

City of Fitchburg Catalytic Project – No Increase in Post-Development Runoff Volumes

Concept Design and Modeling Analysis

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McGaw Neighborhood Concept Design

- CARPC requirement: “Control post development runoff volumes to be equal to or less than pre-development runoff volumes for the one-year average annual rainfall period”.
- How can we design a stormwater management plan to meet this standard?

McGaw Neighborhood Concept Design

- Goal of concept design & modeling analysis:
 - Demonstrate how stormwater management plan can be designed for higher density development scenario to meet all standards
 - Identify the tools needed to conduct analysis
 - Provide guidance for future development in the McGaw Neighborhood Area

McGaw Neighborhood Concept Design

- Who has rules/requirements that need to be met?
 - City of Fitchburg
 - Capital Area Regional Planning Commission
 - Dane County
 - Wisconsin Department of Natural Resources

McGaw Neighborhood Concept Design

- What are the rules/requirements that need to be met?
 - Rate Control
 - Volume Control
 - Pretreatment Standards
 - Water Quality Standard
 - Recharge Requirement
 - Groundwater Mounding Analysis

McGaw Neighborhood Concept Design

- How to demonstrate that these rules/requirements can be met in the McGaw Neighborhood?
 - Hypothetical Blocks
 - Medium-Density Residential Development (R2)
 - Transit-Oriented Development (TOD)

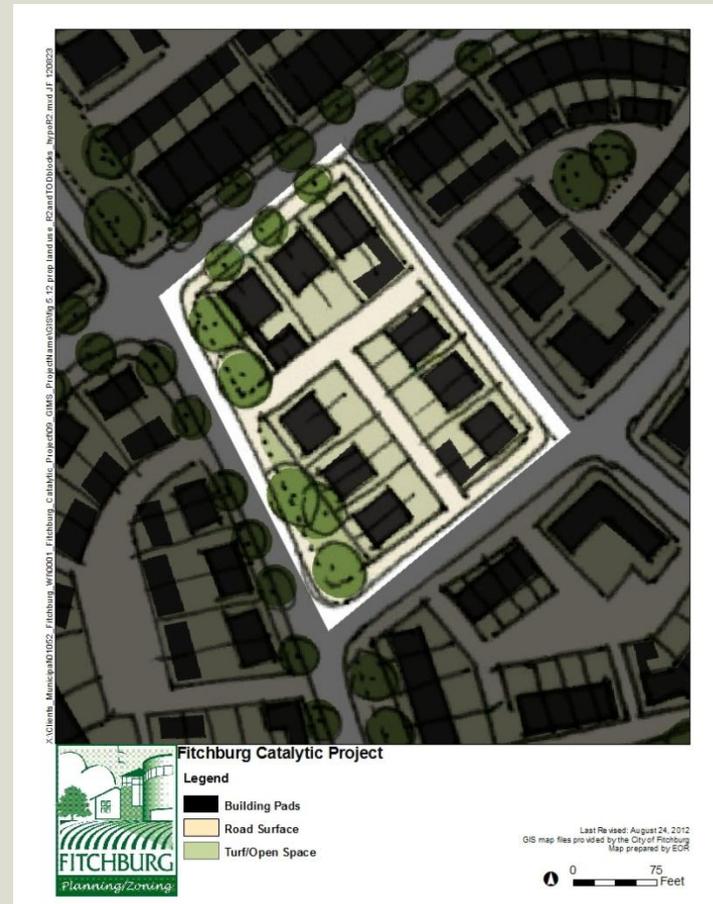


McGaw Neighborhood Concept Design

Hypothetical Block
Med-Density Res.

Total Area [Acres]	Total Imperv. Area [Acres]	Percent Imperv. [%]
1.91	1.01	53

Bldgs [Acres]	Parking/Roads [Acres]	Open Space [Acres]
0.44	0.57	0.90

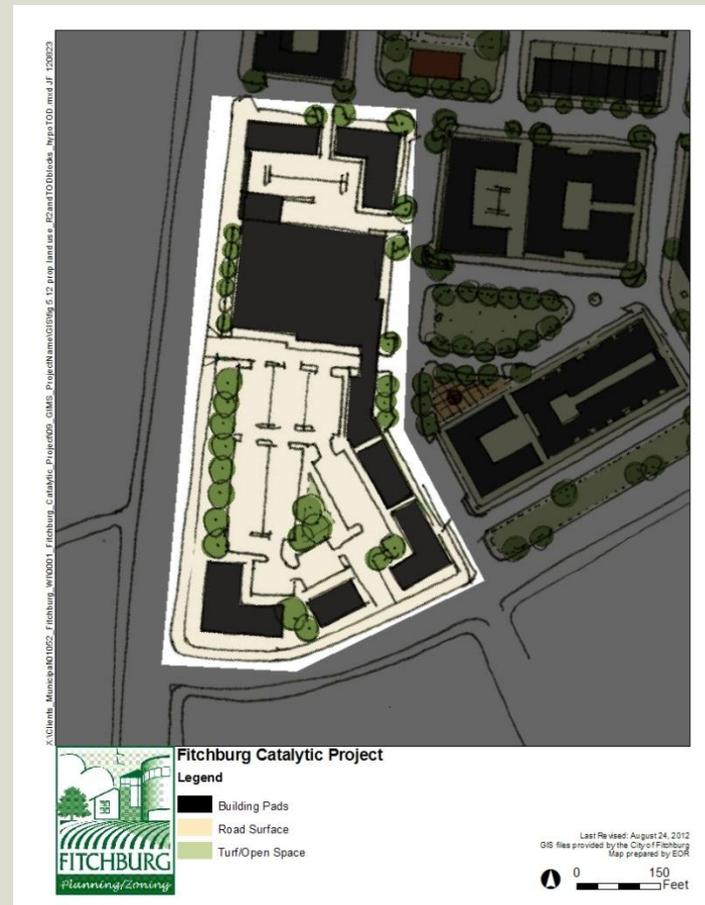


McGaw Neighborhood Concept Design

Hypothetical Block
Transit-Oriented Dev.

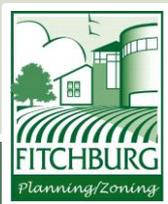
Total Area [Acres]	Total Imperv. Area [Acres]	Percent Imperv. [%]
9.83	9.26	94

Bldgs [Acres]	Parking/Roads [Acres]	Open Space [Acres]
3.04	6.22	0.57



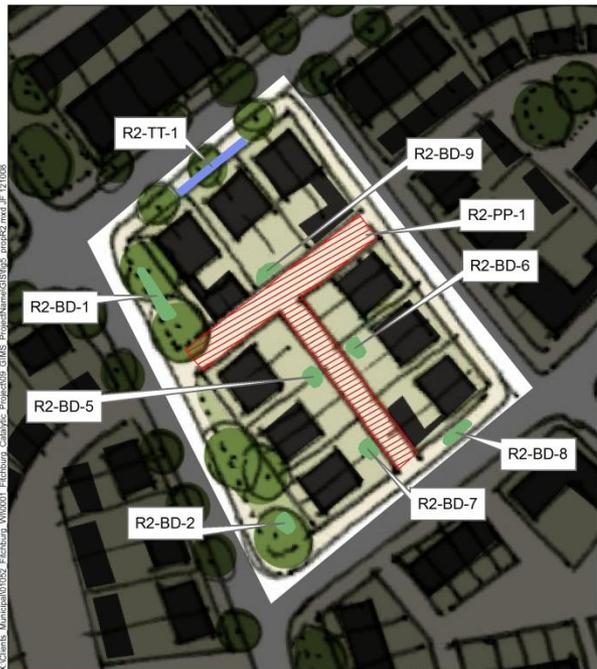
McGaw Neighborhood Concept Design

Hypothetical Block
McGaw Neighborhood

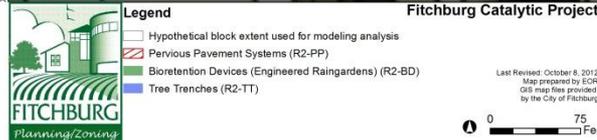


McGaw Neighborhood Concept Design

Concept Design
Med-Density Res.



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Volume Control BMP

Quantity

Bioretention Devices
(Engineered Raingardens)



- 7 Engineered Raingardens
- Located along edge of individual lots and in open space

Pervious Pavement Systems



- 9,000 sq. ft. of pervious pavement
- Located in alley

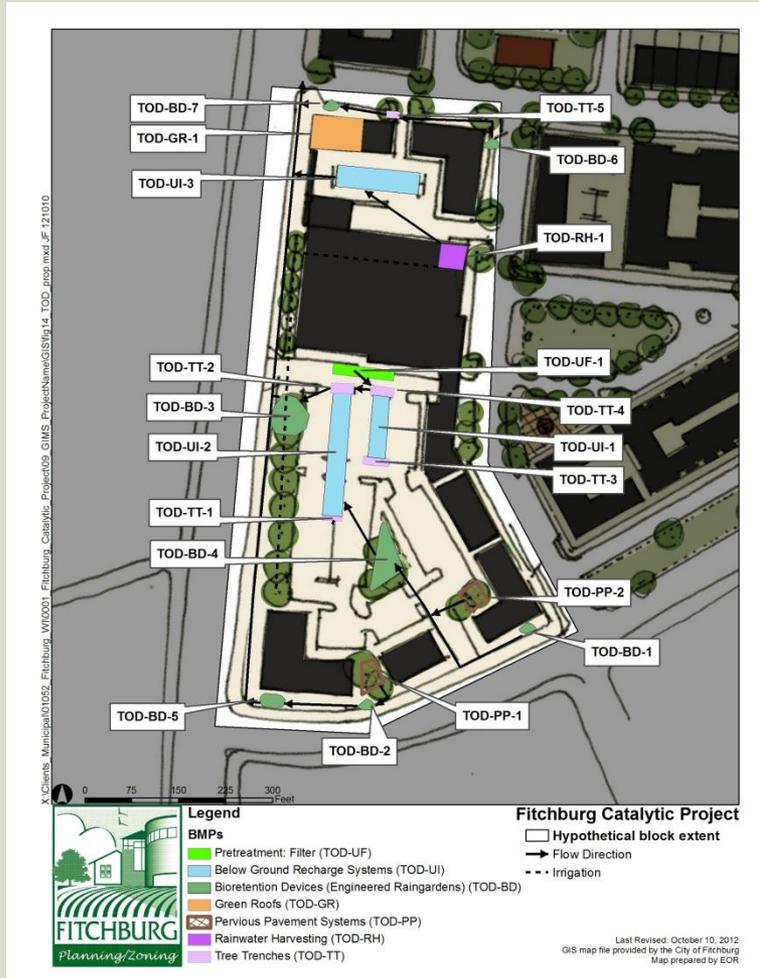
Tree Trenches



- 1 Tree Trench System
- Located adjacent to sidewalk

McGaw Neighborhood Concept Design

Concept Design Transit-Oriented Dev.



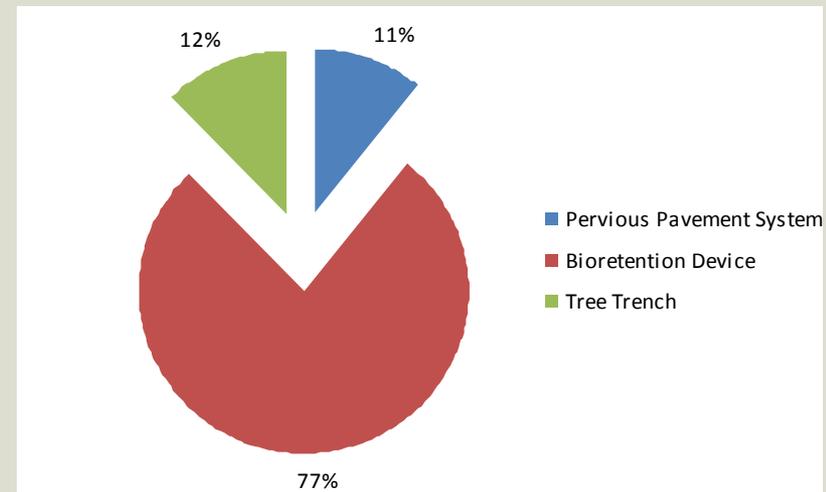
McGaw Neighborhood Concept Design

- Modeling Analysis
 - Hydrology & Hydraulics – XP-SWMM
 - Water Quality – P8
 - Annual Recharge Rate – RECARGA
 - Groundwater Mounding – AQTESOLV
 - Rainwater Harvesting Assessment - SRM

McGaw Neighborhood Concept Design

Concept Design
Med-Density Res.

- Following rules/requirements met or exceeded:
 - Rate control
 - Volume control
 - Water quality
 - Groundwater recharge



McGaw Neighborhood Concept Design

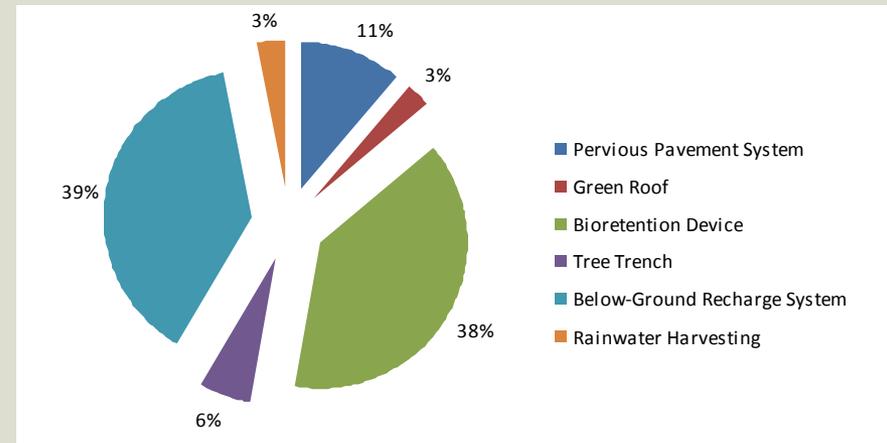
Concept Design
Med-Density Res.

BMP	BMP Area [sq. ft.]	% of BMP Area	% of Total Area
Pervious Pavement Systems	9,148	80%	11%
Bioretention (Eng. Raingardens)	1,855	16%	2%
Tree Trenches	493	4%	1%
TOTAL	9,717	100%	14%

McGaw Neighborhood Concept Design

Concept Design
Transit-Oriented Dev.

- Following rules/requirements met or exceeded:
 - Rate control
 - Volume control
 - Water quality
 - Groundwater recharge



McGaw Neighborhood Concept Design

Concept Design
Transit-Oriented Dev.

BMP	BMP Area [sq. ft.]	% of BMP Area	% of Total Area
Pervious Pavement Systems	2,542	8%	1%
Bioretention (Eng. Raingardens)	8,299	26%	2%
Tree Trenches	2,168	7%	1%
Below-Ground Recharge System	13,477	42%	3%
Green Roof	4,330	13%	1%
Rainwater Harvesting	1,559	5%	0%
TOTAL	32,376	100%	8%



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Legend

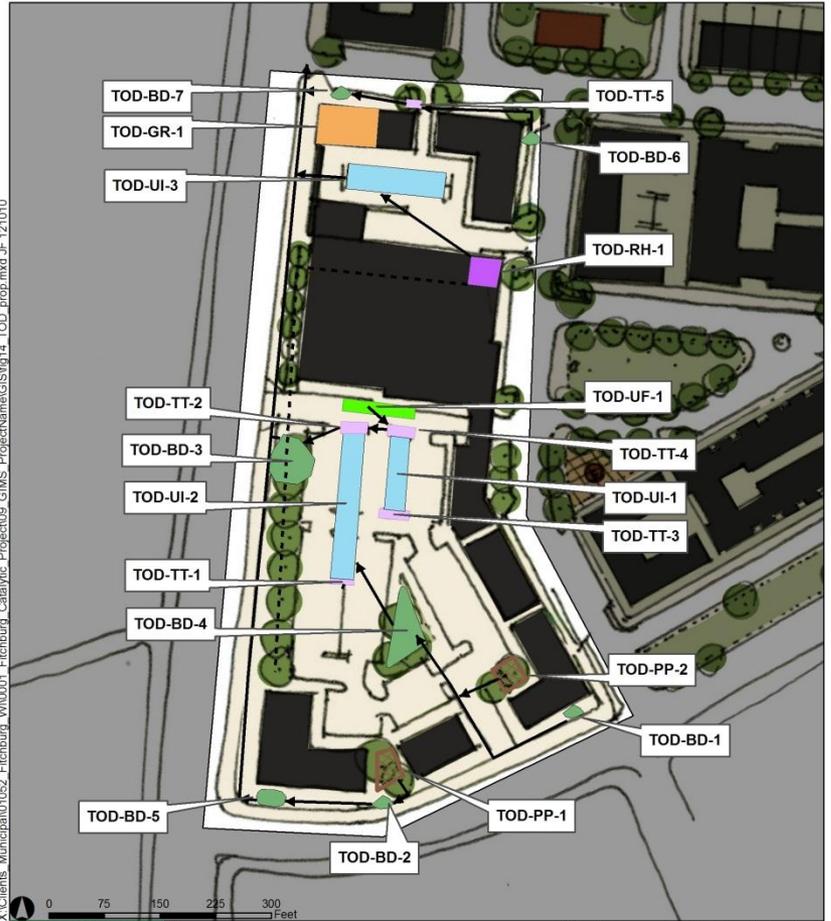
- Hypothetical block extent used for modeling analysis
- Pervious Pavement Systems (R2-PP)
- Bioretention Devices (Engineered Raingardens) (R2-BD)
- Tree Trenches (R2-TT)

Fitchburg Catalytic Project

Last Revised: October 8, 2012
Map prepared by EOR
GIS map files provided by the City of Fitchburg



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Legend

- BMPs**
- Pretreatment: Filter (TOD-UF)
 - Below Ground Recharge Systems (TOD-UI)
 - Bioretention Devices (Engineered Raingardens) (TOD-BD)
 - Green Roofs (TOD-GR)
 - Pervious Pavement Systems (TOD-PP)
 - Rainwater Harvesting (TOD-RH)
 - Tree Trenches (TOD-TT)

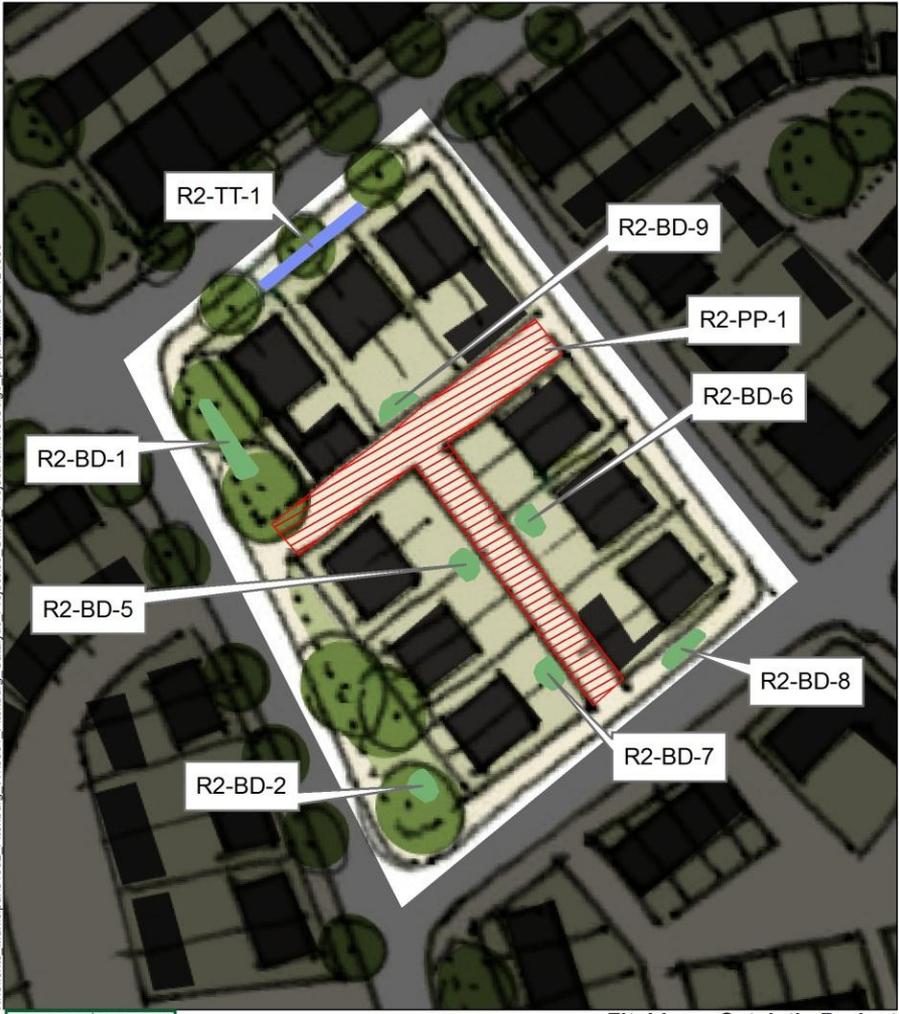
Fitchburg Catalytic Project

- Hypothetical block extent
- Flow Direction
- Irrigation

Last Revised: October 10, 2012
GIS map file provided by the City of Fitchburg
Map prepared by EOR



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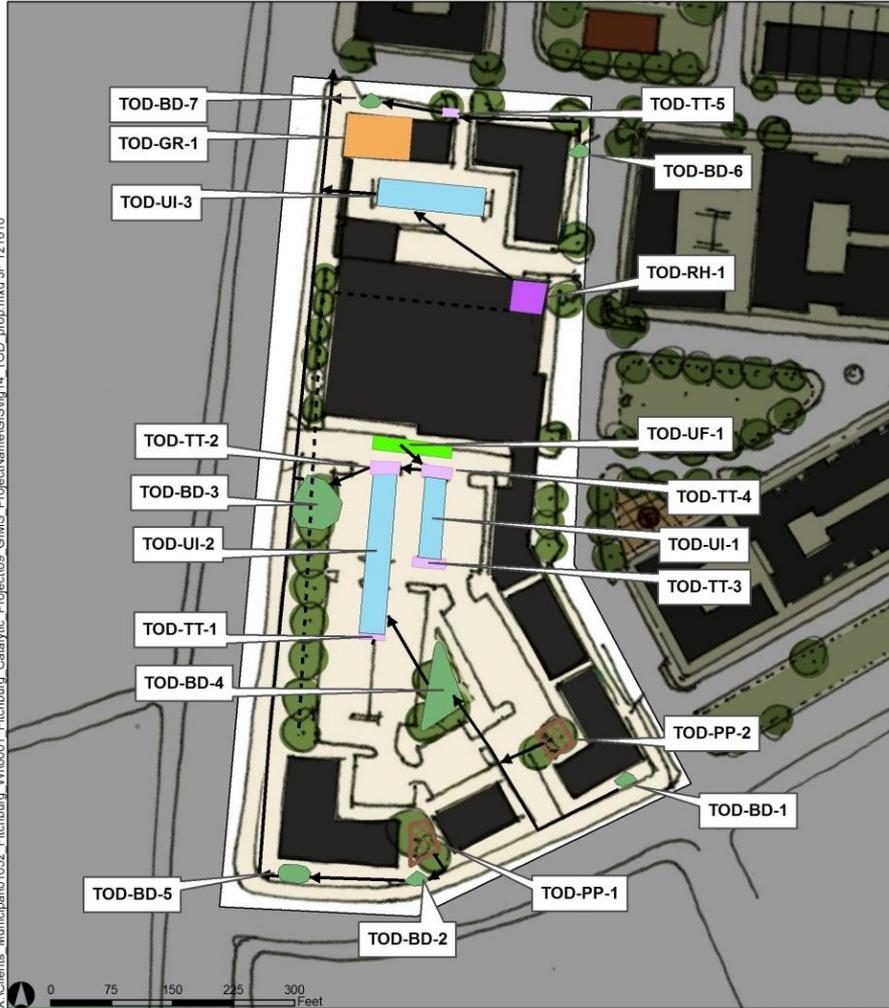
- Legend**
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Fitchburg Catalytic Project

Last Revised: October 8, 2012
Map prepared by EOR
GIS map files provided
by the City of Fitchburg



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- Legend**
- BMPs**
- Pretreatment: Filter (TOD-UF)
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- Fitchburg Catalytic Project**
- Hypothetical block extent
 - Flow Direction
 - - - Irrigation

Last Revised: October 10, 2012
 GIS map file provided by the City of Fitchburg
 Map prepared by EOR



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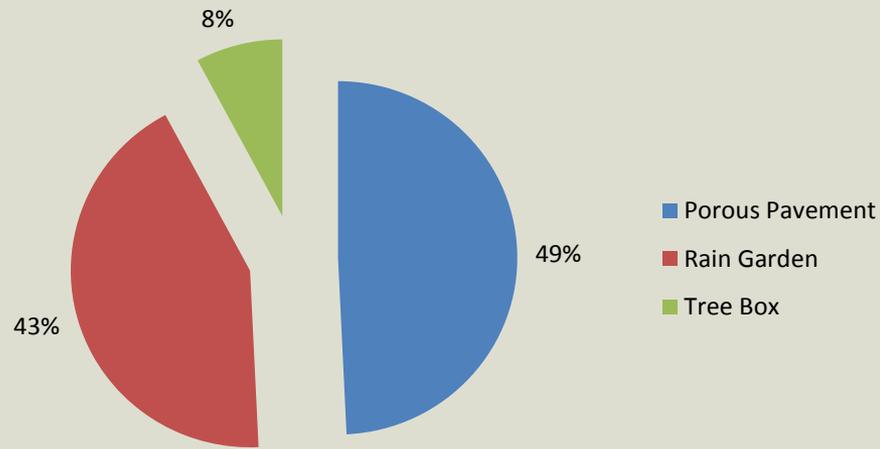


Fitchburg Catalytic Project
Legend

- BMPs
 - Bioretention Devices (Raingardens)
 - Pervious Pavement Systems
 - Tree Trenches
- Flow Direction

Last Revised: August 24, 2012
GIS map files provided by the City of Fitchburg
Map prepared by EOR

0 75 Feet



BMP	BMP Area [sq. ft.]	% of BMP Area	% of Total Area*
Pervious Pavement Systems	2,954	59%	3.5%
Rain Garden	1,578	32%	1.9%
Tree Trench	470	9%	0.6%
Total	5,002	100%	6%



Thank you

Contact Information:

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