

# Depot Street Corridor Study

Manchester, Vermont

Funded in part by a Municipal Planning Grant from the Vermont Agency of Commerce  
and Community Development

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Bennington County Regional Commission

**INTRODUCTION 3**

Vision Statement 3

**KEY BACKGROUND INFORMATION 3**

Study Background 3

Project Goals 3

Public Process 3

Project Area 4

Road Classification 4

Public Right of Way 4

Speed Limit 5

Traffic Volume 5

Crash Data 5

Road Network 5

Neighborhood Character 5

**PROBLEMS 5**

Depot Street is Uncomfortable for Pedestrians 5

Depot Street Does Not Invite Cycling 7

Depot Street Has Poor Access Management 7

Depot Street's Design Promotes Speeding 8

Impact of Vehicle Speed on Pedestrians 8

Comparison with North Street in Bennington 8

Depot Street is Unattractive 9

**3. CROSS SECTIONS 10**

Cross-Section: Existing 10

Cross-Section: Proposed Typical 11

Cross-Section: Downhill Shared Lane and Bicycle Lane 14

Cross-Section: Median Island and Shared Lane 15

Cross-Section: Median Island with Bicycle Lane 16

Cross-Section: Left-Turn Lane with Shared Lanes 17

Cross-Section: Left-Turn Lane with Bicycle Lane 18

Proposed Cross-Section Dimensions 19

Cross-Walk Statistics 19

**INTERSECTIONS 20**

Center Hill Road Intersection 20

Richville Road Intersection 20

Eastern Gateway 20

**ACCESS MANAGEMENT 20****IMPLEMENTATION STRATEGY 20****SOURCES 21****CONCEPTUAL PLAN DETAILS 22****COST ESTIMATE 40****GMP SUBSTATION RELOCATION 41**

Green Mountain Power Substation Relocation Costs 42

## INTRODUCTION

Depot Street in Manchester, VT was reconstructed in the 1980's to maximize the flow of motor vehicle traffic. Traffic does flow smoothly today, but the street does not work well for everyone. Long pedestrian crossing distances, frequent, excessively wide driveways, oversized intersections, and a streetscape of big, barren expanses of pavement make it an uninviting place to walk, shop or ride a bicycle. The street's design reflects an outdated approach to traffic engineering that prioritizes the flow of motor vehicle traffic over all other values.

This study suggests changes to the street so it works better for all users – pedestrians, cyclists, motor vehicles, and business owners. For pedestrians, we recommend creating a planted buffer between the sidewalk and the curb and installing a series of pedestrian refuge islands to make it safer and more comfortable to cross the street. For cyclists, we suggest striping bicycle lanes and shared lane markings, which allocate space to ride, tell motorists that bikes belong on the road, and calm traffic by visually narrowing the street. To benefit all road users, including motor vehicles, we recommend safety and traffic-calming measures including tighter curb radiuses, more efficient driveway entrances and a new roundabout at the eastern end of the commercial area. We also recommend aesthetic

improvements including planting over 100 new street trees.

The final section of this report investigates relocating the Green Mountain Power substation to remove an eyesore and free a valuable site for development.

### Vision Statement

“Our downtown development pattern will follow the classic village pattern. It will be pedestrian oriented – human in scale. It will replace the prevailing “suburban” development pattern in which buildings are sited to accommodate the automobile. [...] We will reduce the detrimental effect of automobiles on our quality of life and sense of community.”

*Town of Manchester Vision Statement, 1994*

## KEY BACKGROUND INFORMATION

### Study Background

In 2013, the Town of Manchester was awarded a Municipal Planning Grant from the Vermont Agency of Commerce and Community Development to update the Depot Street Corridor Study, completed in 2004, by the consulting team of Bailliere Consulting/URS Corporation. The previous study identified problems with the corridor and developed two conceptual alternatives for reconstructing the street. This update builds on the previous study but in-

cludes improvements for bicycles, more robust pedestrian improvements and assesses the possibility of relocating the Green Mountain Power substation.

### Project Goals

The goals for the corridor study update, established at public Manchester Planning Commission meetings:

- Reflect changes in the project area.
- Develop a conceptual alternative that that complies with Vermont's new Complete Streets Law (H.198, Act 34). The Complete Streets concept is that streets should safely accommodate all transportation system users, regardless of age, ability, or preferred transportation mode - walking, biking, driving, or public transit.
- Assess the feasibility of moving the Green Mountain Power substation.

### Public Process

For the original 2004 study, a public survey was conducted and two public presentations were made to discuss changes to Depot Street. Public comments were noted for inclusion in the alternative evaluation process. For this study, presentations and public comments were made at four Planning Commission meetings.

### Project Area

The project area is Depot Street, beginning at the Depot/Main Street intersection, and ending at the eastern entrance of the RK Miles store, 0.6 miles to the east.

### Road Classification

Several factors determine the jurisdiction and design standards that apply to Depot Street:

- Depot Street is classified as a minor arterial. The design standards for minor arterials are contained in the Vermont State Design Standards.
- Depot Street is a state highway (VT11/30), but also a Class 1 Town Highway, which means the municipality and VTrans share maintenance responsibility and jurisdiction. Improving Depot Street will require close town-state coordination.

### Public Right of Way

The right of way along Depot Street, (with some variation), is 51 feet wide, slightly wider than a typical 3-rod road (49.5'). The outside edges of the existing sidewalks mark the edge of the right of way. A land survey to establish the exact right-of-way is outside this report's scope but will be necessary for the project's design phase.

The Manchester Planning Commission requested that the conceptual alternative be kept within the existing right of way to avoid the necessity of acquiring permanent



*Project Area*

easements. Some new landscaping outside of the right-of-way is shown in the conceptual plan but is not included in the cost estimate.

**Speed Limit**

The speed limit in the project area is 25 mph. The low speed limit allows for a compact street design with relatively narrow travel lanes and curb radiuses.

**Traffic Volume**

In 2012 Depot Street had a traffic volume (AADT) of 10,300 vehicles. [VTrans]

**Crash Data**

According to Vermont Agency of Transportation Records, from 2008 to 2012 there were 38 vehicle crashes on Depot Street in the project area resulting in six injuries. The records do not specify if the crash involved a cyclist or pedestrian. [VTrans General Yearly Summaries]

**Road Network**

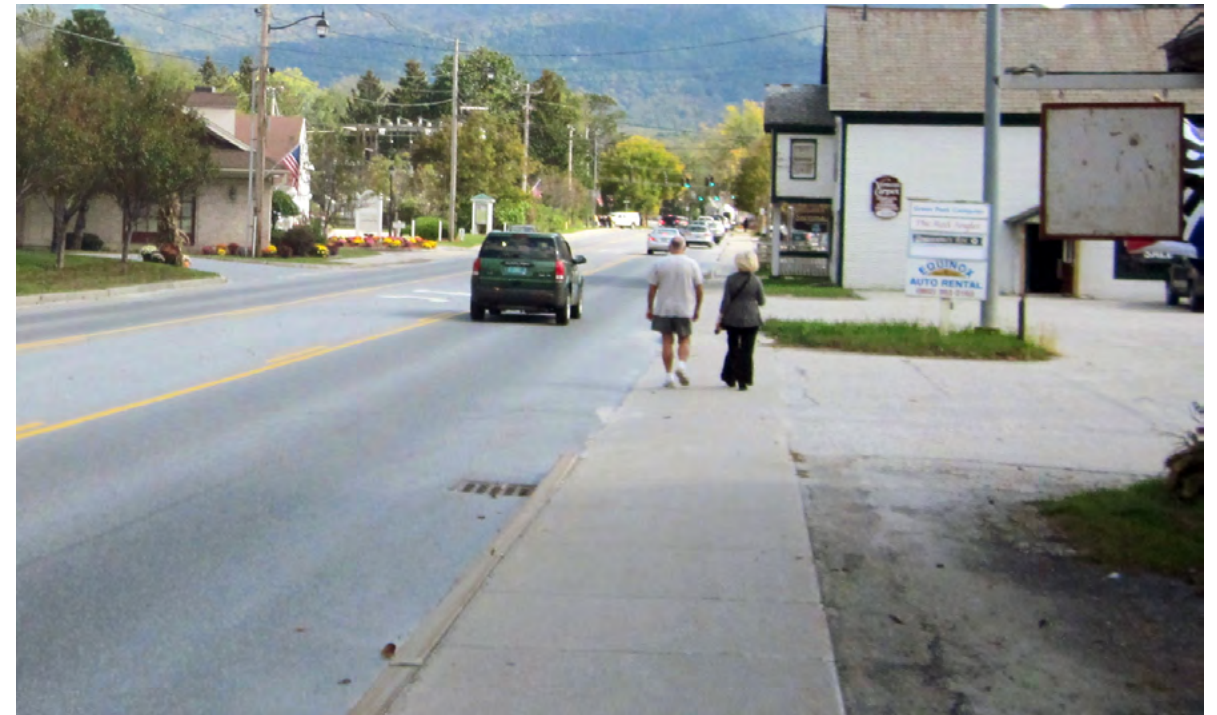
Depot Street links Manchester's village center with Route US7, a limited access highway and the primary north-south route in Bennington County. The surrounding street network is limited. There are no quiet parallel streets that cyclists and pedestrians could use as an alternative although some may use Center Hill Road to bypass Depot Street's western end.

**Neighborhood Character**

Depot Street's western end intersects Main Street in the village center where a new, efficient and attractive roundabout was recently built. To the east, the street's character quickly changes to a suburban development pattern with detached buildings surrounded by landscaping and strip-style shopping plazas with parking lots. Many of the business are outlet stores that attract tourists. The structures west of Richville Road are mostly older and more closely spaced and contain a mix of residential and commercial uses.

**PROBLEMS****A. Depot Street is Uncomfortable for Pedestrians***Problem: the sidewalks are next to the travel lane*

Except along a few short sections, there is no buffer between the sidewalk and the travel lane to visually define the road or to separate pedestrians from the noise, danger and pollution of traffic.



*There is no buffer between the sidewalk and the travel lane.*

*Problem: it is difficult to cross Depot Street*

Depot Street has a long crossing distance – 40 feet. There is a steady flow of traffic at peak travel times. The lack of a median means pedestrians have to wait for a break in traffic in both directions to cross. Sometimes they give up and dash across the street. Some may avoid crossing the street at all.



*Worn crosswalk, spanning three travel lanes (above). Long crosswalk at Riverside Heights (top right).*

*Problem: it is difficult to cross side streets*

Six streets intersect Depot Street in the project area. All have longer than necessary crossing distances created by excessively long curb radiuses. Highland Avenue and Richville Road both have particularly excessive crossing distances.

*Problem: poor pedestrian conditions hurt the retail environment*

In general, shoppers prefer attractive, inviting and lively walking environments. Because it is uninviting to walk along Depot Street, or to cross it, shoppers may be reluctant to walk between stores.



*Shoppers flock to Harvard Square, in Cambridge, MA, in part because it is an attractive pedestrian environment.*



*This cyclist chose to ride on the sidewalk – a sign the street intimidates cyclists.*

**B. Depot Street Does Not Invite Cycling**

*Problem: Depot Street has no bike lanes or shared lane markings*

Although there is enough space (14 foot travel lanes), there are no bike lanes, shared lane markings, or painted shoulders that allocate space for cyclists or tell drivers to expect cyclists on the road.

*Problem: cyclists ride on the sidewalk*

Some cyclists now ride on the sidewalk, often a sign that a street feels like a dangerous place to ride. Sidewalk riding is hazardous for pedestrians *and* cyclists. Bikes on sidewalks can be hit at driveway entrances where vehicles don't expect them.

*Problem: existing drainage inlets are a hazard for cyclists*

Storm drains are a hazard for cyclists. Bicycles are less stable than motor vehicles and a slippery storm drain or a grate not perfectly flush with the road's surface can cause a crash. Depot Street's storm drains extend two feet from the curb, close to where many cyclists ride.



*Depot Street's storm grates are a hazard for cyclists.*

**C. Depot Street Has Poor Access Management**

*Problem: Many excessively wide or redundant commercial driveways:*

- Increase the area where pedestrians, cyclists and vehicles can be hit by entering and exiting vehicles.
- Allow vehicles to turn faster, increasing crash severity.
- Expand paved areas, which is unaesthetic and increases water runoff.



*Wide driveway access near Manchester Woodcraft*

### D. Depot Street's Design Promotes Speeding

#### Problem: most vehicles on Depot Street speed

The posted speed in the project area is 25 mph. For this report, BCRC conducted an informal speed study using a radar gun and found 60 out of 112 vehicles exceeding the speed limit. The average speed was 34 mph – almost ten mph over the limit, confirming public comments that speeding is a problem. A more statistically significant speed study should be conducted to verify this finding.

#### Impact of Vehicle Speed on Pedestrians

Vehicle speed is a critical factor in whether a pedestrian survives a being hit by a car. ***A pedestrian has a 95% chance of surviving if the vehicle is traveling 20 mph but only a 15% chance of surviving if the vehicle is traveling 40 mph.*** [FHWA]

#### Problem: wide lanes and curb radiuses invite speeding

Depot Street was reconstructed in the 1980's to create a more frictionless driving environment. Travel lanes were expanded to 14-feet. Curb radiuses were extended. A 12-foot turning lane spanning most of the corridor was added. The result is a road designed for speeds higher than the 25 mph limit.

### Comparison with North Street in Bennington

North Street in Bennington is similar to Depot Street. Both are Class 1 Town Highways and state highways. Both are lined with commercial buildings with frequent driveway accesses. The two streets have similar traffic volume and the same speed limit. There is one big difference – North Street has no turning lanes except for a short left turn lane at the Main Street intersection. Despite the lack of turn lanes, traffic flows smoothly.

*The clock and refuge island add friction for drivers, which calms traffic and makes it easier to cross the street.*



*North Street in Bennington is similar to Depot Street, but it has no turning lanes and calmer traffic than Depot Street.*



**E. Depot Street is Unattractive**

*Problem: too much pavement*

Depot Street is a wide river of pavement. It measures 40 feet curb-to-curb, and has wide curb radiuses and driveway entrances. Parking lots dominate the surrounding landscape.

*Problem: the street's edges are poorly defined*

Many excessively wide driveways erode the street's visual edge. Also, there is often no green strip between the parking areas and the back of the sidewalk, which creates large expanses of continuous pavement.

*Problem: lack of street trees and landscaping*

There is almost no landscaping and only a few street trees in the public right of way.

*Problem: many buildings are not oriented towards the street*

Many buildings have parking lots in front separating them from the street. Often, facades and entrances are oriented towards the parking lots, not the street.

*Problem: substation is unattractive and a poor use for the location*

(See GMP Substation Relocation)

*Problem: utility poles and wires clutter the visual field*



*Depot Street has wide expanses of pavement and lacks street trees.*



*The corner building in this California shopping plaza is oriented towards the street.*

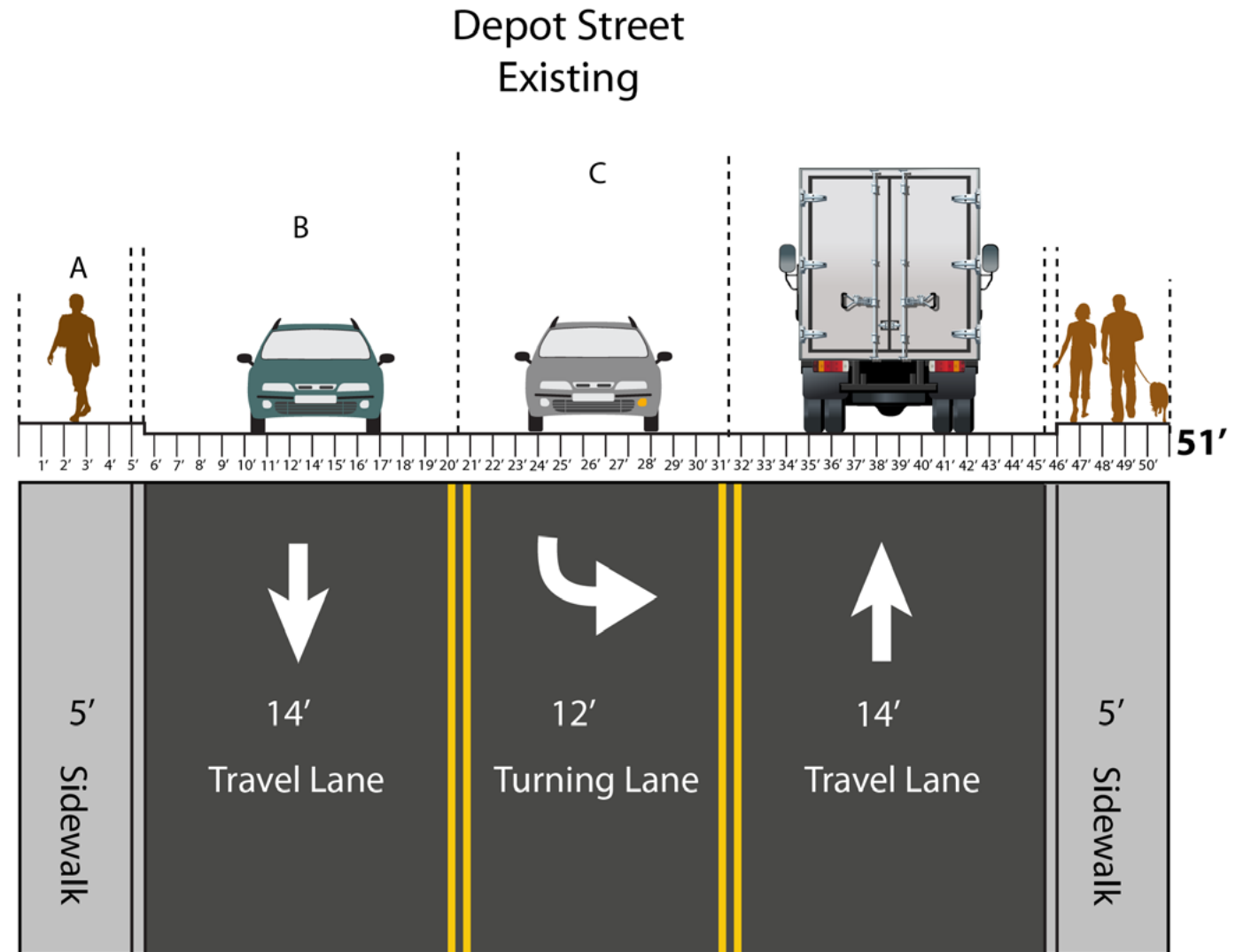
### 3. CROSS SECTIONS

This section, organized by cross-section, describes the conceptual plan to improve Depot Street. The proposed alternative has six cross-sections:

- Existing
- Proposed Typical
- Downhill Shared Lane & Bicycle Lane
- Median Island with Shared Lanes
- Median Island & Bicycle Lane
- Left-Turn Lane & Shared Lanes
- Turning Lane & Bicycle Lanes

#### Cross-Section: Existing

The existing configuration is two 14-foot travel lanes, one 12-foot turning lane, and two five-foot sidewalks (and two six-inch curbs) for a total of 51 feet.



- A. Sidewalk
- B. Green Strip/Curb Zone
- C. Street Trees/ Tree Pits
- D. Debris Zone
- E. Cyclist
- F. Bicycle Lane
- G. Passing Margin
- H. Travel Lane

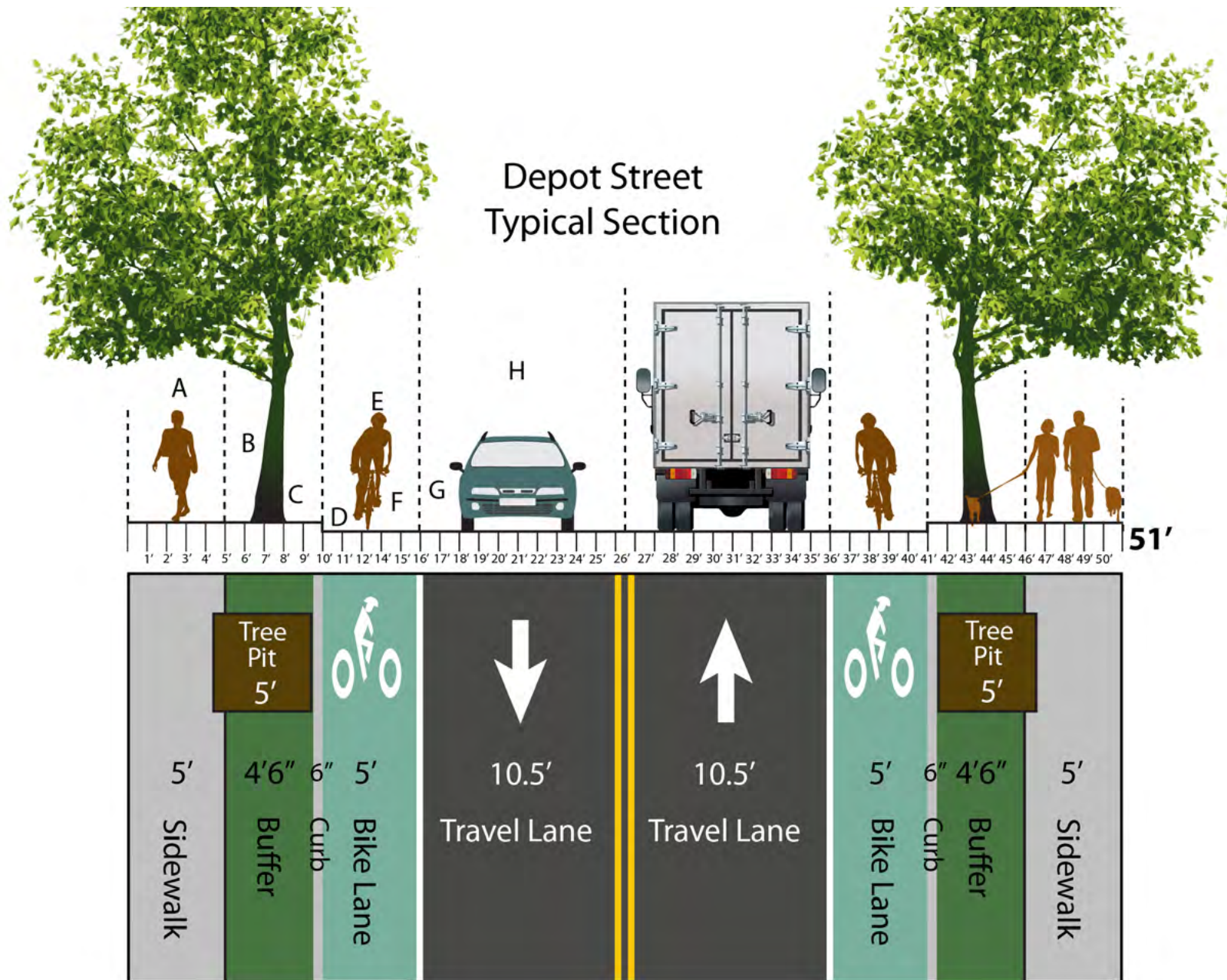
**Cross-Section: Proposed Typical**

A. Sidewalk

Most sections of the existing 5-foot sidewalk will remain. Five feet is just wide enough for two people to walk side-by-side or pass comfortably. The recommended minimum width for commercial areas outside the central business district is 6-feet, but due to Depot Street’s constrained right of way, we recommend keeping the 5-foot sidewalks.

B. Green Strip/Curb Zone

We suggest moving the curbs to narrow the roadway and to create a green strip between the sidewalks and the road. The green strip will buffer pedestrians from traffic and provide space for street trees, plantings, street furniture, lighting, utility poles and snow storage.



C. Street Trees/ Tree Pits

The 4.5-foot wide green strip is just shy of the recommended 5-foot minimum width for tree pits. To provide enough space for healthy trees, we recommend extending the tree pit six inches into the sidewalk.

Street trees are typically planted 20 to 40 feet apart, depending on their variety. The conceptual plan has 150 new street trees planted 30 feet apart.

- Trees must be planted no less than:
- 5 feet from underground utility lines
- 10 feet from power poles
- 7.5 feet from driveways
- 20 feet from streetlights and existing trees
- 30 feet from intersections

D. Debris Zone

Cyclists usually ride (bicycle wheels track) at least 1.5 to 2.5 feet out from the edge of the curb to avoid catch basins, broken glass, sand and other debris, pushed against the curb by water runoff.

Drain Grates

Depot Street’s storm drain grates extend 2-feet from the edge of the curb, a hazard for cyclists. We recommend relocating the drain inlets into the face of the curb. Cross-slopes should be minimal so cyclists are not pulled into

the curb. The drain inlets should be wide enough to handle water flow.

E. Cyclist

Cyclists typically ride 10-15 mph and occupy two feet of street width.

F. Bicycle Lane

We recommend striping five-foot wide bicycle lanes wherever feasible. Where they are not feasible, we recommend using shared lane markings. Bicycle lanes visually narrow the road, which calms traffic, gives cyclists a space to ride, allows vehicles to safely pass cyclists without crossing into the opposite travel lane, and gives cars a place to pull over for emergency vehicles.

Studies show that cyclists prefer riding on streets with bicycle lanes [Dill]. Some towns and cities that have installed extensive and high-quality bike lane networks have seen dramatic increases in cycling.

Bike lanes can be striped different ways. They can be simple— just a white line five feet from the curb with bike lane symbols spaced 100 to 200 feet apart. Sometimes they are painted green or blue (as shown in this conceptual plan). Bike lanes should always be marked through intersections.



Simple bike lanes



Bike Lane - Baldwin Park, CA  
Photo: www.pedbikemages.org - Dan Burden



*Green bike lane in New York City*

*Shared lane marking (sharrow)*



*G . Passing Margin*

Three to four feet is considered the minimum safe margin for a car or truck to pass a cyclist. By law in Vermont (and in many other states) motorists must allow at least three feet of passing space. The Vermont Driver’s Manual says to allow at least four feet of passing space.

The proposed design allows vehicles to safely pass cyclists without traveling into the opposite lane. The section drawing shows a six-foot wide car with a 5-inch mirror driving two feet shy of the centerline, passing a cyclist tracking 2.25 feet from the curb. The passing distance is just over three feet.

Cars are usually 6’ wide. Large trucks are 8’ wide, not including side mirrors.

*H . Travel Lanes*

Vermont State Design Standards allow for 10-12 foot travel lanes on minor arterials. In general, the lower the speed limit the narrower the travel lane can be. If a road has many large trucks, lanes should be a little wider.

Narrow travel lanes calm traffic and are appropriate for a 25 mph zone. We recommend 10.5-foot travel lanes, slightly wider than the minimum, because Depot Street does have some large trucks that may need a little extra space to safely pass cyclists.

*H. Vehicle Shy Distance*

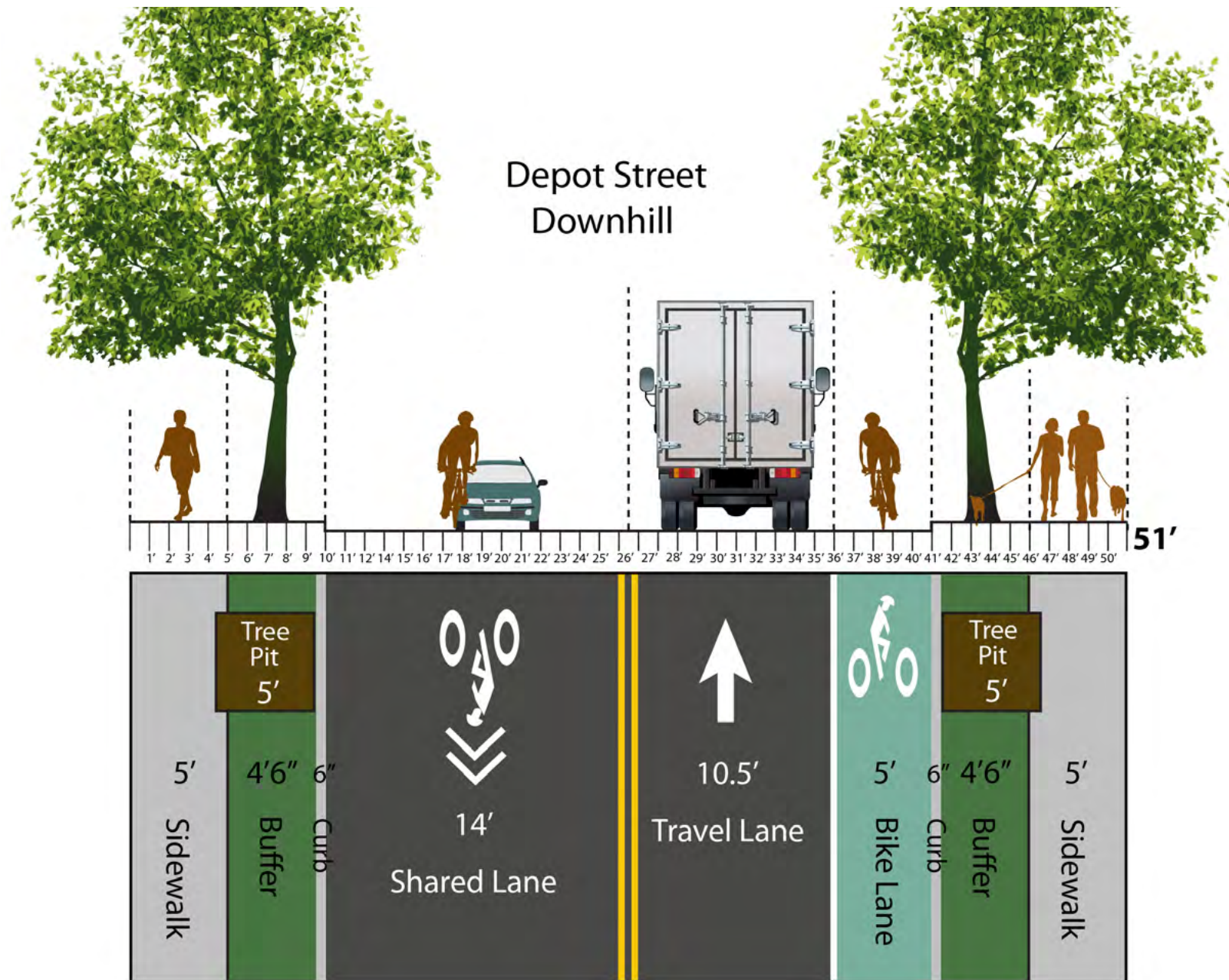
Vehicles typically track in the middle of the lane no closer than 2 feet from the left line. The yellow no passing line zone is one foot wide made from two 4” wide yellow lines separated by a 4” gap.



*Example of a drain inlet embedded into the face of the curb out of bikes’ way.*

**Cross-Section: Downhill Shared Lane and Bicycle Lane**

Downhill bicycle lanes are not recommended. Bicycles travel faster going downhill, closer to the speed of traffic, and should ride closer to the center of the travel lane where they are more visible. On the hill at the western end of Depot Street, we recommend using shared lane markings in the eastbound lane instead of a bike lane. The shared lane markings will give cyclists more freedom to move laterally and to ride closer to the middle of the travel lane.



*Hill on Depot Street. Cyclists travel closer to the speed of traffic going downhill. Shared lanes are safer than bike lanes on downhill grades.*



**Cross-Section: Median Island and Shared Lane**

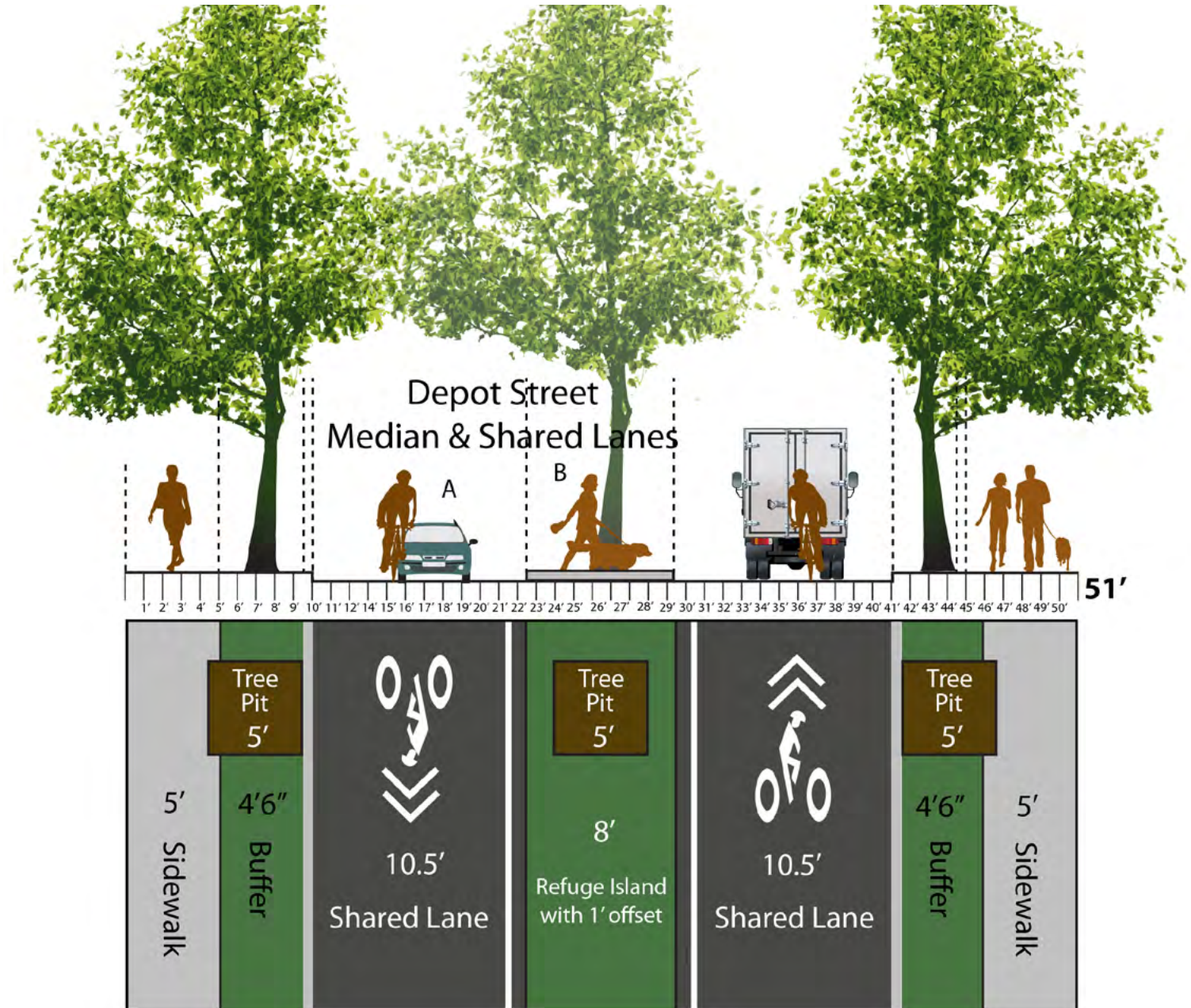
*A. Shared lane*

A shared lane can be used when a travel lane is too narrow for a car to safely pass a cyclist. Shared lane markings (sharrows) indicate to cyclists and vehicles that they must share the lane. In order to make room for some of the pedestrian refuge islands and a turning lane near the Price Chopper entrance, we recommend two short sections of shared lanes. The longest shared lane in the proposed plan is approximately 400 feet long, which would take a cyclist traveling at 15 mph 35 seconds to traverse. The other shared lane is very short – only about 50 feet long.

50-foot mixing zones transition the bicycle lanes to the shared lanes. (See Plan Details)

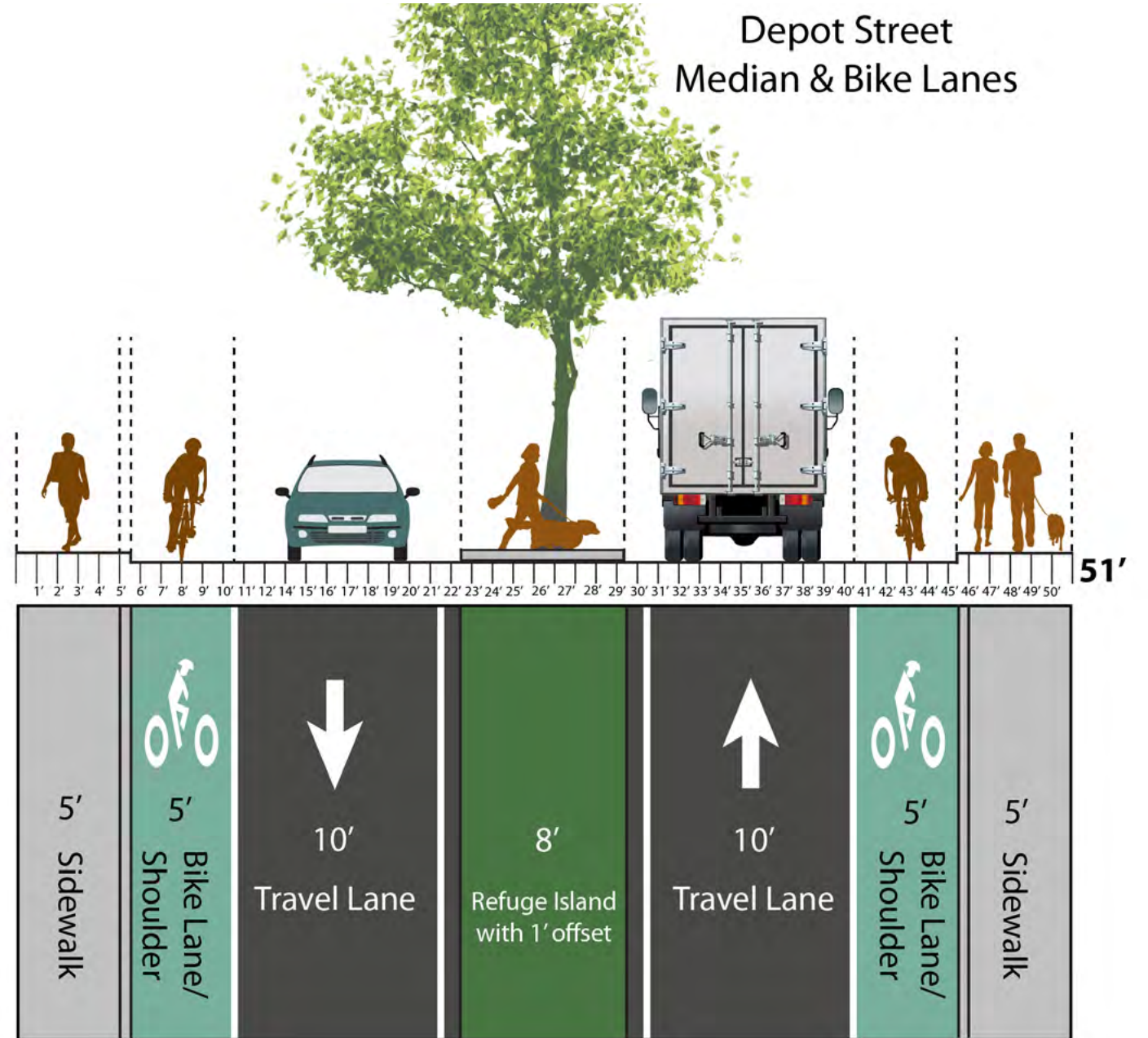
*B. Pedestrian Refuge Islands*

The conceptual alternative has six pedestrian refuge islands. The islands have several benefits: They calm traffic. They shorten the crossing distance by 8 feet. They make it much easier for pedestrians to cross at mid-block by allowing them to cross one lane at a time instead of waiting for a simultaneous traffic gap in both directions. They provide space for trees and plantings.



**Cross-Section: Median Island with Bicycle Lane**

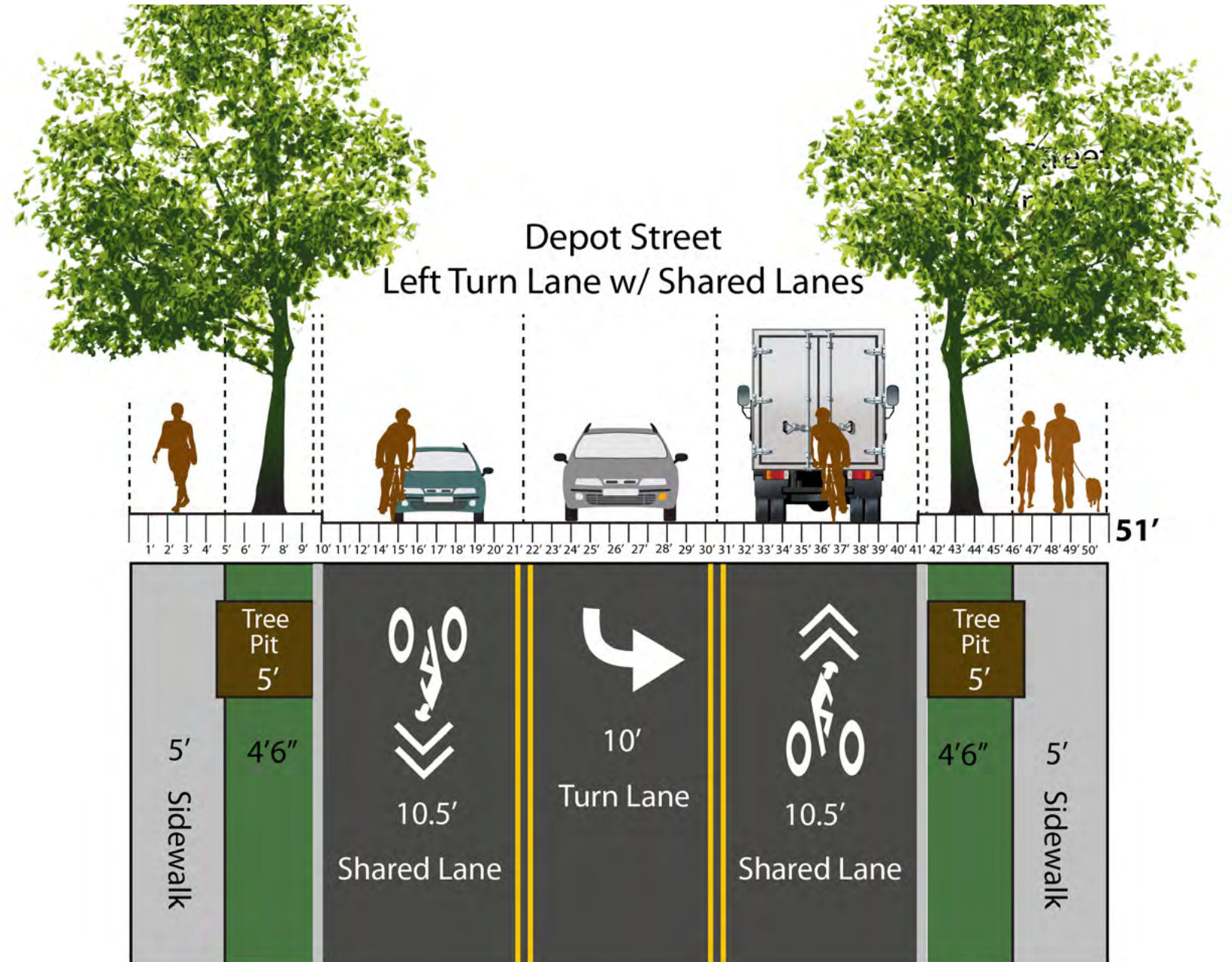
This cross section is similar to the pedestrian refuge island with shared lane cross-section except that the bicycle lane is included. It is used at the eastern end of Depot Street because vehicles will get impatient sharing a lane with cyclists at the signalized intersections.





**Cross-Section: Left-Turn Lane with Shared Lanes**

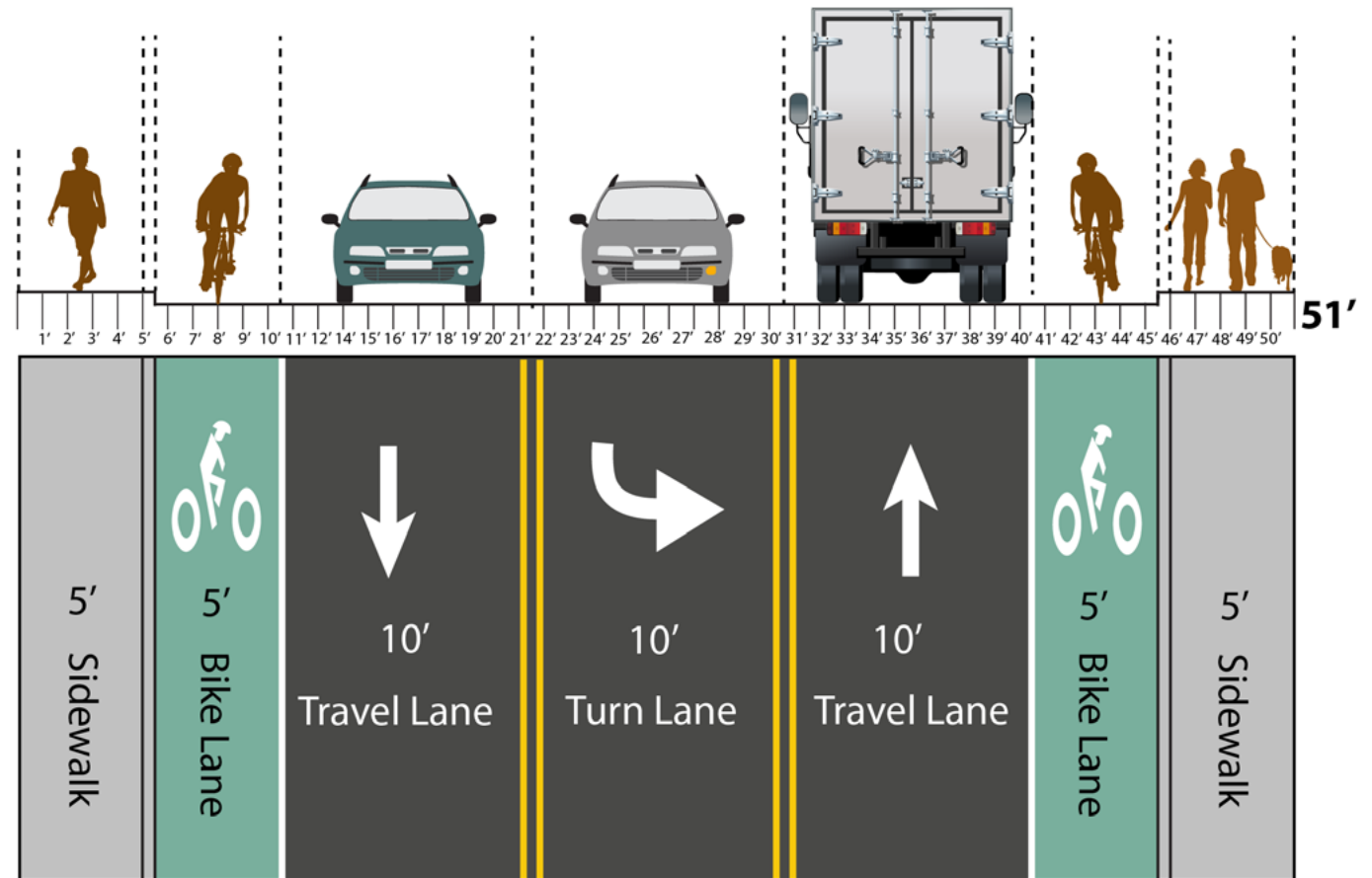
Many vehicles make left-turns into Price Chopper Plaza, and we recommend a left-turn lane there.



**Cross-Section: Left-Turn Lane with Bicycle Lane**

We recommend using this cross-section near Center Hill Road and between Richville Road and Highland Avenue. The Vermont Design Standards allows a 10-foot turning lane width.

Depot Street  
Left Turn Lane w/ Bike Lanes



Proposed Cross-Section Dimensions

EXISTING

	SIDEWALK	CURB	TRAVEL LANE	TURN LANE	TRAVEL LANE	CURB	SIDEWALK	
	5	0.5	14	12	14	0.5	5	51
	CURB TO CURB =			40				

PROPOSED TYPICAL

BIKE LANES BOTH DIRECTIONS	SIDEWALK	GREEN STRIP	CURB	BIKE LANE	TRAVEL LANE	TRAVEL LANE	BIKE LANE	CURB	GREEN STRIP	SIDEWALK	
	5	4.5	0.5	5	10.5	10.5	5	0.5	4.5	5	51
	CURB TO CURB =			31							

HILL

UPHILL BIKE LANE + DOWNHILL SHARED LANE	SIDEWALK	GREEN STRIP	CURB	SHARED LANE	CENTER LINE	TRAVEL LANE	BIKE LANE	CURB	GREEN STRIP	SIDEWALK	
	5	4.5	0.5	15	1	10	5	0.5	4.5	5	51
	CURB TO CURB =			31							

REFUGE ISLAND W/ SHARED LANES

	SIDEWALK	GREEN STRIP	CURB	SHARED LANE	OFFSET LINE	REFUGE ISLAND	OFFSET LINE	SHARED LANE	CURB	GREEN STRIP	SIDEWALK	
	5	4.5	0.5	10.5	1	8	1	10.5	0.5	4.5	5	51
	CURB TO CURB =			31								

REFUGE ISLAND W/ BIKE LANES

	SIDEWALK	CURB	BIKE LANE	TRAVEL LANE	OFFSET LINE	REFUGE ISLAND	OFFSET LINE	TRAVEL LANE	BIKE LANE	CURB	SIDEWALK	
	5	0.5	5	10	1	8	1	10	5	0.5	5	51
	CURB TO CURB =			40								

TURN LANE W/ SHARED LANES

	SIDEWALK	GREEN STRIP	CURB	SHARED LANE	TURN LANE	SHARED LANE	CURB	GREEN STRIP	SIDEWALK	
	5	4.5	0.5	10.5	10	10.5	0.5	4.5	5	51
	CURB TO CURB =			31						

TURN LANE W BIKE LANE

	SIDEWALK	CURB	BIKE LANE	TRAVEL LANE	TURN LANE	TRAVEL LANE	BIKE LANE	CURB	SIDEWALK	
	5	0.5	5	10	10	10	5	0.5	5	51
	CURB TO CURB =			40						

## INTERSECTIONS

### Center Hill Road Intersection

To reduce the long crossing distance and wide paved area:

- Eliminate the unnecessary right-turn lane on Center Hill Road.
- Reduce the excessive curb radiuses.
- Add a new crosswalk at the west side of the intersection.
- Adjust the road alignment slightly so it intersects Depot Street at a right angle.
- If the substation is relocated, consider moving the intersection to the west and installing a roundabout.

(See Plan Details)

### Richville Road Intersection

- Redefine Richville Road's mouth by reducing its width to a standard three-lane configuration with smaller curb radiuses. This will significantly reduce the crossing distance and the paved area.
- Add a cross walk at the west side of the intersection.
- Consider installing a roundabout.

(See Plan Details)

## ACCESS MANAGEMENT

Depot Street has many excessively wide, redundant and unnecessary driveway accesses. Better access manage-

ment will reduce the conflict points where turning vehicles can hit pedestrians, cyclists or through traffic. It will shrink the amount of paved land, reduce water run-off, and increase land available for trees and other landscaping, and will significantly improve aesthetics. We recommend the following:

*Eliminate redundant and unnecessary driveways where feasible.*

Many driveways in the project area could be combined with neighboring driveways. Some properties have multiple driveways when only one is necessary.

*Reduce width of excessive driveways.*

Unless special circumstances exist, reduce access width to the minimum width allowable in the VTrans Access Management Guidelines: 18 feet for one-way accesses and 24 feet for two-way accesses. Accesses with significant traffic volume or significant large truck traffic may need to be wider. A detailed access management study is needed before the project's design phase.

*Use minimal curb radiuses at driveways.*

This will improve safety by slowing turning vehicles and will improve aesthetics by reducing the amount of paved land.

*Continue sidewalks across driveways at a constant elevation.*

This will slow down drivers and clearly establish that pedestrians have the right of way at driveways.

## EASTERN GATEWAY

### Roundabout

A small roundabout is shown in the conceptual plan at the eastern edge of the project. It is not included in the cost estimate and is not recommend unless the proposed passenger rail station is constructed. The roundabout would act as the entry/exit point for the businesses on both sides of the road and to the passenger rail station. It would be the first traffic calming measure for vehicles heading in from the east, greatly reducing vehicle speed. The eastern approach splitter could serve as a gateway and could include the town sign and other information. This would have a strong "gateway" effect on vehicles entering town and help encourage drivers to drop to the speed limit. (See Plan Details)

## IMPLEMENTATION STRATEGY

We recommend reconstructing Depot Street in phases. The conventional project development process proceeds from plan to capital construction over a number of years, during which momentum and funding can fade. Small-scale, low-cost interim improvements, such as striping bike lanes

and installing pedestrian refuge islands, can deliver results quickly, help build momentum, and test the impacts of the project in real time.

#### **Possible project implementation strategy:**

- **Phase 1:** Refine conceptual plan based on feedback from VTrans, the public and other stakeholders. Conduct any necessary traffic and access management studies.
- **Phase 2:** Low-cost, interim improvements:
  - Strip bike lanes and sharrows
  - Adjust intersections by restriping and installing flexible bollards
  - Mark refuge islands with flexible bollards and planters
- **Phase 3:** Intermediate Improvements:
  - Construct pedestrian refuge islands
  - Begin to narrow and consolidate driveways
- **Phase 4:** Full project build-out

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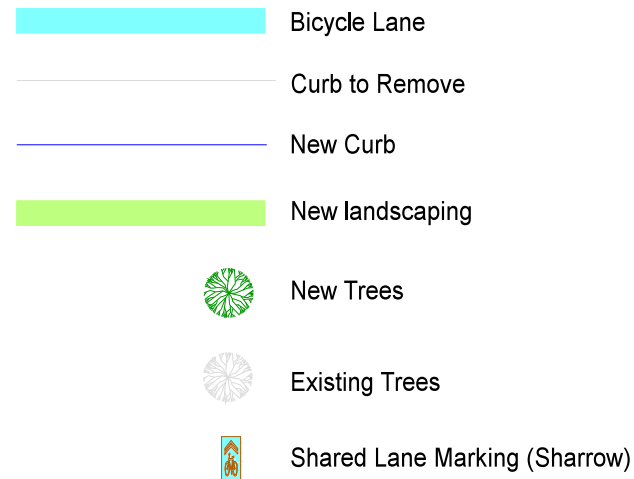
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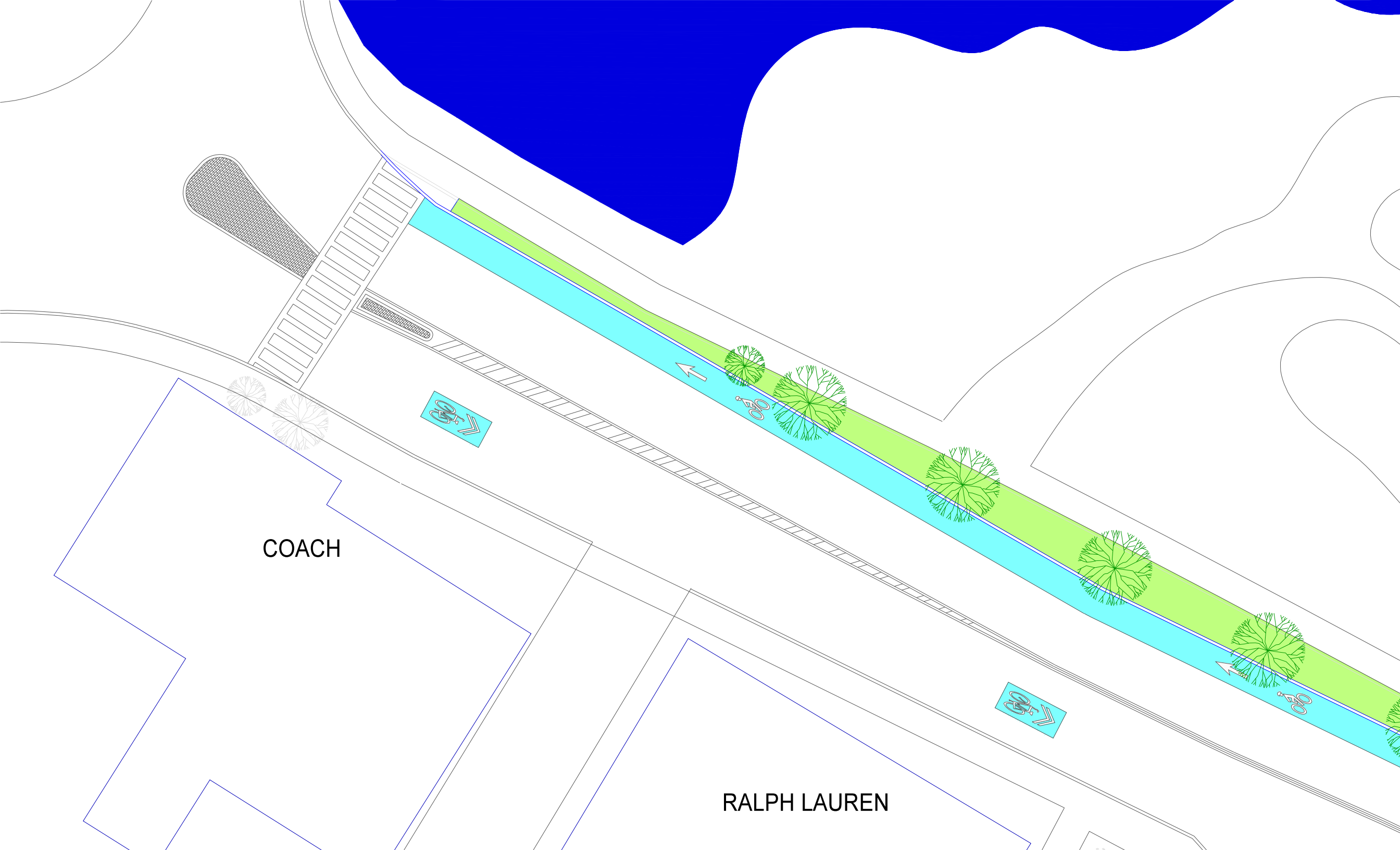
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**CONCEPTUAL PLAN DETAILS**

- The following pages contain details from the conceptual plan.
- If viewing PDF, zoom in for detail.
- The complete conceptual plan is available as a separate document.

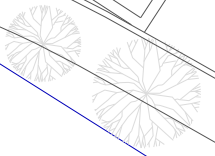
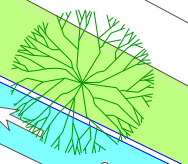
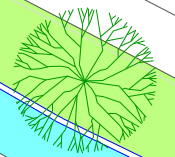
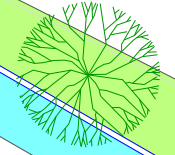
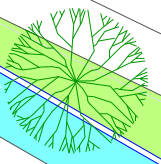
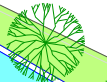


**DEPOT STREET CONCEPTUAL PLAN**  
**DRAFT: MARCH 10, 2014**  
**BENNINGTON COUNTY REGIONAL COMMISSION**



COACH

RALPH LAUREN



RALPH LAUREN



Access 22'

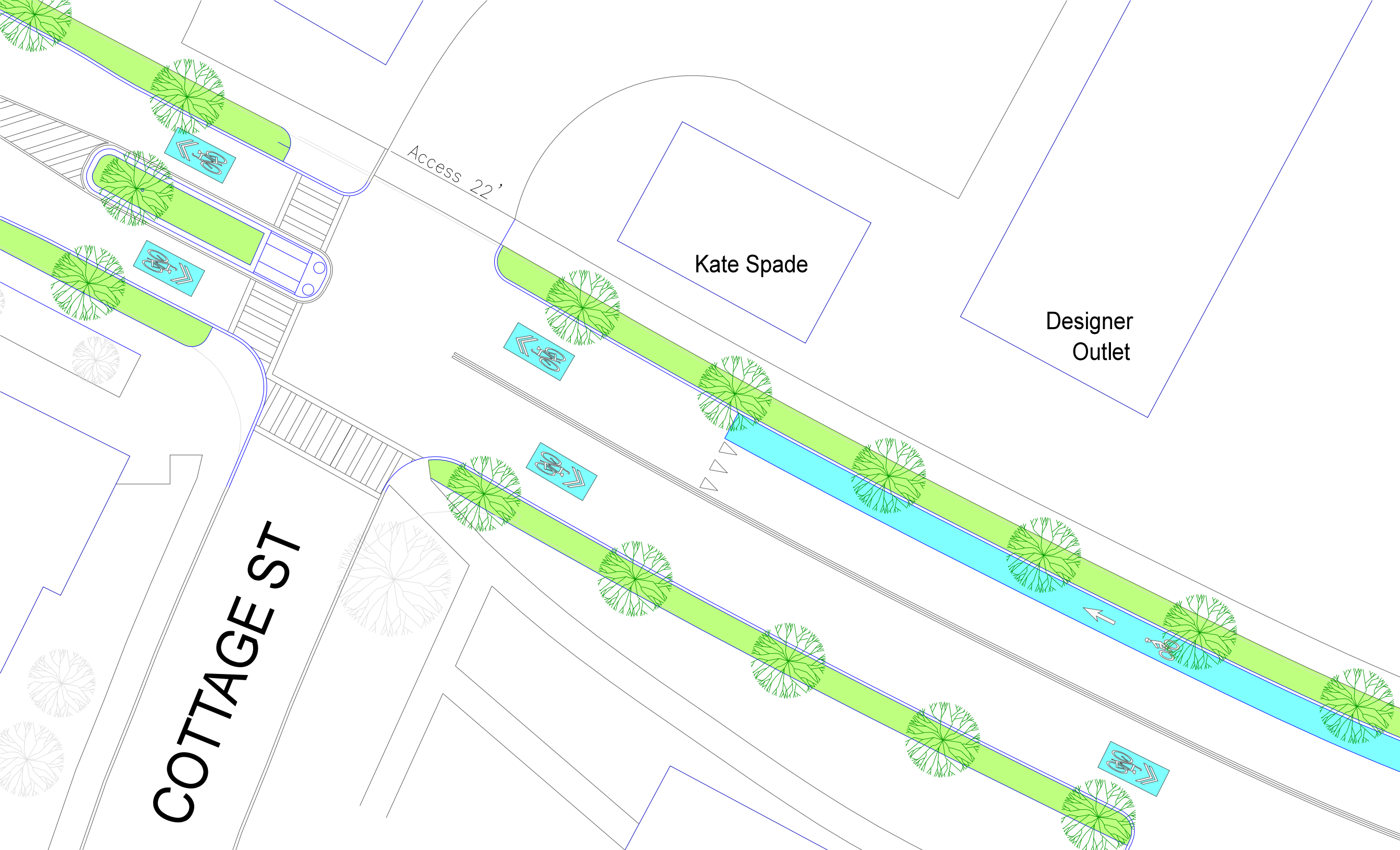


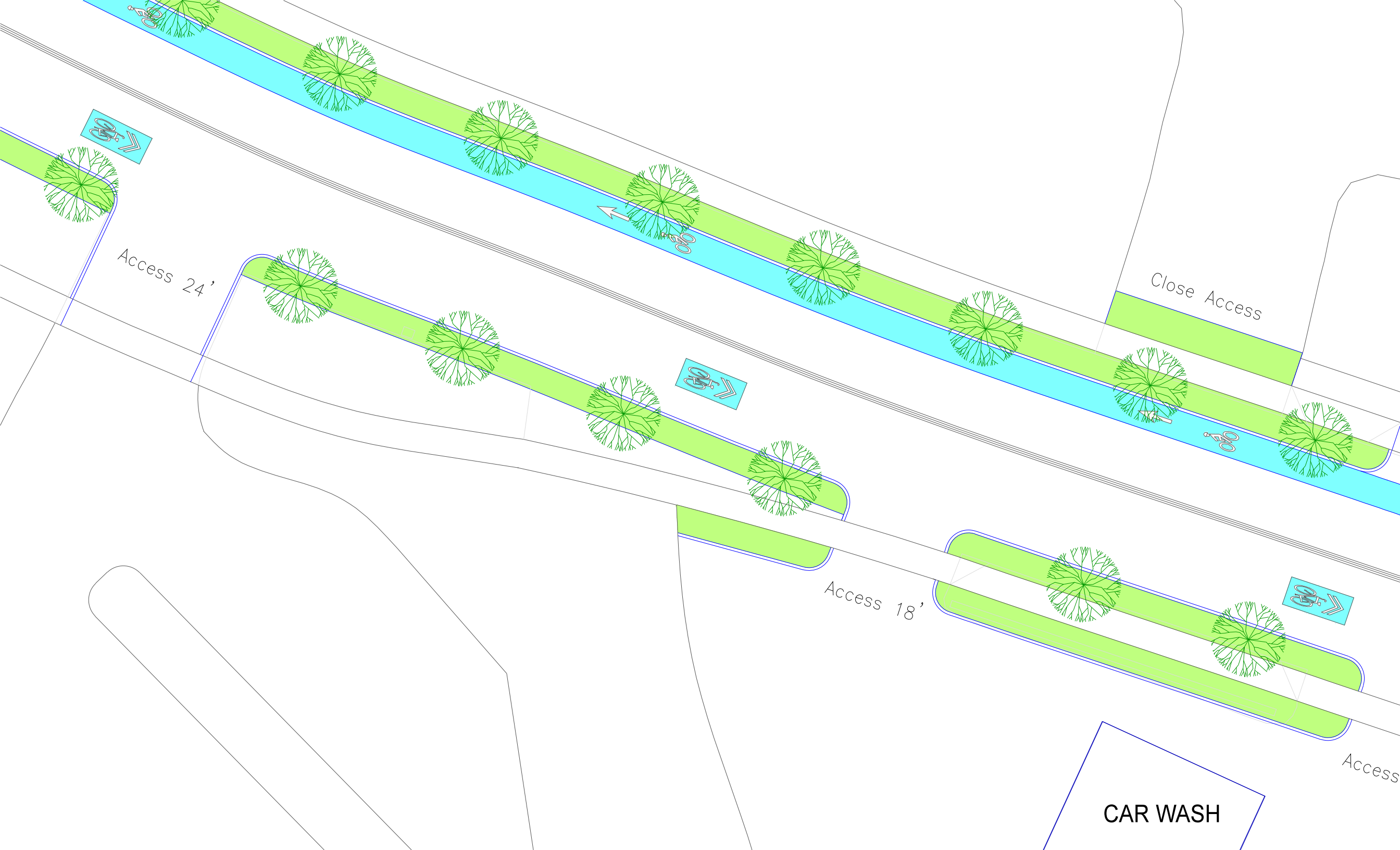
COTTAGE ST

Access 22'

Kate Spade

Designer Outlet





Access 24'

Close Access

Access 18'

CAR WASH

Access

Access 24'

Close Access

Access 18'

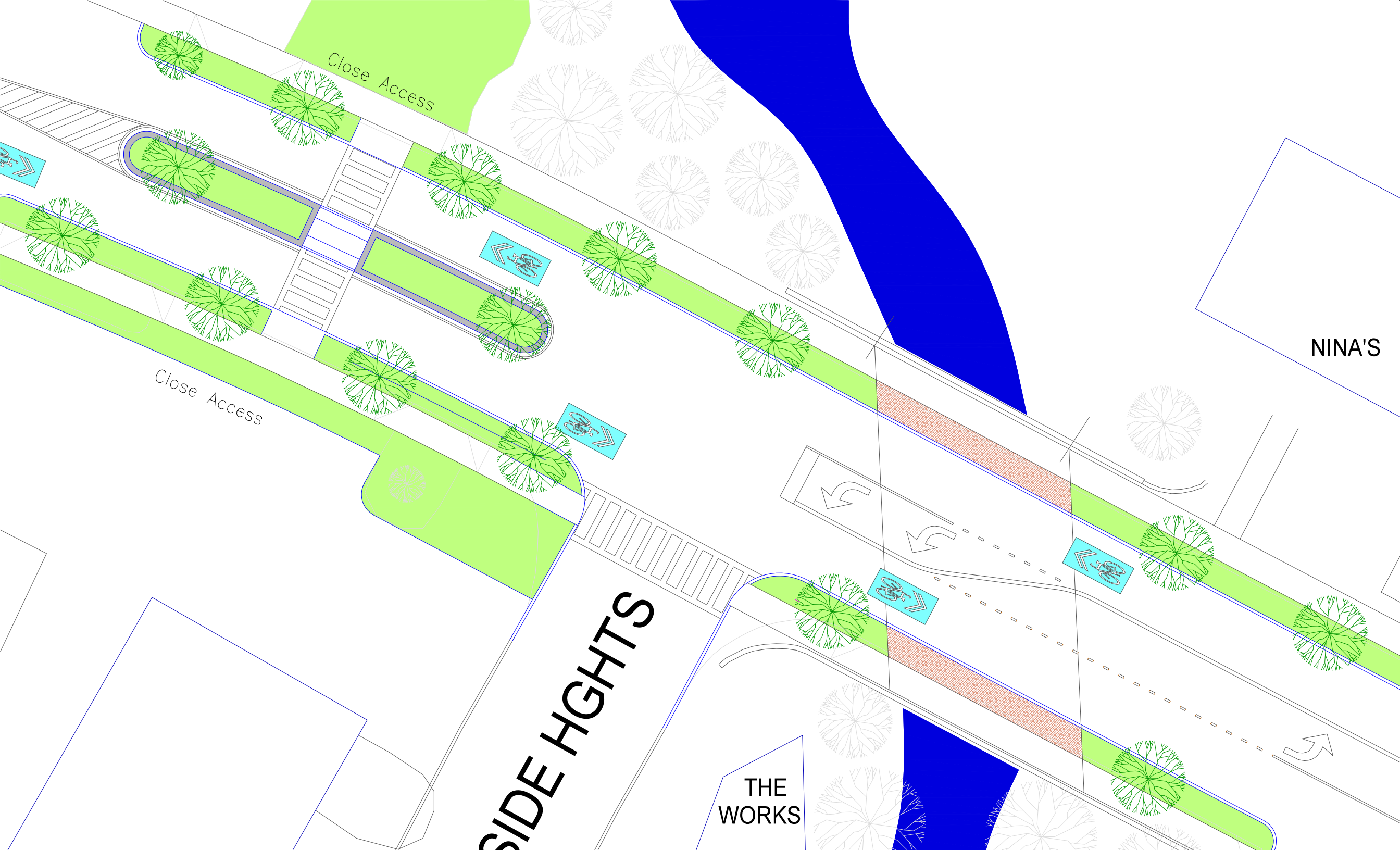
Access 24'

Access 18'

Access 18'

McD'S





Close Access

Close Access

SIDE HGHTS

THE WORKS

NINA'S

MAC'S

Access 21'

Access 21'

Access 24'

REDBOX

Access 24'

Access





ESCADA

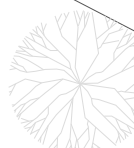
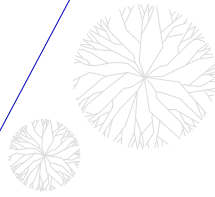
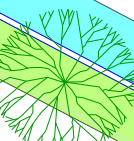
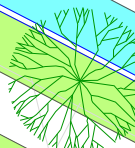
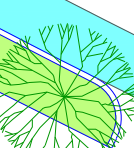
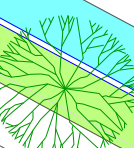
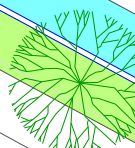
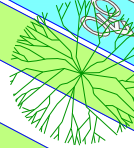
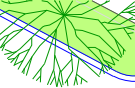
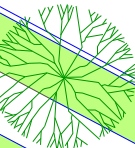
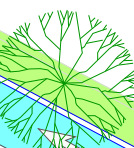
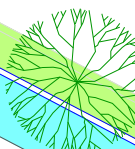
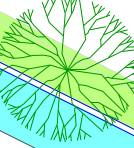
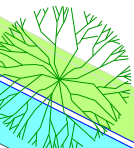
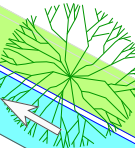
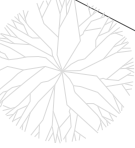
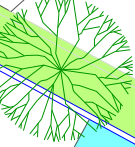
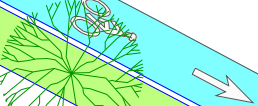
BCBG

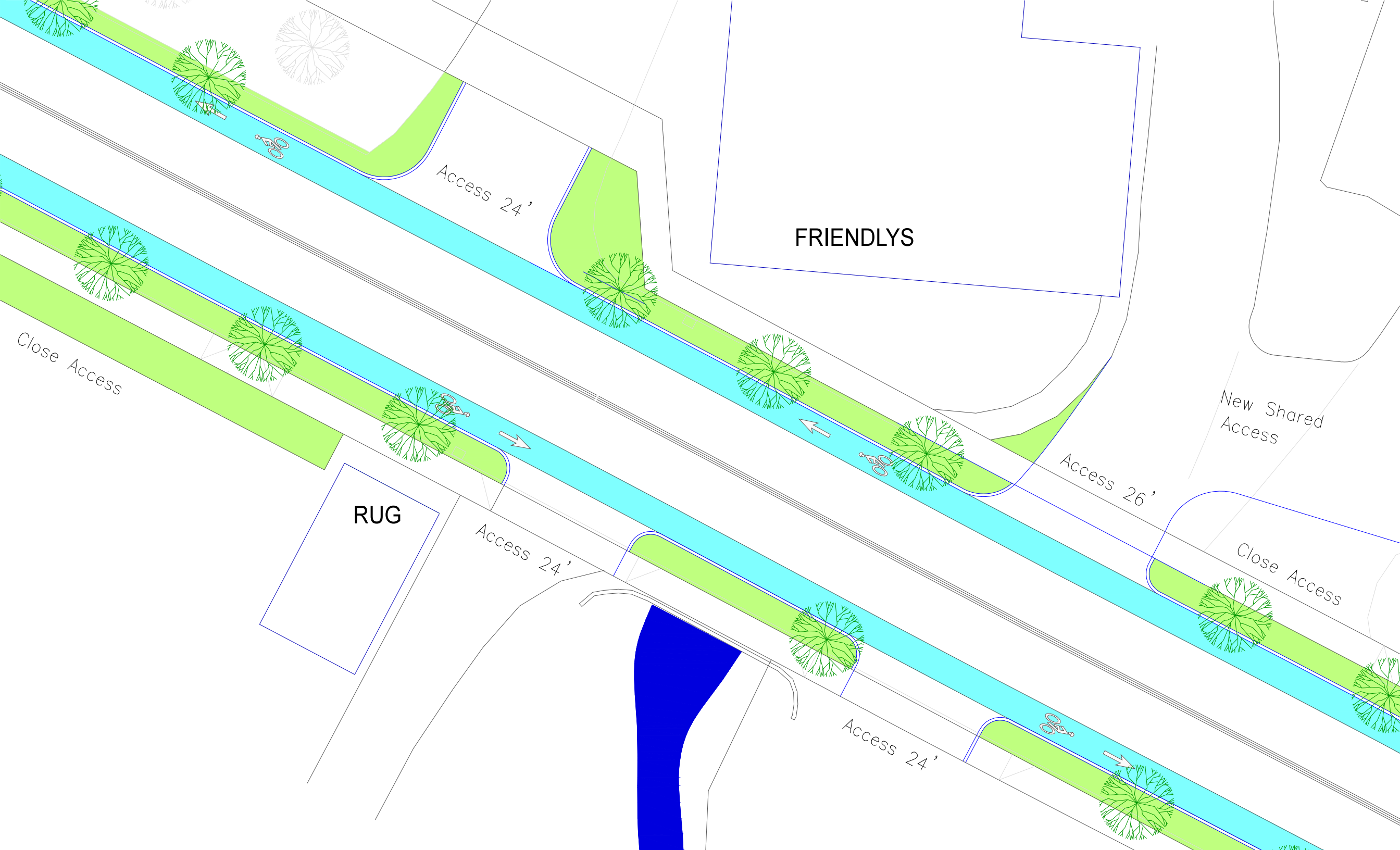
REEL ANGLER

Access 34'

Access 24'

Access 24'





FRIENDLYS

RUG

Access 24'

Access 26'

Access 24'

Access 24'

Close Access

New Shared Access

Close Access

BEVERAGES



Access 24'

Power lines

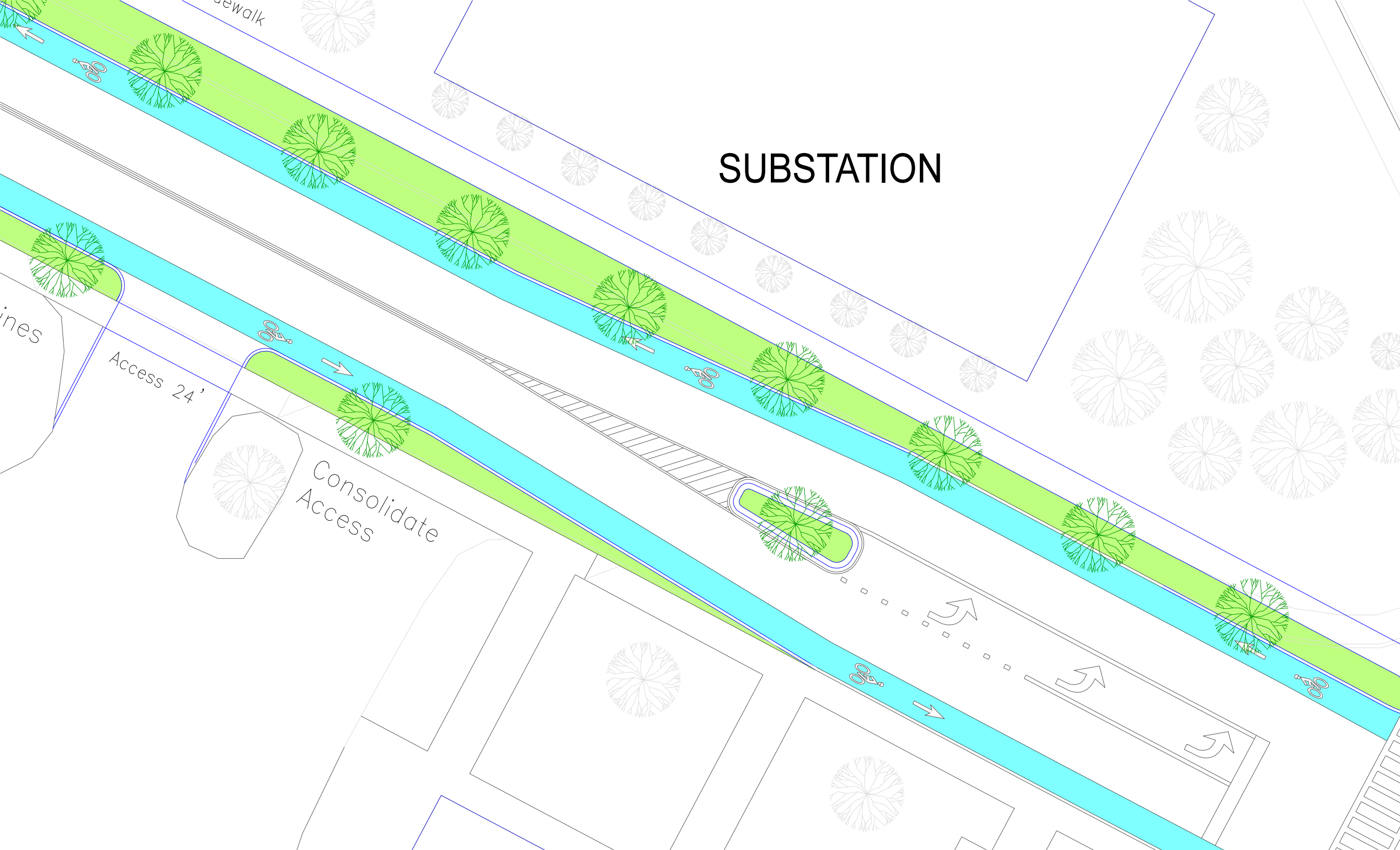
Relocate sidewalk

Access 24'

Comp



# SUBSTATION



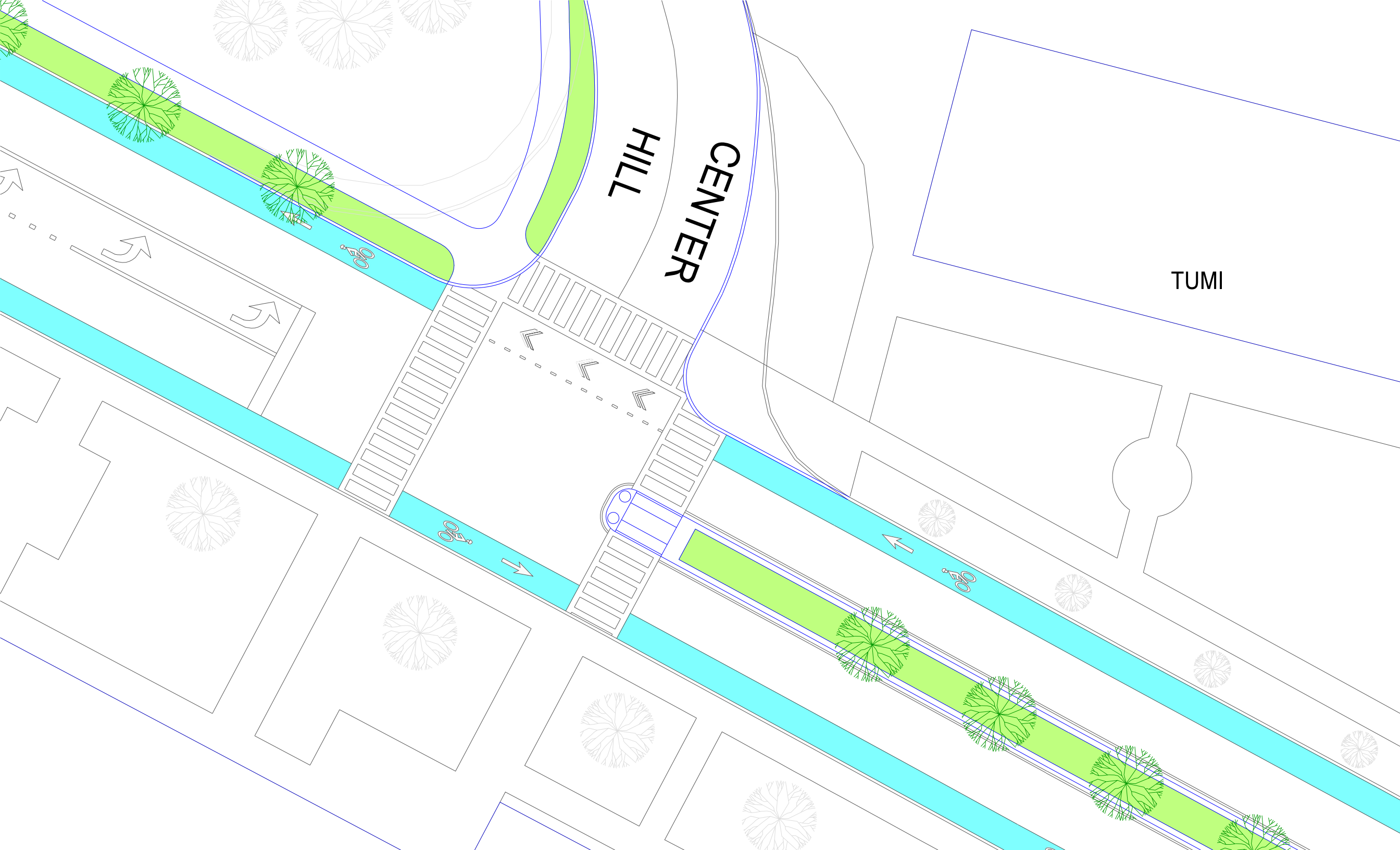
sewage

lines

Access 24'

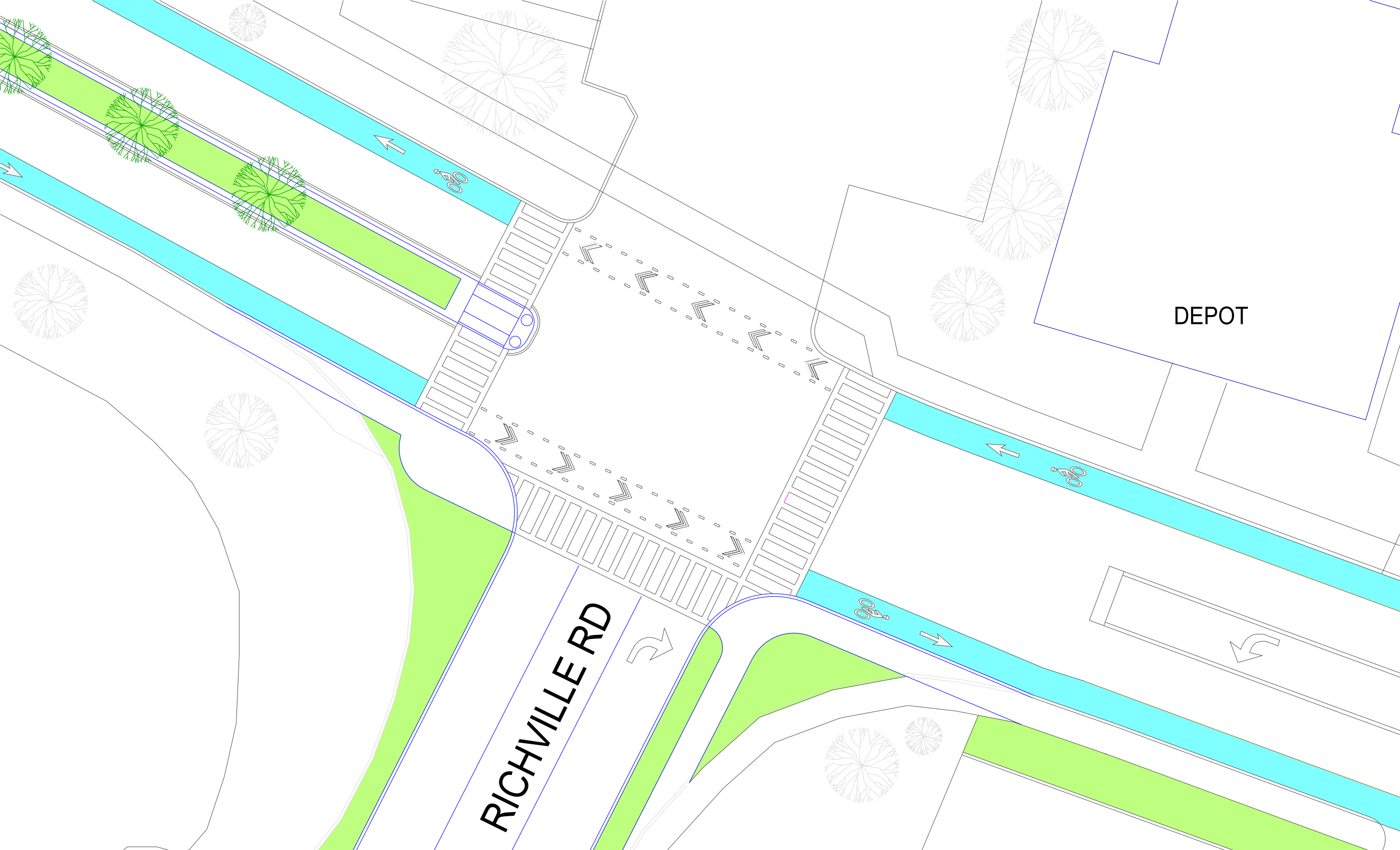
Consolidate  
Access

Access 24'



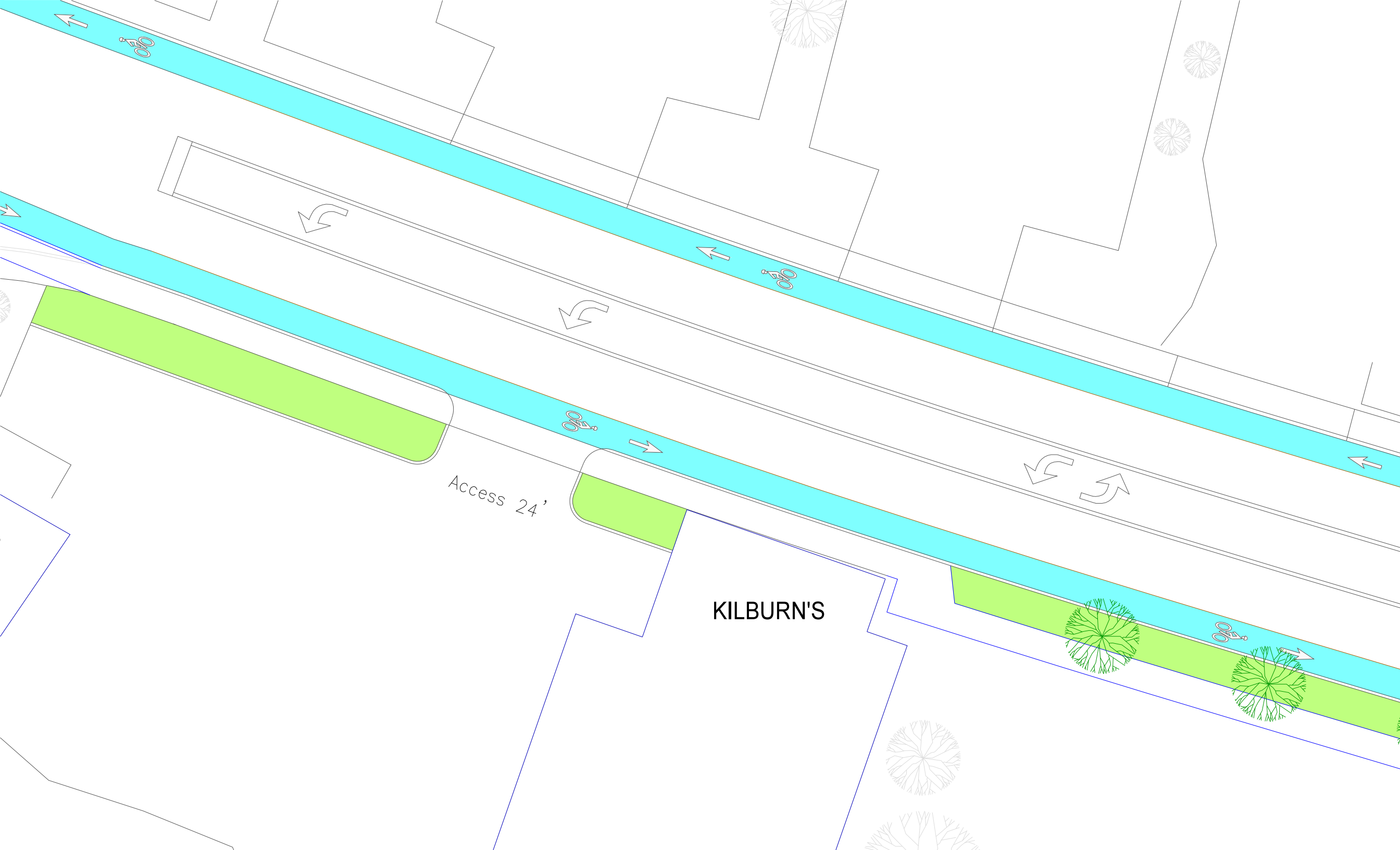
HILL  
CENTER

TUMI



RICHVILLE RD

DEPOT



Access 24'

KILBURN'S

HIGHLAND A

WINDMILLS



Access 24'

Access 32'

YARNS

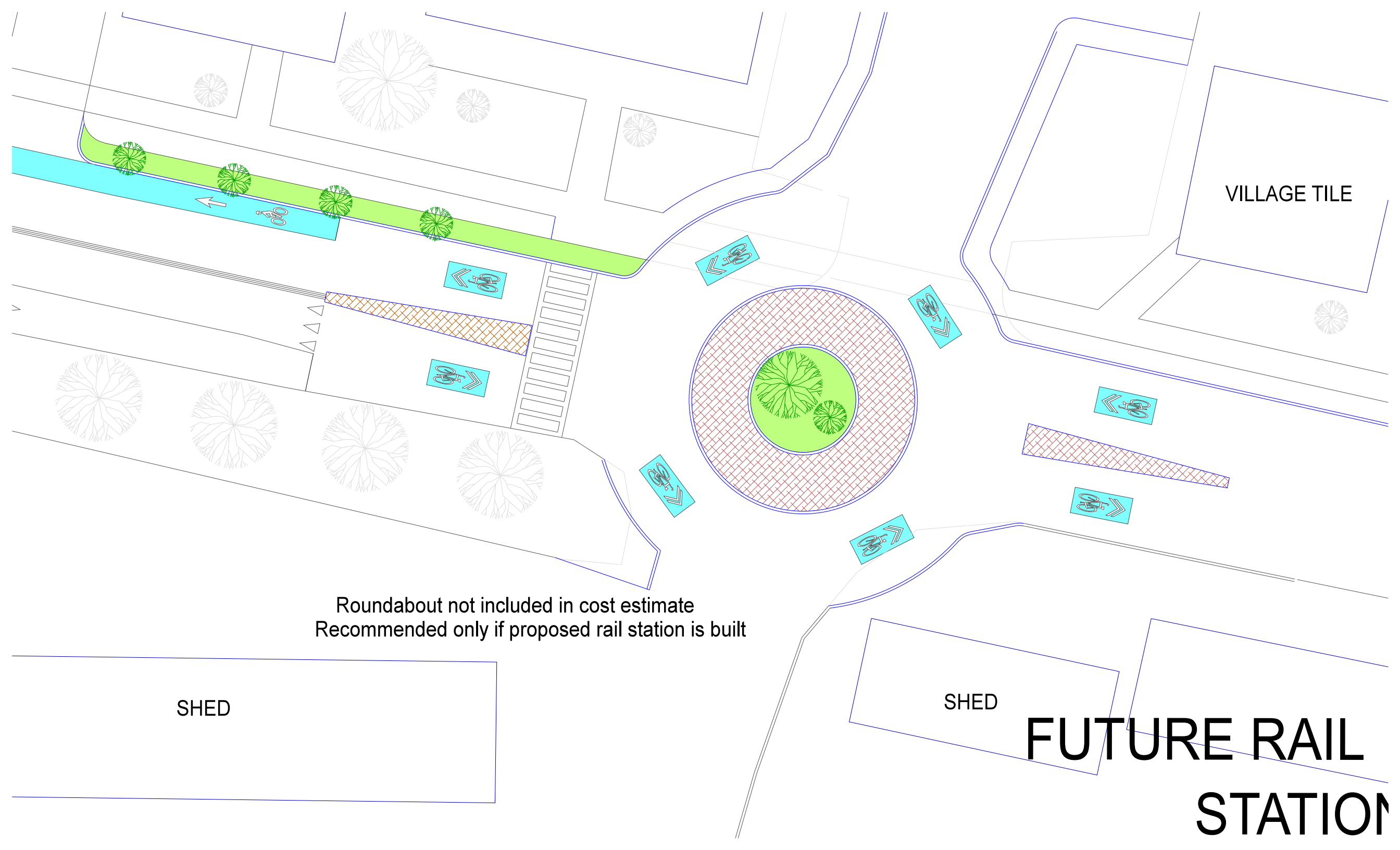
PETCETERA

PROPERTIES



Access 32'

R.K. MILES



VILLAGE TILE

Roundabout not included in cost estimate  
Recommended only if proposed rail station is built

SHED

SHED

**FUTURE RAIL  
STATION**

ITEM	DESCRIPTION	UNIT	EST. QTY	UNIT PRICE	TOTAL
203.15	COMMON EXCAVATION	CY	900	\$20.00	\$17,996.00
203.28	EXCAVATION OF SURFACES AND PAVEMENTS (5" DEPTH)	CY	1243	\$60.00	\$74,580.00
301.25	SUBBASE OF CRUSHED GRAVEL (COARSE GRADED)	CY	605	\$40.00	\$24,200.00
404.65	EMULSIFIED ASPHALT	CWT	1	\$125.00	\$137.50
406.25	BITUMINOUS CONCRETE PAVEMENT (3.5")	TON	303	\$200.00	\$60,500.00
604.20	PRECAST REINFORCED CONCRETE CATCH BASIN	EA	19	\$2,500.00	\$46,750.00
616.200	GRANITE SLOPE EDGING	LF	991	\$40.00	\$39,644.00
616.210	VERTICAL GRANITE CURB	LF	1964	\$40.00	\$78,540.00
616.400	REMOVE AND RESET CURB	LF	4070	\$10.00	\$40,700.00
618.10	PORTLAND CEMENT CONCRETE SIDEWALKS (5" THICK)	SY	805	\$67.00	\$53,948.40
618.30	DETECTABLE WARNING SURFACES	SF	634	\$38.00	\$24,076.80
635.11	MOBILIZATION/DEMOBILIZATION	LS	1	\$40,500.00	\$40,500.00
646.30	DURABLE LETTER OR SYMBOL	EA	147	\$20.00	\$2,948.00
646.41	DURABLE 4" YELLOW LINE	LF	5488	\$1.25	\$6,859.88
646.45	DURABLE 8" YELLOW LINE	LF	139	\$1.50	\$208.50
646.47	DURABLE 12" YELLOW LINE	LF	475	\$2.00	\$950.40
646.48	DURABLE 24" STOP BAR	LF	55	\$6.00	\$330.00
646.50	DURABLE CROSSWALK MARKINGS	LF	686	\$25.00	\$17,160.00
651.15	SEED	LB	17	\$8.00	\$132.00
651.25	HAY MULCH	TON	2	\$100.00	\$165.00
651.35	TOPSOIL (2")	CY	165	\$50.00	\$8,250.00
656.3	DECIDUOUS TREE (2.5 CA TREE)	EA	153	\$400.00	\$61,160.00
675.2	TRAFFIC SIGNS TYPE 'A'	EA	290	\$40.00	\$11,616.00
675.341	SQUARE TUBE SIGN POST & ANCHOR	EA	370	\$20.00	\$7,392.00
900.675	STAMPED CONCRETE	SY	40	\$100.00	\$4,000.00

Total Construction	\$622,744.48
Engineering	\$50,000.00
Inspection	\$30,000.00
<b>Total Cost</b>	<b>\$702,744.48</b>

Estimate by MSK Engineering & Design



## GMP SUBSTATION RELOCATION

Previous studies of the Depot Street Corridor have noted the presence of the prominent electricity distribution substation (currently owned by Green Mountain Power, formerly by Central Vermont Public Service) at the base of Center Hill Road. The substation occupies a lot of 0.88 acres and includes 270 feet of frontage on Depot Street. The electrical equipment is surrounded by a large chain link fence that covers much of the lot. Landscaping is provided with street trees and shrubs, although the need for access to the substation equipment limits the size and extent of vegetation in certain areas, including much of the frontage along Depot Street.

Interest has been expressed in improving the appearance and function of this segment of Depot Street through modifications to the substation property. Ideas have included additional landscaping around the existing facility, additional landscaping while also reducing the footprint of the substation, and relocation of the substation to an alternative site. This last (relocation) option also opens the possibility of realigning the lower portion of Center Hill Road to the west (through the substation property) and adding the existing lower portion of Center Hill Road to the (former) substation parcel. Realigning Center Hill Road in this way would improve roadway geometry and allow for more efficient traffic control systems at both the Center Hill Road/Depot Street and adjacent Richville Road/Depot Street intersections.

After meeting with Green Mountain Power substation and facility management staff, it was determined that it would be difficult to expand the extent of the current landscaping without compromising safety and access and that only very modest reductions in the



*Green Mountain Power's Depot Street substation*

footprint of the substation would be possible. The only substantive option beyond maintaining the current site as is, therefore, involves relocation of the substation to GMP's property located off Richville Road. The additional cost and site work associated with relocating the lower portion of Center Hill Road – relative to the substantial traffic management and streetscape benefits achieved – would be minor, so it is assumed that this realignment would be integrated with any relocation project.

Green Mountain Power owns several acres of land off Richville Road, just south of the bridge over the East Branch of the Batten Kill. An existing transmission substation is located on that property and several acres of additional land are available to accommodate the relocated substation. GMP also has maintained utility rights-of-way so that overhead power lines can be routed to that property without acquisition of additional property or easements.

A conceptual development plan for the relocated substation has been developed by GMP (Figure #) along with a cost estimate for the project. The relocated substation, accessed from a short driveway, would be almost entirely screened from the road and any adjacent properties by the existing topography and vegetation. This relocation would be an expensive project, however, and it is likely that most, if not all, of the costs would be borne by the Town. The total cost of relocating the substation would likely exceed three million dollars:

<b>Green Mountain Power Substation Relocation Costs</b>	
Construction of New Substation	\$ 2,500,000
Distribution Line Construction and Reconfiguration	\$ 250,000
Demolition of Existing Substation and Remediation*	\$ 250,000
Acquisition of Former Substation Property by the Town**	\$ 150,000
<b>TOTAL COST</b>	<b>\$ 3,150,000</b>

\*GMP notes that there may be additional costs if it is found that significant site remediation is required.

\*\* Based on current valuation by the Town of Manchester Assessing Office.

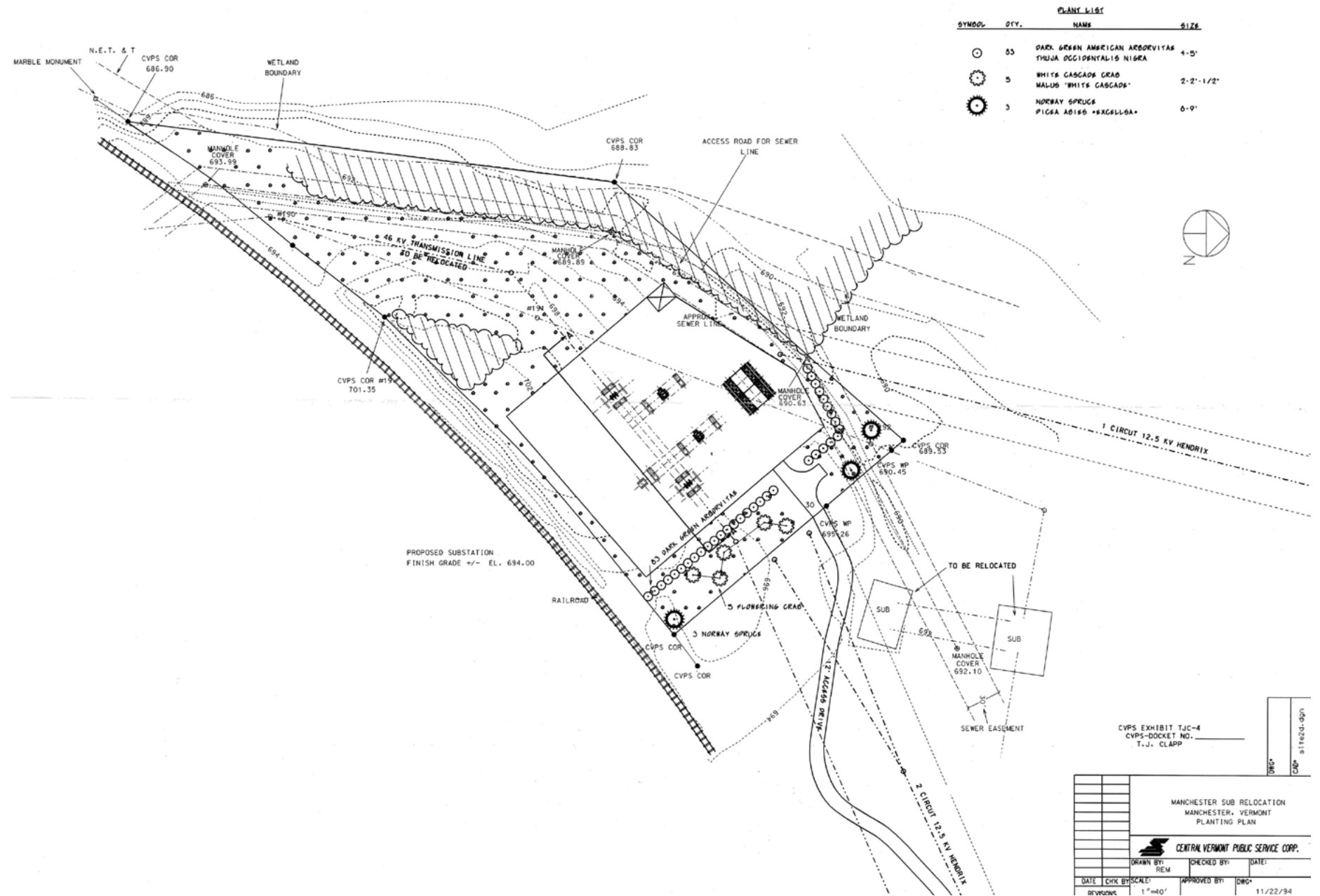
The benefits of relocating the substation have been pointed out earlier. A large piece of utility infrastructure would be removed to make way for a development more in keeping with the streetscape that is sought by the community. If the



Potential roundabouts as depicted in the 2004 “Depot Street Corridor Study.”

Town were to acquire the property – GMP has indicated they would offer it to the Town at fair market value – it would be possible to determine exactly how that property is developed in the future. One option would be to lease the property to a private entity which would develop it according to a site plan approved by the Town; in such an arrangement, the Town also would receive regular lease arrangements. The Town currently receives \$125,000 in annual lease payments from the commercial developer of a nearby property. Assuming the lease payments on the lots would be roughly proportionate to their respective sizes, annual payments to the Town would be approximately \$80,000 from development on the former substation property. Relocation of the substation also would allow for construction of an attractive sidewalk, curb line,

and landscaping, all features currently limited by the presence of the utility infrastructure. The associated realignment of the Center Hill Road intersection to the western end of the property would provide numerous benefits including better access to existing and new parking, greater separation (and thus improved traffic control) between adjacent intersections, and the ability to incorporate roundabouts into the street design at some future time.



Conceptual plan of a relocated Green Mountain Power electrical distribution substation near Richville Road.

Opportunities to obtain grant funding to partially or wholly cover the cost of the substation relocation are quite limited. The federal “Transportation Enhancements” program, which provided funding for development of the “town green” near the mill pond at the west end of Depot Street, was modified recently and now excludes projects of this type (the program is now known by the name of “Transportation Alternatives”). It might be possible to obtain funding through a US Economic Development Administration grant, provided the project is identified as a priority in an economic development strategy document. More likely, funding would have to come from private donations, foundations, and/or municipal revenues. If the Town were to borrow the funds needed for this project, lease payments from this and the other leased municipal property could cover most or all of the bond repayment; however, those lease payments would no longer be available for other uses (including reducing the amount of money needing to be raised via property taxes to fund general government activities).

If the Town decides to pursue this relocation plan, it will be necessary to obtain planning and design services to ensure that the relocation of Center Hill Road, and any resulting changes to driveways and intersections, is accomplished safely and in a manner that meets all applicable roadway design standards. Alternatively, the Town could require the Center Hill Road relocation to be included as a requirement of any subsequent commercial development (whether the property remains in Town ownership or not), with the design and construction work subject to local and state review and approval.