

Exercise: Using the New LID Feasibility Screening Worksheet

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Case Studies

- ✓ 1. San Mateo County Subdivision
2. Oakland Multi-Family Redevelopment
3. Dublin Commercial Redevelopment
4. Fremont Commercial Redevelopment



Fill Out the LID Feasibility Screening Worksheet: Case Study 2 - Oakland



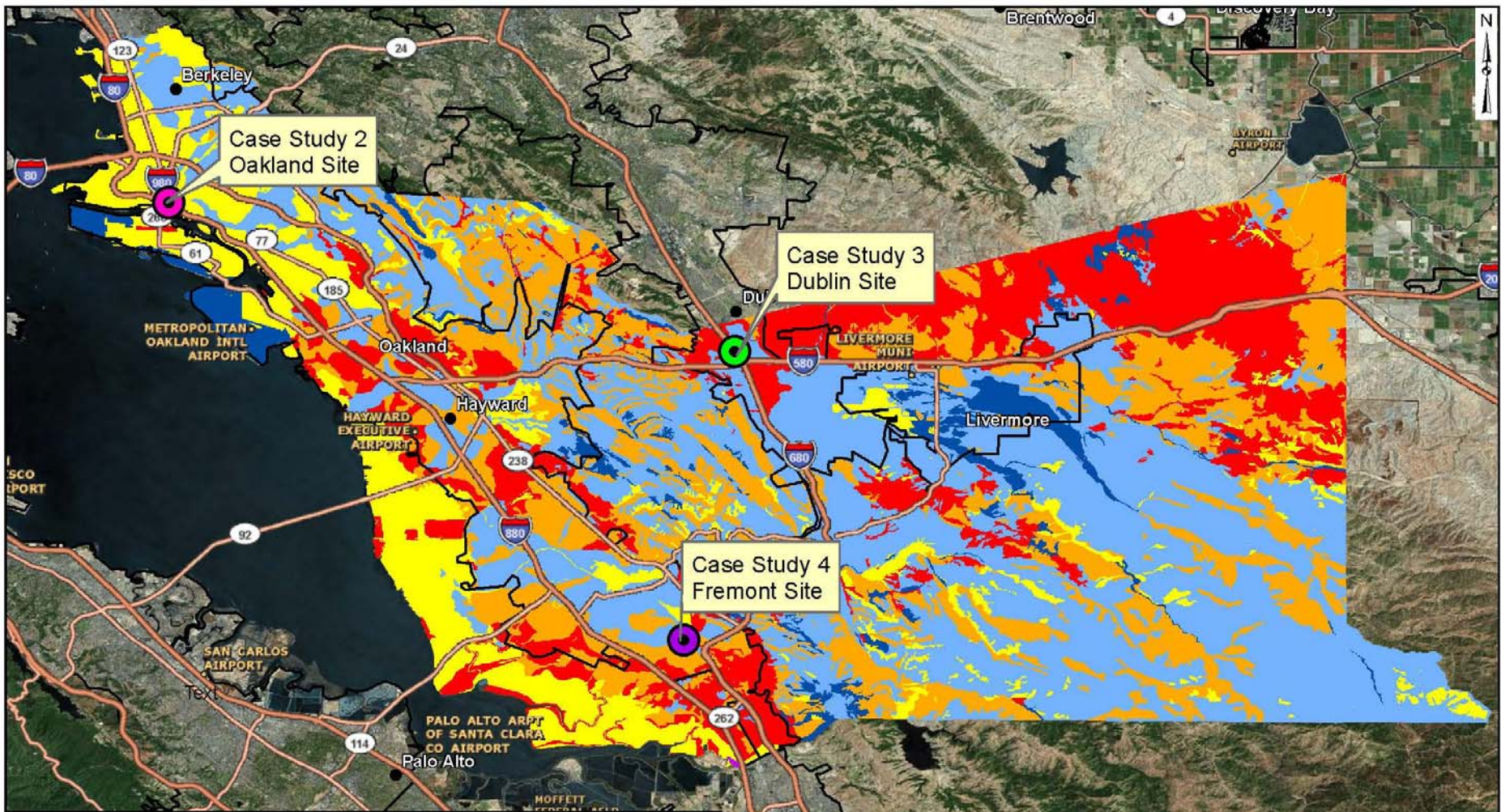
- ▶ Urban infill project in downtown district
- ▶ Multi-Family land use
 - Total project: 0.81 acres (35,300 sq-ft)
 - Existing impervious surface: 33,500 s.f.
 - Replaced impervious surface: 0.75 acres (33,500 sq-ft)
 - Assume 0.04 acre landscaping (1,800 s.f.)
 - 475 dwelling units/acre
- ▶ Ksat range: 0.0-0.1 in/hr per map
- ▶ Floor area ratio greater than 2

Oakland: LID Feasibility Screening Worksheet

- 2.a. Do site soils either:
 - Have a Ksat LESS THAN 1.6 inches/hour, or
 - Consist of Type C or D soils?

Yes





Legend

- Precipitation Gage
- ▭ Urban Areas

Saturated Hydraulic Conductivity (in/hr)	0.5 - 0.7
0.0 - 0.1	0.7 - 0.9
0.1 - 0.2	0.9 - 1.1
0.2 - 0.3	1.1 - 1.3
0.3 - 0.4	1.3 - 1.5
0.4 - 0.5	> 1.5

Note: Saturated hydraulic conductivities (Ksat) presented are NRCS "representative" values in the absence of complete coverage of "low" value.



8 4 0 8 Miles

Saturated Hydraulic Conductivity (Ksat) and Precipitation Polygons
Alameda County, CA

Geosyntec
consultants

Oakland Office February 2011

Figure E-1



Oakland: LID Feasibility Screening Worksheet

- ▶ 2.b. Check box if the project is installing and using a recycled water plumbing system for indoor non-potable use

If recycled water system will be used, rainwater harvesting is infeasible

Box not checked.

Table 1: Calculation of the Potential Rainwater Capture Area

Type of Impervious Surface	1	2	3
	Pre-Project Condition (sq.ft)	Proposed Impervious Surface (IS), in sq. ft.	
		Replaced IS	New IS
a. Footprint of building(s), excluding building with green roofs			
b. Impervious surface other than building footprint, including driveway(s), Patio(s), Impervious deck(s), Unroofed porch(es), Uncovered parking lot (including top deck of parking structure), Impervious trails, Miscellaneous paving or structures, Off-lot Impervious Surface (Streets, Sidewalks and/or Bike lanes built as part of new street)			
e. Total Impervious Surface in Square Feet for the Potential Rainwater Capture Area	33,500	33,500	0

Oakland: LID Feasibility Screening Worksheet

- ▶ 3.1 Is the amount of impervious surface replaced or added by the project equal to 50% or more of the existing area of impervious surface?

Yes [C.3 requirements apply to whole site, including areas of impervious surface that will remain in place]

- ▶ 3.2/ 3.3 Enter the square footage and acreage of the Potential Rainwater Capture Area:

33,500 square feet

0.77 acre



Oakland: LID Feasibility Screening Worksheet

- ▶ 3.4 Is landscaped area LESS THAN 2.5 times the acreage of Potential Rainwater Capture Area

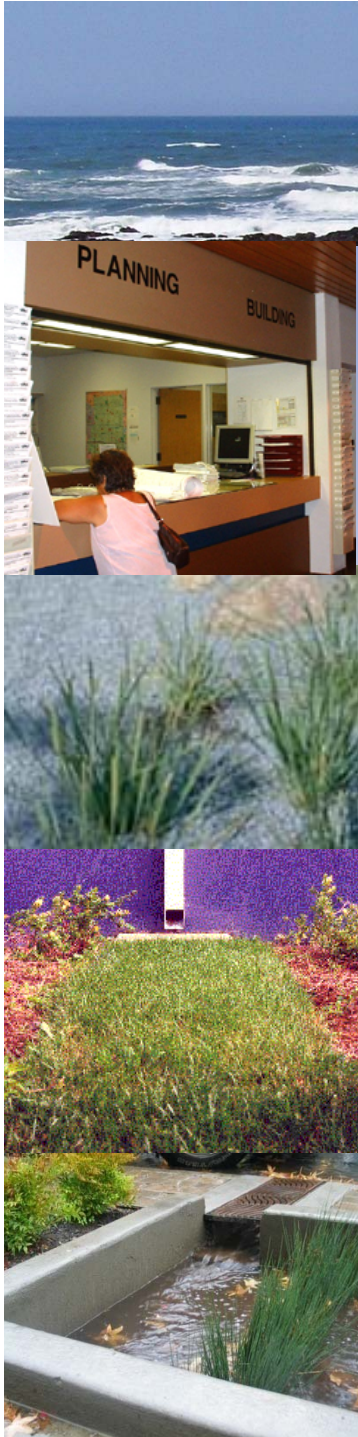
Landscaping and Open Space = 0.04 acre

$2.5 * \text{Capture Area} = 2.5 * 0.77 \text{ acre}$

$2.5 * \text{Capture Area} = 1.92$

0.04 is LESS THAN 1.92

Yes



Oakland: LID Feasibility Screening Worksheet

- 3.5.a. Residential Projects: Is proposed density (dwelling units/acre) LESS than 100 DU/Acre:

475 DU/Acre

Greater than 100 DU/Acre

No



Oakland: LID Feasibility Screening Worksheet

- 4. All questions in Sections 2 and 3 answered Yes?

No

Further analysis of rainwater harvesting is needed.



Oakland: LID Feasibility Screening Worksheet

- 5. Is project potentially a Special Project Category A?

No

Project creates/replaces more than 0.5 acre of impervious surface.

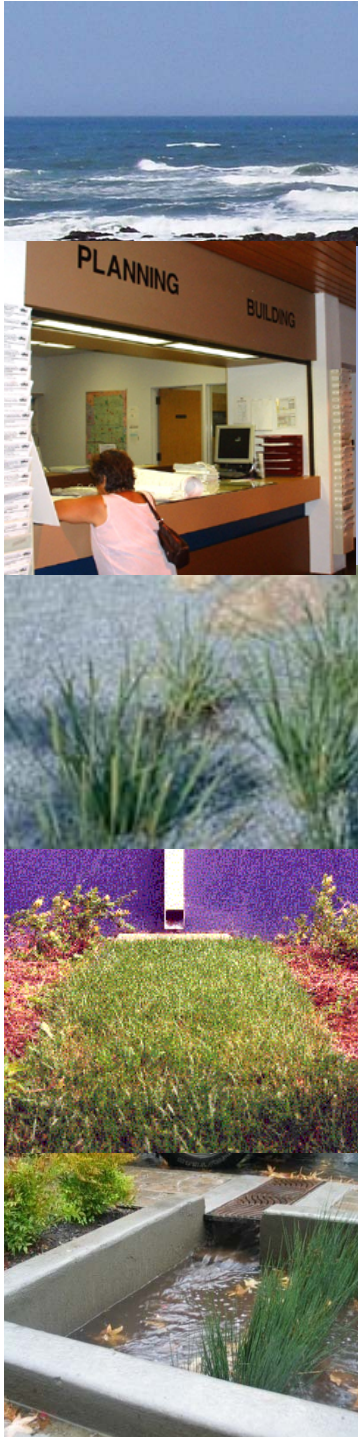


Oakland: LID Feasibility Screening Worksheet

- 5. Is project potentially a Special Project Category B?

Yes – Complete the Special Projects Worksheet

- ✓ Urban infill project in downtown commercial district
- ✓ Project creates/replaces no less than 0.5 acre and no more than 2 acres of impervious surface.
- ✓ Density \geq 50 dwelling units per acre.



Oakland: LID Feasibility Screening Worksheet

- 5. Is project potentially a Special Project Category C?

Yes – Complete the Special Projects Worksheet

- ✓ At least 50 percent of project is located within 0.5 mile radius of transit hub
- ✓ Non-auto-oriented use.



Oakland: LID Feasibility Screening Worksheet

- 6. Results of Screening Analysis
 - ✓ Conduct further analysis of rainwater harvesting and use by completing the Rainwater Harvesting and Use Worksheet
 - ✓ Conduct further analysis of Special Projects status by completing the Special Projects Worksheet.

Fill Out the LID Feasibility Screening Worksheet:

Case Study 3 - Dublin

- Commercial Land Use
 - Total Project: 1.9 acres (84,500 sq-ft)
 - Existing impervious surface =(IS): 1.70 acre
 - Replaced IS: 1.70 acres (74,000 sq-ft)
 - Landscaping: 0.2 acre (8,500 sq-ft)
- Ksat range: 0.5-0.7 in/hr per map
- Assume FAR = 1:1
 - Interior floor area = 74,000 s.f.
 - Interior floor area per acre of Capture Area = 44,000 s.f.

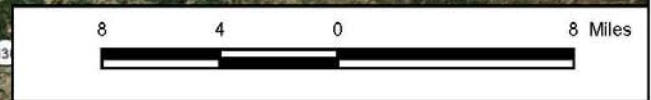
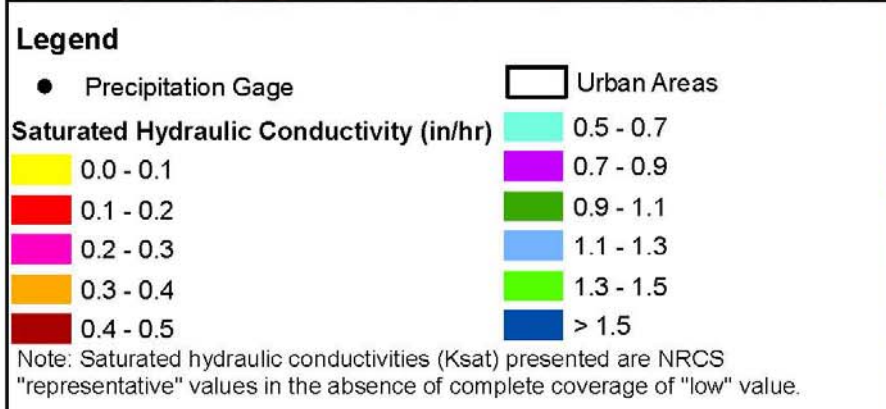
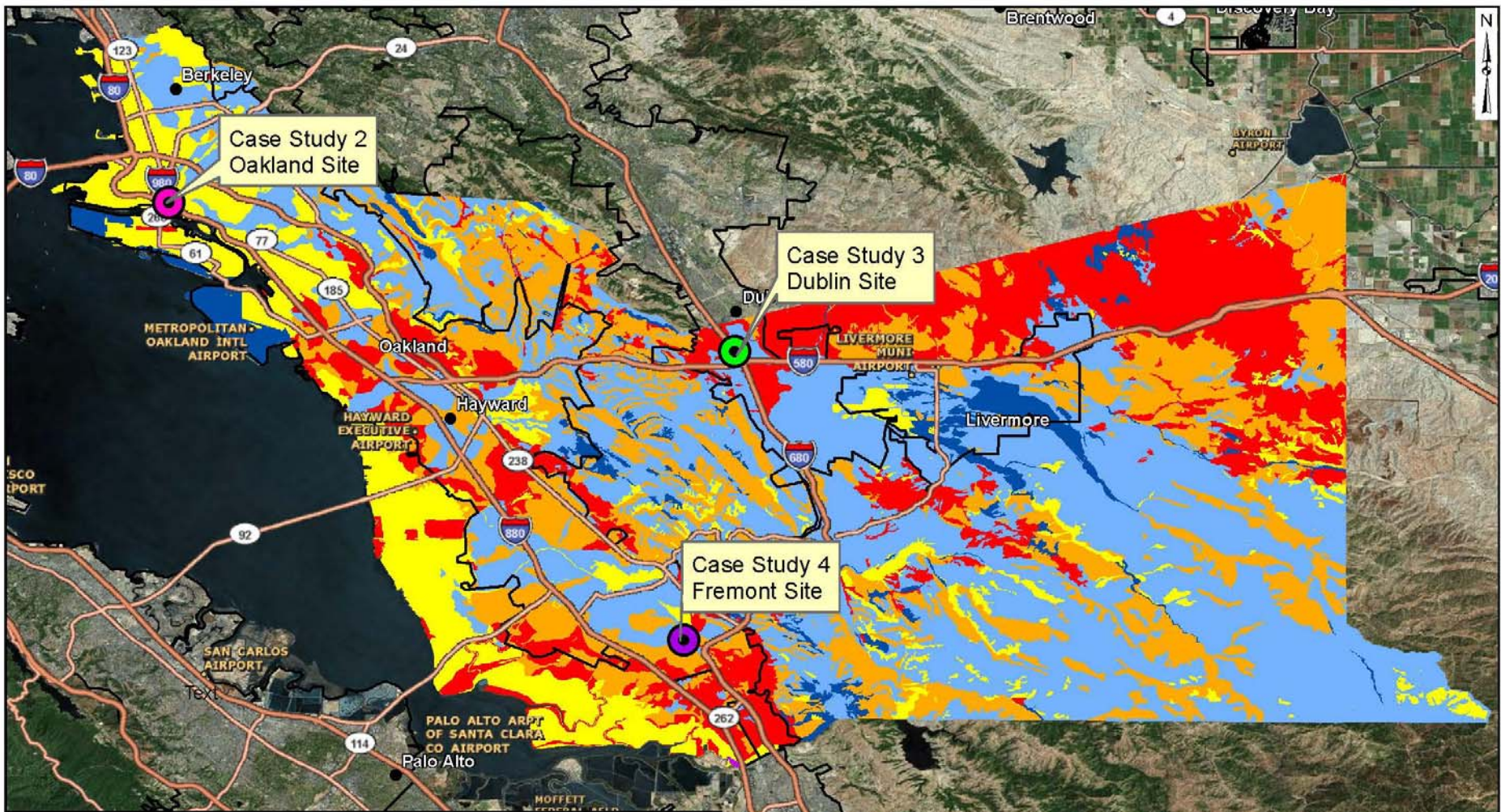




Dublin: LID Feasibility Screening Worksheet

- 2.a. Do site soils either:
 - Have a Ksat LESS THAN 1.6 inches/hour, or
 - Consist of Type C or D soils?

Yes



Saturated Hydraulic Conductivity (Ksat) and Precipitation Polygons
Alameda County, CA

		Figure E-1
Oakland Office	February 2011	



Dublin: LID Feasibility Screening Worksheet

- ▶ 2.b. Check box if the project is installing and using a recycled water plumbing system for indoor non-potable use

- If recycled water system will be used, rainwater harvesting is infeasible

Box not checked.

Table 1: Calculation of the Potential Rainwater Capture Area

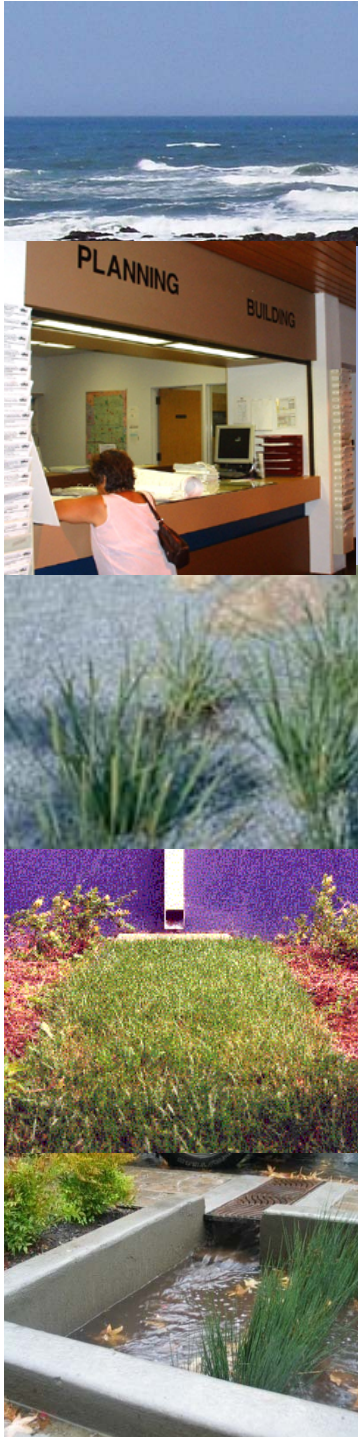
Type of Impervious Surface	1	2	3
	Pre-Project Condition (sq.ft)	Proposed Impervious Surface (IS), in sq. ft.	
		Replaced IS	New IS
a. Footprint of building(s), excluding building with green roofs			
b. Impervious surface other than building footprint, including driveway(s), Patio(s), Impervious deck(s), Unroofed porch(es), Uncovered parking lot (including top deck of parking structure), Impervious trails, Miscellaneous paving or structures, Off-lot Impervious Surface (Streets, Sidewalks and/or Bike lanes built as part of new street)			
e. Total Impervious Surface in Square Feet for the Potential Rainwater Capture Area	74,000	74,000	0

Dublin: LID Feasibility Screening Worksheet

- ▶ 3.1 Is the amount of impervious surface replaced or added by the project equal to 50% or more of the existing area of impervious surface?

Yes [C.3 requirements apply to whole site, including areas of impervious surface that will remain in place]

- ▶ 3.2/ 3.3 Enter the square footage and acreage of the Potential Rainwater Capture Area: **74,000 square feet**



Dublin: LID Feasibility Screening Worksheet

- ▶ 3.4 Is landscaped area LESS THAN 2.5 times the acreage of Potential Rainwater Capture Area

Landscaping and Open Space = 0.2 Acre

$2.5 * \text{rainwater capture area} =$

$2.5 * 1.70 = 4.25$

0.2 is LESS THAN 4.25

Yes



Dublin: LID Feasibility Screening Worksheet

- 3.5.a. Commercial Projects: Is proposed density (sq. ft. of interior floor area per impervious acre) **LESS THAN 70,000 sq.ft./impervious acre?**

Proposed interior floor area: 74,000

Proposed interior floor area/acre: 44,000

LESS THAN 70,000 interior floor area/acre

Yes

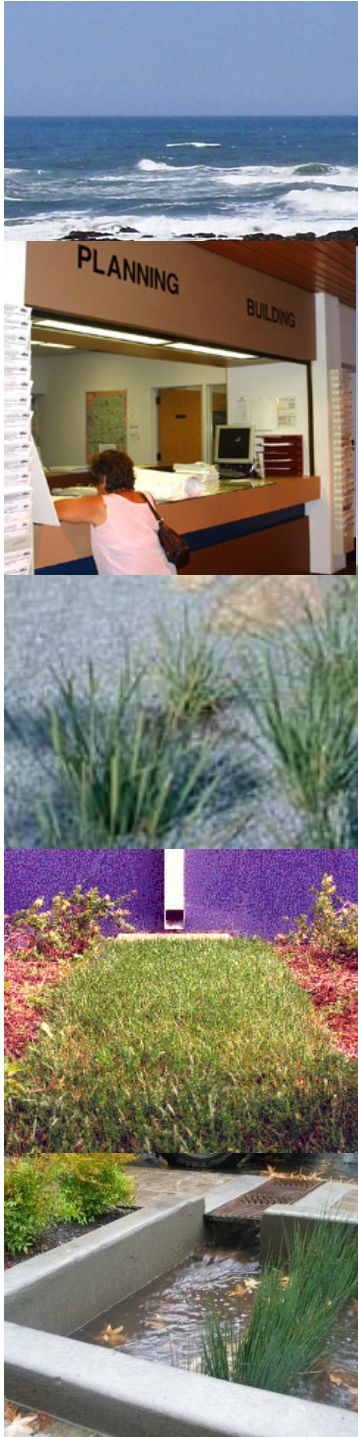
Dublin: LID Feasibility Screening Worksheet

- 4. All questions in Sections 2 and 3 answered Yes?

Yes

Implement biotreatment



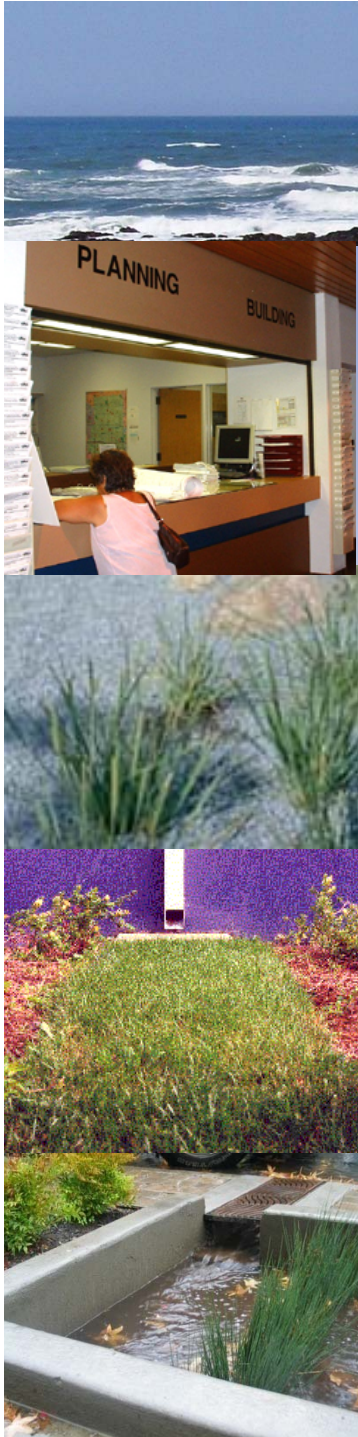


Dublin: LID Feasibility Screening Worksheet

- 5. Is project potentially a Special Project Category A?

No

Project creates/replaces more than 0.5 acre of impervious surface.

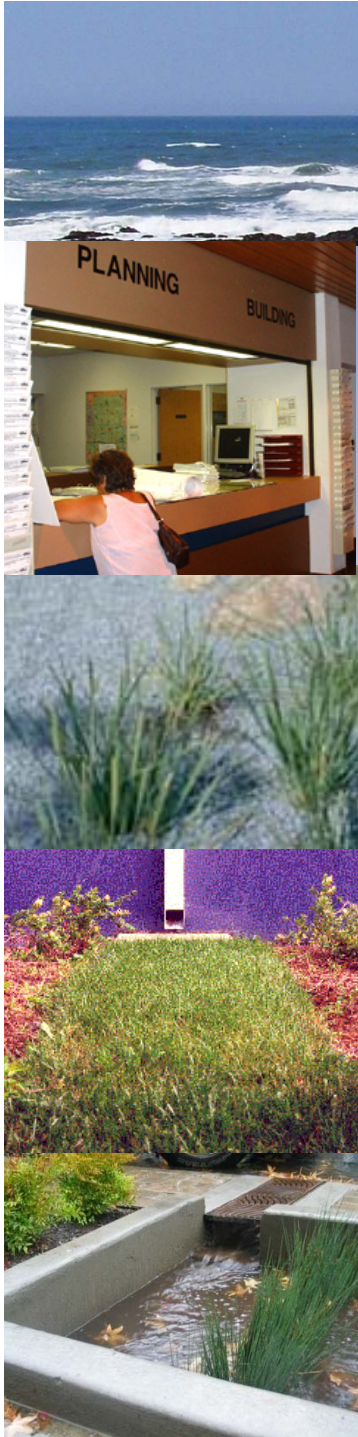


Dublin: LID Feasibility Screening Worksheet

- 5. Is project potentially a Special Project Category B?

No

Proposed floor-area ratio is less than 2:1.



Dublin: LID Feasibility Screening Worksheet

- 5. Is project potentially a Special Project Category C?

No

Project is located outside a 0.5 mile radius of any transit hub

Dublin: LID Feasibility Screening Worksheet

- 6. Results of Screening Analysis
 - ✓ Implement biotreatment measures



Fill Out the LID Feasibility Screening Worksheet:

Case Study 4 - Fremont

- ▶ Neighborhood Commercial infill
- ▶ Surface parking
- ▶ Commercial Land Use
 - Total Project: 0.36 acres (15,800 sq-ft)
 - Existing impervious surface (IS): 0.18 acre
 - Replaced IS: 0.18 acre (7,900 sq-ft)
 - New IS: 0.14 acre (6,100 sq.ft.)
 - Landscaping: 0.04 (1,800 sq.ft.)
 - Int. floor area 6,000 s.f.; Int. floor area per acre of impervious surface 16,667 s.f.
- ▶ Ksat within 0.3-0.4 range

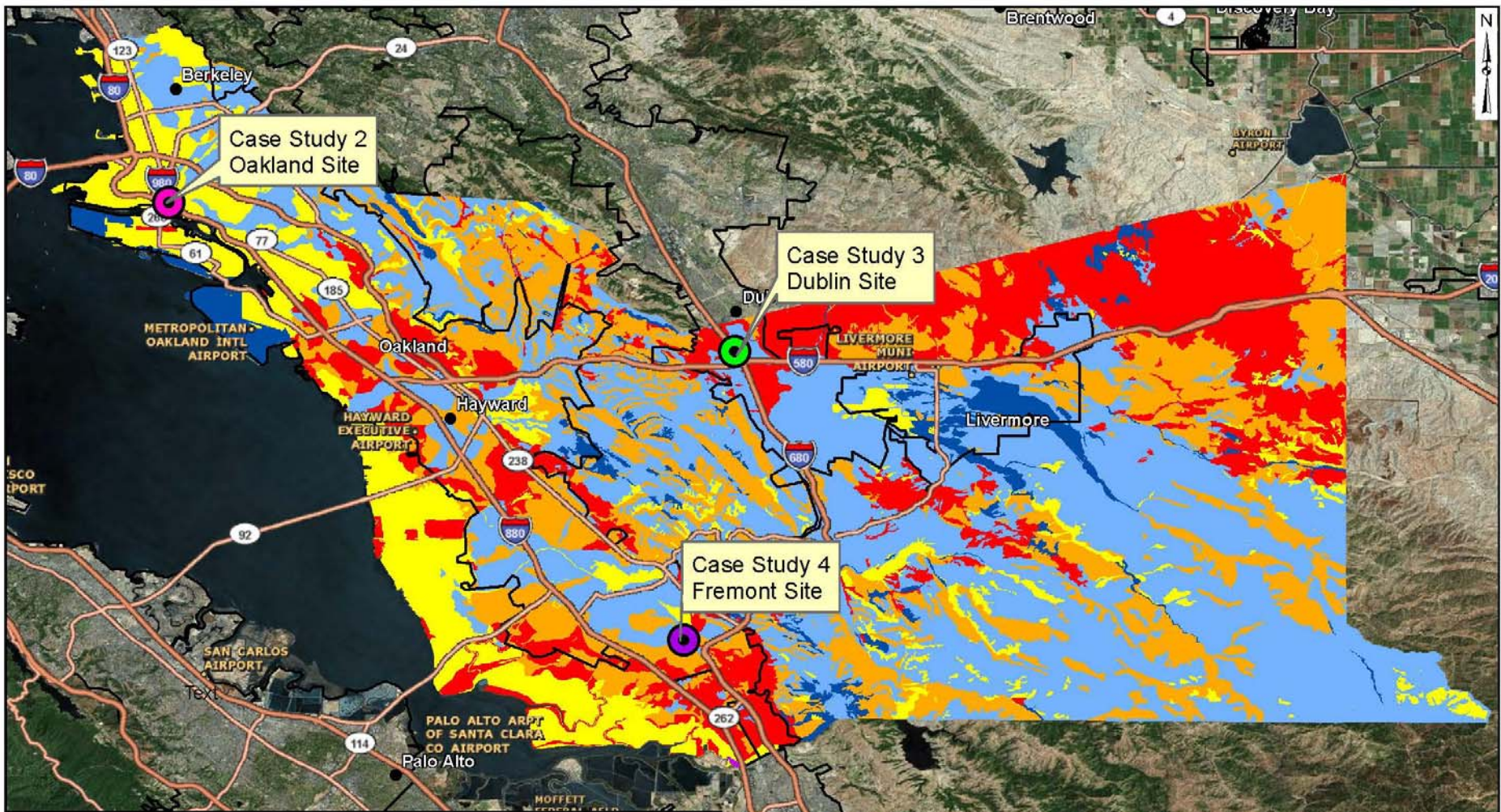


Fremont: LID Feasibility Screening Worksheet

- 2.a. Do site soils either:
 - Have a Ksat LESS THAN 1.6 inches/hour, or
 - Consist of Type C or D soils?

Yes





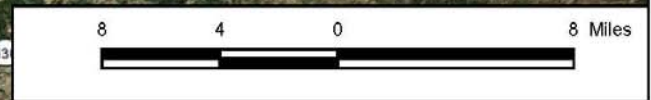
Legend

- Precipitation Gage
- ▭ Urban Areas

Saturated Hydraulic Conductivity (in/hr)

0.0 - 0.1	0.5 - 0.7
0.1 - 0.2	0.7 - 0.9
0.2 - 0.3	0.9 - 1.1
0.3 - 0.4	1.1 - 1.3
0.4 - 0.5	1.3 - 1.5
	> 1.5

Note: Saturated hydraulic conductivities (Ksat) presented are NRCS "representative" values in the absence of complete coverage of "low" value.



Saturated Hydraulic Conductivity (Ksat) and Precipitation Polygons
Alameda County, CA

		Figure E-1
Oakland Office	February 2011	



Fremont: LID Feasibility Screening Worksheet

- ▶ 2.b. Check box if the project is installing and using a recycled water plumbing system for indoor non-potable use

- If recycled water system will be used, rainwater harvesting is infeasible

Box not checked.

Table 1: Calculation of the Potential Rainwater Capture Area

Type of Impervious Surface	1	2	3
	Pre-Project Condition (sq.ft)	Proposed Impervious Surface (IS), in sq. ft.	
		Replaced IS	New IS
a. Footprint of building(s), excluding building with green roofs			
b. Impervious surface other than building footprint, including driveway(s), Patio(s), Impervious deck(s), Unroofed porch(es), Uncovered parking lot (including top deck of parking structure), Impervious trails, Miscellaneous paving or structures, Off-lot Impervious Surface (Streets, Sidewalks and/or Bike lanes built as part of new street)			
e. Total Impervious Surface in Square Feet for the Potential Rainwater Capture Area	7,900	7,900	6,100

Fremont: LID Feasibility Screening Worksheet

- ▶ 3.1 Is the amount of impervious surface replaced or added by the project equal to 50% or more of the existing area of impervious surface?

Yes [C.3 requirements apply to whole site, including areas of impervious surface that will remain in place]

- ▶ 3.2/ 3.3 Enter the square footage and acreage of the Potential Rainwater Capture Area: **14,000 square feet**



Fremont: LID Feasibility Screening Worksheet

- ▶ 3.4 Is landscaped area LESS THAN 2.5 times the acreage of Potential Rainwater Capture Area

Landscaping and Open Space = 0.04 Acre

2.5 * rainwater capture area =

2.5 * 0.32 = 0.8

0.04 is LESS THAN 0.8

Yes



Fremont: LID Feasibility Screening Worksheet

- 3.5.a. Commercial Projects: Is proposed density (sq. ft. of interior floor area per impervious acre) **LESS THAN 70,000 sq.ft./impervious acre?**

Proposed interior floor area: 6,000 sq.ft.

Proposed interior floor area/acre: 16,667 sq.ft.

LESS THAN 70,000 interior floor area/acre

Yes



Fremont: LID Feasibility Screening Worksheet

- 4. All questions in Sections 2 and 3 answered Yes?

Yes

Implement biotreatment



Fremont: LID Feasibility Screening Worksheet

- 5. Is project potentially a Special Project Category A?

No

Project is not located in a downtown commercial or comparable pedestrian oriented district

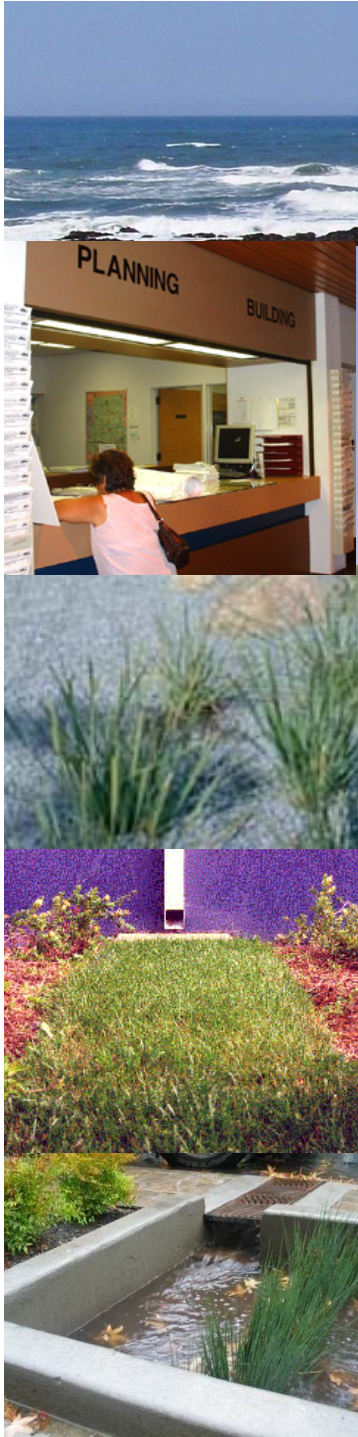


Fremont: LID Feasibility Screening Worksheet

- 5. Is project potentially a Special Project Category B?

No

- ✓ Creates/replace less than 0.5 acre of impervious surface



Fremont: LID Feasibility Screening Worksheet

- 5. Is project potentially a Special Project Category C?

No

Project is located outside a 0.5 mile radius of any transit hub



Fremont: LID Feasibility Screening Worksheet

- 6. Results of Screening Analysis
 - ✓ Implement biotreatment measures.



“Special Projects” Category A Infill Projects

- Located in central business district or comparable pedestrian oriented district.
- Built as part of objective to preserve or enhance pedestrian-oriented environment.
- Creates or replaces ½ acre or less of impervious surface.
- No surface parking except for emergency access, ADA or loading requirements.
- 85% of lot is covered by buildings; remaining 15% is for safety access, trash/recycling, public uses, etc.
- 100% LID treatment reduction credit.



“Special Projects” Category B High Density Projects

- Located in central business district or comparable pedestrian oriented district.
- Built as part of objective to preserve or enhance pedestrian-oriented environment.
- Creates or replaces $> \frac{1}{2}$ acre, but no more than 2 acres, of impervious surface.
- No surface parking except for emergency access, ADA or loading requirements.
- 85% of lot is covered by buildings; remaining 15% is for safety access, trash/recycling, public uses, etc.
- Graduated system of LID treatment reduction credit.



"Special Projects" Category B

Graduated credit system

LID Treatment Reduction	Land Use	Density
50%	Commercial or Mixed Use	Floor Area Ratio 2:1
50%	Residential	50 dwelling units/acre
75%	Commercial or Mixed Use	Floor Area Ratio 3:1
75%	Residential	75 dwelling units/acre
100%	Commercial or Mixed Use	Floor Area Ratio 4:1
100%	Residential	100 dwelling units/acre

“Special Projects” Category C Transit Oriented Development Projects

- Prerequisites
 - Must be a non-auto oriented project. (No stand-alone surface parking lots, car dealerships, auto and truck rental facilities with onsite surface storage, etc.)
- If it is a commercial or mixed use project, a minimum floor area ratio of 2:1 is required.
- If it is a residential project, a minimum density of 25 dwelling units/acre is required.
- Graduated system of LID treatment reduction credit.
 - Location credit
 - Density credit
 - Minimize surface parking credit



“Special Projects” Category c Location Credit System

LID Treatment Reduction	Location
50%	Within ¼ mile radius of existing or planned transit hub
25%	Within ½ mile of radius of existing or planned transit hub
25%	Within a planned Priority Development Area (designated by ABAG/MTCA)



“Special Projects” Category C

Density credit system

LID Treatment Reduction	Land Use	Density
10%	Commercial or Mixed Use	Floor Area Ratio 2:1
10%	Residential	30 dwelling units/acre
20%	Commercial or Mixed Use	Floor Area Ratio 4:1
20%	Residential	60 dwelling units/acre
30%	Commercial or Mixed Use	Floor Area Ratio 6:1
30%	Residential	100 dwelling units/acre

“Special Projects” Category C

Minimize surface parking credit system

LID Treatment Reduction	Location
10%	10% or less of the total post-project impervious surface is dedicated to at-grade surface parking
20%	No surface parking except for emergency vehicle access, ADA accessibility, and loading zones

