



13TH AVENUE

DOWNTOWN-CAMPUS CORRIDOR CONCEPT PLAN

Final Report



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Concept Plan

LiveMove ByDesign



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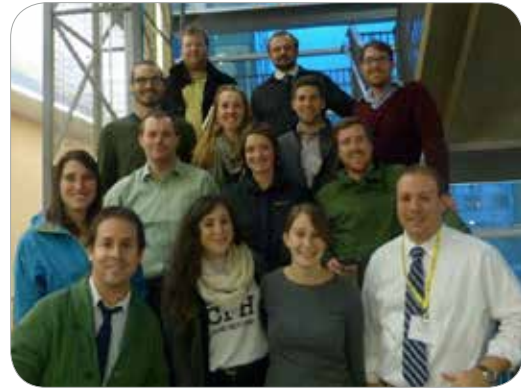
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LiveMove is a University of Oregon student group that brings together undergraduate and graduate students from a variety of backgrounds and disciplines to focus on transportation and livability issues on campus, in the community, and throughout the State of Oregon. The group began four years ago, and has grown in membership and capacity each year. The group has nearly 40 undergraduate and graduate members representing the Departments of Planning Public Policy and Management (PPPM), Architecture, Environmental Studies, the College of Business, and the School of Law.

LiveMove's mission is to:
 "Promote healthy, sustainable communities by integrating transportation and livability through collaboration, education, research and outreach."

LiveMove achieves this mission by hosting monthly speaker series with regional and national experts in the transportation and livability fields. Over the past four years, the group developed partnerships through its speaker series and various other projects with UO Administration, Associated Students of the University of Oregon (ASUO), Sustainable Cities Initiative (SCI), PPPM, the UO Outdoor/Bike Program, the Cities of Eugene and Springfield, Lane Transit District (LTD), and the Lane Council of Governments (LCOG). The trust and understanding of LiveMove's work has deepened as the group continues to improve its work in the community.

"Promote healthy, sustainable communities by integrating transportation and livability through collaboration, education, research and outreach."

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Chapter 1: Introduction.....

This last academic year, LiveMove established “LiveMove ByDesign” in order to provide students with an applied, real-world project. The group developed after LiveMove members identified challenges with roadway safety conditions and access for bicyclists and pedestrians on 13th Avenue, a heavily used, direct connection to the University of Oregon. In an effort to educate students and members of the community, LiveMove ByDesign applied the group’s unique and diverse skills to develop a plan and street redesign for the “13th Avenue Downtown-Campus Corridor.” The corridor project area is nearly a mile along 13th Avenue stretching from Olive Street to the UO campus at Kincaid Street.

A key opportunity that sparked student interest in redesigning 13th Avenue relates to the soon-to-be-completed 13th and Olive Apartments, locally known as the Capstone development. The development will carry a large, long-lasting impact on the corridor. The two-phased multi-family housing project will be located between Charnelton and Willamette Streets along the 13th Avenue corridor. The project is estimated to cost \$89 million dollars (Register-Guard 2013), and includes nearly 1,200 students in a 375-unit student apartment complex (Russo 2013). The developer, Capstone Collegiate Communities, has proposed providing nearly one car parking space for each bed space, a number that requires them to include two structured parking garages with more than 1,000 parking spaces.

In response to the parking proposal, LiveMove led an effort, along with others in the community, to dissuade the developer from providing parking that ratio; an effort that was unsuccessful. Nonetheless, students realized the importance of a strong and

robust connection between the Capstone development and the University of Oregon.

The Capstone development is located one block from LTD’s Eugene Station, which has numerous bus lines running to both the UO campus and the Lane Community College (LCC) main campus. The development is a couple of blocks from LCC’s new Downtown Campus, and nearly three quarters of a mile from the west entrance of the UO campus. Additionally, the development is within the downtown core, which exempts new developments from parking requirements (Register-Guard 2013).

LiveMove initially raised concerns about the parking proposal to Capstone, because the group felt the number of spaces was unwarranted due to student travel patterns, as well as the impact the parking requirement will have on the cost of housing. According to the UO 2013 Commuter Survey, 16 percent of students living off campus drive alone to class, while 79 percent get to campus by other transportation modes, including walking, bicycling, bus, or carpooling. Additionally, only 56 percent of all students own a car (UO Campus Planning and Real Estate 2013). These facts, in addition to the student housing development’s proximity to Eugene Station, the new LCC Downtown Campus, and to the UO campus, have informed LiveMove’s assertions that students living at Capstone would be less likely than the overall student population to drive or own a car.

Furthermore, the cost of a parking space substantially increases rent, which may make the Capstone development cost prohibitive for many students. Capstone’s two structured parking garages

are estimated to cost nearly \$12 million, not including operations and maintenance costs. This cost is equal to about \$12,000 per parking space (Register-Guard 2013). Parking represents a set cost that will be levied against all tenants, whether they have a car or not.

Regardless of parking, at the heart of the issue is the lack of an adequate, safe, and efficient connection to campus for transportation modes other than cars. LiveMove and other regional advocates argue that the 13th Avenue Downtown-Campus Corridor is currently unsafe for bicyclists, with the problem only set to get worse with a denser corridor. LiveMove received support from the Eugene Transportation Planning Office to examine ways to further research and plan for a safe, accessible, and vibrant roadway. The student-driven team translated its diverse skills and brainstorming into realistic actions with the LiveMove ByDesign Downtown-Campus Corridor Redesign and Plan.

The student conducted a corridor study, case studies of best practices used around the world, and hosted a design charrette with area professionals. From this, ByDesign developed a preferred design alternative for this corridor and hosted an open house with more than 50 attendees, including City of Eugene traffic engineers and planners, campus administrators, area business representatives and students.

ByDesign's proposed design offers a safe, easy-to-understand link for cyclists traveling between downtown Eugene and campus. The ByDesign team did its homework when evaluating

the current conditions as well as the techniques used in the redesign. We feel confident that the assessment and proposal in this report represents a complete solution for 13th Avenue. This report serves as a strong starting point for any further studies, outreach, or plans conducted by the City of Eugene and the UO Administration. Thirteenth Avenue can be safer and better for everyone, and the LiveMove ByDesign team is proud to offer this report as our plan to make that change happen.

“LiveMove and other regional advocates also argued that the Downtown-Campus Corridor, under current conditions, is not safe for bicyclists, and the problems would only be further intensified as the corridor becomes denser with student housing.”

Study Area:
13th Avenue stretching from Olive Street to the UO campus at Kincaid.



“16 percent of students living off campus drive alone to class, while 79 percent get to campus by other transportation modes, including walking, bicycling, bus, or carpooling.”

The ByDesign Project:

- A real-world, applied, experiential learning project for LiveMove and the community
- A concept plan and design alternative focusing on 13th Avenue and intersecting roadways
- A do-it yourself planning and design exercise to raise awareness to a safety concern

The ByDesign project is not:

- A study of all feasible route options that connect downtown Eugene with the UO campus
- A final plan and design

Chapter 2: Existing Conditions.....



thus, create more dangerous travel conditions. This may result in decreased safety and overall health and wellbeing for the entire Eugene population.

The current conditions analysis provides data and information that aid in making informed decisions that foster a safer, accessible, and more livable Downtown-Campus Corridor.

ByDesign finds that the current condition of the existing 13th Avenue Downtown-Campus Corridor's roadway is suitable for many of its users. As engineered, the automobiles are able to pass through the corridor with relative ease, cyclists can travel with the direction of traffic with minimal level of stress, and pedestrian conditions are largely above average.

However, the roadway and its adjacent uses are changing. Auto traffic has declined nearly 10 percent since 2007. Community bicyclists use 13th Avenue as a primary corridor to travel east and west as evidenced by the CycleLane application, and the largest daily total bicyclists in the region are found at locations near the UO campus. Further, at intersections closer to the UO campus, ByDesign estimates that the ratio of cyclists to cars is near 1:1.

The 13th Avenue Downtown-Campus Corridor's character is defined by rental housing units along the middle of the corridor, while larger structures like PeaceHealth and the future Capstone development anchoring both ends. ByDesign believes that the corridor will continue to redevelop and densify with more student renters and new commercial offerings to support the increasing population. Further, the group believes the increased population of student residents in the corridor and within one mile of major destinations such as downtown, the LCC downtown campus, and the UO campus will likely increase bicycling and walking counts.

As the corridor continues to densify with students renters, and the use of cycling along the corridor is expected to increase, ByDesign believes the number of bicyclists riding against the flow of traffic either in the roadway or on sidewalks could increase, and



Roadway Conditions

13th Avenue is a one-way, minor arterial roadway with two to three automobile lanes heading east towards the UO campus. Below is a summary of 13th Avenue's characteristics.

- Traffic direction:** Eastbound
- Classification:** Minor arterial
- Posted speed:** 20 miles per hour
- Travel lanes:** 2 or 3
- Bike lanes:** South side between Lincoln and Kincaid Streets; contraflow lane on the north side between Kincaid and Hilyard Streets
- On-street parking:** 69 spaces (between Olive and Kincaid Streets)
- Sidewalks:** At least 5-foot sidewalks along the entire corridor



Traffic Counts

In the fall of 2012, during the weeks of November 12-16 and 26-30, ByDesign conducted a traffic study to help determine the current conditions of the 13th Avenue Downtown-Campus Corridor. As part of the traffic study, the ByDesign team measured the vehicle volumes and turning movements at signalized intersections along 13th Avenue between Olive Street and Alder Street. Volumes were counted for four 15-minute increments, between 7:30 and 8:30 AM, and 4:30 and 5:30 PM. Using the empirical relationships based on the Highway Capacity Manual, 4th Edition, and taken from Traffic Engineering by Roess, et al, 3rd Edition, the values were converted from hourly volumes into average daily traffic (ADT) volumes.

While the estimated ADT values do not reflect the precision of automatic counters over a 24-hour period and adjustment for seasonal differences, they hold a high degree of accuracy. When compared to traffic counts completed by the Traffic Operations section at the City of Eugene in 2007, ByDesign's estimations shared the same trend of decreasing volumes the closer the intersection was to campus, heading east on 13th Avenue. The majority of ByDesign's counts were within 30 percent of Eugene's 2007 traffic counts.

However, ByDesign believes their counts are far closer to present day traffic patterns than represented by this comparison. Based on traffic data taken from Oregon Department of Transportation (ODOT) traffic counting program's website, since 2006 there has been a 10 percent decrease both in vehicle miles traveled (VMT) in Oregon, and in traffic volumes in Eugene. Nationwide, Americans' per capita annual VMT peaked in 2005, and the average American

is now driving at the same levels as 1995 (Short). This trend is projected to continue into the future, with Americans choosing to drive less and take alternative modes of transportation. The precision of ByDesign's counts, including the assumption of a 10 percent reduction from City of Eugene values, is further supported by a recent traffic impact analysis submitted to the City of Eugene as part of a land use application for the Capstone development. Group Mackenzie completed hourly traffic counts at the intersections of 13th Avenue and Olive Street, and 13th Avenue and Willamette Street, among others. In Group Mackenzie's study, the hourly values were within 5 to 15 percent of the counts completed by LiveMove.

Table 1 contains a 2012 ADT volume estimate for the corridor based on 10 percent reduction from Eugene's 2006 ADT volumes to follow the trend discussed above. The values decrease along 13th Avenue in the eastbound direction as one gets closer to the UO campus. Also listed are peak hourly counts for eastbound through traffic and number of through travel lanes between Willamette and Hilyard Streets.

From the study, ByDesign determined the following key findings:

- Vehicle miles traveled (VMT), and overall automobile volumes, are expected to remain steady, or decline in the coming years
- The 13th Avenue Downtown-Campus Corridor, excluding the Olive Street intersection, has ADT's lower than 9,000 average daily vehicles, when accounting for a 10 percent reduction in values obtained in 2006. It is expected these values will remain stable, or decrease over time
- Peak Hourly Factors, a common measure of the capacity over time of a roadway, are equal to, or lower than 0.95. With only two intersections having PHF's of 0.95, which is common for urban streets, the roadway overall has more capacity than required.
- The corridor has no more than 350 cars per hour per lane, with the maximum values occurring at the intersection of Willamette Street. While not a direct comparison, New York City uses a maximum design value of 700 cars per lane per hour, which further demonstrates 13th Avenue is under capacity for automobile traffic (Sativka).

Table 1. Estimated eastbound automobile volumes on 13th Avenue

	Olive	Willamette	Oak	Pearl	High	Patterson	Hilyard
2012 estimate*	11,250	8,550	8,100	8,640	6,0630	8,100	4,500
ByDesign hourly peak count	829	642	505	473	378	316	170
Number of through lanes	3	2	2	2	2	2	1
Peak hourly factor (PHF)	0.86	0.95	0.93	0.95	0.90	0.79	0.90

* 2012 values are based on a 10 percent reduction for the City of Eugene's 2006 traffic counts.

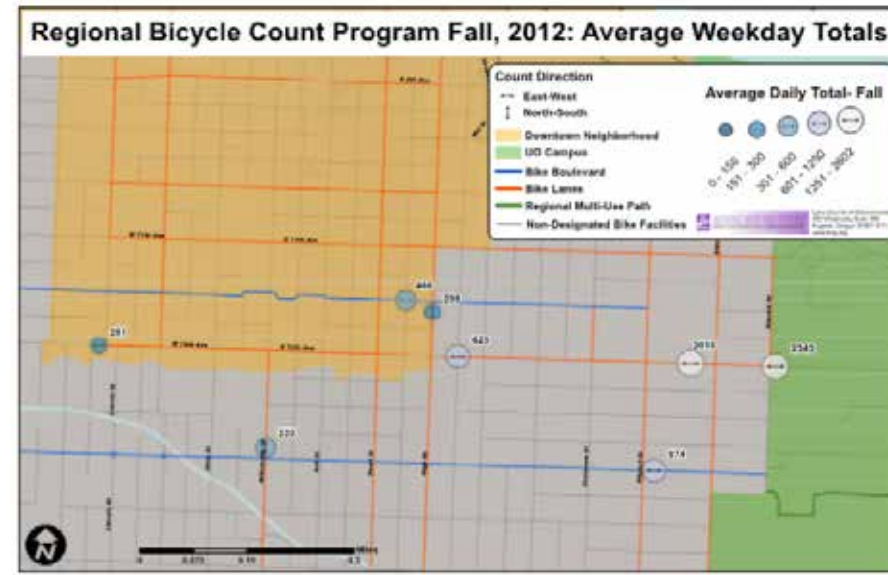
Bicycle Counts

ByDesign partnered with Central Lane Metropolitan Planning Organization (CLMPO) to conduct comprehensive 24-hour counts throughout the corridor to establish a representative portrait of bicycle demand and trends. ByDesign has used core data gathered from 24-hour count cycles to relate monthly and annual estimates, and estimate roadway user percentages.

Using data from the Regional Bicycle Count Program (RBCP), CLMPO's smart phone application (CycleLane), and local knowledge, ByDesign chose a set of relevant data points based on a combination of existing count and trip datasets from the CLMPO. CycleLane recorded track points to represent the route taken by bicyclists. An analysis determining the frequency of use by road segment indicates 13th and 12th Avenues are used by bicyclists more than other nearby roads.

ByDesign positioned count station locations at 13th Avenue and Lincoln, High, Alder, and Kincaid. Data was collected from an additional count station located at 12th Avenue and High Street.

Using methodology borrowed from the RBCP, ByDesign parsed out 24-hour count datasets from multi-day collection periods. This was done to capture consistent and representative average daily totals. ByDesign counted weekday volumes during Tuesday and Thursday count periods. Data sourced from the RBCP indicates consistent patterns of volumes for the Tuesday/Thursday 24-hour count cycles. Specifically, average daily count volumes vary only 5.6 percent between Tuesdays and Thursdays. This suggests that data collected from both the RBCP and ByDesign are consistent, overall, in relative weekday bicycle traffic volumes and patterns.



Frequency of bicycle use on existing facilities. Source: CLMPO

The impact of seasonal variation on overall volumes has yet to be determined, but preliminary count data suggests that bicyclists exhibit representative patterns in periods of peak travel. Count station data collected from the RBCP locations near the University of Oregon informed the following estimates of average daily totals by season.



Key Findings:

- Roughly 40 percent of all bicycle commute trips into campus crossed the western boundary of University of Oregon (source: CLMPO).
- By estimate, in the early fall roughly 3,500 bicyclists travel daily on 13th Avenue east of Kincaid.
- The ByDesign team anticipates greater volumes for late spring/early summer when more people choose to bike.
- Based on patterns of usage, hourly volumes along the 13th Avenue corridor plateau later in the day and for a longer duration than national factors.
- The RBCP count station near the UO campus recorded the largest average daily totals, regionally.

Table 2. Average weekday bike estimates

Count Season	12th and High*	13th and Lincoln	13th and High	13th and Alder	13th and Kincaid
Early Fall	466	410	910	2,602	3,410
Late Fall*	-	281	623	1,417	2,343
Winter	393	323	717	1,631	2,697
Spring	425	325	720	1,636	2,704

* Figures are actual average weekday totals from the RBCP

Roadway User Analysis

Through analysis of the average daily traffic and bicycle count measurements, ByDesign created a rough estimate of who are users of the roadway at peak hours. The roadway has been reconfigured in parts since the Eugene’s 2006-2007 traffic counts. The team believes these changes have improved bicycle access for those heading in the eastward direction, and bicyclists heading west before reaching Hilyard Street.

In the comparison of vehicle and bicycle traffic represented in Table 3, ByDesign found that as you get closer to campus, the roadway user ratio is closer to 1:1 between bicycles and automobiles during peak hours. As new student housing is developed along the 13th Avenue Downtown-Campus Corridor it’s likely that this roadway will accommodate an increasing number of bicyclists. This assertion has informed the group’s belief that the bicycle to automobile ratio will trend towards bicycles in the coming years.

Table 3. Estimated roadway user ratios at peak hours

	13th east of Lincoln	13th west of High	13th west of Alder	13th and Kincaid
Estimated 2012*	12,100	6,700	5,000	4,500
ByDesign Bike Count	410	910	2,602	3,410
Percent bicycles	3%	12%	34%	46%
Percent cars	97%	88%	66%	54%

*Based on 10 percent reduction for 2006 levels.



Automobile Parking Analysis

To understand parking occupancy along the corridor, ByDesign spent a week counting cars along 13th Avenue and one block north and south of 13th Avenue between Olive and Kincaid Streets. The counts took place Sunday, February 10 through Saturday, February 16. Weekday counts were taken at 10 AM, 3 PM and 8 PM; weekend counts were taken at 10 AM and 3 PM. These times were selected with input from Jeff Petry, the Parking Services Manager for the City of Eugene.

Prior to counting cars, ByDesign inventoried all the public parking in the study area. This inventory consisted of counting the total number of spaces available, determining whether parking was free or metered, noting restrictions on time or duration of parking, and classifying the type of parking. The focus of the parking analysis was on-street, but ByDesign included six off-street parking areas as well (five Diamond Parking lots and the metered spaces in the ground floor of the PeaceHealth parking garage at Hilyard Street and 13th Avenue).

There are a total of 447 spaces available in the study area. 300 of the spaces are on-street (65 of which are on 13th Avenue), with the remaining 147 spaces located in the Diamond Parking lots or in the PeaceHealth garage. Of the 300 on-street spaces, seven are commercial or loading spaces. The remaining on-street spaces are metered or have time limits (both in effect generally from 7 AM to 6 or 8 PM, Monday through Saturday).

The results from the parking counts are displayed in Table 4 and on the maps on the following pages. In general, parking is underutilized throughout the study area. However, there are areas

of much higher occupancy rates concentrated in the on-street spaces in the West University residential neighborhood (from High to Patterson Streets) and closest to the University of Oregon.

Of the 65 spaces directly on 13th Avenue (not including the four spaces designated for loading), about 44 percent of the spaces were occupied at 10 AM, 62 percent at 3 PM, and 56 percent at 8 PM. On the weekends, 43 percent of the spaces were occupied at 10 AM, and 72 percent were occupied at 3 PM. The off-street parking spaces are underutilized, with the highest rate of occupancy at 50 percent during weekday mornings.

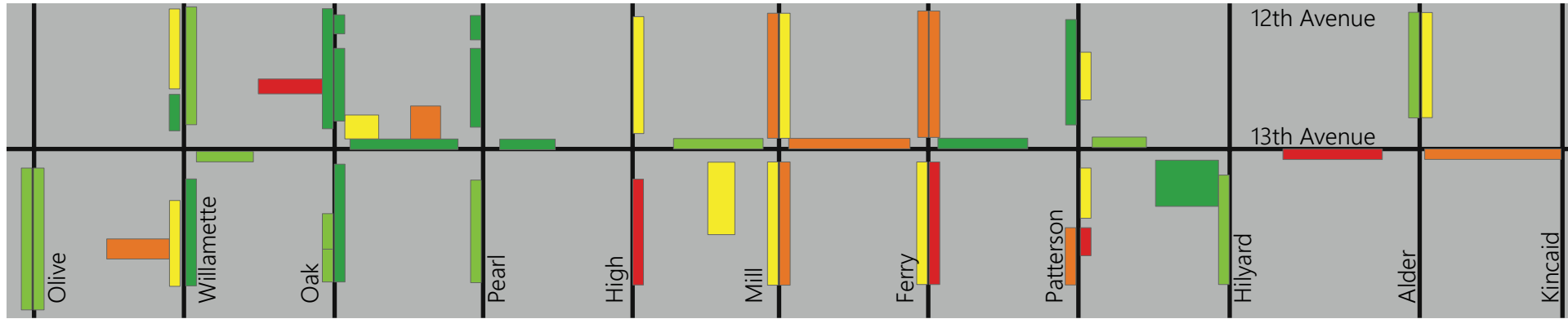
Table 4. Parking occupancy by time of day

	Overall	13th Avenue	Off-street	On-Street	West University
Weekday 10 AM	46%	44%	50%	43%	58%
Weekday 3 PM	47%	62%	41%	49%	65%
Weekday 8 PM	42%	56%	13%	56%	65%
Saturday/Sunday 10 AM	33%	43%	10%	45%	50%
Saturday/Sunday 3 PM	42%	72%	10%	58%	65%

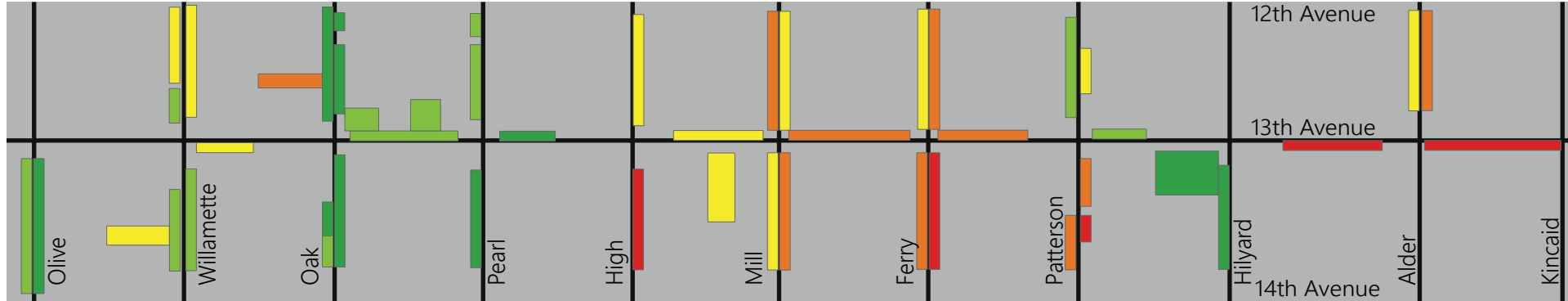
See Appendix B for more details.

Automobile Parking Occupancy Data

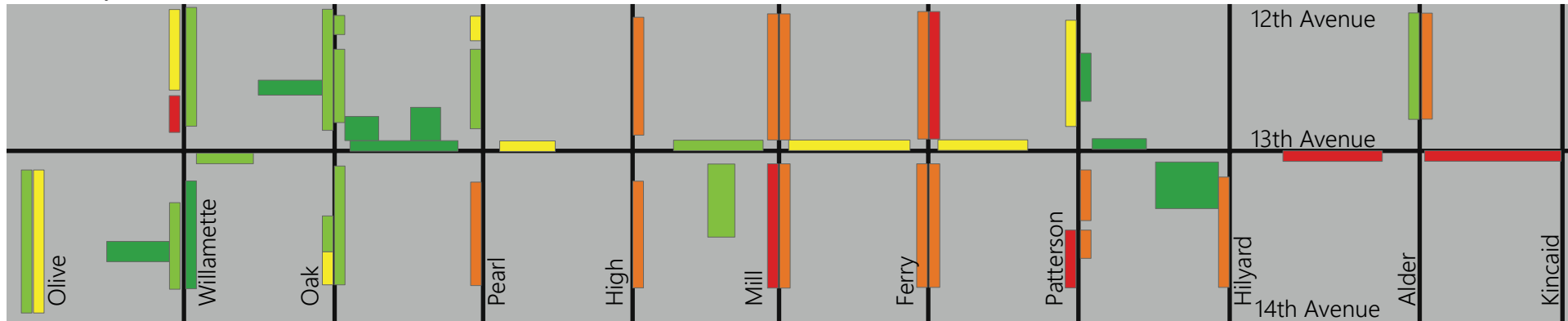
Weekdays 10 AM



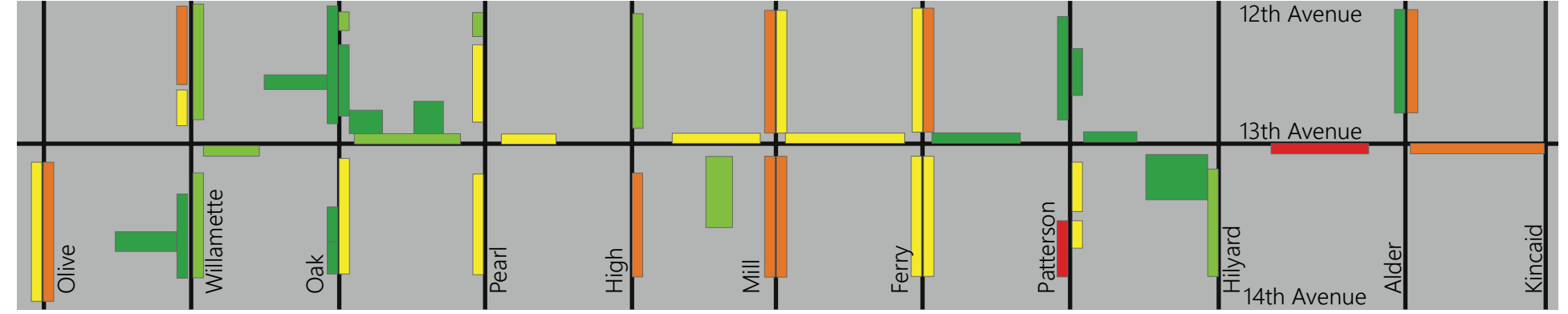
Weekdays 3 PM



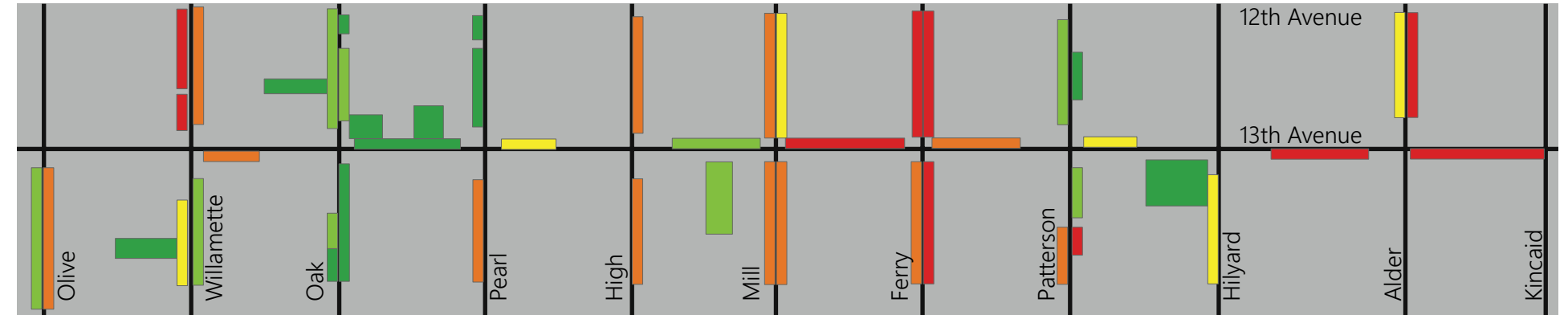
Weekdays 8 PM



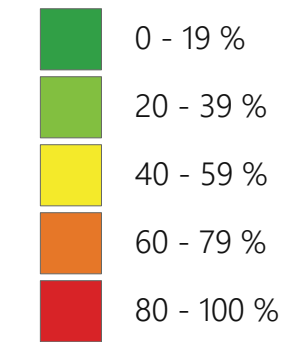
Weekends 10 AM



Weekends 3 PM



Average occupancy



Pedestrian Facilities

Sidewalks are provided throughout the corridor's roadway, and are mostly in good condition. The team measured the widths of the sidewalks and found the majority of sidewalks are 5.0 feet wide. There are a few areas where the sidewalks are wider than 5 feet. The widest sidewalk measured 13.3 feet and is located on the north side of 13th Avenue just east of Willamette Street. In general, the areas with sidewalks wider than 5.0 feet were in front of commercial or office buildings. Many of these wider sidewalks extend outside the right-of-way. The 8-foot sidewalks on the north side of 13th Avenue between Patterson and Hilyard Streets are an exception, as they are completely within the right-of-way. All sidewalks in the residential portions of 13th Avenue are 5 feet wide.



Bicycle Facilities

There is an eastbound bike lane on the south side of 13th Avenue between Lincoln and Kincaid Streets. This bike lane is at least 4 feet wide in most areas. The lane is considered largely suitable for most adults (Peter Furth's level of stress 2). However, it is more stressful and less comfortable for the general population between Olive and Willamette because a right turn automobile lane and the bike lane cross paths. A sign states "through bikes merge left," but does not ask automobiles to yield to bicyclists during this transition.

Another concern for bicyclists is the issue with westbound travel. Bicyclists coming from UO have few alternatives. They can take 13th Avenue to Hilyard Street, and go north and connect with a designated bike route on 12th Avenue. Once on 12th Avenue, bicyclists must stop at Patterson, High, Pearl and Oak Streets. This is inconvenient for cyclists who want a direct westbound route. The stop-go-stop-go pattern for bicyclists traveling along 12th



Avenue is at odds with the concept of bicycle boulevards, which are expected to provide safe, direct and convenient access for bicycles along relatively traffic-free routes.

It's common for bicyclists to illegally ride westbound on 13th Avenue, either on the sidewalks, in the wrong direction in the eastbound bike lane, or in automobile travel lanes. This makes the environment unsafe because motorists, pedestrians and other bicyclists do not expect people to travel westbound on an eastbound-only road.

Another westbound option for cyclists to reach downtown is to take the bike lane on 11th Avenue. ByDesign believes this option is avoided by many bicyclists (with the exception of those who are confident), because of the traffic speed, the volume of vehicles, and the position of the bike lane between moving cars and buses.

Bicycle Parking

There are 35 existing bike parking facilities that correspond to businesses along the 13th Avenue Downtown-Campus Corridor. Bike parking is common and is generally in better condition closer to campus, but west of Pearl Street, bike parking is considered inadequate.

"It's common for bicyclists to illegally ride westbound on 13th Avenue, either on the sidewalks, in the wrong direction in the eastbound bike lane, or in car travel lanes."



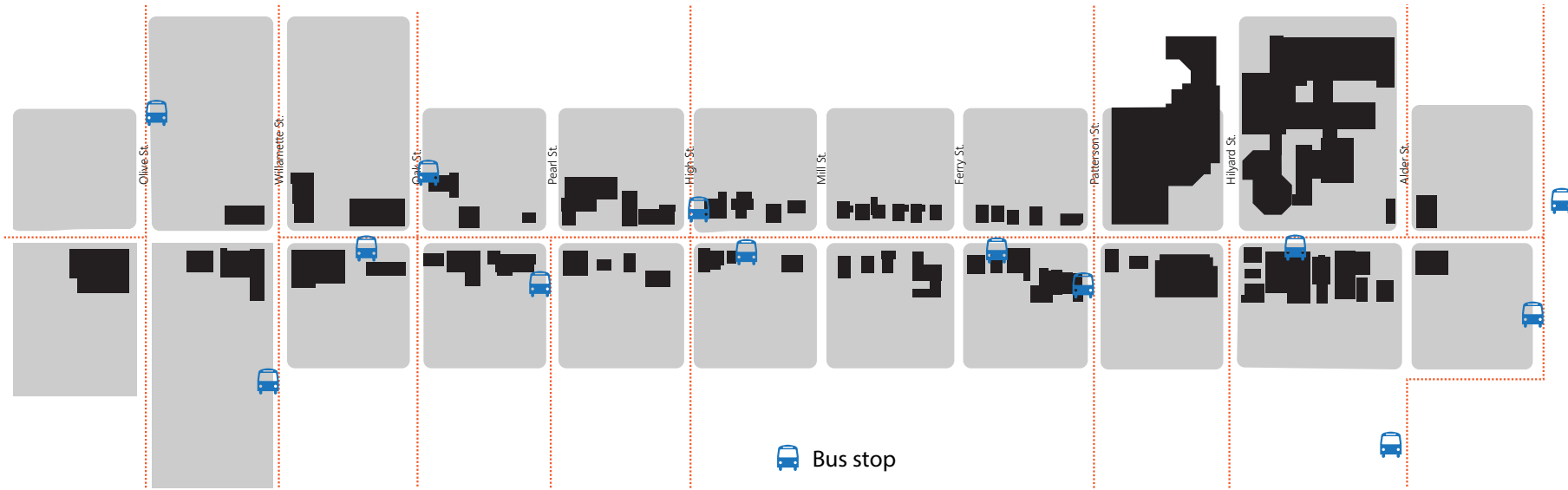
Transit Service

The 13th Avenue Downtown-Campus Corridor is serviced by Lane Transit District. Eugene Station is located two blocks north of 13th Avenue at 11th Avenue and Willamette Street. This station serves as the City of Eugene’s main transit hub.

The corridor is served by a large number of transit routes, with frequent service along 13th Avenue to the UO via Routes 28 and 76, and partial use of the corridor for an additional five routes. The EmX bus rapid transit line passes adjacent to the corridor along 11th Avenue and connects Eugene Station to the UO campus. The bus lines provide service for riders who want to quickly get from the corridor to UO campus, downtown, and adjacent neighborhoods.

The corridor is well served with four bus stops along 13th Avenue, and an additional four stops within one block on intersecting streets. The stops along 13th Avenue are located on the south side of the roadway between Willamette and Oak, High and Mill, Ferry and Patterson, and Hilyard and Alder Streets.

It should be noted that all UO students pay a fee for an unlimited LTD transit pass.



Streetscape Lighting

The corridor is serviced by ample street lighting, creating a presence that may bring about a safer and livelier commercial district at night, as well as a safer biking and walking environment.

Roadway Curb Cuts

All block faces along 13th Avenue have curb cuts. Three blocks have one curb cut, five blocks have two curb cuts, seven blocks have three curb cuts, two blocks have four curb cuts and one block has five curb cuts. There are 23 curb cuts on the north side and 24 curb cuts on the south side.



Roadway Signage

Table 5 is a list of signs located along the Downtown-Campus Corridor. This list does not include parking signs.

Table 5. Signage

Sign	Audience	Quantity
13th Avenue closed at Kincaid	Cars	1
Bike Route	Bicyclists	2
Bike Wayfinding Sign	Bicyclists	1
Bikes use 12th Avenue	Bicyclists	1
Chamber of Commerce →	All	1
Combined Lane	Cars and bicyclists	2
← Emergency Entrance	All	1
← Hospital	All	1
Left Lane Must Turn Left	Cars	2
No Skateboards or Dogs	Pedestrians and skateboarders	16
Restricted Area ↔	All	9
Right Lane Must Turn Right	Cars	1
Speed 20	Cars	2
Through Bikes Merge	Cars and bicyclists	1
Thru Traffic Use Hilyard	Cars	1

Accident Analysis

According to the US Census 2011 American Community Survey, Eugene is ranked fifth in the country for percentage of people who commute to work by bicycle. Additionally, the Regional Bike Count Program's count station near the UO campus records the largest average daily totals in the region, with nearly 3,500 bicyclists entering campus from the west on 13th Avenue at peak times of the year. As downtown continues to develop and more student housing is built throughout the 13th Avenue Downtown-Campus Corridor, ByDesign strongly feels that the 13th Avenue corridor becomes ever more important to safely accommodate all users.

ByDesign conducted manual bike counts at the same time as the fall auto counts. Similar to the auto counts, the team counted bicycle volumes and turning movements at major intersections along 13th Avenue between Olive Street and Alder Street. Volumes were counted in 15-minute increments, between 7:30 and 8:30 AM, and 4:30 and 5:30 PM. Table 6 presents the number and

percentage of total bicyclists riding illegally westbound along 13th Avenue.

When counting bicyclists, ByDesign did not indicate how many bicyclists riding against traffic were in the roadway or on the sidewalk. The table below shows intersections farther from campus sees fewer bicyclists riding illegally westbound. However, the table indicates more than 20 percent of all cyclists during evening peak hour are willing to ride illegally at intersections between High and Hilyard Streets. ByDesign believes that the willingness for bicyclists to disobey the law and ride against the direction of traffic even without any facilities show a desire for a direct route to travel west of campus on 13th Avenue.

Bicycling against the direction of traffic is unsafe, not only for the bicyclists themselves, but also for the pedestrian and drivers on the corridor. Riding in the roadway against the direction of traffic is extremely unsafe. On average, all bicyclists traveling

Table 6. Bicyclists riding westbound along 13th Avenue

Street	Morning counts			Evening counts		
	Total bicyclists	Westbound bicyclists	Percent westbound	Total bicyclists	Westbound bicyclists	Percent westbound
Hilyard	207	6	3%	149	38	26%
Patterson	170	5	3%	132	51	39%
High	-	-	-	89	19	21%
Pearl	100	8	8%	52	6	12%
Oak	97	0	0	34	5	15%
Willamette	94	0	0	70	11	16%
Olive	79	2	3%	67	9	13%

See Appendix A for more details.

“On average, all bicyclists traveling against the flow of traffic are 3.6 times more likely to be involved in an accident as those traveling with traffic.”

University of Oregon students enrolled in the 2013 Spring Term's Introduction to City Planning (PPPM 205) were asked to observe an intersection for 45 minutes, identify a problem, and provide reasonable solutions from a planner's perspective for an assignment. The memorandums received by the Graduate Teaching Fellows were overwhelmingly focused on intersections at 13th Avenue and Alder or Hilyard Streets. The vast majority of student who focused on these intersections identified pedestrian and bicyclist safety as the most pressing issue, often noting that large percentages of bicyclists rode against traffic in the roadway or on the sidewalk.

“Cyclists using sidewalks in the direction of traffic are 1.8 times more likely to be involved in an accident ... the City of Eugene does not recommend this behavior.”

against the flow of traffic are 3.6 times more likely to be involved in an accident than those traveling with traffic (Wachtel). Drivers, pedestrians and other bicyclists do not expect bikes to travel the wrong way and they are less likely to watch out for them.

When bicyclists ride on the sidewalk, it leads to pedestrian-bicycle conflicts. With only five feet of sidewalk along most of 13th Avenue, ByDesign feels there is not enough space to accommodate both pedestrians and bicyclists and therefore bicyclists should not ride on the sidewalk. Additionally, drivers are not looking for or expecting that bicyclists will be on the sidewalk, and often their visibility may be obstructed by street trees or parked cars. Drivers expect people on the sidewalk to be moving at walking speed and may not notice a bicyclist by the time they pull into the intersection. Sidewalk cyclists enter conflict areas with auto drivers at every intersection, including every driveway and alley. Cyclists using sidewalks in the direction of traffic are 1.8 times more likely to be involved in an accident. While biking on the sidewalk on 13th Avenue is legal, the City of Eugene does not recommend this behavior because it is unsafe (Henry).

To help determine the amount of bicycle and pedestrian accidents with vehicles along 13th Avenue, ByDesign obtained accident reports from the Eugene Police Department dating back to 2005. There were 255 reported accidents along the 13th Avenue Downtown- Campus Corridor between 2005 and August 2012. Of these, 73 (29 percent) accidents were between a vehicle and either a bicycle or pedestrian. Of the 73, 11 percent (8) resulted in police issuing citations for offenses, or emergency medical services being called to the scene.

While accident data can help represent the day-to-day safety scenario, it is by no means comprehensive. The figures presented above only display the reported incidents, and do not account for the near misses, close calls, or unreported accidents.

From its analysis, ByDesign finds the level of cyclists using the 13th Avenue against the direction of traffic within the roadway or on the sidewalk extremely unsafe and represents a community safety issue that the City of Eugene and the UO Campus Administration should be concerned about and actively addressing either through enforcement, education or engineering, or a mix of all three. ByDesign prefers the mix of enforcement, education and engineering as the best way to improve safety for all Eugene residents, including drivers, bicyclists, pedestrians, and the campus community.



13th Avenue and Hilyard Street

Downtown-Campus Corridor Land Use

The primary land use along 13th Avenue Downtown-Campus Corridor is commercial and residential, consisting mostly of student multi-family housing. The largest use in the corridor is the PeaceHealth University District Hospital located between Patterson and Alder Streets. The corridor's character is defined by small residential structures, while larger anchor structures like PeaceHealth and the future Capstone development exist at both ends.

Residential

In 1975, the Oregon State Legislature adopted legislation that enabled cities to establish transit oriented district tax exemptions. In 1978, Eugene adopted the Multi-Unit Property Exemption (MUPTE) in accordance with the state statute (City of Eugene). Recently, the amount of available multi-family housing options in downtown Eugene has increased, and continues to grow. Housing developers have taken advantage of the MUPTE because of the growing enrollment at the University of Oregon. In addition to Capstone development's planned capacity for 1,200 residents, Westgate Apartments, located at 740 East 13th, opened in 2011 adding 70 residential units. These apartments are specifically targeted towards students. Other proposed multifamily housing projects along the corridor include:

- The Patterson: 13th and Patterson; 102 proposed units
- 712 East 14th Avenue; 29 proposed units
- 12th and Patterson; 75 proposed units
- 15th and Patterson; 52 proposed units

According to the US Census, the majority of the corridor's housing units are renter-occupied, which has not changed from 2000

to 2010. The majority of these renters are college students and are located within one mile of the UO campus, which ByDesign believes are most likely to take transit, ride their bike or walk to campus using 13th Avenue.

Commercial

Most of the commercial establishments that front the corridor are small markets, bars, restaurants and small shops that could cater to bicyclists and pedestrians, with the potential for more of these businesses developing should the corridor continue to redevelop. Most all of the buildings fronting the corridor are zoned Community Commercial, with a few parcels closer to downtown as Major Commercial. ByDesign believes there is opportunity to reclaim more commercial space frontage where existing underutilized off-street parking lots are present ranging from 2,586 to 9,302 square feet, shown on the map below as infill opportunities.

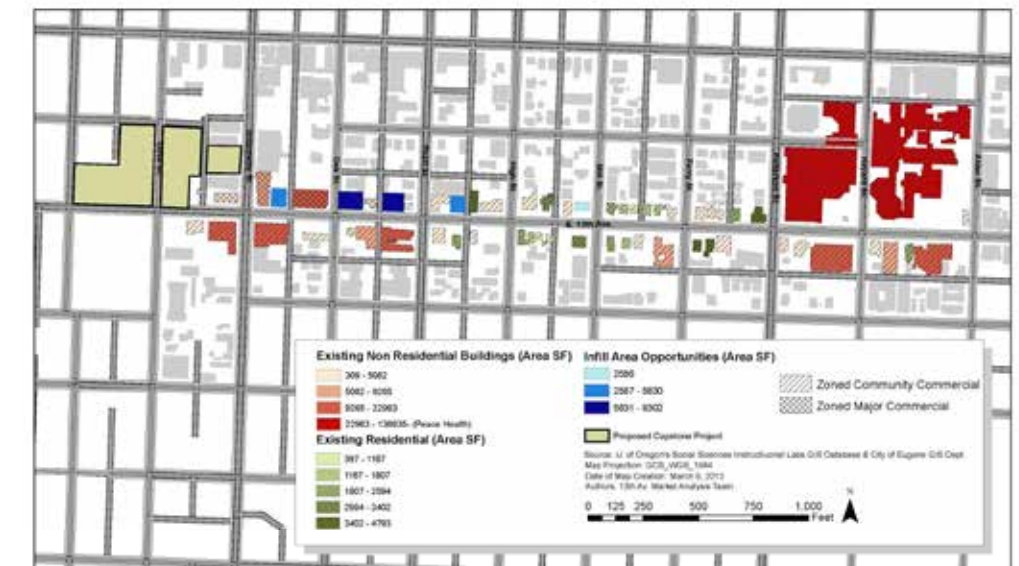
Population Trends

Lane County's population is predicted to increase by 21 percent, with around 71,830 more persons in 2035 than in 2008. Eugene is expected to increase by 27 percent, or 41,200 persons (City of Eugene). Much of this population growth in Eugene could stem from multi-family housing opportunities near the University of Oregon campus.

In the short term, according to the 2009 and 2011 U.S. Census American Community Survey 5-year estimates, population declined west of downtown, but the percentage of students living closer to 13th Avenue and campus increased. To add, the

projected 1,200 students that will live in Capstone will increase the number of students in the west end of the corridor, and will likely reverse the trend of a decreasing student, and overall population in the downtown core.

E. 13th Ave. Existing Building Use Frontage and Infill Opportunities, Eugene, OR



Relevant Policy and Planning Document Analysis

The City of Eugene, UO, and the greater Eugene-Springfield area have all clearly identified multi-modal infrastructure as a priority. The policies in the region’s plans, as well as guiding documents from national transportation organizations, support infrastructure changes to 13th Avenue.

The documents analyzed and summarized include:

- Eugene-Springfield Metro Plan
- Eugene-Springfield TransPlan
- City of Eugene Bike and Pedestrian Master Plan
- Envision Eugene
- University of Oregon’s Bicycle Plan
- Eugene Downtown Plan
- Eugene Bike Design Guide
- NACTO Urban Bikeway Design Guide
- Lane Transit District Mode Study

All planning documents focused on Eugene contain an element stressing the development of bicycle infrastructure throughout the city. Envision Eugene states that the city should “plan growth to reduce need for autos” and “support the efforts of the bicycle/pedestrian master plan,” which outlines a goal to double the percentage of trips taken on bike by 2031, and provide “continuous and direct routes, and convenient connections.”

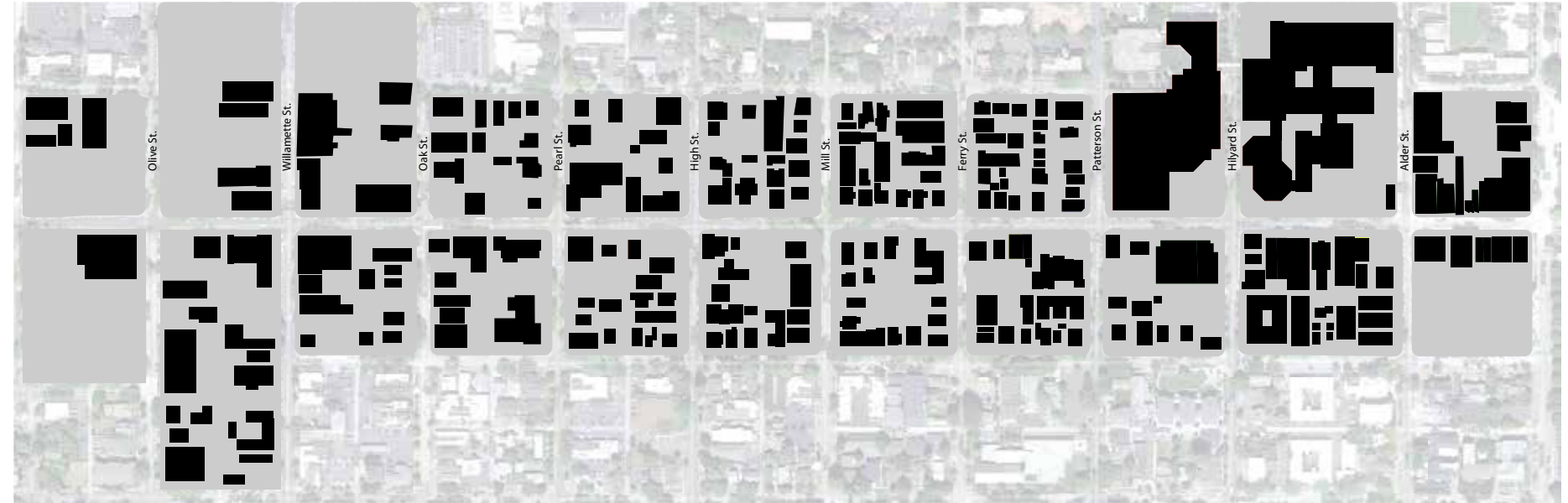
More specifically, Metro Plan goal F.22 and TransPlan Goal 3 state, “Require bikeways to connect new development with nearby activity centers and major destinations.” With current estimates of bicycle trips totaling over 3,000 per day at points along the 13th Avenue Downtown-Campus corridor, it already has

become a major bicycle thoroughfare. In addition, the Capstone development will likely contribute to increased bike trips along this corridor. The increase, ByDesign believes, could contribute to unsafe conditions on 13th Avenue if bicyclists continue to travel against auto traffic.

As bicycle infrastructure becomes more common across the country, design guides have been developed to account for nearly any situation involving the interactions of vehicles and bikes to ensure the safe and efficient travel of both modes. The NACTO Urban Bikeway Design Guide provides comprehensive analyses and recommendations for accomplishing safe and efficient roadway redesigns for all users’ needs. The guide’s bikeway facilities and infrastructure are all permitted (with two exceptions) under the Manual on Uniform Traffic Control Devices (MUTCD). Moreover, all of the treatments are used internationally and in many cities around the US. The ByDesign team followed the NACTO Urban Bikeway Design Guide standards for its designs to ensure a safe and functional corridor for all roadway users.

The University of Oregon ranks the needs of bicyclists fourth in its transportation plan, after emergency vehicles, pedestrians, and people with disabilities. The Bicycle Plan encourages using alternative modes of transportation to travel to campus, and recommends linking university infrastructure to the city network.

This analysis demonstrates that the City of Eugene, the Eugene-Springfield area, and the University of Oregon have clearly defined bicycle infrastructure as a priority in their transportation agenda.



Building footprints on the 13th Avenue Downtown-Campus Corridor



Land uses on the 13th Avenue Downtown-Campus Corridor



ByDesign Design Charrette

Chapter 3: Vision

For more than half a century, US transportation policy has placed a premium on automobile mobility above all other modes. With the investment in auto-oriented infrastructure, Americans' behaviors followed suit: vehicle miles traveled, commute distance, and per-capita automobile ownership all increased, while a disinvestment in alternative transportation modes resulted in a decrease in ridership.

In 2005, American per-capita driving peaked and continues to decrease, while public transportation, bicycling and walking is seeing a revolution, especially in the college-aged population. However, transportation modeling, planning, funding, and policy decisions are not adjusting with the change in transportation behaviors and demands, especially in many urban areas.

Eugene, Oregon is often perceived as a progressive city that is friendly to all modes of transportation. Eugene has one of the highest bicycle commute to work mode shares in the country, as well as a robust transit system. However, the ByDesign team feels that the bicycle network is disconnected in areas, leading many people to perceive the network as unsafe.

ByDesign's primary focus has been to improve safety and access for all users of the 13th Avenue Downtown-Campus Corridor through reprioritizing the movement of people over automobiles. The hundreds of daily bicyclists using 13th Avenue against the direction of traffic within the roadway or on the sidewalk represent a community safety issue. The City of Eugene and UO Campus Administration need to actively address this issue through enforcement, education, engineering, or a mix of all three. The

team believes re-engineering the roadway to match human behaviors' proven travel preference should be the centerpiece for the plan to improve safety, accessibility and economic vitality.

Active, economically healthy corridors like 13th Avenue often represent a central piece of a larger comprehensive network of accessibility and urban amenities. Just as our community's needs and infrastructure continue to evolve, street designs and their uses can no longer remain static.

Acknowledging these facts, the group's overarching vision for the Downtown-Campus Corridor redesign and plan is:

To create safer roads for all users through the development of connected bikeways that enhances Eugene's multi-modal transportation system and improve health and livability for all Eugene residents, while also improving the economic vibrancy of its business corridors. To achieve this, the team has identified its preferred solution for a redesign of 13th Avenue that improves safety, while maintaining functional use for all of its users.

The 13th Avenue corridor represents more than a line between two points; it is a cornerstone at the very foundation of a comprehensive system of access that embraces all modes of travel. ByDesign's preferred design alternative is pivotal, with outcomes from this plan embracing a culture of sustainable transportation options and a higher quality of living. Key to securing that sustainable future will be a safer, connected, vibrant street, set to foster meaningful social interactions and ignite economic growth.

ByDesign Proposal

ByDesign proposes a two-way buffered cycle track on the north side of the 13th Avenue Downtown-Campus Corridor. This change is significant when compared to the one-way bike lane that exists currently. To accommodate this change, elements of the street such as parking, car lanes, and traffic signals will need to change as well.

The Cycle Track

A two-way cycle track is a bicycle facility separated from moving automobiles. Common methods of separation include parked cars, paint, or flexible bollards. These facilities are commonly found on one-way streets to provide a safe contra-flow option for cyclists. The benefits, according to the National Association of City Transportation Officials (NACTO), include:

- Dedicates and protects space for bicyclists by improving perceived comfort and safety. Eliminates risk and fear of collisions with overtaking vehicles.
- Reduces risk of 'dooring' compared to a bike lane, and eliminates the risk of a doored bicyclist being run over by a motor vehicle.
- On one-way streets, reduces inefficient and indirect travel by providing contra-flow movement.
- Low implementation cost when making use of existing pavement and drainage and using parking lane or other barrier for protection from traffic.
- More attractive to a wide range of bicyclists at all levels and ages.

The two-way buffered cycle track ByDesign proposes consists of elements designed to make it stand out, both as an iconic piece

of bicycle infrastructure and as a safety measure on behalf of the bicyclists who will use it. The design proposes using green paint to highlight the part of the right-of-way dedicated to cyclists. Green is a standard color in the United States to denote space for cyclists. In Eugene, green is primarily used for indicating places where zones for cyclists intersect zones for cars. The proposed cycle track takes the concept farther by making everything green and dashing the green lane at those intersection points. Portland uses this technique in its downtown on SW Stark and SW Oak. This treatment will make cyclists more visible across the entire 10-block area of 13th Avenue.

In addition to the green paint, we propose adding a yellow painted buffer strip to further increase the visibility of the cycle track. This technique is used in Portland on NE Multnomah Boulevard to distinguish the zones for cars and for bikes. Taken with the green lane treatment, the cycle track will provide clear and uninterrupted visibility for the bi-directional flow of bicyclists while also sporting an attractive UO color scheme. These changes can be done with roadway paint, making it an affordable way to create an iconic transportation corridor for the City of Eugene.

The proposed cycle track conforms to the NACTO Urban Bikeway Design Guide. The guide recommends eight to twelve foot cycle track widths with a minimum of a three-foot buffer. This cycle track proposal is typically ten to twelve feet wide with buffers often wider than three feet.

In addition to paint and adequate space, ByDesign considered how to make the cycle track safe and legible at intersections and

other potential conflict points. ByDesign proposes adding bicycle boxes at intersections where there are likely to be many turns by bicyclists, both turning onto the cycle track as well as turning off of the cycle track on to other streets. Bicycle boxes allow cyclists to move in front of cars at red lights, enhancing their visibility and allowing for easier turn movements. Bicycle boxes also reduce accidents between bicyclists heading straight and cars turning into the space where bicycles are located. Bicycle boxes are becoming more common and recent studies by the Portland State University Institute for Bicycle and Pedestrian Innovation found that 42 percent of drivers and 77 percent of bicyclists felt safer at intersections with bicycle boxes (Dill).

In areas along the cycle track near a bus stop, ByDesign propose adding flexible bollards to discourage drivers from passing a stopped bus by driving onto the cycle track.

Parking and Car Lanes

The addition of a westbound bicycle lane and three-foot minimum buffer will require more space between curbs, which requires reapportioning the space currently available. The design proposal displaces automobile parking and automobile travel lanes in strategic locations designed to minimize impacts on drivers. ByDesign members conducted thorough, weeklong traffic and parking studies to determine the demand for parking and car lanes along the corridor. This research led the group to recommend the removal of parking spaces between Willamette Street and High Street, as parking occupancy rates were low while traffic volumes were high. ByDesign also proposes to retain parking between High Street and Ferry Street while displacing an

automobile travel lane, as the data showed the reverse conditions of the previous segment of roadway. Finally, the design proposal eliminates parking between Patterson Street and Hilyard Street, but would retain parking spaces between Hilyard Street and Alder Street. ByDesign believes this strategic balance of displacing parking or automobile travel lanes limits the negative impact on residents and businesses along the 13th Avenue Downtown-Campus Corridor.

Parking in Detail

Currently, there are 52 on-street parking spaces along 13th Avenue between Olive and Alder Streets. Of these spaces, 4 are loading spaces, 25 are metered spaces, and 23 are time-limited free parking spaces. ByDesign's preferred alternative provides for 28 on-street spaces, a parking space reduction of 46 percent. The spaces were strategically removed from areas with low parking demand. Parking between Mill and Patterson Streets and between Hilyard and Alder Streets have the highest parking occupancies. Parking was preserved on these blocks to account for the high demand for these spaces. The removal of parking in other areas is expected to shift parking demand to 12th Avenue, 14th Avenue, onto the north-south streets, or onto unused off-street parking. Table 7 lists the proposed parking space changes by block. ByDesign recommends all parking spaces be priced using variable pricing to manage the parking occupancy to ensure at least one available space on each block at all times.

Table 7. Changes to on-street parking on 13th Avenue

Street segment	Current parking	Proposed parking	Change
Olive to Willamette	0	0	0
Willamette to Oak	4	0	-4
Oak to Pearl	7	0	-7
Pearl to High	2	0	-2
High to Mill	8	4	-4
Mill to Ferry	7	10	+3
Ferry to Patterson	10	6	-4
Patterson to Hilyard	6	0	-6
Hilyard to Alder	8	8	0
TOTAL	52	28	-24

Signs and Signals

With the introduction of westbound bicycle traffic on the 13th Avenue Downtown-Campus Corridor, new signs and signals will need to be added to educate and guide all road users.

The ByDesign plan includes new traffic signage to be added throughout the corridor to inform all roadway users to expect two-way traffic on the one way auto traffic street, and that automobiles yield to bicyclists at intersections, alleys and driveways. The signs conform to the Manual on Uniform Traffic Control Devices. The signage to be added includes:

- “ONE WAY” sign (MUTCD R5-1, R6-2) with “EXCEPT BIKES” plaque to be posted along the facility and at intersecting streets, alleys, and driveways informing motorists to

expect two-way traffic. This is a requirement for two-way cycletracks installed on one-way streets.

- “DO NOT ENTER” signs (MUTCD R5-1) with “EXCEPT BIKES” plaque is required to be posted along the facility to only permit use by bicycles on the cycletrack facility.
- Roadway color, yield lines and “Yield to Bikes” signage should be used to identify the conflict area and make it clear that the cycletrack user has priority over entering and exiting traffic. The conflict areas include all driveways, and minor and major intersections. Variant of MUTCD R10-15 which includes helmeted bicycle rider symbol should be used (MUTCD figure 9C-3 B). Alternate signs in common use are similar to MUTCD R1-5, 1-5a. The City of Eugene uses a similar sign at 11th Avenue and Mill to warn left turn autos to yield to LTD buses.

Traffic signals need to be added to accommodate the new westbound traffic. As the new traffic will be bicycle only, ByDesign proposes adding bicycle-specific traffic lights at eye level. Bicycle-specific traffic signals are approved by the Oregon Legislature and already in use in Eugene at 18th Avenue and Alder Street. The total cost for that signal and installation was \$1,250 (Wolf).

Adding bicycle-specific signals can pose challenges when used on a new two-way cycle track on what was previously a one-way street. Bicyclists will inevitably experience some delays, as creating timings that allow for green lights along the entire length of the corridor is impossible in two directions. ByDesign proposes balancing the delays so as not to favor one direction over the other.

To increase safety, we recommend adding a separate, quick signal phase that gives pedestrians and cyclists an extra second or two to enter the intersection before eastbound car traffic gets a green light. This allows drivers to more easily see pedestrians and bicyclists before starting their turning movement.

Education Campaign

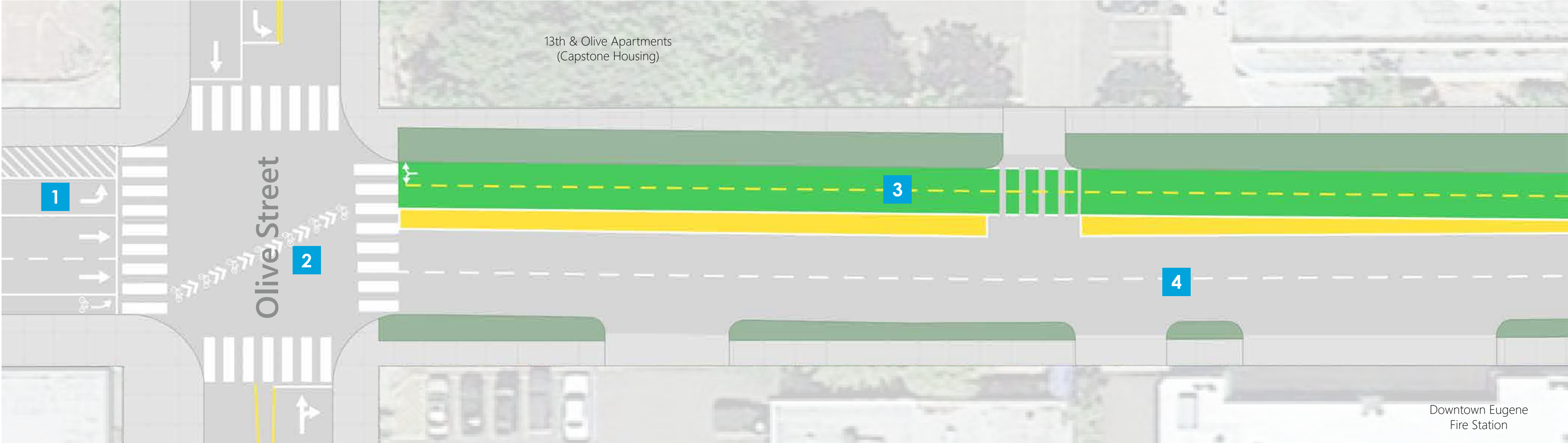
It’s important that an education campaign coincide with the installation of ByDesign’s preferred design alternative. Bicyclists need to be educated of their new responsibilities that come with new access, pedestrians need to be aware of two-way traffic and to look both directions, and auto drivers must be aware of the changing roadway configuration and new responsibilities. To adequately disseminate educational materials into the broad public domain, ByDesign recommends:

Bicycle Education should be twofold: education and enforcement. Volunteer or part-time “Bicycle Ambassadors” should be used for the first three weeks after installation to answer questions for all users, hand out pamphlets with bicycle education information, inform users when they are not using the new facility correctly and also inform them that the roadway’s rules will be strictly enforced. Throughout the third week of the ambassador program, ByDesign recommends that the City of Eugene Police Department take extra consideration in monitoring the cycle track and enforcing the rules of the road against any violators, including bicyclists, pedestrians, and auto drivers.

Pedestrian Education is important and should not be overlooked. ByDesign recommends that the City of Eugene consider implementing aspects of New York’s “LOOK” campaign. The innovative campaign includes street markings, advertisements in cabs and on street amenities, and through public service videos. ByDesign recommends implementation of the innovative street markings or some variation of it to raise pedestrians’ awareness to look both ways before stepping into the cycletrack (New York City DOT).

Auto Driver Education is more challenging, but opportunities such as effective signage and communication through media exist. ByDesign recommends strong enforcement of the roadway’s new regulations, but also strong pre- and post-implementation public awareness efforts. This includes press releases to media outlets, making public employees accessible for interviews, and diligent follow-up to ensure the message is being properly presented as an education tool.

CONCEPTUAL DESIGN: OLIVE STREET TO WILLAMETTE STREET



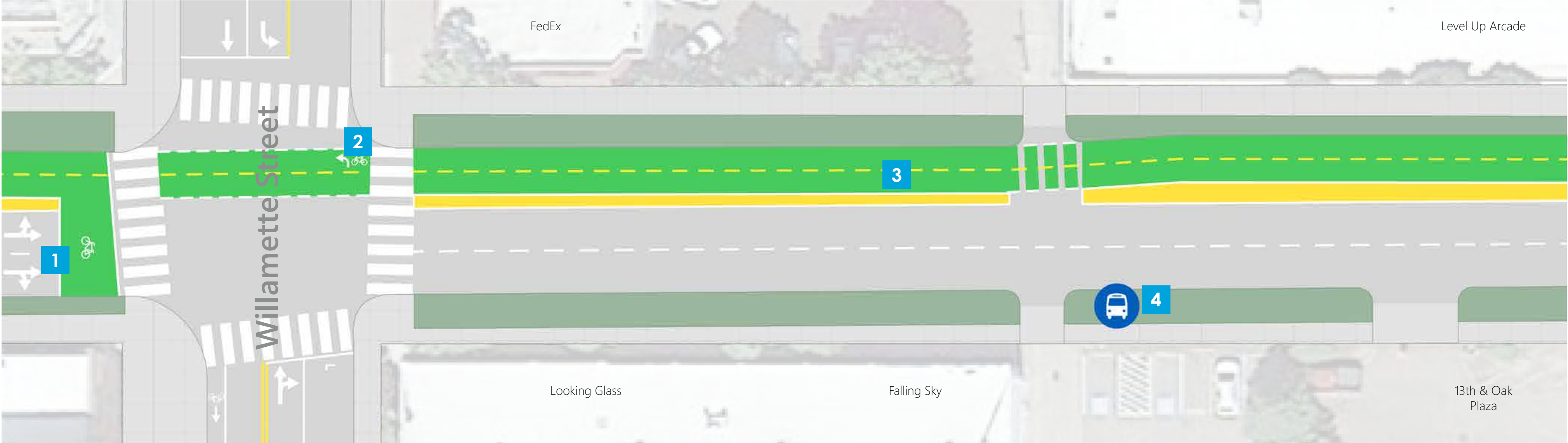
1 Left turn lane from 13th Avenue onto Olive Street will remain.

2 Bicyclists will use a dedicated signal phase to cross Olive Street and use the two-way cycle track.

3 A two-way buffered cycle track provides access and safety for people on bikes.

4 Two eastbound traffic lanes.

CONCEPTUAL DESIGN: WILLAMETTE STREET TO OAK STREET



1 Right turn lane from 13th Avenue onto Willamette Street eliminated. Bike box added to provide space for bikes to turn right on to Willamette Street.

2 Two-stage left turn. Bicyclists travelling north on Willamette can wait here to turn west onto 13th Avenue.

3 A two-way buffered cycle track provides access and safety for people on bikes.

4 LTD bus stop remains.

CONCEPTUAL DESIGN: OAK STREET TO PEARL STREET



1 Left turn lane from 13th Avenue onto Oak Street will be eliminated.

2 A two-way buffered cycle track provides access and safety for people on bikes.

CONCEPTUAL DESIGN: PEARL STREET TO HIGH STREET



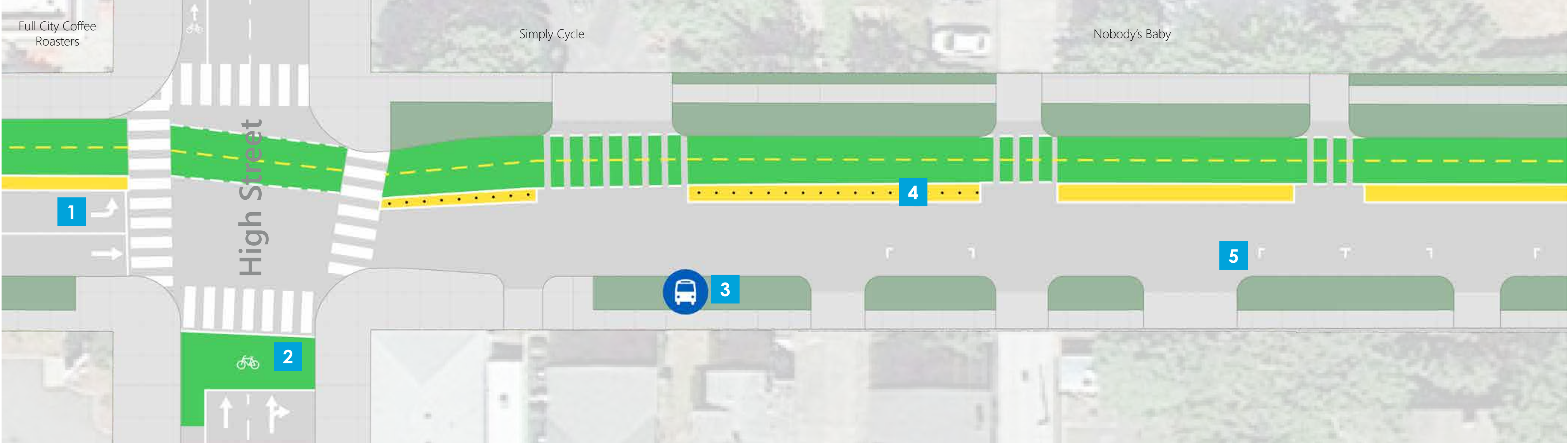
1 Right turn lane from 13th Avenue onto Pearl Street eliminated.

2 Bike boxes added to provide space for bikes to turn right onto Pearl Street and right onto 13th Avenue.

3 Striping pattern at driveways and alleyways increase awareness of conflict zones for bikes and drivers.

4 Left lane becomes turn-only lane as driver nears High Street.

CONCEPTUAL DESIGN: HIGH STREET TO MILL STREET



1 Left turn lane from 13th Avenue onto High Street will remain. 13th Avenue becomes one-lane road east of High Street.

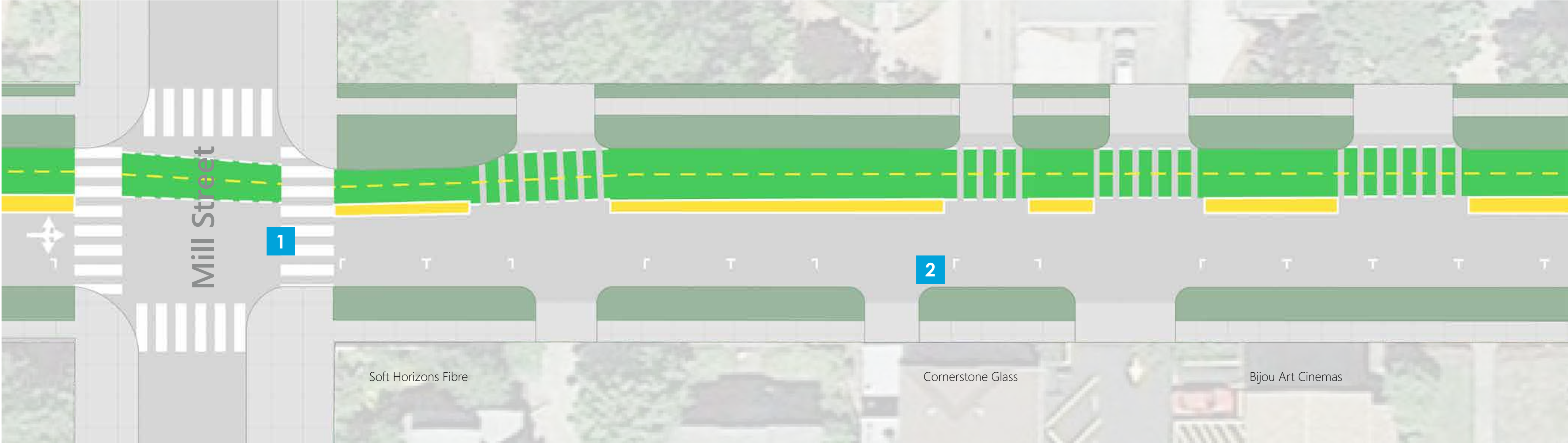
2 Bike box added to provide space for bikes to turn right onto 13th Avenue.

3 LTD bus stop remains.

4 Flexible bollards protect bicyclists from vehicles going around a stopped bus.

5 4 curbside parking spaces.

CONCEPTUAL DESIGN: MILL STREET TO FERRY STREET



1 Crosswalks added to improve safe walkways across 13th Avenue.

2 10 curbside parking spaces.

CONCEPTUAL DESIGN: FERRY STREET TO PATTERSON STREET



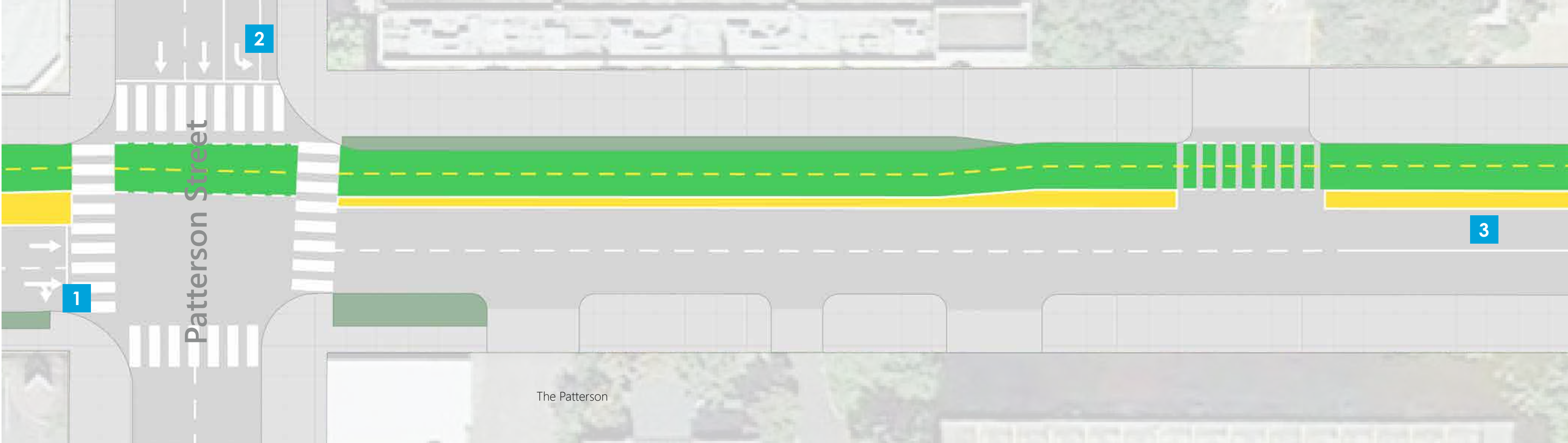
1 Crosswalks added to improve safe walkways across 13th Avenue.

2 6 curbside parking spaces.

3 LTD bus stop moved a couple hundred feet east to provide space for curbside parking spaces.

4 Parking lane becomes second travel lane.

CONCEPTUAL DESIGN: PATTERSON STREET TO HILYARD STREET

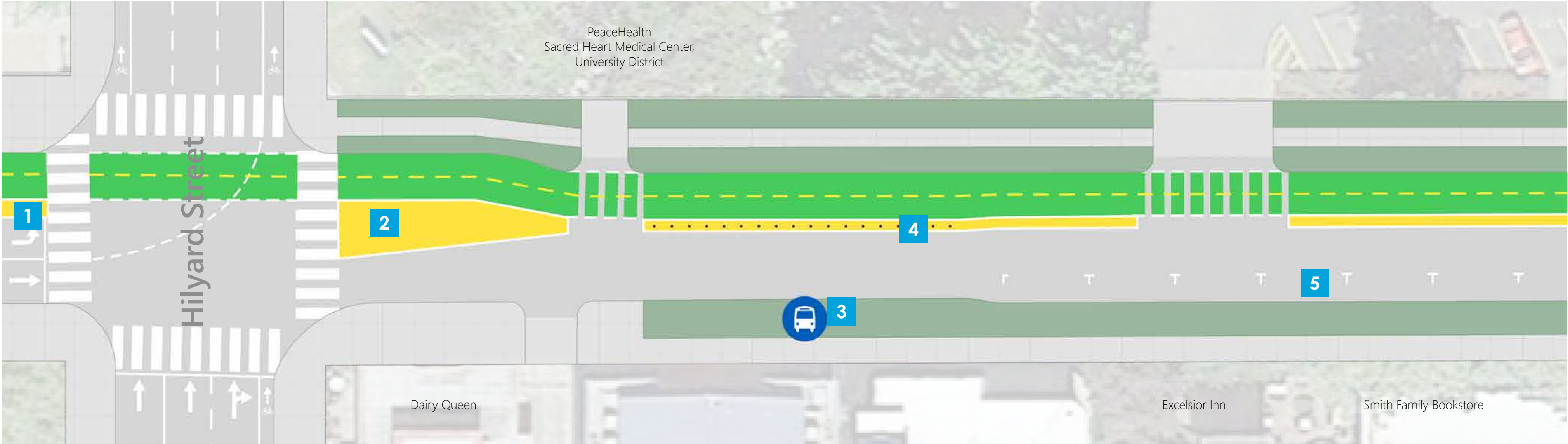


1 Right turn lane from 13th Avenue onto Patterson Street eliminated.

2 Left turn lane and bicycle lane switched to eliminate conflicts between vehicles and bicycles.

3 Left lane becomes urn-only lane as driver nears Hilyard Street.

CONCEPTUAL DESIGN: HILYARD STREET TO ALDER STREET



1 Second left turn lane from 13th Avenue onto Hilyard Street eliminated.

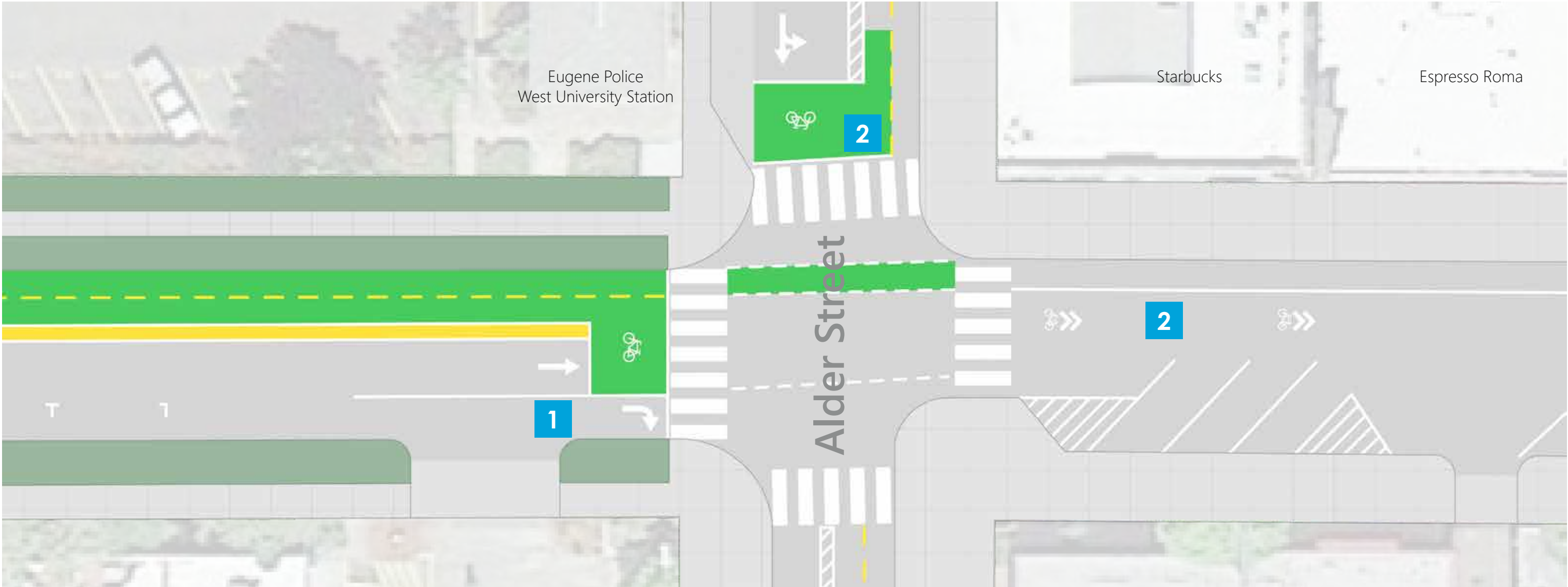
2 Painted median provides egress for emergency vehicles at PeaceHealth University District Hospital.

3 LTD bus stop remains.

4 Flexible bollards protect bicyclists from vehicles going around a stopped bus.

5 8 curbside parking spaces.

CONCEPTUAL DESIGN: ALDER STREET AND 13TH AVENUE

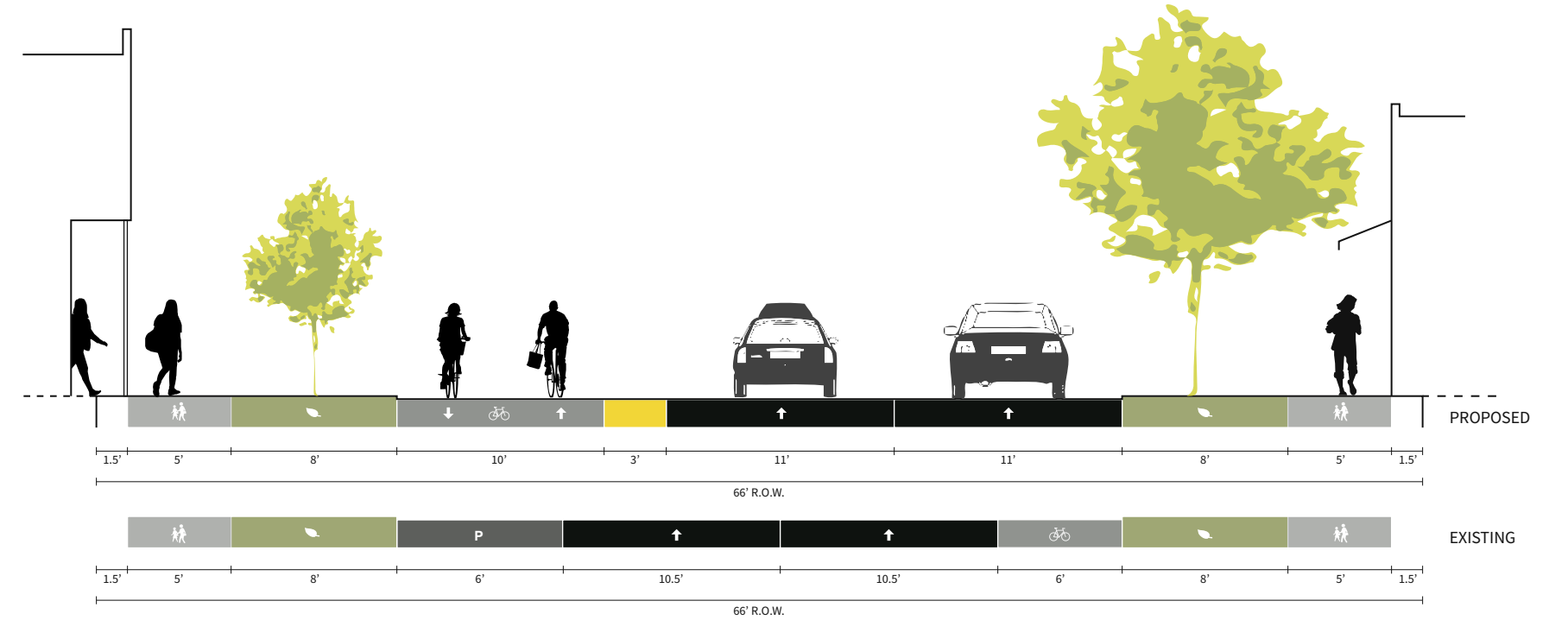


1 Right turn lane from 13th Avenue onto Alder Street will remain.

2 All design features on Alder Street and 13th Avenue east of Alder will remain the same.



Conceptual rendering between Willamette and Oak Streets.



Section view of 13th Avenue, with proposed and existing lane widths.



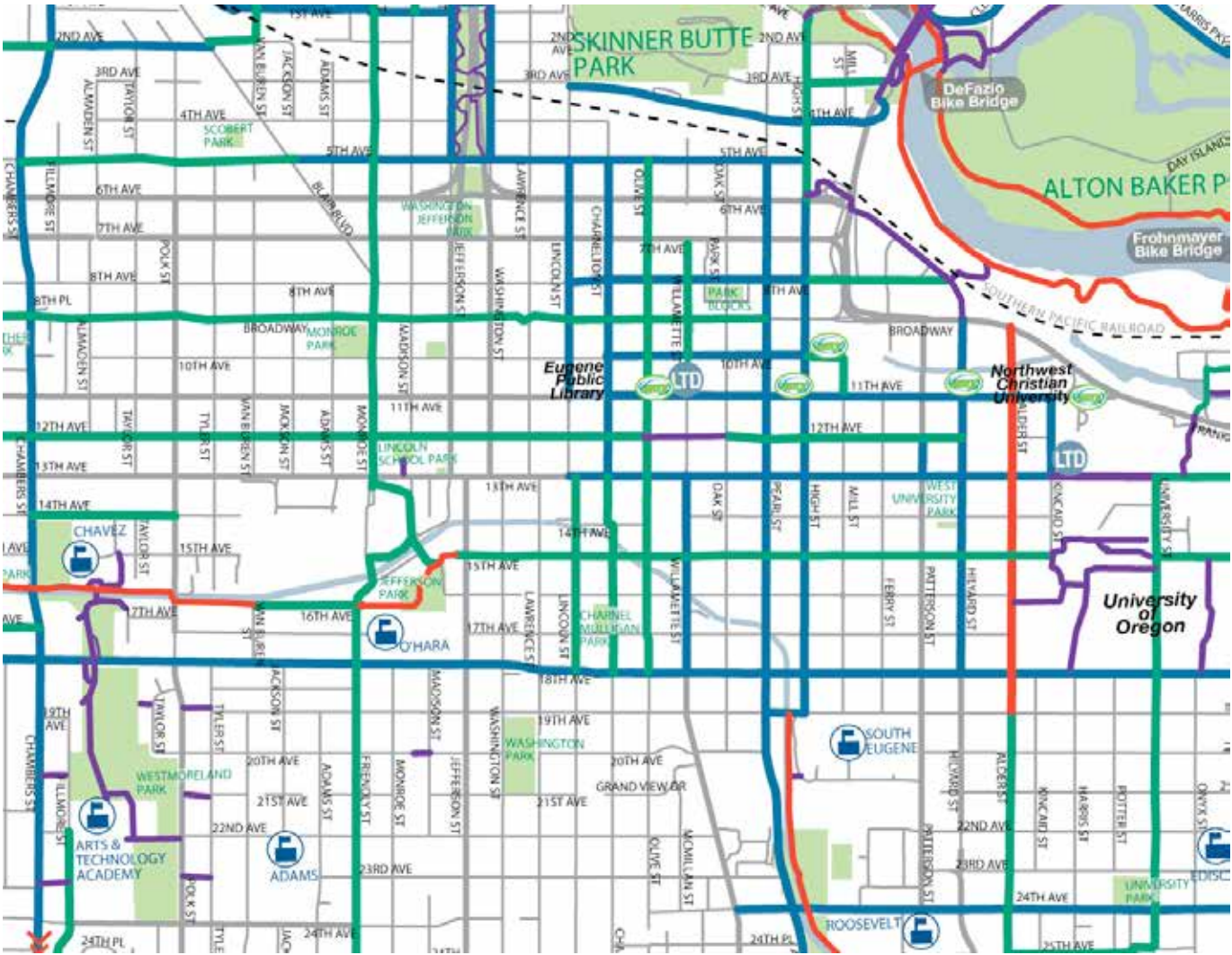
Conceptual rendering between Hilyard and Alder Streets.



Conceptual rendering between Olive and Willamette Streets.

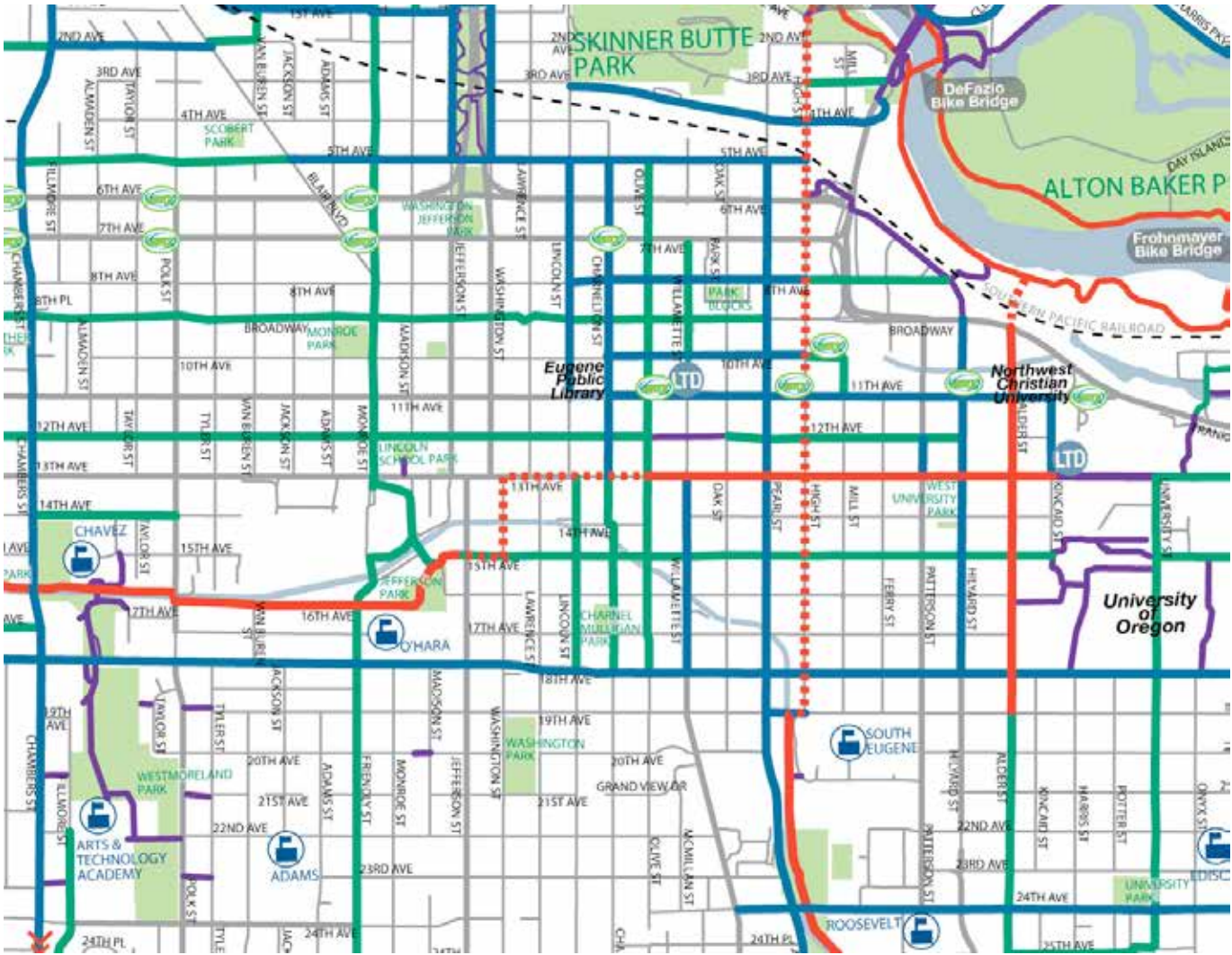
EUGENE BIKE NETWORK

Existing map



- Primary regional bike facilities
- Off-street path
- Bike lanes
- Shared roadway

Future vision



ByDesign’s preferred design is part of a broader vision for the bicycle network in Eugene. The red lines on these maps represent the primary regional bike facilities that provide efficient and stress-free connectivity, including cycle-tracks and off-street paths.

Chapter 4: Case Study

Economics

The 13th Avenue Downtown-Campus Corridor is an important link between downtown Eugene and the UO. The availability of multi-family housing options in the downtown area has increased and continues to grow. Most notably is the Capstone development that is under construction and will open in fall 2013. Improving bicycle facilities along 13th will not only make it easier for people to connect from downtown to campus, but will also stimulate economic growth. A recent study conducted by the Oregon Transportation and Education Consortium concluded that the average monthly expenditures by customer's travel mode reveals that bicyclists, transit users, and pedestrians are competitive consumers compared to automobile drivers and, for all businesses except supermarkets, spend more on average than those who drive. (OTREC).

Adding a cycle track that provides two-way bicycle access along the 13th Avenue Downtown-Campus Corridor is an affordable way to expand transportation options between downtown and the UO. Recent studies indicate that investments in bicycling infrastructure can generate significant returns in the form of better public health and safety, economic development, and job growth. Additionally, a cycle track will help to reduce traffic congestion, which ultimately can increase the capacity of roads at much lower costs than increasing the capacity for cars through roadway expansion. Furthermore, improving the area for cyclists and pedestrians will help the city avoid the costs associated with parking facilities (Wisconsin Department of Transportation). Most notably, the improvement will encourage users to leave their cars behind in favor of cycling or walking. According to the Local Governments

Commission, "Forty-six percent of Americans would walk or bike to work or for errands if they only had facilities that were safe and convenient" (Zykofsky).

The amount of bicycling and pedestrians in a community is a barometer of a community's quality of life. Streets that are busy with bicyclists and pedestrians are considered human-scaled environments that foster a sense of neighborhood and community (Wisconsin Department of Transportation). Developing areas that are more inviting to cyclists and pedestrians will help with economic development. The Cities of Portland and New York recently released studies of the economic impacts of increased bicycle ridership on key business corridors. In both cases, the cities looked at areas that improved bicycle infrastructure by adding two-way cycle tracks, secure bicycle parking infrastructure, and other facility enhancements. Both studies concluded that improvements to bicycle infrastructure correlated with economic growth along the corridors. The infrastructure resulted in more customers to the businesses and clientele that tends to spend more capital on goods. Additionally, bicycling and pedestrian enhancements can be leveraged to attract new business and economic activity.

Below are other key factors that demonstrate the economic benefit of enhancing and adding quality cycling infrastructure:

- The City of Portland, a League of American Bicyclists platinum-level city saw an economic increase of \$90 million as a result of bicycle-related activity in 2008. Nearly

60 percent of that activity came from retail, rental, and repair, with manufacturing and distribution, bicycle events, and professional services, such as bike messengers and coaching and legal expertise. (Flusche).

- Policies encouraging bicycling and increased urban density result in Portlanders saving on transportation costs, allowing them to have more money to spend on things they value (Flusche). Compared to the distance and time spent commuting to work in the average American city, Portlanders travel 2.9 billion fewer miles and spend 100 million fewer hours in their cars. This saves them \$2.6 billion a year (Clifton).
- Car drivers spend the lowest amount per person/per month when compared to those who biked, walked, or take transit (Clifton).
- Bicyclists also have more money to spend. According to the American Automobile Association (AAA), bicyclists save an average of \$9,100 a year from not owning a car and \$11,600 for SUVs (Pritchett).
- Protected bike lanes bring increased sales to businesses. Businesses along 8th and 9th Avenues in NYC's Lower East Side saw a 49 percent increase in retail sales compared to 3 percent borough-wide (New York City DOT)
- There were 49 percent fewer commercial vacancies after protected cycle tracks were installed in Union Square North in New York City compared to 5 percent borough-wide (New York City DOT).
- Bicyclists spend more money than drivers on Bloor Street in Toronto (Blue).
- Reduced traffic speeds and pedestrian amenities can

also make small commercial districts more attractive and accessible to nearby residents. One study found that traffic restraints that reduced traffic volumes on residential streets by several hundred vehicles per day increased house values by an average of 18 percent (Bagby; Littman).

- Bicyclists in the UK take fewer sick days on average and are more productive at work. The UK projects this savings at \$200 million a year (London School of Economics).



SW Oak between SW 2nd and 3rd Avenue, Portland.
Source: Jonathan Maus

Traffic Control Devices

Bicycle Boxes

A bicycle box is an intersection safety design enhancement intended to improve visibility, and prevent bicycle/car collisions. The boxes are designated space on roadway intersections where cyclists wait in front of automobiles during a red light. This makes the cyclists more visible and provides them safer movement through the intersection when the light turns green. Additionally, if a bicyclist is in a bicycle lane on the left side of the road, and they want to turn right (or vice versa), the boxes provide them with a safe way to do so. The boxes are particularly effective at preventing conflict when cars are turning, and cyclists are going straight. The cost of bicycle boxes is between \$2,500-3,000 (Center for Transportation Research).

A study was conducted to test the compliance and safety of cyclists and drivers using bicycle boxes (USA Today). Portland State



Bicycle Box in Portland, Oregon

University Institute for Bicycle and Pedestrian Innovation surveyed 3,722 cyclists and 4,163 automobiles at intersections with bicycle boxes. Using 918 hours of total video footage they found:

Compliance

- 73 percent of automobile operators stopped in the correct position behind the box and 86 percent of those survey said they understood the markings.
- 73 percent of people on bikes stopped ahead of the motor vehicle stop line, only 5 percent of bicycle riders positioned themselves in the bike box (out of the bike lane) in front of the motor vehicle stop line. That number jumped of 38 percent when one bike was already in the box.
- Bicyclist encroachment in the crosswalk decreased after installation dropping from 41 to 35 percent of cyclists arriving on a red signal.
- 90 percent of motorists preferred the green bike box to the no-color bike box.

Safety

- 42 percent of automobile operators who do not ride bicycles felt that driving through the intersection was safer with the bike boxes (compared to 14 percent who felt it was more dangerous)
- 77 percent of people who biked through the intersections felt they were safer with the bicycle boxes
- Controlling for differences in volumes of bicycles and right-turning vehicles, fewer bicycle-automobile conflicts are expected for an intersection with a bike box (Dill, et al.).

Bicycle Traffic Signals

In order to reduce conflict with motorized traffic, bicycle-specific traffic signals provide cyclists with exclusive right-of-way, and provide sufficient time for bicyclists to clear the intersection.. The Oregon Legislature passed Senate Bill 130, which added bicycle-specific signals to the Oregon State list of traffic control devices. The City of Eugene has one bicycle signal located at the intersection of 18th Avenue and Alder. The total cost for installation and the signal was \$1,250 (Wolf).

Benefits of bicycle-specific traffic signals:

- Reduces risk of cyclists who are entering an intersection by giving them protected crossing time, during which all motor vehicles must wait.
- Allow all users to feel more comfortable on the road.



Bicycle Traffic Signal

Study of bicycle traffic signals in Washington D.C.

The District Department of Transportation (DDOT) evaluated bicycle facilities on 16th Street NW and New Hampshire Avenue in Washington, D.C. The analysis looked at contra-flow bicycle lanes with bicycle signals. They concluded:

- Signal progression is meant to help vehicles and bicycles progress with reduced delay at intersections and works best on one-way facilities and facilities with heavy travel in one direction. However, when users are traveling in both directions, one direction inevitably experiences increased delays while the other is able to progress more efficiently. While signal timing can be coordinated to balance these results, two-way cycle tracks located on one-way streets inevitably pose challenges for signal timing.
- To help bicyclists understand the traffic control that applies to them, the application of bike signals should be consistent along a particular facility.
- Bicycle detection is provided in the contra-flow bicycle lanes on New Hampshire Avenue in Washington DC, so that the signal controller detects bicycles as they approach the intersection. Overall, the bicycle facilities did not significantly change motor vehicle travel speeds along 15th Street. Analysis of travel time runs done both before and after installation of the cycle tracks showed no significant difference in corridor travel time for motor vehicles.
- Pedestrians indicated that they are encountering fewer cyclists on sidewalks.

Two-way cycle track

Two-way cycle tracks are 2-way bike lanes that are physically separated from automobile traffic (often parked cars or paint). They often include bicycle-specific signals at intersections in order to separate cyclists from pedestrian and automobile activity. The benefits, according to the National Association of City Transportation Officials (NACTO), include:

- Dedicates and protects space for bicyclists by improving perceived comfort and safety. Eliminates risk and fear of collisions with overtaking vehicles.
- Reduces risk of 'dooring' compared to a bike lane, and eliminates the risk of a doored bicyclist being run over by a motor vehicle.
- On one-way streets, reduces out-of-direction travel by providing contra-flow movement.
- Low implementation cost when making use of existing pavement and drainage and using parking lane or other barrier for protection from traffic.
- More attractive to a wide range of bicyclists at all levels and ages.



Alder Street Cycle Track in Eugene

15th Street NW (E Street to V Street), Washington, D.C. Two-way cycle track

Washington, D.C. emerged as one of the nation's leaders in increasing bicycle use and adding innovative infrastructure. The city's concerted efforts to prioritize people movement over automobiles has supported the development of a bicycle network where all can feel safe and secure (Nicholson). Projects include a 2-way bicycle track that runs down the center of Pennsylvania Avenue connecting the US Capitol with the White House; intersection treatments at New Hampshire Avenue NW/U Street NW/16th Street NW including bike boxes, bicycle traffic signals, and contra-flow bike lanes.

Another project is a two-way cycle track on 15th Street NW stretching from E Street to V Street for 2 miles. 15th Street is a one-way northbound street for motor vehicles. Before the enhancements, southbound cyclists did not have access on this roadway. The two-way cycle track is located between the sidewalk and a row of parked vehicles on the westside of the street.



15th Street NW. Source: bikede.org

The two-way cycle track is eight feet wide, and has a three-foot buffer between it and vehicle traffic or the row of parked cars. As cyclists approach intersections along 15th Street, the approaching lane is separated from the other cycle lane, creating a 7-foot buffer between the two. The design was done to increase cyclist visibility to left-turning auto drivers.

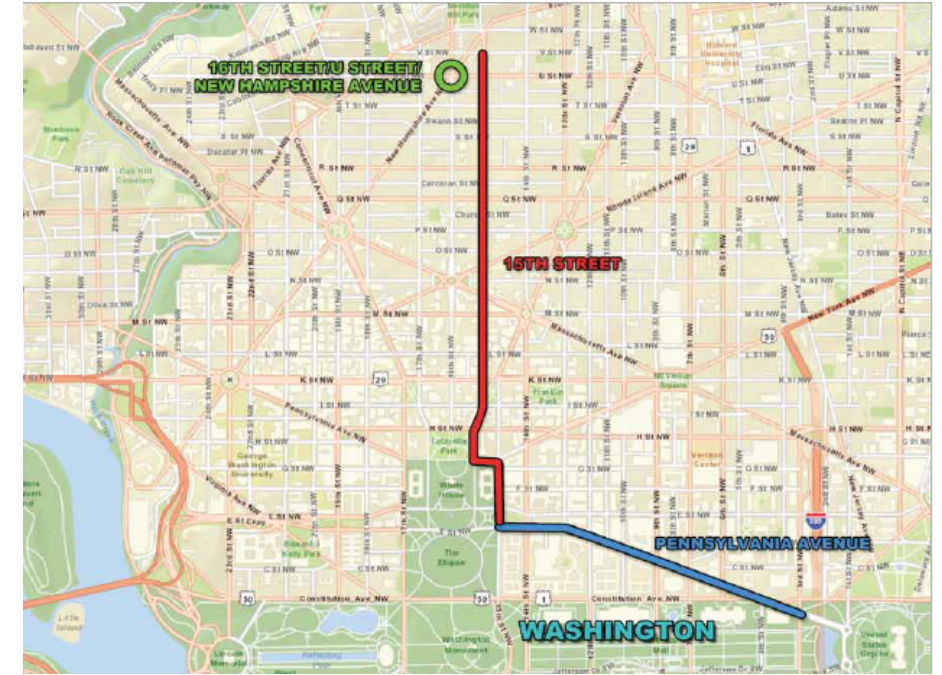
Three other changes to the roadway included:

- **Shared lane markings** were added through intersections to indicate the likely presence of bicyclists and to limit unambiguity in priority for cyclists and turning motorists
- **Left-turn restrictions** were instituted to reduce potential conflicts between cyclists and left-turn vehicles at locations where left-turns had previously been permitted. Left turns were eliminated at some signals, while others remained using protected left turn phases.
- **Signal timing changes** were made to accommodate bicyclists. Additional time was provided for bicyclists to enter the intersection prior to motor vehicle movement

The DC Department of Transportation (DDOT) evaluated the two-way cycle track and found that the bicycle treatments improved conditions for cycling without negatively impacting other modes in the vicinity of the investment. The key findings and recommendations include:

Findings

- Bicycle volumes increased by approximately 200 percent for areas of the corridor during PM peak traffic.



Map of study area in red. Source: dc.gov

- Motor vehicle volumes remained relatively constant on 15th Street before and after the bicycle facilities were installed.
- LOS remained largely unchanged before and after the bicycle facilities were installed (LOS D&E)
- The street's Danish bicycle LOS jumped from D to A.
- Cycling accidents did not increase after installation, after considering the increased ridership volumes.
- Red-light running by cyclists is high, with over 40 percent of cyclists observed disobeying signals.
- Cyclists overwhelmingly feel that riding on 15th Street with the cycle track is much safer and easier with the new enhancements.

- Motorist are generally favorable toward the cycle track.
- Pedestrians indicated that they are encountering fewer cyclists on sidewalks

Recommendations

- Consider installing a flashing yellow left-turn signal for motorists. A flashing yellow arrow for left turning motorists may help convey through bicycle priority and reduce risk of crashes. Implementing this as an experimental treatment at one or more intersections would allow a review of its effectiveness before full corridor implementation.
- Consider using green colored pavement at unsignalized conflict areas
- Green pavement might also be appropriate through intersections to provide a visual cue to motorists to watch for potential conflicts and not block the intersection while waiting to turn.
- Improve, to the extent possible, signal progression for southbound cyclists
- Add pedestrian islands to crossings
- DDOT should consider a cyclist education and enforcement campaign to encourage compliance with traffic signals.

DDOT's two-way cycle track installations, which rely on current lighting and low cost improvements such as paint and flex posts, have cost approximately \$100,000 per mile. By comparison, the Ninth Avenue one-way cycle track in New York, which includes dedicated bike traffic signals, trees and pedestrian refuge islands, cost approximately \$1.5 million per mile (Miller).



15th Street NW morning commute
Source: WAMU/Di Caro



15th Street and R NW
Source: Borderstan

Conclusion

Over the past few years, the West University neighborhood, downtown Eugene, and the UO have changed significantly. With more students enrolling at the UO, the demand for housing near campus exploded and the trend continues. The 13th and Olive Apartments and a new development on Patterson Street and 13th Avenue are two of the latest housing developments to break ground on 13th Avenue, bringing more than 1,200 additional residents to the corridor. In addition, downtown Eugene is experiencing a renaissance, with several new dining and entertainment options opening in the past year with more still to open. This increase in student housing density, coupled with the anchors of a resurgent downtown Eugene and a growing UO campus, places an increasingly large burden on 13th Avenue.

Thirteenth Avenue serves as the primary and symbolic connector between campus and downtown. The street is one of Eugene's busiest bicycle and pedestrian routes. This is not surprising, as 13th Avenue serves as one of the gateways to campus and 79% get to campus by alternative transportation modes, including walking, bicycling, bus, or carpooling.. Only 16 percent use a car to commute to campus.

With the non-car traffic on an already busy 13th Avenue likely to grow, and an increasingly-popular downtown and new housing options drawing bicyclists westward, the LiveMove ByDesign team believes the demand exists for a two-way cycle track on the street to replace the current eastbound bicycle lane. In this report, we have demonstrated that every day hundreds of cyclists already go westbound on 13th Avenue, but do not have adequate facilities to do it safely. Furthermore, space can be repurposed

from underused parking spaces and overbuilt car lanes to increase capacity and accessibility for bicycles.

Our proposed design offers a safe, easy-to-understand link for cyclists traveling between downtown Eugene and campus. Our plan does not require expensive techniques to build, transit can operate largely as it does now, and no additional right-of-way needs to be acquired. Paint, flexible plastic poles, and a few traffic signals are all that is required. We recommend that an educational and enforcement campaign coincide with the design's installation to best answer questions and ensure proper use by all roadway users.

The ByDesign team did its homework when evaluating the current conditions as well as the techniques used in the redesign. We feel confident that the assessment and proposal in this report represents a complete solution for 13th Avenue. This report serves as a strong starting point for any further studies, outreach, or plans conducted by the City of Eugene and the UO Administration. Thirteenth Avenue can be safer and better for everyone, and the LiveMove ByDesign team is proud to offer this report as our plan to make that change happen.

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Appendices

Appendix A: Automobile and Bike Counts

13th Avenue and Hilyard Street AM Counts

Counter(s) Joe McAndrew; Emma Newman
 Date 11/12/12
 Time 8-9 AM
 Weather Rainy; 45-50 degrees

Bicyclists

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
8:00-8:15	0	0	3	4	19	0	1	0	0	0	2	1	30	14%
8:15-8:30	0	0	3	3	38	0	1	0	0	0	0	0	45	22%
8:30-8:45	0	1	0	1	44	0	1	0	0	0	2	1	50	24%
8:45-9:00	0	2	6	1	65	0	2	0	0	1	2	3	82	40%
Total	0	3	12	9	166	0	5	0	0	1	6	5	207	
Percent		1%	6%	4%	80%		2%			1%	3%	2%		

Cars

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
8:00-8:15	0	90	21	21	62	0	0	0	0	0	0	0	194	25%
8:15-8:30	0	104	9	17	27	0	0	0	0	0	0	0	157	20%
8:30-8:45	0	158	21	32	17	0	0	0	0	0	0	0	228	29%
8:45-9:00	0	165	12	33	0	0	0	0	0	0	0	0	210	27%
Total	0	517	63	103	106	0	0	0	0	0	0	0	789	
Percent		66%	8%	13%	13%									

Notes: There was never any cars backing up at this intersection. The only disturbance to cars came when cars were heading east and turning north at this intersection. Cars had to stop and wait for pedestrians to cross before they could make their turn.

13th Avenue and Hilyard Street PM Counts

Counter(s) Joe McAndrew and Paul Leitman
 Date 11/27/12
 Time 4:30 to 5:30 PM
 Weather Overcast; 40 degrees; cold

Bicyclists

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
4:30-4:45	0	2	1	0	14	0	0	2	0	0	4	4	27	18%
4:45-5:00	0	1	1	0	21	0	0	1	0	0	9	9	42	28%
5:00-5:15	0	2	0	0	8	0	1	0	0	0	11	16	38	26%
5:15-5:30	0	3	1	0	9	0	0	0	0	0	14	15	42	28%
Total	0	8	3	0	52	0	1	3	0	0	38	44	149	
Percent		5%	2%		35%		1%	2%			26%	30%		

Note: Many conflicts between bikes heading west on 13th and cars turning from 13th, onto Hilyard.

Cars

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
4:30-4:45	0	182	24	63	44	0	0	0	0	0	0	0	313	23%
4:45-5:00	0	234	26	39	38	0	0	0	0	0	0	0	337	25%
5:00-5:15	0	233	28	68	41	0	0	0	0	0	0	0	370	28%
5:15-5:30	0	208	25	41	47	0	0	0	0	0	0	0	321	24%
Total	0	857	103	211	170	0	0	0	0	0	0	0	1341	
Percent		64%	8%	16%	13%									

Note: It appeared as though the majority of the cars turning from 13th onto Hilyard were occupying the right turn lane (in order to make the right turn onto 11th). For further study, it might be good to have someone count the turning cars to determine which lanes they use.

13th Avenue and Patterson Street AM Counts

Counter(s) Joe McAndrew
 Date 11/26/2012
 Time 8-9 am
 Weather 50 degrees, blue skies, slight breeze

Bicyclists

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
8:00-8:15	0	1	0	0	13	0	0	0	0	0	0	0	14	8%
8:15-8:30	0	0	0	0	29	0	4	1	0	0	1	0	35	21%
8:30-8:45	0	0	0	0	29	0	3	0	0	0	0	0	32	19%
8:45-9:00	0	1	0	0	70	3	11	0	0	0	4	0	89	52%
Total	0	2	0	0	141	3	18	1	0	0	5	0	170	
Percent		1%			83%	2%	11%	1%			3%			

Cars

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
8:00-8:15	0	0	0	0	55	12	17	90	0	0	0	0	174	20%
8:15-8:30	0	0	0	0	57	21	25	99	0	0	0	0	202	24%
8:30-8:45	0	0	0	0	38	21	30	113	0	0	0	0	202	24%
8:45-9:00	0	0	0	0	70	33	26	145	0	0	0	0	274	32%
Total	0	0	0	0	220	87	98	447	0	0	0	0	852	
Percent					26%	10%	12%	52%						

13th Avenue and Patterson Street PM Counts

Counter(s) Simranjit Khalsa
 Date 11/15/2012
 Time 4:30-5:30
 Weather 50 degrees, no rain

Bicyclists

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
4:30-4:45	0	0	0	0	16	0	9	0	0	0	7	0	32	24%
4:45-5:00	0	0	0	0	16	3	3	2	0	0	18	0	42	32%
5:00-5:15	0	0	0	0	7	0	3	5	0	0	9	1	25	19%
5:15-5:30	0	0	0	0	10	0	5	2	0	1	15	0	33	25%
Total	0	0	0	0	49	3	20	9	0	1	49	1	132	
Percent					37%	2%	15%	7%		1%	39%	1%		

Cars

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
4:30-4:45	0	0	0	0	100	45	26	241	0	0	0	0	412	31%
4:45-5:00	0	0	0	0	89	43	27	178	0	0	0	0	337	25%
5:00-5:15	0	0	0	0	61	29	10	128	0	0	0	0	228	17%
5:15-5:30	0	0	0	0	66	37	33	233	0	0	0	0	369	27%
Total	0	0	0	0	316	154	96	780	0	0	0	0	1346	
Percent					23%	11%	7%	58%						

13th Avenue and High Street AM Counts

Counter(s) N/A
 Date
 Time 8-9 AM
 Weather

Information was lost.

13th Avenue and High Street PM Counts

Counter(s) Dave Amos
 Date
 Time 4:30-5:30 PM
 Weather

Bicyclists

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
4:30-4:45	0	7	0	1	12	0	0	1	0	0	3	0	24	27%
4:45-5:00	1	9	0	2	4	0	0	2	0	1	6	1	26	29%
5:00-5:15	0	4	1	1	9	0	1	0	0	0	2	0	18	20%
5:15-5:30	1	5	1	0	8	0	0	0	0	1	5	0	21	24%
Total	2	25	2	4	33	0	1	3	0	2	16	1	89	
Percent	2%	28%	2%	4%	37%		1%	3%		2%	18%	1%		

Cars

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
4:30-4:45	0	98	9	32	75	0	0	0	0	0	0	0	214	22%
4:45-5:00	0	105	13	42	105	0	0	0	0	0	0	0	265	27%
5:00-5:15	0	95	9	44	98	0	0	0	0	0	0	0	246	25%
5:15-5:30	0	96	9	37	100	0	0	0	0	0	0	0	242	25%
Total	0	394	40	155	378	0	0	0	0	0	0	0	967	
Percent		41%	4%	16%	39%									

13th Avenue and Pearl Street AM Counts

Counter(s) Hannah Klausman
 Date
 Time 8:00 - 9:00 AM
 Weather Overcast, Rain expected later in the day

Bicyclists

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
8:00-8:15	0	0	0	0	17	0	1	2	0	0	1	0	21	21%
8:15-8:30	0	1	0	0	21	0	10	0	0	0	7	0	39	39%
8:30-8:45	0	0	0	0	9	0	3	1	0	0	0	0	13	13%
8:45-9:00	0	0	0	0	22	1	3	1	0	0	0	0	27	27%
Total	0	1	0	0	69	1	17	4	0	0	8	0	100	
Percent		1%			69%	1%	17%	4%			8%			

Cars

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
8:00-8:15	0	0	0	0	134	35	15	136	0	0	0	0	320	27%
8:15-8:30	0	0	0	0	126	53	11	117	0	0	0	0	307	26%
8:30-8:45	0	0	0	0	95	30	12	123	0	0	0	0	260	22%
8:45-9:00	0	0	0	0	118	28	14	138	0	0	0	0	298	25%
Total	0	0	0	0	473	146	52	514	0	0	0	0	1185	
Percent					40%	12%	4%	43%						

13th Avenue and Pearl Street PM Counts

Counter(s) Hannah Klausman and Jason Lugo
 Date 11/30/2012
 Time 4:30-5:30
 Weather Sprinkling

Bicyclists

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
4:30-4:45	0	0	0	0	8	0	0	4	1	0	4	0	17	33%
4:45-5:00	0	0	0	0	4	0	2	4	0	0	0	0	10	19%
5:00-5:15	0	0	0	0	1	0	0	1	0	0	0	0	2	4%
5:15-5:30	0	0	0	0	6	0	1	14	0	0	2	0	23	44%
Total	0	0	0	0	19	0	3	23	1	0	6	0	52	
Percent					37%		6%	44%	2%		12%			

Cars

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
4:30-4:45	0	0	0	27	110	0	24	201	0	0	0	0	362	24%
4:45-5:00	0	0	0	34	114	0	27	174	0	0	0	0	349	23%
5:00-5:15	0	0	0	38	105	0	17	223	0	0	0	0	383	26%
5:15-5:30	0	0	0	36	105	0	25	233	0	0	0	0	399	27%
Total	0	0	0	135	434	0	93	831	0	0	0	0	1493	
Percent				9%	29%		6%	56%						

13th Avenue and Oak Street AM Counts

Counter(s) Paul Leitman
 Date 11/15/12
 Time 8-9 AM
 Weather Mid 40s; partly cloudy

Bicyclists

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
8:00-8:15	0	0	0	0	13	0	0	0	1	0	0	0	14	14%
8:15-8:30	0	1	0	0	26	0	0	0	0	0	0	0	27	28%
8:30-8:45	0	0	0	0	22	0	0	0	0	0	0	0	22	23%
8:45-9:00	0	1	0	0	33	0	0	0	0	0	0	0	34	35%
Total	0	2	0	0	94	0	0	0	1	0	0	0	97	
Percent		2%			97%				1%					

Cars

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
8:00-8:15	0	134	13	48	128	0	0	0	0	0	0	0	323	25%
8:15-8:30	0	144	14	38	143	0	0	0	0	0	0	0	339	26%
8:30-8:45	0	169	9	35	135	0	0	0	0	0	0	0	348	27%
8:45-9:00	0	159	16	24	99	0	0	0	0	0	0	0	298	23%
Total	0	606	52	145	505	0	0	0	0	0	0	0	1308	
Percent		46%	4%	11%	39%									

13th Avenue and Oak Street PM Counts

Counter(s) Paul Leitman
 Date 11/13/12
 Time 4:30-5:30 PM
 Weather Low 50s; partly cloudy; dusk

Bicyclists

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
4:30-4:45	0	1	0	0	6	0	0	0	0	0	0	0	11	32%
4:45-5:00	0	1	0	1	4	0	1	0	0	0	0	1	8	24%
5:00-5:15	0	0	0	0	7	0	0	0	0	0	0	0	7	21%
5:15-5:30	0	1	0	1	5	0	0	1	0	0	0	0	8	24%
Total	0	3	0	2	22	0	1	1	0	0	5	0	34	
Percent		9%		6%	65%		3%	3%			15%			

Cars

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
4:30-4:45	0	184	23	28	109	0	0	0	0	0	0	0	344	23%
4:45-5:00	0	200	14	27	129	0	0	0	0	0	0	0	370	25%
5:00-5:15	0	232	15	38	132	0	0	0	0	0	0	0	417	28%
5:15-5:30	0	200	8	16	123	0	0	0	0	0	0	0	347	23%
Total	0	816	60	109	493	0	0	0	0	0	0	0	1478	
Percent		55%	4%	7%	33%									

13th Avenue and Willamette Street AM Counts

Counter(s) Paul Leitman
 Date 11/13/12
 Time 8-9 AM
 Weather Cloudy; 48-50 degrees; no rain at the time, but the streets were still wet

Bicyclists

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
8:00-8:15	0	0	0	0	16	1	0	0	2	0	0	1	20	21%
8:15-8:30	0	3	3	0	21	1	3	1	0	0	0	1	33	35%
8:30-8:45	0	2	0	0	12	0	0	4	0	0	0	0	18	19%
8:45-9:00	0	2	1	0	17	1	0	2	0	0	0	0	23	24%
Total	0	7	4	0	66	3	3	7	2	0	0	2	94	
Percent		7%	4%		70%	3%	3%	7%	2%			2%		

Cars

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
8:00-8:15	0	6	3	8	179	56	12	33	0	0	0	0	297	25%
8:15-8:30	0	8	6	11	184	56	7	35	0	0	0	0	307	26%
8:30-8:45	0	8	7	6	131	53	9	42	0	0	0	0	256	22%
8:45-9:00	0	26	3	12	148	74	6	47	0	0	0	0	316	27%
Total	0	48	19	37	642	239	34	157	0	0	0	0	1176	
Percent		4%	2%	3%	55%	20%	3%	13%						

13th Avenue and Willamette Street PM Counts

Counter(s) Molly Bacon, Briana Orr
 Date 11/27/2012
 Time 4:30 - 5:30
 Weather dry, foggy, cold

Bicyclists

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
4:30-4:45	0	6	0	0	6	0	0	1	0	0	3		16	23%
4:45-5:00	4	2	0	0	7	0	0	3	0	0	2	0	18	26%
5:00-5:15	3	4	3	0	3	2	0	4	0	0	3	0	22	31%
5:15-5:30	0	1	0	0	6	0	0	4	0	0	3	0	14	20%
Total	7	13	3	0	22	2	0	12	0	0	11	0	70	
Percent	10%	19%	4%		31%	3%		17%			16%			

Cars

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
4:30-4:45	15	22	7	6	134	64	15	60	0	0	0	0	323	29%
4:45-5:00	15	23	9	7	137	98	15	79	0	0	0	0	383	34%
5:00-5:15	7	35	7	8	116	72	11	61	0	0	0	0	317	28%
5:15-5:30	21	22	10	14	135	63	25	69	0	0	0	0	359	32%
Total	58	102	33	35	522	33	66	269	0	0	0	0	1118	
Percent	5%	9%	3%	3%	47%	3%	6%	24%						

13th Avenue and Olive Street AM Counts

Counter(s) Paul Leitman
 Date 11/27/12
 Time 8 AM to 9 AM
 Weather 35-40 degrees; foggy

Bicyclists

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
8:00-8:15	0	1	1	2	9	0	3	0	0	0	0	1	17	22%
8:15-8:30	0	2	5	0	11	0	5	0	0	0	0	1	24	30%
8:30-8:45	0	4	0	1	12	0	3	0	0	0	0	0	20	25%
8:45-9:00	0	2	0	0	11	0	3	2	0	0	0	0	18	23%
Total	0	9	6	3	43	0	14	2	0	0	0	2	79	
Percent		11%	8%	4%	54%		18%	3%				3%		

Cars

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
8:00-8:15	0	3	8	7	200	9	8	4	0	0	0	0	239	23%
8:15-8:30	0	11	2	10	241	7	10	12	0	0	0	0	293	28%
8:30-8:45	0	7	11	15	185	11	11	8	0	0	0	0	248	24%
8:45-9:00	0	8	8	13	203	5	8	22	0	0	0	0	267	26%
Total	0	29	29	45	829	32	37	46	0	0	0	0	1047	
Percent		3%	3%	4%	79%	3%	4%	4%						

13th Avenue and Olive Street PM Counts

Counter(s) Edem Gomez
 Date 11/27/2012
 Time 4:30-5:30 PM
 Weather

Bicyclists

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
4:30-4:45	-	-	-	-	-	-	-	-	-	-	-	-	0	-
4:45-5:00	-	-	-	-	-	-	-	-	-	-	-	-	0	-
5:00-5:15	-	-	-	-	-	-	-	-	-	-	-	-	0	-
5:15-5:30	-	-	-	-	-	-	-	-	-	-	-	-	0	-
Total	0	6	4	0	23	1	10	14	0	0	9	0	67	
Percent		9%	6%		34%	1%	15%	21%			13%			

Cars

Times	Goring North			Going East			Going South			Going West			Total	Percent
	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right	Left	Straight	Right		
4:30-4:45	-	-	-	-	-	-	-	-	-	-	-	-	0	-
4:45-5:00	-	-	-	-	-	-	-	-	-	-	-	-	0	-
5:00-5:15	-	-	-	-	-	-	-	-	-	-	-	-	0	-
5:15-5:30	-	-	-	-	-	-	-	-	-	-	-	-	0	-
Total	0	85	40	73	827	26	109	72	0	0	0	0	1232	
Percent		7%	3%	6%	67%	2%	9%	6%						

*Note PM bicycle and car counts were counted for the entire hour, and not separated into 15 minute intervals

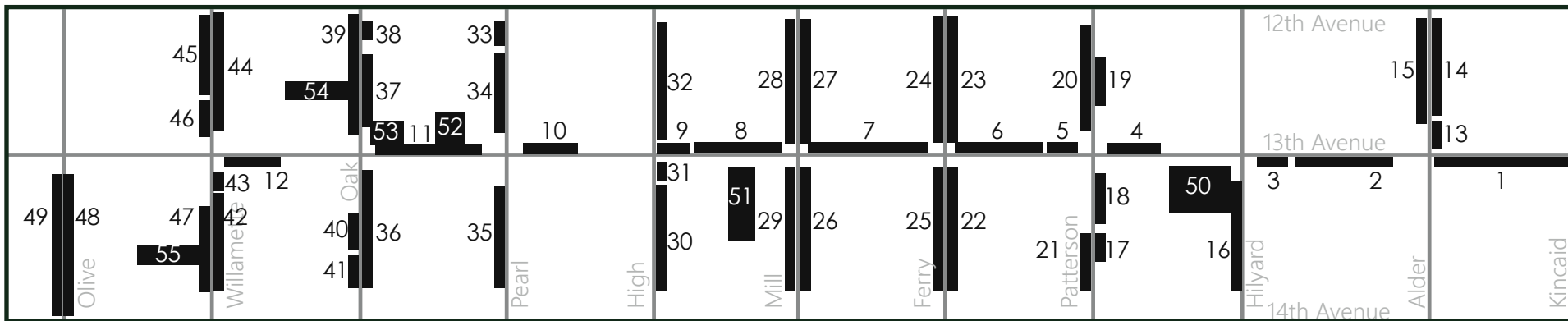
Appendix B: Parking Counts

Area	Capacity	Type	Weekday				Weekend		
			10 AM	3 PM	8 PM	Overall	10 AM	3 PM	Overall
1	17	1-hour meter	67%	85%	95%	82%	68%	100%	82%
2	6	1-hour meter	83%	83%	87%	84%	92%	92%	84%
3	2	Loading	40%	40%	60%	47%	50%	75%	47%
4	6	2-hour meter	23%	37%	20%	27%	8%	58%	27%
5	2	10-min loading	10%	0%	10%	7%	0%	0%	7%
6	8	1-hour free	13%	70%	45%	43%	6%	75%	43%
7	7	2-hour free	71%	69%	51%	64%	43%	93%	64%
8	7	2-hour free	37%	51%	31%	40%	43%	36%	40%
9	1	30-min free	20%	80%	40%	47%	50%	0%	47%
10	2	2-hour meter	10%	20%	60%	30%	50%	50%	30%
11	7	2-hour meter	11%	23%	20%	18%	21%	14%	18%
12	4	2-hour meter	30%	55%	35%	40%	25%	75%	40%
13	2	30-min commercial	60%	20%	70%	50%	0%	25%	50%
14	6	1-hour meter	60%	63%	70%	64%	75%	92%	64%
15	8	1-hour meter	30%	43%	35%	36%	19%	50%	36%
16	9	1-hour meter	27%	18%	67%	37%	28%	56%	37%
17	2	2-hour free	100%	90%	70%	87%	50%	100%	87%
18	4	1-hour free	55%	70%	75%	67%	50%	38%	67%
19	4	2-hour meter	50%	50%	10%	37%	0%	0%	37%
20	9	1-hour free	9%	33%	51%	31%	17%	33%	31%
21	3	2-hour free	80%	67%	87%	78%	83%	67%	78%
22	8	2-hour free	85%	90%	75%	83%	56%	81%	83%
23	6	2-hour free	77%	63%	83%	74%	67%	83%	74%
24	6	2-hour free	63%	60%	67%	63%	42%	92%	63%

Area	Capacity	Type	Weekday				Weekend		
			10 AM	3 PM	8 PM	Overall	10 AM	3 PM	Overall
25	10	2-hour free	52%	66%	68%	62%	55%	70%	62%
26	10	2-hour free	64%	64%	74%	67%	65%	65%	67%
27	9	2-hour free	53%	58%	67%	59%	50%	56%	59%
28	9	2-hour free	69%	76%	78%	74%	67%	61%	74%
29	8	2-hour free	58%	58%	90%	68%	75%	63%	68%
30	11	free	93%	93%	76%	87%	77%	77%	87%
31	1	30-min free	0%	40%	20%	20%	100%	100%	20%
32	7	2-hour free	57%	49%	63%	56%	29%	71%	56%
33	2	5-hour meter	20%	40%	60%	40%	25%	0%	40%
34	8	2-hour meter	13%	30%	35%	26%	44%	0%	26%
35	5	5-hour meter	40%	16%	68%	41%	50%	70%	41%
36	9	2-hour meter	4%	9%	33%	16%	50%	6%	16%
37	4	2-hour meter	0%	10%	30%	13%	0%	25%	13%
38	2	10-hour meter	0%	10%	30%	13%	25%	0%	13%
39	8	2-hour meter	5%	15%	38%	19%	6%	38%	19%
40	3	2-hour meter	27%	7%	27%	20%	0%	33%	20%
41	3	5-hour meter	33%	33%	47%	38%	0%	0%	38%
42	9	2-hour meter	18%	24%	9%	17%	33%	39%	17%
43	1	10-min loading	0%	0%	0%	0%	0%	0%	0%
44	12	1-hour meter	35%	42%	38%	38%	33%	67%	38%
45	7	free	46%	51%	54%	50%	71%	86%	50%
46	4	1-hour meter	20%	30%	85%	45%	50%	88%	45%
47	3	2-hour meter	53%	27%	40%	40%	17%	50%	40%
48	9	2-hour free	31%	20%	44%	32%	61%	61%	32%

Area	Capacity	Type	Weekday				Weekend		
			10 AM	3 PM	8 PM	Overall	10 AM	3 PM	Overall
49	10	2-hour free	34%	30%	40%	35%	50%	25%	35%
50	34	3-hour meter garage	3%	4%	4%	4%	0%	0%	4%
51	35	Diamond off-street	57%	59%	38%	51%	36%	30%	51%
52	20	Diamond off-street	69%	37%	1%	36%	0%	0%	36%
53	16	Diamond off-street	44%	31%	1%	25%	0%	0%	25%
54	19	Diamond off-street	91%	73%	14%	59%	0%	3%	59%
55	23	Diamond off-street	66%	57%	8%	43%	7%	15%	43%

The numbers in the Area column correspond with the parking areas represented in this map.



Appendix C: Charrette

LiveMove hosted a design charrette with area professionals and Downtown-Campus business representatives to present preliminary findings from current conditions analysis and develop designs for the roadway. The design charrette took place on Tuesday, February 26 from 2:30-4:30 in the Susan Campbell Hall on the UO campus. The list of attendees includes:

Community Members

- Rob Inerfeld, City of Eugene Transportation Planning Manager
- Reed Dunbard, City of Eugene Associate Transportation Planner
- Emily Eng, University of Oregon Planning Associate
- Gwen Bolden, University of Oregon Director of Parking and Transportation
- Briana Orr, University of Oregon Bike Program Coordinator
- Phil Farrington, Sacred Health Medical Center Director of Land Planning
- Neva Becker, Rainbow Optics Manager
- Sue Wolling, area resident
- Shane MacRhodes, area resident and Eugene 4J Safe Routes to School Program Manager

LiveMove Members

- Molly Bacon
- Michael Duncan
- Hagen Hammons
- Paul Leitman
- Jason Lugo
- Joe McAndrew
- Nick Meltzer
- Emma Newman
- Alex Page
- Jon Reha



Appendix D: Open House

LiveMove ByDesign hosted an open house to unveil the group's draft "Downtown-Campus Corridor Redesign and Plan." The open house occurred from 5:30-7:00 pm on Tuesday, May 28 on the UO campus in Lawrence Hall, Room 206. 54 people attended the open house, including city traffic engineers and planners, area professionals, campus administration, Downtown-Campus business owners, and students. 36 of the attendees provided feedback and recommendations on ByDesign's draft plan and design, and recommendations for LiveMove as a whole. Below are the responses that the open house attendees provided ByDesign.

Do you support LiveMove's redesign of 13th Avenue?

Yes	32	100%
No	0	0%

Why?

- It seems like a wonderful idea to improve the bike traffic on 13th for the entire community and not just the University community.
- I have been one of your stats who rides the wrong way on 13th Ave.
- Because it's a direct and probably most traveled bike route to the UO. It would be an innovative project with a huge impact locally and maybe nationally.
- Their goals are in check with the future of transportation
- Because it will make pedestrians, bicyclists, and cars more safe on 13th. People will keep using 13th the way they want to whether or not they are supposed to.
- One way biking on 13th (High to Alder) is inadequate. 2 lanes would improve safety and is convenient.

- Safety issue of contraflow travel currently requires an engineering response.
- I support looking at many of the details more closely. Traffic analysis, fire, and emergency vehicle access in single-lane section and separation of cycle track from travel lane.
- Great evidence and research about the current condition. I also live on 13th and would definitely appreciate this addition.
- As mentioned, lack of bike capacity, conflicts with cars in current design, expected increase in cycling mode share.
- I live on 13th and Jefferson. Getting to school is a breeze, but getting home takes 5 minutes longer because I have to divert from 13th to 11th. I would LOVE a two way bike path. 13th could become a major spine. The path on 11th feels dangerous.
- A qualified "yes". There are many details that would need to be addressed, and interest groups & individual stakeholders that must be engaged, heard, and considered



in order to have full community support and make proper investigations.

- I encounter bikers and skaters using the existing bike lane in the opposite direction EVERY day, which is dangerous for myself as it is.
- Increased bike transportation would support UO's need to decrease car use close to campus.
- 13th Avenue needs a safer way to travel for other modes of trans besides autos
- As a new biker I currently won't bike down 13th because it doesn't feel safe. If 13th were redesigned like this or in a similar way, I would bike down 13th.
- Preliminary
- It's a lot less expensive than I initially believed. As a bicyclist, I'm into better bike infrastructure.
- I JUST narrowly escaped being run over by a car on 13th who was trying to parallel park! Making a strong, human scale connection between campus and downtown would open the community up to students. The current one confuses me - it feels further than it actually is by bicycle.
- Necessary!
- I would bike westward on 13th if I could because it is a direct route to school and to my home.
- A comprehensive, progressive design of a street that is vital to the downtown to campus corridor is something that represents UofO's sustainable efforts.
- The current conditions are unsafe for the number of bicyclists going through the corridor.
- SAFETY: bikers go the wrong way all the time - it's time it was redesigned to fit how it's used.



- I am always in support of bicycle infrastructure.
- I support the redesign because every day I see riders who fail to see the opportunity to use 12th as a westbound corridor.
- Increase in # of students who will use 13th, chance for vitalizing businesses on this stretch, reduce # illegal riders, cycle tracks are fun to use and important connectors
- As a cyclist, I have often experienced the identified issues of 13th. I want to be able to zip between campus & downtown and not get turned around :-)
- Our son David Minor was killed at 13th and Willamette on his bicycle
- I'm encouraged by the ideas for opening safe travel for bikes.

Do you have any recommendations for the design proposal?

- See if there is any way to reduce the sidewalk space so there can be a consistent two lanes of car traffic for future city growth.
- If not already incorporated, planters between sidewalk and cycle track.
- -Identify issues that have not yet been resolved (i.e. left turn coming off cycle track) - Include measurements on the plan (i.e. bike lanes, car lanes) / identify # parking spaces removed (somewhere, not necessarily on plan) - Include diagram showing existing conditions
- Extend it even further down 13th. I ride to school in traffic from Tyler St on 13th. Many more people doing the same. (see map on back of written comment card)
- Put bike entrances to campus around the PLC.
- Have studies been conducted to see the effects of removing on-street parking from 13th?
 - Physical separation (curb) where possible - Go all the way to Kincaid - Assemble a sign plan
- Add street names to maps on the cross-streets and mainline to help orientation. There are a lot of good ideas here that merit taking more time to develop.
- Bring it out into the greater Eugene community (you may be doing this already, but I'm not sure)
- Consider opportunity with private land to accommodate parking. Identify large surface lots that are underutilized. Identify current % use of nearby parking structures. Consider recommending closure of some driveways where it can reduce conflicts. Propose tree planting plan to shade roadway and reduce speeds.

- Looks good! Need a better solution for where it ends at Olive.
- 1) Identify all adjacent uses on maps, dimension all r.o.w. areas (street widths, parking strips, etc.) 2) Show where/how many parking spaces (on street) would be impacted/lost. 3) Consider treatments @ 13th/Patterson & Hilyard that WILL be needed (bike lanes, signage, signal timing changes) 4) Provide cost estimates 5) Consider changes to parking permit provision west campus area.
- Maybe extend to connect S. Eugene via Willamette?
- Just an observation: eliminating car turn lanes onto Willamette and Pearl may make it more difficult to convince drivers of the plan.
- Pushing for commercial development along the bike corridor.



- Articulation of pausing points. Current proposal: <-----> Potential: <-----o-----o-----o-----> and then... what are they?
- Keep it up!
- Perhaps more raw data in the slides or in report
- Just do it! [Nike swish]
- Git 'r done.
- I feel that the yellow painted buffer isn't sufficient. I propose installing a rumble strip or raised square reflectors. Paint won't catch your attention if you're looking at your phone while driving.
- Concern about reduced auto parking (especially Willamette, Oak, Pearl, High). Concern about # driveways on north side of street next to cycle track.
- Scope too narrow
- The left turns across traffic are not yet clear.

Do you have any recommendations for LiveMove as a group?

- Counts on 12th Ave traveling west
- Keep up the great work!
- Push harder to make these ideas a reality.
- More press! Bring elected officials
- Advertise yourselves more! You are doing really great things
- Nice work. Thank you for all you are doing. You are a legitimate force for change in Eugene.
- More visibility in Lawrence would be great!
- Expand outreach efforts - more applied public involvement - include using shoe leather to promote/ door-to-door w/ local businesses on the corridor.

- Finding a platform for this kind of presentation in the community. Saturday market?
- More on-campus outreach & visibility
- Focus more on other modes of transportation besides bikes. The group would appeal to others also interested in walking and bus transportation.
- Work on improving the Pearl bike lane
- More events like these OUTSIDE on campus.
- Keep it interdisciplinary!
- Engage more with local businesses and the public in the area. Education is key!
- Reach out to more kinds of students. Grad, undergrad, other departments.
- You are awesome! Your work in general & this project - well thought out, researched, and presented.
- LiveMove is one of the most together and productive groups on campus! Real change! Awareness through other groups/cross pollinating
- Keep it going
- Encourage bike rider awareness of others and courtesy to pedestrians. SLOW in congested areas. Allow people to share ideas or concerns.

Do you have any recommendations for this project?

- Keep up the good work!
- Not sure. It wouldn't hurt to state the mission for this project at the beginning.
- Open this discourse to the community at large.
- Put all data in the report! Testimonials? - Why do people elect to compromise their safety for convenience?

- More awareness to students about the dangers of going the wrong way in the bike lane!
- Engage w/local businesses who will be affected.
- Best of luck!
- Thanks for the presentation. Very well done.
- Add bike parking on 13th! :-)
- Better imagery to grab people.
- How do businesses benefit directly?
- Great scope of projects. Would like to see it continued next year to enjoy the fruits of our labor.
- See it through next year. Don't stop pushing the city and university! Keep the pressure up!
- Don't stop believin'!
- More data would support the project. For example, how many riders use 12th, and how does that # compare with those misusing 13th?
- Start outreach to businesses soon. Emphasize that peds & cyclists spend more than drivers.
- Need more street sections to show impact.
- Be sure to ask businesses about their concerns and ideas. It's great to see such passion and support for cycling!



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