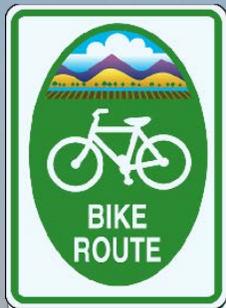
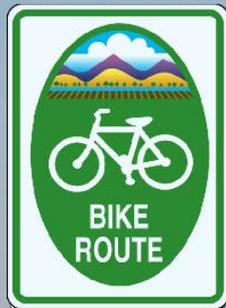


SOLANO COUNTYWIDE BICYCLE AND PEDESTRIAN WAYFINDING SIGNAGE PLAN

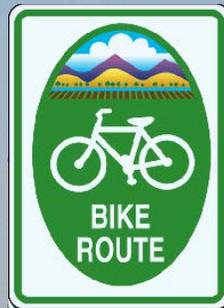


Downtown	2.6
Reg. Transit	3.9

Confirmation Sign



Turn Sign



↑	Downtown
←	Amtrak Station
	Bay Trail →

Decision Sign



Prepared
January 2013

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Bicycle & Pedestrian Wayfinding Signage Plan



Chapter 1: Background and General Approach

Background

Goal in the Solano Countywide Bicycle and Pedestrian Transportation Plans (2012) state, "Route Signage: Develop an informative and visible signage system for the bikeway and pedestrian transportation networks, building on existing signage, that includes directional and distance information to major destinations as guidance for implementation by all cities." In the past, STA has supported a route signage policy by requiring the installation of the countywide bike route sign on all bikeway projects in Solano County. Some exemplary locations where these signs can be seen are Pitt School Road in unincorporated Solano County, Walters Road in Suisun City, and Wilson Avenue in City of Vallejo (see Figure 1.1)

Figure 1.1



General Approach

Destination, direction, and distance information will be included on designated bikeways and pedestrian transportation routes. This Plan is organized by listing supported destinations & routes by jurisdiction (listed in alphabetical order) and mapping them. Jurisdictions included in this planning document include the cities of Benicia, Dixon, Fairfield, Rio Vista, Suisun City, Vacaville, & Vallejo and the County of Solano.

The destinations are organized into a hierarchy of three categories. **Primary** destinations are downtown and adjoining districts, which are signed at distances of up to five miles. **Secondary** destinations are transit stations and districts, which are signed at distances of up to two miles. **Tertiary** destinations include parks, landmarks, colleges, hospitals, high schools, and those optionally identified by each jurisdiction at the local level. These destinations are signed at distances up to one mile. Overall, the system supports (#) destinations.

Standard Signs for Bicycle and Pedestrian Wayfinding

The overall approach follows the look and feel of standard highway guide signs while the detailed design is tailored for bicyclists. The guidelines use the following standard signs included in the Manual on Uniform Traffic Control Devices (MUTCD) and the California MUTCD:

- D11-1: Bicycle Route Guide Sign
- D1-1b: Destination Supplemental Sign
- M7-1 to M7-7: Direction Arrow Supplemental Sign

By using standard signage, the STA builds upon readily recognizable imagery and encourages consistency with other agencies. However, the guidelines include specific modifications and additions to the standards to provide a wayfinding system that is more robust than the direction currently provided by state and national standards.

Sign Types

The system is composed of three sign types (Figure 3):

Confirmation signs confirm that a cyclist is on a designated bikeway. Each confirmation sign includes a Bicycle Route Guide Sign (D11-1) and a Destination Supplemental Sign (D1-1b). Confirmation signs are located mid-block or on the far-side of intersections. Confirmation signs include destinations and their associated distances, but not directional arrows.

Turn signs indicate where a bikeway or pedestrian route turns from one street onto another street. (They are not used at the junction of intersecting bikeways.) Turn signs are located on the near-side of intersections. Each turn sign includes a Bicycle Route Sign Guide (D11-1) and the appropriate Direction Arrow Supplemental Sign (M7-1 to M7-7).

Decision signs mark the junction of two or more bikeways. Decision signs are comprised of a Bicycle Route Guide Sign (D11-1) and a Destination Supplemental Sign (D1-1b). Decision signs are located on the near-side of intersections. They include destinations and their associated directional arrows, but not distances.

Sign Placement Principles

The following principles inform the placement of individual signs:

1. A confirmation sign will be located at the beginning of each bikeway.
2. When a bikeway turns, a turn sign will be located in advance of the turn (e.g., near-side of the intersection)
3. When bikeways intersect, a decision sign will be located on the near-side of each intersection approach.
4. To allow adequate notification of left turns, the decision or turn sign should be placed a distance before the intersection based on the total number of lanes the bicyclist must merge across in order to make a legal left turn, as summarized in the following table:

MERGE TYPE (# OF LANES)	DESCRIPTION	DISTANCE BEFORE INTERSECTION
Zero	single travel lane in each direction	25' preferred (15' to 50' recommended)
One	single travel lane and bike lane in each direction; two lanes in each direction; single travel lane in each direction plus center/left turn lane or pockets; one-way street with two lanes	100' preferred (75' to 150' recommended)
Two	one travel lane and bike lane in each direction with center/left turn lane or pockets; two travel lanes and bike lane in each direction; three lanes in each direction; two travel lanes in each direction plus center/left turn lane or pockets; one-way street with three lanes	200 preferred (175' to 300' recommended)
Three or more	two travel lanes and bike lane in each direction plus center/left turn lane or pockets; one-way street with four lanes	

The decision or turn sign should always be located in the block immediately preceding the junction or turn and at least 25' past the preceding intersection. In locations with short blocks, it will not be possible to satisfy the above recommendations. In each instance, turn and decision signs should be located based on local circumstances and good judgement.

5. Confirmation signs will be located at intervals of one-half mile to one mile, based on the density of streets and intersecting bikeways (e.g., downtown versus more rural or even suburban areas). At locations with complicated turns or decisions, locate a confirmation sign on the far-side of the intersection, within sight distance of the intersection, but at least 25' past the intersection.
6. Confirmation signs should be located immediately following bikeway junctions on streets that do not have bicycle lanes or sharrows (e.g., in the rural/suburban areas).

Sign Frequency

In general, there will be four to five bikeway guide signs for each directional mile of bikeway. In other words, one mile of bikeway will include four to five bikeway guide signs in each direction. The proposed bikeway network includes bikeways spaced at intervals of one-half mile. On average, each directional mile of bikeway will include two decision signs. Confirmation signs at one half mile to one mile intervals add an additional one to two signs per directional mile of bikeway. A typical bikeway will thus include three to four guide signs per directional mile, plus any turn signs that are needed based on the particular route. Assuming an average of four to five bikeway guide signs per directional mile, build-out of the proposed 218-mile bikeway network will include approximately 2,000 bikeway guide signs.

Sign Layout Principles

The following principles determine the layout of individual signs. See Figures 4-7 for sign layout details. Turn signs follow the details and dimensions specified in the MUTCD. Figure 8 shows the layout for all supported destination names.

1. The Bicycle Route Guide Sign (D11-1) is 24" wide and 18" tall.
2. The Destination Supplemental Signs (D1-1b) are 24" wide with the height determined by the number of destinations.
3. No more than three dimensions are included on any single sign pole.
4. Destinations shall use mixed case letters (e.g., upper case and lower case)
5. The Destination Supplemental Signs (D1-1b) shall use the FHWA 2000 C series font with 2" cap height.
6. For long destination names that do not fit on one line, these approaches are used in the following order of preference:
 - For destination names slightly longer than one line, compress the font horizontally to no less than 90% of its standard size.
 - Use intuitive abbreviations in the destination name.
 - Use a two-line entry for the destination name.
7. On decision signs, the straight destination shall be listed on top, the left destination in the middle, and the right destination on the bottom.
8. On decision signs, the straight arrow shall be placed to the left of a destination, the left arrow to the left of a destination, and the right arrow to the right of a destination.
9. On decision signs, straight destinations shall be left-justified, left destinations shall be left-justified, and right destinations shall be right-justified. The straight arrow shall be centered over the left arrow.
10. On confirmation signs, the closest destination shall be listed on top and the furthest destination shall be listed on the bottom.
11. Left, right, and compound turn arrows generally provide the clearest direction. Avoid the use of diagonal arrows on turn signs and decision signs wherever possible.
12. Do not use periods in the abbreviation of destination names (e.g., "Air Base Pkwy" and "Main St").
13. Common symbols are used to convey destination information in a space-efficient manner. The symbols shown below are used for "Amtrak", "hospital", "Bay Trail", and "Transit Station." The symbol shall precede the destination name (e.g., <H symbol> "Kaiser").

Logos/Symbols Used on Decision/Confirmation Signs

<insert logos and symbols here>

Differences From the MUTCD Sign Layout Specifications

These guidelines deviate from the MUTCD in the following ways:

Difference	Rationale
Reduces horizontal buffer between edge of green and sign content from 1.5" to 0.75"	Greater ability to accommodate longer destination names
Incorporates symbols with destination names	Above plus improved communication
Maintains 24" wide supplemental sign (D1-1b)	Aesthetic and consistent width
Includes horizontal rules to separate multiple destinations	Aesthetic and space-efficient
Uses FHWA 2000 (Highway Gothic) C series font series (rather than D series)	Greater ability to accommodate longer destination names; maintains 2" cap height; consistent with the cities of Chicago and Seattle
Inclusion of City tree logo on D11-1 sign, by reducing cap height of "BIKE ROUTE" to 2.75" (from 3")	Provides local flavor and sense of place

Sign Messaging Principles

The following principles inform the messaging of individual decision and confirmation signs. They provide a framework for selecting which of the 102 supported destinations are best included on any individual sign. For readability, any individual sign will include a maximum of three destinations. Superior message selection provides wayfinding that—from the user's perspective—is accurate, consistent, understandable, and ultimately useful.

1. Determine the supported destinations in a given corridor by identifying the destinations that are located on the bikeway, off-route destinations that are within a few blocks of the corridor, and destinations served by intersecting bikeways.
2. As identified in Figure 1, primary destinations are signed at distances of up to five miles; secondary destinations at distances up to two miles; and tertiary destinations at distances up to one mile.
3. The bikeways endpoint destination should be included on confirmation signs along the length of the route to communicate the overall extent of the bikeway. This destination should be included irrespective of the distance associated with its designation as a primary, secondary, or tertiary destination. For bikeways that pass through downtown, use Downtown as the endpoint destination.
4. If a bikeway ends in a location where there is no obvious destination, use the closest major destination on an intersecting bikeway. If there is no intuitive destination, the name of the intersecting street where the bikeway ends may be used as the destination.
5. For decision signs at intersections with primary bikeways, include on the decision sign the closest major destination (e.g., a primary or secondary destination). Primary bikeways are defined by the City of Oakland's Bicycle Master Plan (BMP) as the "arterial" streets of the bikeway network; see BMP, Figure H-6.

6. For decision signs at intersections with secondary bikeways, include on the decision sign the closest destination (e.g., a primary, secondary, or tertiary destination). Secondary bikeways are defined by the BMP as the "collector" streets of the bikeway network (and include all those other than the primary bikeways described above).
7. For decision signs, destinations listed on prior confirmation signs are assumed to be straight ahead unless otherwise noted. If this is not the case, multiple turn lanes for a single direction may be included on the decision sign so long as there are no more than three destinations on the sign. If this cannot be accommodated, delete the unsupported destinations from the upstream signs.
8. Some supported destinations are located within a few blocks of a designated bikeway, but not directly served by a designated bikeway. In such instances, support the off-route destination with a decision sign on the designated bikeway if the off-route destination is along a straight path of travel and within three blocks of the designated bikeway. Note that there most intuitive connection to the off-route destination may be different for each approach direction on the designated bikeway or pedestrian route.

Installation Specifications

Poles

the standard pole for bikeway guide signs is a 2" square perforated unistrut pole. Poles of 14' in length are generally adequate to accommodate typical installations. The pole should be placed 18" to 24" in the ground, depending upon the overall weight of the signs and the soil/pavement conditions. Heavy sign installations may require poles up to 36" into the ground.

As shown in Figure 11, the D11-1 should be installed at 11.5' in height as measured from the top edge of the sign. This height will allow for the installation of the D1-1b or M7 supplementary signs plus an additional sign of up to 18" in height (e.g., no parking, street sweeping) on a single pole. This configuration maintains a minimum 7' clearance to the bottom edge of the bottom sign while locating the bottom edge of the bottom wayfinding sign at a minimum height of 8.5' to reduce the sign's exposure to graffiti. When mounted on a pole with an existing parking restriction sign, the D11-1 assembly should be located above the parking restriction sign. Signs shall not be mounted to utility poles or traffic signal mast arms. Existing poles should be used wherever practical.

Blades

Based on review of local specifications/product types to produce wayfinding signs, STA recommends to the following:

- Material: 0.080 inch aluminum
- Reflective sheeting: Diamond Grade (3M™)
- Film: ElectroCut (EC) Film Series 1170 (3M™), green (1177)
- 3M™ Premium Protective Overlay Film Series 1160

Blades are expected to last six to seven years.

Coordination With Other Agencies

This Plan has been developed in coordination with each of the seven (7) cities and the County of Solano for consistency with existing signage standards and local policies.

In addition to STA's member agencies, other agencies have expressed interest in providing bicycle wayfinding signage in Solano County. The San Francisco Bay Trail Project and the Bay Conservation and Development Commission typically include guide signage for bicyclists and pedestrians, directing people to public shorelines and along the Bay Trail. Bay Trail project staff have also expressed interest in additional guide signs that would support long distance bicycling along the Bay Trail. The Metropolitan Transportation Commission (MTC) has published a Regional Transit Wayfinding Guidelines and Standards document which defines the specifications for signage on the approach and within Transit Facilities of Regional Significance (TFORS). We maintain consistency with this plan by referring these guidelines on the approach and within TFORS. This ensures consistency for the user when travelling from our transit system to connecting in other regional transit stations such as Amtrak and the Bay Area Rapid Transit (BART). BART is seeking to improve bicycle wayfinding in its station areas. Furthermore, STA Board of Directors has expressed interest in a coordinated signage system for countywide bikeways and pedestrian routes. This interest is supported by priority recommendations from the Bicycle Advisory Committee (BAC) and the Pedestrian Advisory Committee (PAC). In some instances, all of these wayfinding efforts overlap in the same location: a local bikeway that is also a countywide bikeway, is a pedestrian route, that is part of the Bay Trail, and near a TFORS (e.g., Central County Bikeway near Suisun City Fairfield Amtrak Station). It was planned from the outset to coordinate these efforts through this guidebook.

These and other overlapping wayfinding systems for bicyclists and pedestrians shall be supplemental to the County's base system, limiting sign clutter and providing clear information to the intended users. Any additions should provide consistent content in an integrated format based on the Bicycle Route Guide Sign (D11-1) and the Destination Supplemental Sign (D1-1b). As described in these guidelines, the inclusion of the Amtrak logo in destination names is one example of this integration.

Detours

The STA promotes the use of bicycle- and pedestrian-specific detours for temporary roadway closures when the preferred route for bicyclists differs from the detour provided for motor vehicles. For example, the preferred routing for motor vehicles may use roadways that are poorly suited for bicyclists and/or pedestrians. In some instances, a preferred detour for bicyclists and pedestrians may not allow access for motor vehicles—like a bicycle path, or a road closure that prohibits motor vehicle access but maintains bicycle access. This guide also provides bicycle-specific detours for the temporary closure of bicycle and pedestrian paths.

To meet this need for bicycle-specific detours, the STA has developed detour signage that builds upon the design guidelines for bicycle and pedestrian wayfinding signage. As illustrated in Figure 12, the system uses modifications to the standard bicycle guide signs (D11-1, D1-1b, M7 series) plus the Bicycle Route Name Marker (S17-CA) and other standard detour signs (M4 series). This combination provides detailed information in a readable and space-efficient format that is superior to the standard Bicycle Pedestrian Detour signs (M4-9 series).

All signs have a black legend and border on an orange background and use FHWA Series C Typeface. On the D11-1, the words "Bike Route" are replaced with "Detour." The S17-CA is supplemental to the D11-1 and provides the name of the detour, typically the roadway or path that is closed. The modified M4 series signs (begin/end) are also supplemental to the D11-1 to indicate the beginning and end of the detour. The M7 series arrows are supplemental to the D11-1 and indicate turns along the detour. In contrast to the standard bicycle wayfinding signs, the "straight ahead" arrow (M7-2) may be used, for example, when a motor vehicle detour turns but bicyclists and pedestrians specifically should be directed to proceed straight. Lastly, the D1-1b may be used instead of an M7 series arrow to provide an arrow, a destination, and potentially a cardinal direction. This additional information is important for turns that may be counterintuitive on detours that require out-of-direction travel. See Figure 13 for examples of how blades may be messaged and combined to create sign assemblies.



Existing and Planned Bikeway Facilities Map

A complete list of the projects shown in this map are shown on the following page.

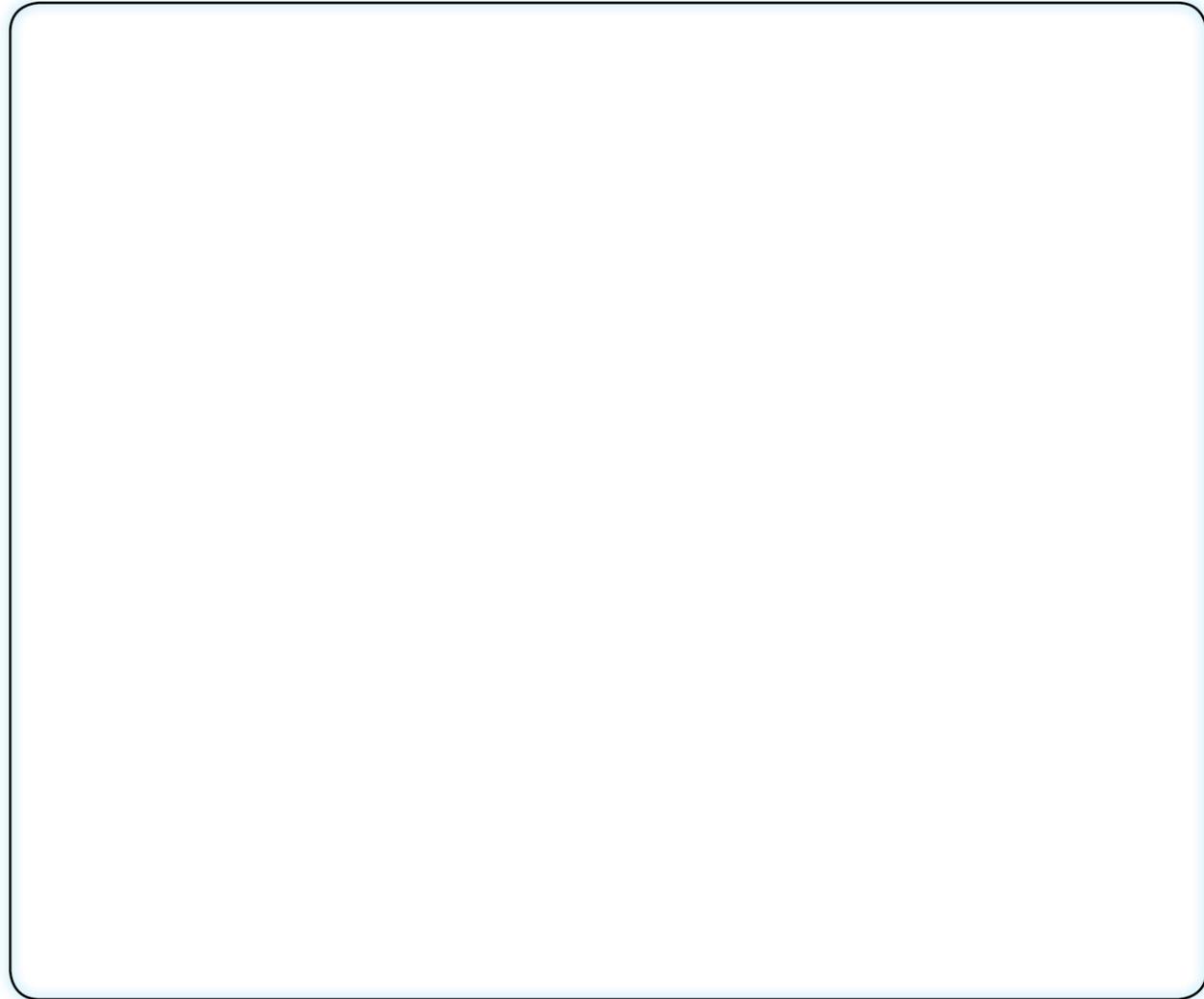
Existing and Planned Bikeway Facilities

Existing Facilities

Street Name	From	To	Length	Bike Route Signs (Y/N)	Number of Bike Route Signs Needed
Military West	Benicia Rd	1st St	0.1		
1st Street	Military West	West I St			
West I Street	1st St	Benicia Rd			
East 2nd Street	Rose Dr	Hillcrest Ave			
Adams Street	Military East	Park Rd			

Planned Facilities

Street Name	From	To	Class	Length	Number of Bike Route Signs Needed
Lake Herman Rd	Benicia City Limit	East 2nd St	II	0.1	
Military East	Military West	East 2nd St	II		
East 2nd St	Military East	Hillcrest Ave	II		
East 2nd St	Rose Dr	Lake Herman Rd	II		
Military East	E 7th St	Adams St	II		



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Existing Facilities

Street Name	From	To	Length	Bike Route Signs (Y/N)
First Street			0.1	

Planned Facilities

Street Name	From	To	Length	Number of Bike Route Signs Needed
First Street			0.1	



Existing and Planned Bikeway Facilities

Existing Facilities

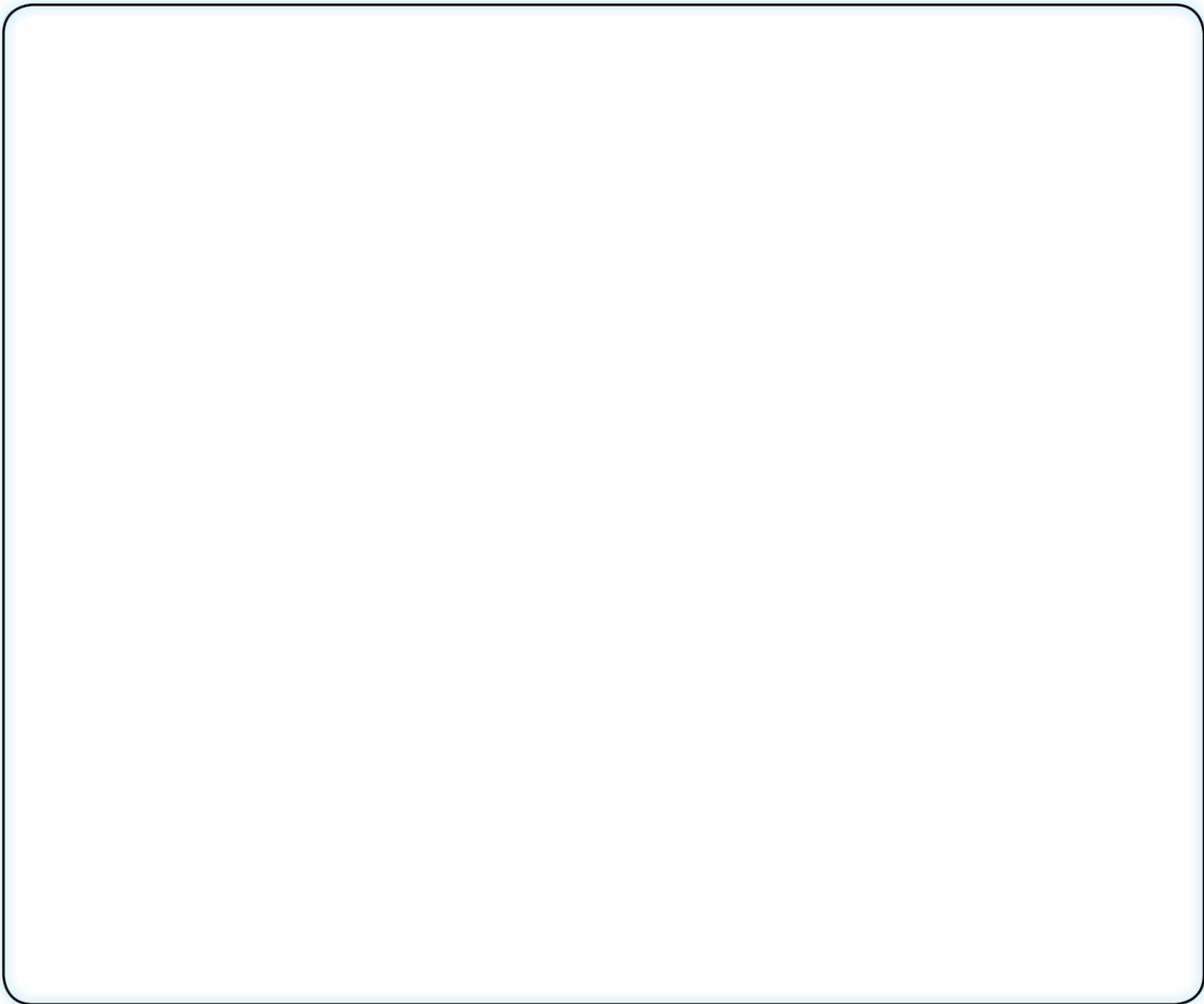
Street Name	From	To	Length	Bike Route Signs (Y/N)
First Street			0.1	

Planned Facilities

Street Name	From	To	Length	Number of Bike Route Signs Needed
First Street			0.1	

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Street Name	From	To	Length	Bike Route Signs (Y/N)
First Street			0.1	

Planned Facilities

Street Name	From	To	Length	Number of Bike Route Signs Needed
First Street			0.1	



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Existing Facilities

Street Name	From	To	Length	Bike Route Signs (Y/N)
First Street			0.1	

Planned Facilities

Street Name	From	To	Length	Number of Bike Route Signs Needed
First Street			0.1	



Existing and Planned Bikeway Facilities

Existing Facilities

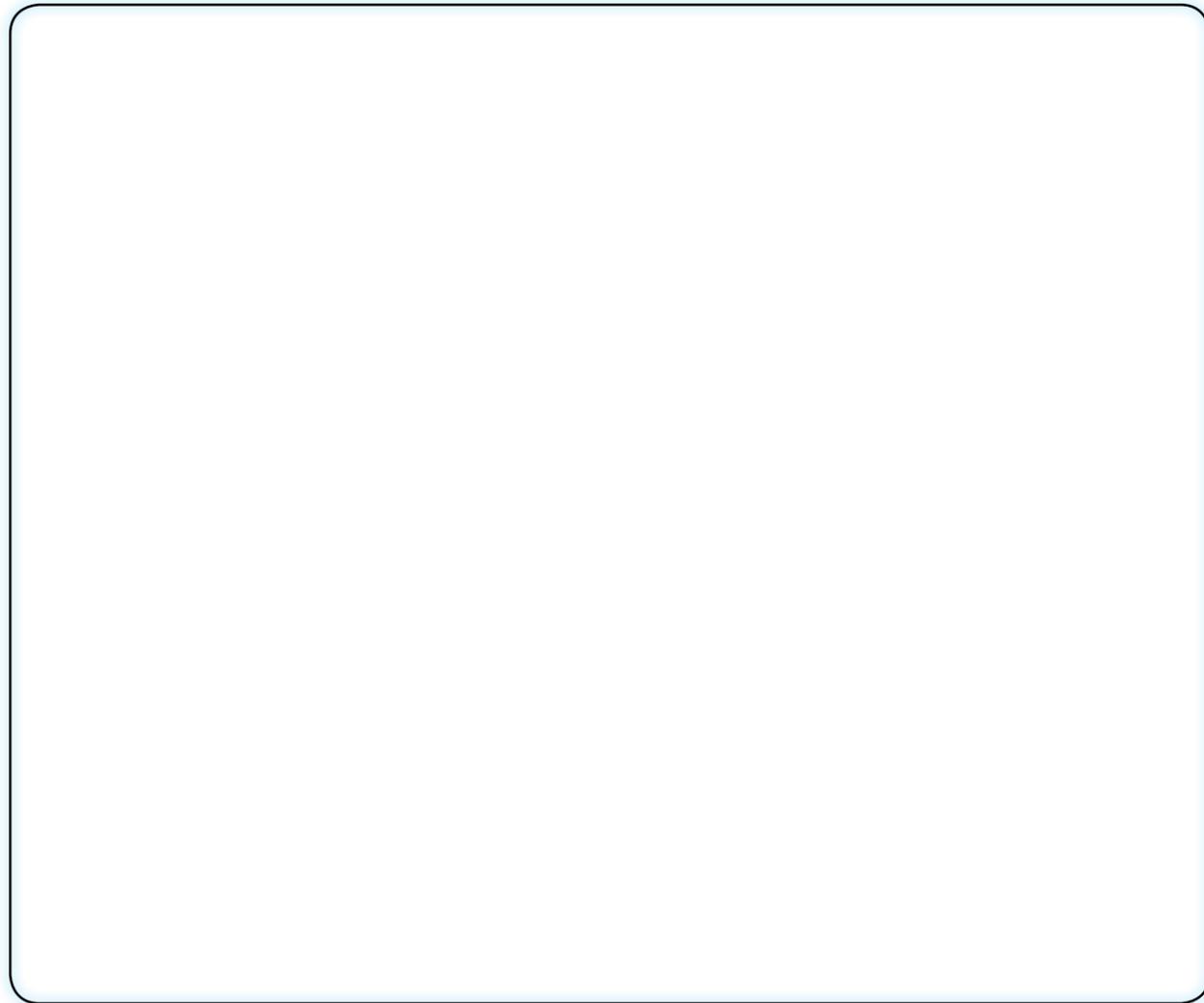
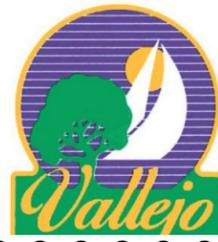
Street Name	From	To	Length	Bike Route Signs (Y/N)
First Street			0.1	

Planned Facilities

Street Name	From	To	Length	Number of Bike Route Signs Needed
First Street			0.1	

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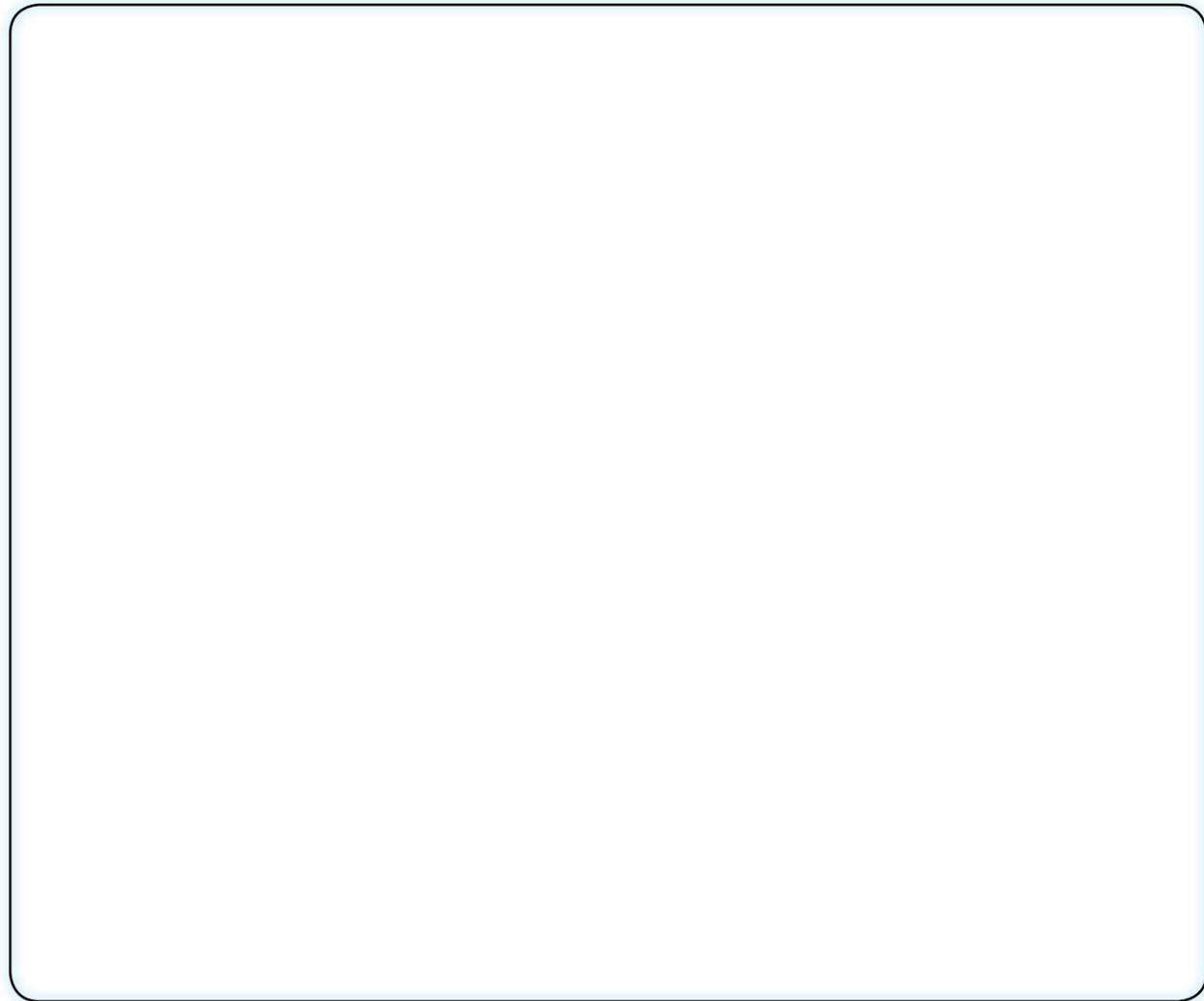
Existing and Planned Bikeway Facilities

Existing Facilities

Street Name	From	To	Length	Bike Route Signs (Y/N)
First Street			0.1	

Planned Facilities

Street Name	From	To	Length	Number of Bike Route Signs Needed
First Street			0.1	



Existing and Planned Bikeway Facilities Map

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Existing and Planned Bikeway Facilities

Existing Facilities

Street Name	From	To	Length	Bike Route Signs (Y/N)
First Street			0.1	

Planned Facilities

Street Name	From	To	Length	Number of Bike Route Signs Needed
First Street			0.1	

Banner