

STORMWATER CURB EXTENSION FEASIBILITY

The following worksheet is for assessing the feasibility of bioretention stormwater curb extensions at intersections. This page provides instructions and examples of the maps/images needed to complete the assessment. The feasibility criteria page outlines the sizing and design criteria, and provides visual examples of where to make the measurements at an intersection. The intersection opportunity assessment sheet includes a checklist and suggestions for maps/images to facilitate the assessment.

This tool is intended to provide guidance based on typical constraint criteria. Jurisdictions may employ a feasibility process and criteria, including sizing and design guidance, that differ from those presented in this tool.

Page 1 - Introduction and Setup

- Identify an intersection for assessment or refer to the suggested priority locations from the CCAG Sustainable Streets Master Plan project viewer located here: <http://ccag-gis.paradigmh2o.com/maps/CCAG%20Sustainable%20Streets%20Master%20Plan>.
- On the CCAG Sustainable Streets Master Plan online map, navigate to the street being assessed. Ensure the map layers for Catch Basins, Flow Path and Catchments are turned on. Take a screenshot of the intersection and drop the photo into the applicable photo field.
- Starting from the northern corner, working clockwise, label the corners of the intersection: A, B, C, D. Repeat adding a 1 and 2 to each lettered corner.
- Take a screenshot of Google Maps street view with the street being assessed as the main view. Repeat from the opposite side of the intersection. Drop the photos into the applicable photo fields. Label each intersection in correspondence with the labels applied in the previous step.

Page 2 - Feasibility Criteria

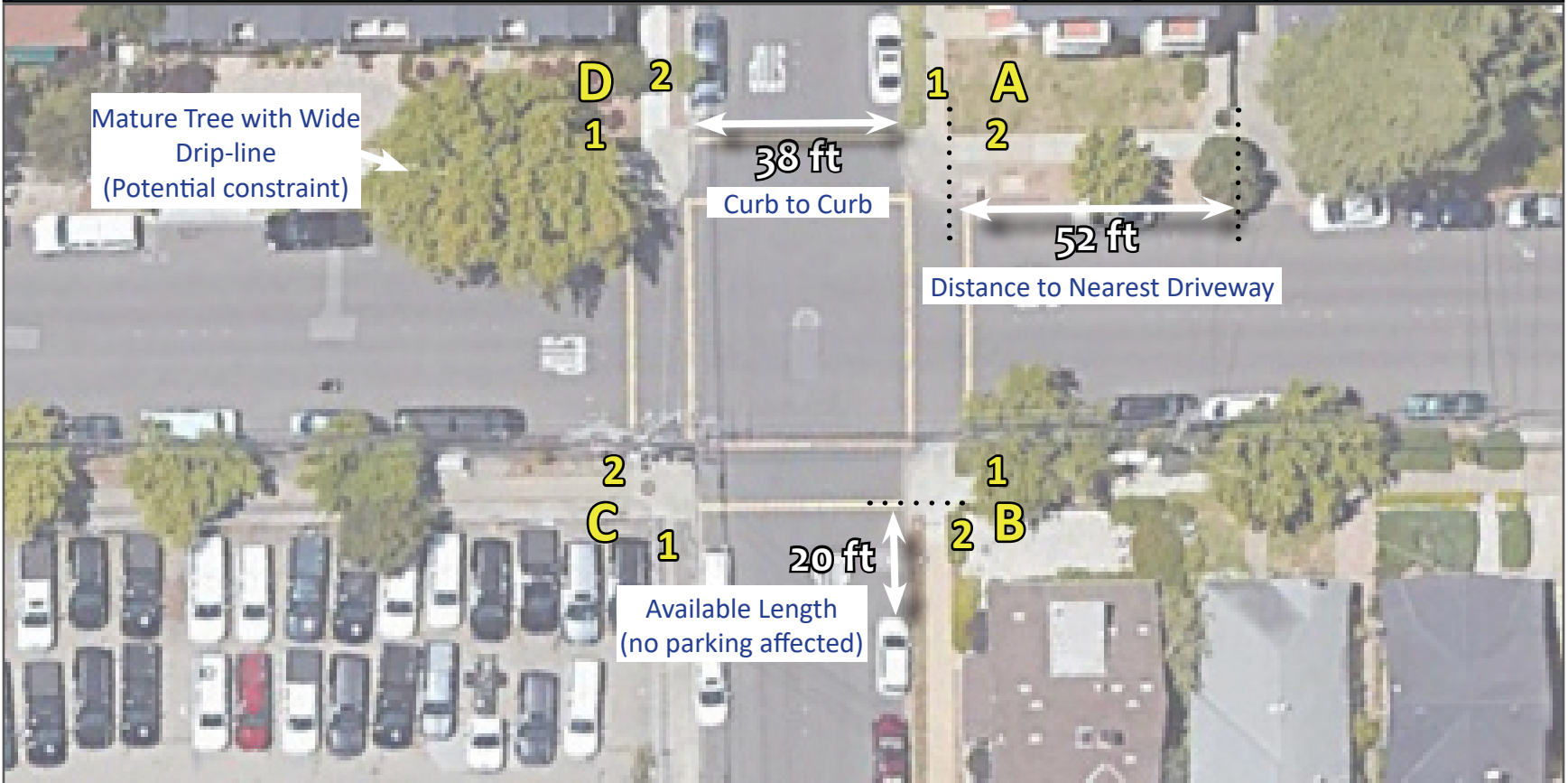
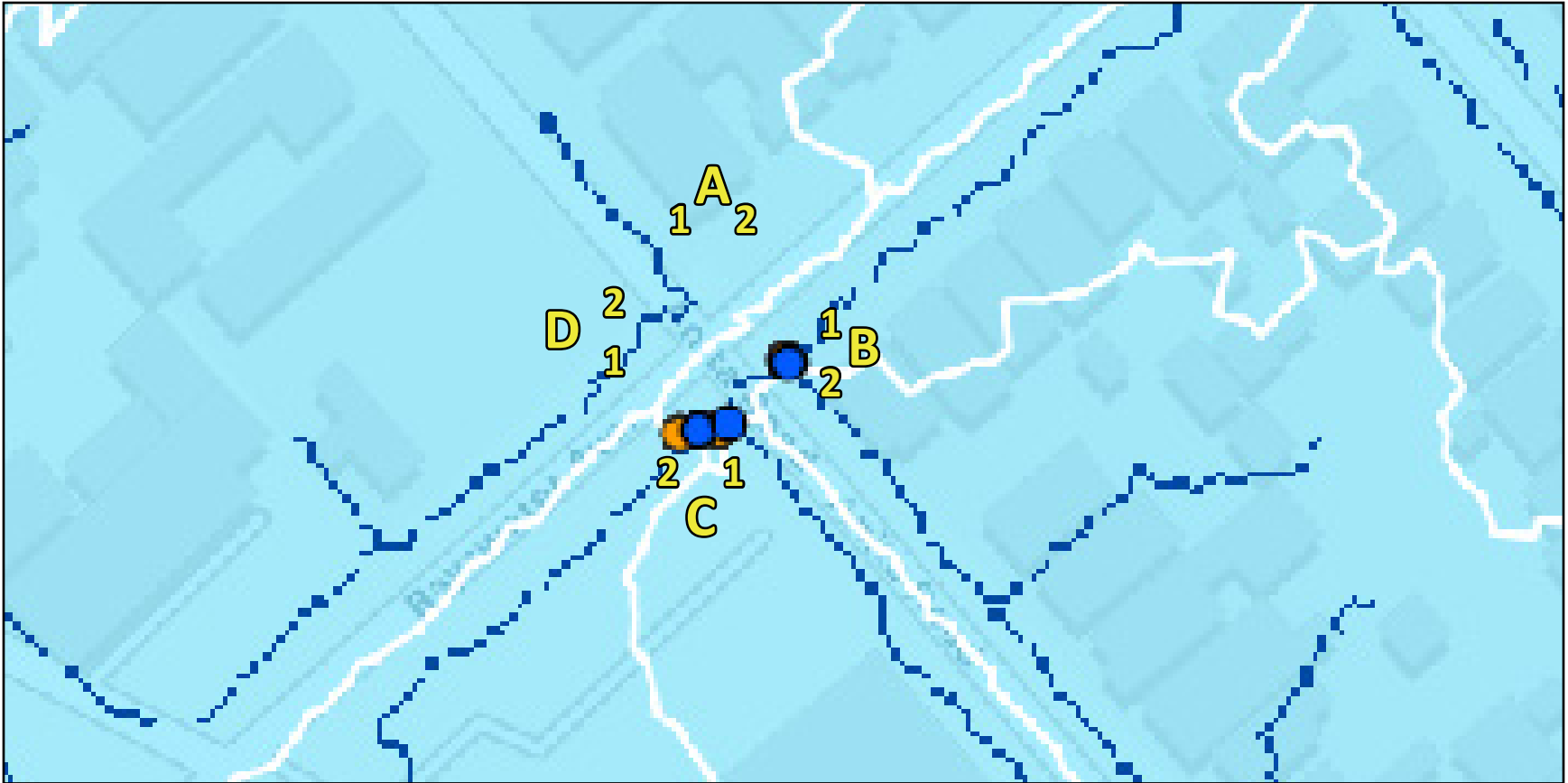
- Review the design and sizing criteria on page 2.
- Review the minimum width table.
- Note: feasibility criteria and minimum widths are intended to be “typical” and may differ by jurisdiction.

Page 3 - Intersection Assessment

- Complete tables on page 3 to evaluate each corner of the intersection and determine if a curb extension is recommended.

Page 4 - Assessment Footnotes

- Footnotes for the assessment table are provided here for additional support in completing page 3.



Intersection of Bayswater Ave and Anita Road in Burlingame, CA

STORMWATER CURB EXTENSION - FEASIBILITY CRITERIA



Intersection of Burlingame Ave and Park Road in Burlingame, CA

TABLE 1 - SIZING AND DESIGN CRITERIA

CURB EXTENSION SIZING	
Width	Standard: 6 ft
	Typical: 6 - 7 ft (not including 1 ft setback from curb)
Length ¹	Minimum: 20 ft
	Typical: 20 - 25 ft
Sidewalk Through-way Width	Minimum: 5 ft
DMA Sizing Ratio	Range: 2.5%-5%
	Typical: 4%
DESIGN RESTRICTIONS ²	
Fire Hydrants	Can't encroach on access
Bus Pad	
Driveway	Must have 2 ft of separation from curb ext.
Existing Roadway Width	Can't be less than corresponding minimum width in Table 2
DESIGN CONSTRAINTS	
Water Main	3 ft of horizontal separation
Duct Bank ³	
Mature Trees ⁴	Outside drip-line or 10x diameter at breast height
Power Poles ⁵	Can't be located within planter
Catch Basins	If bulbout will be underdrained, there must be a catch basin at intersection
Bus Stop	Must be room to move bus stop to before bulbout
Existing Sidewalk Width	Meets ADA code (5 ft through-way width)
<div>1 - Assumes 5 ft tangent after S-curve. 2 - Costs to address these constraints often make stormwater curb extension infeasible. 3 - PG&E requirement, can obtain variance to protect in place through gravel layer. 4 - If tree obstructs line of sight at intersection, risks encroaching on power lines, or is in poor condition, then it may need removal and therefore should not be considered a constraint. 5 - Curb extension design can be adjusted to avoid pole. May reduce sizing ratio and increase cost.</div>	

TABLE 2 - MINIMUM ROADWAY WIDTH CRITERIA

Roadway Type	Min. Allowed Width of Travel Lane Nearest to Curb Ext. (ft)	Min. Curb-to-Curb Roadway Width for Curb Extensions ⁶	
		2-Lane Road	4-Lane Road
Residential	10	34	54
Transit Route	11	36	58
Freight Route or Industrial	12	38	62
Residential + Bike Lane ⁷	15	44	74

6 - Assumes extensions on both sides of roadway with min. width of 6 ft and a 1 ft setback from face of curb.
7 - Assumes bike lane on both sides of roadway. If only on one side, subtract 5 ft from the total width needed.

STORMWATER CURB EXTENSION - INTERSECTION OPPORTUNITY ASSESSMENT

CCAG Map Photo In- sert Here		Google Maps Street View #1 Insert Here				Google Maps Street View #2 Insert Here			
STREET DETAILS		ADDITIONAL NOTES							
Primary Street Being Assessed									
Street Type ^a									
Available Width (ft) ^b									
4-CORNER ASSESSMENT	A1	A2	B1	B2	C1	C2	D1	D2	
Section 1 - Feasibility	Curb extension not recommended at corner if any of the boxes below are checked								
Does not receive any stormwater runoff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Underdrain needed and no storm drain at intersection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Water main on same side of street with dia ≥ 12 inch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Less than 20 ft from start of corner to first driveway ^c	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Roadway width is less than minimum required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Major gas transmission pipeline on same side of street ^d	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Bus stop with concrete pad within footprint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Longitudinal street slope > 5%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Large duct bank (≥ 3 ft) within proposed footprint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Electrical/telecom vault within proposed footprint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Section 2 - Constraints	Curb extension not recommended at corner if 3 or more of the boxes below are checked								
Duct bank within proposed footprint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Electrical/telecom vault on sidewalk adjacent to pro- posed footprint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Sewer main below proposed footprint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Water main < 12 inch dia within proposed footprint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Fire hydrant at corner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Depth to groundwater or bedrock < 10 ft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Open Geotracker cleanup site within 200 ft ^e	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Drainage area to curb extension < 1000 sqft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Mature tree ≥ 6 inch dia within 20 ft of corner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Recommended for Curb Extension									

STORMWATER CURB EXTENSION - ASSESSMENT FOOTNOTES

4-Corner Assessment Table Footnotes:

- a) Typical street classes include local, collector, and arterial, but jurisdictions may have more specific standard street types.
- b) Determine the available width for a curb extension by taking the existing curb-to-curb width of the street and subtracting the minimum curb-to-curb roadway width in Table 2 on page 2. Divide the result by 2.
- c) Length measurements should be taken from the extension of property line at the intersection to the identified obstruction. If the property line is not known, measure lengths from the start of the curve at the corner.
- d) Available at: https://www.pge.com/en_US/safety/how-the-system-works/natural-gas-system-overview/gas-transmission-pipeline/gas-transmission-pipelines.page.
- e) Geotracker website for contamination constraints: <https://geotracker.waterboards.ca.gov/map/>.