentation. She also indicated that she has instructed members of the public who wish to speak that they should not repeat themselves and be brief in their remarks. She views this call to attend council meetings not as an effort to intimidate or lay blame on any cities or their governing bodies; rather, her intent is to demonstrate to the Council that there is citizen support for certain ideas like speed enforcement, efforts to make trail users feel safer, creation of noise ordinance statutes, installation of safety features and other strategies to address the growing incompatibilities between residents and the new allowances on this freeway.



# CITY OF NORTH SALT LAKE COMMUNITY & ECONOMIC DEVELOPMENT

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10 East Center Street, North Salt Lake, Utah 84054  
(801) 335-8700  
(801) 335-8719 Fax

## MEMORANDUM

**TO:** Honorable Mayor and City Council  
**FROM:** Ali Avery, Long Range Planner  
**DATE:** January 21, 2020  
**SUBJECT:** Consideration of ORD 2020-03 a General Plan update to include an Active Transportation Plan within the Transportation Element

---

### RECOMMENDATION

The Planning Commission recommended approval of the draft update to the Transportation Element of the General Plan, as amended, with the following findings:

1. North Salt Lake, with Bountiful and Centerville cities, sought to improve active transportation in south Davis County to create safe alternate transportation methods; and
2. The state legislature has determined that cities must include the general location and extent of active transportation facilities in the General Plan; and
3. The proposed draft meets the requirements of the state code to continue to allow the City to apply for Transportation Investment Fund money.

### BACKGROUND

The State Code in section 10-9a-403 requires that municipalities prepare a General Plan to address the present and future needs of the city and guide future growth and development. One of the requirements in a General Plan is a transportation and traffic circulation element. The state code requires the following:

- (ii) a transportation and traffic circulation element that:
- (A) provides the general location and extent of existing and proposed freeways, arterial and collector streets, public transit, active transportation facilities, and other modes of transportation that the planning commission considers appropriate;
  - (B) for a municipality that has access to a major transit investment corridor, addresses the municipality's plan for residential and commercial development around major transit investment corridors to maintain and improve the connections between housing, employment, education, recreation, and commerce;
  - (C) for a municipality that does not have access to a major transit investment corridor, addresses the municipality's plan for residential and commercial development in areas that will maintain and improve the connections between housing, transportation, employment, education, recreation, and commerce; and
  - (D) correlates with the population projections, the employment projections, and the proposed land use element of the general plan; and

## **REVIEW**

The draft Active Transportation Plan meets the requirements of the state code for the Transportation and Traffic Circulation Element of the General Plan, and with its adoption, will allow the City to continue to seek Transportation Investment Fund money. Additionally, the Active Transportation Plan will guide the establishment of a cohesive network of facilities in South Davis County.

Some changes have been made to the draft since it was distributed to the City Council for review. Most of the changes were minor, but a few of them are worth noting:

1. On page 46, the following changes were made to the “Network Recommendations” map:
  - a. 2600 South, east of Main Street, was changed from a Separated Bike Lane to “Future Study, TBD”
  - b. The Jordan River Trail Extension was changed from a Proposed facility to an Existing facility
  - c. The recommended facilities were clipped at the City boundary
2. Page C-50 was added to provide design guidelines for Railroad At-grade Crossings

In addition to the edits from the consultant, the Planning Commission requested one change to the plan on page 58, simply mentioning the Wasatch Choice 2050 Vision.

## **POSSIBLE MOTION**

I move that the City Council adopt ORD 2020-03 amending the City’s General Plan to include the proposed Active Transportation Plan as an amendment to the Transportation Element with the following findings:

1. North Salt Lake, with Bountiful and Centerville cities, sought to improve Active Transportation to create safe alternate transportation methods; and
2. The state legislature has determined that cities must include the general location and extent of active transportation facilities in the General Plan; and
3. The proposed draft meets the requirements of the state code to continue to allow the City to apply for Transportation Investment Fund money.

## Attachments

- 1) Draft Active Transportation Plan
- 2) ORD 2020-03

**ORDINANCE NO. 2020-03**

**AN ORDINANCE ADOPTING CERTAIN AMENDMENTS TO THE CITY OF NORTH SALT LAKE GENERAL PLAN RELATED TO THE TRANSPORTATION ELEMENT AND ESTABLISHING AN EFFECTIVE DATE.**

WHEREAS, City of North Salt Lake is an incorporated city in Davis County Utah; and

WHEREAS, the City Council of North Salt Lake, in cooperation with Bountiful City and Centerville City, has identified the necessity for a south Davis County region plan to improve active transportation and create safe alternative transportation methods; and

WHEREAS, the City Council of North Salt Lake has determined that certain amendments to the City General Plan are also necessary to comply with Utah State Statute 10-9a-403 requiring the City General Plan address active transportation as part of the transportation planning element; and

WHEREAS, the Planning Commission conducted a public hearing on the proposed amendments on January 14, 2020 and made a recommendation for amendment of the General Plan's Transportation Element to the City Council as proposed; and,

WHEREAS, the City Council finds that it is in the public interest that the North Salt Lake General Plan be amended at this time.

NOW THEREFORE BE IT ORDAINED by the Governing Body of the City of North Salt Lake amends the City of North Salt Lake General Plan, Transportation Element to include the South Davis Active Transportation Plan as attached:

- 1) Exhibit "A", South Davis County Active Transportation Plan.
- 2) This ordinance shall take effect immediately upon posting as required by Utah Code.

Passed by the Governing Body this 21<sup>st</sup> day of January, 2020.

CITY OF NORTH SALT LAKE  
By:

\_\_\_\_\_  
LEONARD K. ARAVE  
Mayor

ATTEST:

City Council Vote as Recorded:

\_\_\_\_\_  
City Recorder

<u>Name</u>	<u>Vote</u>
Council Member Baskin	_____
Council Member Gordon	_____
Council Member Horrocks	_____
Council Member Mumford	_____
Council Member Porter	_____

# SOUTH DAVIS COUNTY ACTIVE TRANSPORTATION PLAN

A multi-jurisdiction plan for the Cities of  
Bountiful, Centerville, and North Salt Lake



This Plan was prepared for the Cities of Bountiful, Centerville, and North Salt Lake by Alta Planning + Design and Township + Range Community Planning, with funding and planning assistance from the Wasatch Front Regional Council, Steering Committee, and local staff.





## **Project Team**

Ali Avery, City of North Salt Lake  
Mackenzie Wood, City of Centerville  
Bruce Cox, City of Centerville  
Curtis Poole, City of Bountiful  
Alex Roy, Wasatch Front Regional Council

## **Steering Committee**

Ali Avery, City of North Salt Lake  
Curtis Poole, City of Bountiful  
Mark Oligschlaege  
Paul Ottoson, City of North Salt Lake  
Mike Smith, City of Centerville  
Jake Layton, Centerville Trails Committee  
Andrea Olson, UDOT Region 1  
Llyod Cheney, City of Bountiful  
Mackenzie Wood, City of Centerville  
Jeff Oyler, Davis County  
Sherrie Llewelyn, City of North Salt Lake  
Alex Roy, Wasatch Front Regional Council

## **Alta Planning + Design**

Danielle Berger, Project Manager  
Mack Drzayich, Assistant Project Manager  
David Foster  
Joe Gilpin  
Jonathan Hilton  
Emily Guffin

## **Township + Range**

Tim Sullivan

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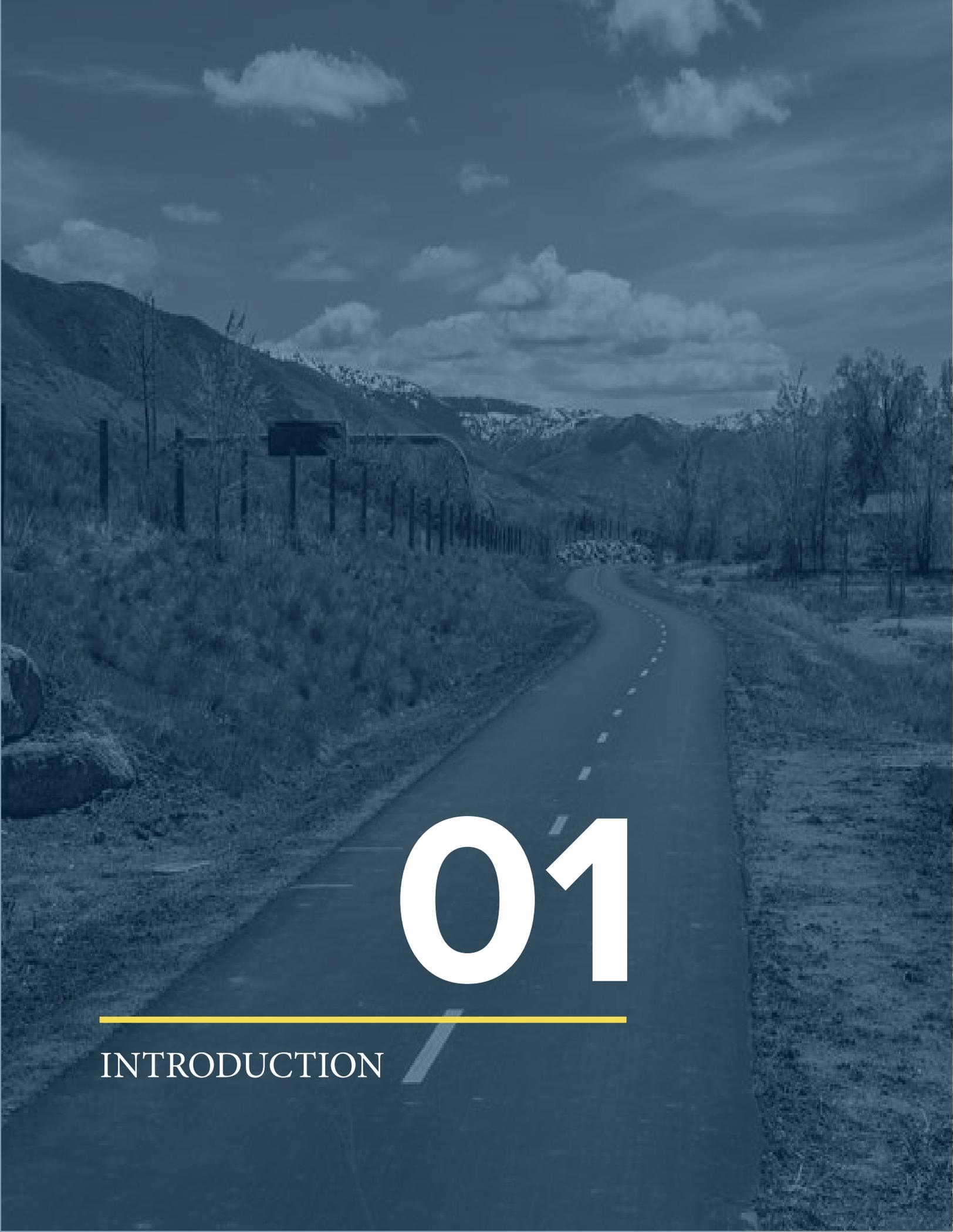
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Appendix A: Implementation Tables
Appendix B: Model Policies
Appendix C: Design Guidelines



# 01

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INTRODUCTION

## ABOUT THE PLAN

The cities of Bountiful, Centerville, and North Salt Lake were collectively awarded a Transportation Land Use Connection<sup>1</sup> (TLC) grant through the Wasatch Front Regional Council (WFRC) in 2018. All three communities share a common goal of providing improved active transportation options for the residents in South Davis County.

The cities recognize that by providing multiple options for transportation, they will better serve our populations who do not wish to use or do not have the ability to use personal vehicles. The three cities hope to provide an active transportation network that will allow residents to recreate within their own communities, and potentially commute to work as a pedestrian or cyclist.

The South Davis County Active Transportation Plan (ATP) will serve as a guide to city staff, commissions, and elected officials on how to allocate funds and properly construct (and reconstruct) roadways that are conducive to multiple modes of transportation. The Plan hopes to improve the health of residents by promoting exercise and active transportation while reducing the environmental impacts of personal vehicles on communities, specifically by improving the air quality.

Implementing the strategies of the ATP will further establish South Davis County as a recreation destination, promoting economic development and tourism. Additionally, with the adoption of the Plan, there is the potential for grant opportunities to become available for implementation.

The recommendations in this Plan and its appendices may change as the cities within the study area change, as priorities shift, and as opportunities arise to complete project. The Plan should be considered a fluid document. Some of the projects may need to be implemented incrementally and specific recommendations may be altered; specific and recommended facility types are the ultimate goal, but other treatments may need to be used in the interim.

## PLANNING PROCESS

The development of the South Davis County Active Transportation Plan took place over an 15-month period starting in October 2018. Key components of the process included:

- » A project kickoff meeting to review project goals and schedule
- » Development of a Steering Committee to gather input and provide updates
- » Existing conditions report summarizing current walking and bicycling challenges, policies and programs
- » Extensive public input collected through pop-up outreach events, online webmap, survey, and stakeholder interviews
- » Infrastructure Design Guide
- » Policy recommendations
- » Draft and final report

<sup>1</sup>The Transportation and Land Use Connection (TLC) program is a partnership between the Wasatch Front Regional Council (WFRC), Salt Lake County, Utah Department of Transportation (UDOT), and Utah Transit Authority (UTA). Learn more here: <https://wfrc.org/programs/transportation-land-use-connection/>

## WHAT IS ACTIVE TRANSPORTATION

Active transportation is defined as “human-powered modes of transportation, primarily walking and bicycling”. In addition to providing a low-cost and accessible form of transportation, walking and biking offers many additional benefits to communities that choose to plan and invest in developing comprehensive and connected active transportation systems.

The Cities of Bountiful, Centerville, and North Salt Lake are uniquely positioned to realize many of these benefits such as improved quality of life for residents, enhanced community health, improved air quality and even economic benefits. The South Davis County Active Transportation Plan establishes a blueprint for developing a system and culture where bicycling and walking are integral parts of everyday life.

### WHY IS IT IMPORTANT?

#### Health

Walking and bicycling have profound effects on the health of individuals and communities. Levels of diabetes, high blood pressure, and obesity are all lower in cities with higher percentages of commuters bicycling or walking to work. Likewise, where commuters bicycle or walk to work in higher percentages, more of the population is meeting the recommended amount of weekly physical activity.

#### Safety

Incorporating pedestrian and bicycle infrastructure improves safety by increasing predictability, slowing motor traffic speeds in some cases, increasing separation between cars and more vulnerable users, and encouraging a more deliberate and attentive use of the roadway system.<sup>1</sup>

#### Winter Air Quality

Combustion engines and industry combine with geographic constraints to create air quality concerns along the urbanized Wasatch Front, including Davis County. Replacing driving trips with walking and bicycling trips can play an important part in a comprehensive strategy to mitigate poor air quality.

#### Economics

Bicycling and walking can also have positive impacts on local economies in a variety of ways. Infrastructural improvements can sustain contracting jobs. Additionally, tourism, retail sales<sup>2</sup>, property values<sup>3</sup> and worker productivity can all be enhanced through active transportation.

#### Quality of Life

People who can easily and safely walk and ride a bicycle are happier and experience a higher quality of life, including the following factors:

- » Freedom of choice: Improving active transportation options opens opportunities for residents who are too young/old to drive or who otherwise are unable to drive. In general, more transportation options benefits the community by allowing people to spend less time/money on transportation or confidently allowing children to walk to school, the park, or friends' houses.
- » Health and Safety: Streets that are designed for the safety of vulnerable road users (i.e. pedestrians and bicyclists) are safe for everyone. Active transportation options also promote more active living and help residents meet physical activity guidelines for good health.

<sup>1</sup> Ewing, R. and Dumaugh, E. (2010). The Built Environment and Traffic Safety: A Review of Empirical Evidence, *Injury Prevention* 16: 211-212.

<sup>2</sup> Business Cycles: Catering to the Bicycling Market. (2012) Transportation Research Board. Kelly J. Clifton, Sara Morrissey, and Chloe Ritter. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.685.4497&rep=rep1&type=pdf#page=28>

<sup>3</sup> Walking the Walk: How Walkability Raises Home Values in U.S. Cities. (2009) CEOs for Clities: [https://nacto.org/docs/usdg/walking\\_the\\_walk\\_cortright.pdf](https://nacto.org/docs/usdg/walking_the_walk_cortright.pdf)

## TYPES OF BICYCLISTS

It is important to consider bicyclists of all skill levels when planning a network of bikeways. Infrastructure should allow for a comfortable experience for the greatest number of users and user types as possible.

There are four general types of bicyclists<sup>1</sup> people identify as:

- » **Strong and fearless** bicyclists will typically ride anywhere regardless of road or weather conditions, ride faster than other user types, prefer direct routes, and will typically choose to ride on the road, even if shared with vehicles, over separate bikeways like shared use trails.
- » **Enthusied and confident** bicyclists are fairly comfortable riding in dedicated bikeways but usually choose low traffic streets or shared use trails when available.
- » **Interested but concerned** bicyclists comprise the majority of the population (approximately 60%) and are typically those who only ride on low traffic streets or shared use trails in fair weather and prefer separation from motor traffic. This demographic would like to bike more but have concerns such as safety.

- » **“No way, no how”** people will not ride a bicycle under any circumstances, either due to physical disability or overall lack of interest.

According to a survey conducted by People for Bikes, nearly half of American adults (47 percent) would like to ride a bicycle more often, and 43 percent would be more likely to ride if bikeways were physically separated from motor vehicles, confirming that the potential for higher ridership is present, but that a lack of comfortable infrastructure is a major barrier.<sup>2</sup> The South Davis County Active Transportation Plan seeks to address this issue by recommending a denser and more comfortable network of bikeways in Bountiful, Centerville, and North Salt Lake.

<sup>1</sup> Four Types of Cyclists. (2009). Roger Geller, City of Portland Bureau of Transportation: <https://www.portlandoregon.gov/transportation/44597?a=237507>

<sup>2</sup> U.S. Bicycling Participation Study. (2018) People for Bikes: <https://peopleforbikes.org/wp-content/uploads/2019/04/Corona-Report-for-PFB-Participation-2018-for-Website.pdf>



## PROJECT VISION

*Bountiful, Centerville, and North Salt Lake will work together to improve quality of life, community health, and recreational access in South Davis County by connecting neighborhoods and destinations through safe walking and bicycling facilities.*



## PROJECT GOALS



### **Connectivity** - Develop a connected walking and bicycling system that can be used for a variety of trips

Increase and improve pedestrian and bicyclist access to employment centers, schools, existing and future transit, and other community destinations across Davis County.



### **Safety** - Ensure residents feel safe and protected when walking or bicycling

Improve safety for active transportation users of all ages and abilities through the design and maintenance of sidewalks, streets, intersections, and other roadway improvements such as signage, striping, lighting, wayfinding, and landscaping.



### **Recreation** - Increase and improve access to regional trail facilities

Develop a walking and bicycling network that provides year-round access to regional recreational facilities such as Legacy Parkway and Bonneville Shoreline Trail for all users.



### **Sustainability** - Help improve air quality through commuting options for those who work in Davis County and neighboring cities

Provide seamless connections to existing and future transit including FrontRunner and Bus Rapid Transit (BRT) services. Provide safe, connected facilities for those who commute by bicycle to Salt Lake City and other employment areas.



### **Partnerships** - Collaborate and maintain partnerships to realize shared interests in active transportation

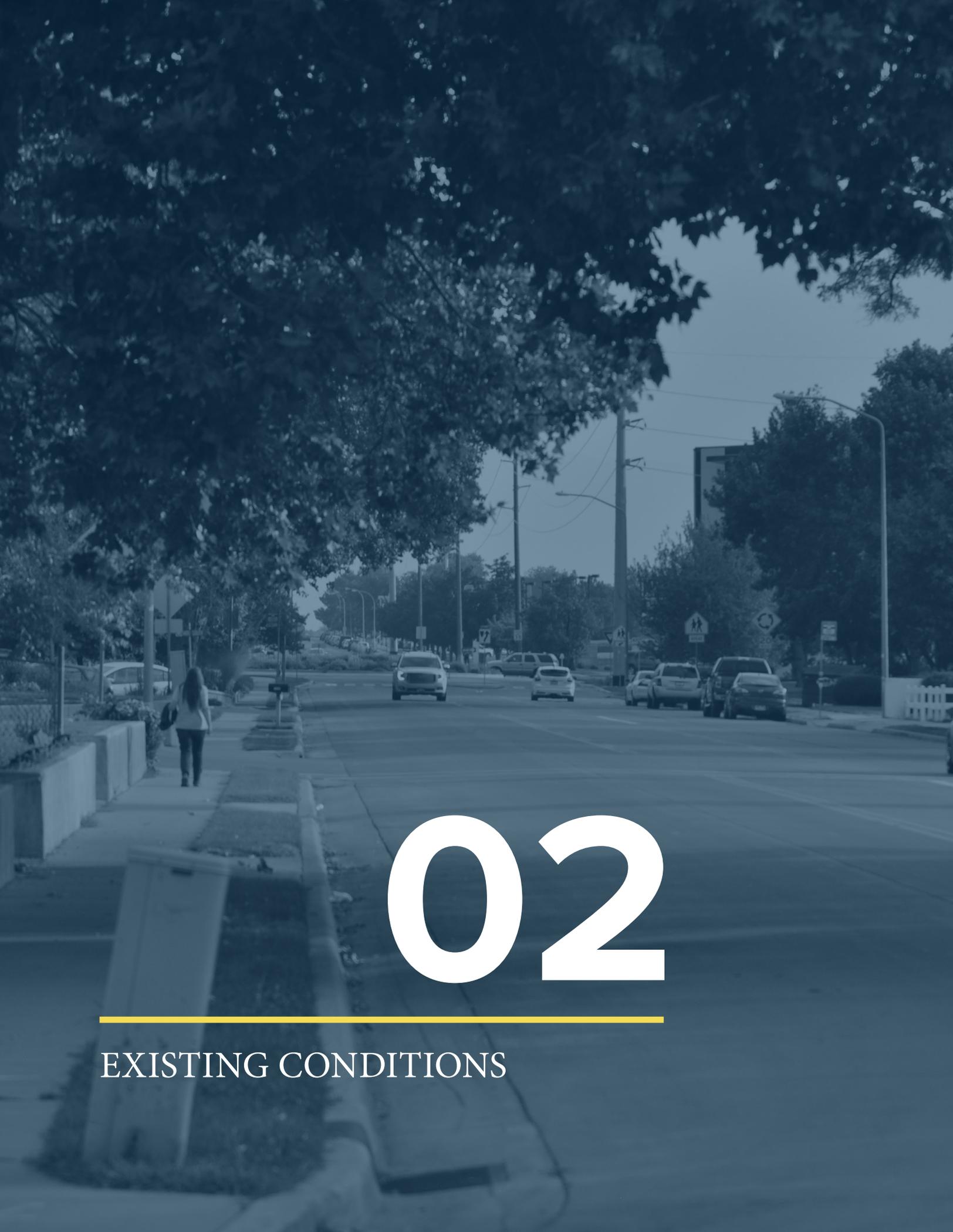
Pursue collaborative funding strategies to support implementation of new and improved walking and bicycling facilities.

Coordinate with partners to promote development of active transportation educational and encouragement programs such as Davis County Health Department and Davis School District.



### **Health** - Improve community health

Provide easy and convenient opportunities to integrate exercise and physical activity into daily routines with connected walking paths and safe bicycle facilities.

A blue-tinted photograph of a city street. In the foreground, a person is walking away on a sidewalk. The street has several cars parked and driving. There are trees lining the street and utility poles. The overall scene is a typical urban environment.

# 02

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EXISTING CONDITIONS



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## OVERVIEW

As is true for many of the communities along the Wasatch Front, the cities of Bountiful, Centerville, and North Salt Lake face a handful of related challenges in cultivating a culture of high active transportation participation. These include: past development patterns aided by and dependent upon vehicular transportation, significant topography, inclement winter weather, circuitous street network patterns, and the presence of high-volume, high-speed roads and highways that bisect neighborhoods, town centers, and communities. This section seeks to paint a picture of the current state of active transportation in South Davis County by looking at current trends in local active transportation, planning efforts to date, and existing walking and biking infrastructure.

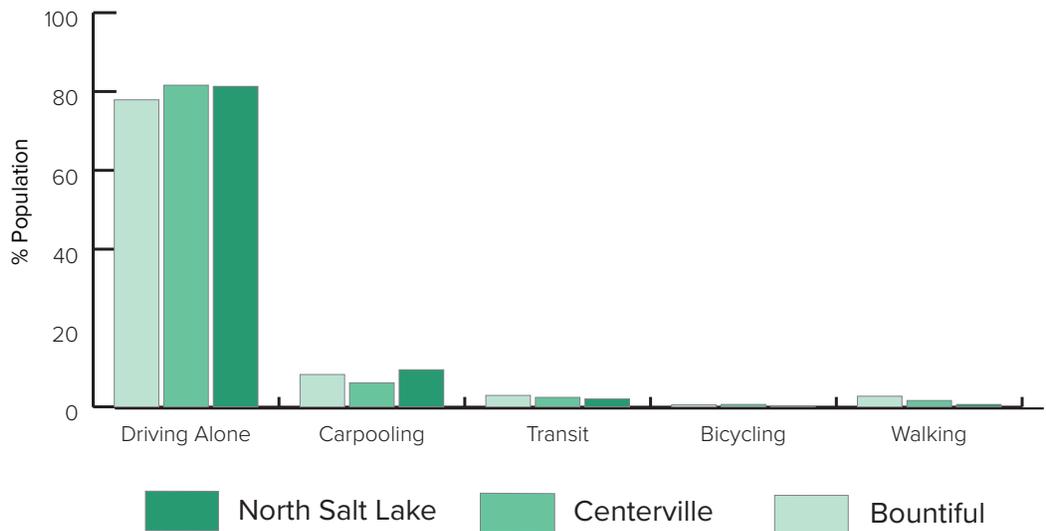
## CURRENT TRENDS

As part of the existing conditions analysis, the planning team tried to understand current trends in transportation among South Davis County residents by analyzing data with regards to mode share. Mode share refers to the percentage of trips taken by a particular form of transportation (i.e. car, bus, bicycle, walk, taxi). Three data sources are used in this analysis: the American Community Survey (2017), the Utah Travel Study (2012) and the National Household Travel Survey (2017).

### American Community Survey Data

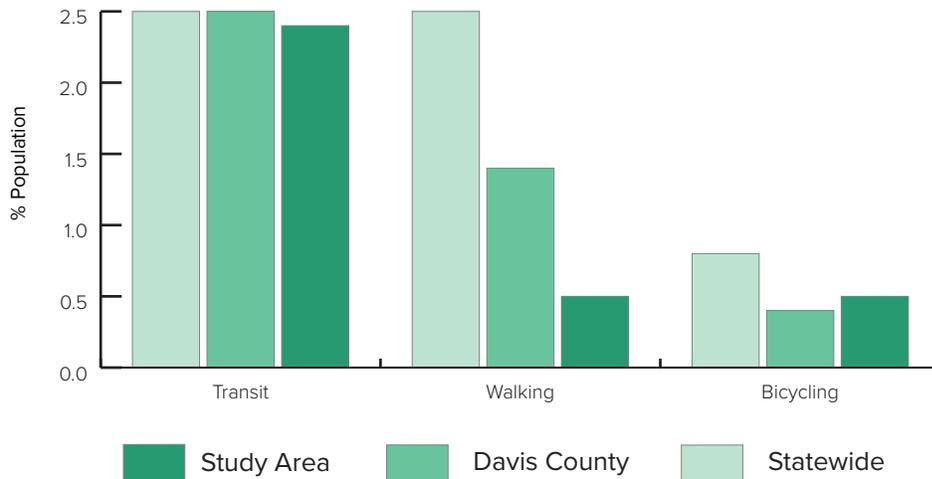
Based on 2013-2017 American Community Survey (ACS) data, the cities of Bountiful, Centerville, and North Salt Lake show the majority of residents commuting to work by driving alone (78%, 82%, and 81%, respectively), followed distantly by those carpooling (8%, 6%, and 9%, respectively). The percent of residents commuting to work by walking is very low (3%, 2% and 1%, respectively) and those commuting by bicycling even lower (less than 1% for all cities). See Figure 2.1 for a visualization of this data. While these numbers do not shine positively on active transportation use, they could be attributed to the lack of current bicycle and pedestrian infrastructure as well as the hilly topography within the area.

**Figure 2.1** ACS Commute Data for Bountiful, Centerville, and North Salt Lake



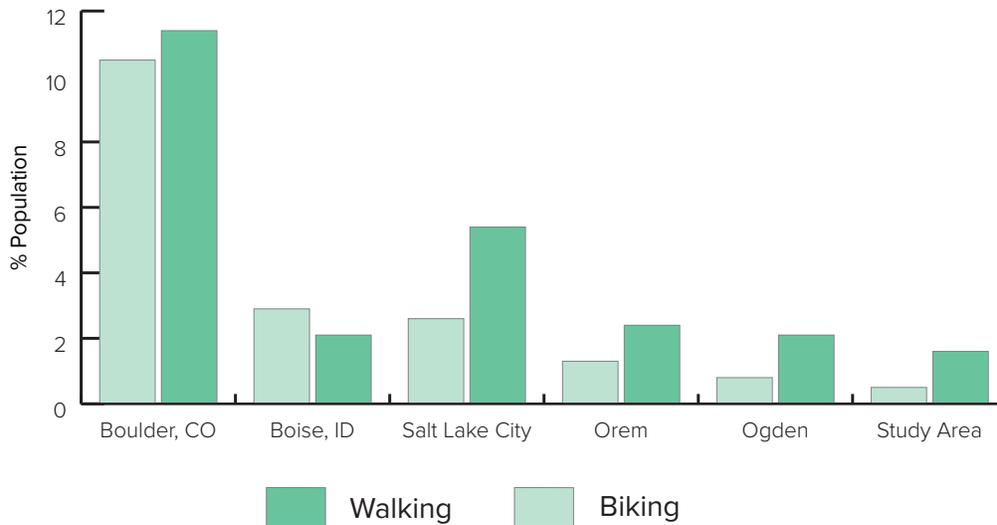
When comparing these cities' averages to state and county averages; however, it is also apparent that Bountiful, Centerville, and North Salt Lake have a lower than average number of people commuting to work by bike or foot. The population percentage using public transit within Bountiful, Centerville, and North Salt Lake is comparable to the percent population in Utah and Davis County. See Figure 2.2.

**Figure 2.2** ACS Commute Data for mode share comparison across the State and County



Comparisons with towns within the mountain west region further highlight the lack of active transportation mode share. Comparing these three cities to Orem, Ogden, or Salt Lake City (all fairly comparable cities), it is apparent that Bountiful, Centerville, and North Salt Lake don't have nearly the same amount of active transportation commuters. In fact, out of all of the cities, Bountiful, Centerville, and North Salt Lake show the lowest numbers of people bicycling or walking to work. Comparing these cities to more established leaders in bicycle and pedestrian planning, such as Boulder, Colorado, and Boise, Idaho, further demonstrates the work needed to develop a community committed to active transportation. See Figure 2.3 for a visualization of these comparisons.

**Figure 2.3** ACS Commute Data for other Mt. West cities



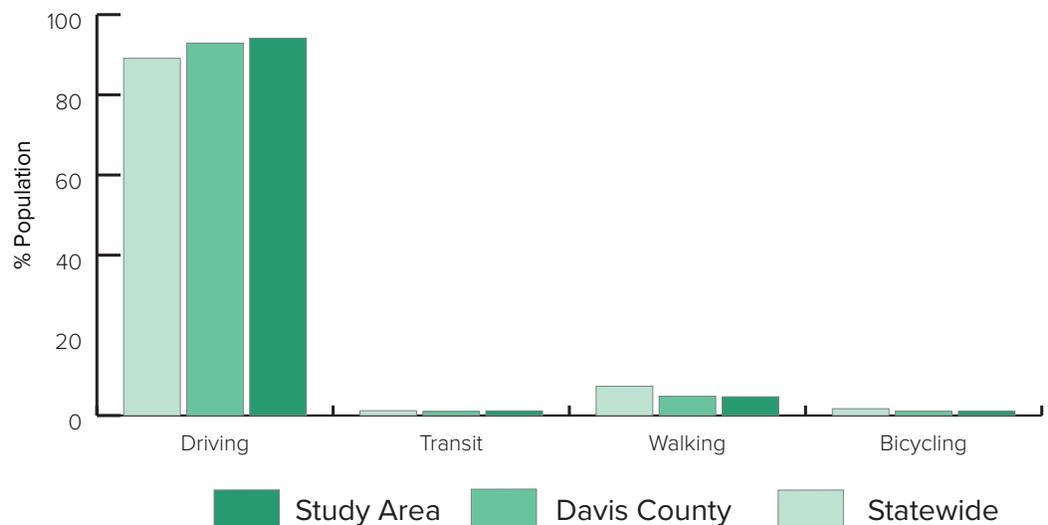
## The Utah Travel Survey (2012) and National Household Travel Survey (2017)

Journey to work data from the ACS is an important and consistent data source to measure changes in mode share over time; however, this data represents only one type of trip and does not accurately reflect overall levels of bicycling and walking for all trip purposes. For example, people may choose alternative modes of transportation for trips that involve going to school, running errands, dropping family members off, and so forth.

The 2017 National Household Travel Survey was developed by the Federal Highway Administration (FHWA) and provides information on national travel behavior at the household level. It is the only source of national data that shows trends in personal and household travel, including non-work related trips by all transportation modes and characteristics of the people traveling, their household, and their vehicles. The state of Utah, in collaboration with the Utah Department of Transportation and the Utah Transit Authority, also undertook a similar study in 2012 that examined travel behavior at a more detailed level within the state of Utah. Since both of these datasets measure trips for all modes and purposes (not just journey to work), it can paint a clearer picture of current transportation habits beyond the ACS data.

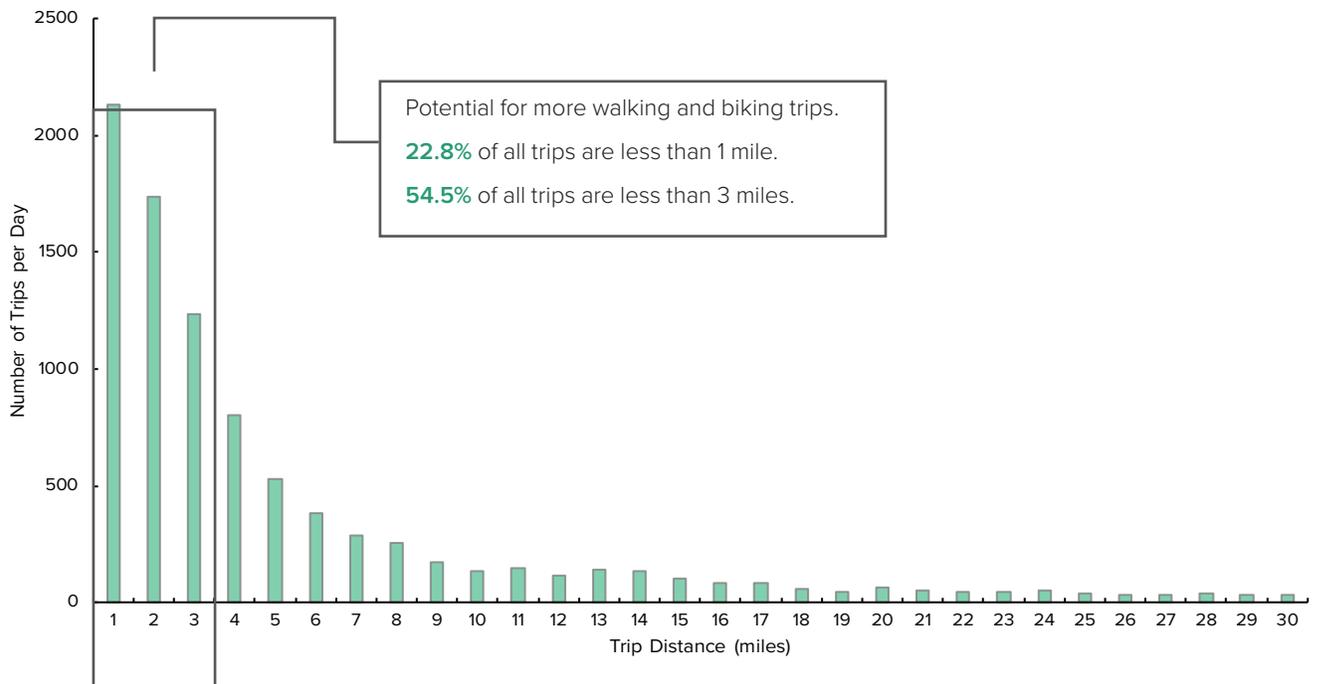
However, even when these trip variations are taken into account, Figure 2.4 still shows that the cities of Bountiful, Centerville, and North Salt Lake are again below state and county averages for percentage of trips taken by foot or bike. There are several possible reasons that could be associated with these low numbers. For example, the communities of Bountiful, Centerville, and North Salt Lake are characterized by typical suburban development with low density development, segregated land uses, numerous cul-de-sac developments and dead-end neighborhood streets, and high-speed arterials with frequent ingresses and egresses for shopping plazas. This type of urban form does not provide many route options for people choosing to walk or bike to local destinations. These communities also currently do not have very much active transportation infrastructure in place; perhaps these numbers will increase as more infrastructure becomes developed.

**Figure 2.4** Utah Travel Survey mode share for all trips



While these numbers do not paint a positive picture for Bountiful, Centerville, and North Salt Lake in terms of bicycle and pedestrian friendliness, there is great room for progress. As shown in Figure 2.5, the Utah Travel Study shows that 22.8 percent of all trips within Davis County are less than or equal to one mile. Further, 54.5 percent of all trips within Davis County are less than or equal to three miles. This presents a tremendous opportunity to transform many of these short trips into biking or walking trips. Many of these cities' major destinations, such as downtown areas, shopping plazas, or community gathering places, are centrally located and in normal biking or walking distance for many neighborhoods.

**Figure 2.5** Utah Travel Survey - Davis County trip distances



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## PREVIOUS PLANNING EFFORTS

Several local and regional studies have been completed in South Davis County that directly or indirectly address active transportation. This plan seeks to build upon previous planning efforts in order to develop appropriate network recommendations and infrastructure design guidelines. The following studies have been reviewed to determine their impact on the South Davis County Active Transportation Plan and capitalize on previous lessons learned. For purposes of promoting cross-jurisdictional collaboration, plan summaries from each of the participating jurisdictions are included in this section:

### **BOUNTIFUL**

- » **Bountiful Downtown Master Plan (2009)**
- » **Bountiful Recreation and Trails Master Plan Policies (2009)**
- » **Bountiful Transportation Master Plan (2009)**
- » **Bountiful Plat A - Main Street Goals and Policies (N.D.)**
- » **Bountiful Trails Master Plan (2019)**

### **CENTERVILLE**

- » **West Centerville Neighborhood Plan (2009)**
- » **Centerville South Main Street Corridor Plan (2010)**
- » **Centerville Parks and Trails and Proposed Bike Lanes Map (2015)**
- » **Centerville General Plan (2016)**

### **NORTH SALT LAKE**

- » **North Salt Lake Annexation Policy Plan (2003)**
- » **North Salt Lake General Plan (2013)**
- » **North Salt Lake Town Center Master Plan (2016)**

In addition to these plans, Wasatch Front Regional Council's 2019-2050 Regional Transportation Plan was referenced throughout the development of the network recommendations (see Chapter 4) to ensure synergy between regional goals and plans and local planning and implementation efforts.

## BOUNTIFUL DOWNTOWN MASTER PLAN (2009)

**Study Area:** Local

**Plan Type:** Subarea Plan (subset of the Comprehensive Plan)

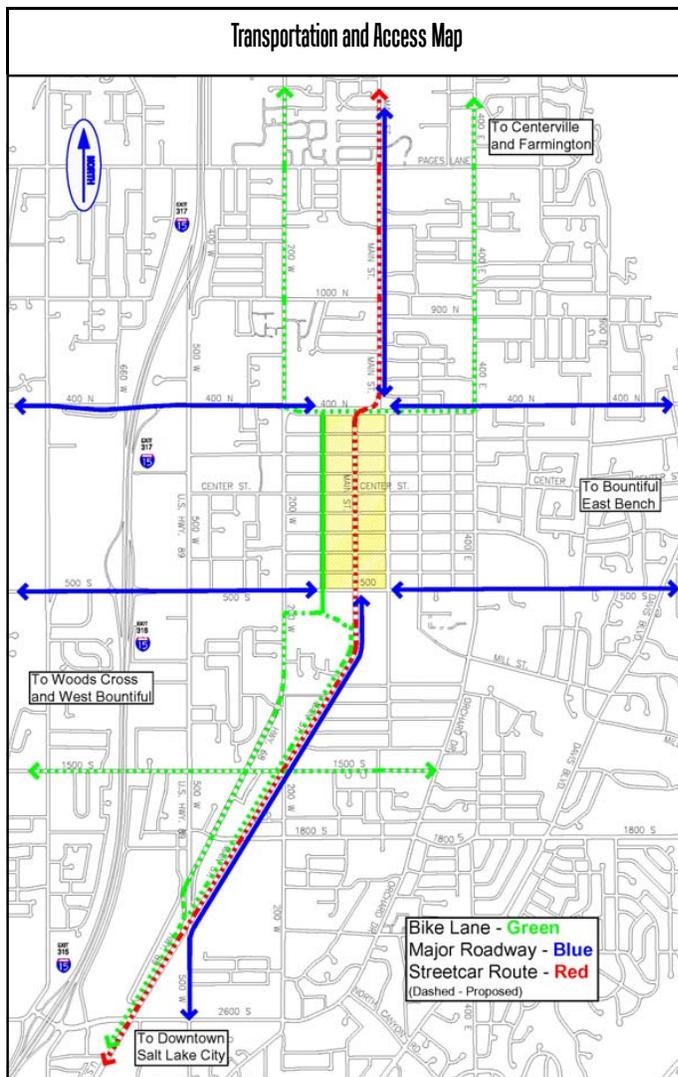
**Plan Overview:** The plan identifies specific issues that are affecting the viability of downtown and proposes goals and actions to address them

**Plan Vision Statement:** Downtown will be a unique destination that is a positive amenity of the community

**Influence on ATP:** Includes some recommendations for improving pedestrian and bicyclist access to downtown, including the location of potential bike lanes

**Key Recommendations Relating to Active Transportation:**

- » Provide additional pedestrian mid-block access between parking lots and Main St.
- » Construct bike lanes to connect adjacent neighborhoods to downtown
- » Provide bicycle parking on Main St.



Transportation and Access Map from the 2009 Bountiful Downtown Master Plan

## BOUNTIFUL RECREATION AND TRAILS MASTER PLAN (2009 & 2019)

**Study Area:** Local

**Plan Type:** Subarea Plan (subset of the Comprehensive Plan)

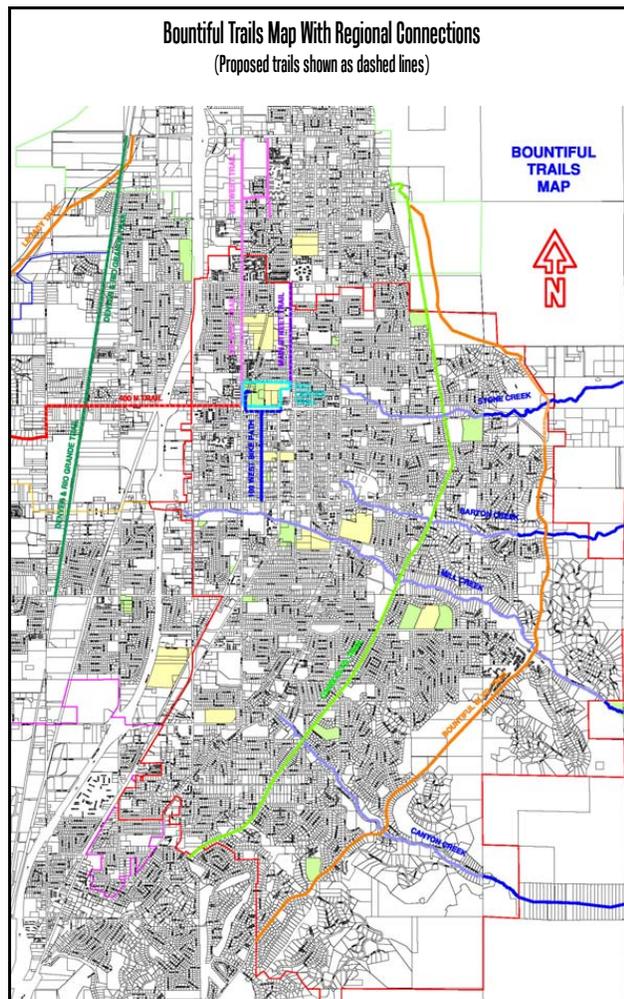
**Plan Overview:** The plan identifies specific issues that are affecting the recreation and trails and proposes goals and actions to address them

**Plan Vision Statement:** Improve residents' quality of life by providing a diverse type of recreational opportunities, including natural open space, shooting ranges, motorized trails, active parks, and natural surface trails

**Influence on ATP:** Establishes goals for increasing bicycle facilities, creating a citywide trail system, and improving existing trails

### Key Recommendations Relating to Active Transportation:

- » Increase bicycle routes and trails by 50% by 2019; develop plan to do so
- » Establish a citywide trail system that connects destinations
- » Post a trail map at every trailhead and install trail markers every 1/8 mile
- » Establish a minimum trail improvement standard and bring all trails within the city up to the minimum standard



*Trails Map from the 2009 Bountiful Recreation and Trails Master Plan*

## **BOUNTIFUL TRANSPORTATION MASTER PLAN (2009)**

**Study Area:** Local

**Plan Type:** Subarea Plan (subset of the Comprehensive Plan)

**Plan Overview:** The plan identifies specific issues that are affecting transportation and proposes goals and actions to address them

**Plan Vision Statement:** N/A

**Influence on ATP:** Identifies areas where certain modes of transportation should be concentrated or balanced

### **Key Recommendations Relating to Active Transportation:**

- » Preserve the Hwy 89/500 West corridor between 2600 South and 900 North for automobile traffic and automobile oriented commercial development
- » Establish the Hwy 89 corridor from 1800 South to Salt Lake City a transit, bicycle, and automobile corridor (include shoulder bikeways).
- » Construct parkstrips on Orchard Dr reduce obstruction of the sidewalk.
- » Create trails on major north/south corridors such as Davis and Bountiful Blvds, and flatter areas west of 400 East/Orchard Dr. Develop an urban trails plan to do so.
- » Create an enhanced pedestrian corridor along Center St between 200 West and Main St. Develop a plan to do so.

## **BOUNTIFUL PLAT A - MAIN STREET GOALS & POLICIES (N.D.)**

**Study Area:** Local

**Plan Type:** Subarea Plan

**Plan Overview:** Outline goals and policies for the Plat A neighborhood (also known as the Historic Downtown) and Main Street

**Plan Vision Statement:** Make Main Street the “heart” of Bountiful and South Davis County

**Influence on ATP:** Identifies areas where certain modes of transportation should be concentrated or balanced

### **Key Recommendations Relating to Active Transportation:**

- » Improve pedestrian safety and comfort on Main St by enhancing pedestrian crossings with bulb-outs and textured surfaces and prohibiting new driveway curb-cuts on Main St between 400 North and 500 South.
- » Improve walkability on 200 West
- » Create an attractive setting for pedestrian access to transit along 200 West with sidewalk and ADA improvements, among others.
- » Increase the number of residents and employees able to access Main Street by walking.
- » Stabilize the old fort residential neighborhoods in part by installing traffic calming treatments.

## CENTERVILLE GENERAL PLAN (2016)

**Study Area:** Local

**Plan Type:** Comprehensive Plan

**Plan Overview:** Includes general recommendations for each aspect of Centerville's planning and development; also identifies an area for potential annexation

**Plan Vision Statement (relating to Active Transportation):** Bicycling in the City should promote, increase, improve, and enhance riding in the City as a safe, healthy, and enjoyable means of transportation and recreation. (Section 12-450-3 Bicycle and Non-Motorized Vehicle Pathways)

Centerville City aims to create and maintain an organized network of urban trails connecting destinations within the city and adjacent communities. (Section 12-460-2 Trails)

**Influence on ATP:** Identifies general strategies Centerville should use to improve connectivity and conditions for pedestrians, bicyclists, and trail users. If annexed, the City will provide infrastructure and services for the area in question, potentially including active transportation facilities

### **Key Recommendations Relating to Active Transportation:**

Bicycle and Non-motorized Vehicle Pathways (12-450-3)

- » Provide bike facilities along 1250 W, Frontage Rd, Main St, 400 E, Chase Ln, Parrish Ln, and Pages Ln
- » Create bike friendly streets with signage and pavement markings.
- » Provide enforcement and education programs to support adherence to traffic laws related to bicycling.
- » Create and maintain a city bikeways map categorizing bicycle facilities as Class I Bike Paths, Class II Bike Lanes, or Class III Bicycle Routes and Bike Friendly Streets.
- » Establish bicycle connections with neighboring jurisdictions to support regional bicycle events.
- » Adopt bicycle parking requirements for new commercial developments.

Trails (12-460-2)

- » Promote trail and bikeway use by increasing the amount of signage, maps, and trailhead kiosks.
- » Extend the Bonneville Shoreline Trail.
- » Continue existing trails education and activity program.
- » Encourage pedestrian enhancement in the Parrish Gateway and eventually develop a pedestrian plan for the area.
- » Develop a citywide bike plan.
- » Improve pedestrian and bicycle access to current and proposed trails west of I-15, including a trailhead to the Legacy Parkway Trail on 1275 North

## WEST CENTERVILLE NEIGHBORHOOD PLAN (2009)

**Study Area:** Local

**Plan Type:** Subarea Plan

**Plan Overview:** This plan is a comprehensive guide to inform the development of the West Centerville neighborhood with the construction of the Legacy Parkway, a limited access highway that bisects the neighborhood

**Influence on ATP:** Includes recommendations for connecting trails and bikeways to the Legacy Nature Preserve

**Key Recommendations Relating to Active Transportation:**

- » Complement and support the Legacy Nature Preserve by developing a master trails plan to integrate the Legacy Parkway Trail, the UTA multiple-use corridor, and west side development.
- » Integrate the Parrish/Legacy Trailhead Park into the trail system and loop the system with east side frontage road trails between Glover's Lane and Parrish Lane.
- » Connect the Legacy Parkway trail with the Bonneville Shoreline Trail via city trails and paths.
- » Create a Class I or II bikeway that connects the east side area with the Legacy Parkway trail system

## CENTERVILLE SOUTH MAIN STREET CORRIDOR PLAN (2010)

**Study Area:** Local

**Plan Type:** Subarea Plan

**Plan Overview:** This plan is a guide for reestablishing Centerville's commercial core and creating a more pedestrian-friendly environment

**Plan Vision Statement:** To return Main Street to "center stage" as the civic, cultural, and community heart of Centerville City

**Influence on ATP:** Includes recommendations for connecting trails and bikeways to the Legacy Nature Preserve

### **Key Recommendations Relating to Active Transportation:**

- » Lower the speed limit on the south Main Street Corridor to increase safety.
- » Work with UDOT to provide additional crosswalks and other pedestrians safety features on Main Street.
- » Advocate for wider sidewalks when improvements are being considered. Prioritize Safe Routes to School and the Traditional Main Street Commercial District.
- » Consider striped bike lanes, planted medians, raised intersections, bulb-outs and other improvements to preserve and enhance mobility.
- » Allow shared roadway bicycle routes to provide opportunities for bike lanes on Main Street and on surrounding neighborhood streets that connect to Main Street.
- » Connect Main Street to adjacent neighborhoods and commercial districts with new trails, bicycle routes, sidewalks, and paths.
- » Provide a safe pedestrian route from the core area to school by continue sidewalks (minimum 6' wide) on both sides of Main Street into the Residential Boulevard District.
- » Improve existing crosswalks and identify a location for an additional crosswalk to access the school.
- » Increase pedestrian comfort and safety by widening the sidewalk to at least 6' and the parking strip to 5', (ideally 8') in the Residential Boulevard District.
- » Enhance pedestrian connections to the mixed-use nodes and other areas along the Main Street corridor.

## NORTH SALT LAKE GENERAL PLAN (2013)

**Study Area:** Local

**Plan Type:** Comprehensive Plan

**Plan Overview:** Guides the development of land use policies and provides the basis for land use decisions in North Salt Lake

**Plan Vision Statement (relating to Active Transportation):** North Salt Lake envisions a balanced and integrated multimodal transportation system that is bicycle and pedestrian friendly, fully accessible to all users, and provides safe connections to destinations and amenities.

**Plan Goals (relating to Active Transportation):**

- » Provide for and encourage transportation by walking and bicycling. (T-4)
- » Promote a walkable and bike-able community. (PR-2)

**Influence on ATP:** Identifies general strategies and specific actions for improving bicycle and pedestrian connectivity in North Salt Lake

**Key Recommendations Relating to Active Transportation:**

Chapter 4: Transportation

- » Analyze methods to balance modes on Hwy 89, potentially implementing 8' sidewalks and 5.5' bike lanes.
- » Implement a 6' pedestrian trail and 5' bike lanes on 1100 North, among other improvements.
- » Continue the 10' trail on the south side of Center St east of 400 west; maintain bike lanes where possible.
- » Prioritize the filling of gaps in the sidewalk network based on identified priority routes and proximity to bus routes, schools, parks, and higher density/small lot residential areas.
- » Develop a citywide bicycle plan for Class I multi-use trails.
- » Provide 8' minimum separation between trails and traffic, when possible.
- » Improve pedestrian and bicycle connectivity at Foxboro, particularly to Redwood Rd, 900 North and Cambridge.
- » Continue the multi-use trail on west side of Redwood Rd, maintaining 8-10' in width and at least 8' of landscaped buffer between the trail and curb. Provide 5' sidewalks on the east side of Redwood Rd.
- » Expand the Bamberger Trail from the "Linear Park" to Main St and Bamberger Station.
- » Construct a multi-use trail on Center St east of Main St.
- » Develop a high-density street grid east of Hwy 89 and construct multi-use trails on one side of the streets.
- » Develop trails through the Town Center south of Center St.
- » Improve trails on Center St between Legacy Pkwy and Hwy 89, including a 10' landscaped buffer.
- » Establish Town Center street standards for pedestrians, including a minimum width of 6' for sidewalks, with 8' separation from the curb.
- » Include a 5-6' shoulder bikeway on Hwy 89.

## **NORTH SALT LAKE GENERAL PLAN (2013) CONTINUED**

### **Key Recommendations Relating to Active Transportation** *(continued)*:

Chapter 6: Parks, Trails, and Recreation

- » Prioritize pedestrian and bicycle connectivity to strategic destinations.
- » Maximize connectivity to regional trails.
- » Investigate the possibility of establishing a pedestrian connection to the Town Center along the Bamberger rail corridor.
- » Promote trail safety and awareness with wayfinding strategies and facilities segregation by speed

## **NORTH SALT LAKE TOWN CENTER MASTER PLAN (2016)**

**Study Area:** Local

**Plan Type:** Subarea Plan

**Plan Overview:** The plan builds upon the North Salt Lake General Plan recommendations for the development of a town center, by providing a detailed concept of the project, an illustrative plan, design guidelines, and implementation considerations

**Plan Vision Statement:** A Town Center will be formed by integrating what is currently three distinct neighborhoods into a single destination where the unique qualities of each sub-district are nonetheless preserved. It will be a special destination that is attractive and unique in appearance, but also a place with heart and soul.

### **Plan goals (relating to Active Transportation):**

- » Improve the appearance and safety of the Town Center and Highway 89 corridor.
- » Establish multi-modal streets

**Influence on ATP:** Establishes a pedestrian-oriented town center concept for North Salt Lake that includes specific recommendations for enhancing pedestrian and bicycle safety, comfort, and access

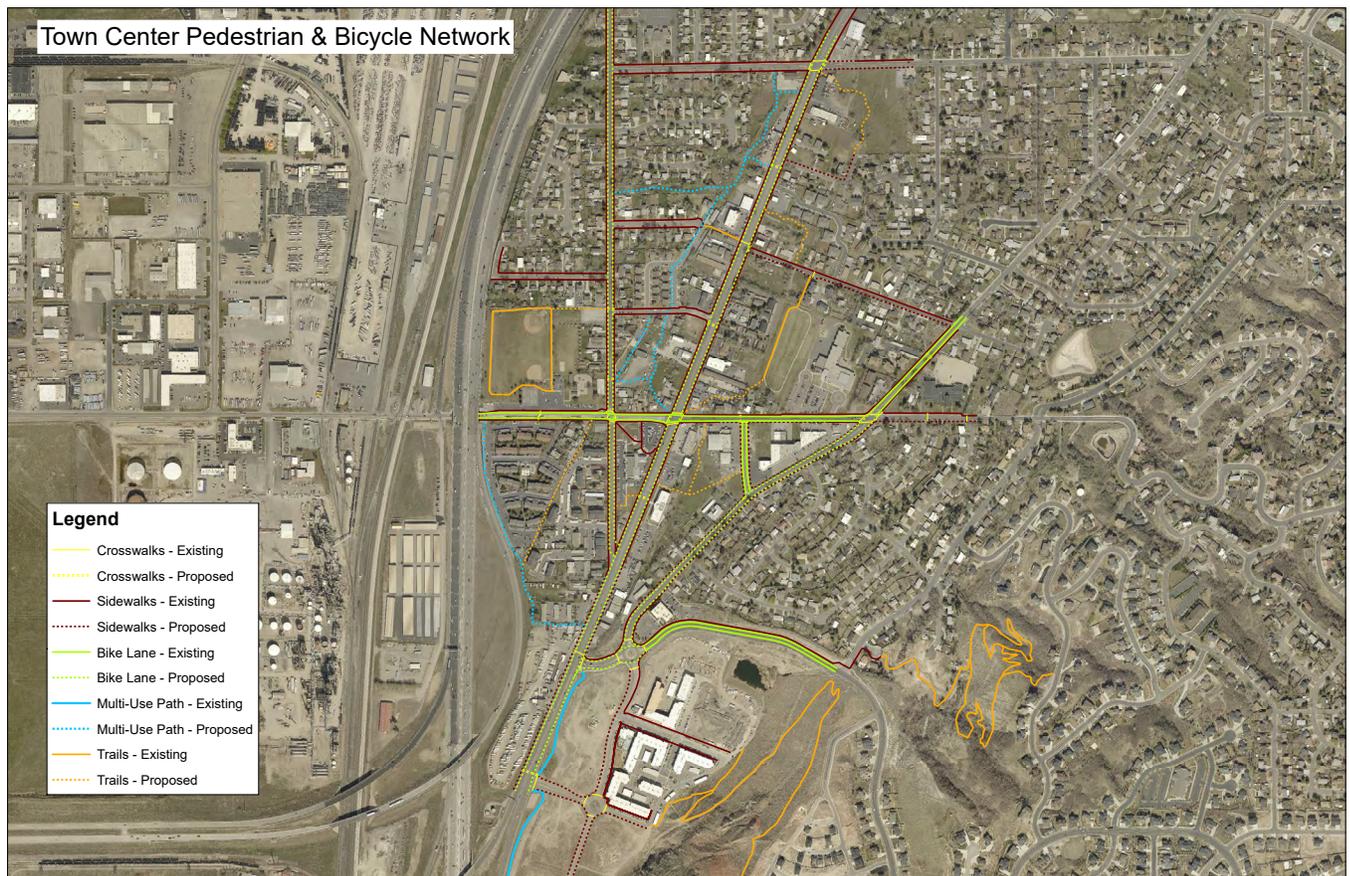
### **Key Recommendations Relating to Active Transportation:**

- » Accommodate BRT on Hwy 89
- » Convert Hwy 89 into a pedestrian friendly corridor that is unified with the Town Center
- » Develop new public open spaces, including pedestrian corridors
- » Make streets safe and attractive for multiple transportation modes
- » Include active transportation and transit options for district residents
- » Establish Center St as the primary east-west bicycle corridor with bike lanes
- » Stripe bike lanes on Orchard Dr.
- » Widen Hwy 89 to provide space for buffered bike lanes
- » As land becomes available, consider the use of alleys and the development of additional paths for further bicycle connections
- » Widen the pedestrian realm on Center St to establish it as the focal point for Town Center

## NORTH SALT LAKE TOWN CENTER MASTER PLAN (2016) CONTINUED

### Key Recommendations Relating to Active Transportation *(continued)*:

- » Construct a transit center at Center St and Hwy 89
- » Provide a safer pedestrian crossing of Hwy 89, ideally at Main St.
- » Make Main St more pedestrian-oriented as development occurs
- » Add sidewalks to Orchard Dr.
- » Utilize a Complete Streets approach



Town Center Pedestrian and Bicycle Network Map from the 2016 North Salt Lake Town Center Master Plan

## EXISTING NETWORK

Much of what North Salt Lake has for active transportation facilities is fragmented and/or doesn't lead to meaningful destinations as identified in the public outreach process. Like the other cities in this study, North Salt Lake has low street connectivity and circuitous street patterns which are less conducive to active transportation, but efforts are already being made to dedicate more space to active modes on City streets. In total, the City has about 19 miles of bicycle/pedestrian facilities (excluding sidewalks), made up of bike lanes, shared use paths, and sidepaths.

### EXISTING FACILITY TYPES

8.7  
miles



**Bike Lanes** are a common facility type in many cities, designating 4-7 feet of roadway width with 6-inch striping and bike lane symbols. Bike lanes are typically comfortable only for confident cyclists, unless they're located on low-speed, low-volume streets.

6.4  
miles



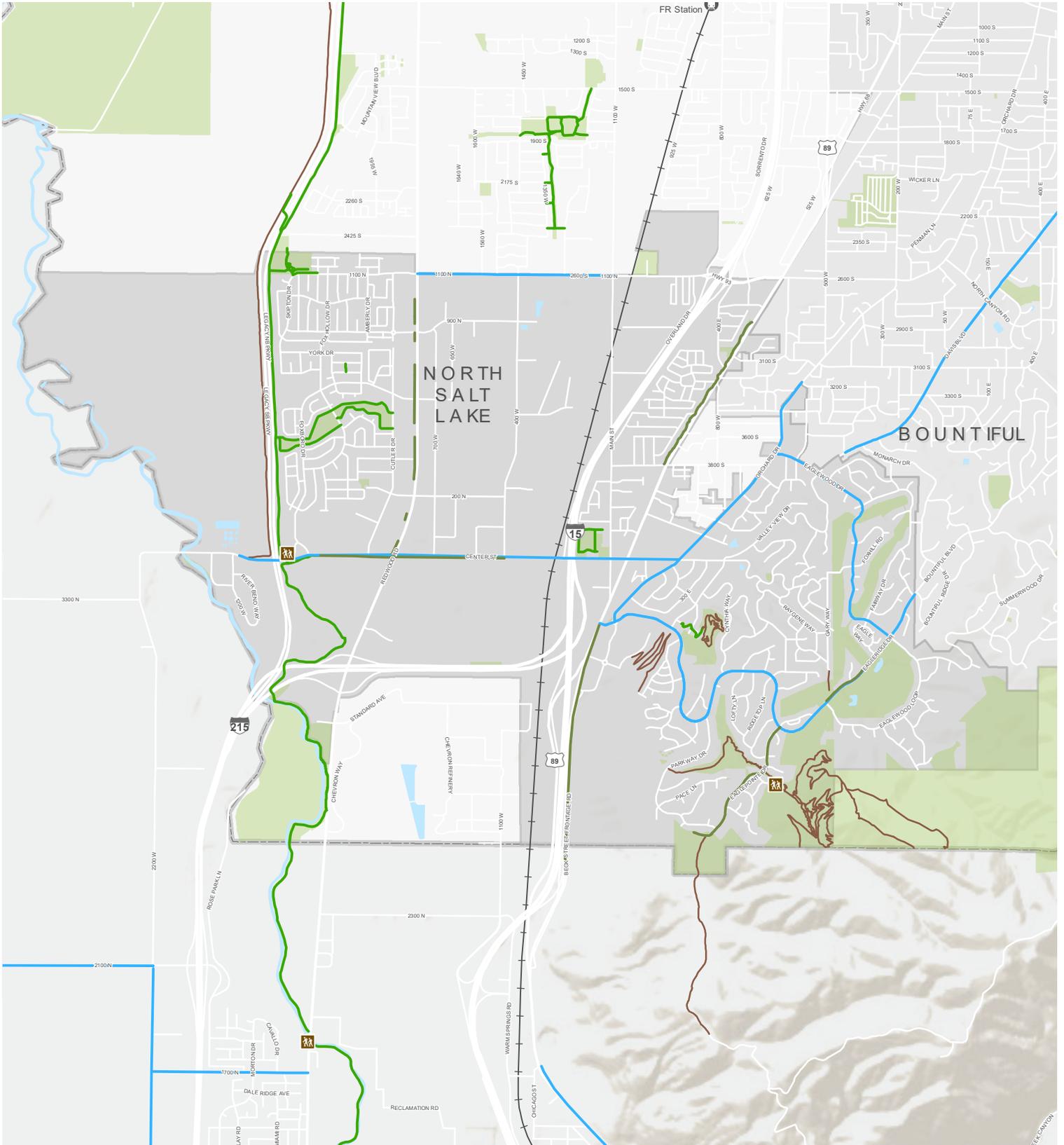
**Shared Use Paths** are paved paths/trails, typically 10-12' wide, constructed of asphalt or concrete, that accommodate pedestrians, bicyclists, and other non-motorized modes off street. Sometimes called trails, they're not to be confused with natural surface trails.

4.7  
miles



**Sidepaths** function as shared use paths by accommodating both pedestrian and bicyclists off street, but are located parallel to roadways. Because of this, sidepaths come with unique challenges including frequent driveway crossings, street intersections, and fronting land uses. When designed correctly, sidepaths provide an inviting experience for users who are uncomfortable using on-street bikeways.

MAP 2.1 | SOUTH DAVIS COUNTY ACTIVE TRANSPORTATION PLAN  
**EXISTING NETWORK - NORTH SALT LAKE**



**Existing Facilities**

- Bike lane
- Shared use path
- Sidepath
- Natural surface trail

**Existing Destinations + Boundaries**

- Trailhead
- FrontRunner station
- City limits
- County limits



Data provided by the Cities of Bountiful, Centerville, and North Salt Lake; Davis County; the Utah AGRC; UDOT; UTA; and WFRC  
 Map produced August 2019 by Alta Planning + Design

## CRASH AND SAFETY ANALYSIS

The most reported reason for people not using walking and bicycling for daily transportation is lack of safety, be it perceived safety, based on comfort levels associated with auto-centric street conditions, or actual safety, based on crashes involving pedestrians or bicyclists. Cities and countries across the world are adopting policies and programs aimed at eliminating all traffic-related fatalities, most commonly known as Vision Zero, the fundamental premise of which is that traffic-related deaths and serious injuries are preventable.

According to UDOT’s Numetric data, from 2010-2018, there were 30,647 total crashes reported on the roads of Davis County, excluding crashes that occurred on I-15, I-215, and Highway 67 (Legacy Parkway). Of those crashes, 1,132 (3.7 percent) of them involved pedestrians or people on bicycles. And of those 1,132 crashes, 24 have resulted in fatalities and 102 have resulted in serious injuries.

### PEDESTRIAN INVOLVED CRASHES

From January 1, 2010 to December 31, 2018, there were 620 pedestrian involved crashes reported in Davis County. The graph below illustrates trends for pedestrian involved crashes for the three cities included in this plan and Map 2.2 shows pedestrian involved crashes by location and severity.

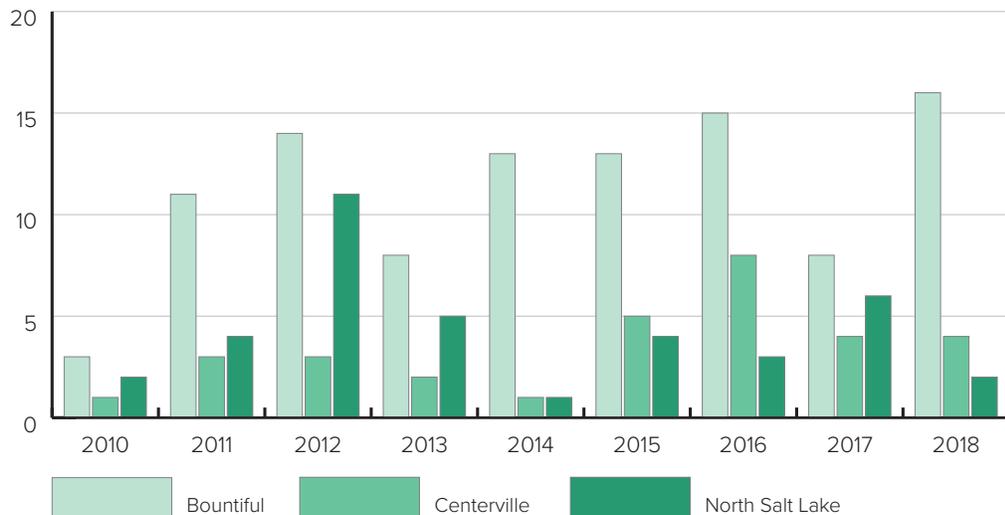
Comparing the three cities under study shows Bountiful as having the most total crashes on roads excluding I-15, I-215, and Highway 67 (Legacy Parkway), while percentages of crashes classified as pedestrian involved for each city are comparable.

**Bountiful:** 5,215 total crashes; **101** pedestrian involved crashes (1.9 percent)

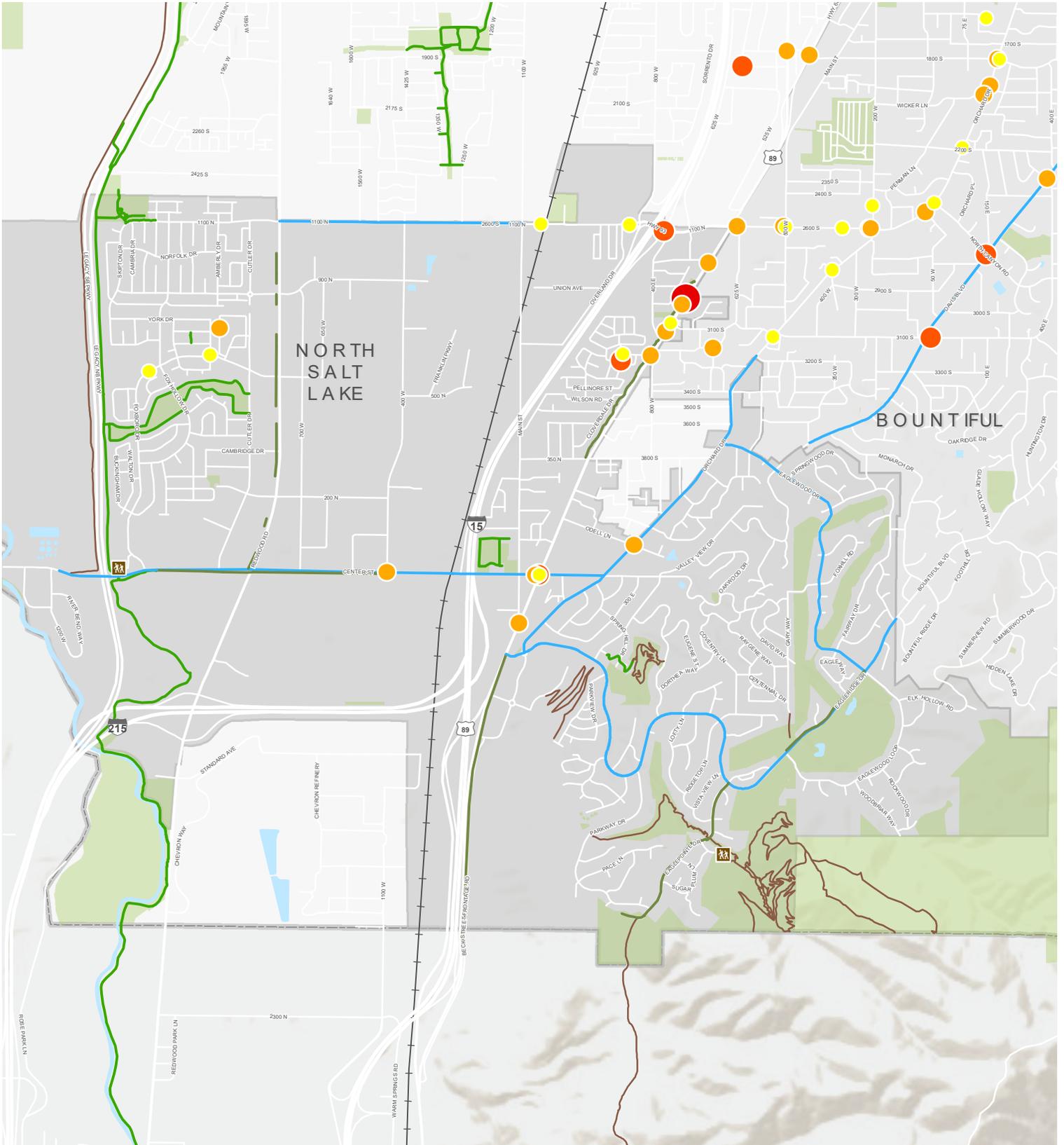
**Centerville:** 1,611 total crashes; **31** pedestrian involved crashes (1.9 percent)

**North Salt Lake:** 2,162 total crashes; **38** pedestrian involved crashes (1.7 percent)

**Figure 2.6** Pedestrian involved crashes (UDOT Numetric data, 2010-2018)



MAP 2.2 | SOUTH DAVIS COUNTY ACTIVE TRANSPORTATION PLAN  
**PEDESTRIAN INVOLVED CRASHES (2010-2018) - NORTH SALT LAKE**



**Existing Facilities**

- Bike lane
- Shared use path
- Sidepath
- Natural surface trail

**Existing Destinations + Boundaries**

- Trailhead
- FrontRunner station
- City limits
- County limits

**Pedestrian Crashes (severity)**

- Fatal
- Serious injury
- Minor injury
- Possible or no injury



Data provided by the Cities of Bountiful, Centerville, and North Salt Lake; Davis County; the Utah AGRC; UDOT; UTA; and WFRC  
 Map produced August 2019 by Alta Planning + Design

## BICYCLIST INVOLVED CRASHES

From January 1, 2010 to December 31, 2018, there were 512 bicyclist involved crashes reported in Davis County. The graph below illustrates trends for bicyclist involved crashes for the three cities included in this plan and Map 2.3 shows bicyclist involved crashes by location and severity.

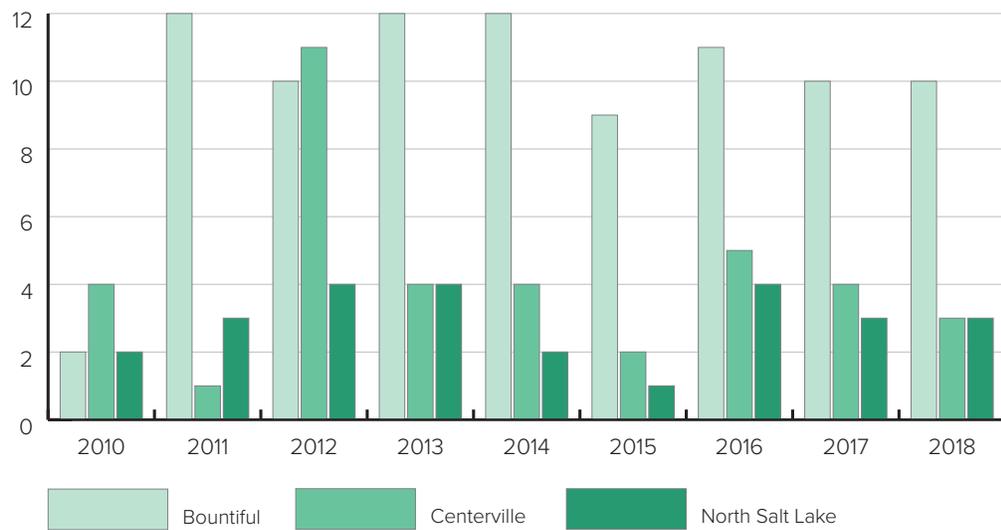
Comparing the three cities under study, Bountiful shows the most bicyclist involved crashes, and percentages of total crashes remain somewhat constant across each jurisdiction.

**Bountiful:** 5,215 total crashes; **88** bicyclist involved crashes (1.7 percent)

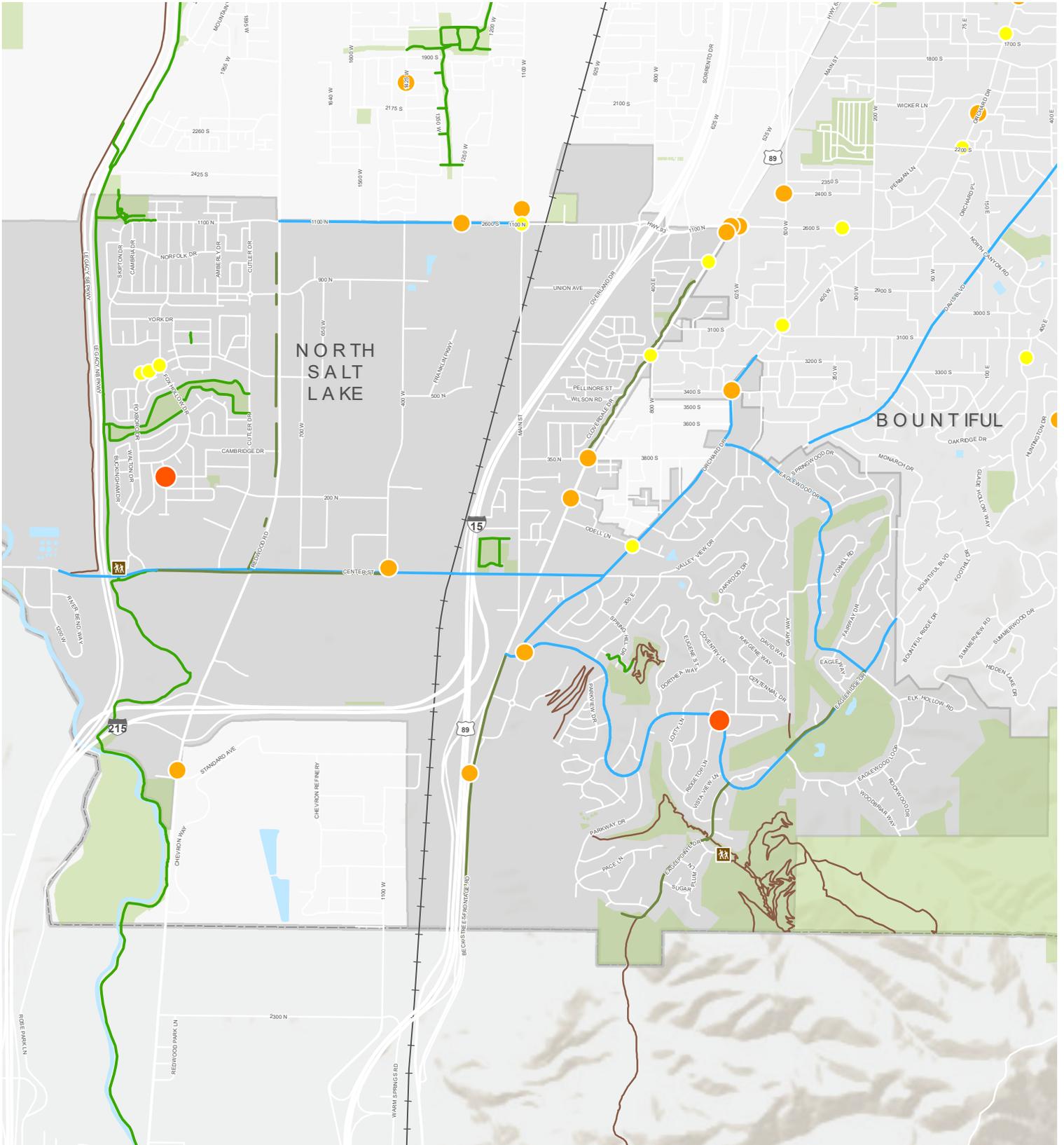
**Centerville:** 1,611 total crashes; **38** bicyclist involved crashes (2.4 percent)

**North Salt Lake:** 2,162 total crashes; **26** bicyclist involved crashes (1.2 percent)

**Figure 2.7** Bicyclist involved crashes (UDOT Numetric data, 2010-2018)



MAP 2.3 | SOUTH DAVIS COUNTY ACTIVE TRANSPORTATION PLAN  
**BICYCLIST INVOLVED CRASHES (2010-2018) - NORTH SALT LAKE**



**Existing Facilities**

- Bike lane
- Shared use path
- Sidepath
- Natural surface trail

**Existing Destinations + Boundaries**

- Trailhead
- FrontRunner station
- City limits
- County limits

**Pedestrian Crashes (severity)**

- Fatal
- Serious injury
- Minor injury
- Possible or no injury



Data provided by the Cities of Bountiful, Centerville, and North Salt Lake; Davis County; the Utah AGRC; UDOT; UTA; and WFRC  
 Map produced August 2019 by Alta Planning + Design



# 03

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PUBLIC INVOLVEMENT



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## OVERVIEW

Much of the success of this project relied on input from stakeholders and community members in order to gain an understanding of existing conditions and develop meaningful recommendations. The planning process included a variety of public outreach methods through which the planning team strove to reach as many everyday users of South Davis County's streets and trails as possible. Outreach methods included Online surveys, Online interactive maps, in-person pop-up events, and charrettes conducted with stakeholders from each of the three cities included in the Plan. In total, over 300 people participated in the development of the plan through the public process.

Efforts to get input from the public were organized into two phases. The focus of Phase 1 was to gather information concerning existing conditions and the needs of residents, including places to which people want to walk or bicycle and barriers to walking and bicycling they experience in their communities. The objective of Phase 2 input was to get feedback on proposed routes and facility types.

Results from these efforts, combined with the input given by engaged project managers from each city, the Steering Committee, and stakeholders, guided the planning team to the recommendations found in Chapter 4.

## ONLINE SURVEY

Over the course of four weeks, more than 200 people responded to an Online survey targeted at understanding residents' current participation in and attitude towards active transportation in South Davis County. The thirteen-question survey included questions about obstacles to walking and bicycling as well as respondents' priorities for future investment in active transportation infrastructure. The survey was distributed by each participating City via their respective websites and social media outlets. This section summarizes survey responses and highlights key findings.

**40%** of respondents live in **BOUNTIFUL**

**19%** of respondents live in **CENTERVILLE**

**27%** of respondents live in **NORTH SALT LAKE**

Why do you walk or bike?

**THE TOP 3 REASONS** people walk or ride a bike include...



Health + Fitness



Spending Time Outdoors

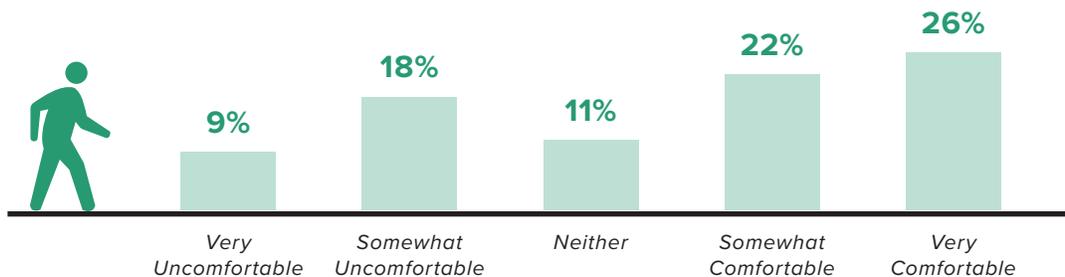


Pleasure + Fun + Socializing

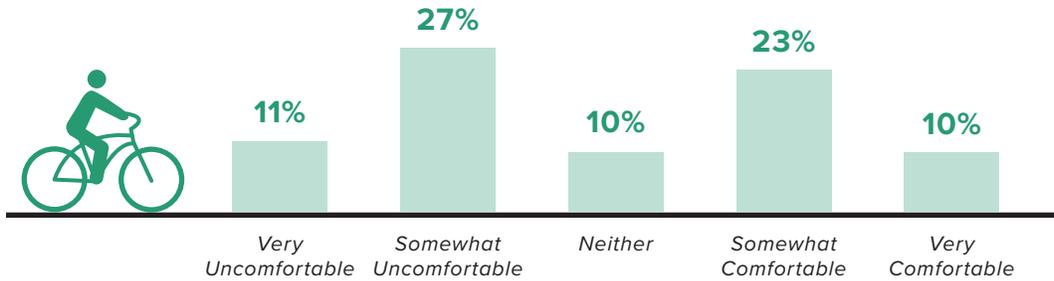
Other reasons for walking and bicycling from the survey include saving money, having less impact on the environment, and getting to transit.

How comfortable do you feel walking in South Davis County?

**ALMOST 1/3** of respondents feel uncomfortable walking in South Davis County



**38%** of respondents feel uncomfortable riding a bicycle in South Davis County



How comfortable do you feel bicycling in South Davis County?

**THE TOP 3 OBSTACLES** that deter respondents from walking and/or bicycling in South Davis County are...



**Aggressive drivers**



**Facilities don't take me where I need to go**



**Streets + sidewalks feel unsafe**

What deters you from walking and/or bicycling?

Other notable obstacles to walking and bicycling from the survey include poorly maintained bikeways and sidewalks and unsafe street crossings.

**THE TOP 3 PRIORITIES** for future active transportation investment according to survey responses are...



**More paved off-street paths**



**Better on-street bikeways (separation from traffic)**



**Better sidewalks (wider, landscape buffers)**

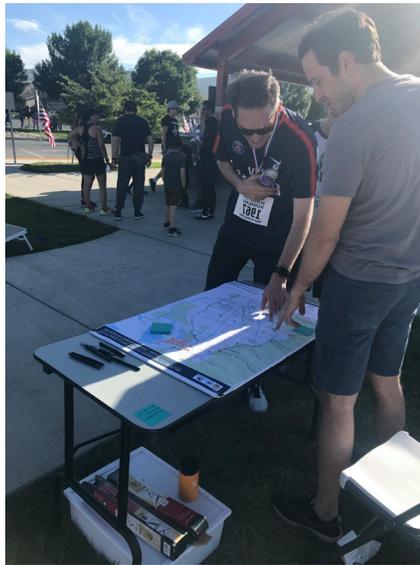
What are your top priorities for future investment?

Other notable priorities from the survey included better crossings of major streets and more on-street bikeways to local destinations.

## IN-PERSON POP-UP EVENTS

An important aspect of the public input process was the in-person contact the planning team had with residents during pop-up events that took place throughout the planning process. On three occasions, once in each City, the planning team stationed a table and information about the project at well-attended events or publicly visible locations in an effort to get input from residents during both phases of public outreach. One advantage to engaging the public in person as opposed to Online is it gives the planning team an opportunity to answer questions and explain concepts and goals behind the recommendations. The planning team held in-person pop-events at the following locations/ events:

- » Megaplex Theatres at Legacy Crossing, Centerville | February 15, 2019
- » South Davis Recreation Center, Bountiful | March 1, 2019
- » Liberty Fest 5k Race, North Salt Lake | June 29, 2019



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## ONLINE INTERACTIVE MAP

For both phases of public outreach, South Davis County residents were invited to give input on an interactive Online map made available via each Cities' website and social media outlets. This public outreach tool enables greater participation than is typically seen during in-person events and it allows residents to give input on their own time.

### PHASE 1: EXISTING CONDITIONS

During the Existing Conditions phase, participants were presented with a map consisting of existing bikeways, parks, streets, trails, and school locations on which they could draw lines and place pins to indicate barriers, important destinations, and overall improvement opportunities. In addition to destinations and barriers, participants identified missing infrastructure critical to developing a safe, convenient network. The image below shows a screenshot of the web map interface, with orange icons representing barriers, green icons representing destinations or opportunities, and black dashed lines showing desired linear improvements drawn by participants.

During the 4-week period the first Online interactive map was available to the public, almost 100 points and lines were drawn by local residents to indicate destinations for walking and bicycling, barriers to active transportation, and desired connections. Maps 3.1-3.3 present a summary of this input.

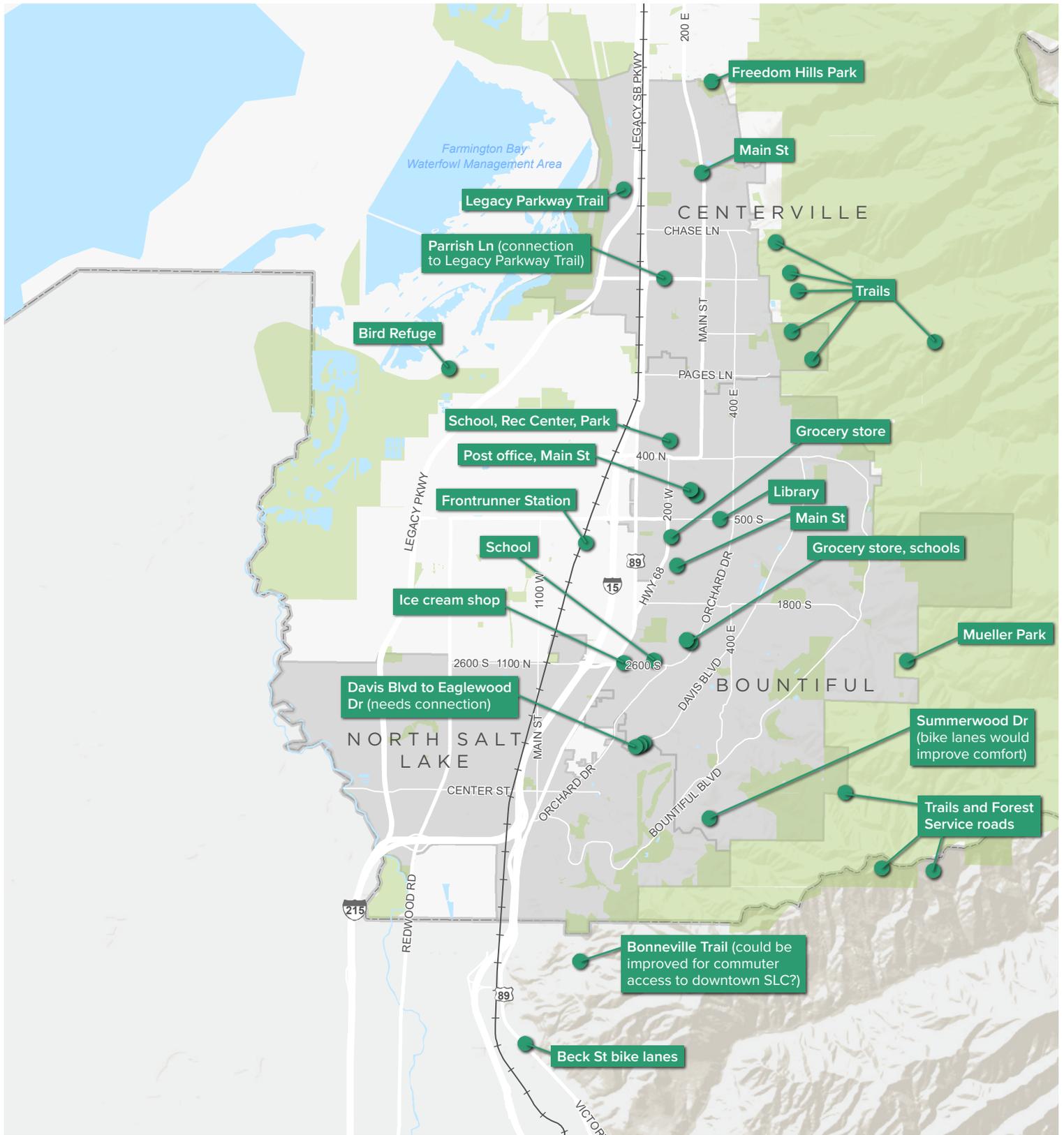
### PHASE 2: RECOMMENDATIONS

The Recommendations phase interactive web map showed the proposed active transportation network. Participants were able to like, dislike, or comment on any given recommendation and were asked to identify five "top priority" projects. The recommended route that received the most "likes" was the separated bike lane proposed on Orchard Drive (56 likes), which spans all three jurisdictions and provides an important north-south connection, connecting several destinations. The next most supported recommendations were the buffered bike lanes along 400 W / 200 W in Bountiful and Centerville (23 likes) and the sidepath and bike lanes along Bountiful Boulevard in Bountiful (22 likes).

Due to hesitations among stakeholders to propose recommendations along UDOT-owned Main Street in Bountiful and Centerville and other major arterials (e.g. Parish Ln in Centerville, 500 S in Bountiful), no recommendations for these corridors were presented to the public via the Online interactive map. However, as part of the Online interactive tool, residents were able to suggest new routes that were not included in the recommendations by drawing them on the map. Other participants were then able to like, dislike, or comment on newly drawn routes. As a result, several new routes were suggested by the public, many of which fall outside of the study area. However, Main Street and 500 S were the two newly suggested routes that received the most "likes" and positive comments from other participants.

Map 3.4 summarizes and illustrates the results from the second Online interactive map, showing total "likes" and newly suggested routes.

MAP 3.1 | SOUTH DAVIS COUNTY ACTIVE TRANSPORTATION PLAN  
**PUBLIC INPUT PHASE 1 - WALKING/BICYCLING DESTINATIONS**

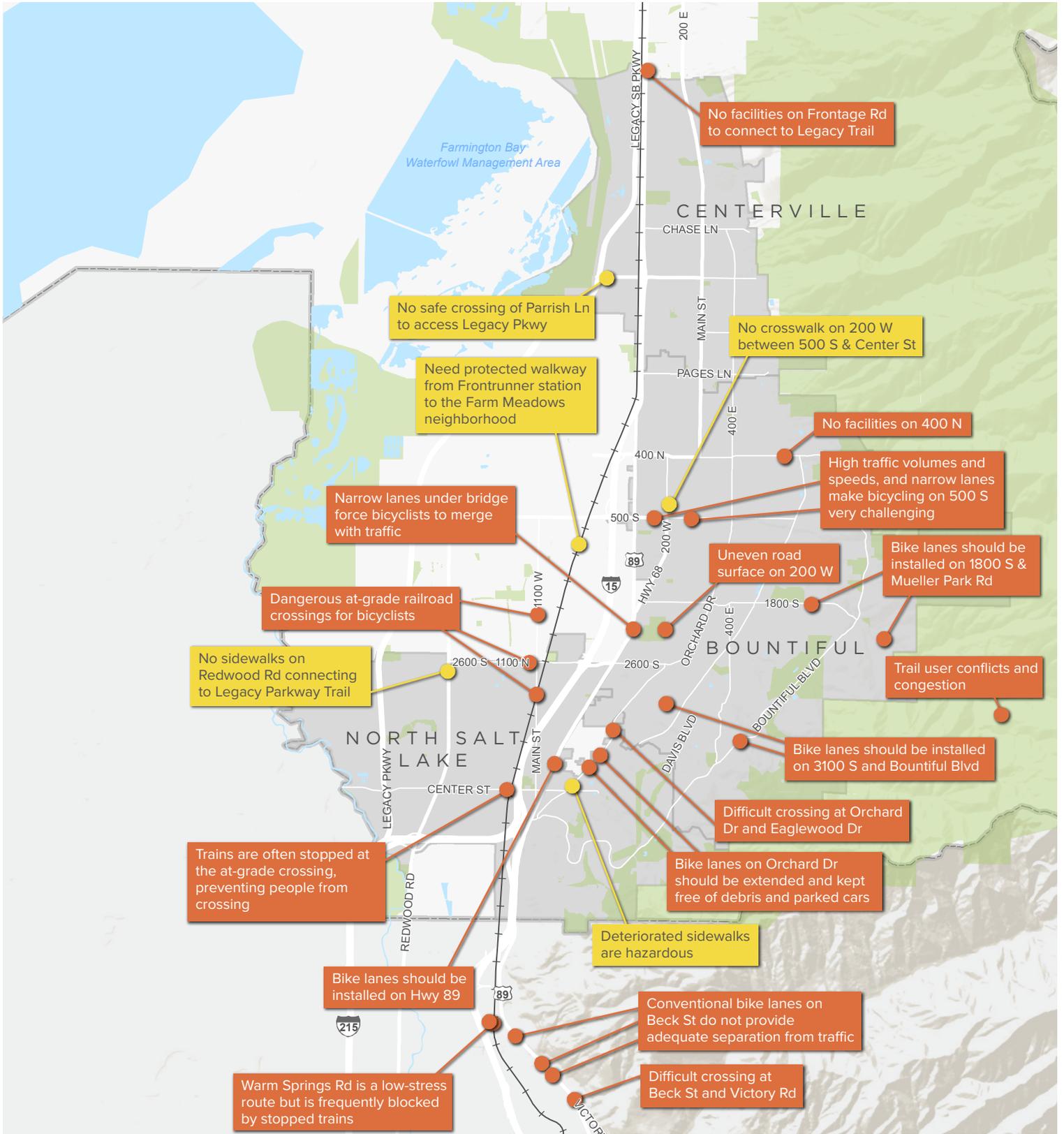


**Boundaries**  
 City limits  
 County limits

**Public Comment**  
 Walking/bicycling destination

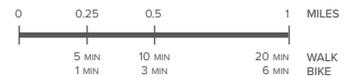


Data provided by the Cities of Bountiful, Centerville, and North Salt Lake; Davis County; the Utah AGRC; UDOT; UTA; and WFRC  
 Map produced August 2019 by Alta Planning + Design



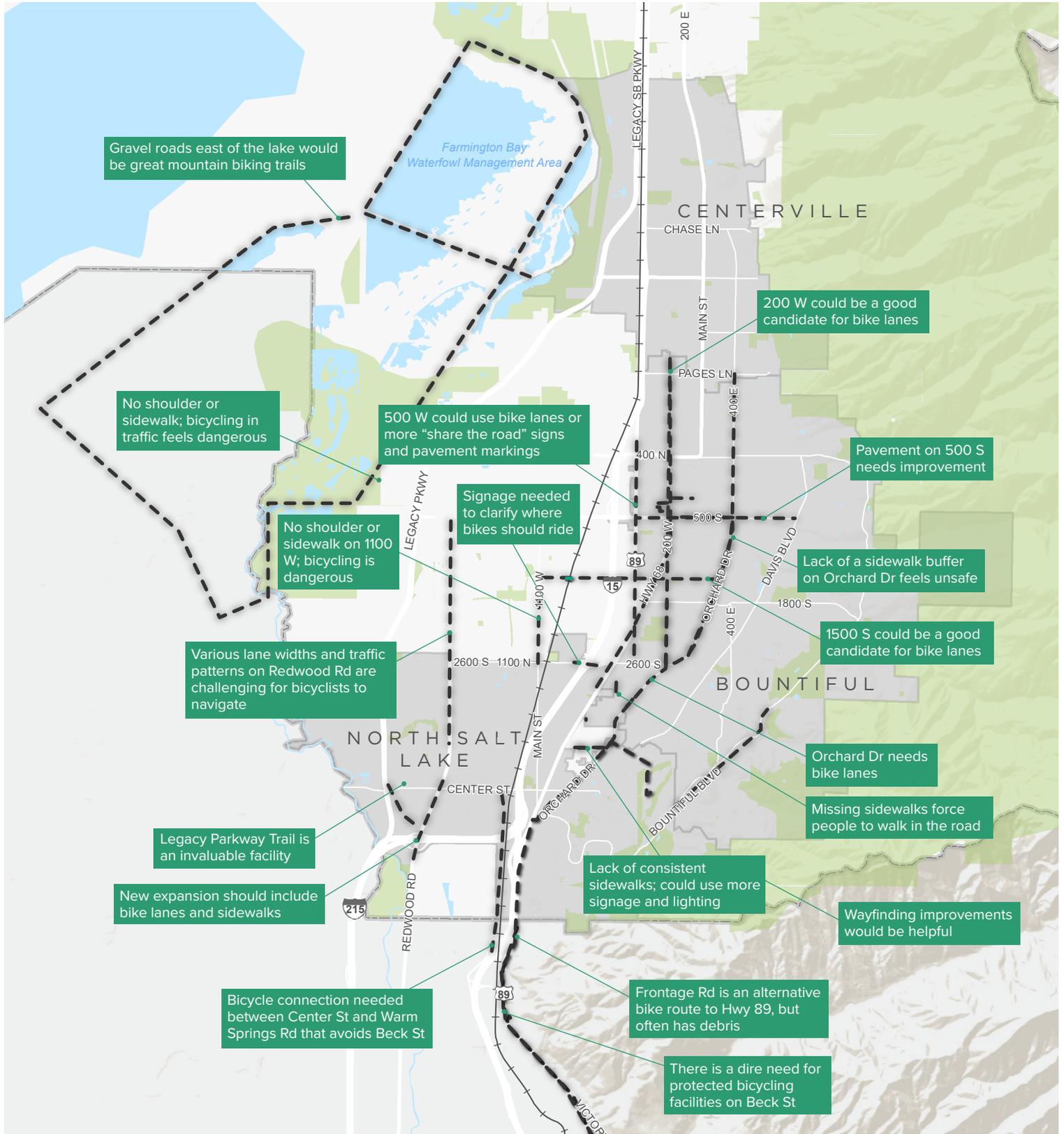
**Boundaries**  
 City limits  
 County limits

**Public Comment**  
 Barrier to walking  
 Barrier to bicycling



Data provided by the Cities of Bountiful, Centerville, and North Salt Lake; Davis County; the Utah AGRC; UDOT; UTA; and WFRC  
 Map produced August 2019 by Alta Planning + Design

**PUBLIC INPUT PHASE 1 - WALKING/BICYCLING SUGGESTED ROUTES**



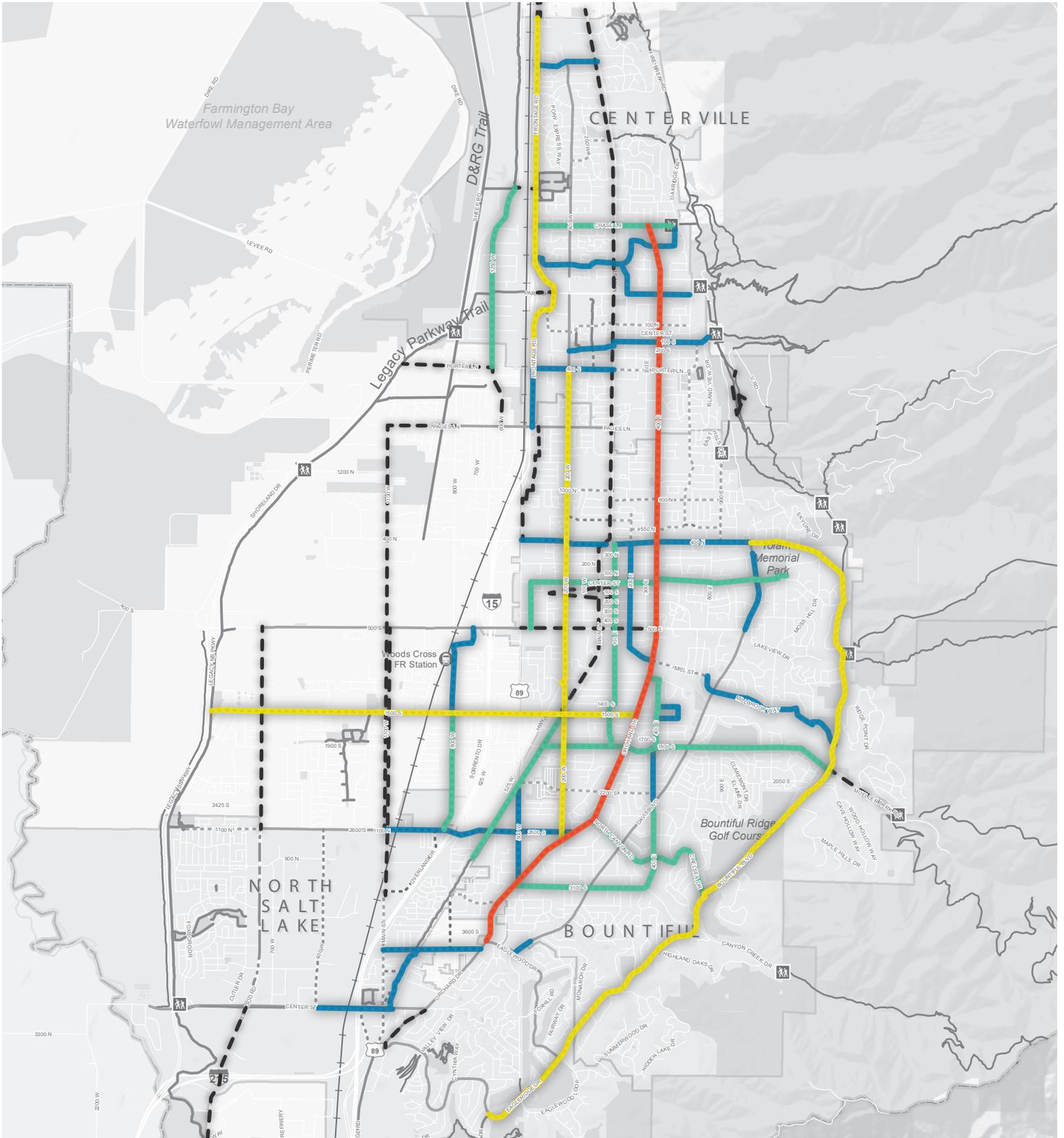
**Boundaries**  
 City limits  
 County limits

**Public Comment**  
 Walking/bicycling suggested route



Data provided by the Cities of Bountiful, Centerville, and North Salt Lake; Davis County; the Utah AGRC; UDOT; UTA; and WFRC  
 Map produced August 2019 by Alta Planning + Design

MAP 3.4 | SOUTH DAVIS COUNTY ACTIVE TRANSPORTATION PLAN  
PUBLIC INPUT PHASE 2 - "LIKED" AND NEWLY SUGGESTED ROUTES



Data provided by the Cities of Bountiful, Centerville, and North Salt Lake; Davis County; the Utah AGRC; UDOT; UTA; and WFRC  
Map produced August 2019 by Alta Planning + Design

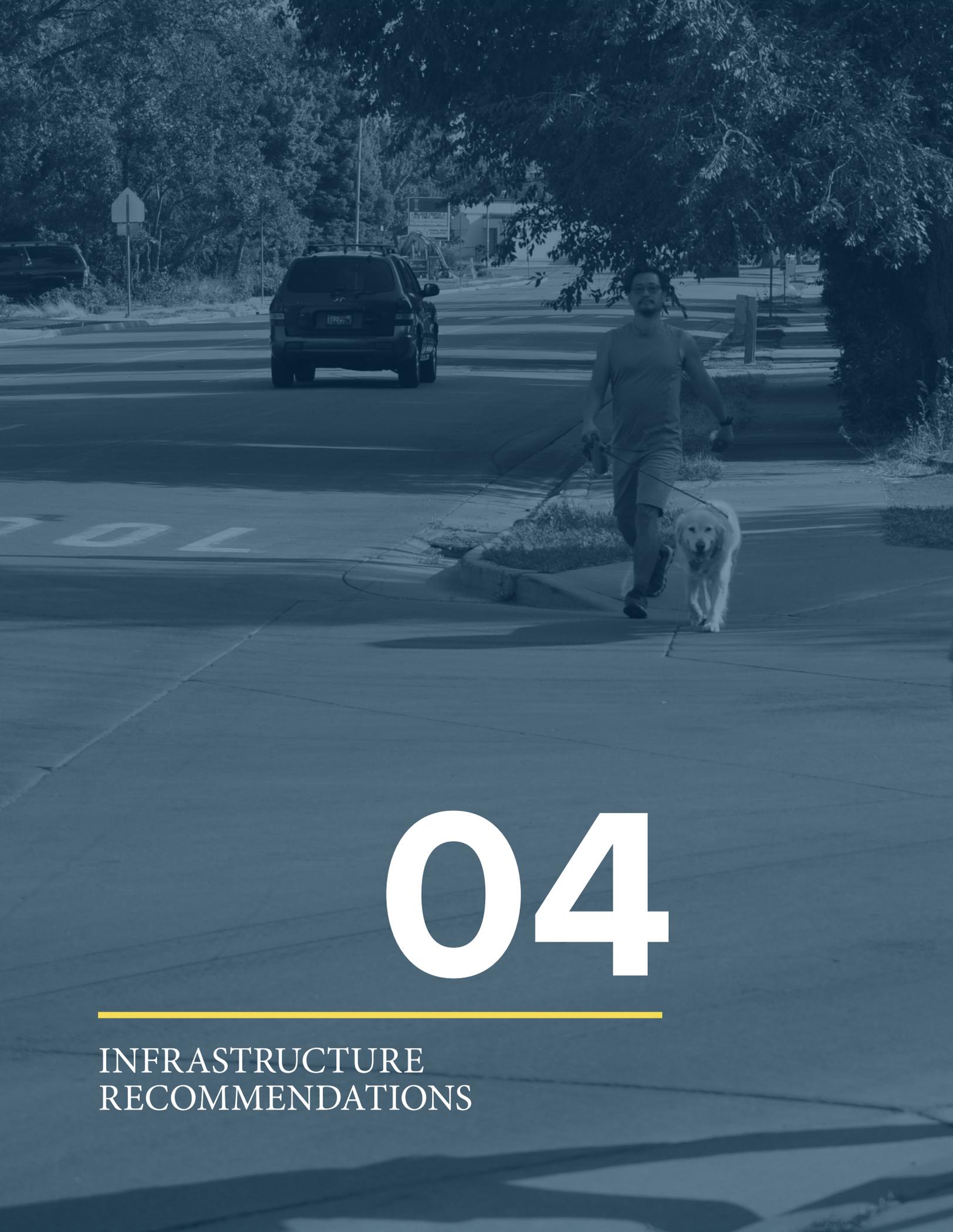
## STAKEHOLDER CHARRETTES

An invaluable aspect of the public process was getting stakeholders from various backgrounds into the same room to talk about specific corridors and the constraints and opportunities they present. The planning team facilitated three charrettes - one with each city and its stakeholders. Participation varied among each city, but in general, participants included planning staff, WFRC representatives, city council members, and individuals from critical city departments such as Engineering, Public Works, and Parks. Using a large printed map of a draft recommended network and Google Earth on a large screen, stakeholders and the planning team analyzed each corridor through which improvements were being proposed and discussed opportunities and concerns not previously identified by the planning team. The result of these charrettes was a proposed network of active transportation infrastructure that was significantly improved from the original draft presented by the planning team, illustrating the value of collaboration and tapping in to local knowledge.





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# 04

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INFRASTRUCTURE  
RECOMMENDATIONS



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## OVERVIEW

Developing the pedestrian and bicycle network recommendations was a multi-step process involving ongoing dialogue with stakeholders and the general public. Recommendations were informed by a combination of the existing conditions analysis, previously adopted plans, public input, and active transportation best practices.

North Salt Lake's 19 miles of existing walking and bicycling infrastructure (excluding sidewalks) are recommended to increase to a total of 34 miles - 15 miles of new active transportation infrastructure. Proposed infrastructure improvements put emphasis on creating a walking and biking network that is comfortable for all ages and abilities to make active transportation a more viable option for getting around for a wider array of people, and the future system will provide new or enhanced connections to destinations such as schools, libraries, parks, and businesses.

## A NETWORK FOR ALL AGES AND ABILITIES (AAA)

The vision and goals of this plan revolve around a desire to make walking and bicycling normal, safe, everyday activities for people of all ages and abilities (AAA), not just people who are already confident and enthusiastic about active transportation. Walking and bicycling facilities like separated bike lanes, shared use paths, wide and/or buffered sidewalks (separated from curb), and neighborhood byways create an AAA network that is appropriate for the majority of South Davis County residents. These facilities are considered high comfort because of physical protection, separation from traffic, or the use of low volume, low speed streets.

Many South Davis County residents would like to walk or ride bicycles more but are discouraged from doing so because of safety concerns, lack of infrastructure, or lack of connectivity to destinations. National surveys indicate that 50-60% of people say they would ride a bicycle more (or start riding if they do not already) if they had access to facilities that provided more separation from traffic, lower traffic speeds, and/or lower traffic volumes. They are interested in bicycling more, but concerned about safety.<sup>1</sup>

On-street bikeways that are separated or are located on traffic-calmed streets also create a better pedestrian experience by reducing traffic speeds or, in the case of separated bike lanes, increasing the physical separation between pedestrian areas and motor vehicle travel lanes. Additionally, evidence has shown that communities with higher bicycling rates tend to have lower crash rates for bicycles and all other modes, benefiting from the effect of “safety in numbers” and increased awareness.<sup>2</sup>

In addition to safety benefits, AAA infrastructure can improve retail sales in commercial areas, contribute to higher property values<sup>3</sup>, and provide more transportation choices to the average person. The latter, in turn, often leads to a more balanced mode share between different transportation modes, contributing to improved air quality, improved health outcomes, more diversified transportation investment, and greater network resiliency and effectiveness.

<sup>1</sup> Four Types of Cyclists. (2009). Roger Geller, City of Portland Bureau of Transportation: <https://www.portlandoregon.gov/transportation/article/264746>.

<sup>2</sup> Marshall, W., and N. Garrick, 2011- Evidence on why bike-friendly cities are safer for all road users, Environmental Practice, 13, 1.

<sup>3</sup> “Omaha Recreational Trails: Their Effect on Property Values and Public Safety”. Rivers and Trails Conservations Assistance, National Park Service. Donald L. Greer, 2000;



*Separated bike lanes create an environment that feels comfortable for people of all ages and abilities*



*Quiet neighborhood streets that prioritize bicycles with traffic calming infrastructure create family friendly routes*

## THE RECOMMENDED NETWORK

The planning team worked with each city, their respective stakeholders, and local residents to develop a recommended active transportation network that gives greater priority to pedestrians and bicyclists than is currently given. Guided by the project vision and goals from Chapter 1, each recommended project serves the purpose of filling crucial gaps in the existing network, increasing connectivity to destinations, and/or striving to provide a more comfortable experience for a wider array of people, particularly the “interested-but-concerned” user group, by proposing high-comfort facilities where possible.

### COMMUNITY CONNECTIONS

In order for the pedestrian and bicycle network to be a legitimate means of transportation for residents, it needs to provide access to useful destinations in a connected and direct manner. Many people are interested in walking or biking for daily trips to work, school, parks, or running short errands, but don't feel like there's an easy and safe way to get there. The recommended network greatly expands connectivity to important destinations for people walking or biking. Not only would implementation of the proposed network enhance existing connections to common destinations, but also provide new connections via active transportation to one additional library, 9 additional grocery stores, 15 additional parks, 14 additional schools, and 39 additional places of worship.

*The recommended pedestrian and bicycle network connects people of South Davis County to...*

**+1** *Libraries*



**+9** *Grocers*



**+13** *Schools*



**+15** *Parks*



**+39** *Churches*



## RECOMMENDED FACILITY TYPES

2.1  
miles



**Separated Bike Lanes** are physically separated from motor vehicle traffic, designed to create the feeling of a trail, but with on-street connectivity.

1.6  
miles



**Buffered Bike Lanes** are visually separated from traffic and/or parking by a striped buffer, but lack any physical separation.

2.8  
miles



**Bike Lanes** are a common facility type in many cities, designating 4-7 feet of roadway width with 6-inch striping.

0  
miles



**Neighborhood Byways** are low-speed, low-volume streets that provide alternatives to busier streets and/or connections to destinations through neighborhoods.

1.2  
miles



**Shared Use Paths** are paved paths/trails, typically 8-12' wide, constructed of asphalt or concrete, that accommodate pedestrians and bicyclists off street.

6.5  
miles



**Sidepaths** function as shared use paths by accommodating pedestrian and bicyclists off street, but are located parallel to roadways.

3  
count

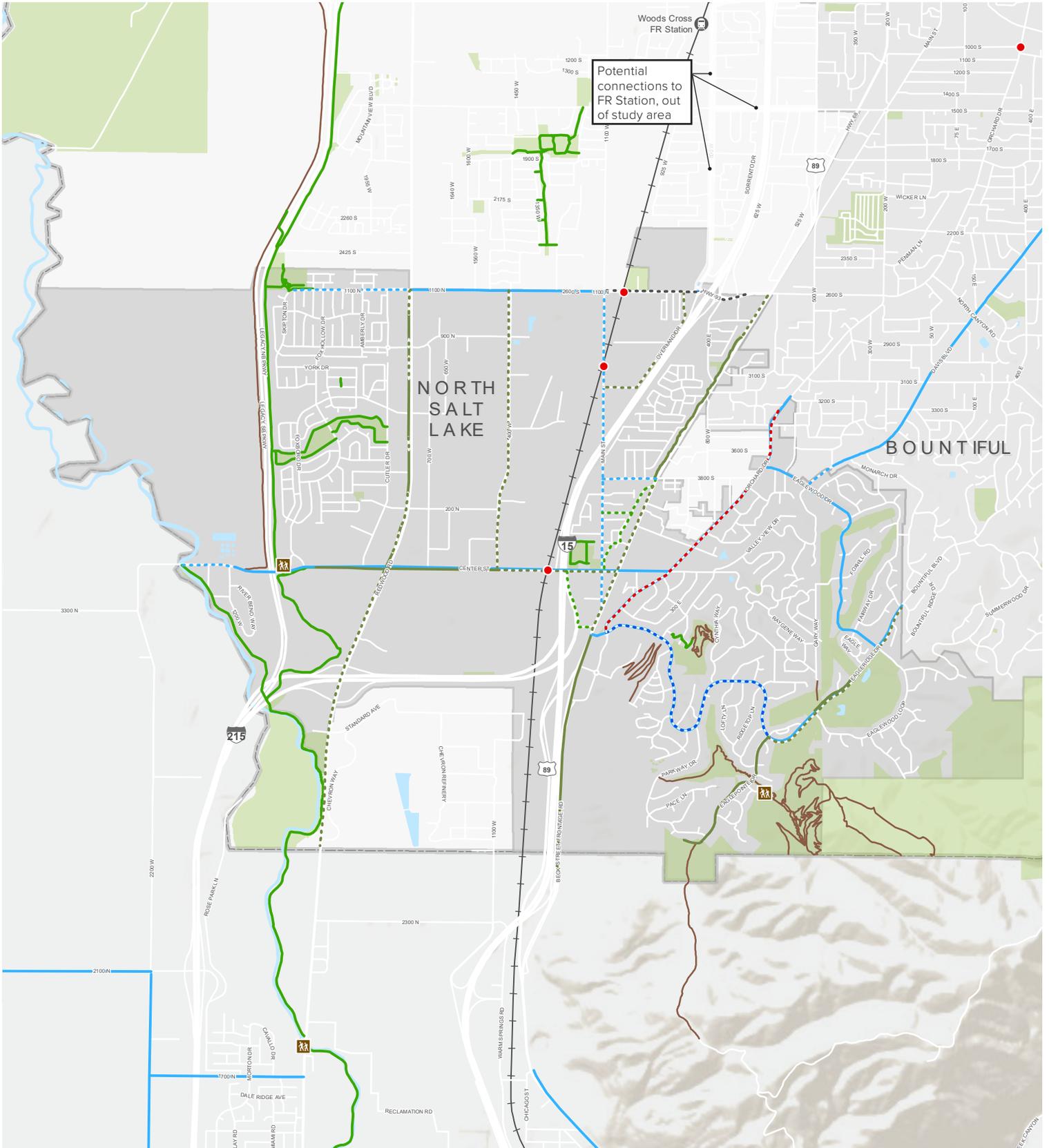


**Rail Crossings** require special consideration and design to safely accommodate pedestrians and bicyclists, especially when railroads cross streets at acute angles

## DESIGN GUIDANCE

For best practices, applications, and design guidance for specific facility types shown above, refer to Appendix C (Design Guidelines) of this plan.

MAP 4.1 | SOUTH DAVIS COUNTY ACTIVE TRANSPORTATION PLAN  
**NETWORK RECOMMENDATIONS - NORTH SALT LAKE**



**Existing Destinations + Boundaries**

- Trailhead
- FrontRunner station
- City limits
- County limits

**Existing | Proposed Facilities**

- Separated bike lane
- Buffered bike lane
- Bike lane
- Neighborhood byway
- Shared use path
- Sidepath
- Future study, TBD
- Natural surface trail

**Spot Improvements**

- Rail crossing



Data provided by the Cities of Bountiful, Centerville, and North Salt Lake; Davis County; the Utah AGRC; UDOT; UTA; and WFRC  
 Map produced August 2019 by Alta Planning + Design

## WALKABLE ACTIVITY CENTERS

In collaboration with City Project Managers, seven areas were identified as walkable activity centers, based on existing and future land uses as well as specific areas that are currently designated with policies promoting pedestrian comfort and walkability. These areas are highlighted with half mile walksheds on Map 5.2. Each walkshed was analyzed for walkability based on street connectivity, major streets that present challenges for pedestrian comfort and safety, and street crossings that serve as barriers to walkability. Based on this analysis, this section recommends a series of connections in each of the seven areas analyzed. These recommendations are illustrated on Map 5.3 (Walkshed Connectivity Recommendations). There are a range of types of recommended connection improvements, including linking dead-end streets to nearby streets, pedestrian crossings of major roadways, and preservation and enhancement of existing pathways to schools.

These connections should be pursued opportunistically, through capital improvements and as part of new development. Note that some of these connections are designed to be combined to create major upgrades to the street and pathway framework – for example the linking of a cul-de-sac extension to a new roadway crossing.

### TYPES OF CONNECTIONS

**Near-term retrofitted street or pathway connections** are opportunities to connect two streets that will significantly increase the area walk-shed and could potentially be undertaken under the existing development pattern. For example, if the connection location is vacant land.

**Long-term retrofitted street or pathway connections** are opportunities to connect two streets that will significantly increase the area walk-shed and likely needs a change in development pattern or redevelopment to be feasible. For example, if the connection location is an existing cul-de-sac completely surrounded by homes.

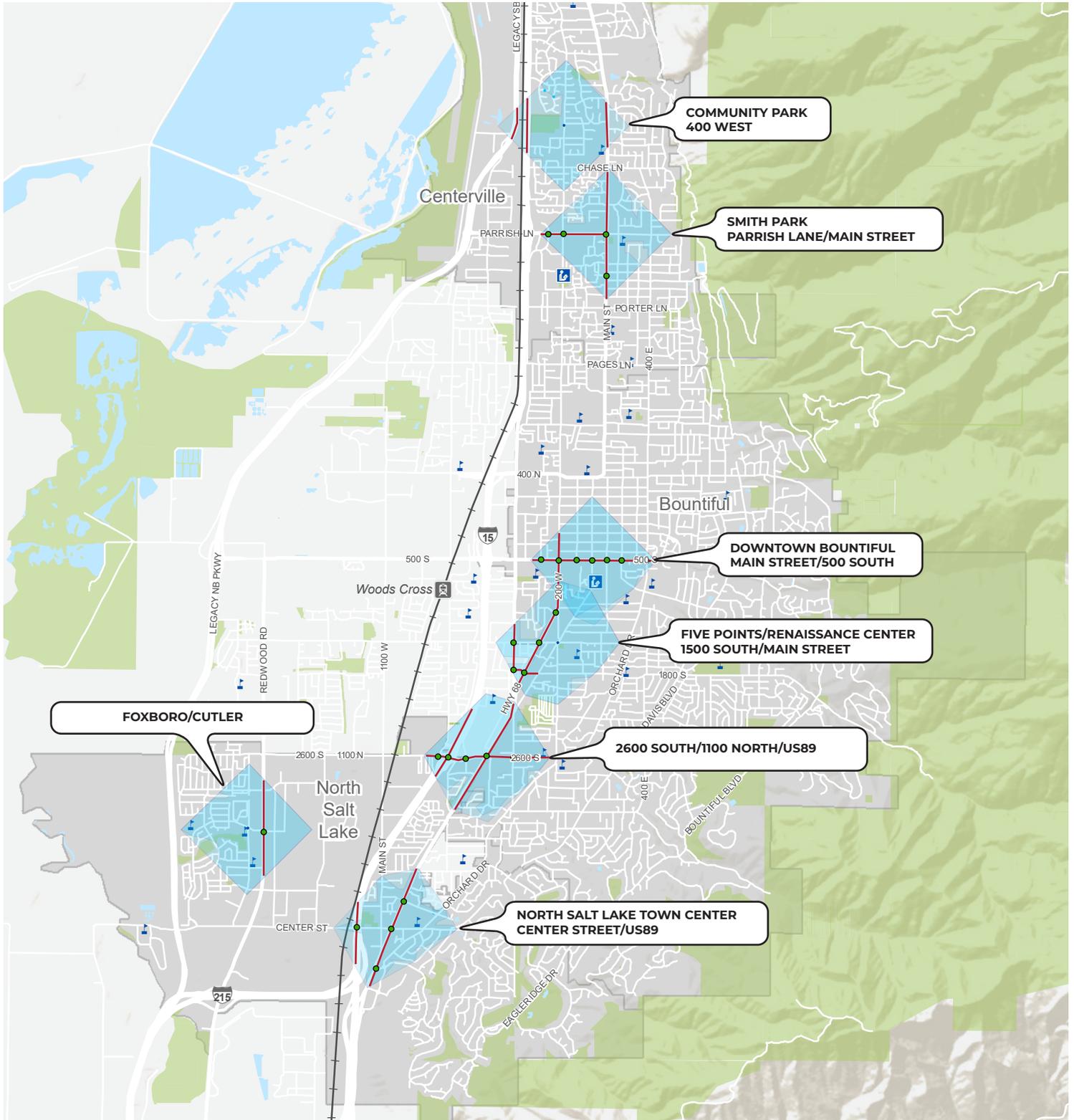
**New pedestrian crossings of roadways** are opportunities where a new marked and/or signalized crossing of a major roadway will significantly increase the area walk-shed.

**Connections to include in future development** refers to where a large future development site presents an opportunity to increase pedestrian and bicyclist connectivity in the area.

**Pathways through commercial superblocks** are opportunities where providing a safe and convenient active transportation link through a large commercial site such as a shopping center and its parking lots is key to connecting the greater area.

**School ped/bike connections, including existing connections to be preserved/enhanced,** refer to connections from neighborhoods to schools.

**Linear waterway/easement opportunities** are where a linear easement such as a canal, creek, or power easement presents a unique opportunity to create an off-street active transportation (and recreation) connection.



**Existing Destinations + Boundaries**

-  FrontRunner station
-  School
-  Library
-  Water
-  Park
-  Study area

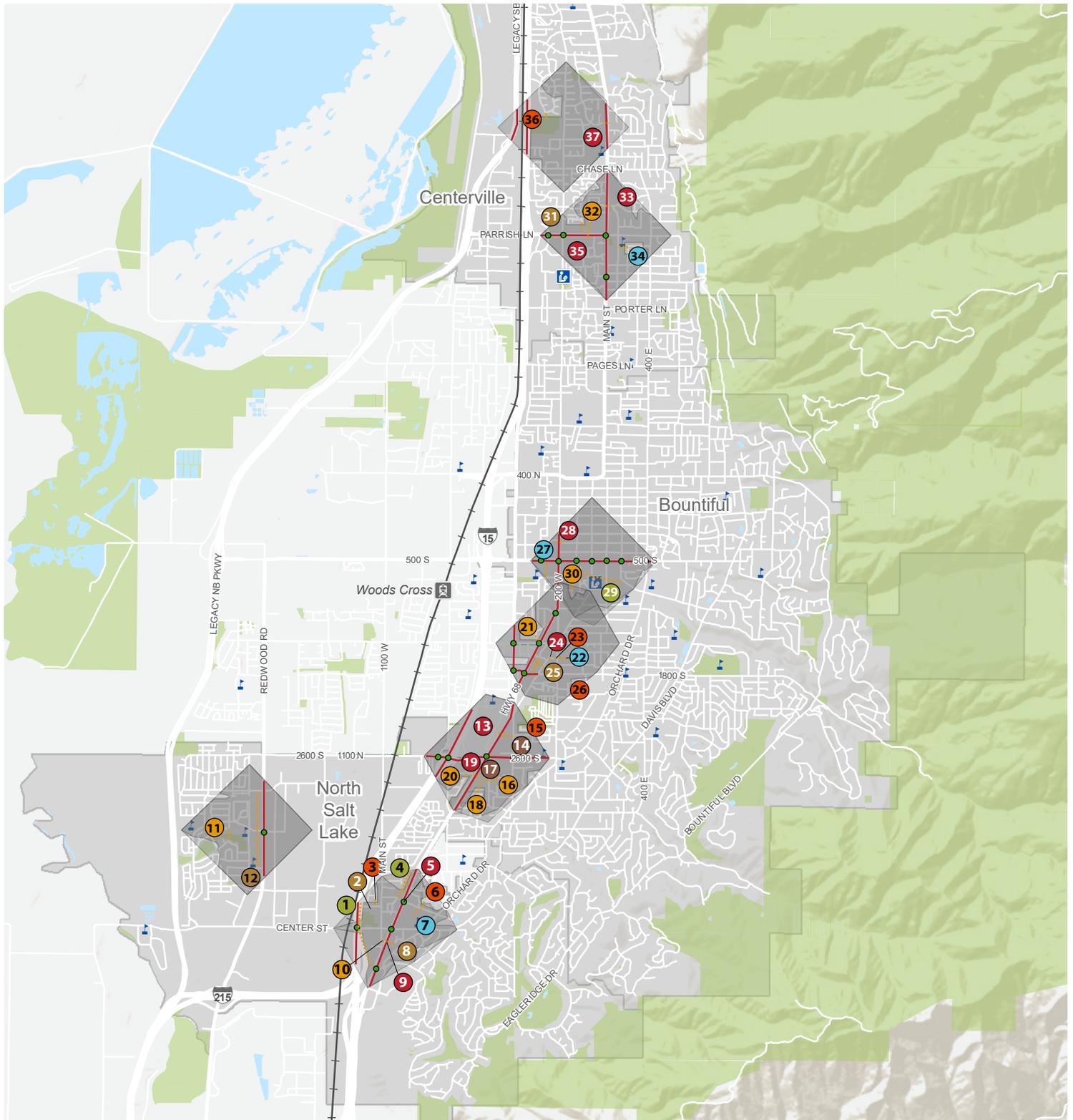
**Walkshed Analysis**

-  Potential walkshed (half mile)
-  Actual Walkshed (half mile)
-  Barrier street
-  Barrier street crossing



*Data provided by the Cities of Bountiful, Centerville, and North Salt Lake; Davis County; the Utah AGRC; UDOT; UTA; and WFRC  
 Map produced August 2019 by Alta Planning + Design*

MAP 4.3 | SOUTH DAVIS COUNTY ACTIVE TRANSPORTATION PLAN  
**WALKSHED CONNECTIVITY RECOMMENDATIONS**



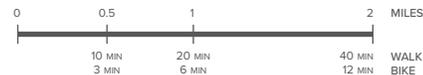
**Existing Destinations + Boundaries**

- FrontRunner station
- School
- Library
- Water
- Park
- Study area

**Walkshed Analysis**

- Potential walkshed (half mile)
- Actual Walkshed (half mile)
- Barrier street
- Barrier street crossing

- Near-term street or pathway connections
- Long-term street or pathway connections
- New pedestrian crossings
- Connections to include in future development
- Pathways through commercial superblocks
- School connections, including preserving/enhancing existing links
- Connection as part of a planned trail corridor or trail opportunity



*Data provided by the Cities of Bountiful, Centerville, and North Salt Lake; Davis County; the Utah AGRC; UDOT; UTA; and WFRC  
 Map produced August 2019 by Alta Planning + Design*

## RECOMMENDED CONNECTIONS

### NORTH SALT LAKE TOWN CENTER

- 1 A new pathway linking neighborhoods north and south of Hatch Park to Hatch Park and Center Street via a trail alongside I-15 - extension of planned path shown in Town Center Pedestrian/Bicycle Network.
- 2 Connection between 150 North and Hatch Park through extension of the park to 150 North.
- 3 Additional street and/or pathway connections in the neighborhood north of Hatch Park.
- 4 Street or pathway connection(s) from 300 North and/or 250 North to US 89, and improvement of the connection between US 89 and 200 North, as part of the development of the Bamberger Trail.
- 5 Exploration of improvement of the marked crosswalk at Odell Lane with a pedestrian-activated signal such as a rectangular rapid flashing beacon or HAWK.
- 6 Enhance pathway connection from 4100 South to 100 North to create a more inviting and safe experience.
- 7 Preservation of pathway connection from 100 North to Orchard Elementary School; make new connection through school to Center Street.
- 8 Pathway connection between Orchard Drive and US 89 to better link neighborhoods to the Town Center - planned for between Walker Lane and ULGT property.
- 9 New crossing of US 89 signal or pedestrian-activated signal, especially if this is the location of the Town Center bus rapid transit (BRT) station - link with Connections 7 and 8.
- 10 Pathway connection between Main Street and US 89, likely in the form of stairs - align if possible with Connections 7 and 8.

### FOXBORO/CUTLER

- 11 A pathway connection between Alton Drive and Foxboro Drive across the wetland – ideally equidistant from Cutler Drive and Fox Hollow Drive, connecting to existing trail.
- 12 Ensure a continuous north-south active transportation connection in new development between 900 North and Robinson Drive.

### 2600 SOUTH

- 13 New pedestrian street crossing of US 89 – ideally aligned with Connection 9.
- 14 Pedestrian connection through commercial superblock as an extension of 2400 South or 2350 South – ideally aligned with Connection 8.
- 15 Future connection of 2300 South to 500 West if the opportunity arises.
- 16 Public street connection between 500 West and 625 West – preferably at 2800 South or further south but could also use existing 2600 South connection – ideally aligned with Connection 17.
- 17 Pedestrian or street connection through the commercial superblock between 625 West and US 89 – ideally aligned with Connection 16.
- 18 Seek to leverage future redevelopment for a pathway connection of Eastpointe Drive north to US 89, preferably via the connection established in Connection 17.
- 19 New pedestrian street crossing of US 89 – ideally aligned with Connection 17.
- 20 Street or pathway connection between 500 East and US 89 or 1000 North – through the wall that separates these two streets.

### **FIVE POINTS**

- 21 Street or pathway connection between 350 West and intersection of 300 West and 1500 South. Because of complexity of five-way intersections, a pathway is the likely connection.
- 22 Preserve and enhance pathway connecting 200 West and Bountiful Elementary.
- 23 Street or pathway connection between 200 West and Main Street, aligned with Connection 16.
- 24 New pedestrian street crossing aligned with Connections 17 and 18.
- 25 Ensure that new Renaissance Center development has connected network of streets linked as closely as possible to surrounding street grid.
- 26 If the opportunity arises, future connection between 1900 South and 200 West potentially extended to Main Street.

### **DOWNTOWN BOUNTIFUL**

- 27 Enhance pathway between 500 South and future development (former Washington Elementary).
- 28 New pedestrian crossings of 200 West roadway to connect neighborhoods to downtown Bountiful.
- 29 Trail along Mill Creek corridor connecting Washington Elementary, Washington Park, Davis County Library, Millcreek Junior High, and commercial area.
- 30 Street or pathway connection between neighborhood and 500 South commercial area.

### **CENTERVILLE MAIN STREET AND PARRISH LANE**

- 31 If mobile home park is redeveloped, ensure quality connections to surrounding streets and pathways.
- 32 Formalize the pathway connections between 200 West and 150 West, at the end of the dead-ends, and between 150 West and commercial center on Parrish Lane.
- 33 New pedestrian crossing of Main Street
- 34 Preserve and enhance pathway from 200 East/300 North through Centerville Elementary to 100 East/Smith Park.
- 35 New pedestrian crossing of Parrish Lane, ideally aligned with existing Bellano Way pathway along Walmart parking lot and aligned with Connection 27.

### **CENTERVILLE COMMUNITY PARK**

- 36 Street or pathway connection between Willow Valley/550 West to Community Park.
- 37 New pedestrian crossing of Main Street at or around 1350 North.



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A monochromatic blue-toned photograph of a cyclist riding on a paved road that stretches into the distance. The road is flanked by tall grasses and a utility pole on the left. In the background, there are rolling hills and a cloudy sky. The cyclist is wearing a helmet and dark clothing, riding away from the viewer.

# 05

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POLICY RECOMMENDATIONS



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## OVERVIEW

Adopted policies play a crucial role in encouraging quality development patterns and placemaking standards that are equitable and beneficial to all road users. This section outlines foundational policies that Bountiful, Centerville, and North Salt Lake can put in place to enable active transportation improvements and programs. These tools are the big picture tools that both allow it to prioritize active transportation and to create environments supportive of active transportation. Some policy recommendations are further expounded upon with general model policy language that can be used as a starting point for cities to implement these recommendations. These model policies are found in Appendix B of this plan.

---

## POLICY RECOMMENDATIONS

The following policies are general recommendations that can provide guidance for each City to adopt their own policies that are tailored to its specific needs. Policies in this section may already be codified in some form by one or all three of the Cities participating in this plan; regardless, existing policies should be revisited to consider up-to-date best practices and opportunities to improve conditions for active transportation.

### COMPLETE STREETS

Complete streets policies establish foundational policy support for all transportation modes and other uses of the street. Complete streets policies are especially important for active transportation because they integrate a city’s consideration of these often-ignored modes at a fundamental level. Establishing a complete streets policy helps multi-modal priority to endure changes in elected officials’ administrations and staff.

Complete streets policies also mean a complete process. These policies help facilitate the planning, design, building, and maintenance of complete streets within a jurisdiction. Good policies help jurisdictions overcome the “siloeing” that has been at the root of much of the failure of streets to address the needs of people on foot, bikes, and other active modes.

North Salt Lake and Bountiful do not currently have a complete streets policy. The model policy draft recommended in Appendix B provide a foundation to implement the recommended network and facility designs of this plan.

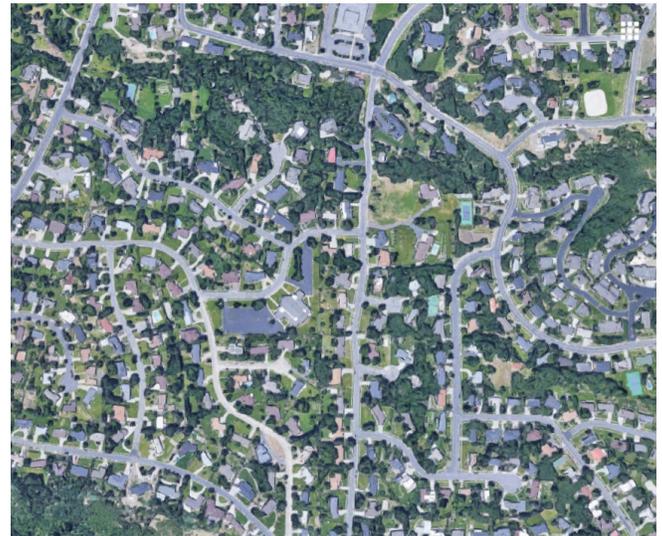
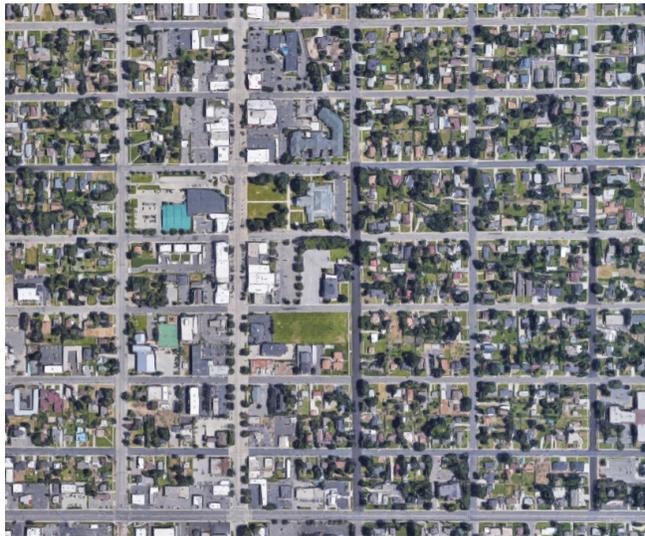
*Below: Complete streets are pedestrian friendly, have strong land use connections, and accommodate multiple modes of transportation*



## STREET AND PATHWAY CONNECTIVITY

The most basic aspect of the active transportation experience is good street and pathway connectivity. Streets form the frame of a community and influence its basic character. For cities like North Salt Lake, Bountiful, and Centerville, much of whose growth has occurred in the last 50 years, street networks often lack connection as a result of efforts to better serve automobility and quality of life.

The two images below show an example of a well-connected network in historic Downtown Bountiful and a less connected network nearby in a newer residential area to the east.



However, a growing body of research shows the importance of reconnecting communities with improved street networks. High levels of street connectivity do a better job of achieving many of the goals established for South Davis communities – economic vitality, the effectiveness of infrastructure, health, and transportation choice.

Street connectivity is especially beneficial for people on foot, bike, and other active modes. The shortening of distances between origins and destinations make them walkable and bikeable. At the same time, connected networks disperse traffic and prevent major streets from becoming active transportation barriers.

See Appendix B for a Model Street Connectivity Policy relevant to South Davis County Communities.

*Left: Connected street network in Downtown Bountiful*  
*Right: Disconnected street network in Bountiful*

## WALKABLE PARKING POLICY

Automobile parking policy has a major impact on the ability for people to walk, bike, and use other active modes in an area. The prevalence of parking lots or other facilities in an area negatively affects its walkability, takes space away from people-oriented uses, and free or low-cost parking does not reflect the true cost of using space to store autos, creating uneven competition between driving and active modes. Local governmental policy can strongly influence how parking is provided through standards for the amount and design of parking.

Walkable parking policy addresses the four major issues with conventional parking policy: the amount of parking, the individualization of parking, the economics of parking, and the design of parking. These and other issues are addressed in the model policy for walkable parking in Appendix B.

## AMENITY REQUIREMENTS

It is important to the creation of bikeable places to have quality “end-of-trip” and other supportive facilities. These include bicycle parking, showers, repair, and information.

### Short term bicycle parking

Short term bicycle parking is bicycle parking for those visiting a place for up to a few hours. It mostly consists of bike racks. Users of short-term bike parking tend to be infrequent visitors, so the bike parking needs to be self-explanatory and convenient. It should be within 50 feet of the entry of the building it is serving and as weather protected as possible.

Rates for short term bike parking range from 0.5 spaces for each bedroom in multi-family dwellings, 1 space per 2,000 square feet of floor area for general food sales or groceries, 1 space per 5,000 square feet of floor area for general retail, or 1 space per 20,000 square feet of floor area for office buildings.

### Long term bike parking

Long term bicycle parking is for those spending longer amounts of time at a place – i.e. a workday or work shift, or at a multi-family residential building. Long term bicycle parking is designed to be more secure than short term parking and provides enclosed space for one or more bikes. Types of long-term bicycle parking include lockers, cages, and bike rooms.

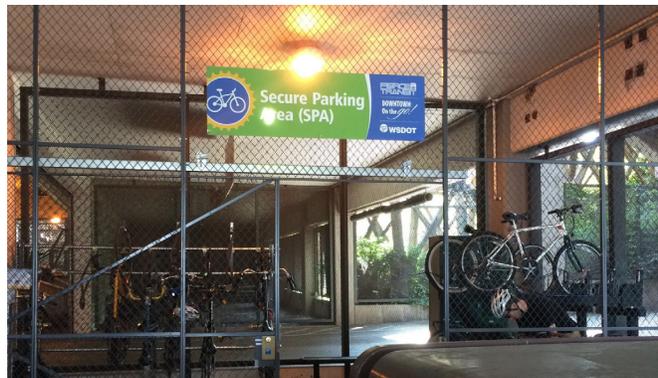
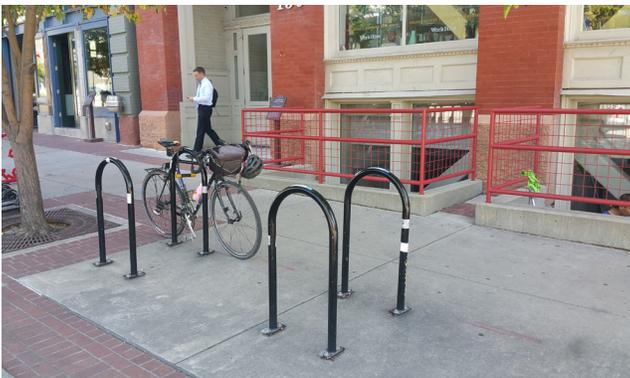
Rates for long term bicycle parking are generally 1 space per 10,000 square feet for office, 1 space per 12,000 square feet for general retail, or 0.5 spaces per bedroom for multi-family residential.

### Encouraged bicycle amenities

- » Showers, especially for employment land uses
- » Bicycle repair and maintenance station
- » Information – maps and brochures about bike routes and destinations
- » Unified and cohesive wayfinding system for bicycle and pedestrian networks
- » Loaner bicycles for resident or employee use

*Left: Short term parking*

*Right: Long term, secure parking*



## WALKABLE ACTIVITY CENTER POLICIES

Walkable centers are areas of activity that draw people from a neighborhood, a city, or an entire region. They are called “walkable” because the concentration of uses and activity are essential elements for communities to be accessible on foot. In addition, centers that are not walkable are serious liabilities for traffic congestion, safety, and overall regional and community health.



Walkable centers should have a network of elements that create places comfortable and compelling for people. These include a foundation of streets designed for people rather than autos, land uses that emphasize destinations, density, and mixes of uses, connected streets and small blocks, human-scale development frontage, great pedestrian realms and streetscapes, and safe, short street crossings.

Key aspects of walkable center policies are:

- » The creation of walkable land use patterns that emphasize intensive mixes of complementary uses;
- » The shaping of walkable, human scale development frontage; and
- » The shaping of a high-quality pedestrian realm and streetscape.

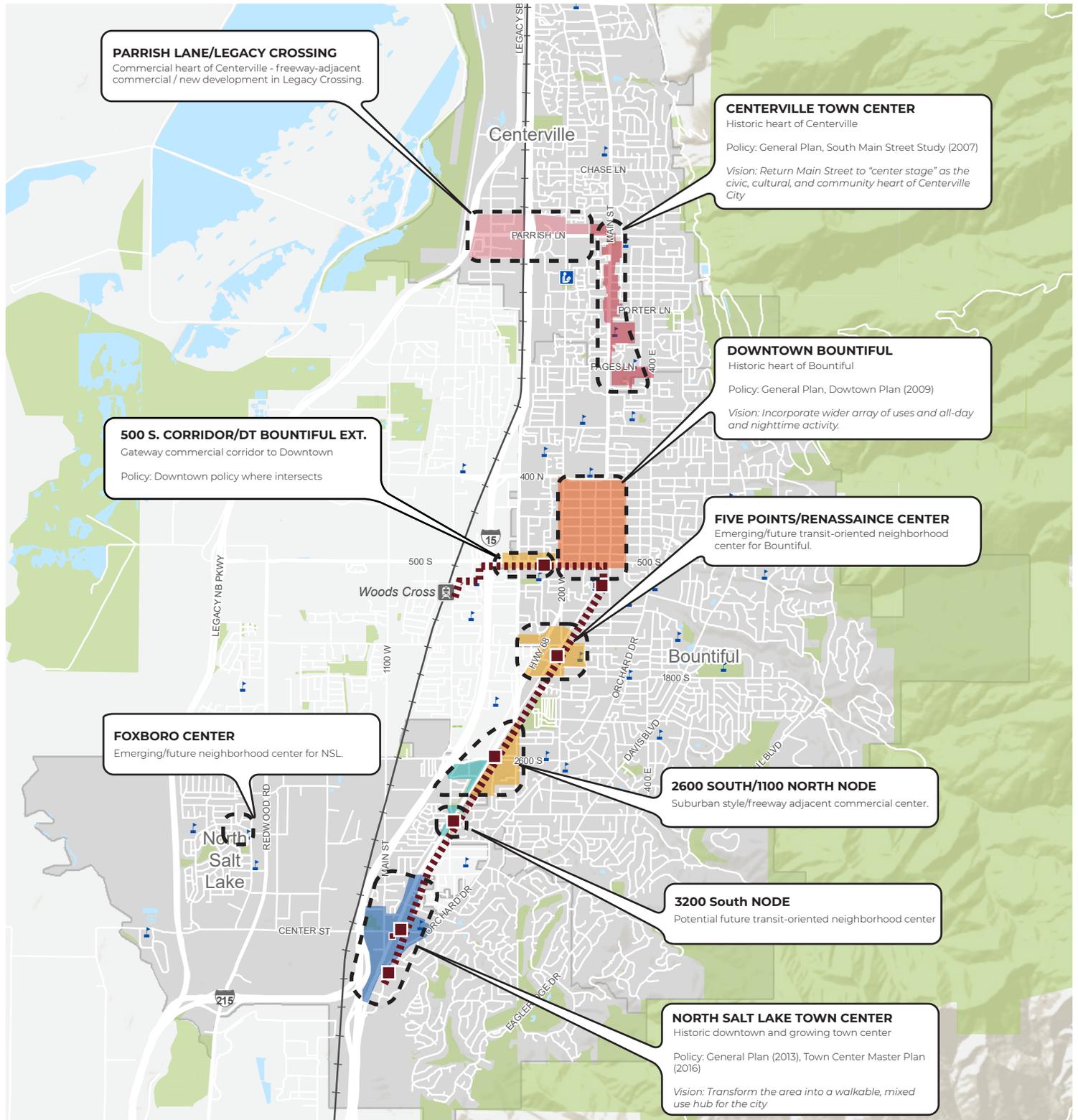
Existing walkable centers in South Davis County tend to be focused on the cities’ historic downtowns. It is in these areas where the cities have focused the majority of their walkable center policy. However, there are other opportunities for South Davis communities to develop walkable centers, including the suburban commercial centers and at planned bus rapid transit station areas. This plan recommends that the cities consider expanding and adapting their existing walkable center policies to include these additional areas.

Map 5.1 identifies areas currently with walkable center policy as well as the areas recommended for this expansion of this walkable policy. These are summarized below.

A good first step with each area recommended for walkable policy is the collaborative development of a vision for the area.

*Left: Downtown Bountiful’s Main Street commercial store fronts and pedestrian realm*  
*Right: New multi-family residential development in North Salt Lake*

MAP 5.1 | SOUTH DAVIS COUNTY ACTIVE TRANSPORTATION PLAN  
**WALKABLE CENTERS, EXISTING AND POTENTIAL**



**PARRISH LANE/LEGACY CROSSING**  
 Commercial heart of Centerville - freeway-adjacent commercial / new development in Legacy Crossing.

**CENTERVILLE TOWN CENTER**  
 Historic heart of Centerville  
 Policy: General Plan, South Main Street Study (2007)  
 Vision: Return Main Street to "center stage" as the civic, cultural, and community heart of Centerville City

**500 S. CORRIDOR/DT BOUNTIFUL EXT.**  
 Gateway commercial corridor to Downtown  
 Policy: Downtown policy where intersects

**DOWNTOWN BOUNTIFUL**  
 Historic heart of Bountiful  
 Policy: General Plan, Downtown Plan (2009)  
 Vision: Incorporate wider array of uses and all-day and nighttime activity.

**FIVE POINTS/RENAISSANCE CENTER**  
 Emerging/future transit-oriented neighborhood center for Bountiful.

**FOXBORO CENTER**  
 Emerging/future neighborhood center for NSL.

**2600 SOUTH/1100 NORTH NODE**  
 Suburban style/freeway adjacent commercial center.

**3200 South NODE**  
 Potential future transit-oriented neighborhood center

**NORTH SALT LAKE TOWN CENTER**  
 Historic downtown and growing town center  
 Policy: General Plan (2013), Town Center Master Plan (2016)  
 Vision: Transform the area into a walkable, mixed use hub for the city

**Existing Destinations + Boundaries**

- FrontRunner station
- School
- Library
- Water
- Park
- Study area

**Existing + Potential Walkable Centers**

- Downtown Bountiful
- Recommended area in Bountiful to expand walkable policy
- North Salt Lake Town Center
- Recommended area in North Salt Lake to expand walkable policy
- Centerville Main Street
- Recommended area in Centerville to expand walkable policy
- Planned BRT station location and alignment



Data provided by the Cities of Bountiful, Centerville, and North Salt Lake; Davis County; the Utah AGRC; UDOT; UTA; and WFRC  
 Map produced August 2019 by Alta Planning + Design

## **NORTH SALT LAKE**

### **Areas with existing walkable policy**

The area North Salt Lake calls its Town Center is focused on US 89 and Center Street. It includes some key civic features, such as the City Hall and Hatch Park, as well as a few commercial amenities. The Town Center area is interwoven with North Salt Lake's historic neighborhoods and some newer housing developments, but it is also occupied by many land uses that do not necessarily gel with the Town Center vision, especially along US 89.

The city developed a Town Center Master Plan in 2016 that developed strategies to transform the area into a walkable, mixed use hub for the city. The Plan also recognized the area's proximity to downtown Salt Lake City and the potential for the planned BRT to spur transit-oriented redevelopment. The Plan covers most of the walkable center criteria, defining strategies to make it denser, more mixed-use, more connected, and with more walkable streets.

Thus far, the primary changes related to the Town Center Master Plan are some new higher density residential developments on US 89, as well as a potentially catalytic project breaking ground at Center Street and U.S. 89. In these new projects, one can see the City's vision of the new US 89 corridor, with a human-scale frontage and a wider pedestrian realm. The City is also drafting a form-based code for town center.

### **Potential additional areas for walkable policy**

- » 2600 South area
- » 3200 South area

This plan recommends that North Salt Lake City develop visions for each of these areas, and potentially develop a prototype of a BRT station area policy and/or plan. The City can also adapt the Town Center Master Plan Goals to these other areas, including:

- » Create a distinct and positive identity for the Town Center.
- » Encourage intensity of activity in the Town Center. The Town Center should become a center of activity and the focal point for the City as a whole.
- » Improve the appearance and enhance the safety of the Town Center and Highway 89 Corridor.
- » Establish streets that work for multiple modes of transportation.
- » Bring high-capacity transit to Highway 89.
- » Expand multi-family development options around Hatch Park by examining use of transfer of development rights (TDR).

In addition, the North Salt Lake General Plan sets out a "recipe for walkability" that has three parts: ensuring the pedestrian experiences soft landscaping more than a hardscape environment; human-scaled design elements such as windows, doors, and awnings and not parking areas or garage doors; and pedestrian Safety, focused on narrowing and enclosing roadways.

## MULTI-MODAL INTEGRATION RECOMMENDATIONS

For the purposes of this plan, multi-modal integration refers to ensuring that active transportation investments are coordinated and connected to the complementary networks of activity centers, transit, and other modes that may be used in an active transportation-based trip.

This section highlights the opportunities to complement the planned South Davis bicycle network with a broader network of supportive modes and places.

### TRANSIT

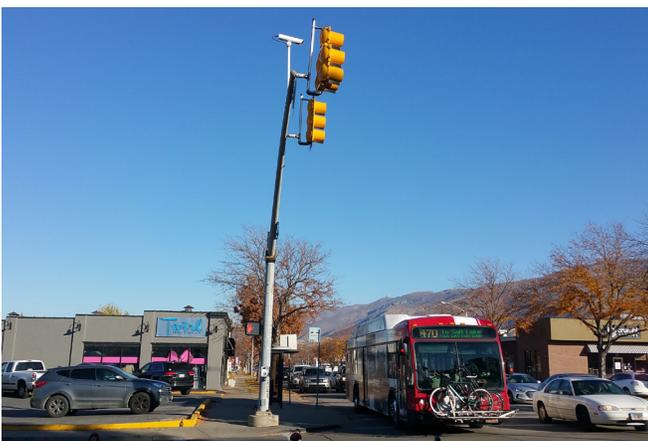
South Davis County’s communities are served primarily by Utah Transit Authority. They include all-day buses, commuter bus routes, and FrontRunner Commuter Rail. The primary transit feature relevant to this plan is the corridor created by the 455 and 470 Routes. These routes run all day up and down a central spine of the county that includes Main Street/U.S. 89 and Orchard Drive/400 East (455). U.S. 89 is the corridor that the Davis-Salt Lake City Bus Rapid Transit (BRT) service is planned to run along, at least as far as Bountiful.

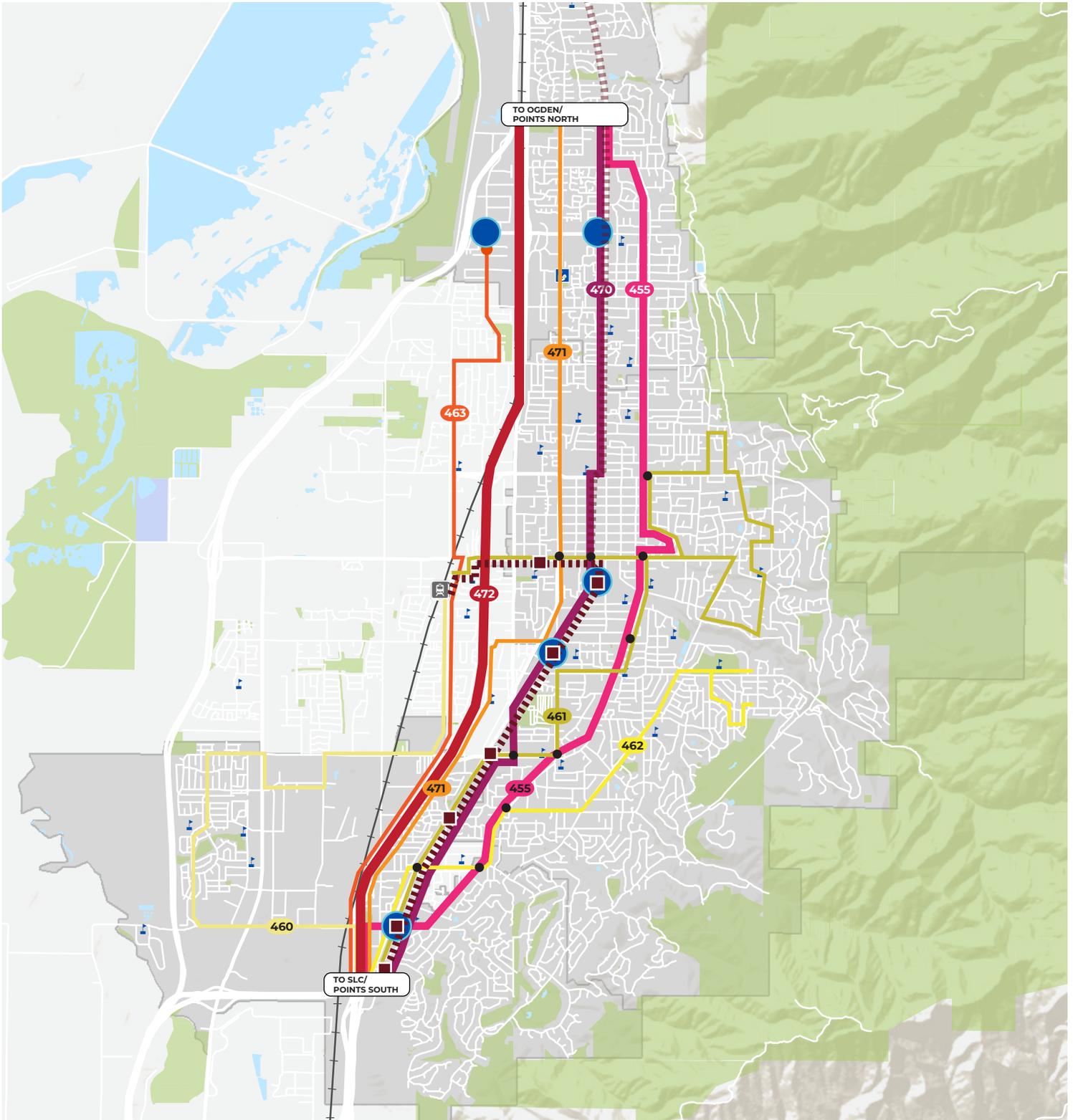
The majority of the rest of UTA’s routes in South Davis County are peak-only commuter routes that thread into residential areas. UTA is moving away from this approach, of trying to cover low-ridership areas with fixed route service, and more toward serving low-ridership areas with more flexible means, such as ride hail shuttles it refers to as “microtransit.” This allows for the concentration of more frequent service along high-ridership corridors such as the 470/455/BRT corridor.

The implications of this trend toward concentrating service along a central transit spine for active transportation in South Davis County include:

- » Support for creating the option for more of a transit lifestyle in some parts of South Davis County – specifically where walkable centers and high-frequency service coincide, and to focus walkable land use patterns, walkable development frontage and a high-quality pedestrian realm – see Walkable Centers Policy section of this Plan;
- » A greater impetus to provide high quality active transportation connections to the corridors, hubs, and centers that have high frequency service, from throughout the communities.
- » A greater ability and urgency to provide mobility hubs, even where there is not rail service. With the microtransit to high-frequency corridor model, transfer points will gain importance, as will first-last mile solutions for these hubs. UTA is supportive of the creation of these mobility hubs. See Mobility Hubs section.

*Left: Integrating active transportation and public transit UTA's bus system  
Right: Sheltered seating and bicycle amenities near a gas station and bus service in Centerville*





**Existing Destinations + Boundaries**

-  FrontRunner station
-  School
-  Library
-  Water
-  Park
-  Study area

**Existing and Future Transit**

-  UTA Bus Route
-  Planned BRT station location and alignment
-  Potential community mobility hub location



*Data provided by the Cities of Bountiful, Centerville, and North Salt Lake; Davis County; the Utah AGRC; UDOT; UTA; and WFRC  
 Map produced August 2019 by Alta Planning + Design*

With these implications in mind, the key recommendation for transit access and integration is to ensure that the planned network is well connected with bus stops along this central transit corridor. The bike facilities planned along Orchard Drive/400 East and U.S. 89/Main Street, many of them separated/protected, provide a good foundation for transit access.

As part of this, the planned BRT station locations are especially critical to improve active transportation connectivity. The majority of the street and pathway connectivity recommendations improve connectivity to BRT station locations. This Plan recommends that new crossings created to access BRT stations be aligned with active transportation routes and facilities.

In addition, active transportation connections to the Woods Cross FrontRunner Station are also critical. These include 500 South, to Bountiful, and 800 West, to North Salt Lake.

### SHARED MOBILITY

Shared mobility encompasses emerging technology-driven options for people to use shared vehicles. These shared vehicles include cars, such as transportation network companies (TNCs) such as Uber and Lyft; vans, such as UTA's vanpools; bikes, such as Salt Lake City's GreenBike; and scooters, such as Lime and Bird, which have begun to be offered in Salt Lake Valley.

Currently, TNCs and UTA vanpools (and carpools) serve Davis County, as they do the entire Wasatch Front. But there are no shared bike or scooter services yet serving the cities in this plan.

Even though they are not yet available, bike and scooter share offer the most opportunities of the shared mobility options for integration with active transportation planning in South Davis communities. Shared bikes and scooters present an often-ideal option for covering the "first and last mile" left between a transit stop and a destination, especially in a low-density environment like South Davis's where most transit riders' origins/destinations are far from their transit stops. These modes also need high-quality active transportation facilities.

The largest opportunities for shared bike and scooter service "hubs" in South Davis County are at the Woods Cross FrontRunner station and at high ridership 470 or 455 stops that are also planned BRT stations and are within high activity areas or the town center areas. See "Mobility Hubs".

*Left: Summit County's bike share system*

*Right: Designated e-scooter parking*



## MOBILITY HUBS

Mobility hubs are places where a variety of shared transportation options are concentrated in a strategic location. In the last decade, these options have grown, and now include shared e-scooters and e-bikes and transportation network companies such as Lyft and Uber, in addition to the traditional modes of public transit, walking and bicycling. Mobility hubs provide nodes where people can easily and confidently obtain use of these modes and transfer between them. Mobility hubs especially provide places to transfer between longer distance transit service and “first-last mile” services like bikes and scooters.

Mobility hubs can provide support for active transportation in South Davis County by creating easy transfer points, providing information, and providing a convenient location for shared mobility. Proposed locations for mobility hubs are:

- » Bountiful: Renaissance Center and/or 500 South/Main Street.
- » Centerville: Leverage existing Maverick Legacy trailhead/mobility hub at Parrish Lane/1250 West, and potentially add a hub at Smith Park.
- » North Salt Lake: U.S. 89 and Center Street.

## PROGRAMS AND ENFORCEMENT

In addition to adopting active transportation oriented policy, the communities of South Davis County can focus programs, campaigns, and collaboration with law enforcement to further their efforts in achieving the goals of this plan.

### PROGRAMS

Formal programs adopted by schools, communities, or City staff play an integral role in educating citizens about active transportation and promoting safe streets. Below are just a few examples of programs Bountiful, Centerville, and North Salt Lake can implement or improve.

- » **Safe Routes to School:** The Safe Routes Utah program, which replaced SNAP (Student Neighborhood Access Program) helps schools and communities develop plans that inform and encourage students to walk and bike safely to school. Under Utah Law, every elementary, middle, or junior high school is required to have a Safe Routes Plan. This plan recommends each City ensure compliance with this law and that Safe Routes Plans are reviewed annually for opportunities to improve safety and increase student participation.
- » **Bike Utah’s Youth BEST Program:** The Youth Bicycle Education and Safety (BEST) Program teaches kids how to safely and confidently experience their communities by bicycle. The program is a 5-hour, in-class and on-bike program taught at schools around Utah. Bike Utah provides trained instructors, bicycles, helmets and all other equipment for the program.
- » **Regular evaluation and data collection:** One of the best ways to get support for future active transportation investments is to establish a program for regularly evaluating mode trends and infrastructure performance. Each City should make an effort to collect pre- and post-implementation data for all projects recommended in this plan. This data should include safety and crash statistics as well as active transportation participation (i.e. user counts).
- » **Maintenance:** Some people rely on active modes like walking and bicycling year round. Just as motor vehicle travel lanes are diligently maintained and kept clear of obstruction, equal emphasis should be placed on keeping pedestrian and bicycle facilities, including off-street paths, plowed in the winter and cleared of debris, including goat heads, throughout the year.

- » **Bike Month and associated Bike to Work/School Days:** Bike Month is a marketing method to encourage people to ride bicycles. Rather than one event, there are engaging activities throughout the month of May, providing people with multiple opportunities and incentives to try bikes. Activities can include safety workshops, giveaways, free breakfast for bicyclists, Bike to Work Day, and Bike to School Day. See the League of American Bicyclist's Bike Month web page for more ideas: <https://bikeleague.org/bikemonth>
- » **Open Streets events:** Open Streets events bring communities together in celebration of active and healthy lifestyles and local culture. These events temporarily close a route of one or multiple streets to motorized traffic and allow pedestrians, bicyclists, vendors, and various activities to occupy the streets. Typically, events feature an iconic street with connectivity to community destinations like retail, libraries, or parks.

### **ENFORCEMENT**

Much of the effort to make streets safer for pedestrians and bicyclists through infrastructure and policy is nullified by lack of enforcement. One of the issues facing the communities of South Davis County is the lack of enforcement with regards to parking in bicycle lanes. Some bicycle facilities can be mistaken for parking lanes or shoulders where parking is allowed. In these cases, efforts should first be made to ensure proper signage and pavement markings, including "No Parking" signs, are properly installed and maintained. Law enforcement then plays a crucial role in educating drivers about parking laws and ensuring bicycle facilities are kept clear for their intended use.

This plan recommends that each City work with law enforcement, making sure officers are aware of bicycle laws and the initiatives of the City to promote active transportation. This can be done through seminars or educational presentations. Additionally, this plan recommends that each City consider establishing a compliance division dedicated to street safety and operations. Each City should also consider implementing a way for residents to report non-compliance via the 311 system or other communication means established by the City.



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A person is walking away from the camera on a sidewalk. To the right is a road with a car and a utility vehicle. The scene is framed by large trees and a blue-tinted sky. A large white number '06' is overlaid on the image.

# 06

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IMPLEMENTATION



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## OVERVIEW

Implementation strategies for active transportation projects require a blend of careful planning and opportunistic decision making. On-street projects, like bike lanes, can often be implemented quickly and efficiently when coordinated with planned roadway projects or pavement management activities like overlays or seal coatings. Conversely, shared-use path projects may require more extensive easement negotiations, permitting, or fundraising to reach construction.

This chapter outlines a brief, planning-level analysis of project cost estimates and outlines different funding sources and strategies. This section also presents the criteria for prioritizing projects recommended in this plan and provides detailed implementation strategies for the priority projects, including information on project extents, length, and any important implementation notes.

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## COST ESTIMATES

The cost estimates in the table on the following page give planning-level estimates for each project type in the proposed system, including linear bicycle and pedestrian facilities and spot improvements, such as crossings. The estimates are derived from industry standards and labor and material costs from similar projects in Utah and the United States. They do not include costs related to inflation, permitting, environmental impacts, engineering, design, bidding services, mobilization, traffic control, land acquisition, or any other contingencies.

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## FUNDING SOURCES

Many funding sources are potentially available at the federal, state, regional, and local levels for South Davis County to implement projects in the Active Transportation Plan. The majority of non-local public funds for bicycle and pedestrian projects are derived through a core group of federal and state programs. Federal funds from the Surface Transportation Block Grant Program (STBGP) are allocated to UDOT and Wasatch Front Regional Council (WFRC) and distributed by these agencies proportional to population, allowing funding to get to as many different types of communities as possible. The tables on pages 36-41 provide a list of funding sources that may be applicable to projects identified in this plan. Most of these sources are competitive and require applications. For multi-agency projects, applications may be more successful if prepared jointly with other local and regional agencies.

South Davis County should also take advantage of private contributions, if appropriate, in developing the proposed system. This could include a variety of resources, such as volunteer or in-kind labor during construction, right-of-way donations, outreach, planning and design, or monetary donations towards specific improvements.

Additionally, the County and/or individual municipalities should develop a dedicated local funding source for active transportation improvements through a general fund allocation, which will be sustainable funding that can be used to leverage other sources as well as develop projects. In addition to these funds, active transportation projects can be funded through a variety of measures at the local level: bonds financing, special improvement districts, or specified local sales taxes.

**Table 6.1** General cost estimates

Facility Type	Unit	Unit Cost	Assumptions
Neighborhood Byways (per direction)	LF	\$3.00	double for two-way corridor cost
Shared lane marking	EACH	\$500.00	thermoplastic, spaced every 200'
Regulatory sign	EACH	\$300.00	spaced every 600'
Crossings and traffic calming			See individual items below
Bike Lanes (per direction)	LF	\$5.00	double for two-way corridor cost
6" white striping	LF	\$3.50	thermoplastic
Bike lane symbol pavement marking	EACH	\$500.00	thermoplastic, spaced every 500'
Sign	EACH	\$300.00	spaced every 600'
Buffered Bike Lanes (per direction)	LF	\$9.13	double for two-way corridor cost
Bike lane total cost	LF	\$5.00	
6" white striping	LF	\$3.50	thermoplastic
8" buffer hatching	LF	\$0.63	thermoplastic, 30' spacing
Separated Bike Lanes (per direction)	LF	\$74.50	double for two-way corridor cost
18" wide concrete curb	LF	\$70.00	cast in place
Bike lane symbol pavement marking	EACH	\$500.00	thermoplastic, spaced every 500'
Flex post installation	EACH	\$175.00	50' spacing
Sidepath	LF	\$160.00	
10' wide concrete path	LF	\$160.00	8" concrete, saw cut joints
Shared-Use Path	LF	\$130.00	asphalt
10' wide path - asphalt	LF	\$130.00	
10' wide path - concrete	LF	\$160.00	8" concrete, saw cut joints
Crossings and Traffic Calming			
Install RRFB with ped refuge island	EACH	\$25,000.00	mast arm mounted
Install pedestrian hybrid beacon	EACH	\$113,000.00	mast arm mounted
Curb extensions (per corner)	EACH	\$4,000.00	

Costs are estimated at a planning level. On-street bikeways assume proposed facilities can fit within the existing curb-to-curb cross section and do not require relocation of curb and gutter or pavement widening. Estimated costs do not include engineering, permitting, mobilization, street resurfacing, or removal of existing pavement striping.

## FEDERAL FUNDING SOURCES

SOURCE	SUMMARY	MORE INFORMATION
FAST ACT	<p>In Utah, federal monies are administered through the Utah Department of Transportation (UDOT) and Council of Governments (COG's) or Metropolitan Planning Organizations (MPOs). Most, but not all, of these programs are oriented toward transportation versus recreation, with an emphasis on reducing auto trips and providing inter-modal connections. Federal funding is intended for capital improvements and safety and education programs, and projects must relate to the surface transportation system.</p> <p>There are a number of programs identified within the Fixing America's Surface Transportation Act (FAST Act) that are applicable to pedestrian and bicycle projects. These programs are discussed below.</p>	<p><a href="http://www.fhwa.dot.gov/fastact">www.fhwa.dot.gov/fastact</a></p>
TRANSPORTATION ALTERNATIVES	<p>The FAST Act recently replaced the former Transportation Alternatives Program (TAP) with set-aside funds under the Surface Transportation Block Grant Program (STBG). For administrative purposes, the Federal Highway Administration (FHWA) refers to these funds as TA Set-Aside. Projects eligible for TA Set-Aside funds include on- and off-road active transportation facilities, improvements to non-driver access to transit, recreational trails, and safe routes to school. WFRC administers these funds through the WFRC Transportation Improvement Program (TIP)</p>	<p><a href="https://wfrc.org/programs/transportation-improvement-program/transportation-alternatives-program/">https://wfrc.org/programs/transportation-improvement-program/transportation-alternatives-program/</a></p> <p><b>Local Match: 20%</b></p>
SURFACE TRANSPORTATION BLOCK GRANT PROGRAM (STBG)	<p>The FAST Act converts the long-standing Surface Transportation Program (STP) into the Surface Transportation Block Grant Program. The STGB promotes flexibility in State and local transportation decisions and provides flexible funding to best address State and local transportation needs. Eligible projects include all prior STP eligibilities; additional eligibilities can be found on FHWA's website using the link at right. The WFRC and the State are responsible for distributing the these funds, which are allocated by FHWA.</p>	<p><a href="https://www.fhwa.dot.gov/fastact/factsheets/stbgfs.cfm">https://www.fhwa.dot.gov/fastact/factsheets/stbgfs.cfm</a></p> <p>WFRC: <a href="https://wfrc.org/programs/transportation-improvement-program/surface-transportation-program/">https://wfrc.org/programs/transportation-improvement-program/surface-transportation-program/</a></p> <p><b>Local Match: 6.77%</b></p>
CONGESTION MITIGATION & AIR QUALITY PROGRAM (CMAQ)	<p>For transportation projects and programs that help meet the requirements of the Clean Air Act. Funding is available to areas in nonattainment or maintenance for ozone, carbon monoxide, and/or particulate matter. Federal CMAQ funds are administered by WFRC.</p>	<p><a href="https://wfrc.org/programs/transportation-improvement-program/congestion-mitigation-air-quality-program/">https://wfrc.org/programs/transportation-improvement-program/congestion-mitigation-air-quality-program/</a></p> <p><b>Local Match: 6.77%</b></p>

## FEDERAL FUNDING SOURCES

SOURCE	SUMMARY	MORE INFORMATION
RECREATIONAL TRAILS	<p>RTP funds may be used to develop and maintain recreational trails and trail-related facilities for both active and motorized recreational trail uses. Examples of trail uses include hiking, bicycling, in-line skating, equestrian use, and other active and motorized uses. These funds are available for both paved and unpaved trails, but may not be used to improve roads for general passenger vehicle use or to provide shoulders or sidewalks along roads.</p> <p>Recreational Trails Program funds may be used for:</p> <ul style="list-style-type: none"> <li>• Maintenance and restoration of existing trails</li> <li>• Purchase and lease of trail construction and maintenance equipment</li> <li>• Construction of new trails, including unpaved trails</li> <li>• Acquisition or easements of property for trails</li> <li>• State administrative costs related to this program (limited to seven percent of a state’s funds)</li> <li>• Operation of educational programs to promote safety and environmental protection related to trails (limited to five percent of a state’s funds)</li> <li>• Grant applications are typically due in April each year.</li> </ul>	<p><a href="https://stateparks.utah.gov/resources/grants/recreational-trails-program/">https://stateparks.utah.gov/resources/grants/recreational-trails-program/</a></p> <p><b>Application Deadline:</b> May 1, annually</p> <p><b>Local Match:</b> 50/50 sponsor match</p>
HIGHWAY SAFETY IMPROVEMENT PROGRAM (HSIP)	<p>HSIP provides \$2.4 billion nationally for projects and programs that help communities achieve significant reductions in traffic fatalities and serious injuries on all public roads, bikeways, and walkways. Infrastructure and non-infrastructure projects are eligible for HSIP funds. Pedestrian and bicycle safety improvements, enforcement activities, traffic calming projects, and crossing treatments for active transportation users in school zones are examples of eligible projects. All HSIP projects must be consistent with the state’s Strategic Highway Safety Plan (SHSP).</p>	<p><b>For information specific to HSIP in the state of Utah, visit:</b> <a href="https://www.udot.utah.gov/main/f?p=100:p-g:0:::1:T,V:2933">https://www.udot.utah.gov/main/f?p=100:p-g:0:::1:T,V:2933</a>,</p> <p><b>Application Deadline:</b> Ongoing</p>
CENTERS FOR DISEASE CONTROL AND PREVENTION GRANTS (CDC)	<p>The CDC provides funding opportunities for several different organization and jurisdiction types that can potentially support pedestrian and bicycle infrastructure, planning or other support programs.</p>	<p><a href="https://www.cdc.gov/grants/">https://www.cdc.gov/grants/</a></p> <p><b>Application Deadline:</b> Varies</p> <p><b>Local Match:</b></p>

## FEDERAL FUNDING SOURCES

SOURCE	SUMMARY	MORE INFORMATION
<p>RIVERS, TRAILS, AND CONSERVATION ASSISTANCE PROGRAM</p>	<p>The Rivers, Trails, and Conservation Assistance Program (RTCA) is a National Parks Service (NPS) program providing technical assistance via direct NPS staff involvement to establish and restore greenways, rivers, trails, watersheds and open space. The RTCA program provides only for planning assistance—there are no implementation monies available. Projects are prioritized for assistance based on criteria including conserving significant community resources, fostering cooperation between agencies, serving a large number of users, encouraging public involvement in planning and implementation, and focusing on lasting accomplishments. This program may benefit trail development in the region indirectly through technical assistance, particularly for community organizations, but should not be considered a future capital funding source.</p>	<p><a href="https://www.nps.gov/orgs/rtca/apply.htm">https://www.nps.gov/orgs/rtca/apply.htm</a></p> <p><b>Application Deadline:</b> June 30, annually</p>
<p>COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM (CDBG)</p>	<p>The Community Development Block Grants (CDBG) program provides money for streetscape revitalization, which may be largely comprised of pedestrian improvements. Federal CDBG grantees may “use Community Development Block Grants funds for activities that include (but are not limited to): acquiring real property; reconstructing or rehabilitating housing and other property; building public facilities and improvements, such as streets, sidewalks, community and senior citizen centers and recreational facilities; paying for planning and administrative expenses, such as costs related to developing a consolidated plan and managing Community Development Block Grants funds; provide public services for youths, seniors, or the disabled; and initiatives such as neighborhood watch programs.” Trails and greenway projects that enhance accessibility are the best fit for this funding source. CDBG funds could also be used to create an ADA Transition Plan. States designate CDBG funds to “entitlement communities” – generally major cities with more than 50,000 people – and “non-entitlement communities”.</p>	<p><a href="https://www.daviscountyutah.gov/ced/planning/grant-program/cdbg">https://www.daviscountyutah.gov/ced/planning/grant-program/cdbg</a></p> <p><b>Application Deadline:</b> Mandatory “How to Apply” workshops held annually in October/November</p>

## FEDERAL FUNDING SOURCES

SOURCE	SUMMARY	MORE INFORMATION
<p>LAND AND WATER CONSERVATION FUND</p>	<p>The Land and Water Conservation Fund (LWCF) provides grants for planning and acquiring outdoor recreation areas and facilities, including trails. Funds can be used for right-of-way acquisition and construction. The program is administered by Utah State parks as a grant program. Any projects located in future parks could benefit from planning and land acquisition funding through the LWCF. Funding is also available for new parks, and trail corridor acquisition can be funded with LWCF grants as well.</p>	<p><a href="https://www.nps.gov/subjects/lwcf/stateside.htm">https://www.nps.gov/subjects/lwcf/stateside.htm</a></p> <p><b>Application Deadline:</b> Spring, annually</p> <p><b>Local Match:</b> 50/50 match</p>
<p>EPA GREEN INFRASTRUCTURE GRANTS</p>	<p>The EPA offers a number of grant resources that serve to improve clean water in communities such as the EPA Clean Water State Revolving Fund, EPA Clean Water Act Non point Source Grant and EPA Community Action for a Renewed Environment (CARE) Grants.</p>	<p><b>More information on these, and other funding sources can be found through the EPA’s website:</b> <a href="https://www.epa.gov/green-infrastructure/green-infrastructure-funding-opportunities">https://www.epa.gov/green-infrastructure/green-infrastructure-funding-opportunities</a></p>
<p>ENHANCED MOBILITY OF SENIORS &amp; INDIVIDUALS WITH DISABILITIES</p>	<p>Section 5310 of the FAST ACT – Enhanced Mobility of Seniors and Individuals with Disabilities provides capital and operating costs to provide transportation services and facility improvements that exceed those required by the Americans with Disabilities Act. Examples of pedestrian/ accessibility projects funded in other rural communities include installing Accessible Pedestrian Signals (APS), enhancing transit stops to improve accessibility, and establishing regional one-click systems.</p>	<p><a href="https://www.transit.dot.gov/funding/grants/enhanced-mobility-seniors-individuals-disabilities-section-5310">https://www.transit.dot.gov/funding/grants/enhanced-mobility-seniors-individuals-disabilities-section-5310</a></p> <p><b>Application Deadline:</b></p> <p><b>Local Match:</b> 20% minimum</p>
<p>ADDITIONAL FTA FUNDING SOURCES FOR BIKE/PED INFRASTRUCTURE</p>	<p>Most Federal Transit Administration (FTA) funding can be used to fund pedestrian and bicycle projects that “enhance or are related to public transportation facilities.”</p>	<p><a href="https://www.transit.dot.gov/">https://www.transit.dot.gov/</a></p>

## STATE FUNDING SOURCES

SOURCE	SUMMARY	MORE INFORMATION
CLASS B & C ROAD FUNDS	Class B & C roads are all public roads which are not state or federal roads. Funds are generated from a combination of state fuel taxes, registration fees, driver license fees, and other revenue sources. County roads are financed by Class B funds, while roads owned by incorporated municipalities are financed by Class C funds. Enhancement of traffic and pedestrian safety, including sidewalks, safety features, signals, and bicycle facilities are examples of permissible uses of these funds.	<b>Regulations Governing Class B &amp; C Road Funds:</b> <a href="https://www.udot.utah.gov/main/f?p=100:pg:0::::V,T;134">https://www.udot.utah.gov/main/f?p=100:pg:0::::V,T;134</a>
SAFE ROUTES TO SCHOOL (SRTS) & SAFE ROUTES UTAH	The SRTS and Safe Routes Utah programs are sources of funding for education, enforcement, evaluations, and infrastructure improvements (e.g. sidewalks, bike parking, etc.) that encourage elementary and middle school students to walk or bike to school. The Utah Department of Transportation (UDOT) administers these programs using Federal Surface Transportation Block Grant Set-Aside funds and Highway Safety Improvement Program funds.	<a href="https://www.udot.utah.gov/main/f?p=100:pg:0::::V,T;1388g:0::::V,T;1388f?p=100:pg:0::::T,V:1388">https://www.udot.utah.gov/main/f?p=100:pg:0::::V,T;1388g:0::::V,T;1388f?p=100:pg:0::::T,V:1388</a>  <b>Application Deadline:</b> July, annually
FEDERAL LANDS ACCESS PROGRAM (FLAP)	The FLAP program funds improvement to transportation facilities that provide access to Federal lands. These funds supplement State and local resources for public roads, transit systems, and other transportation facilities, with an emphasis on high-use recreation sites and economic generators. Administered by the State, funds are allocated based on road mileage, number of bridges, land area, and visitation. Projects are selected by a Programming Decision Committee (PDC) established in each state.	<a href="https://flh.fhwa.dot.gov/programs/flap/">https://flh.fhwa.dot.gov/programs/flap/</a>  <b>Application Deadline:</b> Varies.
SAFE SIDEWALK PROGRAM	The legislature of the State of Utah has recognized the need for adequate sidewalk and pedestrian safety devices. State policy declares that “pedestrian safety” considerations shall be included in all State highway engineering and planning for all projects where pedestrian traffic would be a significant factor. The Safe Sidewalks Program provides a legislative funding source for construction of new sidewalks adjacent to state routes where sidewalks do not currently exist and where major construction or reconstruction of the route, at that location, is not planned for ten or more years.	<a href="https://www.udot.utah.gov/main/f?p=100:pg:0::::1:T,V:583">https://www.udot.utah.gov/main/f?p=100:pg:0::::1:T,V:583,</a>  <b>Local Match: 25%</b>
UDOT - MAINTENANCE PROGRAM	UDOT’s routine street resurfacing can be used as an opportunity to add bikeways or buffers to existing facilities. This option does not require additional funding. The FHWA provides a handout on using routine resurfacing projects to implement bike facilities (see more information link).	<a href="https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/resurfacing/resurfacing_workbook.pdf">https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/resurfacing/resurfacing_workbook.pdf</a>

## STATE FUNDING SOURCES

SOURCE	SUMMARY	MORE INFORMATION
UTAH OUTDOOR RECREATION GRANT	The Utah Outdoor Recreation Grant is intended to improve recreational opportunities through the construction of trails, pathways, and other recreational amenities. The program is administered through the Governor's Office of Economic Development. Grant awards in 2019 may range from \$5,000 to \$250,000. A 50% match is required however 25% of the total grant award may be provided through in-kind services.	<a href="https://business.utah.gov/outdoor/uorg/">https://business.utah.gov/outdoor/uorg/</a>  <b>Application Deadline:</b> March, annually  <b>Local Match:</b> 50/50
UDOT STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM (STIP)	<i>In addition to WFRC administered TAP and STP funds, UDOT is another source for these funds. Requirements are similar with the exception that Buy America requirements, which are excluded from UDOT STIP funds.</i>	<a href="https://www.udot.gov/main/f?p=100:pg:0:::1:T,V:40">https://www.udot.gov/main/f?p=100:pg:0:::1:T,V:40</a> ,  <b>Application Deadline:</b> February, annually  <b>Local Match:</b> none
UDOT TRANSPORTATION INVESTMENT FUNDS (TIF)	Transportation investment funds are a relatively new funding source for active transportation projects in Utah. The program, created in 2005, has traditionally funded roadway capacity projects, however in 2018 the passage of SB 72 added standalone active transportation projects as an approved project type. Active transportation projects should help mitigate congestion and be included in an active transportation plan approved by UDOT. Projects require a 40% non-state match and can be used for design, construction, or maintenance of TIF-constructed facilities.	<a href="https://www.udot.utah.gov/main/f?p=100:pg:0:::1:T,V:5323">https://www.udot.utah.gov/main/f?p=100:pg:0:::1:T,V:5323</a> ,  <b>Local Match:</b> 40%
UDOT TRANSIT TRANSPORTATION INVESTMENT FUNDS (TTIF)	The UDOT Transit Transportation Investment Fund (TTIF) can be used for public transit capital development of new capacity projects. This fund can also be used to aid in first mile/last mile connections.	<a href="https://wfrc.org/Public-Involvement/GovernmentalAffairs/2019/SB72Transportation-GovFundRevs.pdf">https://wfrc.org/Public-Involvement/GovernmentalAffairs/2019/SB72Transportation-GovFundRevs.pdf</a>  <b>Local Match:</b> 40%
BIKE UTAH 1,000 MILES CAMPAIGN	In 2017, Governor Herbert initiated the 1,000 Miles Campaign to build 1,000 miles of family-friendly bike paths, lanes, and trails by 2027. Bike Utah supports this effort by offering strategic planning, technical assistance, and connections to financial resources so that communities can begin or continue developing bicycling in their area.	<a href="https://www.bikeutah.org/1000miles/">https://www.bikeutah.org/1000miles/</a>

## PROJECT PRIORITIZATION

Implementation strategies for active transportation projects require a blend of careful planning and opportunistic decision making. On-street projects, like bike lanes, can often be implemented quickly and efficiently when coordinated with planned roadway projects or pavement management activities like overlays or seal coatings. Conversely, shared-use path projects may require more extensive easement negotiations, permitting, or fundraising to reach construction.

The following project prioritization methodology should serve as a general guide for prioritizing investment in the active transportation system; however, flexibility in implementation is highly encouraged when opportunities arise to share resources, achieve cost savings, or partner with other agencies. For each project identified as part of the proposed system, scoring was established based on criteria and weighting agreed upon by the project's Steering Committee.

The categories and individual criteria are outlined below.

### PRIORITIZATION CRITERIA

The project prioritization framework relies upon category-based criteria. The following criteria will be applied to each facility and each recommended facility will be assigned a numeric value to the degree it meets the criteria requirements. The criteria values are outlined in Table 5.1. The criteria multipliers were determined by the Steering Committee and can be adjusted by County or municipality preference to align with South Davis County's values and priorities in the future.

#### **Provides Access to Transit**

People are much more likely to use transit if they can access it by bike or on foot. Improving connections to bus stops and park-and-ride locations will improve perceived safety and convenience as well as encourage people to use public transportation more often. Facilities that provide this connectivity to transit qualify for this criterion.

#### **Safety**

Maintaining or improving safety is a prerequisite for all bicycle and pedestrian projects. One of the goals of this plan is to establish a system that makes walking and biking safer and more comfortable for people of all ages and abilities. Pedestrian and bicycle facilities that achieve this are typically characterized by physical separation from motor traffic and/or being located on a street that experiences low traffic volumes and operating speeds. Projects that address or remedy existing safety issues for bicyclists and/or pedestrians and/or are located at the location of a crash that involved a bicyclist or pedestrian qualify for this criterion.

#### **Access to Schools**

Many parents don't feel comfortable sending their children to school on foot or bicycle due to unsafe roadways or crossings. One of the goals of this plan is to enable more students, faculty, and staff to access schools by walking or bicycling. Any recommendation that provides new or enhanced access to schools qualifies for this criterion.

#### **Connectivity to Existing Facilities**

Any transportation infrastructure is only as useful as the degree to which it connects users to their destinations. Even trails predominantly used for recreation are more attractive and more highly used as a means of utilitarian transportation when they connect to meaningful

places such as schools, parks, commercial centers, libraries, and other civic destinations. Increasing bicycle and pedestrian connectivity to these destinations will allow many trips to be converted into walking and bicycling trips. Any facilities, including spot improvements, that grant new or improved direct access to community destinations qualify for this criterion.

### **Public Support**

Public support is an important criterion when evaluating potential bicycle and pedestrian facility improvements. Throughout the planning process for the South Davis County ATP, the project team received feedback from more than 300 people via online surveys and interactive maps as well as in-person outreach activities. Because public support can give implementation efforts the necessary momentum to reach construction, streets/locations that were identified by the public as desirable for a future pedestrian and/or bicycle improvement qualify for this criterion.

### **Access to Parks or Civic Centers**

Any transportation infrastructure is only as useful as the degree to which it connects users to their destinations. Even trails predominantly used for recreation are more attractive and more highly used as a means of utilitarian transportation when they connect to meaningful places such as parks and other civic destinations. Increasing bicycle and pedestrian connectivity to these destinations will allow many trips to be converted. Any recommendation that provides new or enhanced access to parks or civic centers qualifies for this criterion.

### **Future Development Synergy**

In a multi-jurisdictional effort such as the South Davis ATP, proposed facilities that connect existing bicycle and pedestrian to destinations throughout the region present opportunities for collaboration in both the planning and funding of new improvements and developments. Providing a synergistic connection between active transportation facilities and new development concept plans promotes economic growth and community development. Any proposed improvement that has strong potential to be included in future development projects qualifies for this criterion.

### **Access to Retail**

Retail destinations act as key community gathering places for local residents. However, these destinations are often difficult to travel to due to unsafe roadways, poor street crossings, and lack of bicycle-related amenities at the destination. One of the goals of this plan is to enable more residents to access these destinations by walking or bicycling. Any recommendation that provides new or enhanced access to retail destinations qualifies for this criterion.

### **Access to Churches**

Many families don't feel comfortable traveling to religious institutions on foot or bicycle due to unsafe roadways or crossings. One of the goals of this plan is to enable more residents to access churches by walking or bicycling. Increasing bicycle and pedestrian connectivity to these destinations will allow many trips to be converted. Any recommendation that provides new or enhanced access to one or more churches qualifies for this criterion.

**Table 6.2** Project prioritization scoring table

Criteria	Score	Multiplier	Total	Description
Access to transit	2	1.80	3.60	Provides direct access to transit
	0		0	Does not provide direct access to transit
Safety	2	1.73	3.50	Addresses locations with high rates of bicycle/pedestrian crashes (multiple times)
	1		1.73	Addresses locations with moderate rates of bicycle/pedestrian crashes (once)
	0		0	Does not address locations with bike/pedestrian crashes
Access to schools	2	1.70	3.40	Provides new or enhanced access to multiple schools
	1		1.70	Provides new or enhanced access to one school
	0		0	Does not provide new or enhanced access to schools
Connectivity to existing facilities	2	1.65	3.30	Connects directly to multiple existing trails or bike facilities
	1		1.65	Connects directly to one existing trail or bike facility
	0		0	Does not connect directly to an existing trail or bike facility
Public support	2	1.60	3.20	Street/location was identified by the public as desirable for a future facility (multiple times)
	1		1.60	Street/location was identified by the public as desirable for a future facility (once)
	0		0	Was not identified by the public as desirable for a future facility
Access to parks or civic centers	2	1.58	3.16	Provides new or enhanced access to multiple parks or civic centers
	1		1.58	Provides new or enhanced access to one park or civic center
	0		0	Does not provide new or enhanced access to parks or civic centers
Future development synergy	2	1.46	2.92	Has strong potential to be included in future development projects
	0		0	Has weak potential to be included in future development projects
Access to retail	2	1.41	2.82	Provides new or enhanced access to multiple retail destinations
	1		1.41	Provides new or enhanced access to one retail destination
	0		0	Does not provide new or enhanced access to retail
Access to churches	2	1.1	2.20	Provides new or enhanced access to one or more churches
	0		0	Does not provide new or enhanced access to churches

*This prioritization scoring system is intended to be a flexible tool in determining implementation priorities. Opportunistic implementation should be pursued where feasible. Changing transportation patterns, political landscapes, or other emerging trends likely will also influence the ultimate funding and implementation of specific projects.*

## PRIORITY PROJECT CONCEPTS

Using the prioritization scoring methodology and understanding local needs and opportunities, each City selected 2-3 projects from the recommended network that are considered high priorities for implementation. This section of the plan further explores these priority projects at a conceptual level to aid each city in developing momentum into implementation. Each project concept includes the following information:

- » Project summary, including extents and context
- » Facility type
- » Length
- » Estimated cost, based on planning level costs estimates in this chapter
- » Impacts
- » Phasing, if applicable
- » Funding sources
- » Benefits
- » Plan view and cross section illustrations of existing and proposed conditions

The following projects were selected for concept development:

### **Bountiful**

- » Buffered bike lanes on 200 W
- » Neighborhood byway on Center Street
- » Shared street on Main Street in the downtown area

### **Centerville**

- » Buffered bike lanes on 400 W
- » Separated bike lanes on 400 E

### **North Salt Lake**

- » Buffered bike lanes on Eagle Ridge Drive
- » Bamberger Trail corridor



## Buffered Bike Lanes on Eagle Ridge Drive

### Project Summary:

Eagle Ridge Drive is a steep residential street that currently accommodates two travel lanes, bike lanes in both directions, and on-street parking on both sides of the street. To improve the safety of bicyclists from Orchard Dr to Eaglepointe Dr, this plan recommends that the bike lanes be upgraded to buffered bike lanes by rebalancing the street to limit on-street parking to one side, providing more separation between bicyclists and motor vehicles. It is recommended that on-street parking be removed from the downhill side where bicyclists are traveling significantly faster, for two reasons: 1) drivers exiting driveways will have a clearer view of fast-traveling bicyclists, and 2) downhill bicyclists have less time to maneuver around open car doors. Alternatively, the City may opt to maintain parking on both sides, convert uphill travel to a buffered bike lane, and reduce downhill travel to a shared lane, made feasible by the smaller speed differential between downhill bicyclists and cars.

**Jurisdiction:** North Salt Lake

**Facility Type:** Buffered Bike Lanes

**Length:** ± 1.6 miles

**Estimated Cost:** \$218,718 per the proposed cross section on next page

**Impacts:** Reduced on-street parking

**Phasing:** N/A

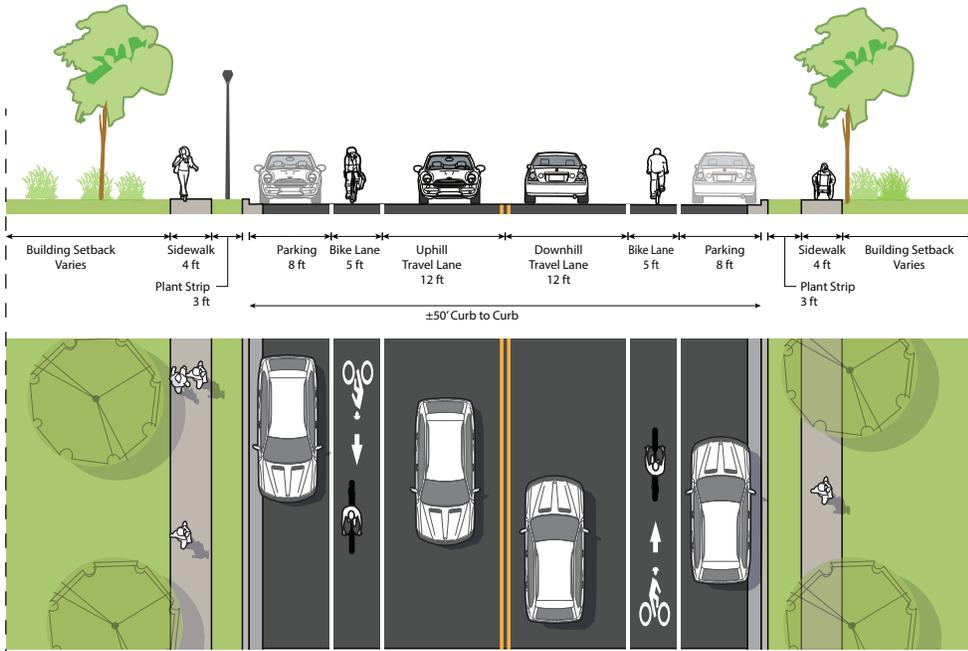
**Funding Sources:** Class B & C Road Funds; UDOT Transportation Investment Funds; Highway Safety Improvement Program; Safe Routes to School & Safe Routes Utah

**Benefits:** Allocating more space to bicyclists along this corridor increases the safety of uphill bicyclists by providing more space for slower, less direct uphill travel and downhill bicyclists by minimizing the dangers presented by on-street parking with regards to faster travel speeds and frequent driveway conflicts. While this facility, because of its steep slope, is not naturally a comfortable bikeway for all ages and abilities, these improvements have the potential to make Eagle Ridge Drive comfortable for a broader range of bicyclists.

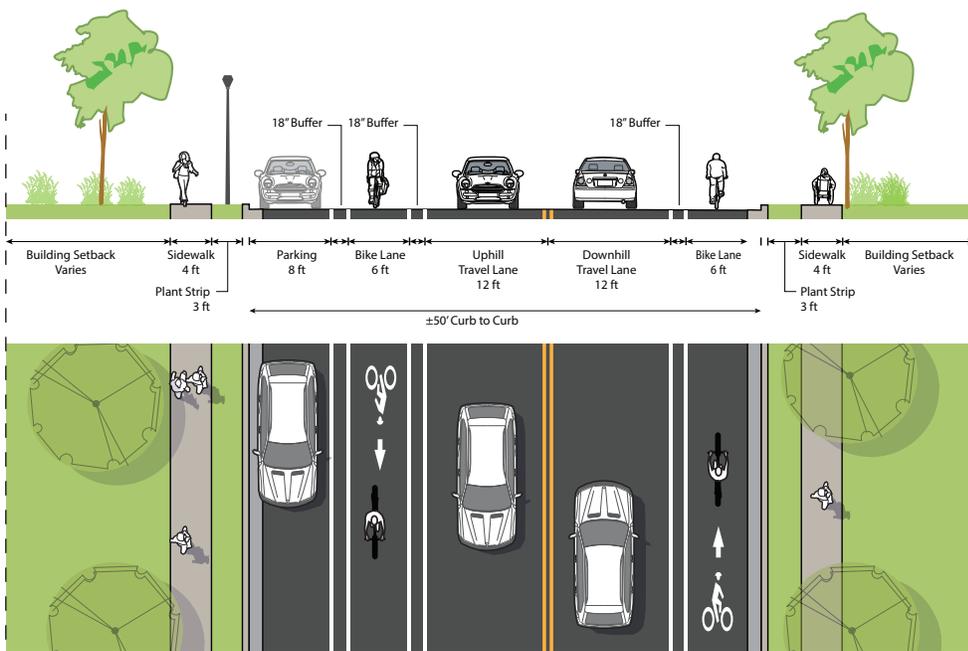


## Section A - A':

### Existing Street Cross-Section + Plan View



### Proposed Cross-Section + Plan View



Buffered bike lanes with on-street parking on the uphill side

**\*Option:** Maintain on-street parking on both sides, buffered bike lane in uphill direction, shared lane in downhill direction

## Bamberger Trail Corridor

### Project Summary:

This project is an urban trail in North Salt Lake’s town center area, extending from 350 N to Center Street, including a trail connection from the Bamberger corridor to Main Street (approximately 0.7 miles of trail in total). Primarily a shared use path, the facility type through this corridor varies based on urban context, and is meant to be flexible depending on future development plans. Once completed, this portion of the Bamberger Trail Corridor will provide better access to the Town Center area and create placemaking opportunities as the City ensures trail-oriented development.

**Jurisdiction:** North Salt Lake

**Facility Type:** Shared use path, shared street, sidepath

**Length:** ± 0.7 miles total

**Estimated Cost:** \$435,365 (assuming asphalt shared use paths); \$558,320 (assuming concrete shared use paths)

**Impacts:** Increased public exposure of residential neighborhood west of Town Center

**Phasing:** Phasing may be required depending on future development and coordination with private developers

**Funding Sources:** Funded by private developers, facility required as part of the rezoning and/or permitting process; Bike Utah 1,000 Miles Campaign may also be an opportunity

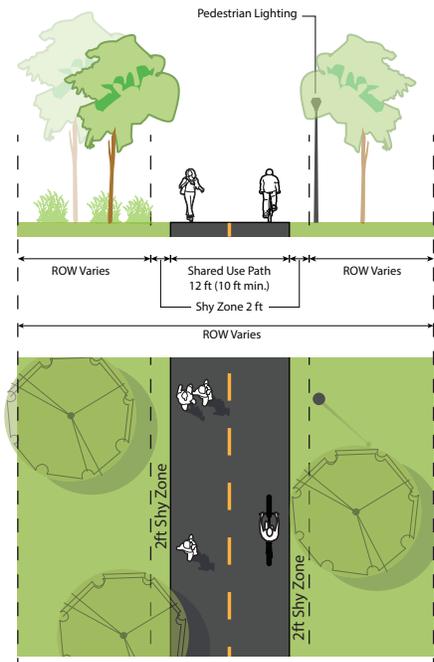
**Benefits:** First and foremost, this project will improve connectivity to and through North Salt Lake’s Town Center, an area seeing an increase in investment from the City and private developers. A well-designed urban trail with adjacent public space and access to commercial and mixed-use developments can create a vibrant corridor of activity. When completed, this project is more likely to encourage people to access Town Center using active transportation.



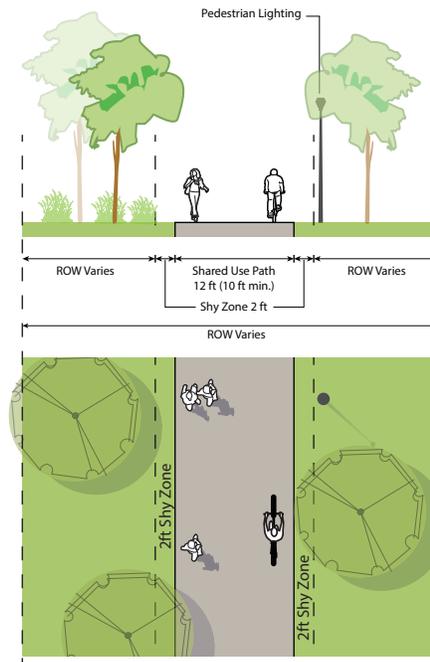
Base image source: 2016 North Salt Lake Town Center Master Plan; bikeway alignment may vary, to be coordinated with future development

## Typical Shared Use Path Cross Section :

Asphalt



Concrete



Vertical object such as curbs, light posts, benches, signage, fences, trees, shrubs, etc. not to encroach 2' shy zone; Concrete joints to be saw cut, not tooled



# APPENDIX A

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## IMPLEMENTATION TABLES



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## OVERVIEW

This appendix provides detailed information about each recommended facility, including the corridor/street name, extents, length, implementation notes, and planning level cost estimates.

## IMPLEMENTATION TABLES

The following tables contain information for each recommended project from Map 4.1 regarding route corridor, recommended facility type, corridor extents, overall length, implementation notes, and cost estimate. The cost estimates are planning level, and were derived using general numbers from Table 6.1.

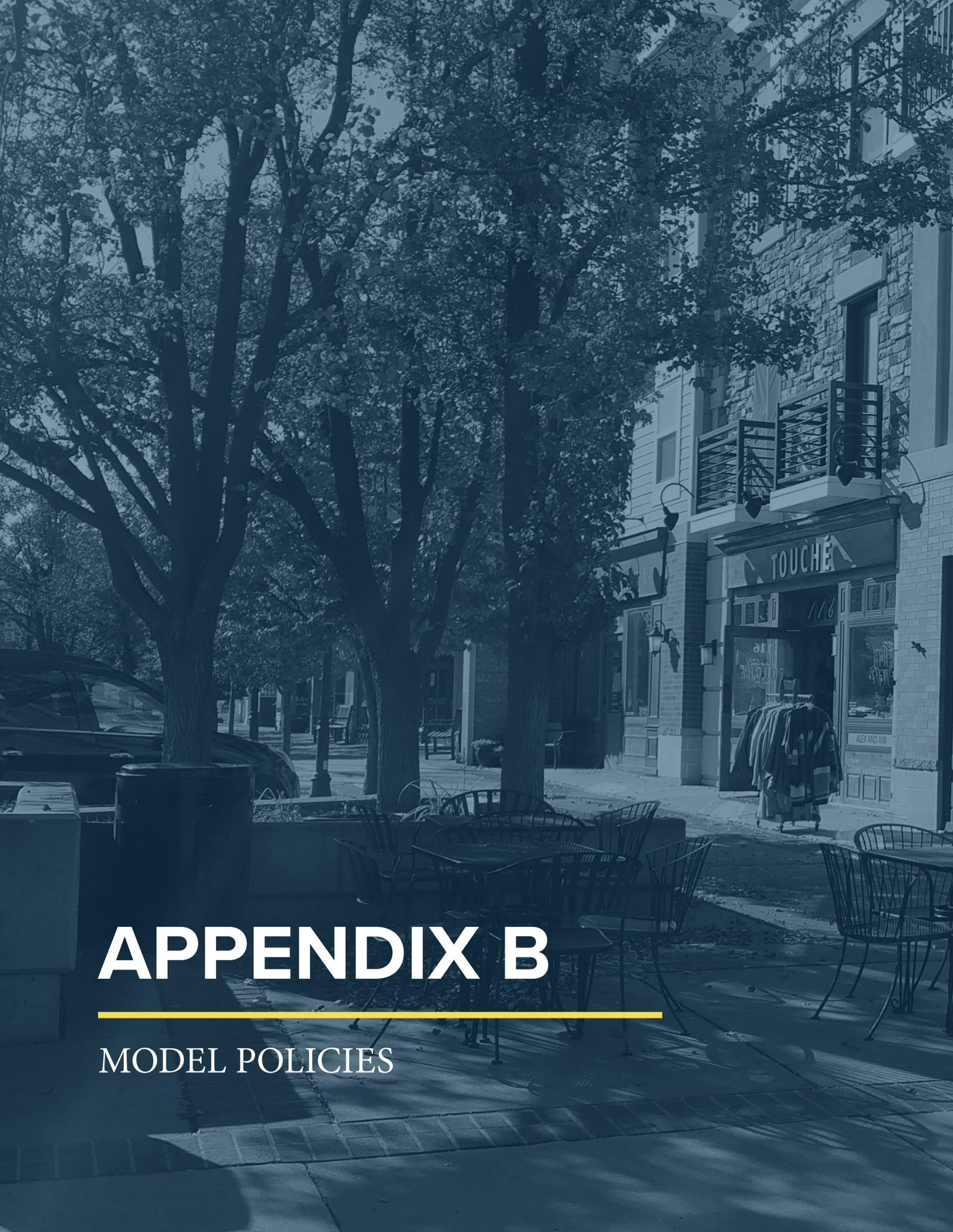
All neighborhood byway cost estimates assume curb extensions on all four corners of major intersections or intersections of through streets. Street crossings for neighborhood byways and other routes, shown as spot improvements on Map 4.1 are also included in the cost estimates below.

**\* indicates corridors fully or partially owned by UDOT or that will require UDOT coordination**

**† indicates projects that will require multi-jurisdictional coordination**

Street/ Corridor	Facility Type	Start	End	Length (miles)	Notes	Cost Estimate
1100 N	Bike Lane	Legacy Parkway	Redwood Road	0.57	Repurpose existing parking lane	\$30,306
* † 2600 S	Future Study	Main St	500 W	0.70	Proposed WFRC bike lane; suggest road reconfiguration for higher comfort facility	TBD
† 350 N/3800 S	Bike Lane	1100 W	HWY 89	0.28	Upgrade to buffered bike lane where possible; coordinate with Davis County to extend East to Orchard Drive	\$14,743
† 400 E/ Orchard Drive	Separated Bike Lane	200 W	Eagle Ridge Drive	1.43	Street design will vary throughout corridor depending on context	\$1,121,803
400 W	Sidepath	1100 N	Center St	1.36	Low priority, pending redevelopment	\$1,152,210
Bamberger Trail	Shared Use Path	350 N	Center St	0.55	Coordinate with future development, ensure connections	\$328,542 (asphalt)
Bamberger Trail Connection	Shared Use Path	Main St	Bamberger Trail	0.14	Through vacant lots, 12' wide	\$106,823 (asphalt)
* Belt Route / Pointe at Northridge Apts	Shared Use Path	HWY 89	Center St	0.36	Partial implementation by private developers	\$245,558
† Bountiful Blvd / Eagle Ridge Dr	Sidepath	Eagle-pointe Dr	Davis Blvd	0.97	10' multi-use path with 5' landscape buffer; would require curb realignment and limit on-street parking to one side; enhance existing wide sidewalks near Bountiful Temple	\$821,227

Street/ Corridor	Facility Type	Start	End	Length (miles)	Notes	Cost Estimate
Center St / 3300 N	Bike Lane	Jordan River	1200 W	0.27	Continue Center St bike lanes to City limits	\$14,002
Center St	Sidepath	400 W	Hwy 89	0.59	Continue existing sidepath, south side	\$495,067
† Davis Blvd	Bike Lane	Eaglewood Dr	425 W	0.14	Implement when Davis Blvd is extended to Eaglewood Dr; Consider interim shared use path bicycle/pedestrian connection	\$7,428
Eagle Ridge Dr	Buffered Bike Lane	Orchard Dr	Eaglepointe Dr	1.60	See cut sheet in report (South Davis County ATP)	\$218,718
* † Hwy 89	Sidepath	End of existing path	2600 S	0.24	Implement in conjunction with corridor redesign	\$205,207
Main St	Bike Lane	Hwy 89	1100 N	1.56	From Town Center Plan; limit on-street parking to one side; ensure proper crossing of railroad, minimum 60 degrees	\$82,529
* Main St / Hwy 89	Sidepath	Eagle Ridge Dr	350 N	0.78	West side of street, in coordination with future corridor BRT implementation, 10' wide concrete path	\$659,764
Overland Rd / Pacific Ave	Sidepath	Main St	1100 N	0.71	Will require moving curb and gutter and/or land acquisition	\$596,965
* Redwood Rd	Sidepath	1100 N	Center St	0.63	Tie together existing fragments	\$529,927
* † Redwood Rd	Sidepath	Center St	City boundary at Salt Lake Imports	1.00	10' min. path with 5' min. buffer; may require downgrade to buffered bike lane over I-215 bridge	\$884,995



# APPENDIX B

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MODEL POLICIES



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## OVERVIEW

This section builds on the policy recommendations in Chapter 5 by outlining model policies that each City can use as a starting point to develop their own policies to promote active transportation.

## MODEL POLICY FOR COMPLETE STREETS

This model Complete Streets Policy lays out the key policy elements recommended for North Salt Lake and Bountiful. Complete Streets policies should have a purpose (“why”); content (“what”); and mechanisms to implement it (“how”). In this model policy, the Intent and Community Vision lay out the “why”; the Policy Elements provide the “what”; and the Applications and Implementation sections address the “how.”

### Intent

- » This Complete Streets Policy establishes foundational policy support for all transportation modes and other uses within city streets. The City recognizes the need to have a safe, reliable, efficient, and integrated multi-modal streets and pathways network.
- » This policy is intended to guide the planning, design, construction, maintenance, and modification of city streets to integrate all modes and uses of the street as well as the streets’ community context. The overall purpose of the policy is to bring a holistic approach to streets, both in terms of their physical form as well as the collaborative processes and culture needed to achieve this holistic physical form.

### Community Vision

- » Streets are a framework for the community, and so streets should achieve the community vision and goals as identified in other policy documents such as the General Plan.
- » Central to the community vision is the need to have a safe, reliable, efficient, and integrated multi-modal transportation network.
- » Potential goals that a complete streets policy can help achieve:
  - Maximize choice in mobility
  - Make street safer for all users
  - Make streets great places and not just conduits for mobility
  - Increase health of residents
  - Catalyze economic development
  - Display environmental stewardship
  - Maximize use of city infrastructure

### Policy Elements

- » Create quality networks for all modes
  - Complete streets most importantly mean complete networks. These networks include walking, driving motor vehicles, bicycling, and other micromobility modes, public transit, and freight.
  - Critical elements of these networks are:
    - Connectivity
    - Choice
    - Facility quality
    - Access to key destinations throughout the city
    - Harmony among the networks in streets and at nodes
    - Connection and relevance to regional networks and adjacent jurisdictions
- » Consider all modes on each street
  - Each phase in the life of a roadway takes into account all transportation modes. The word “consider” is key. Streets serve different and unique purposes in the various

networks. Instead of trying to make each street perfect for every traveler, it is important to create an interwoven array of streets that emphasize different modes and provide quality accessibility for everyone.

- Most streets should accommodate all modes. Exceptions generally lie in the extremes - for example, bicyclists or pedestrians on freeways, or motorists on pedestrian trails.
- » Enhance public space
  - All street projects in the public realm shall be approached as opportunities to enhance the city’s public spaces and the places at which these spaces are the center.
  - Examples of public space elements of streets are the “furnishing” zone of sidewalks and the “frontage” zone of sidewalks that may be occupied by sidewalk dining, bulb-outs, pocket plazas and parks.
  - The way private development fronts onto a street and the interaction between development sites and the street is a major part of the public realm.
- » Compliment community context
  - As streets are the framework of the community, streets serve different types of neighborhoods and districts, including residential neighborhoods, downtowns, commercial and mixed-use centers, educational and employment campuses, parks and open space, and industrial areas. Sensitivity to this context can help align transportation and land use planning goals, creating livable, strong neighborhoods and districts and an overall community.
  - The planning and design of streets should strongly consider the needs of the type of context the street is serving and be planned and designed in harmony with the community, with a strong sense of place.
  - In this way, street design should be flexible, innovative, and balanced to address the needs of the context.
- » Create a culture of complete streets and collaboration
  - This Complete Streets policy is applicable to every City department.
  - Complete streets are a routine part of everyday operations.
  - Complete streets planning, design, construction and maintenance should occur as collaboration among departments and partners.
- » Take initiative
  - Actively look for opportunities to repurpose rights of way to achieve this policy
- » Integrate public participation in street decisions
  - The larger community is a critical piece in ensuring complete streets

**Applications (how the policy will be used)**

- » The Complete Streets Policy will be applied in the following situations, including but not limited to:
  - Capital projects
  - Development review
  - Studies or projects approved or funded by the City

**Implementation**

Implementation of the Complete Streets Policy will occur through the development of an ongoing Complete Streets Program with the following elements:

- » Designate authority. Designate an agency for implementation, administration and

enforcement:

- » Create a Complete Streets Committee consisting of representatives of a range of City departments, with an emphasis on those planning, designing, building, modifying, and maintaining streets, but also including departments representing the complementary aspects of the community affected by and influencing the design of streets. This committee should guide the implementation and evolution of the policy.
- » Designate funding. Designate sources of funding for specific projects implementing the policy.
- » Develop a program to measure progress.
  - Develop performance measures. Examples of Complete Streets performance measures are:
    - Mode split/shift
    - Vehicle-ped and Vehicle-bike crashes or fatalities
    - Bike lane miles
    - Percentage of street miles with sidewalks
    - Missing or non-compliant curb ramps
    - Design speeds
    - Tree canopy coverage
    - New street trees planted
    - Fitness of schoolchildren
    - Sales tax revenue
    - New multi-modal LOS metric
  - Develop benchmarks for the performance measures.
  - Develop baseline data assessing performance measures and a system for re-assessing periodically.

#### **Follow-up plans or guides**

- » Street typologies system
- » Complete Streets Plan

#### **Exemptions**

- » Create a clear procedure for allowing exceptions, such as written permission from a specific person of authority.
- » Ensure that the record of exceptions is clear and publicly available.
- » Frame how exceptions are provided for emergency maintenance operations.
- » Note how excessive cost or in-feasibility of building pedestrian or bike infrastructure as part of a project could warrant an exception.

#### **Definitions**

- » It is critical that a complete streets policy create a set of definitions for key terms

## MODEL POLICY FOR STREET AND PATHWAY CONNECTIVITY

### Intent

- » This Street Connectivity Policy provides foundational policy support for a connected street and pathway network.
- » The intent is to use a connected street network to implement the community's vision as stated in the General Plan and other policy documents.
- » This policy is intended to guide the planning, design, construction, maintenance, and modification of city streets to provide connection. The overall purpose of the policy is to ensure that the streets in new neighborhoods have a minimum level of connectivity both within the neighborhood and outside it to existing and future developments.

### Community Vision

A highly-connected street network – one where a dense set of intersections each connect to several streets, that connects a community to its key destinations, and is walkable – provides a multitude of benefits. These include regional and community mobility; transportation choice; safety; infrastructure and growth management; health; economic vitality; environment; and community access.

- » Regional and community mobility - Good street connectivity redistributes traffic among different routes in a network, providing more options and better accessibility for local traffic. This in turn frees some of the capacity on the adjacent arterial roads, which are mostly used by non-local traffic.
- » Transportation choice - Higher street connectivity provides travelers with greater choice of travel modes. In a well-connected network, active transportation modes and transit become more viable choices. This means that these types of networks are less automobile dependent.
- » Safety - In recent years, many studies have shown how built environment factors (such as street connectivity and community) affect physical activity and health.
- » Infrastructure and growth management - Higher street connectivity improves the investment in municipal infrastructure, such as utilities, and services, such as fire and emergency services.
- » Health - Street connectivity has been shown to offer indirect benefits related to health, largely stemming from the health effects of increased physical activity.
- » Economic vitality - Increasing street connectivity has been found to have an impact on a community's economic vitality. Many of the benefits are measurable in the economy or in the fiscal well-being of households and governments.
- » Environment - Street connectivity has major impacts on the environment. Shifts towards transit and active transportation modes in a connected network reduce VMTs, delays, and usage of automobiles which reduces air pollution, noise, and energy consumption.
- » Community access - At a regional or community-wide scale, connectivity improvements can reduce bottlenecks and reduce distances that residents need to travel to jobs. At a neighborhood scale, where connectivity improvements can bring a school, park, or shopping area within walking or bicycling distance to more people.

More information on each of these benefits can be found in the Utah Street Connectivity Guide – [mountainland.org/Utah-street-connectivity-guide](http://mountainland.org/Utah-street-connectivity-guide)

## Policy Elements: Internal Street Connections

### Level of Connectivity

The most basic aspect of street connectivity is the degree to which streets are connected to one another at each intersection. One way to consider this idea is to look at how much “work” each intersection is doing. A six-point intersection is doing a lot of work, transferring traffic and other users among six different streets. But a cul-de-sac, with only one street coming originating from it, is doing the minimum amount of work. Essentially, the relative level of connection tells us how much work each intersection is doing – the more amount of work, the higher the level of connectivity.

This policy shapes high levels of connectivity by requiring a minimum connectivity index, also known as a link-node ratio. The connectivity index is the ratio of the links in a given area to the nodes in the same area. It expresses how efficient the intersections are – the foundation of a well-connected network are intersections that connect to several links. The connectivity index measures this quality.

Measuring the connectivity index is simple. Only a few points of information are needed, each of which is available using basic mapping tools. The connectivity index equals the number of links, or street segments, divided by the number of nodes, or intersections/dead ends within a given area. The connectivity index should be as high as possible.

- » Area: The area is the area of your community you are evaluating. Whether using GIS or another mapping tool, draw or identify your area boundary and measure, in square miles, your area.
- » Links: Links are lengths of street between intersections or dead ends.
- » Nodes: Nodes are points where links meet. They come in two types, each of which you will have to identify and count: intersections and dead ends (cul-de-sacs count as dead ends).

Draw the area, the links and the two kinds of nodes on a map. To calculate the connectivity index, divide the number of links by the number of nodes (combined intersections and dead ends).

### Network Density

The second key aspect of street connectivity is network density. A denser network, with smaller blocks and more streets and intersections, creates more street connectivity, especially when the streets are well-connected. For example, downtown Salt Lake City’s famous historic grid system is well-connected, but its large, 660-foot blocks create a low network density and long distances between streets, and thus reduce overall connectivity, especially for those on foot, bicycles, and other active modes.

In this policy, network density is shaped by establishing maximum block lengths for different contexts. While an urban neighborhood or downtown may have maximum block lengths of 400 or even 300 feet, it probably makes for sense for a more suburban neighborhood with larger lots to have longer block lengths, perhaps 500 or 600 feet. But either standard avoids the issues of excessive block lengths that impede movement around a street network.

### Cul-de-sac Management

Cul-de-sacs impede street connectivity. However, cul-de-sacs create residential environments popular with many people, and cul-de-sacs on their own do not greatly reduce street connectivity. The key to this policy is to manage cul-de-sacs by minimizing

their length, frequency, and ensuring active transportation connections through them.

- » Maximum length: Cul-de-sacs and other dead-end streets included in a subdivision are limited in their allowed length. Specific length varies by zoning category. Stub streets intended for future connections are not included in this requirement.
- » Active transportation connection for each cul-de-sac: At each internal cul-de-sac or other dead-end street terminating within reasonable proximity to another street, a shared use path should be constructed from the cul-de-sac end to the street.
- » Frequency: The number of cul-de-sacs allowed in a street network is limited by the minimum connectivity index and the maximum block size. These requirements can allow for some flexibility in including cul-de-sacs in a network.

### **Policy Elements: External Connections**

In addition to requiring a development to be internally connected, community-wide street connectivity also depends on ensuring high-quality connections outside of a development. This includes connecting to existing adjacent neighborhoods, providing links to future adjacent developments, and providing appropriate levels and types of connectivity to major adjacent streets.

- » Connections to existing adjacent neighborhoods: New developments should connect their streets to those of adjacent existing developments. In cases where the existing adjacent development's network extends a different level of connectivity to the new development, the new development should be connected to the existing one in a way that creates the highest level of connectivity between them.
- » Creating links to future adjacent developments: Stub streets are streets that dead end against vacant or undeveloped land with the intention of connecting to development on that land in the future. In order to maintain a consistent street network that ties together different subdivisions, stub streets are required at a minimum spacing that matches the spacing of streets within a subdivision (reflected in the maximum block length requirement).
- » Connecting to major adjacent streets: Connections between developments and new or existing major streets should follow the maximum street spacing dictated by the maximum block sizes except in cases where the major street corridors have restrictions on street spacing, such as a corridor agreement with the Utah Department of Transportation. In those cases, active transportation pathways should substitute for the street connections.

### **Policy Elements: Master Planned Trail Networks**

Developing networks of master-planned, off-street trails are an integral part of active transportation and quality of life. Designing and implementing these trails will depend on opportunities created from larger developments, citywide initiatives, and regional efforts. For each subdivision/development, the developers, the City, and other stakeholders should work together to identify opportunities for master-planned and off-street trails, both within the subdivision/development and connecting to trails outside it. Developments of over a minimum size will be required to have an off-street, master-planned trail system.

Active transportation connections should connect proposed developments to master planned trails where applicable.

### **Exceptions**

These connectivity requirements may be reduced if the applicant provides clear and convincing evidence that it is impossible or impracticable to achieve due to the following limitations:

- » Topography;
- » Natural features including lakes, rivers, designated wetlands;
- » Existing adjacent development;
- » Rail corridors;
- » Limited access roadways.

Reductions in the required connectivity index will be reviewed on a case-by-case basis and must require recommendations from the reviewing departments.

### **Implementation**

Each development applicant must prepare a Connectivity Plan showing adherence to the requirements stated above, and including the following information:

- » Basic information:
  - Street links
  - Nodes
  - Block length dimensions
  - Cul-de-sac length dimensions
- » Connectivity index
- » Maximum block lengths, if applicable
- » Stub streets with minimum spacing, if applicable
- » Active transportation-only links connecting cul-de-sacs or to access-management controlled major streets.

## **MODEL POLICY FOR WALKABLE PARKING**

Walkable parking policy addresses the four major issues with conventional parking policy: the amount of parking, the individualization of parking, the economics of parking, and the design of parking. Below is an outline for a model sustainable parking policy that addresses each of these:

### **PARKING POLICY PROBLEM #1: THE AMOUNT**

This amount of parking takes space from other, more people-focused uses of space, creates a major cost for developers, and shifts the decision of what mode to use in favor of driving rather than riding. If areas such as walkable centers are well-designed and programmed, a large portion of the area's total trips shift to walking, bicycling and transit, reducing the number of spaces needed. Most cities have minimum requirements for parking for a new development, yet many cities are beginning to question the conventional wisdom on required amounts, and even whether this type of requirement is necessary.

### **Solutions**

Potential solutions for addressing this problem often focus on reducing the amount of parking required, as well as capping the amount of parking that can be built. These solutions include:

- » Elimination of parking minimum requirements: The simplest way to reduce parking is to allow the market to address parking needs.
- » Reductions across the board: Parking policy can simply apply a factor to all parking standards for all land uses, such as a 25 percent reduction.
- » Reductions for each land use: Reductions can target specific land uses to reduce, such as those, like office uses, most likely to attract transit, bicycling, and walking trips.

- » Reductions for proximity to transit: Reductions can be given for specific proximity of the use to a transit station or transit service. Midvale currently offers one type of reduction within 1/8 of a mile and another, smaller reduction within ¼ of a mile from a station.
- » Other types of reductions: Reductions can be provided for other specific aspects of a development, such as its walkable design or a transportation demand management program that has been set up.
- » Parking maximums: Parking policy can also reduce parking by limiting the amount of parking in developments through the use of parking maximum standards. Like the minimum requirements, these maximums are usually expressed as ratios of spaces per square foot of leasable building area.
- » Parking demand studies: Cities can allow developers to undertake a study demonstrating the demand for parking in the development and provide the appropriate number of spaces.

### **PARKING POLICY PROBLEM #2: INDIVIDUALIZATION**

Besides creating too much parking for station areas, conventional parking policy also draws a heavy boundary around each individual development’s provision of parking spaces, typically requiring that all parking spaces are within the development. This individualizing of parking has several interrelated effects. It prevents developments and land uses with different peak periods from leveraging the efficiency of sharing parking spaces. It prevents on-street and other public parking areas from being included in parking provision, both of which lead to unnecessary amounts of space used for parking in the development. One additional negative effect of this individualized approach is that residents, employees and visitors are less likely to be out in the community walking after or before they park, reducing the opportunities for intermingling and public life that is critical to create walkability and supports other active modes.

#### **Solutions**

Potential solutions for addressing this issue focus on allowing developments to incorporate parking in the public realm, on other private property, or shared with other developments. They include:

- » Off-site parking / leverage existing resources: Parking policy can allow developments to incorporate parking spaces outside of the site on another piece of property to the minimum allowed spaces.
- » Shared parking among uses or individual developments: Policy can allow two uses within one development or among developments to share the same set of parking spaces – for example office uses and residential uses. Typically, cities ask that developers or applicants document how these uses are complementary and have different peak parking times.
- » Incorporating on-street parking: Cities can allow station area developments to claim on-street parking spaces as part of their required parking.
- » Parking management plans: Cities can allow or require developments to develop a parking management plan that incorporates several of the above strategies to demonstrate that the parking demand is being met.

### **PARKING POLICY PROBLEM #3: ECONOMICS**

The underlying expectation with most residential developments is that the cost of parking is rolled into the cost of a housing unit; in this way, it appears to be “free.” Likewise, the norm for employers in suburban areas is that parking at the workplace is free for employees. These practices and perceptions distort the real, high costs of parking and subsidize driving alone, skewing the economic choice of what mode to take for daily trips. These costs and

the associated de facto subsidization are especially detrimental to walkable centers, where riding transit and other modes must compete with driving. And those buying or renting units are paying for a parking space even if they don't own a car, challenging housing affordability.

**Solutions**

Solutions for this issue seek to re-balance the economics of transportation. Most either separate the cost of parking from the cost of the real estate (“unbundling”), make alternatives to driving cheaper, or re-route the money paid to otherwise build or use the parking to benefits supportive of other transportation modes. They include:

- » Unbundling from development: Purchasers (or renters) of residential or commercial units pay for parking spaces separately from the unit. People then must make the parking economic decision separately from the primary real estate decision. While any property owner can unbundle parking from units, cities often offer reductions in the number of required spaces if the developer does so, and in some cases the unbundling is required.
- » Cash-out program: Similar to unbundling, purchasers (or renters) of units can get money back if they volunteer to not have a parking space or spaces for their unit.
- » In-lieu fee / benefit district: In lieu of building parking, developers can opt to pay a fee that contributes toward public or shared parking in a district (this solution also addresses Problem #2). .....
- » Public investment and partnerships: Cities and/or other public and private partners can invest in common parking resources.
- » Pricing of public parking: In popular activity centers, cities can charge for on-street and public off-street parking to create a revenue stream and incentivize trips on transit and by active transportation.
- » Transportation demand management: Transportation demand management (TDM) is the umbrella term for strategies that make more efficient use of the transportation system and seek to increase vehicle occupancy. Some of the most popular TDM programs are rideshare services, transit subsidization, guaranteed rides home, bike shares, and promotion of transit and active transportation. TDM is especially effective in employment centers, where commute trips are concentrated.

**PARKING POLICY PROBLEM #4: DESIGN**

This issue has to do with how parking looks and feels. In conventional parking policy, parking is encouraged to be front and center, the assumption being that the vast majority of people arrive by car and need to have a visible, convenient parking space. Especially in walkable activity centers, that assumption is flipped – most people are envisioned to be arriving on foot (or on bike), so it is the building/property entry and pleasing pedestrian-scale features that should be emphasized. Large areas of parking challenge the human scale.

**Solutions**

Solutions focus on placing parking in locations where it does not infringe on the human scale and the relationship of the land use with the street.

- » Requiring parking to be in the back or at side of street-fronting buildings: This is perhaps the single most important aspect of walkable design – orienting buildings and their facades and entries to the sidewalk rather to parking areas. This is easier to do well for some uses (offices, small stores) than others (grocery stores, multifamily residential).

- » Buffering surface lots from pedestrian environment: Where surface lots do sit along the street, they should be well-buffered from the pedestrian environment by landscape, trees, or another attractive buffer.
- » Reduced size of spaces: Reducing the size of spaces can help reduce the footprint of parking lots and structures.
- » Wrapping parking structures with engaging facades: Many cities require that where parking structures sit along street frontage, they contain active ground floor space or another engaging façade such as public art.

**ADDRESSING THE CHALLENGES AND SIDE EFFECTS OF IMPLEMENTING ALTERNATIVES**

In many cases, these initial four problems are not the only problems – there are challenges and side effects to implementing one or more of the solutions described above. These challenges and side effects, along with countermeasures, include:

**Perceived or real neighborhood impacts:**

Parking reductions may create the perception and potential risk that people will park in neighborhoods, creating more noise, foot traffic, and other impacts.

**Potential countermeasures:**

- » Neighborhood parking restrictions.
- » Require a parking management plan.
- » Delay making pedestrian connections between neighborhood and TOD area.

**Perceived or real market discord:**

Tenants, property owners, or other users may want or may be perceived to want a more conventional parking approach. The alternative arrangements may be or appear to be onerous for the developer, and there may be financing obstacles.

**Potential countermeasures:**

- » Provide education and resources to tenants, to users, to developers, and to the financial industry.
- » Help property owners / developers find tenants who want walkable development.

**Potential changing conditions:**

There may be risk for changing conditions, i.e. that the shared/off-site/on-street parking becomes unavailable, and an inability for shared parking to be managed sustainably.

**Potential countermeasures:**

- » Provide a flexible menu of choices that does not over-depend on one strategy.
- » Spell out specifics of reductions, shared parking, and other as much as possible; have as little discretionary as possible.
- » Develop standardized shared parking / off-site parking agreements.

**Unsupportive urban fabric:**

The built environment does not support the walkability necessary for a more transit-oriented parking approach.

**Potential countermeasures:**

- » Create great pedestrian connectivity within walkable areas.

- » Ensure great pedestrian connectivity from larger land uses/redevelopment sites to station.
- » Proper location of off-site, on-street, and shared parking.

**Legal issues:**

There may be concern about property liability issues with off-site parking.

**Potential countermeasures:**

- » Develop standardized shared parking / off-site parking agreements.
- » Specify location and terms of the off-site parking in a written deed, lease or contract.

**Leadership and administration:**

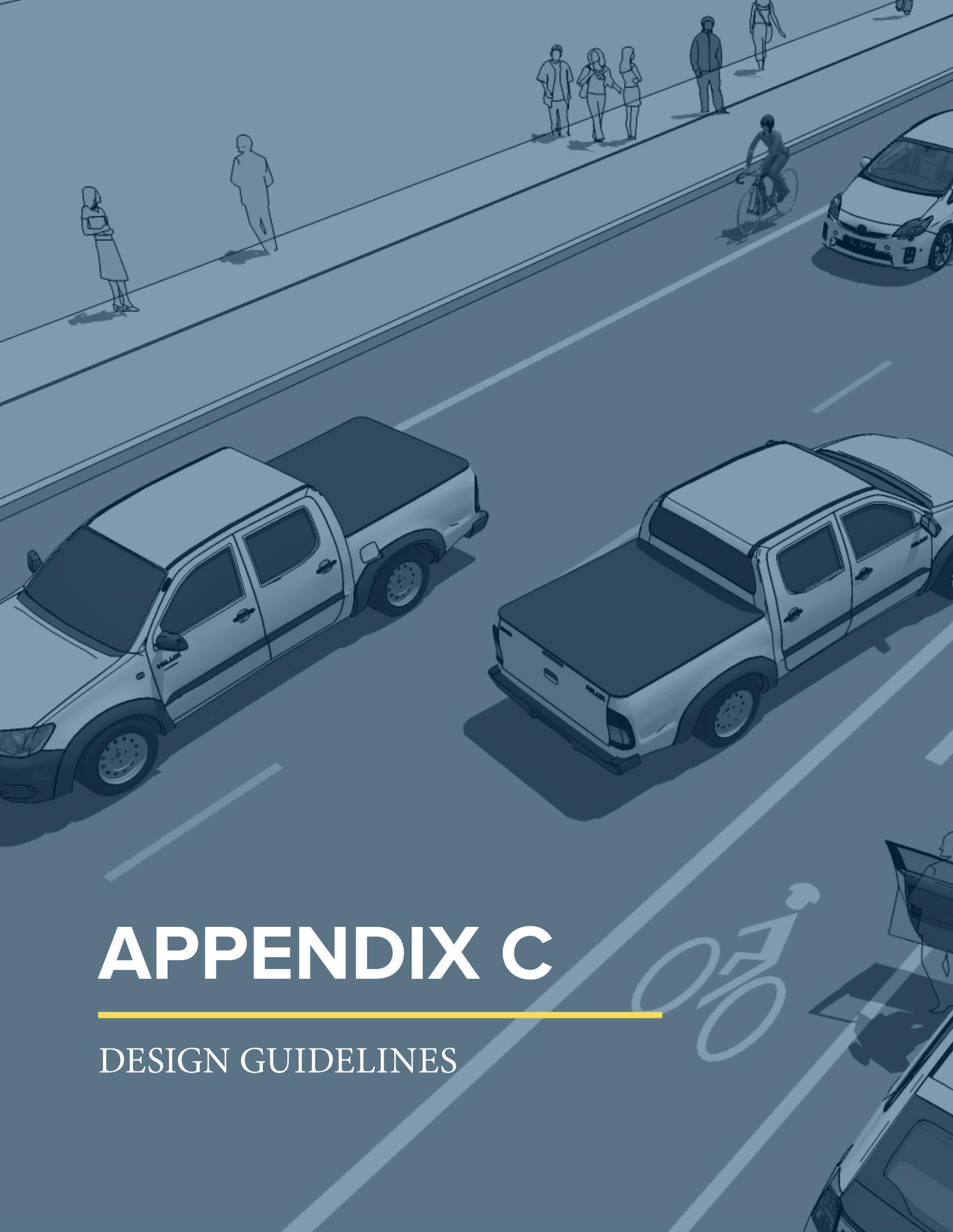
Changing the direction of a parking policy requires leadership, usually within city government. Who leads this effort and ensures it is fair? What is the funding source? How are any programs administered?

**Potential countermeasures:**

- » Provide a flexible menu of choices that does not over-depend on one strategy.
- » District branding that creates an underlying identity that can foster cooperative parking.
- » Identify leadership in City or other for cooperative parking such as a benefit district; shared parking; or TDM.
- » Identify funding sources for cooperative parking infrastructure.



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# APPENDIX C

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DESIGN GUIDELINES



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## OVERVIEW

The sections that follow serve as an inventory of bicycle and trail design treatments and provide guidelines for their development. These treatments and design guidelines are important because they represent the tools for creating a safe and accessible community. The guidelines are not, however, a substitute for a more thorough evaluation by a professional engineer.



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CONTEXT

## NATIONAL GUIDANCE

The following standards and guidelines are referred to in this guide:

- The Federal Highway Administration's (FHWA) **Manual on Uniform Traffic Control Devices (MUTCD)** defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic. The MUTCD is the primary source for guidance on lane striping requirements, signal warrants, and recommended signage and pavement markings.
- American Association of State Highway and Transportation Officials (AASHTO) **Guide for the Development of Bicycle Facilities** (2012) provides guidance on dimensions, use, and layout of specific bicycle facilities.
- The National Association of City Transportation Officials' (NACTO) **Urban Bikeway Design Guide** (2012) is the newest publication of nationally recognized bikeway design standards, and offers guidance on the current state of the practice designs.
- The **AASHTO A Policy on Geometric Design of Highways and Streets** (2011) commonly referred to as the "Green Book," contains the current design research and practices for highway and street geometric design.

## STATE GUIDANCE

- The **UDOT's Pedestrian and Bicycle Guide** provides design guidance and maintenance best practices for pedestrian and bicycle facilities. It also includes resources on funding, education, enforcement, and UDOT's project development process.
- **UDOT's 2014 State Bike Plan** incorporated a route condition inventory and safety gap analysis for each UDOT urban region and identified a regional bicycle network that includes key connections to transit and existing bicycle facilities as a part of the Utah Collaborative Active Transportation Study.

## IMPACT ON SAFETY AND CRASHES

Bicycle facilities can have a significant influence on user safety. The Federal Highway Administration Crash Modification Factor Clearinghouse (<http://www.cmfclearinghouse.org/>) is a web-based database of Crash Modification Factors (CMF) to help transportation engineers identify the most appropriate countermeasure for their safety needs. Where available and appropriate, CMFs or similar study results are included for treatments in this guide.

## User Design Dimensions

The purpose of this section is to provide the facility designer with an understanding of how bicyclists operate and how their bicycle influences that operation. Bicyclists, by nature, are much more affected by poor facility design, construction, and maintenance practices than motor vehicle drivers.

Bicyclists lack the protection from the elements and roadway hazards provided by an automobile's structure and safety features. By understanding the unique characteristics and needs of bicyclists, a facility designer can provide quality facilities and minimize user risk.

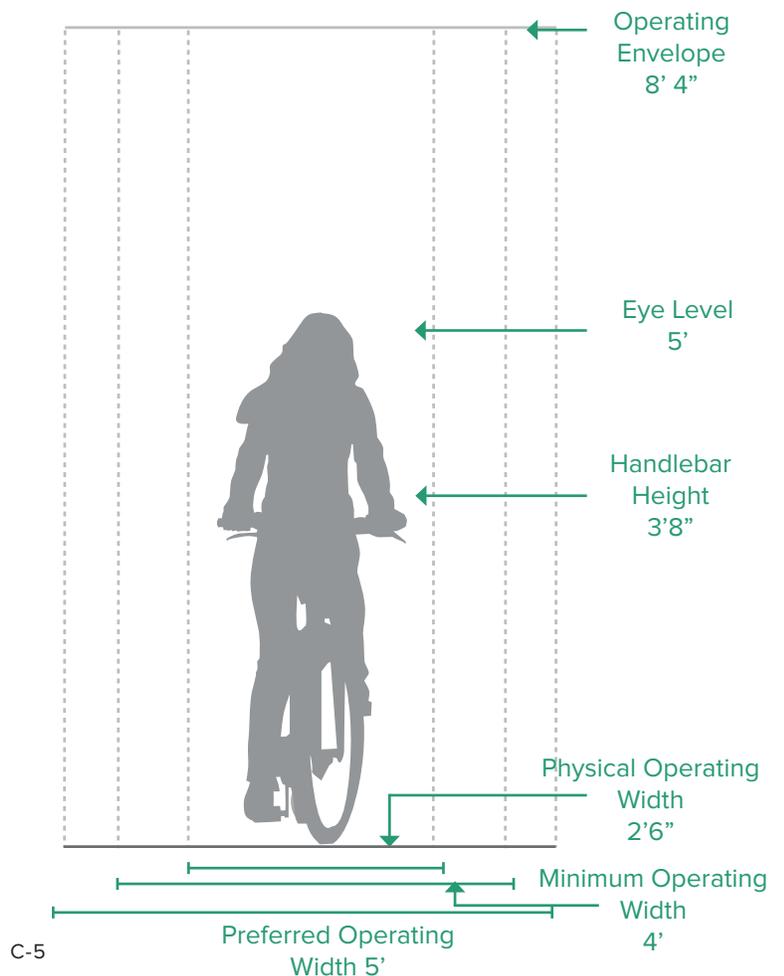
### BICYCLE AS A DESIGN VEHICLE

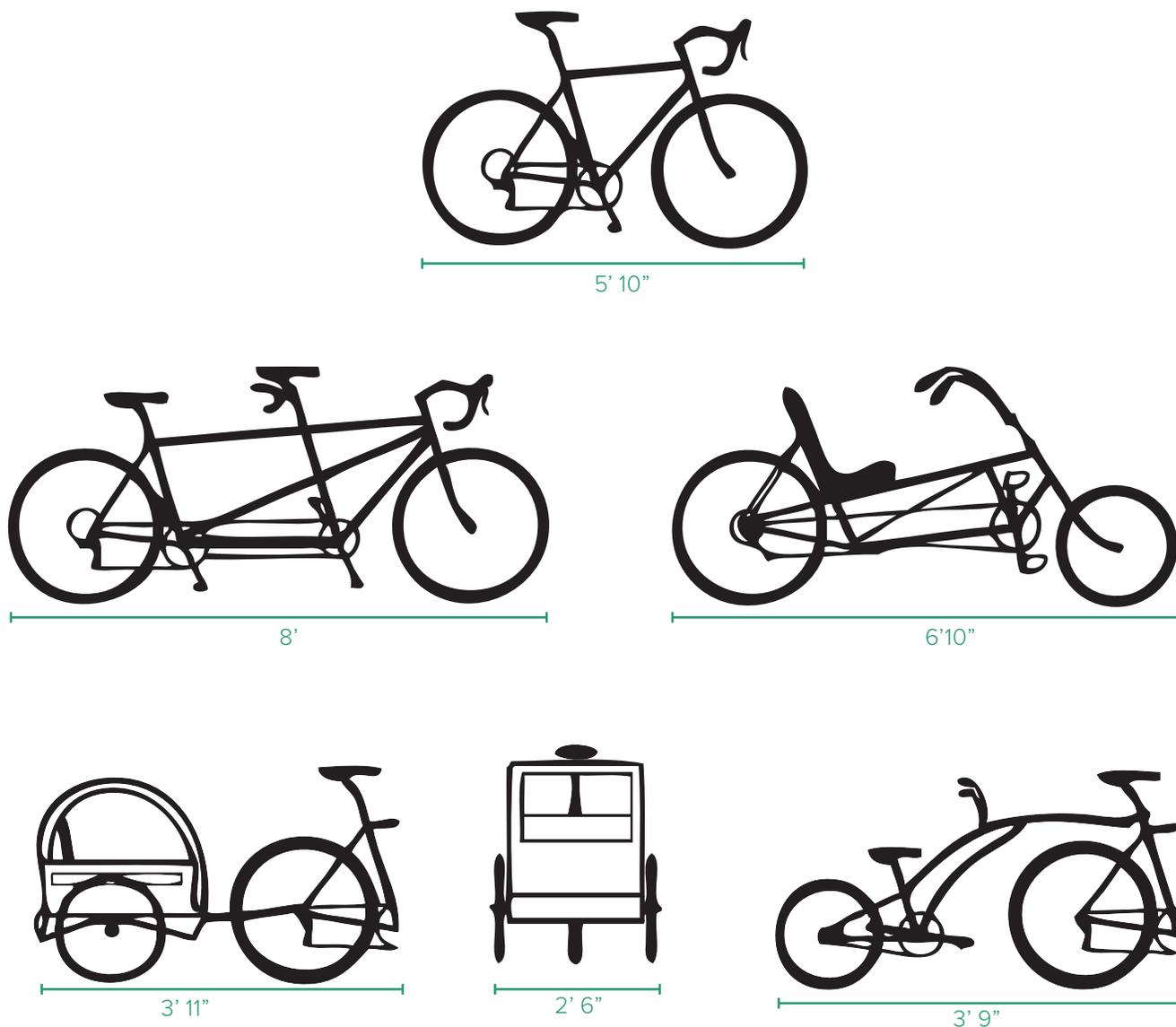
Similar to motor vehicles, bicyclists and their bicycles exist in a variety of sizes and configurations. These variations occur in the types of vehicle (such as a conventional bicycle, a recumbent bicycle or a tricycle), and behavioral characteristics (such as the comfort level of the bicyclist). The design of a bikeway should consider reasonably expected bicycle types on the facility and utilize the appropriate dimensions.

The figure to the right illustrates the operating space and physical dimensions of a typical adult bicyclist, which are the basis for typical facility design. Bicyclists require clear space to operate within a facility. This is why the minimum operating width is greater than the physical dimensions of the bicyclist. Bicyclists prefer five feet or more operating width, although four feet may be minimally acceptable.

In addition to the design dimensions of a typical bicycle, there are many other commonly used pedal-driven cycles and accessories to consider when planning and designing bicycle facilities. The most common types include tandem bicycles, recumbent bicycles, and trailer accessories. The figure to the left summarizes the typical dimensions for bicycle types.

*Bicycle Rider - Typical Dimensions*





Source: AASHTO *Guide for the Development of Bicycle Facilities*, 4th Edition

The expected speed that different types of bicyclists can maintain under various conditions also influences the design of facilities such as shared use paths. The table to the right provides typical bicyclist speeds for a variety of conditions.

**Bicycle as Design Vehicle - Design Speed Expectations**

Bicycle Type	Feature	Typical Speed
<b>Upright Adult Bicyclist</b>	Paved level surfacing	8-12 mph*
	Crossing Intersections	10 mph
	Downhill	30 mph
	Uphill	5 -12 mph
<b>Recumbent Bicyclist</b>	Paved level surfacing	18 mph

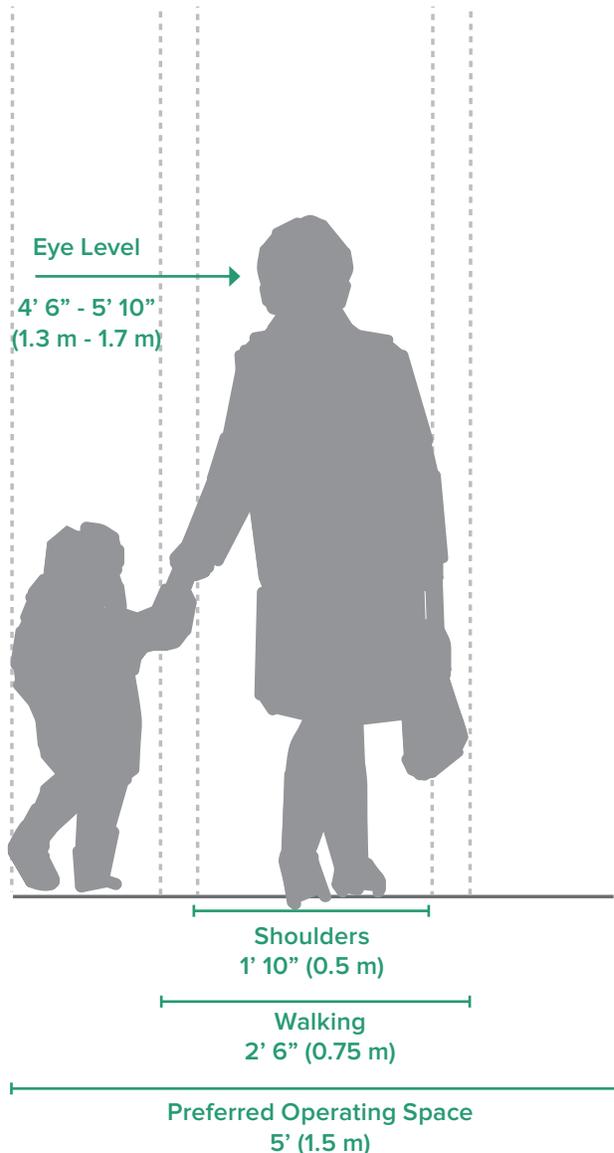
\* Typical speed for causal riders per AASHTO 2013.

## PEDESTRIAN DESIGN NEEDS

### Types of Pedestrians

Pedestrians have a variety of characteristics and the transportation network should accommodate a variety of needs, abilities, and possible impairments. Age is one major factor that affects pedestrians' physical characteristics, walking speed, and environmental perception. Children have low eye height and walk at slower speeds than adults. They also perceive the environment differently at various stages of their cognitive development. Older adults walk more slowly and may require assistive devices for walking stability, sight, and hearing. The table below summarizes common pedestrian characteristics for various age groups.

The MUTCD recommends a normal walking speed of 3.5 feet per second when calculating the pedestrian clearance interval at traffic signals. The walking speed can drop to 3 feet per second for areas with older populations and persons with mobility impairments. While the type and degree of mobility impairment varies greatly across the population, the transportation system should accommodate these users to the greatest reasonable extent.



Pedestrian Characteristics by Age

Age	Characteristics
<b>0-4</b>	Learning to walk Requires constant adult supervision Developing peripheral vision and depth perception
<b>5-8</b>	Increasing independence, but still requires supervision Poor depth perception
<b>9-13</b>	Susceptible to "darting out" in roadways Insufficient judgment Sense of invulnerability
<b>14-18</b>	Improved awareness of traffic environment Insufficient judgment
<b>19-40</b>	Active, aware of traffic environment
<b>41-65</b>	Slowing of reflexes
<b>65+</b>	Difficulty crossing street Vision loss Difficulty hearing vehicles approaching from behind

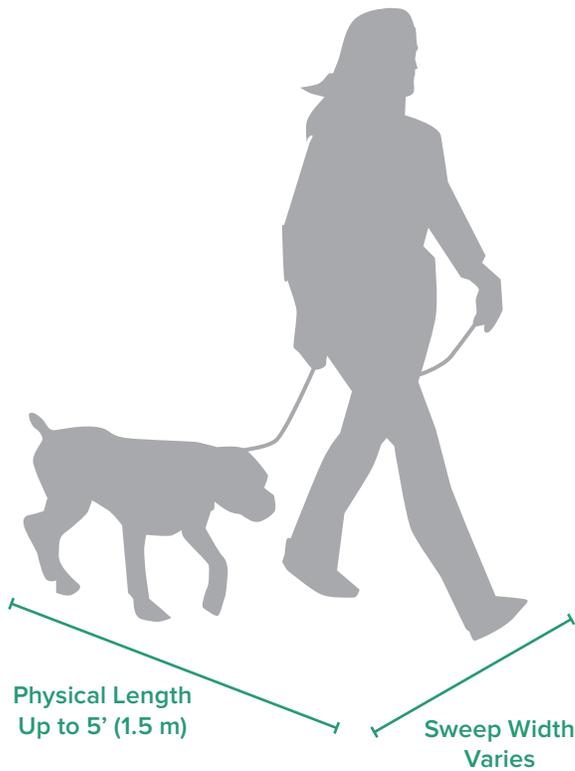
### ADDITIONAL REFERENCES AND GUIDELINES

AASHTO. Guide for the Planning, Design, and Operation of Pedestrian Facilities, Exhibit 2-1. 2004.

### DESIGN NEEDS OF DOG WALKERS

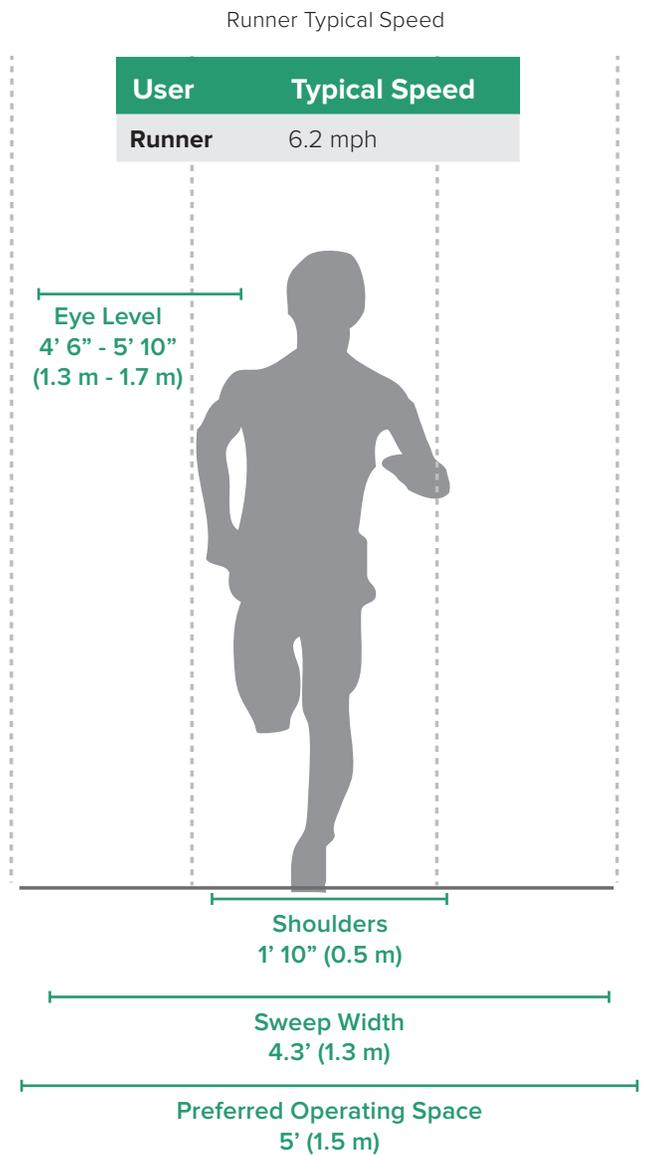
Dog walking is a common and anticipated use on shared use paths. Dog sizes vary largely, as does leash length and walking style, leading to wide variation in possible design dimensions.

Shared use paths designed to accommodate wheelchair users are likely to provide the necessary dimensions for the average dog walker. Amenities such as dog waste stations may enhance conditions for dog walkers.



### DESIGN NEEDS OF RUNNERS

Running is an important recreation and fitness activity commonly performed on shared use paths. Many runners prefer softer surfaces (such as rubber, bare earth or crushed rock) to reduce impact. Runners can change their speed and direction frequently. If high volumes are expected, controlled interaction or separation of different types of users should be considered.



### ADDITIONAL REFERENCES AND GUIDELINES

FHWA. Characteristics of Emerging Road and Trail Users and Their Safety. (2004).

## DESIGN NEEDS OF WHEELCHAIR USERS

As the American population ages, the number of people using mobility assistive devices (such as manual wheelchairs, powered wheelchairs) increases.

Manual wheelchairs are self-propelled devices. Users propel themselves using push rims attached to the rear wheels. Braking is done through resisting wheel movement with the hands or arm. Alternatively, a second individual can control the wheelchair using handles attached to the back of the chair.

Power wheelchairs use battery power to move the wheelchair. The size and weight of power wheelchairs limit their ability to negotiate obstacles without a ramp. Various control units are available that enable users to control the wheelchair movement, based on their ability (e.g., joystick control, breath controlled, etc).

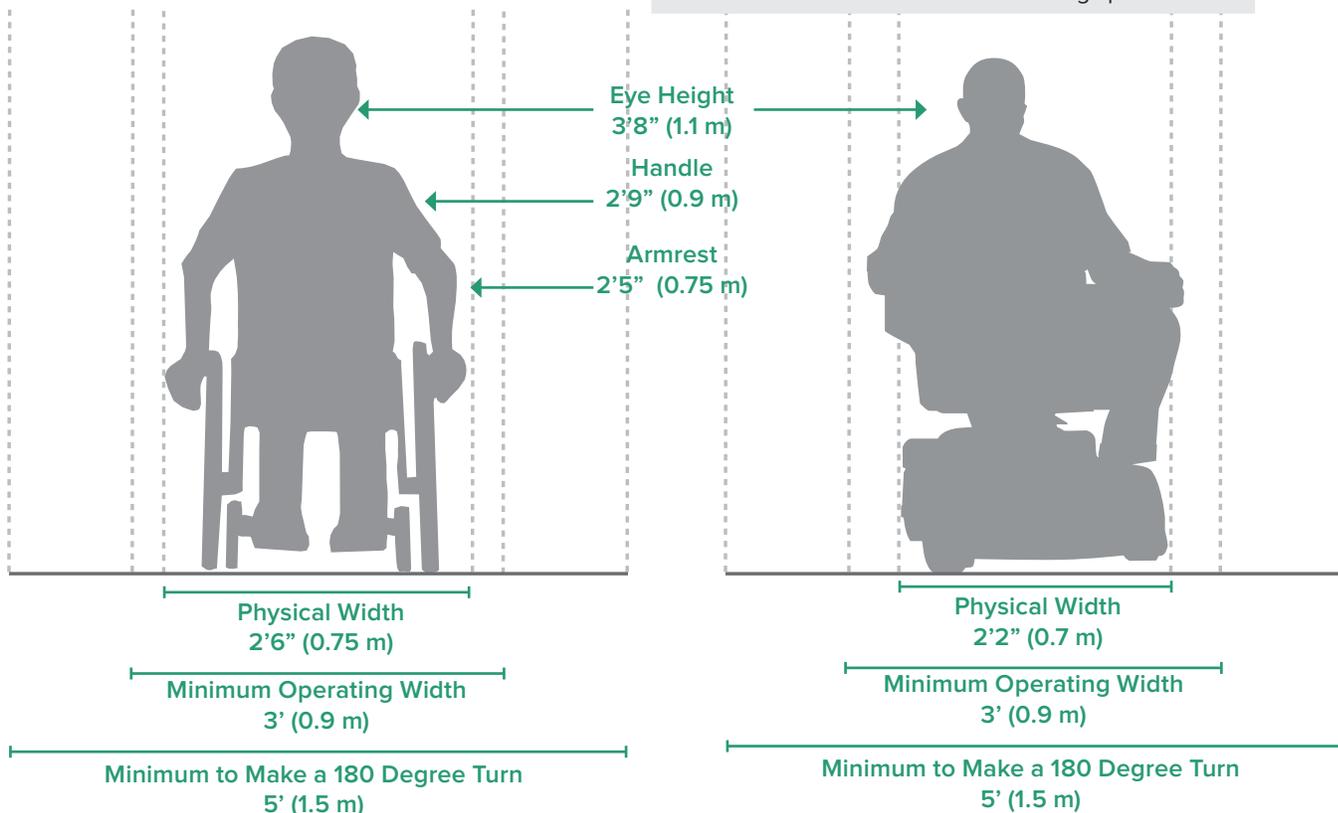
Maneuvering around a turn requires additional space for wheelchair devices. Providing adequate space for 180 degree turns at appropriate locations is an important element for accessible design.

Wheelchair User Typical Speed

User	Typical Speed
Manual Wheelchair	3.6 mph
Power Wheelchair	6.8 mph

Wheelchair User Design Considerations

Effect on Mobility	Design Solution
Difficulty propelling over uneven or soft surfaces.	Firm, stable surfaces and structures, including ramps or beveled edges.
Cross-slopes cause wheelchairs to veer downhill.	Cross-slopes of less than two percent.
Require wider path of travel.	Sufficient width and maneuvering space.



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02

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PEDESTRIAN FACILITIES

# Pedestrian Crossing Location and Facility Selection

## CROSSING TREATMENT SELECTION

The specific type of treatment at a crossing may range from a simple marked crosswalk to full traffic signals or grade separated crossings. Crosswalk lines should not typically be used by themselves and appropriate selection of crossing treatment enhancements should be evaluated in an engineering study.

The engineering study should consider the number of lanes, the presence of a median, the distance from adjacent signalized intersections, the pedestrian volumes and delays, the average daily traffic (ADT), the posted or statutory speed limit or 85th-percentile speed, the geometry of the location, the possible consolidation of multiple crossing points, the availability of street lighting, and other appropriate factors.

## MIDBLOCK CROSSINGS

Midblock crossings are an important street design element for pedestrians. They can provide a legal crossing at locations where pedestrians want to travel, and can be safer than crossings at intersections because traffic is only moving in two directions. Locations where midblock crossings should be considered include:

- Long blocks (longer than 600 feet) with destinations on both sides of the street.
- Locations with heavy pedestrian traffic, such as schools, shopping centers.
- At midblock transit stops, where transit riders must cross the street on one leg of their journey.

PEDESTRIAN CROSSING CONTEXTUAL GUIDANCE At unsignalized locations		Local Streets 15-25 mph			Collector Streets 25-30 mph			Arterial Streets 30-45 mph						
		2 lane	3 lane	2 lane	2 lane with median refuge	3 lane	2 lane	2 lane with median refuge	3 lane	4 lane	4 lane with median refuge	5 lane	6 lane	6 lane with median refuge
1	Crosswalk Only (high visibility)	✓	✓	EJ	EJ	X	EJ	EJ	X	X	X	X	X	X
2	Crosswalk with warning signage and yield lines	EJ	✓	✓	✓	✓	EJ	EJ	EJ	X	X	X	X	X
3	Active Warning Beacon (RRFB)	X	EJ	✓	✓	✓	✓	✓	✓	X	✓	X	X	X
4	Hybrid Beacon	X	X	EJ	EJ	EJ	EJ	✓	✓	✓	✓	✓	✓	✓
5	Full Traffic Signal	X	X	EJ	EJ	EJ	EJ	EJ	EJ	✓	✓	✓	✓	✓
6	Grade separation	X	X	EJ	EJ	EJ	X	EJ	EJ	EJ	EJ	EJ	✓	✓

LEGEND	
Most Desirable	✓
Engineering Judgement	EJ
Not Recommended	X



# Sidewalk Zones and Widths

Sidewalks are the most fundamental element of the walking network, as they provide an area for pedestrian travel separated from vehicle traffic. Providing adequate and accessible facilities can lead to increased numbers of people walking, improved safety, and the creation of social space.



Curbside Lane	Buffer Zone	Pedestrian Through Zone	Frontage Zone
<p>The curbside lane can act as a flexible space to further buffer the sidewalk from moving traffic., and may be used for a bike lane. Curb extensions and bike corrals may occupy this space where appropriate.</p>	<p>The buffer zone, also called the furnishing or landscaping zone, buffers pedestrians from the adjacent roadway, and is also the area where elements such as street trees, signal poles, signs, and other street furniture are properly located.</p>	<p>The through zone is the area intended for pedestrian travel. This zone should be entirely free of permanent and temporary objects. Wide through zones are needed in downtown areas or where pedestrian flows are high.</p>	<p>The frontage zone allows pedestrians a comfortable “shy” distance from the building fronts. It provides opportunities for window shopping, to place signs, planters, or chairs.</p>

In the **edge zone** there should be a 6 inch wide curb.

## TYPICAL APPLICATION

- Sidewalks should be provided on both sides of urban commercial streets, and should be required in areas of moderate residential density (1-4 dwelling units per acre).
- When retrofitting gaps in the sidewalk network, locations near transit stops, schools, parks, public buildings, and other areas with high concentrations of pedestrians should be the highest priority.

## DESIGN FEATURES

- It is important to provide adequate width along a sidewalk corridor. A pedestrian through zone width of six feet enables two pedestrians (including wheelchair users) to walk side-by-side, or to pass each other comfortably.
- In areas of high demand, sidewalks should contain adequate width to accommodate the high volumes and different walking speeds of pedestrians.
- Appropriate placement of street trees in the furnishing zone (minimum width 4 feet) helps buffer pedestrians from the travel lane and increases facility comfort.

## CONSTRUCTION COSTS

The cost of building sidewalks vary based on the location, type of material, the scale, and whether it is part of a broader street construction project. A five-foot concrete sidewalk is approximately \$32 per linear foot on average, with the additional cost of new curbs and drainage likely to be substantially higher.



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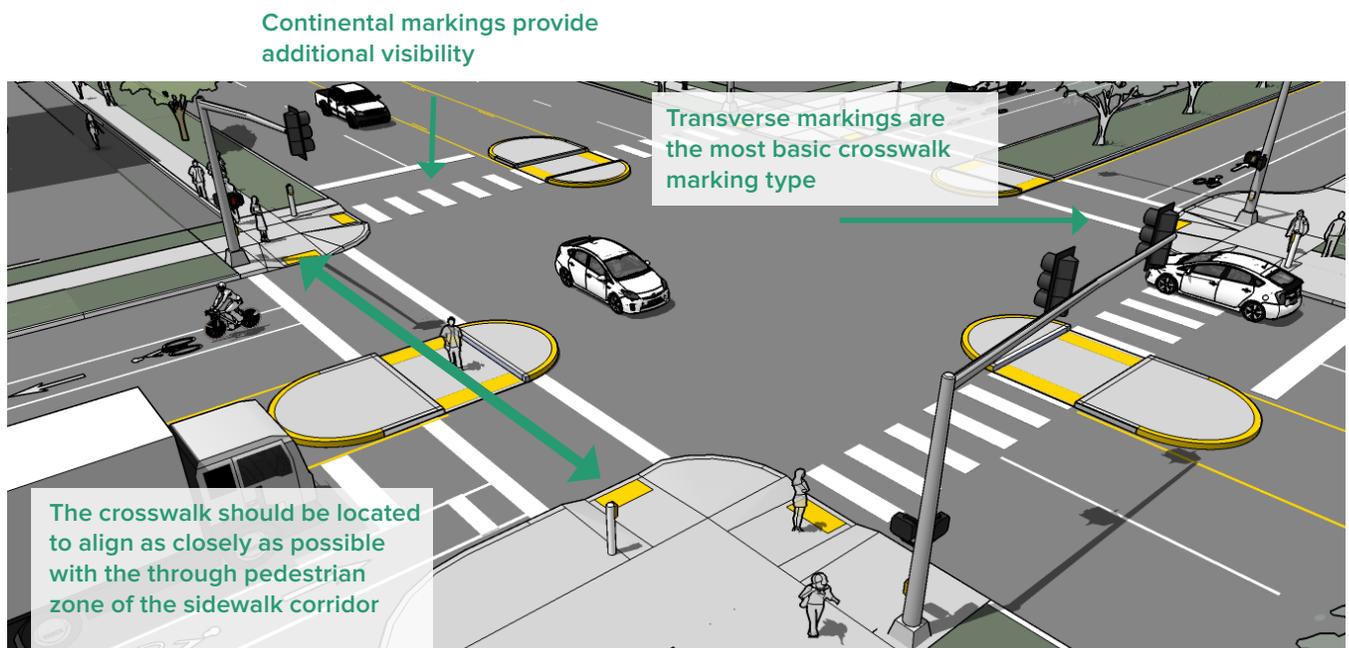
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PEDESTRIAN FACILITIES AT  
INTERSECTIONS

## Marked Crosswalks

A marked crosswalk signals to motorists that they must stop for pedestrians and encourages pedestrians to cross at designated locations. Installing crosswalks alone will not necessarily make crossings safer, especially on multi-lane roadways.

At mid-block locations, crosswalks must be marked to establish a legal crossing.



### TYPICAL APPLICATION

At signalized intersections, all crosswalks should be marked. At unsignalized intersections, crosswalks may be marked under the following conditions:

- At a complex intersection, to orient pedestrians in finding their way across.
- At an offset intersection, to show pedestrians the shortest route across traffic with the least exposure to vehicular traffic and traffic conflicts.
- At an intersection with visibility constraints, to position pedestrians where they can best be seen by oncoming traffic.
- At an intersection within a school zone on a walking route.

### DESIGN FEATURES

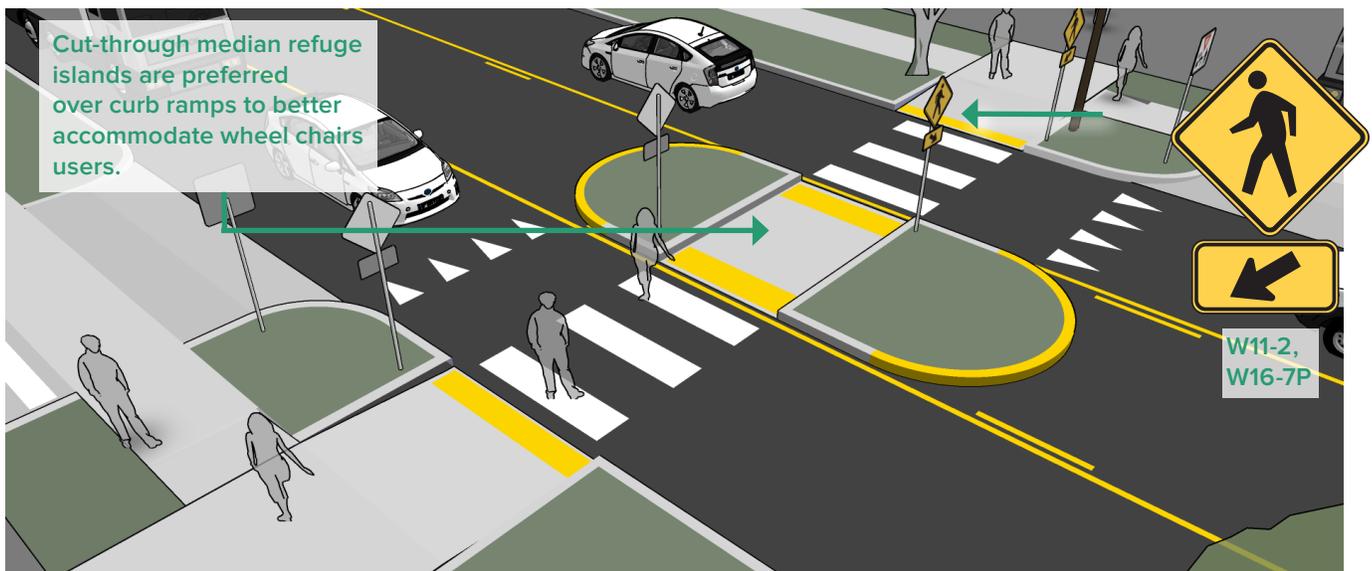
- Because the effectiveness of marked crossings depends entirely on their visibility, maintaining marked crossings should be a high priority.
- Thermoplastic markings offer increased durability than conventional paint.

### ADDITIONAL REFERENCES AND GUIDELINES

FHWA. Safety Effects of Marked vs. Unmarked Crosswalks at Uncontrolled Locations. 2005.  
 FHWA. Crosswalk Marking Field Visibility Study. 2010.  
 NACTO. Urban Street Design Guide. 2013.

## Median Refuge Island

Median refuge islands are located at the mid-point of a marked crossing and help improve pedestrian safety by allowing pedestrians to cross one direction of traffic at a time. Refuge islands minimize pedestrian exposure by shortening crossing distance and increasing the number of available gaps for crossing.



### TYPICAL APPLICATION

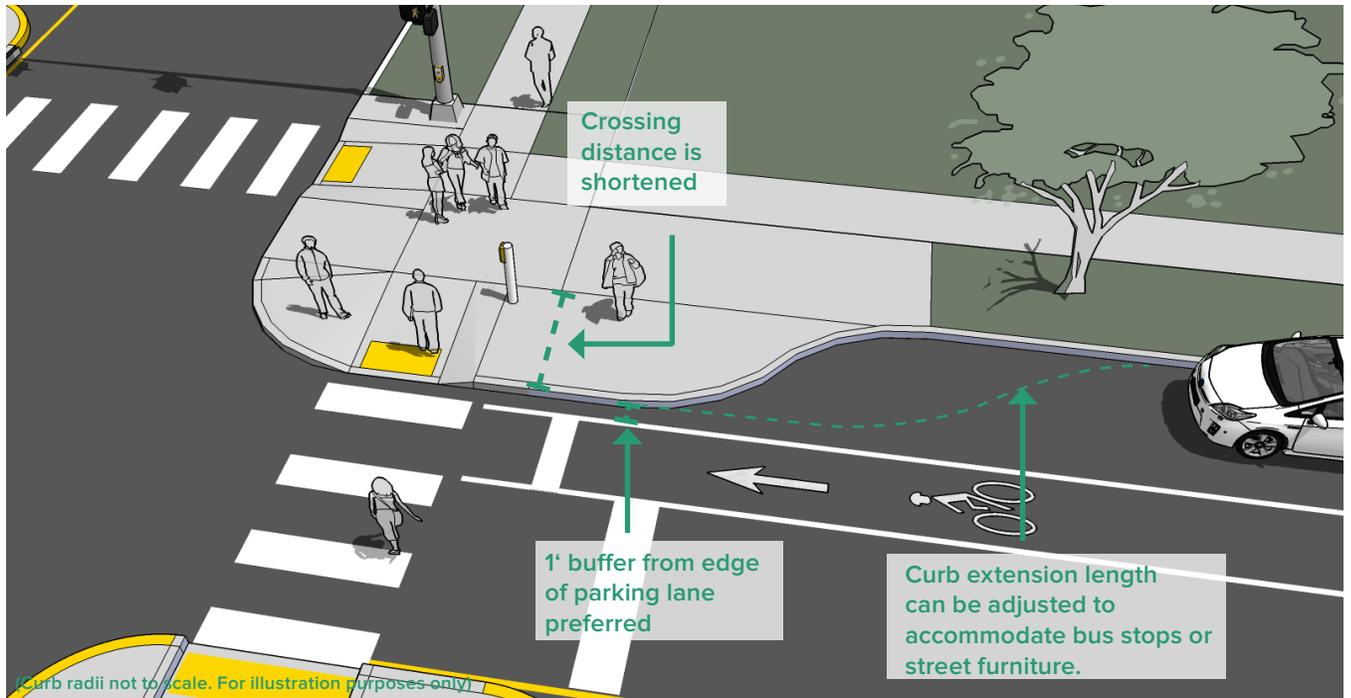
- Can be applied on any roadway with a left turn center lane or median that is at least 6 feet wide.
- Appropriate at signalized or unsignalized crosswalks.
- On multi-lane roadways, consider configuration with active warning beacons for improved yielding compliance.

### DESIGN FEATURES

- The refuge island must be accessible, preferably with an at-grade passage through the island rather than ramps and landings.
- The island should be at least 6 feet wide to be a legal refuge and be wider to accommodate cargo bikes or bikes with child trailers. It should be at least 20 feet long.
- On streets with speeds higher than 25 mph there should also be double centerline marking, reflectors, and “KEEP RIGHT” signage.
- If a refuge island is landscaped, the landscaping should not compromise the visibility of pedestrians crossing in the crosswalk. Shrubs and ground plantings should be no higher than 1.5 feet.

## Curb Extensions

Curb extensions minimize pedestrian exposure during crossing by shortening crossing distance and giving pedestrians a better chance to see and be seen before committing to crossing. They are appropriate for any crosswalk where it is desirable to shorten the crossing distance and there is a parking lane adjacent to the curb.



### TYPICAL APPLICATION

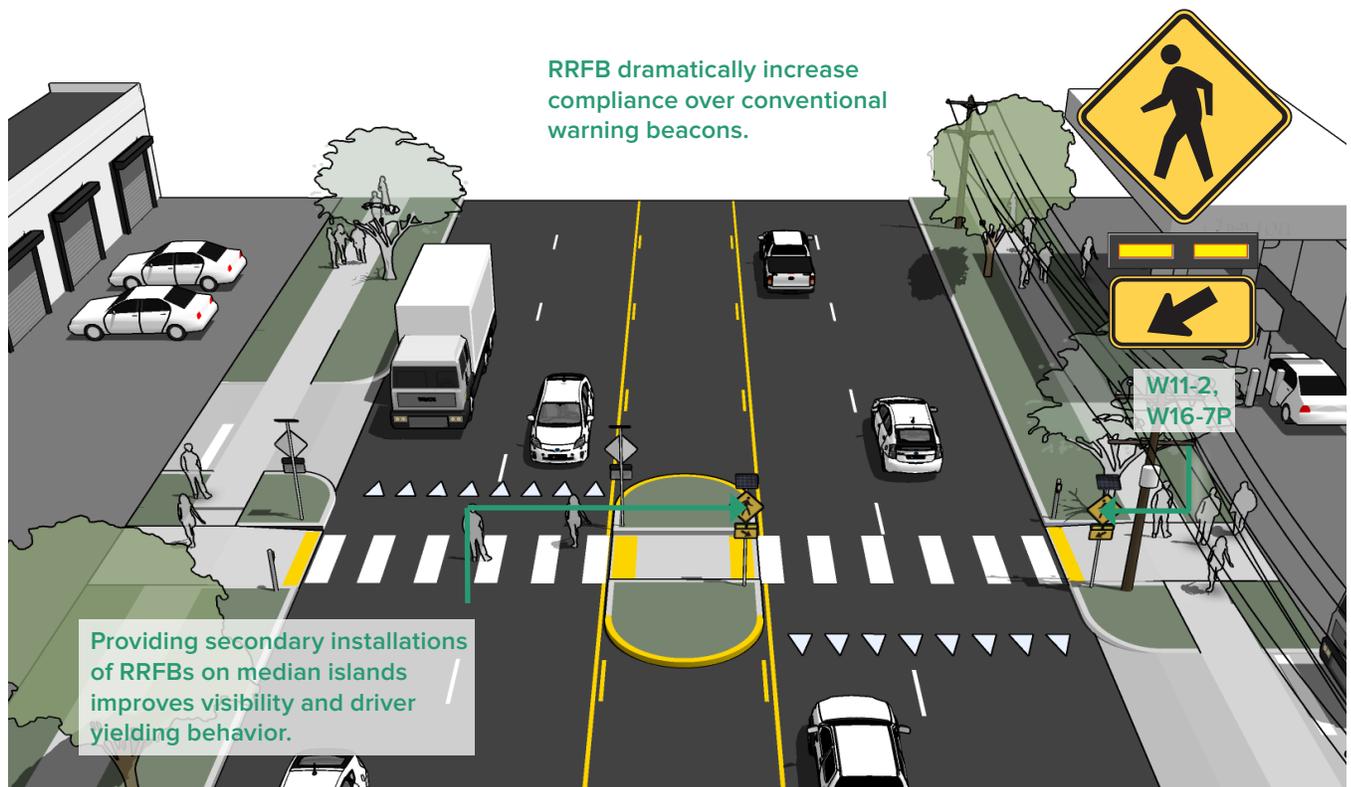
- At signalized intersections with marked crosswalks.
- At unsignalized intersections with marked crosswalks.
- At an intersection with visibility constraints, to position pedestrians where they can best be seen by oncoming traffic.
- At an intersection within a school zone on a walking route.
- Do not block bicycle lanes or shoulders being used by bicyclists with a curb extension. Turning performance by larger vehicles including buses may be impacted by curb extensions.

### DESIGN FEATURES

- In most cases, the curb extensions should be designed to transition between the extended curb and the running curb in the shortest practicable distance.
- For purposes of efficient street sweeping, the minimum radius for the reverse curves of the transition is 10 feet and the two radii should be balanced to be nearly equal.
- Curb extensions should terminate 1 foot short of the parking lane to maximize bicyclist safety.
- Planted curb extensions may be designed as a bioswale, a vegetated system for stormwater management.

## Active Warning Beacons (RRFBs)

Active warning beacons are user actuated illuminated devices designed to increase motor vehicle yielding compliance at crossings of multi-lane or high volume roadways. Types of active warning beacons include conventional circular yellow flashing beacons, in-roadway warning lights, or Rectangular Rapid Flash Beacons (RRFB). RRFBs are recommended as the preferred beacon treatment.



### TYPICAL APPLICATION

- At marked crosswalks where increased pedestrian visibility is needed.
- RRFBs have the most increased compliance of all the warning beacon enhancement options. A study of the effectiveness of going from a no-beacon arrangement to a two-beacon RRFB installation increased yielding from 18 percent to 81 percent.

### DESIGN FEATURES

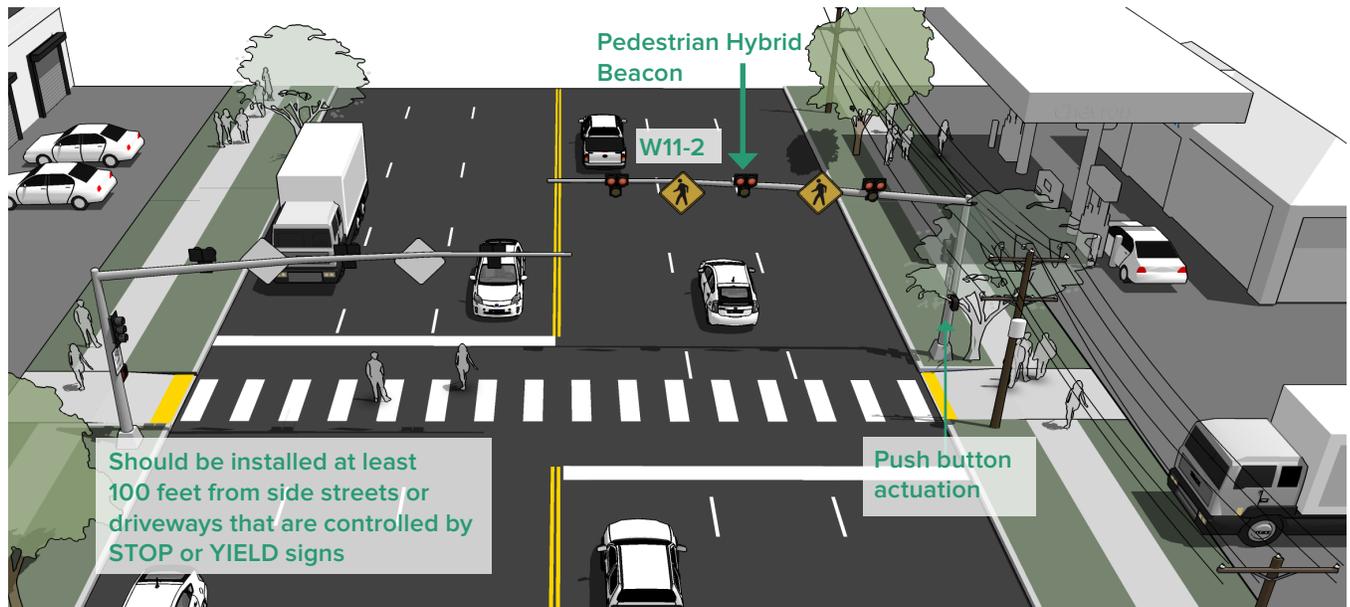
- Warning beacons shall not be used at crosswalks controlled by YIELD signs, STOP signs, or traffic signals.
- Warning beacons shall initiate operation based on pedestrian or bicyclist actuation and shall cease operation at a predetermined time after actuation or, with passive detection, after the pedestrian or bicyclist clears the crosswalk.

### ADDITIONAL REFERENCES AND GUIDELINES

FHWA. MUTCD - Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (IA-21). 2018.

## Pedestrian Hybrid Beacons

Hybrid beacons are used to improve non-motorized crossings of major streets. A hybrid beacon consists of a signal-head with two red lenses over a single yellow lens on the major street, and a pedestrian signal head for the crosswalk.



### TYPICAL APPLICATION

- At unsignalized intersections with high volumes of pedestrians.
- At an intersection within a school zone on a walking route.
- Each crossing, regardless of traffic speed or volume, requires additional review by a registered engineer to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity, and safety.
- If being considered at an existing unsignalized intersection, blank out signs prohibiting conflicting vehicle turning movements with the crosswalk are recommended to be illuminate when the crossing is active.

### DESIGN FEATURES

- Hybrid beacons have less stringent warrants than full signals.
- If installed within a signal system, signal engineers should evaluate the need for the hybrid signal to be coordinated with other signals.
- Parking and other sight obstructions should be prohibited for at least 100 feet in advance of and at least 20 feet beyond the marked crosswalk to provide adequate sight distance.
- Hybrid beacon signals are normally activated by push buttons, but may also be triggered by infrared, microwave or video detectors. The maximum delay for activation of the signal should be two minutes, with minimum crossing times determined by the width of the street.

### ADDITIONAL REFERENCES AND GUIDELINES

FHWA, Pedestrian Hybrid Beacon Guide - Recommendations and Case Study. 2014.



04

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BICYCLE FACILITIES

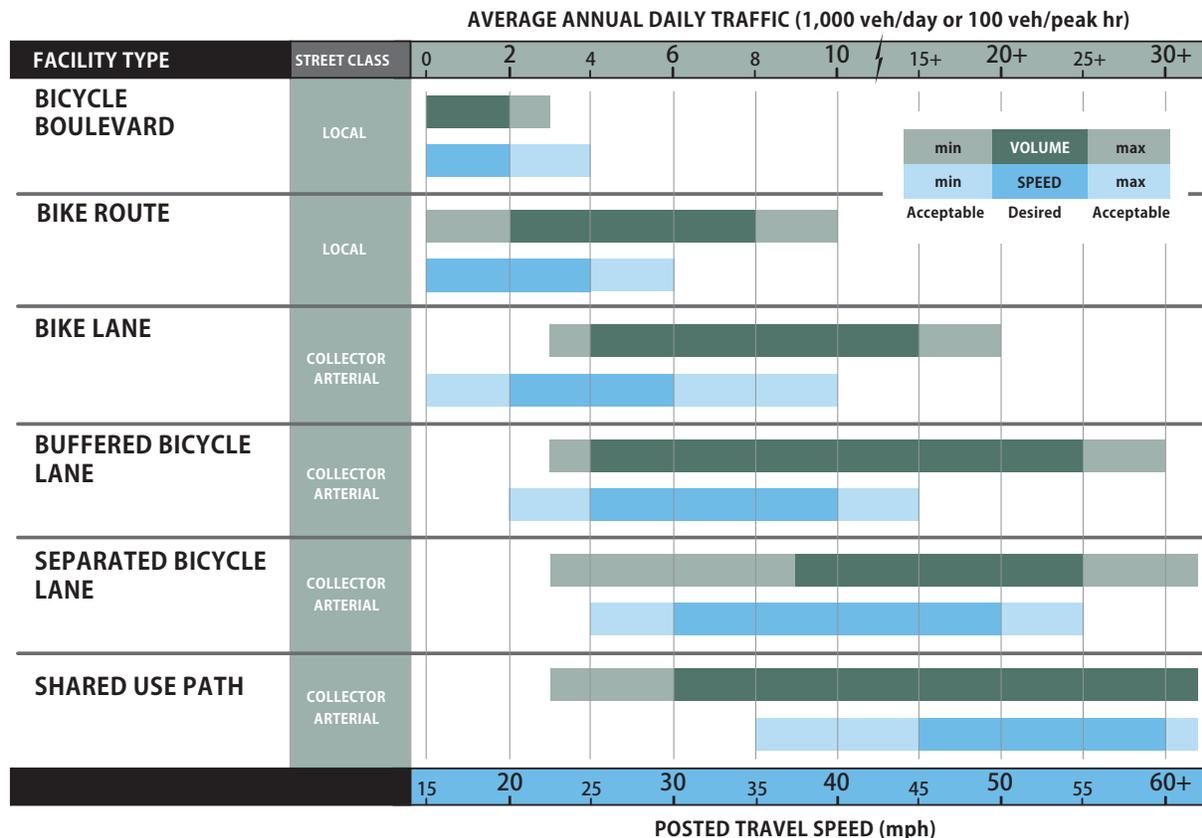
# Facility Selection

Selecting the best bikeway facility type for a given roadway can be challenging, due to the range of factors that influence bicycle users' comfort and safety. There is a significant impact on bicycling comfort when the speed differential between bicyclists and motor vehicle traffic is high and motor vehicle traffic volumes are high.

## Facility Selection Table

As a starting point to identify a preferred facility, the chart below can be used to determine the recommended type of bikeway to be provided in particular roadway speed and volume situations. To use this chart, identify the appropriate daily traffic volume and travel speed on the existing or proposed roadway, and locate the facility types indicated by those key variables.

Other factors beyond speed and volume which affect facility selection include traffic mix of automobiles and heavy vehicles, the presence of on-street parking, intersection density, surrounding land use, and roadway sight distance. These factors are not included in the facility selection chart below, but should always be considered in the facility selection and design process.



## Bicyclist User Type

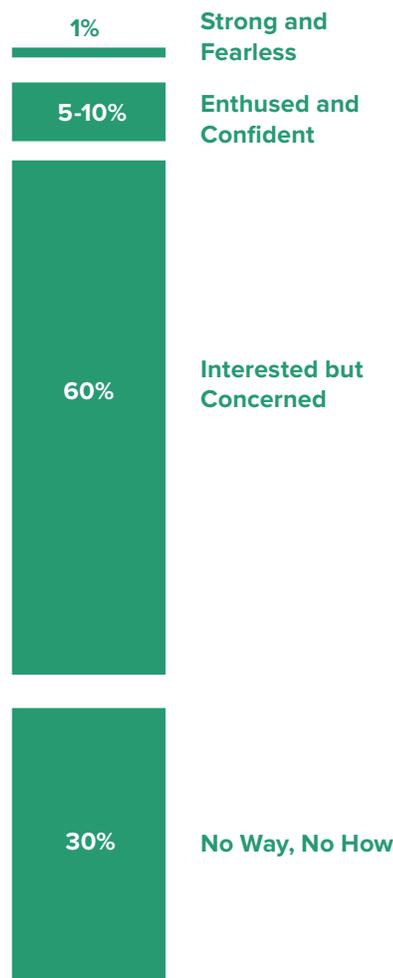
The 2012 AASHTO Guide to the Development of Bicycle Facilities encourages designers to identify their rider type based on the trip purpose (Recreational vs Transportation) and on the level of comfort and skill of the rider (Casual vs Experienced). A user-type framework for understanding a potential rider's willingness to bike is illustrated in the figure below. Developed by planners in Portland, OR and supported by research, this classification identifies four distinct types of bicyclists.

**Strong and Fearless** – Characterized by bicyclists that will typically ride anywhere regardless of roadway conditions or weather. These bicyclists can ride faster than other user types, prefer direct routes and will typically choose roadway connections (even if shared with vehicles) over separate bicycle facilities such as shared-use paths.

**Enthusied and Confident** - This user group encompasses bicyclists who are fairly comfortable riding on all types of bikeways but usually choose low traffic streets or shared-use paths when available. These bicyclists may deviate from a more direct route in favor of a preferred facility type. This group includes all kinds of bicyclists such as commuters, recreationalists, racers and utilitarian bicyclists.

**Interested but Concerned** – This user type comprises the bulk of the cycling population and represents bicyclists who typically only ride a bicycle on low traffic streets or shared-use paths under favorable weather conditions. These bicyclists perceive significant barriers to their increased use of cycling, specifically traffic and other safety issues. These people may become “Enthusied & Confident” with encouragement, education and experience.

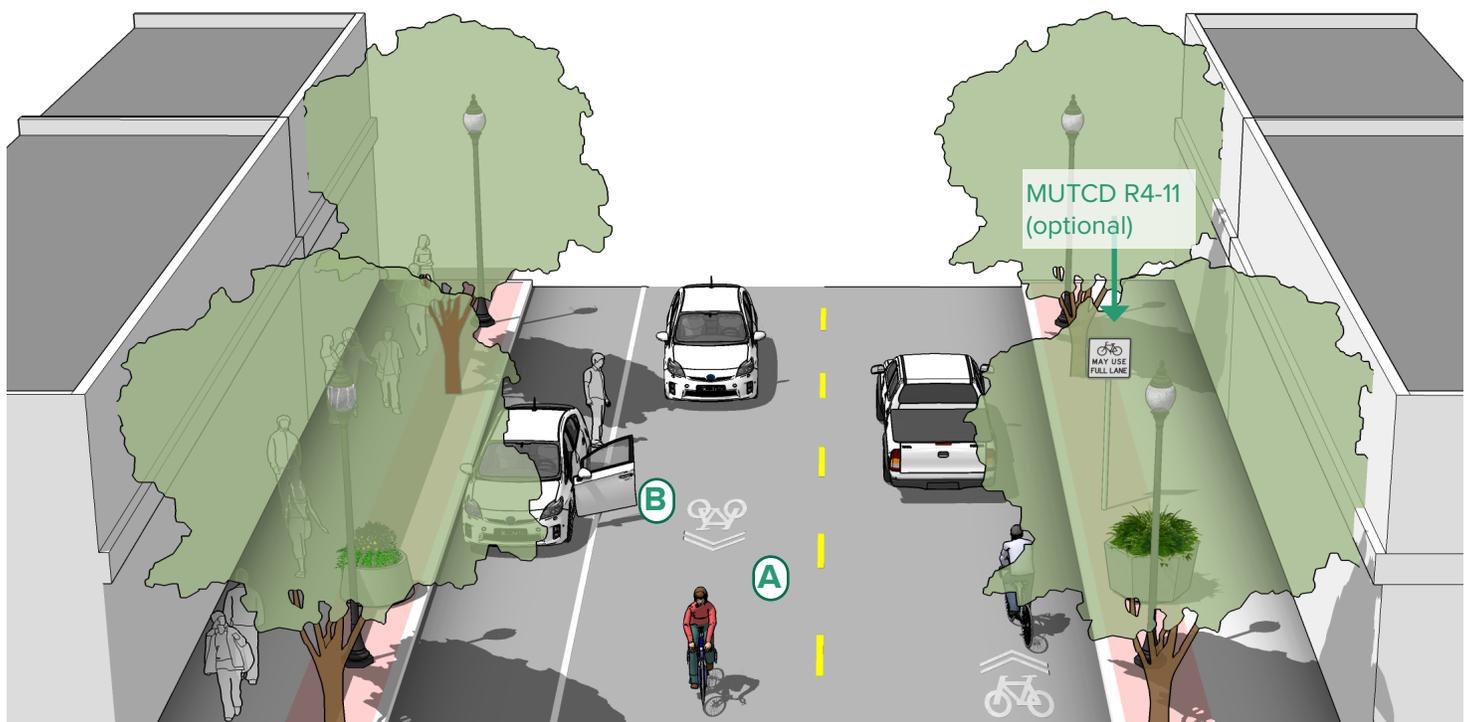
**No Way, No How** – Persons in this category are not bicyclists, and perceive severe safety issues with riding in traffic. Some people in this group may eventually become more regular cyclists with time and education. A significant portion of these people will not ride a bicycle under any circumstances.



**Typical Distribution of Bicyclist Types**

## Signed & Marked Shared Roadway

Signed shared roadways are facilities shared with motor vehicles. They are typically used on roads with low speeds and traffic volumes, however can be used on higher volume roads with wide outside lanes or shoulders. A motor vehicle driver will usually have to cross over into the adjacent travel lane to pass a bicyclist, unless a wide outside lane or shoulder is provided. A marked shared roadway is a general purpose travel lane marked with shared lane markings (SLM) used to encourage bicycle travel and proper positioning within the lane.



### TYPICAL APPLICATION

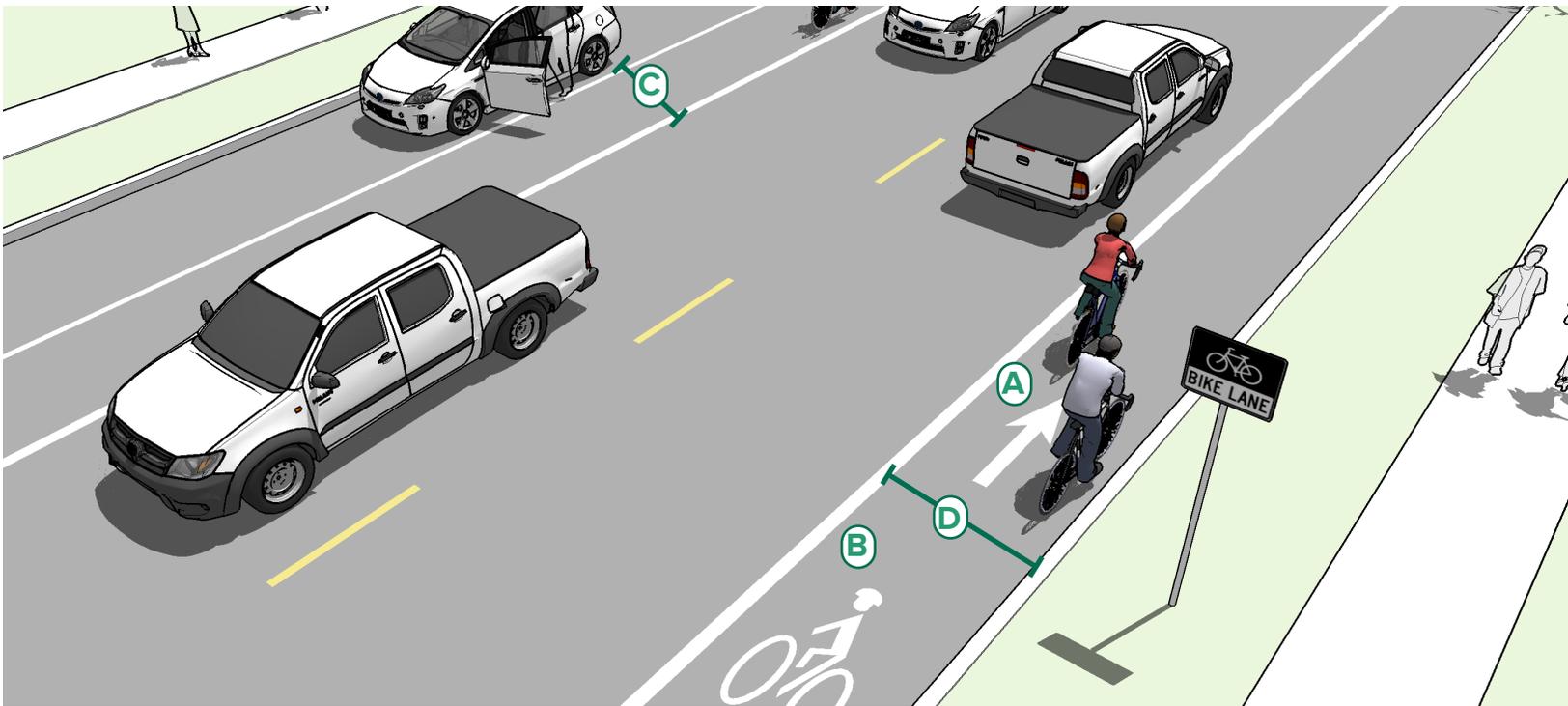
- In constrained conditions, the SLMs are placed in the middle of the lane. On a wide outside lane, the SLMs can be used to promote bicycle travel to the right of motor vehicles.
- In all conditions, SLMs should be placed outside of the door zone of parked cars.

### DESIGN FEATURES

- May be used on streets with a speed limit of 35 mph or under. Lower than 30 mph speed limit preferred.
- (A) In constrained conditions, preferred placement is in the center of the travel lane to minimize wear and promote single file travel.
- (B) Minimum placement of SLM marking centerline is 11 feet from edge of curb where on-street parking is present, 4 feet from edge of curb with no parking. If parking lane is wider than 7.5 feet, the SLM should be moved further out accordingly.

## On-Street Bicycle Lanes

On-street bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signs. The bike lane is located directly adjacent to motor vehicle travel lanes and is used in the same direction as motor vehicle traffic. Bike lanes are typically on the right side of the street, between the adjacent travel lane and curb, road edge or parking lane.



### TYPICAL APPLICATION

- Bike lanes may be used on any street with adequate space, but are most effective on streets with moderate traffic volumes greater than or equal to 6,000 ADT (with a greater than 3,000 ADT min.).
- Bike lanes are most appropriate on streets with low to moderate speeds (25 mph).
- Appropriate for skilled adult riders on most streets.
- May be appropriate for children when configured as 6+ feet wide lanes on lower-speed, lower-volume streets with one lane in each direction.

### DESIGN FEATURES

- (A)** Mark inside line with 6" stripe. Mark 4" parking lane line or "Ts".

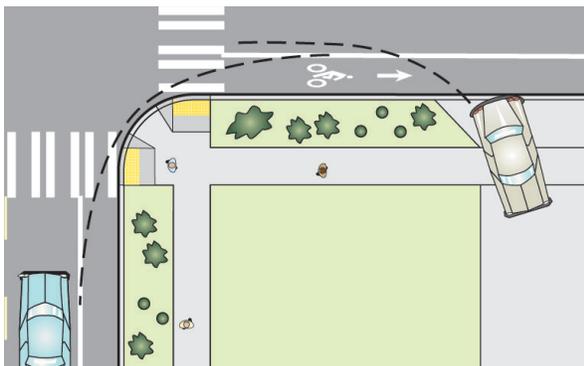
**(B)** Include a bicycle lane marking (MUTCD FIGURE 9C-3) at the beginning of blocks and at regular intervals along the route (MUTCD 9C.04).

**(C)** 6 feet width preferred adjacent to on-street parking (5 feet min.).

**(D)** 6 feet preferred (5 feet min.) adjacent to curb and gutter (4 feet min.) or 4 feet more than the gutter pan width.

  - 6 feet preferred where no curb and gutter exists (4 feet minimum).

### Place Bike Lane Symbols to Reduce Wear



Bike lane word, symbol, and/or arrow markings (MUTCD Figure 9C-3) shall be placed outside of the motor vehicle tread path in order to minimize wear from the motor vehicle path (NACTO 2012).

### Bicycle Lane



Bicycle lanes provide an exclusive space, but may be subject to unwanted encroachment by motor vehicles.

## FURTHER CONSIDERATIONS

On high speed streets (greater than or equal to 40 mph) the minimum bike lane should be 6 feet.

On streets where bicyclists passing each other is to be expected, where high volumes of bicyclists are present, or where added comfort is desired, consider providing extra wide bike lanes up to 7 feet wide, or configure as a buffered bicycle lane.

It may be desirable to reduce the width of general purpose travel lanes in order to add or widen bicycle lanes.

On multi-lane and/or high speed streets, the most appropriate bicycle facility to provide for user comfort may be buffered bicycle lanes or physically separated bicycle lanes.

### Manhole Covers and Grates

Manhole surfaces should be manufactured with a shallow surface texture in the form of a tight, nonlinear pattern.

If manholes or other utility access boxes are to be located in bike lanes within 50 feet of intersections or within 20 ft of driveways or other bicycle access points, special manufactured permanent, nonstick surfaces will be required to ensure a controlled travel surface for cyclists breaking or turning.

Manholes, drainage grates, or other obstacles should be set flush with the paved roadway. Roadway surface inconsistencies pose a threat to safe riding conditions for bicyclists. Construction of manholes, access panels or other drainage elements will be constructed with no variation in the surface. The maximum allowable tolerance in vertical roadway surface will be 1/4 of an inch.

## CRASH REDUCTION

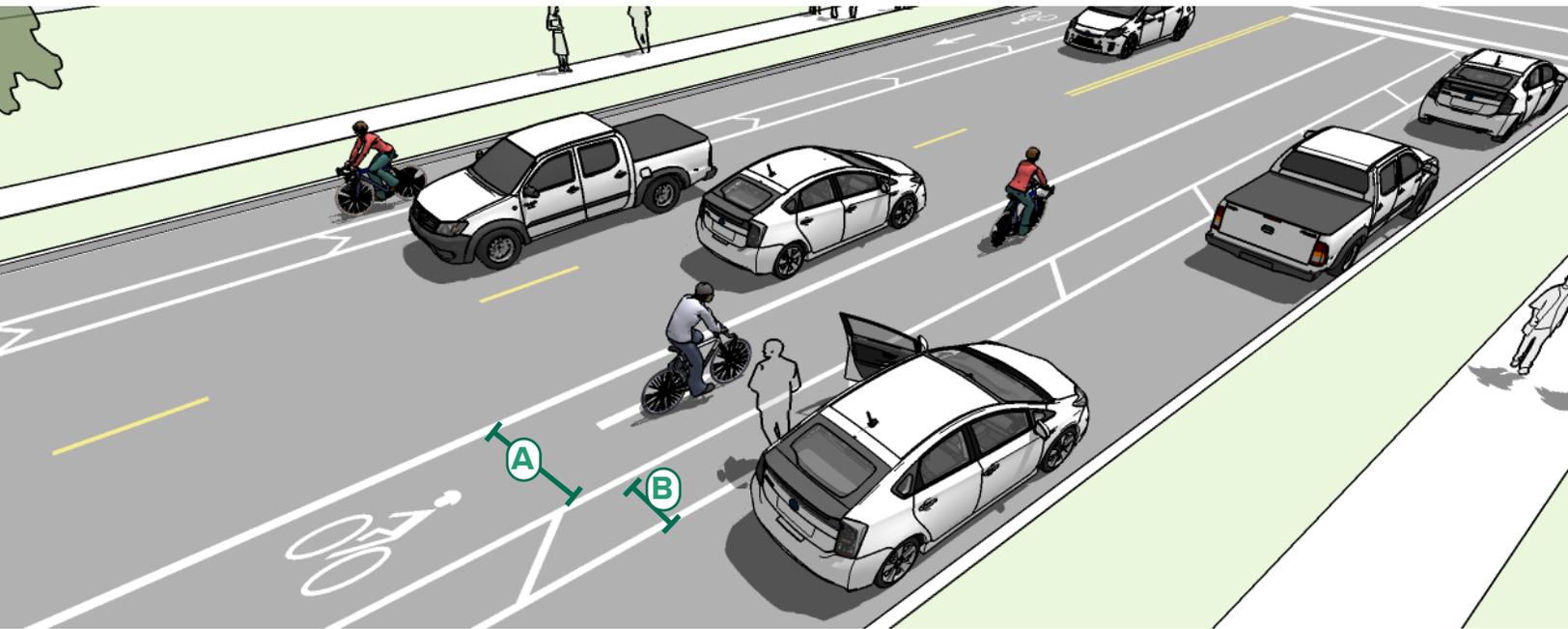
Before and after studies of bicycle lane installations show a wide range of crash reduction factors. Some studies show a crash reduction of 35 percent (CMF ID: 1719) for vehicle/bicycle collisions after bike lane installation.

## CONSTRUCTION COSTS

The cost for installing bicycle lanes will depend on the implementation approach. Typical costs are \$16,000 per mile for restriping.

## Buffered Bicycle Lanes

Buffered bike lanes are conventional bicycle lanes paired with a designated buffer space, separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane.



### TYPICAL APPLICATION

- Anywhere a conventional bike lane is being considered.
- On streets with high speeds and high volumes or high truck volumes.
- On streets with extra lanes or lane width.
- Appropriate for skilled adult riders on most streets.

### DESIGN FEATURES

- A** The minimum bicycle travel area (not including buffer) is 5 feet wide.
- B** Buffers should be at least 2 feet wide. If buffer area is 4 feet or wider, white chevron or diagonal markings should be used.
  - For clarity at driveways or minor street crossings, consider a dotted line.
  - There is no standard for whether the buffer is configured on the parking side, the travel side, or a combination of both.

### Buffered Bicycle Lanes



The use of pavement markings delineates space for bicyclists to ride in a comfortable facility.



The use of pavement markings delineates space for bicyclists to ride in a comfortable facility.

### FURTHER CONSIDERATIONS

- Color may be used within the lane to discourage motorists from entering the buffered lane.
- A study of buffered bicycle lanes found that, in order to make the facilities successful, there needs to also be driver education, improved signage and proper pavement markings.
- On multi-lane streets with high vehicle speeds, the most appropriate bicycle facility to provide for user comfort may be physically separated bike lanes.
- NCHRP Report #766 recommends, when space is limited, installing a buffer space between the parking lane and bicycle lane where on-street parking is permitted rather than between the bicycle lane and vehicle travel lane.

### CRASH PERCEPTION

A before and after study of buffered bicycle lane installation in Portland, OR found an overwhelmingly positive response from bicyclists, with 89 percent of bicyclists feeling safer riding after installation and 91 percent expressing that the facility made bicycling easier.

### CONSTRUCTION COSTS

The cost for installing buffered bicycle lanes will depend on the implementation approach. Typical costs are \$16,000 per mile for restriping. However, the cost of large-scale bicycle treatments will vary greatly due to differences in project specifications and the scale and length of the treatment.

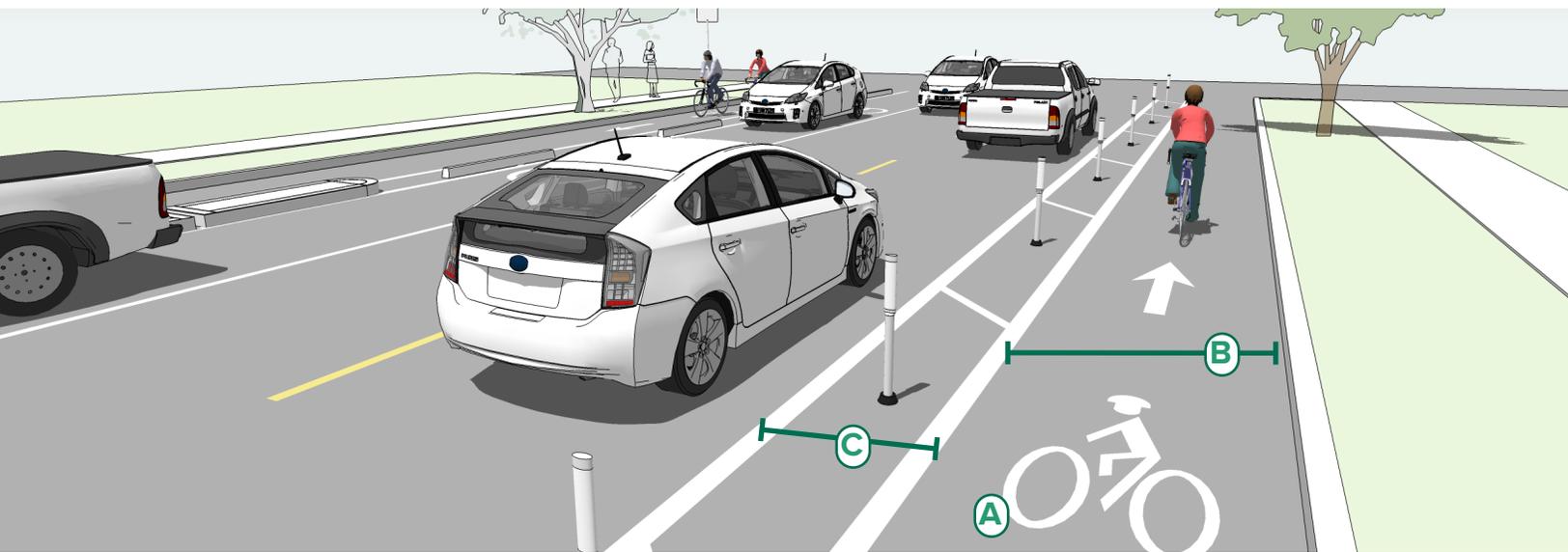
### ADDITIONAL REFERENCES AND GUIDELINES

Monsere, C.; McNeil, N.; and Dill, J., "Evaluation of Innovative Bicycle Facilities: SW Broadway Cycle Track and SW Stark/Oak Street Buffered Bike Lanes. Final Report" (2011). Urban Studies and Planning Faculty Publications and Presentations.

National Cooperative Highway Research Program. Report #766: Recommended Bicycle Lane Widths for Various Roadway Characteristics.

## One-Way Separated Bicycle Lanes

When retrofitting separated bike lanes onto existing streets, a one-way street-level design may be most appropriate. This design provides protection through physical barriers and can include flexible delineators, curbs, on-street parking or other barriers. A street level separated bike lane shares the same elevation as adjacent travel lanes.



### TYPICAL APPLICATION

- Street retrofit projects with limited funds for relocating curbs and drainage.
- Streets with high motor vehicle volumes and/or speeds and high bicycle volumes.
- Streets for which conflicts at intersections can be effectively mitigated using parking lane setbacks, bicycle markings through the intersection, and other signalized intersection treatments.
- Appropriate for most riders on most streets.

### DESIGN FEATURES

- A** Pavement markings, symbols and/or arrow markings must be placed at the beginning of the separated bike lane and at intervals along the facility (MUTCD 9C.04).
- B** 7 feet width preferred to allow bicyclists to pass each other (5 feet minimum).
- C** 3 foot minimum buffer width adjacent to parking. 18 inch minimum adjacent to travel lanes. Channelizing devices should be placed in the buffer area (NACTO, 2012).
- If buffer area is 4 feet or wider, white chevron or diagonal markings should be used.

## Separated Bicycle Lane



Separated Bicycle Lanes can be separated from the street with parking, planters, bollards, or other design elements.

## FURTHER CONSIDERATIONS

- Separated bike lane buffers and barriers are covered in the MUTCD as preferential lane markings (section 3D.01) and channelizing devices (section 3H.01). Curbs may be used as a channeling device, see the section on islands (section 3I.01).
- A retrofit separated bike lane has a relatively low implementation cost compared to road reconstruction by making use of existing pavement and drainage and by using the parking lane as a barrier.
- Gutters, drainage outlets and utility covers should be designed and configured as not to impact bicycle travel.
- Special consideration should be given at transit stops to manage bicycle and pedestrian interactions.

## CRASH REDUCTION

A before and after study in Montreal of physically separated bicycle lanes shows that this type of facility can result in a crash reduction of 74 percent for collisions between bicyclists and vehicles. (CMF ID: 4097) In this study, there was a parking buffer between the bike facility and vehicle travel lanes. Other studies have found a range in crash reductions due to SBL, from 8 percent (CMF ID: 4094) to 94 percent (CMF ID: 4101).

## CONSTRUCTION COSTS

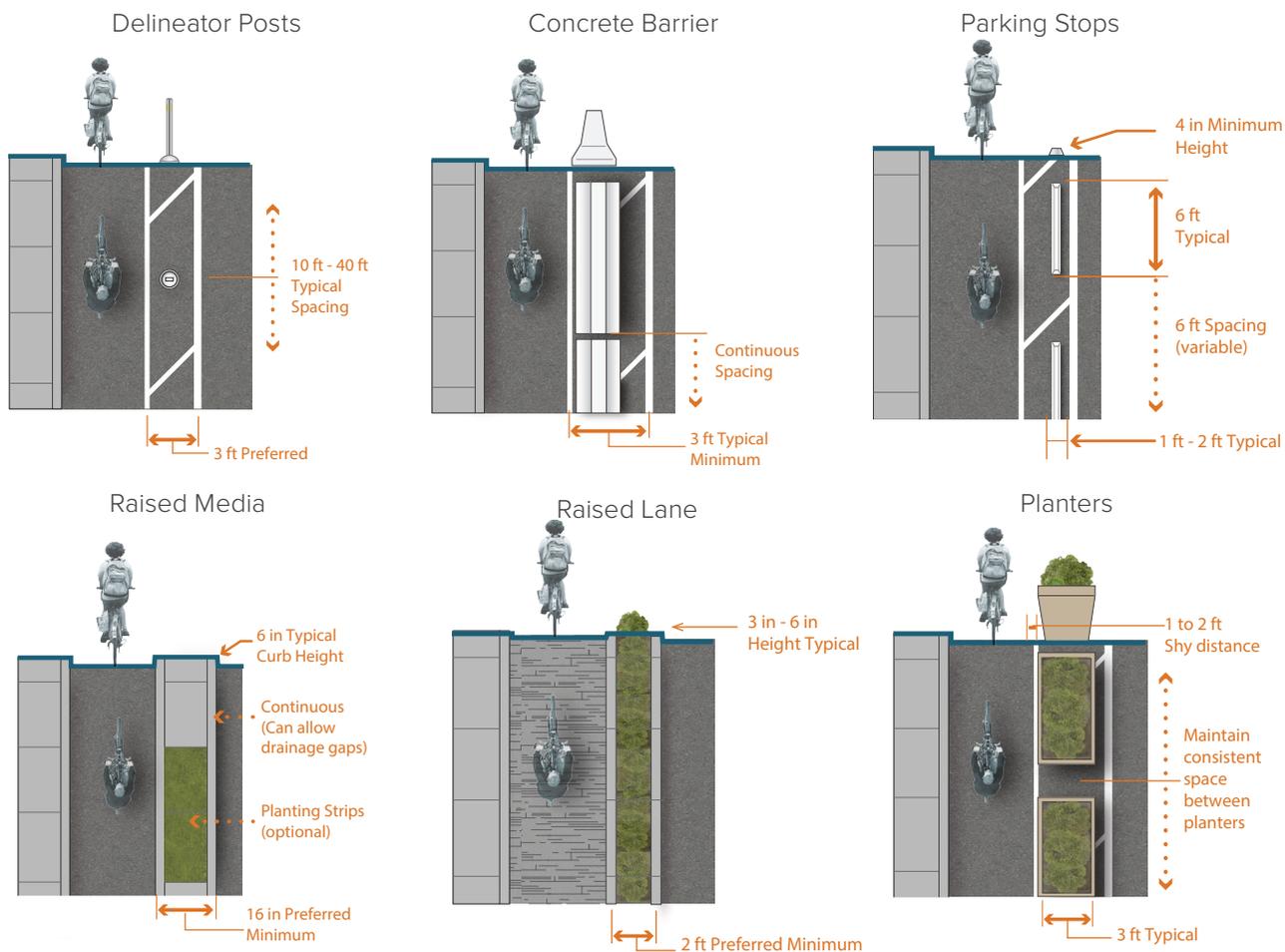
The implementation cost is low if the project uses existing pavement and drainage, but the cost significantly increases if curb lines need to be moved. A parking lane is the low-cost option for providing a barrier. Other barriers might include concrete medians, bollards, tubular markers, or planters.

## ADDITIONAL REFERENCES AND GUIDELINES

FHWA. Separated Bike Lane Planning and Design Guide. 2016.

# Separation Methods

Separated bikeways may use a variety of vertical elements to physically separate the bikeway from adjacent travel lanes. Barriers may be robust constructed elements such as curbs, or may be more interim in nature, such as flexible delineator posts.



## TYPICAL APPLICATION

### Appropriate barriers for retrofit projects:

- Parked Cars
- Flexible delineators
- Bollards
- Planters
- Parking stops

### Appropriate barriers for reconstruction projects:

- Curb separation
- Medians
- Landscaped Medians
- Raised separated bike lane with vertical or mountable curb
- Pedestrian Safety Islands

## Bikeway Separation Methods



Raised separated bikeways are bicycle facilities that are vertically separated from motor vehicle traffic.

## DESIGN FEATURES

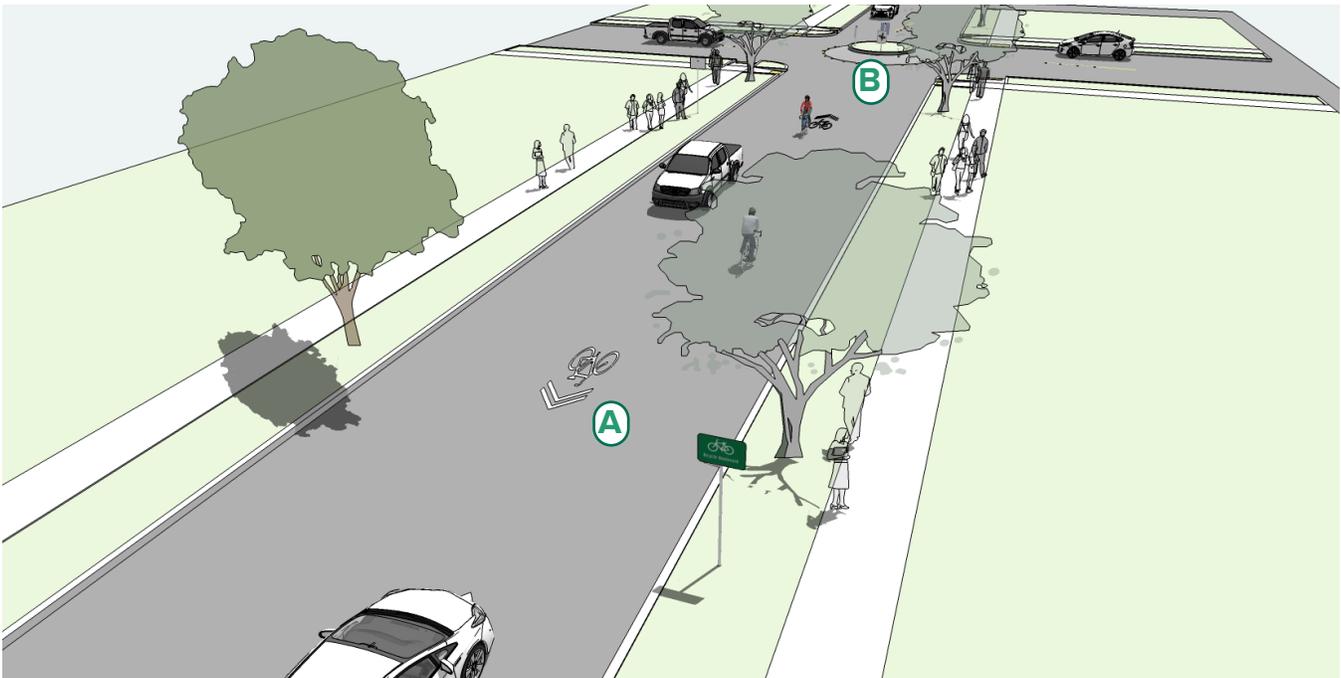
- Maximize effective operating space by placing curbs or delineator posts as far from the through bikeway space as practicable.
- Allow for adequate shy distance of 1 to 2 feet from vertical elements to maximize useful space.
- When next to parking allow for 3 feet of space in the buffer space to allow for opening doors and passenger unloading.
- The presences of landscaping in medians, planters and safety islands increases comfort for users and enhances the streetscape environment.

## FURTHER CONSIDERATIONS

- Separated bikeway buffers and barriers are covered in the MUTCD as preferential lane markings (section 3D.01) and channelizing devices (section 3H.01). Curbs may be used as a channeling device, see the section on islands (section 3I.01).
- With new roadway construction a raised separated bikeway can be less expensive to construct than a wide or buffered bicycle lane, because of shallower trenching and sub-base requirements.
- Parking should be prohibited within 30 feet of the intersection to improve visibility.

## Neighborhood Byways

Neighborhood byways are low-volume, low-speed streets modified to enhance bicyclist and pedestrian comfort by using treatments such as signage, pavement markings, traffic calming and/or traffic reduction, and intersection modifications. These treatments allow through movements of bicyclists while discouraging similar through-trips by non-local motorized traffic.



### TYPICAL APPLICATION

- Parallel with and in close proximity to major thoroughfares (1/4 mile or less).
- Follow a desire line for bicycle travel that is ideally long and relatively continuous (2-5 miles).
- Avoid alignments with excessive zigzag or circuitous routing. The bikeway should have less than 10 percent out of direction travel compared to shortest path of primary corridor.
- Streets with travel speeds at 25 mph or less and with traffic volumes of fewer than 3,000 vehicles per day.

### DESIGN FEATURES

- A** Signs and pavement markings are the minimum treatments necessary to designate a street as a bicycle boulevard.
- B** Intersection crossings should be designed to enhance safety and minimize delay for bicyclists. Midblock crossings, traffic diverters, curb extensions, traffic circles, and/or signals such as RRFB's are appropriate treatments

### Bicycle Boulevards



Neighborhood byways are established on streets that improve connectivity to key destinations and provide a direct, low-stress route for bicyclists, with low motorized traffic volumes and speeds, designated and designed to give bicycle travel priority over other modes.

### Traffic Calming



Streets along classified neighborhood byways may require additional traffic calming measures to discourage through trips by motor vehicles.

## FURTHER CONSIDERATIONS

Neighborhood byway retrofits to local streets are typically located on streets without existing signalized accommodation at crossings of collector and arterial roadways. Without treatments for bicyclists, these intersections can become major barriers along the bicycle boulevard and compromise safety.

Traffic calming can deter motorists from driving on a street. Anticipate and monitor vehicle volumes on adjacent streets to determine whether traffic calming results in inappropriate volumes. Traffic calming can be implemented on a trial basis.

## CRASH REDUCTION

In a comparison of vehicle/cyclist collision rates on traffic-calmed side streets signed and improved for cyclist use, compared to parallel and adjacent arterials with higher speeds and volumes, the bicycle boulevard as found to have a crash reduction factor of 63 percent, with rates two to eight times lower when controlling for volume (CMF ID: 3092).

## CONSTRUCTION COSTS

Costs vary depending on the type of treatments proposed for the corridor. Simple treatments such as wayfinding signage and markings are most cost-effective, but more intensive treatments will have greater impact at lowering speeds and volumes, at a higher cost.



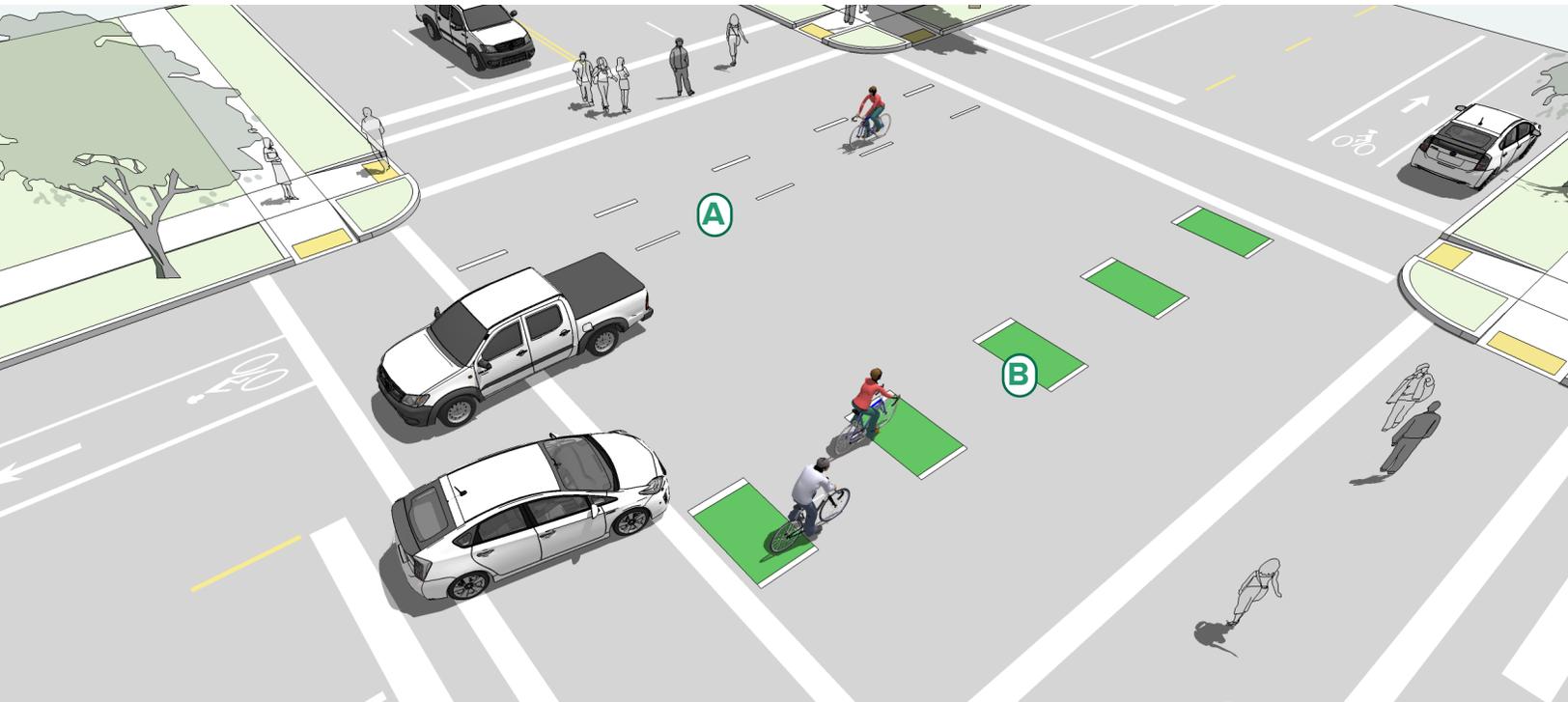
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BICYCLE FACILITIES AT  
INTERSECTIONS

# Intersection Crossing Markings

Bicycle pavement markings through intersections guide bicyclists on a safe and direct path through the intersection and provide a clear boundary between the paths of through bicyclists and vehicles in the adjacent lane.



## TYPICAL APPLICATION

- Streets with conventional, buffered, or separated bike lanes.
- At direct paths through intersections.
- Streets with high volumes of adjacent traffic.
- Where potential conflicts exist between through bicyclists and adjacent traffic.

## DESIGN FEATURES

- Intersection markings should be the same width and in line with leading bike lane.
- A Dotted lines should be a minimum of 6 inches wide and 4 feet long, spaced every 12 feet.
- All markings should be white, skid resistant and retro-reflective (MUTCD 9C.02.02).
- B Green pavement markings may be used between the dotted lines to enhance visibility.

## Intersection Crossing Markings



Intersection crossing markings can be used at signalized intersections or high volume minor street and driveway crossings, as illustrated above.

## FURTHER CONSIDERATIONS

Dropped lanes, where a through lane transitions to the right turn lane, can be particularly challenging for bicyclists and should be avoided where practicable.

### CRASH REDUCTION

A study on the safety effects of intersection crossing markings found a reduction in accidents by 10 percent and injuries by 19 percent.

A study in Portland, OR found that significantly more motorists yielded to bicyclists after the colored pavement had been installed (92 percent in the after period versus 72 percent in the before period).

### CONSTRUCTION COSTS

The cost for installing intersection crossing markings will depend on the implementation approach. On roadways with adequate width for reconfiguration or restriping, costs may be negligible when provided as part of routine overlay or repaving projects.

Typical shared lane markings cost \$180 each.

### Additional References and Guidelines

*Letter to FHWA from the Bicycle Technical Committee for the MUTCD. Bicycle Lane Extensions through Intersections. June 2014.*

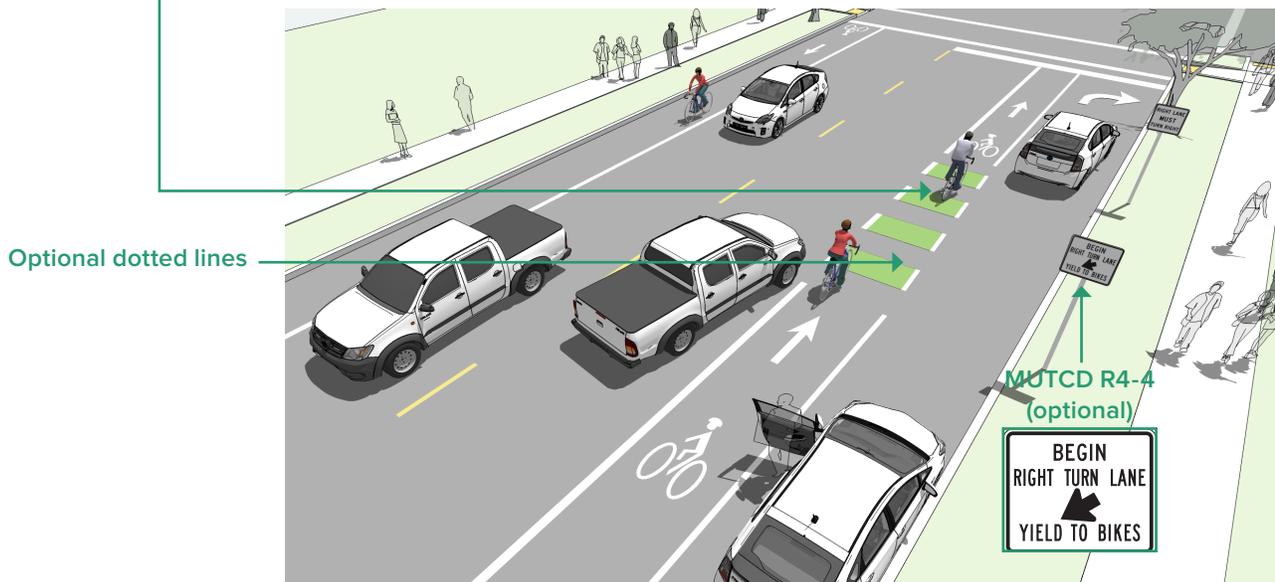
*Jensen, S.U. (2008). Safety effects of blue cycle crossings: A before-after study. Accident Analysis & Prevention, 40(2), 742-750.*

*Hunter, W.W. et al. (2000). Evaluation of Blue Bike-Lane Treatment in Portland, Oregon. Transportation Research Record, 1705, 107-115.*

## Bike Lanes at Right Turns

The appropriate treatment at right-turn lanes is to place the bike lane between the right-turn lane and the right-most through lane or, where right-of-way is insufficient, to use a shared bike lane/turn lane.

Colored pavement may be used in the weaving area to increase visibility and awareness of potential conflict



### TYPICAL APPLICATION & DESIGN FEATURES

#### At auxiliary right turn only lanes (add lane):

- Continue existing bike lane width; standard width of 5 to 6 feet or 4 feet in constrained locations.
- Use signage to indicate that motorists should yield to bicyclists through the conflict area.
- Consider using colored conflict areas to promote visibility of the mixing zone.

#### Where a through lane becomes a right turn only lane:

- Do not define a dotted line merging path for bicyclists.
- Drop the bicycle lane in advance of the merge area.
- Use shared lane markings to indicate shared use of the lane in the merging zone.

## Bike Lanes at Right Turns



Drivers wishing to enter the right turn lane must transition across the bicycle lane in advance of the turn.

## FURTHER CONSIDERATIONS

- The bicycle lane maintains a straight path, and drivers must weave across, providing clear right-of-way priority to bicyclists.
- Maintaining a straight bicycle path reinforces the priority of bicyclists over turning cars. Drivers must yield to bicyclists before crossing the bike lane to enter the turn only lane.
- Through lanes that become turn only lanes are difficult for bicyclists to navigate and should be avoided.
- The use of dual right-turn-only lanes should be avoided on streets with bike lanes (AASHTO, 2013). Where there are dual right-turn-only lanes, the bike lane should be placed to the left of both right-turn lanes, in the same manner as where there is just one right-turn-only lane.

## CRASH REDUCTION

Studies have shown a 3 percent decrease in crashes at signalized intersections with exclusive right turn lanes when compared to sharing the roadway with motor vehicles (CMF ID: 3257).

## CONSTRUCTION COSTS

The cost for installing bicycle lanes will depend on the implementation approach. On roadways with adequate width for reconfiguration or restriping, costs may be negligible when provided as part of routine overlay or repaving projects.

Typical costs are \$16,000 per mile for restriping.



### Combined Bike Lane/Turn Lane



Shared lane markings and signs indicate that bicyclists should ride on the left side of this right turn only lane.

## FURTHER CONSIDERATIONS

- This treatment is recommended at intersections lacking sufficient space to accommodate both a standard through bike lane and right turn lane.
- Not recommended at intersections with high peak motor vehicle right turn movements.
- Combined bike lane/turn lane creates safety and comfort benefits by negotiating conflicts upstream of the intersection area.

## CRASH REDUCTION

A survey in Eugene, OR found that more than 17 percent of the surveyed bicyclists using the combined turn lane felt that it was safer than the comparison location with a standard-width right-turn lane, and another 55 percent felt that the combined-lane site was no different safety-wise than the standard-width location.

## CONSTRUCTION COSTS

The cost for installing a combined turn lane will depend on the implementation approach. On roadways with adequate width for reconfiguration or restriping, costs may be negligible when provided as part of routine overlay or repaving projects.

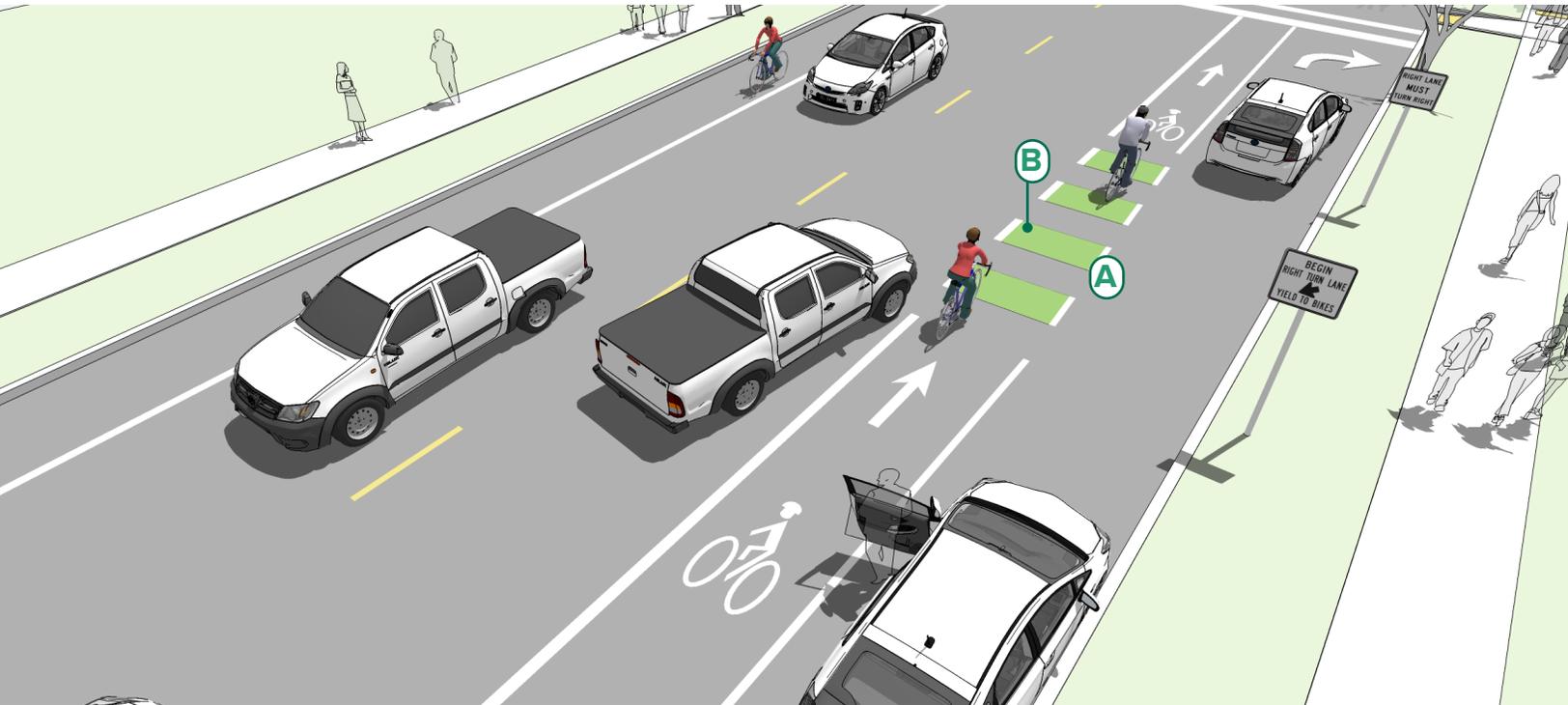
Typical costs are \$16,000 per mile for restriping. Typical yield lines cost \$10 per square foot or \$320 each. Typical shared lane markings cost \$180 each.

### Additional References and Guidelines

Hunter, W.W. (2000). Evaluation of a Combined Bicycle Lane/Right-Turn Lane in Eugene, Oregon. Publication No. FHWA-RD-00-151, Federal Highway Administration, Washington, DC.

## Colored Bicycle Lanes

Colored pavement within a bicycle lane may be used to increase the visibility of the bicycle facility, raise awareness of the potential to encounter bicyclists and reinforce priority of bicyclists in conflict areas.



### TYPICAL APPLICATION

- Within a weaving or conflict area to identify the potential for bicyclist and motorist interactions and assert bicyclist priority.
- Across intersections, driveways and stop or yield-controlled cross-streets.

### DESIGN FEATURES

- (A)** Typical white bike lanes (solid or dotted 6 inch stripe) are used to outline the green colored pavement.
- (B)** In weaving or turning conflict areas, preferred striping is dashed, to match the bicycle lane line extensions.
  - The colored surface should be skid resistant and retro-reflective (MUTCD 9C.02.02).
  - In exclusive use areas, such as bike boxes, color application should be solid green.

## Colored Bicycle Lane



A colored bicycle lane on Laurel Street in Santa Cruz, CA alerts users to potential merging in advance of an intersection.

## FURTHER CONSIDERATIONS

- Green colored pavement shall be used in compliance with FHWA Interim Approval (FHWA IA-14.10).
- While other colors have been used (red, blue, yellow), green is the recommended color in the US.
- The application of green colored pavement within bicycle lanes is an emerging practice. The guidance recommended here is based on best practices in cities around the county.

## CRASH REDUCTION

Before and after studies of colored bicycle lane installations have found a reduction in bicycle/vehicle collisions by 38 percent and a reduction in serious injuries and fatalities of bicyclists by 71 percent. A study in Portland, OR found a 38 percent decrease in the rate of conflict between bicyclists and motorists after colored lanes were installed.

## CONSTRUCTION COSTS

The cost for installing colored bicycle lanes will depend on the materials selected and implementation approach. Typical costs range from \$1.20/sq. foot installed for paint to \$14/sq. foot installed for Thermoplastic. Colored pavement is more expensive than standard asphalt installation, costing 30-50 percent more than non-colored asphalt.

## Additional References and Guidelines

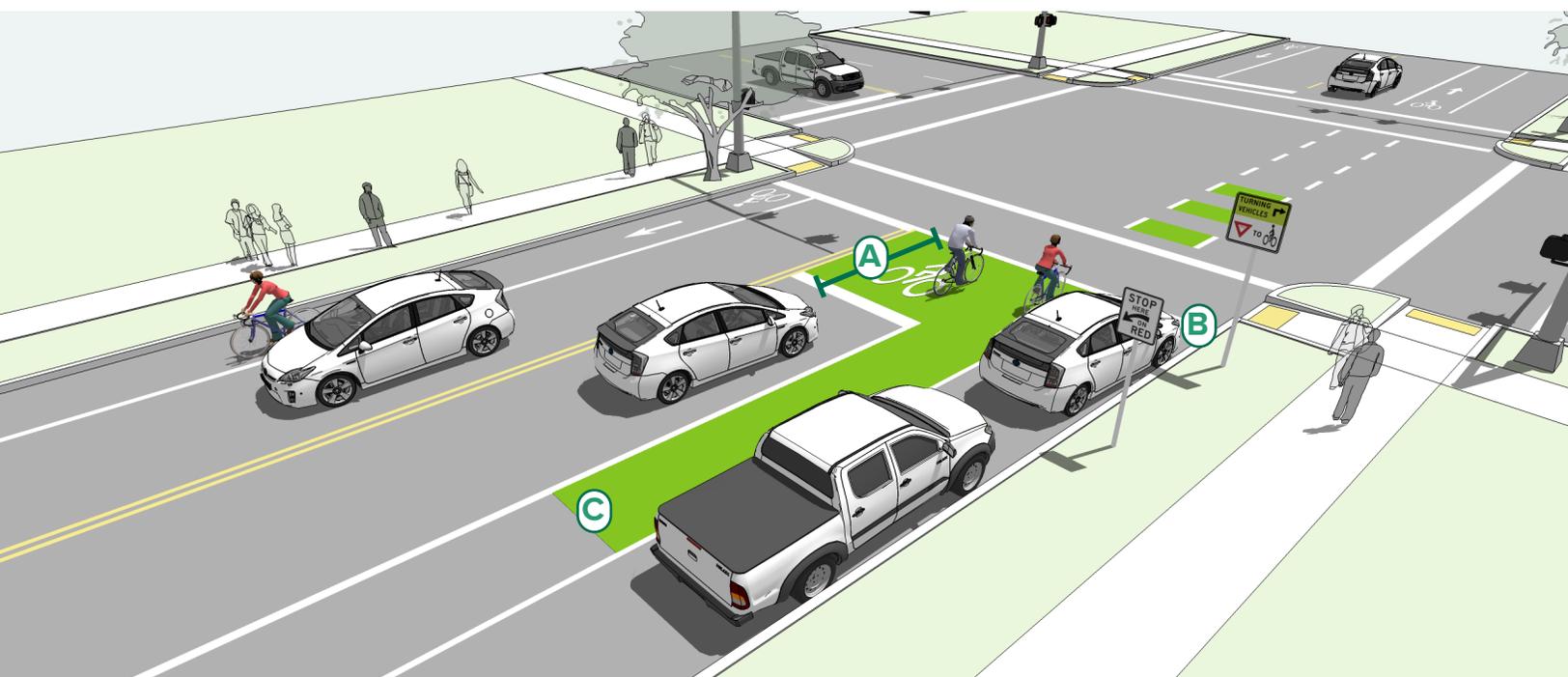
FHWA. Interim Approval for Optional Use of Green Colored Pavement for Bike Lanes (IA-14). 2011.

Jensen, S.U., et. al., "The Marking of Bicycle Crossings at Signalized Intersections," Nordic Road and Transport Research No. 1, 1997, pg. 27.

Hunter, W. W., et. al., Evaluation of the Blue Bike-Lane Treatment Used in Bicycle/Motor Vehicle Conflict Areas in Portland, Oregon, McLean, VA: FHWA, 2000, pg. 25.

## Bike Box

A bike box is a designated area located at the head of a traffic lane at a signalized intersection that provides bicyclists with a safe and visible space to get in front of queuing traffic during the red signal phase. Motor vehicles must queue behind the white stop line at the rear of the bike box. On a green signal, all bicyclists can quickly clear the intersection.



### TYPICAL APPLICATION

- At potential areas of conflict between bicyclists and turning vehicles, such as a right or left turn locations.
- At signalized intersections with high bicycle volumes.
- At signalized intersections with high vehicle volumes.

### DESIGN FEATURES

- A** 14 foot minimum depth from back of crosswalk to motor vehicle stop bar (NACTO, 2012).
- B** A “No Turn on Red” (MUTCD R10-11) sign shall be installed overhead to prevent vehicles from entering the Bike Box. A “Stop Here on Red” (MUTCD R10-6) sign should be post mounted at the stop line to reinforce observance of the stop line.
- C** A 50 foot ingress lane should be used to provide access to the box.

  - Use of green colored pavement is optional.

## Bike Box



A bike box allows for cyclists to wait in front of queuing traffic, providing high visibility, and a head start over motor vehicle traffic.

## FURTHER CONSIDERATIONS

- This treatment positions bicycles together and on a green signal, all bicyclists can quickly clear the intersection, minimizing conflict and delay to transit or other traffic.
- Pedestrians also benefit from bike boxes, as they experience reduced vehicle encroachment into the crosswalk.

## CRASH REDUCTION

A study of motorist/bicyclist conflicts at bike boxes indicate a 35 percent decrease in conflicts (CMF ID: 1718). A study done in Portland in 2010 found that 77 percent of bicyclists felt bicycling through intersections was safer with the bike boxes.

## CONSTRUCTION COSTS

Costs will vary due to the type of paint used and the size of the bike box, as well as whether the treatment is added at the same time as other road treatments.

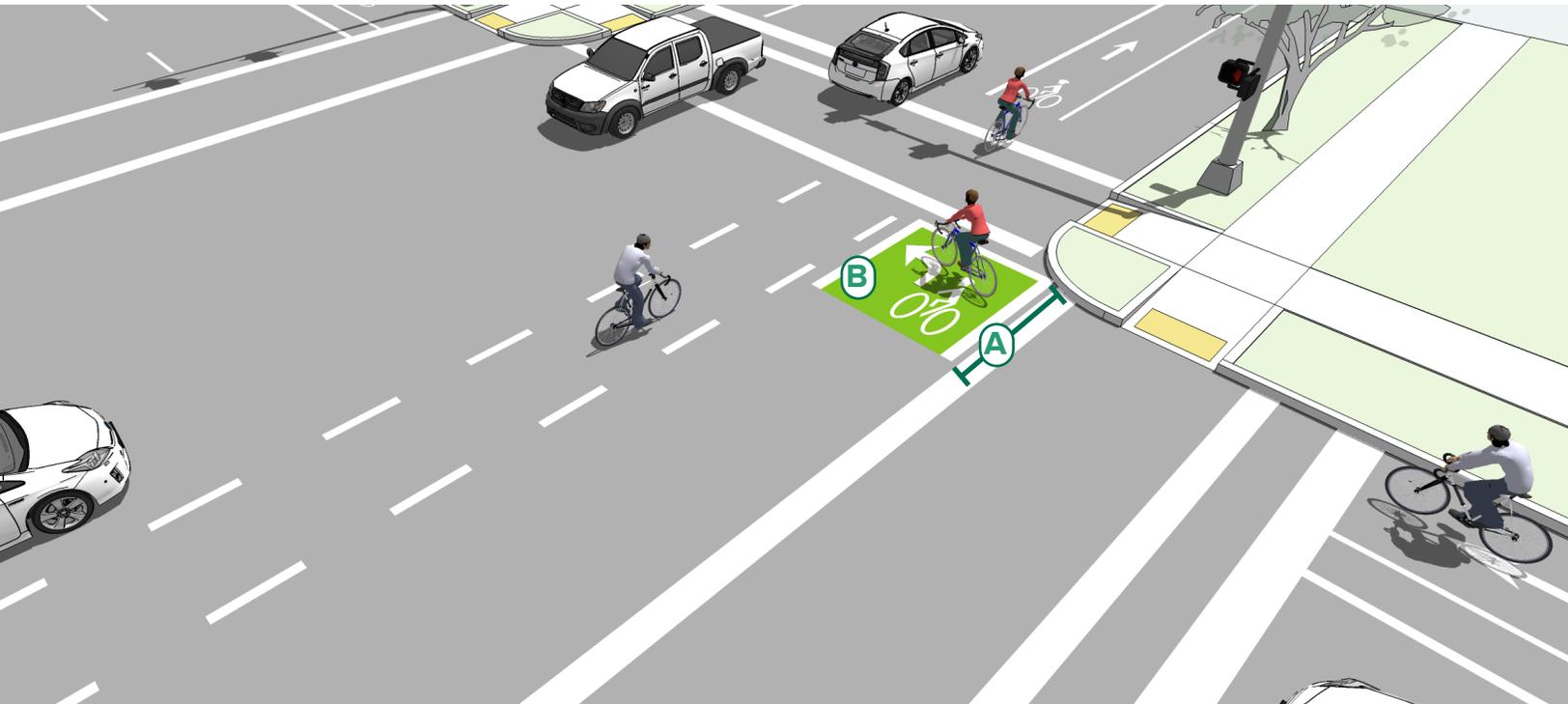
The typical cost for painting a bike box is \$11.50 per sq. foot.

## Additional References and Guidelines

*Monsere, C. & Dill, J. (2010). Evaluation of Bike Boxes at Signalized Intersections. Final Draft. Oregon Transportation Research and Education Consortium.*

## Two-Stage Turn Boxes

Two-stage turn boxes offer bicyclists a safe way to make turns at multi-lane signalized intersections from a physically separated or conventional bike lane. On physically separated bike lanes, bicyclists are often unable to merge into traffic to turn due to physical separation, making the provision of two-stage turn boxes critical.



### TYPICAL APPLICATION

- Streets with high vehicle speeds and/or traffic volumes.
- At intersections locations of multi-lane roads with signalized intersections.
- At signalized intersections with a high number of bicyclists making a left turn from a right side facility.

### DESIGN FEATURES

- The two-stage turn box shall be placed in a protected area. Typically this is within the shadow of an on-street parking lane or separated bike lane buffer area and should be placed in front of the crosswalk to avoid conflict with pedestrians.
- (A)** 8 foot by 6 foot preferred depth of bicycle storage area (6 foot by 3 foot minimum).
- (B)** Bicycle stencil and turn arrow pavement markings shall be used to indicate proper bicycle direction and positioning (NACTO, 2012).

**Jughandle Turn Box**

This MUTCD compliant design carves a jughandle out of the sidewalk to provide space for waiting bicyclists.

**Separated Bike Lane Turn Box**

On separated bike lanes, the two-stage turn box can be located in the protected buffer/parking area.

**FURTHER CONSIDERATIONS**

- Consider providing a “No Turn on Red” (MUTCD R10-11) on the cross street to prevent motor vehicles from entering the turn box.
- This design formalizes a maneuver called a “box turn” or “pedestrian style turn.”
- Some two-stage turn box designs are considered experimental by FHWA.
- Design guidance for two-stage turns apply to both bike lanes and separated bike lanes.
- Two-stage turn boxes reduce conflicts in multiple ways; from keeping bicyclists from queuing in a bike lane or crosswalk and by separating turning bicyclists from through bicyclists.
- Bicyclist capacity of a two-stage turn box is influenced by physical dimension (how many bicyclists it can contain) and signal phasing (how frequently the box clears).

**CRASH REDUCTION**

There are no Crash Modification Factors (CMFs) available for this treatment.

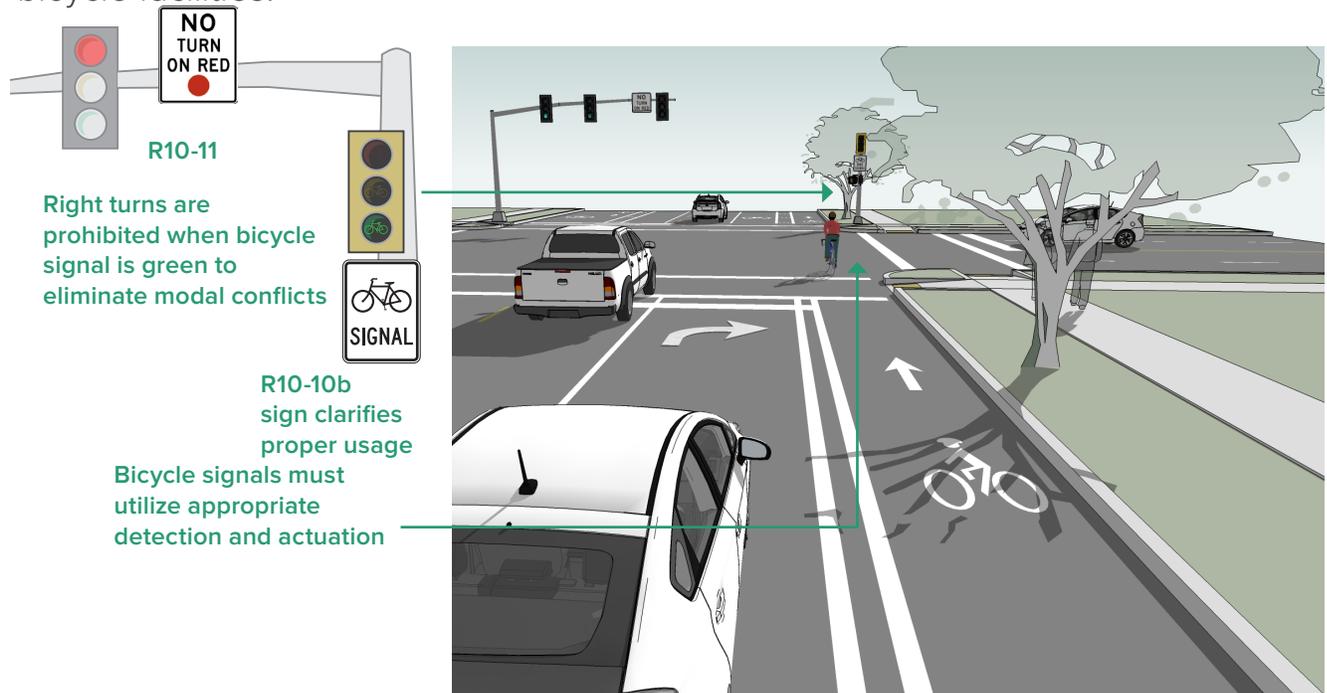
**CONSTRUCTION COSTS**

Costs will vary due to the type of paint used and the size of the two-stage turn box, as well as whether the treatment is added at the same time as other road treatments.

The typical cost for painting a two-stage turn box is \$11.50 per square ft.

## Bike Signal Head

A bicycle signal is an electrically powered traffic control device that should only be used in combination with an existing traffic signal. Bicycle signals are typically used to improve identified safety or operational problems involving bicycle facilities.



### TYPICAL APPLICATION

- Bicycle signal heads may be installed at signalized intersections to indicate bicycle signal phases and other bicycle-specific timing strategies. Bicycle signals can be actuated with bicycle sensitive loop detectors, video detection, or push buttons.
- Bicycle signals are typically used to provide guidance for bicyclists at intersections where they may have different needs from other road users (e.g. bicycle-only movements).

### DESIGN FEATURES

Specific locations where bicycle signals have had a demonstrated positive effect include:

- Those with high volume of bicyclists at peak hours
- Those with high numbers of bicycle/motor vehicle crashes, especially those caused by turning vehicle movements
- At T-intersections with major bicycle movement along the top of the "T."
- At the confluence of an off-street bike path and a roadway intersection
- Where separated bike paths run parallel to arterial streets

### ADDITIONAL REFERENCES AND GUIDELINES

FHWA. MUTCD - Interim Approval for Optional Use of a Bicycle Signal Face (IA-16). 2013.

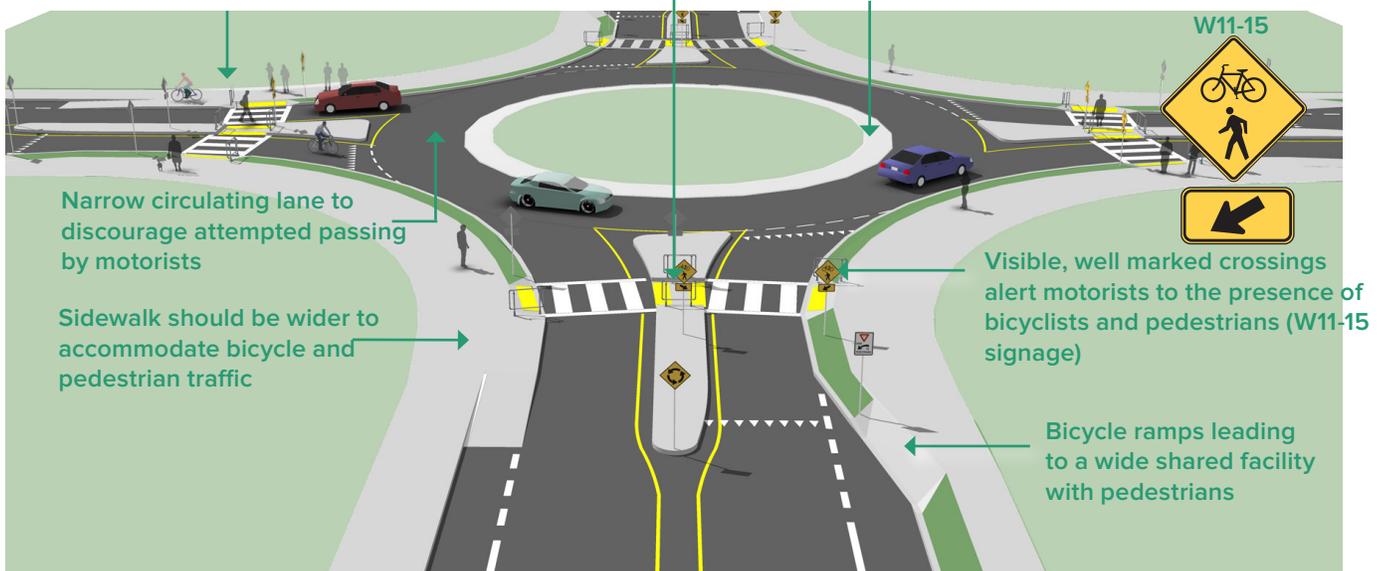
## Bicyclists at Single Lane Roundabouts

Roundabouts are circular intersection designed with yield control for all entering traffic, channelized approaches and geometry to induce desirable speeds. They are used as an alternative to intersection signalization.

Holding rails with bicycle foot rests can provide support for elderly pedestrians or bicyclists waiting to cross the street.

Crossings set back at least one car length from the entrance of the roundabout

Truck apron can provide adequate clearance for longer vehicles



### TYPICAL APPLICATION

- On bicycle routes a roundabout or neighborhood traffic circle is preferable to stop control as bicyclists do not like to lose their momentum due to physical effort required.
- At intersections of multi-use paths, pedestrian and bicycle only roundabouts are an excellent form of non-motorized user traffic control.

### DESIGN FEATURES

It is important to indicate to motorists, bicyclists and pedestrians the right-of-way rules and correct way for them to circulate, using appropriately designed signage, pavement markings, and geometric design elements.

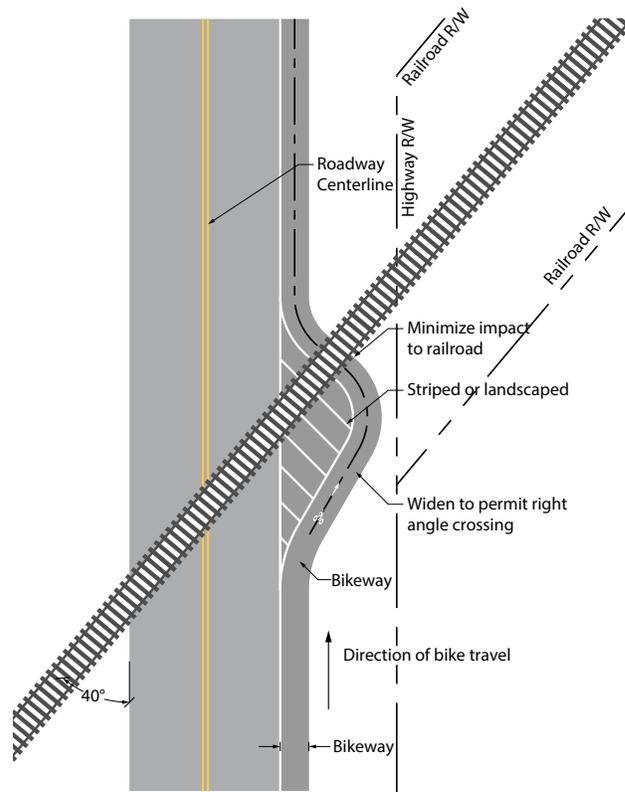
- 25 mph maximum circulating design speed.
- Design approaches/exits to the lowest speeds possible.
- Encourage bicyclists navigating the roundabout like motor vehicles to “take the lane.”
- Maximize yielding rate of motorists to pedestrians and bicyclists at crosswalks.
- Provide separated facilities for bicyclists who prefer not to navigate the roundabout on the roadway.

## Railroad At-grade Crossings

Railroad tracks intersecting with bicycle facilities can be hazardous for bicyclists, people in wheelchairs, and other small-wheeled transportation devices. Rails can cause steering difficulties, wheel damage, or loss of control of the bicycle. Additionally, pavement surfaces, rails, and gaps may be uneven, causing additional obstacles for bicyclists, and metal rails can be slippery when wet.

### TYPICAL APPLICATION

- Any bicycle facility on streets that intersect railroads
- Off-street facilities (shared use paths) that intersect railroads



### DESIGN FEATURES

- Crossing angles should be designed as close to 90 degrees as possible, but no less than 60 degrees. The angle is important to reduce the likelihood of bicycle wheels getting stuck in the flangeway.
- Where 90 degrees cannot be achieved, pavement markings may be added to help guide bicyclists through at the correct angle
- Minimum width of bicycle facilities crossing railroad tracks is 6' to allow for lateral maneuvering if necessary
- Avoid reverse curves when possible as reverse curves require bicyclists to cross tracks when leaning
- Warning signs or markings should be used to inform bicyclists of upcoming rail crossing. Advance warning sign (MUTCD W10-1) and STOP (R1-1) or YIELD (R1-2) signs are required at all railroad crossings that are not equipped with train activated flashing lights
- Detectable warnings are required for any pedestrian facilities at railroad crossings for ADA compliance

### ADDITIONAL REFERENCES AND GUIDELINES

AASHTO, *Guide for the Development of Bicycle Facilities*. Fourth Edition (2012).



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BICYCLE FACILITY AMENITIES

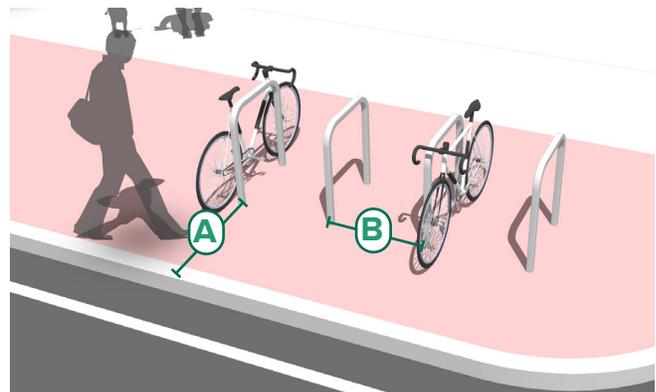
## Bike Parking

Bicyclists expect a safe, convenient place to secure their bicycle when they reach their destination. This may be short-term parking of two hours or less, or long-term parking for employees, students, residents, and commuters.

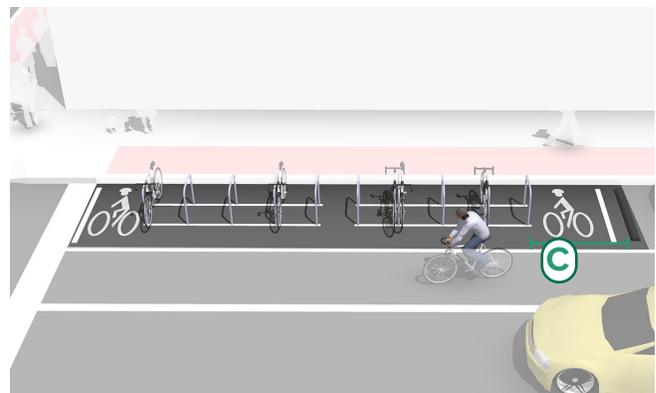
### TYPICAL APPLICATION

- Bicycle parking facilities shall be located in highly visible well-lighted areas. In order to maximize security, whenever possible short-term bicycle parking facilities shall be located in areas highly visible from the street and from the interior of the building they serve (i.e. placed adjacent to windows).
- Bike racks provide short-term bicycle parking and is meant to accommodate visitors, customers, and others expected to depart within two hours. It should be an approved standard rack, appropriate location and placement, and weather protection.
- On-street bike corrals (also known as on-street bicycle parking) consist of bicycle racks grouped together in a common area within the street traditionally used for automobile parking. Bicycle corrals are reserved exclusively for bicycle parking and provide a relatively inexpensive solution to providing high-volume bicycle parking. Bicycle corrals can be implemented by converting one or two on-street motor vehicle parking spaces into on-street bicycle parking. Each motor vehicle parking space can be replaced with approximately 6-10 bicycle parking spaces.

#### Perpendicular Bike Racks



#### Bike Corral



### CONSTRUCTION COSTS

Costs can vary based on the design and materials used. Bicycle rack costs can range from approximately \$60 to \$3,600, depending on design and materials used. On average the cost is approximately \$660. Bicycle lockers costs range from \$1,280 to \$2,680.

## Wayfinding Sign Types

The ability to navigate through a city is informed by landmarks, natural features, and other visual cues. Signs throughout the city should indicate to bicyclists the direction of travel, the locations of destinations and the travel time/distance to those destinations. A bicycle wayfinding system consists of comprehensive signing and/or pavement markings to guide bicyclists to their destinations along preferred bicycle routes.



D11-1c



D1-1



D11-1/D1-3a

### TYPICAL APPLICATION

- Wayfinding signs will increase users' comfort and accessibility to the bicycle network.
- Signage can serve both wayfinding and safety purposes including:
  - Helping to familiarize users with the bicycle network
  - Helping users identify the best routes to destinations
  - Helping to address misconceptions about time and distance
  - Helping overcome a “barrier to entry” for people who are not frequent bicyclists (e.g., “interested but concerned” bicyclists)

### DESIGN FEATURES

- Ⓐ Confirmation signs indicate to bicyclists that they are on a designated bikeway. Make motorists aware of the bicycle route. Can include destinations and distance/time but do not include arrows.
- Ⓑ Turn signs indicate where a bikeway turns from one street onto another street. These can be used with pavement markings and include destinations and arrows.
- Ⓒ Decisions signs indicate the junction of two or more bikeways and inform bicyclists of the designated bike route to access key destinations. These include destinations, arrows and distances. Travel times are optional but recommended.

**Community Logos on Signs**



Wayfinding signs can include a local community identification logo, as this example from Oakland, CA.

**Custom Street Signs (Berkeley, CA)**



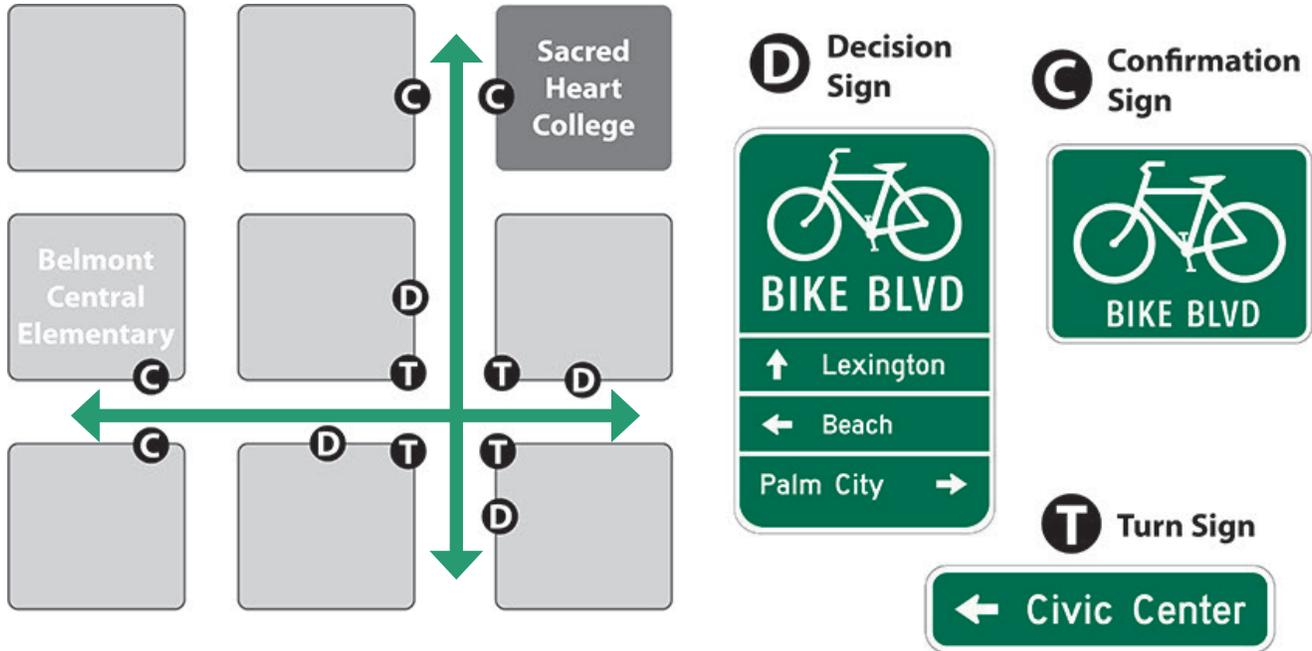
Custom street signs can also act as a type of confirmation sign, to let all users know the street is prioritized for bicyclists.

**FURTHER CONSIDERATIONS**

- Bicycle wayfinding signs also visually cue motorists that they are driving along a bicycle route and should use caution. Signs are typically placed at key locations leading to and along bicycle routes, including the intersection of multiple routes.
- Too many road signs tend to clutter the right-of-way, and it is recommended that these signs be posted at a level most visible to bicyclists rather than per vehicle signage standards.
- A community-wide bicycle wayfinding signage plan would identify:
  - Sign locations
  - Sign type – what information should be included and design features
  - Destinations to be highlighted on each sign – key destinations for bicyclists
  - Approximate distance and travel time to each destination
- Green is the color used for directional guidance and is the most common color of bicycle wayfinding signage in the US, including those in the MUTCD.
- Check wayfinding signage along bikeways for signs of vandalism, graffiti, or normal wear and replace signage along the bikeway network as-needed.

# Wayfinding Sign Placement

Signs are placed at decision points along bicycle routes – typically at the intersection of two or more bikeways and at other key locations leading to and along bicycle routes.



## TYPICAL APPLICATION

### Confirmation Signs

- Placed every ¼ to ½ mile on off-street facilities and every 2 to 3 blocks along on-street bicycle facilities, unless another type of sign is used (e.g., within 150 ft of a turn or decision sign).
- Should be placed soon after turns to confirm destination(s). Pavement markings can also act as confirmation that a bicyclist is on a preferred route.

### Turn Signs

- Near-side of intersections where bike routes turn (e.g., where the street ceases to be a bicycle route or does not go through).
- Pavement markings can also indicate the need to turn to the bicyclist.

### Decision Signs

- Near-side of intersections in advance of a junction with another bicycle route.
- Along a route to indicate a nearby destination.

## DESIGN FEATURES

- MUTCD guidelines should be followed for wayfinding sign placement, which includes mounting height and lateral placement from edge of path or roadway.
- Pavement markings can be used to reinforce routes and directional signage.

### Wayfinding Pavement Markings



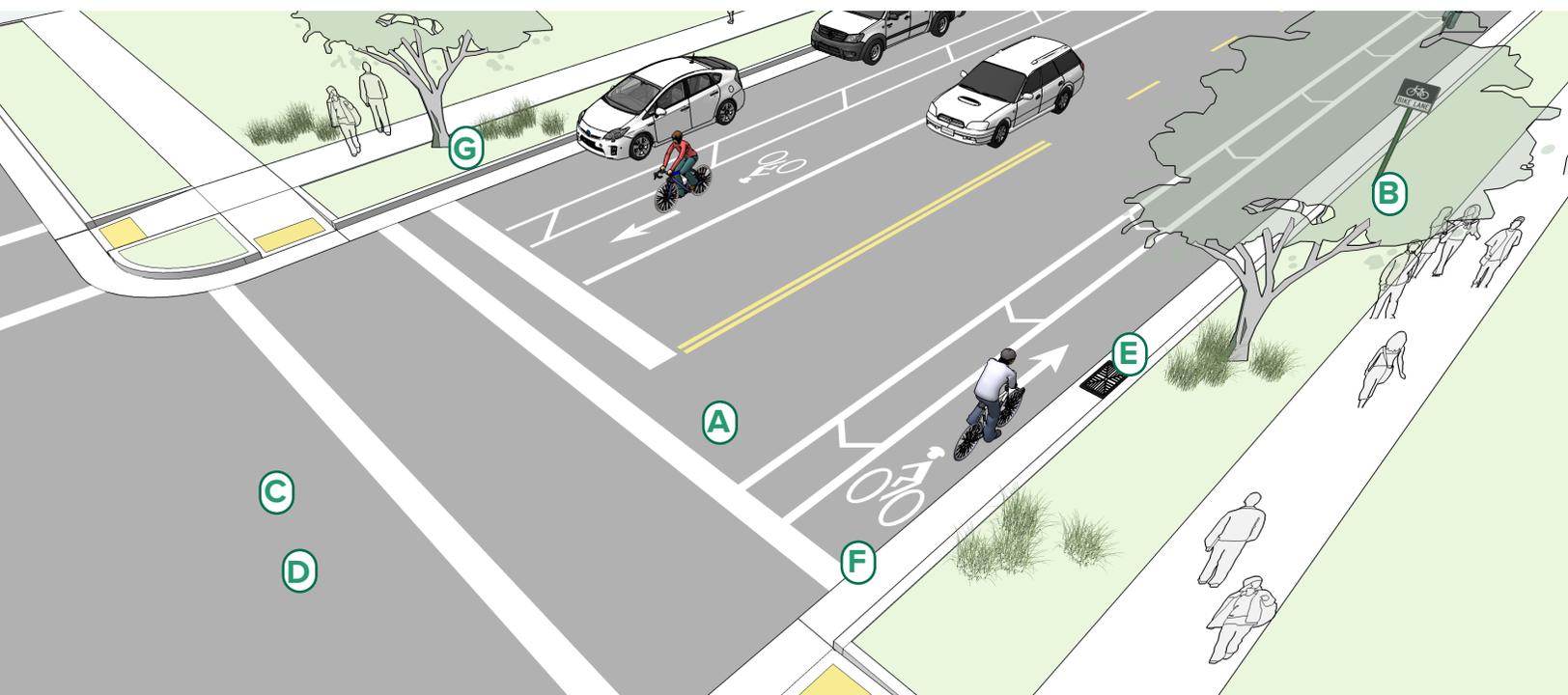
Some cities use pavement markings to indicate required turns along the bicycle route.

### FURTHER CONSIDERATIONS

It can be useful to classify a list of destinations for inclusion on the signs based on their relative importance to users throughout the area. A particular destination's ranking in the hierarchy can be used to determine the physical distance from which the locations are signed. For example, primary destinations (such as the downtown area) may be included on signage up to 5 miles away. Secondary destinations (such as a transit station) may be included on signage up to two miles away. Tertiary destinations (such as a park) may be included on signage up to one mile away.

## Bikeway Maintenance

Regular bicycle facility maintenance includes sweeping, maintaining a smooth roadway, ensuring that the gutter-to-pavement transition remains relatively flush, and installing bicycle-friendly drainage grates. Pavement overlays are a good opportunity to improve bicycle facilities. The following recommendations provide a menu of options to consider to enhance a maintenance regimen.



### MAINTENANCE

#### **A** Sweeping

- Establish a seasonal sweeping schedule that prioritizes roadways with major bicycle routes.
- Sweep walkways and bikeways whenever there is an accumulation of debris on the facility.
- In curbed sections, sweepers should pick up debris; on open shoulders, debris can be swept onto gravel shoulders.

#### **B** Signage

- Check regulatory and wayfinding signage along bikeways for signs of vandalism, graffiti, or normal wear.
- Replace signage along the bikeway network as-needed.
- Perform a regularly-scheduled check on the status of signage with follow-up as necessary.
- Create a Maintenance Management Plan.

**C Roadway Surface**

- Maintain a smooth pothole-free surface.
- Ensure that on new roadway construction, the finished surface on bikeways does not vary more than ¼ inch.
- Maintain pavement so ridge buildup does not occur at the gutter-to-pavement transition or adjacent to railway crossings.
- Inspect the pavement 2 to 4 months after trenching construction activities are completed to ensure that excessive settlement has not occurred.

**D Pavement Overlays**

- Extend the overlay over the entire roadway surface to avoid leaving an abrupt edge.
- If the shoulder or bike lane pavement is of good quality, it may be appropriate to end the overlay at the shoulder or bike lane stripe provided no abrupt ridge remains.
- Ensure that inlet grates, manhole and valve covers are within ¼ inch of the finished pavement surface and are made or treated with slip resistant materials.

**E Drainage Grates**

- Require all new drainage grates be bicycle-friendly, including grates that have horizontal slats on them so that bicycle tires and assistive devices do not fall through the vertical slats.
- Create a program to inventory all existing drainage grates, and replace hazardous grates as necessary – temporary modifications such as installing rebar horizontally across the grate should not be an acceptable alternative to replacement.

**F Gutter to Pavement Transition**

- Ensure that gutter-to-pavement transitions have no more than a ¼ inch vertical transition.
- Examine pavement transitions during every roadway project for new construction, maintenance activities, and construction project activities that occur in streets.

**G Landscaping**

- Ensure that shoulder plants do not hang into or impede passage along bikeways.
- After major damage incidents, remove fallen trees or other debris from bikeways as quickly as possible.

**Maintenance Management Plan**

- Provide fire and police departments with map of system, along with access points to gates/bollards.
- Enforce speed limits and other rules of the road.
- Enforce all trespassing laws for people attempting to enter adjacent private properties.

**Recommended Walkway and Bikeway Maintenance Activities**

Maintenance Activity	Frequency
Inspections	Seasonal – at beginning and end of Summer
Pavement sweeping/ blowing	As needed, with higher frequency in the early Spring and Fall
Pavement sealing	5 - 15 years
Pothole repair	1 week – 1 month after report
Culvert and drainage grate inspection	Before Winter and after major storms
Pavement markings replacement	As needed
Signage replacement	As needed
Shoulder plant trimming (weeds, trees, brambles)	Twice a year; middle of growing season and early Fall
Tree and shrub plantings, trimming	1 – 3 years
Major damage response (washouts, fallen trees, flooding)	As soon as possible

# Regulatory and Warning Signs

Regulatory signs give a direction that must be obeyed, and apply to intersection control, speed, vehicle movement and parking.

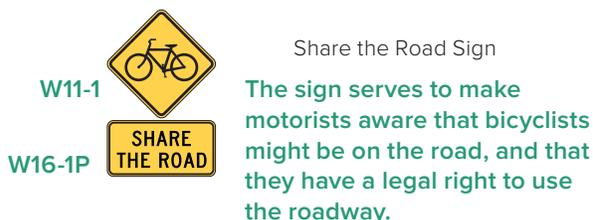
## Common Bicycle Oriented Regulatory Signs



## Additional Bicycle-Oriented Warning Signs



## Bicycle Crossing Assembly



Additional warnings are available to call attention to unexpected conditions for people riding bicycles, such as steep grades, rail crossings, and slippery conditions. A Bicycle Crossing Assembly using W11-1 and W16-7P arrow plaque may be used at the location of a bikeway crossing to warn other road users.

## TYPICAL APPLICATION

- Warning signs call attention to unexpected conditions on or adjacent to a street, and to situations that might not be readily apparent to road users.
- Warning signs alert users to conditions that might call for a reduction of speed or an action in the interest of safety and efficient traffic operations.

## DESIGN FEATURES

- Small-sized signs or plaques may be used for bicycle-only traffic applications, such as along shared use paths.
- See the MUTCD 9B for a detailed list of regulatory sign application and guidance.
- Fieldwork and engineering judgment are necessary to fine-tune the placement of signs.
- The SHARE THE ROAD plaque (W16-P) shall not be used alone, and must be mounted below a W11-1 vehicular traffic warning sign. It is typically placed along roadways with high levels of bicycle usage but relatively hazardous conditions for bicyclists. The sign should not be used to designate a preferred bicycle route, but may be used along short sections of designated routes where traffic volumes are higher than desirable.

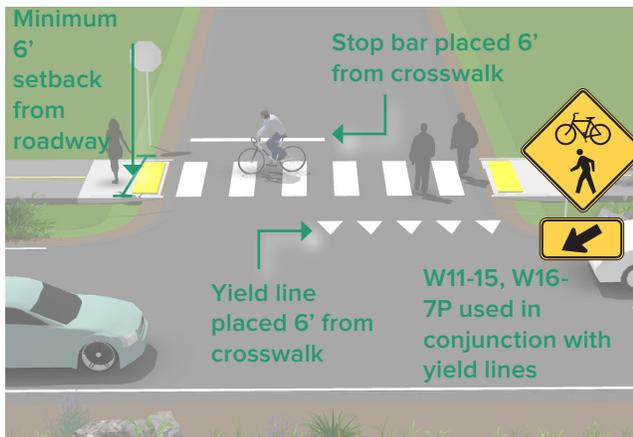


OFF STREET FACILITIES

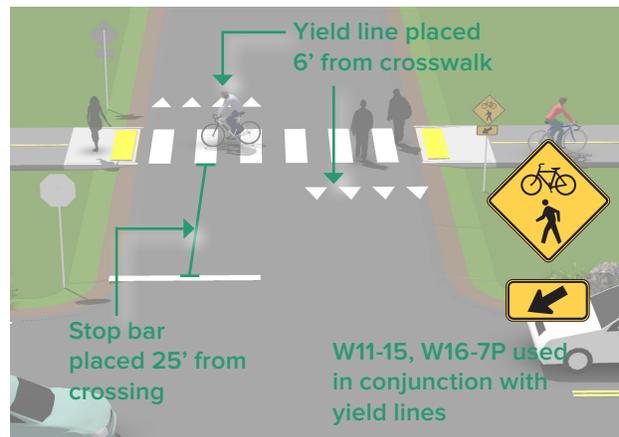
## Sidepaths

Shared use paths along roadways, also called sidepaths, are a type of path that run adjacent to a street.

**Adjacent Crossing** - A separation of 6 feet emphasizes the conspicuous of riders at the approach to the crossing.



**Setback Crossing** - A set back of 25 feet separates the path crossing from merging/turning movements that may be competing for a driver's attention.



### TYPICAL APPLICATION

Along roadways, these facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding where bicyclists enter or leave the path. The AASHTO Guide for the Development of Bicycle Facilities cautions practitioners of the use of two-way sidepaths on urban or suburban streets with many driveways and street crossings. Well designed sidepaths with logical terminations, and good driveway and local street crossings can be safe and valuable components of a transportation system.

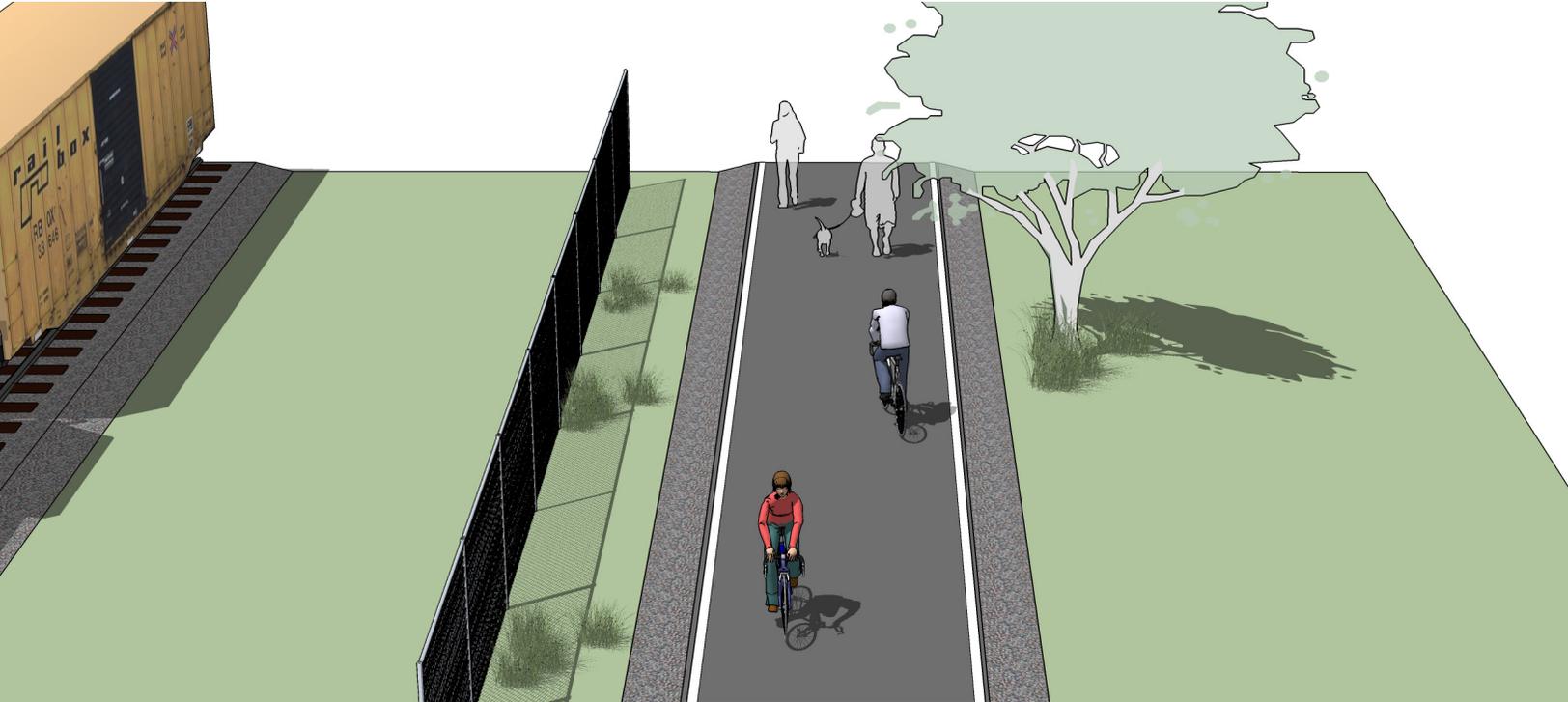
In general, there are two approaches to crossings: adjacent and setback crossings, illustrated above.

### DESIGN FEATURES

- Guidance for sidepaths should follow that for general design practices of shared use paths.
- A high number of driveway crossings and intersections create potential conflicts with turning traffic. Consider alternatives to sidepaths on streets with a high frequency of intersections or heavily used driveways.
- Where a sidepath terminates, special consideration should be given to transitions so as not to encourage unsafe wrong-way riding by bicyclists.
- Crossing design should emphasize visibility of users and clarity of expected yielding behavior. Crossings may be STOP or YIELD controlled depending on sight lines and bicycle motor vehicle volumes and speeds.

## Shared Use Path

Shared use paths can serve transportation, recreation or both types of trips and are desirable for users of all skill levels preferring separation from traffic. Shared use paths use exclusive rights-of-way with minimal cross flow by motor vehicles.



### TYPICAL APPLICATION

- In abandoned rail corridors (commonly referred to as Rails-to-Trails or Rail-Trails).
- In active rail corridors, trails can be built adjacent to active railroads (referred to as Rails-with-Trails).
- In utility corridors, such as powerline and sewer corridors.
- In waterway corridors, such as along canals, drainage ditches, rivers and beaches.
- Along roadways.

## DESIGN FEATURES

### Width

- 8 feet is the minimum allowed for a two-way bicycle path and is only recommended for low traffic situations.
- 10 feet is recommended in most situations and will be adequate for moderate to heavy use.
- 12 feet is recommended for heavy use situations with high concentrations of multiple users. A separate track (5 foot minimum) can be provided for pedestrian use.

### Lateral Clearance

- A 2 foot or greater shoulder on both sides of the path should be provided. An additional ft of lateral clearance (total of 3 feet) is required by the MUTCD for the installation of signage or other furnishings.
- If bollards are used at intersections and access points, they should be colored brightly and/or supplemented with reflective materials to be visible at night.

### Overhead Clearance

- Clearance to overhead obstructions should be 8 feet at minimum, with 10 feet recommended.

### Striping

- When striping is desired, use a 4 inch dashed yellow centerline stripe.
- Solid centerlines can be provided on tight or blind corners, and on the approaches to roadway crossings.

### Slopes

- Vertical grades should generally not exceed 5%, with no more than 30% of the entire trail length having grades in excess of 8%.

## FURTHER CONSIDERATIONS

The provision of a shared use path adjacent to a road is not a substitute for the provision of on-road accommodation such as paved shoulders or bike lanes, but may be considered in some locations in addition to on-road bicycle facilities.

## CRASH REDUCTION

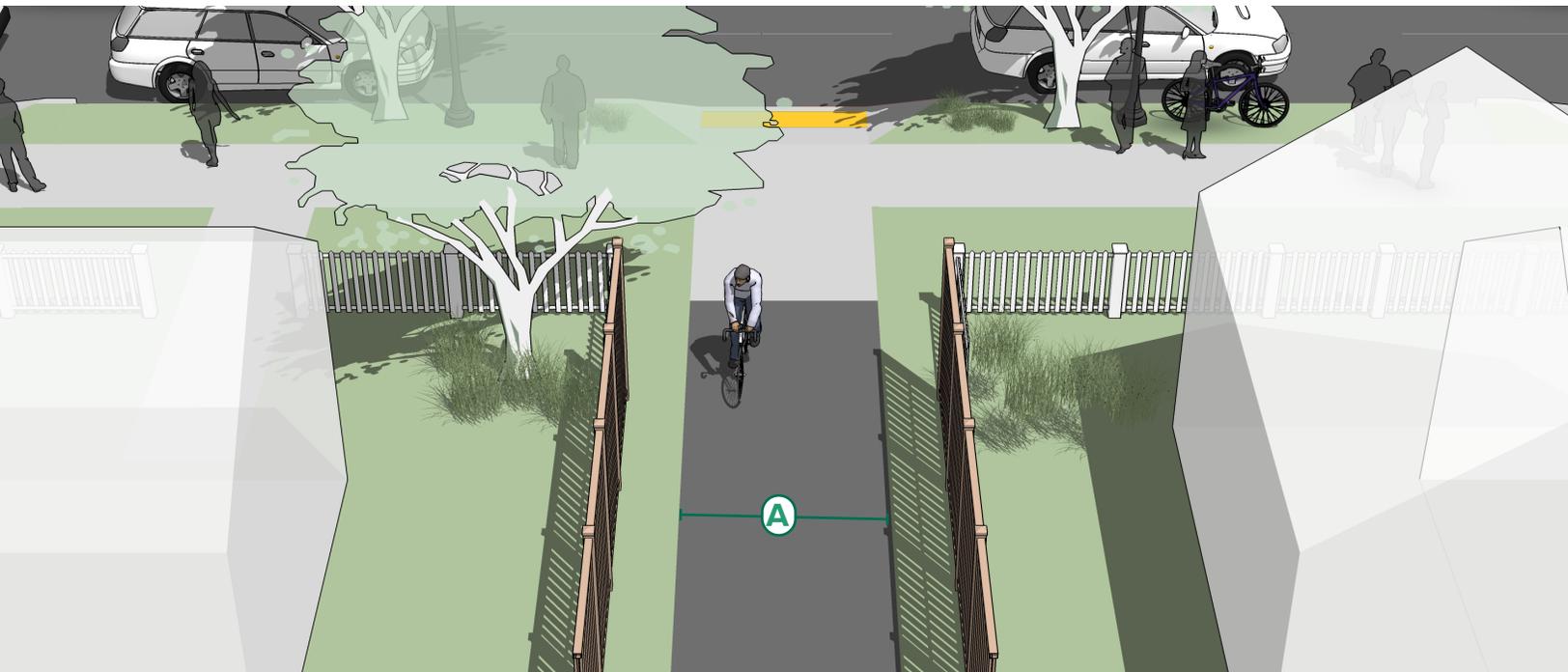
Shared use paths reduce injury rates for cyclists, pedestrians, and other nonmotorized modes by 60 percent compared with on street facilities.

## CONSTRUCTION COSTS

The cost of a shared use path can vary, but typical costs are between \$65,000 per mile to \$4 million per mile.

## Local Neighborhood Accessways

Neighborhood accessways provide residential areas with direct bicycle and pedestrian access to parks, trails, greenspaces, and other recreational areas. They most often serve as small connections to and from the larger network, typically having their own rights-of-way and easements.



### TYPICAL APPLICATION

- Neighborhood accessways should be designed into new subdivisions at every opportunity and should be required by City/County subdivision regulations.
- For existing subdivisions, neighborhood and homeowner association groups are encouraged to identify locations where such connects would be desirable. Nearby residents and adjacent property owners should be invited to provide landscape design input.

### DESIGN FEATURES

- Neighborhood accessways should remain open to the public.
- Ⓐ Trail pavement shall be at least 8 feet wide to accommodate emergency and maintenance vehicles and be considered suitable for multi-use.
- Trail widths should be designed to be less than 8 feet wide only when necessary to protect large mature native trees over 18 inches in caliper, wetlands or other ecologically sensitive areas.

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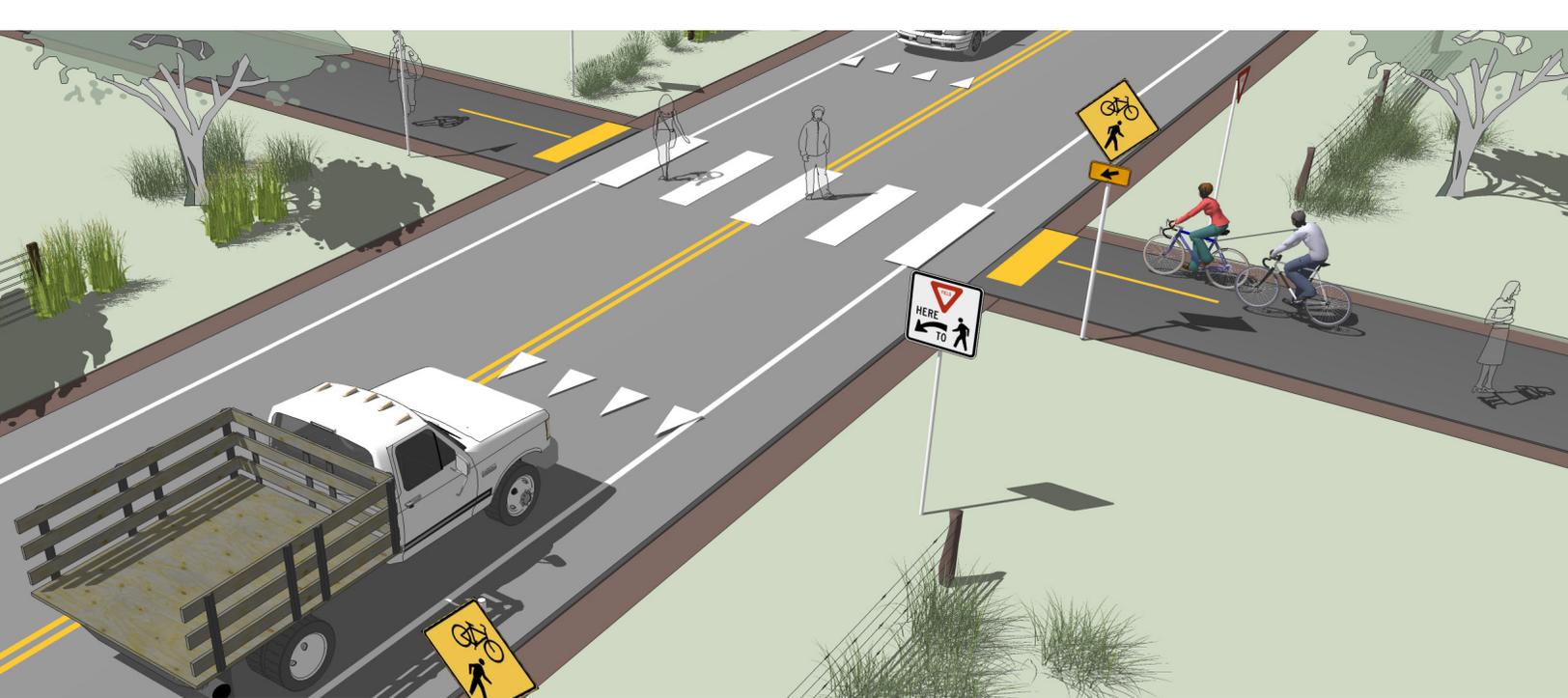
08

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OFF STREET FACILITIES AT  
INTERSECTIONS

## Marked Crossing

A marked/unsignalized crossing typically consists of a marked crossing area, signage, and other markings to raise awareness of the crossing and to reinforce proper yielding behavior. The approach to designing crossings at mid-block locations depends on an evaluation of vehicle volume, line of sight, pathway volume, use patterns, vehicle speed, road type, road width, and other safety issues such as proximity to major attractions.



### TYPICAL APPLICATION

- Maximum Traffic Volumes
  - 9,000-12,000 Average Daily Traffic (ADT) volume
- Maximum travel speed of 35 MPH
- Minimum Sight Lines for motorists to yield to bicyclists. If the path has a stop sign, the below does not apply.
  - 25 MPH zone: 155 feet
  - 35 MPH zone: 250 feet
  - 45 MPH zone: 360 feet

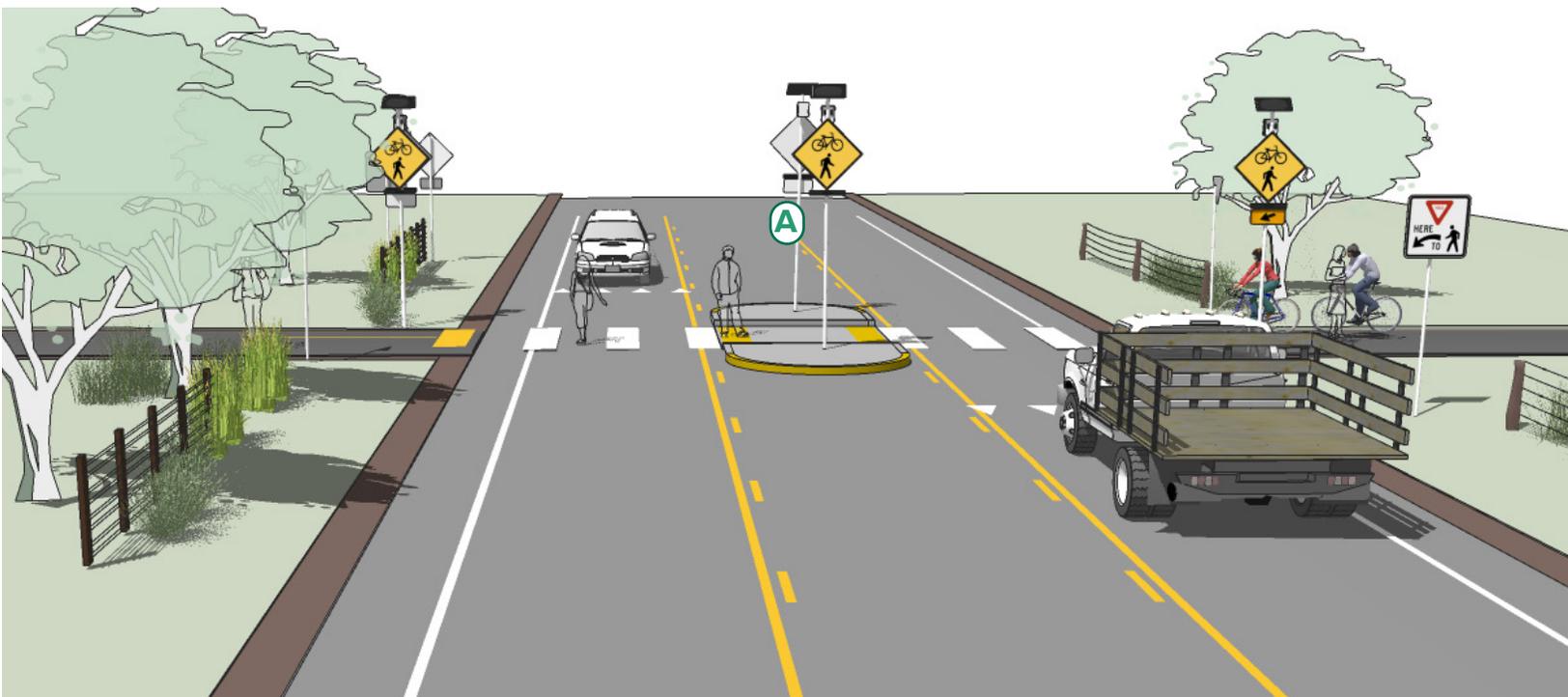
### DESIGN FEATURES

- On roadways with low to moderate traffic volumes (less than 12,000 ADT) and a need to control traffic speeds, a raised crosswalk may be the most appropriate crossing design to improve pedestrian visibility and safety.



## Active Enhanced Crossing

Active enhanced crossings are unsignalized crossings with additional treatments designed to increase motor vehicle yielding compliance on multi-lane or high volume roadways. These enhancements include pathway user or sensor actuated warning beacons and Rectangular Rapid Flash Beacons (RRFB) shown below.



### TYPICAL APPLICATION

- Guidance for marked/unsignalized crossings applies.
- Warning beacons shall not be used at crosswalks controlled by YIELD signs, STOP signs, or traffic control signals.
- Warning beacons shall initiate operation based on user actuation and shall cease operation at a predetermined time after the user actuation or, with passive detection, after the user clears the crosswalk.

### DESIGN FEATURES

- A RRFBs are user actuated lights that supplement warning signs at unsignalized intersections or mid-block crossings.
- RRFBs should be paired with a marked crosswalk and yield teeth.
- Push buttons should be easy to identify and located on the right-hand side of the path. They should be positioned so that bicyclists do not have to dismount to activate.
- Where possible, RRFBs work well as multi-beacon installations on mast arms or in median refuge island crossings to improve driver yielding behavior.

## Route Users to Signalized Crossing

Path crossings within approximately 400 feet of an existing signalized intersection with pedestrian crosswalks are typically diverted to the signalized intersection to avoid traffic operation problems when located so close to an existing signal.



### TYPICAL APPLICATION

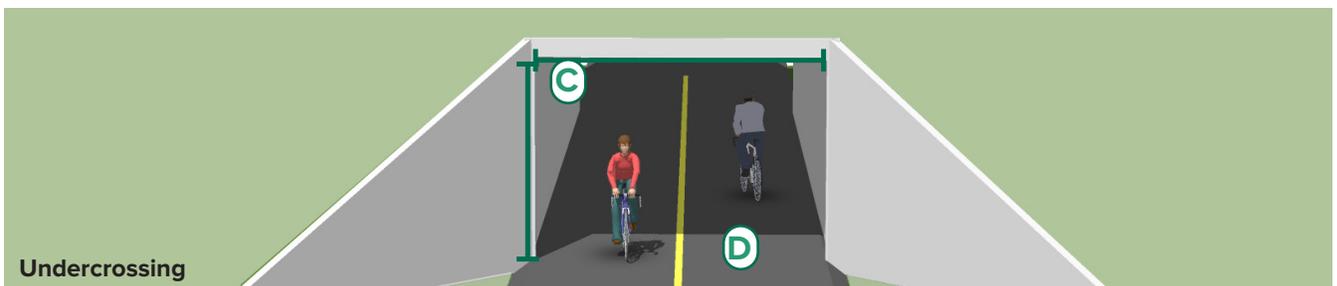
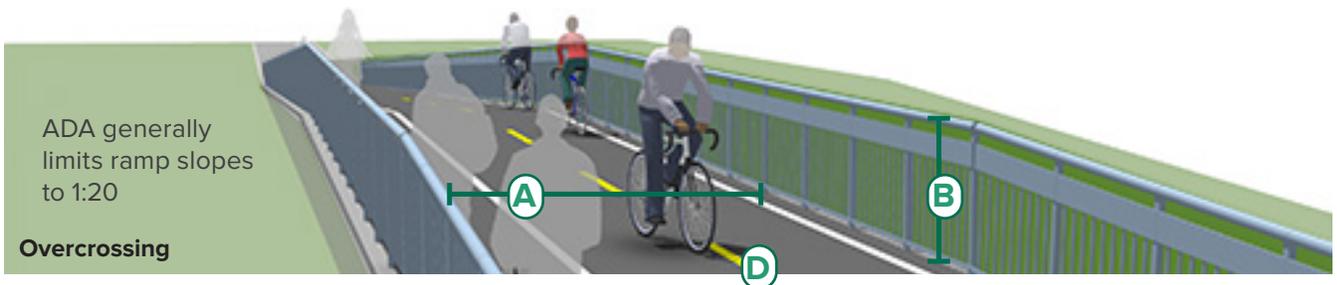
- For this restriction to be effective, barriers and signing may be needed to direct path users to the signalized crossing. If no pedestrian crossing exists at the signal, modifications should be made.
- Path crossings should not be provided within approximately 400 feet of an existing signalized intersection. If possible, route path directly to the signal.

### DESIGN FEATURES

- In the US, the minimum distance a marked crossing can be from an existing signalized intersection varies from approximately 250 to 660 feet.
- Engineering judgment and the context of the location should be taken into account when choosing the appropriate allowable setback. Pedestrians are particularly sensitive to out of direction travel and undesired mid-block crossing may become prevalent if the distance is too great.

## Grade-Separated Crossings

Grade-separated crossings provide critical non-motorized system links by joining areas separated by barriers such as railroads, waterways, and highway corridors. In most cases, these structures are built in response to user demand for safe crossings where they previously did not exist. There are no minimum roadway characteristics for considering grade separation.



### TYPICAL APPLICATION

- Where shared-use paths cross high-speed and high-volume roadways where an at-grade signalized crossing is not feasible or desired, or where crossing railways or waterways.
- Depending on the type of facility or the desired user group, grade separation may be considered in many types of projects.

### DESIGN FEATURES

- A** Overcrossings should be at least 8 feet wide with 14 feet preferred and additional width provided at scenic viewpoints.
- B** Railing height must be a minimum of 42 inches for overcrossings.
- C** Undercrossings should be designed at minimum 10 feet in height and 14 feet in width, with greater widths preferred for lengths over 60 feet.
- D** Centerline stripe is recommended for grade-separated facility.