

Stormwater Management Opportunities in Traverse City's TIF 97 District

Prepared by



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Stormwater Management Opportunities in Traverse City's TIF 97 District

Discussion Topics

- Review Purpose of Work
- Recommendations
- Analysis
- Summary

Purpose

- Provide information on stormwater control mechanisms
- Conduct a watershed characterization
- Develop a BMP toolbox and regional treatment options
- Review stormwater implementation needs

Recommendations

- Support/develop a dedicated funding mechanism for stormwater management
- Focus on water quality for public health and quantity for public infrastructure
- Focus on the areas with the lowest quality stormwater (buildings, roads, parking lots)
- Consider regional and public options

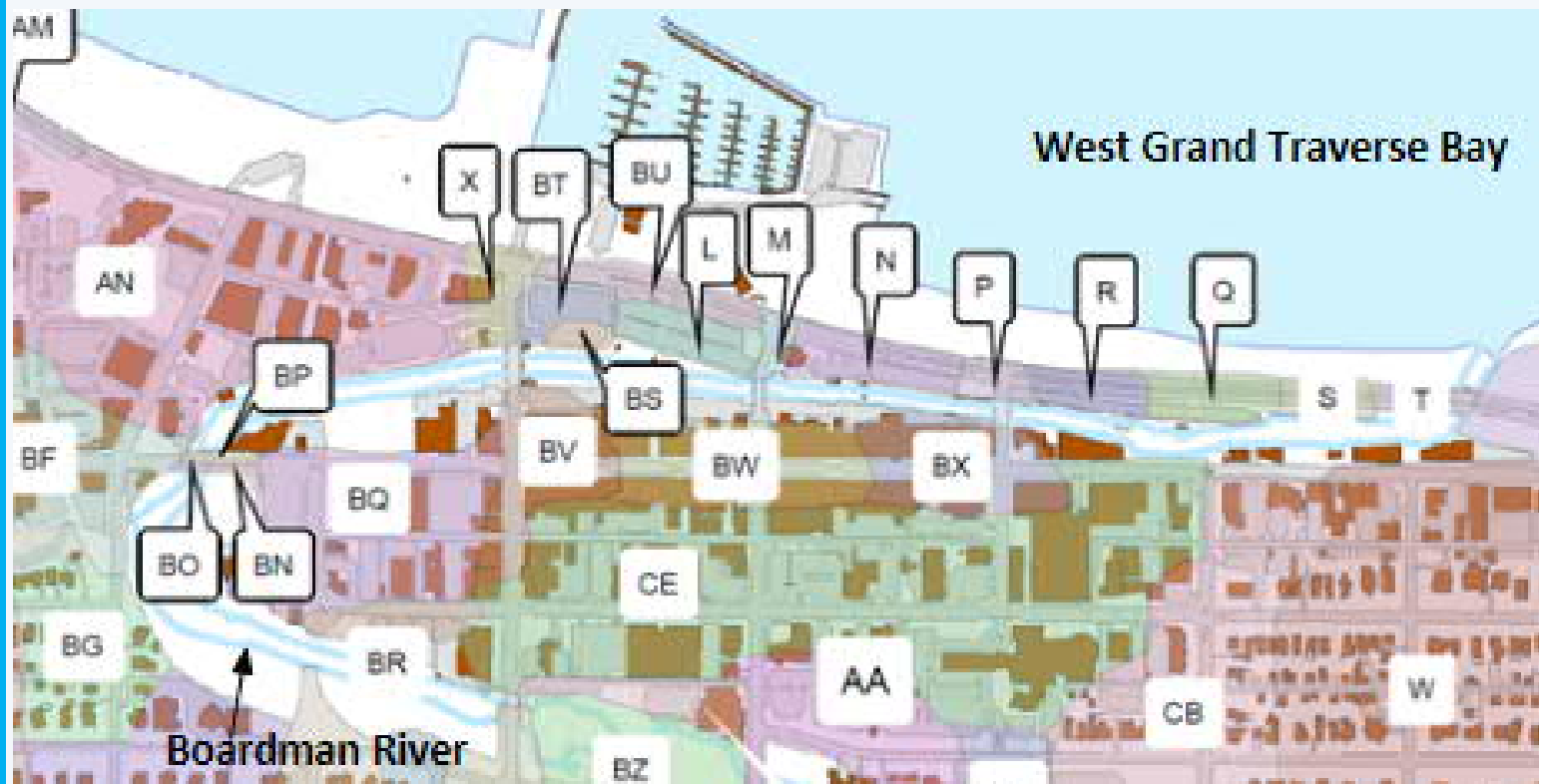
Recommendations

- Support/develop a dedicated funding mechanism for stormwater management
 - The City of Traverse City has a \$1,660,000 annual* gap between allocated funding and stormwater needs.
 - This can often lead to an under performing and poorly maintained stormwater system over the long term.

* From Traverse City's Stormwater Asset Management Plan

Recommendations

- Focus on water quality for public health and quantity for public infrastructure



Nearly the entire TIF District discharges to the lower Boardman River. We are concerned with water quality for human and aquatic health and water quantity for infrastructure O&M/replacement.

POLLUTANT SOURCES





Recommendations

- Focus on the areas with the lowest quality stormwater (buildings, roads, parking lots)

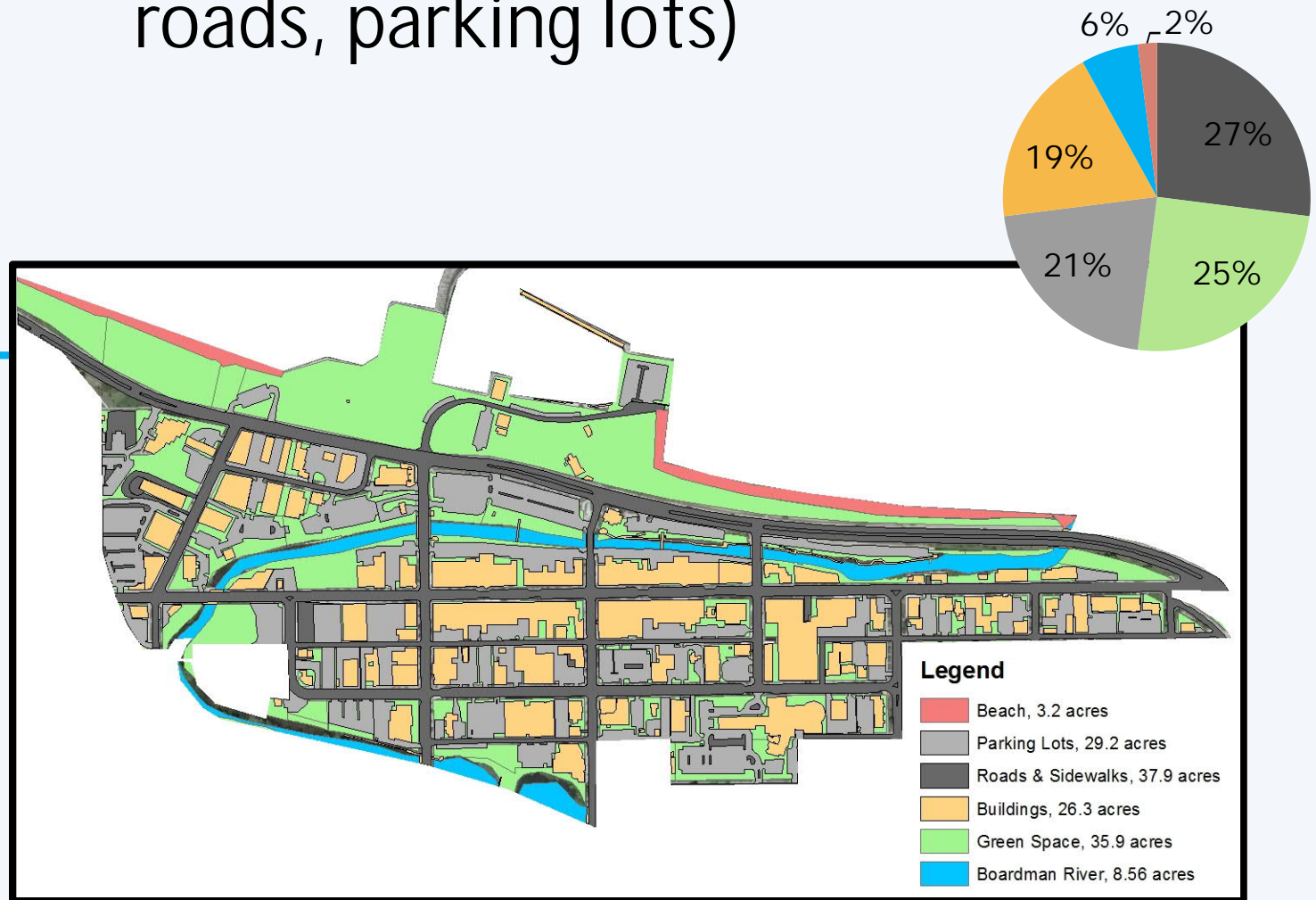


Table 4. TIF 97 Land Use Values

Building		
Roof	23.7 acres	16.8%
Other(patio/deck/pier/dock)	2.6 acres	1.8%
<i>Subtotal, Building Area = 26.3 acres</i>		18.7%
Transportation		
Road	22.6 acres	16%
Alley	2.2 acres	1.6%
Parking	27.1 acres	19.2%
Sidewalk	13.1 acres	9.3%
Other(median/parking island)	2.1 acres	1.4%
<i>Subtotal, Transportation Area = 67.0 acres</i>		47.5%
<i>Subtotal, Impervious Area (Building + Transportation) = 93.3 acres</i>		66.2%
Green Space	35.9 acres	25.5%
Water (Boardman River)	8.6 acres	6.1%
Beach	3.2 acres	2.3%
<i>Subtotal, Pervious Area = 47.7 acres</i>		33.8%
Total, 141 acres		100%

Table 10. Typical TSS Loading from Runoff by Urban Land Use ⁴²

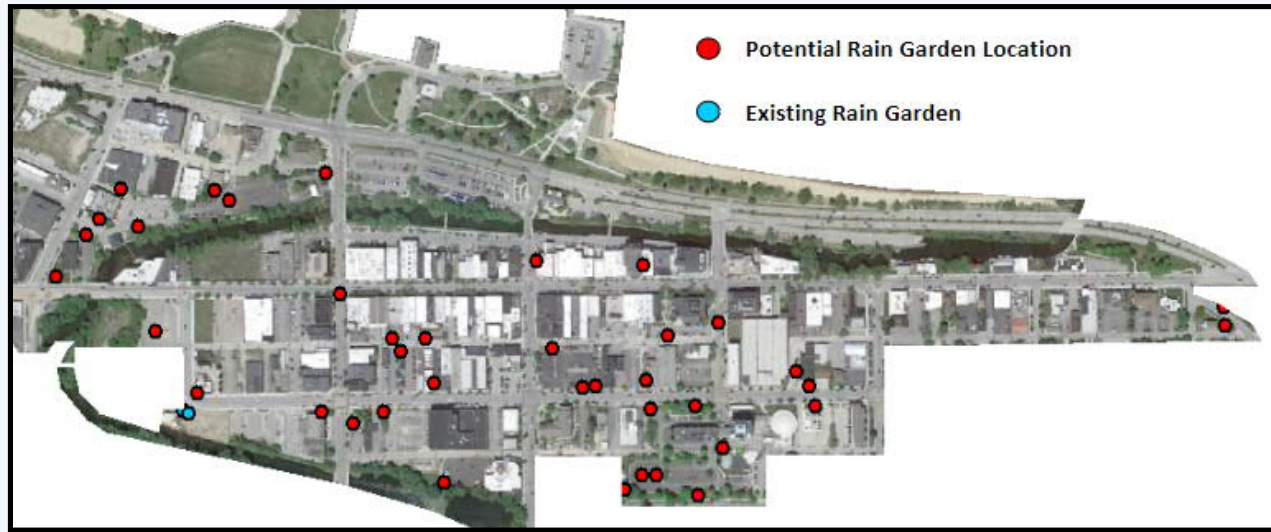
Land Use	Commercial	Parking Lot	High-Density Residential	Low-Density Residential	Freeway	Industrial	Park	Construction
TSS (lbs/acre-yr)	1000	400	420	10	880	860	3	6000

Recommendations

- Consider regional and public options



RAIN GARDENS



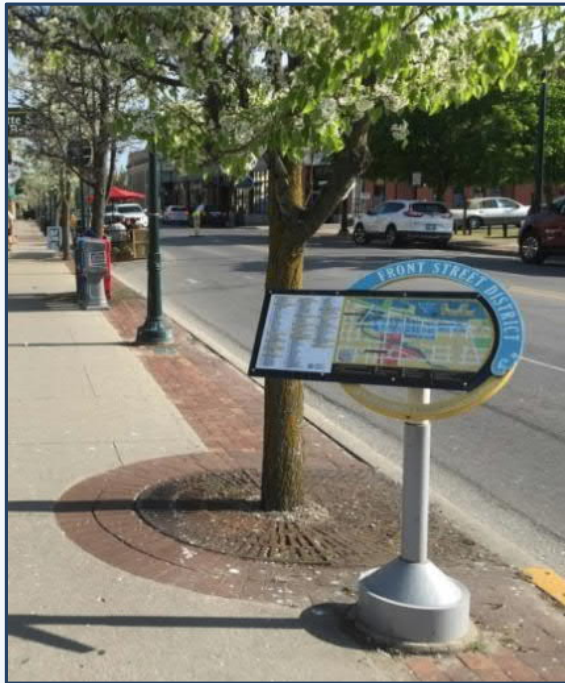
Nearly 40 locations were identified in the TIF 97 District as being appropriate for potential rain garden implementation.

OPPORTUNITY Incorporate rain gardens into parking lots, along roads and sidewalks, and in larger open green spaces to capture, filtrate, and infiltrate the stormwater runoff from the surrounding regions.

PERMEABLE PAVERS – Sidewalks

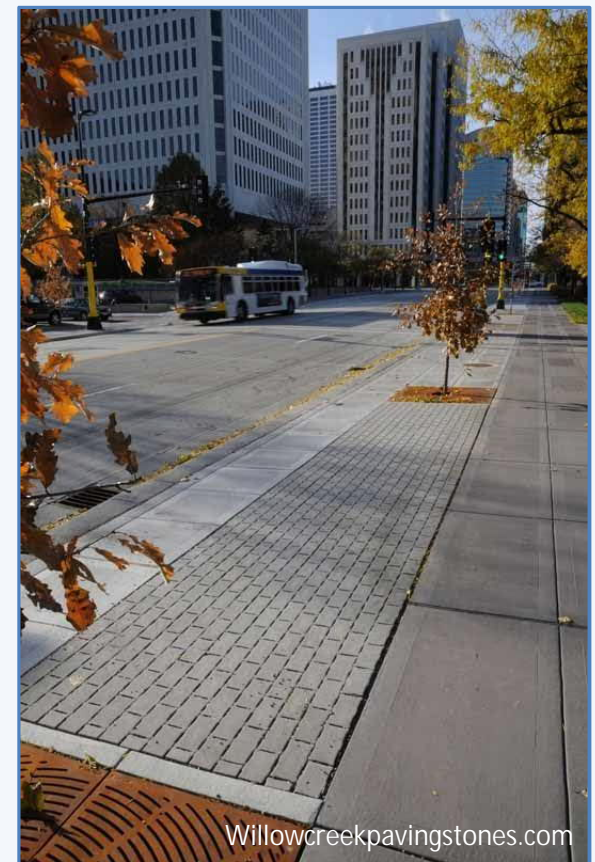
29,000 SQFT Opportunity

Retrofit decorative brick paving in sidewalks with permeable pavers



Marquette Ave in downtown Minneapolis, 2009

15,000 square feet of permeable pavers in tandem with a biofiltration system and 190 trees.



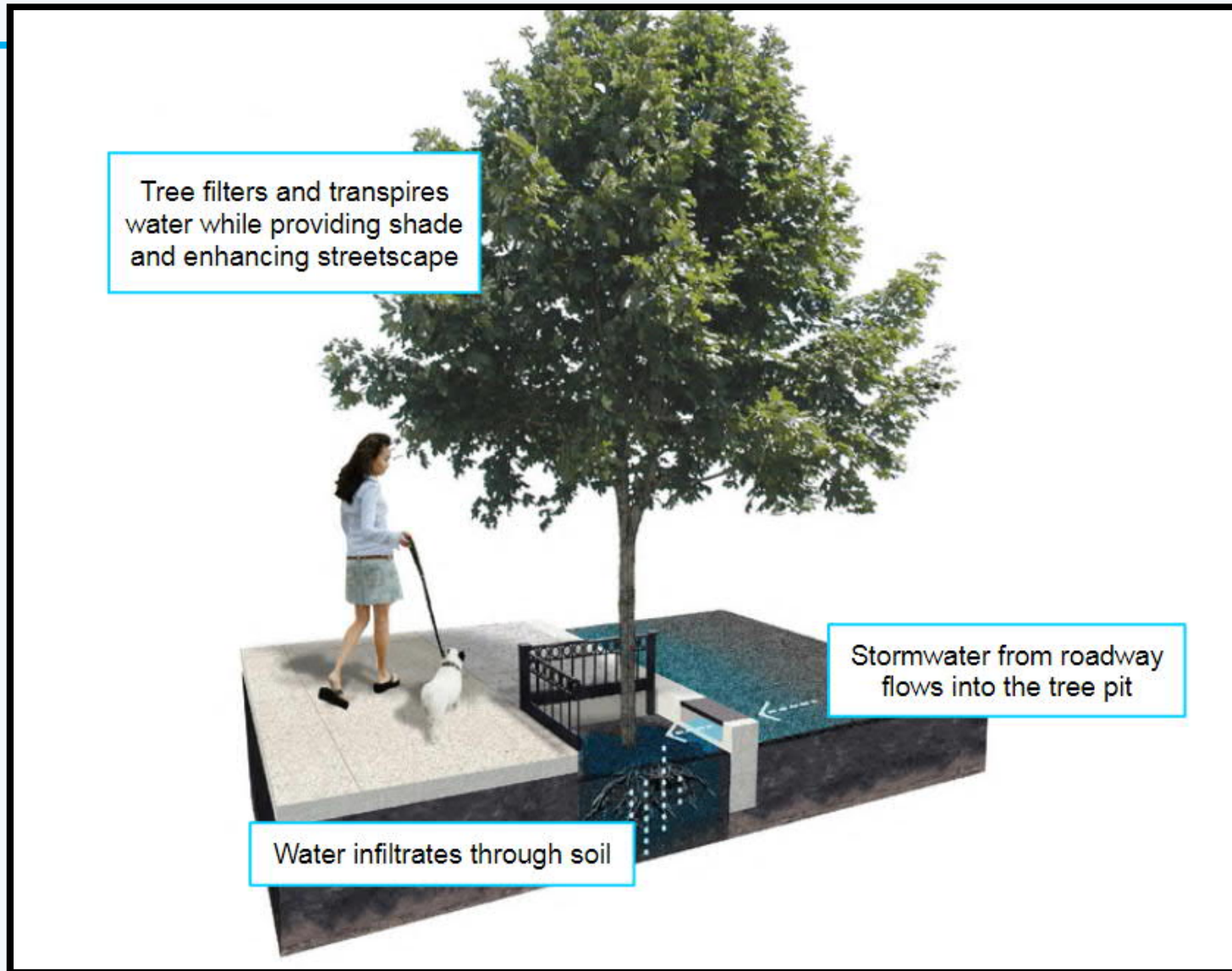
Willowcreekpavingstones.com



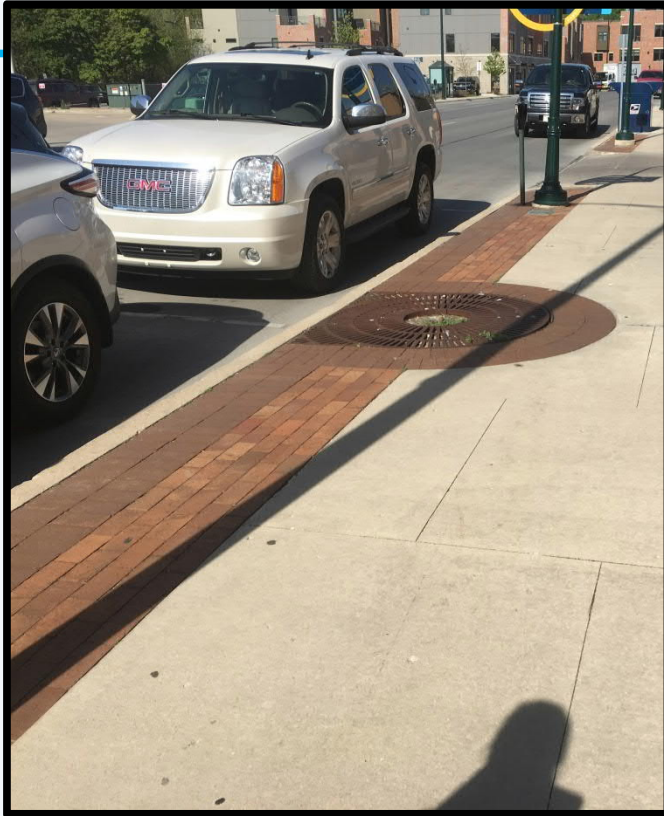
Materials:
\$116,000 -
\$350,000

Paver Type	Brick Pavers	Permeable Pavers
Cost (per sqft)	\$3-\$15	\$4-\$12
Lifetime	20+ years	15-25 years

STORM TREES



STORM TREES



Runoff Reduction: 15%
TSS: 80-90+%
Nitrogen: 40-65%
Total Phosphorus: 50-80%



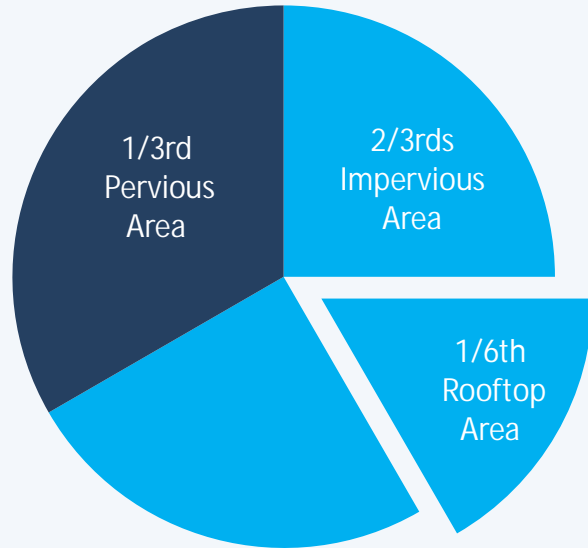
\$20,000 per tree



Japanese Lilac Storm Tree
along Medical Campus Drive.

GREEN ROOFS

TIF 97 Land Use



Stormwater Retention: 60-100%
TSS: 85%.



\$20-\$25 per sq.ft.
Structural roof changes can add an
additional \$20-\$25 per sq.ft.

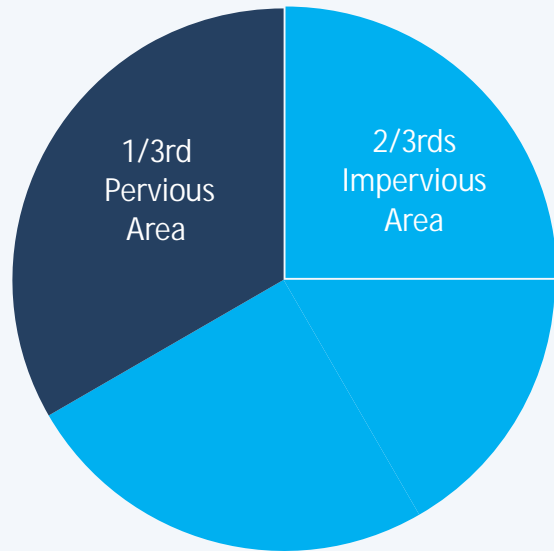
New developments could be incorporating green roofs into design as this is the easiest and most cost effective way to use this technology.



Uptown Condominiums 10,000 sq.ft green roof

MANUFACTURED TREATMENT DEVICES

TIF 97 Land Use



Stormwater Retention: 0%
TSS: 50% - 80%.



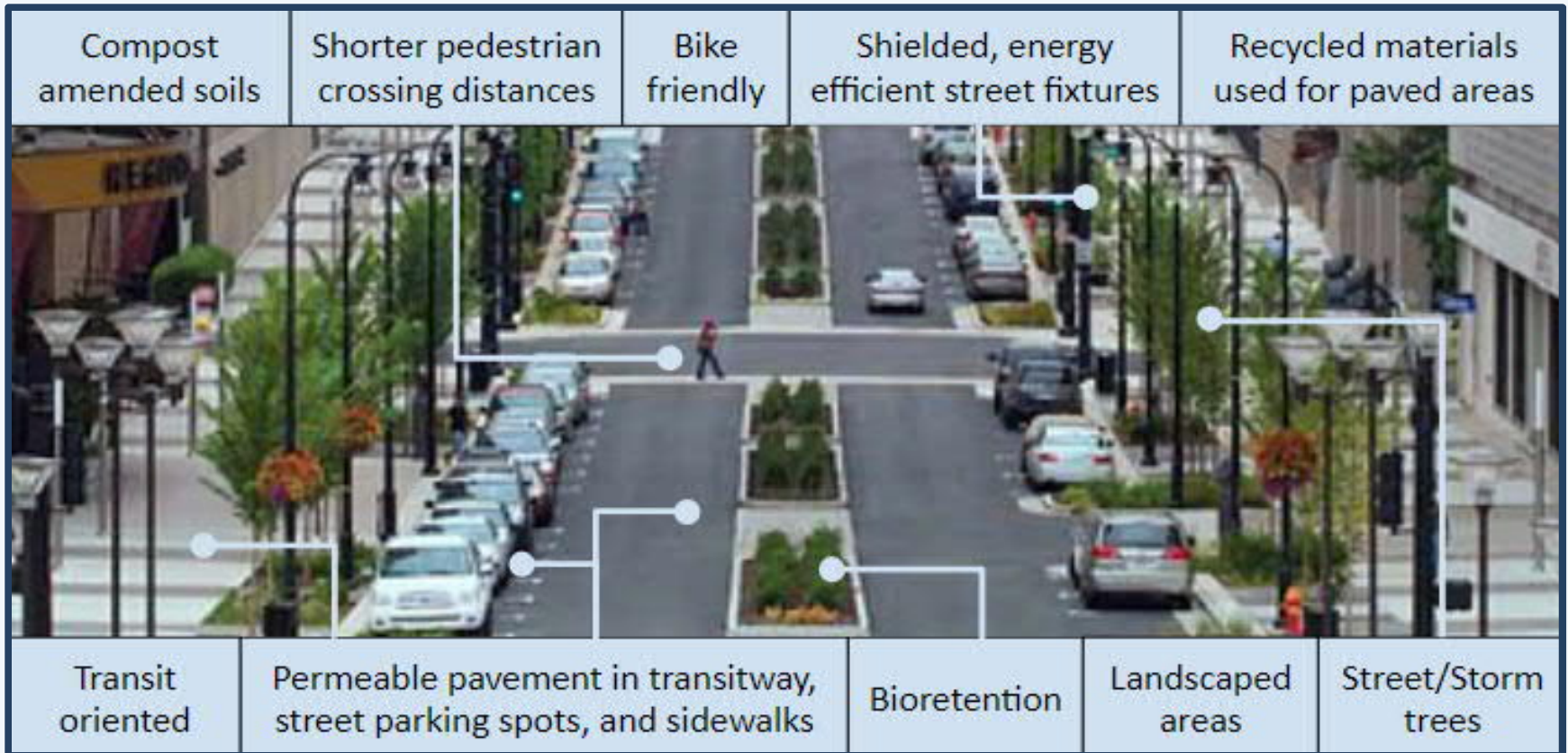
\$10,000 to \$40,000, depending on size

New developments, redevelopments, and public infrastructure projects could be incorporating MTD into designs.



AquaShield in Parking Lot W

GREEN STREETS



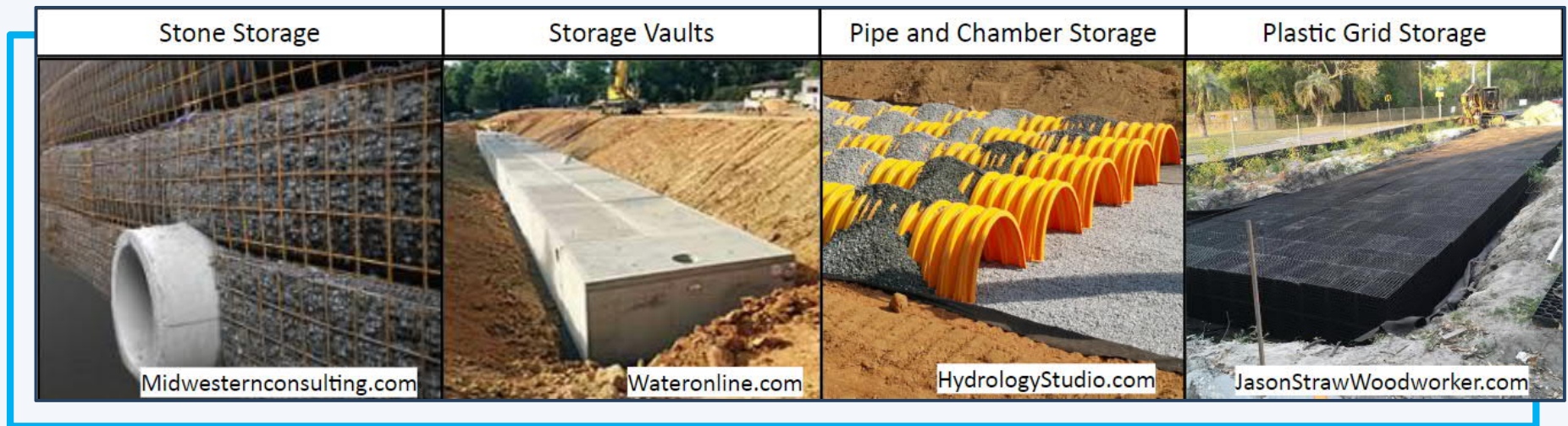
80-94% reduction in peak flow

90% reduction of TSS, organic pollutants/oils, and heavy metals

UNDERGROUND STORAGE

OPPORTUNITY

Construct underground storage facilities under parks, parking lots, roads, or other land uses where surface-based BMPs are impracticable.



Maximum Drainage Area: 25 acres
Capacity: runoff from 100-year design storm



Pipe Storage: \$5-\$7 per CF
Chamber Storage: \$5-\$9 per CF
Pre-Cast Concrete Vault Storage: \$10-\$15 per CF

STREET AND ALLEY SWEEPING



Sediment: 35-80%
Nutrients: 15-40%



Capital Investment: \$100,000+
Twice per year: \$500-\$1,000
Four times per year: \$1,000-\$2,000

Summary

- Need dedicated funding mechanism
 - Cover gap and pay for maintenance
- Benefit public health and infrastructure costs
 - Quality and quantity
- Lots of public and private opportunities for BMP implementation
 - Street ROW, Roofs, Parking lots, etc.

Questions

