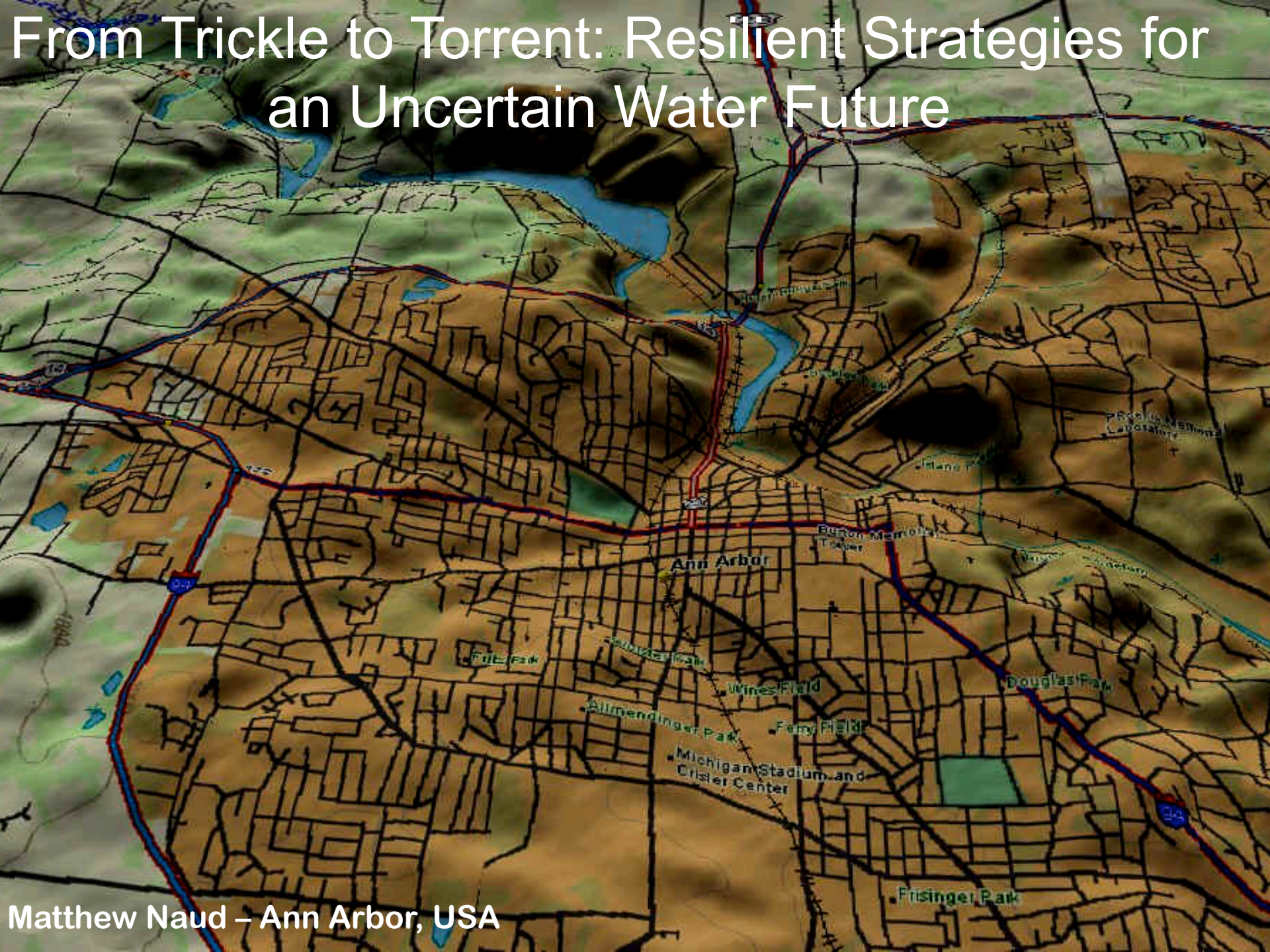


From Trickle to Torrent: Resilient Strategies for an Uncertain Water Future



Matthew Naud – Ann Arbor, USA

SustainA²ble

Cultivating our people, place and potential

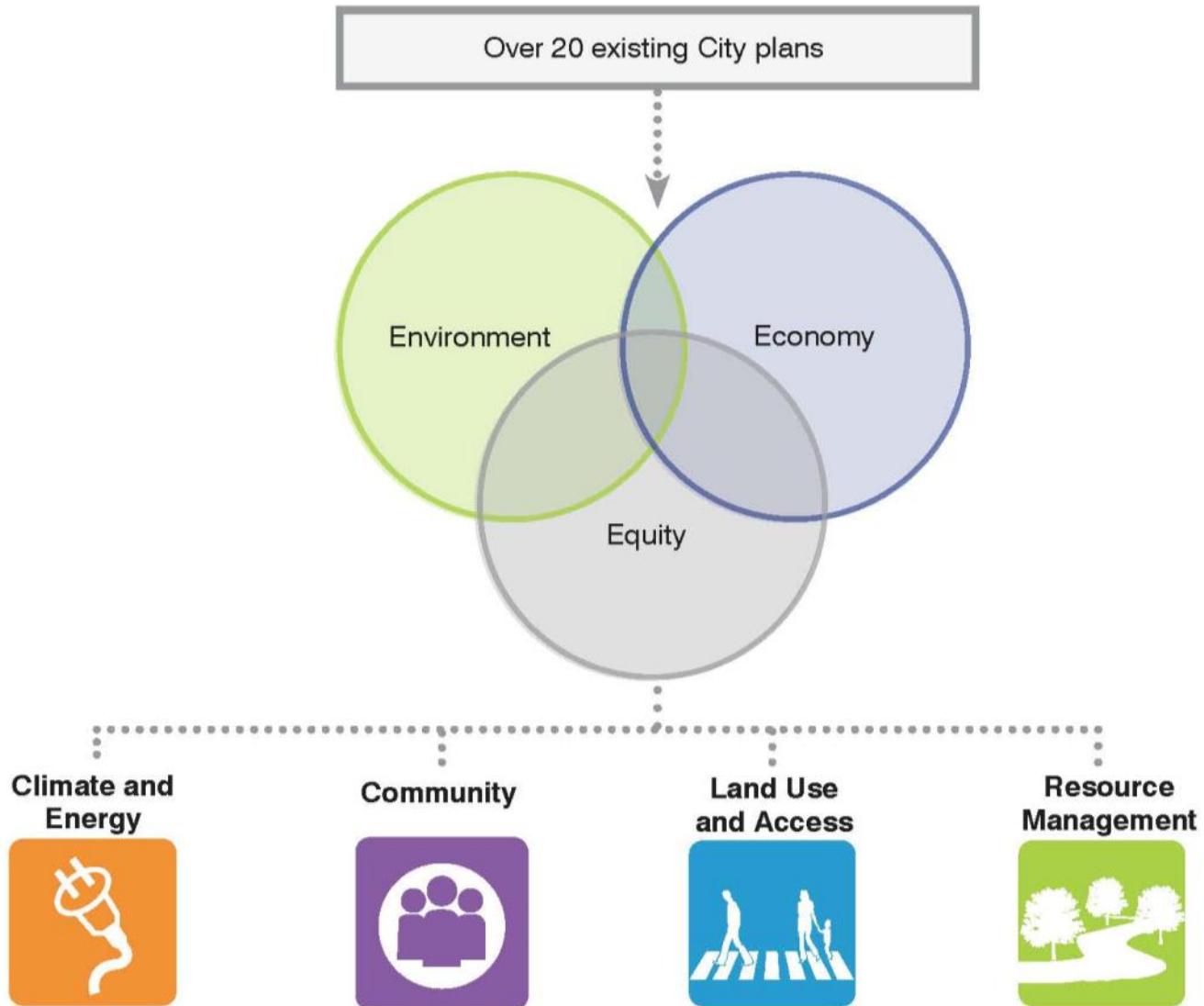


Ann Arbor's Sustainability Action Plan

Why Create a Framework?

Transportation
Washtenaw County
Washtenaw Urban County
Natural Features
Water Treatment Facilities and Water Resources
Housing and Community Development
Millers Creek Watershed Improvement
Greenhouse Gas Emissions Reduction Strategy
Downtown
Climate Action **Greenway Task Force**
Allen Creek Watershed Management **Solar**
Affordable Housing Needs Assessment
Drinking Water Distribution System
Capital Improvements **Solid Waste**
Energy **Huron River and Impoundment Management**
Urban and Community Forest Management
Flood Mitigation **Land Use**
Parks and Recreation and Open Space
Non-motorized Transportation
Wastewater Treatment Facilities
Malletts Creek Restoration
Stormwater

Plan



Sustainability Framework

- 16 overarching sustainability goals captured in four theme areas
- Adopted as policy guidance for the Master Plan in February 2013

Climate and
Energy



Community



Land Use and
Access



Resource
Management



Climate and Energy



Sustainable Energy



Energy Conservation



Sustainable Buildings

Community



Engaged Community



Diverse Housing



Human Services



Safe Community



Active Living



Economic Vitality

Land Use and Access



Transportation Options



Sustainable Systems



Integrated Land Use

Resource Management



Clean Air and Water



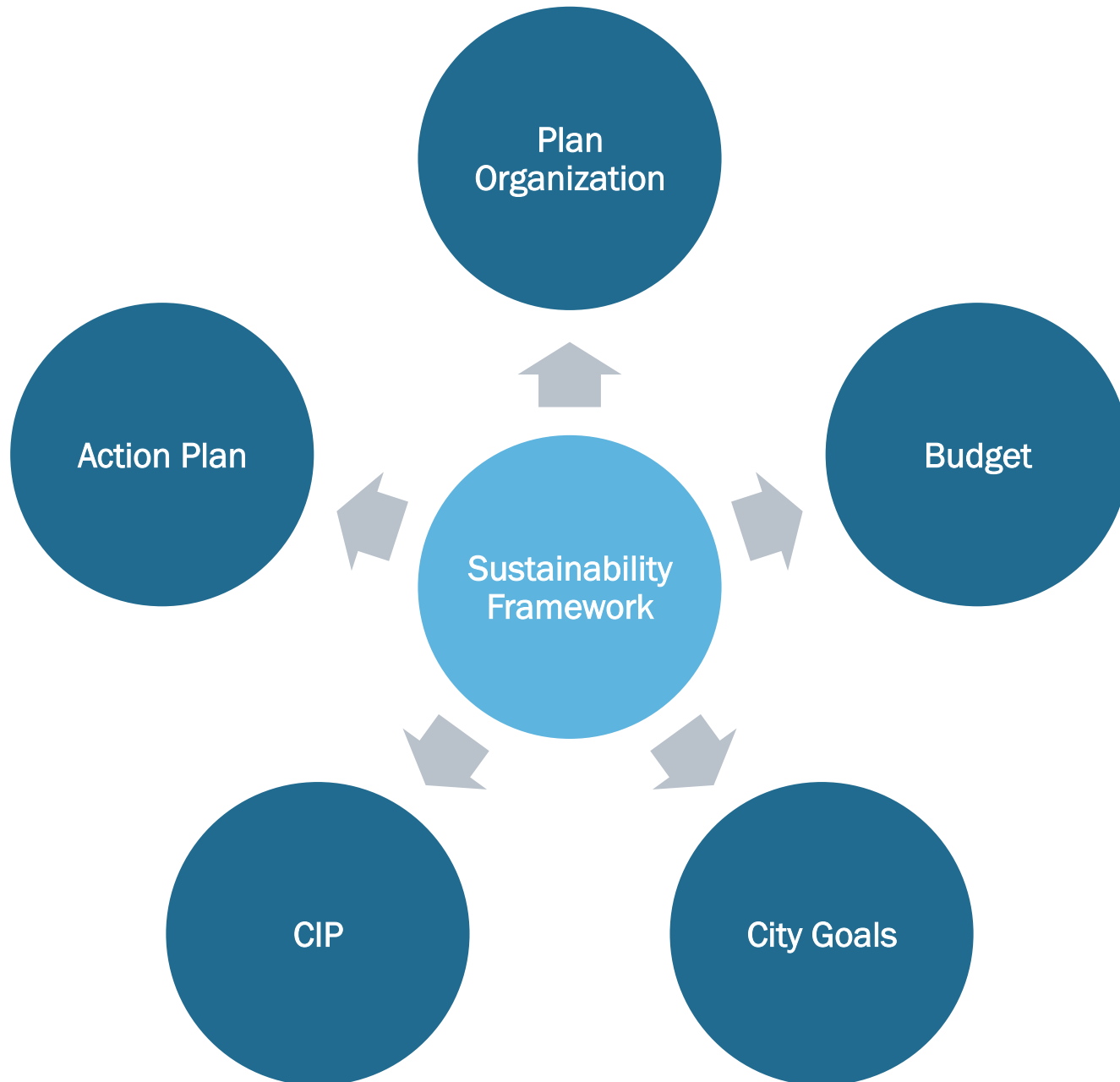
Healthy Ecosystems



Responsible Resource Use



Local Food



SCORING		Low ← → High				
1	Sustainability Framework Goals	0 Contributes to meeting 1 or less of the City's Sustainability Framework Goals	3 Modestly contributes to meeting two to three of the City's Sustainability Framework goals	7 Significantly contributes to meeting two or three of the City's Sustainability Framework goals OR modestly contributes to meeting four or more of the City's Sustainability Framework goals	10 Significantly contributes to meeting 4 or more of the City's Sustainability Framework goals	
2	Safety/Compliance/Emergency Preparedness	0 Does not address safety or emergency preparedness considerations	2 Contributes to meeting public safety, but is not required for compliance	5 Will assist in ability to continue governmental services during emergencies	8 Necessary to meet recommended compliance OR will maximize public safety opportunities	10 Contributes to mandatory compliance OR will prevent potential injury to staff OR is necessary to assure continuance of governmental services during emergencies
3	Funding	0 Has no potential funding	2 Has uncertain funding source(s) (e.g., Special Assessment, General Fund)	6 Funding available from standard City funding sources (e.g., utility rates, road millage, etc.)	8 Has high probability of funding from low-interest loan source (e.g., DWRP, SRF, Energy Fund, etc.) OR partial project funding (<80%) from outside source(s)	10 Has high probability of receiving substantial (>80%) project funding from outside sources (e.g., grant funding, developer, Township financed)
4	Coordination with Other Projects	0 There are no other planned projects that should be coordinated with this Project	5 Costs can be modestly reduced by performing project with another project	8 Schedule is driven by other improvements (e.g., street reconstruction, adjacent utility replacement) resulting in significant (>33%) opportunity cost if project is not completed concurrently with adjacent work	10 Schedule is driven by other high-priority improvements that must be completed within the next two fiscal years	
5	Master Plan Objectives	0 Does not contribute to meeting any of the City's master plan or other strategic planning document goals	3 Modestly contributes to meeting one of the City's master plan or other strategic planning document goals	6 Significantly contributes to meeting one of the City's master plan or other strategic planning document goals OR modestly contributes to meeting two or more of the City's master plan or other strategic planning document goals	10 Significantly contributes to meeting two or more of the City's master plan or other strategic planning document goals	

6	User Experience (Level of Service)	0 Will reduce the quality of the User Experience (Level of Service)	2 Will not affect Level of Service	4 Modestly improves existing Level of Service	10 Significantly improves existing Level of Service OR provides a new service which is requested by the community
7	Innovation	0 Does not include any innovative measures or items	3 Modestly promotes or incorporates multiple known innovative techniques, funding strategies, materials or BMP's	7 Significantly promotes or incorporates multiple known innovative techniques, funding strategies, materials or BMP's on a small scale	10 Significantly promotes or incorporates multiple known innovative techniques, funding strategies, materials or BMP's on a large scale
8	Economic Development/Retention	0 Will not have any effect on economic development/retention		5 Will have modest effect on economic development/retention	10 Will have significant effect on economic development/retention
9	Partnerships	0 Does not provide opportunity for partnerships		3 Promotes regional or interagency planning and coordination OR public/private partnership	10 Promotes regional or interagency planning and coordination OR public/private partnership AND provides for shared staffing resources
10	System Influence/Capacity	0 Does not contribute to larger system network or user demand		3 Meets future user demand	6 Addresses immediate user demand that benefits a portion of the user population
11	O&M (Operations & Maintenance)	0 Will cause increase in O&M costs	2 Has a neutral effect on O&M costs	6 Makes modest contribution to O&M cost reduction	8 Makes modest contribution to O&M cost reduction AND creates opportunities to improve operational flexibility/use of technology, or extends asset life
12	Energy	0 Will cause increase in energy costs	2 Has a neutral effect on energy costs	5 Makes modest contribution to energy cost reduction	8 Makes modest contribution to energy cost reduction AND creates opportunities to improve operational flexibility/use of renewable energy
		10 Makes significant contribution to O&M cost reduction AND creates opportunities to maximize operational flexibility/use of technology, or extends asset life, or utilizes materials or techniques that provide lowest overall life-cycle costs		10 Makes significant contribution to energy cost reduction AND creates opportunities to maximize operational flexibility/use of renewable energy	

Increase Awareness

SUSTAINABLE



ANN ARBOR FORUMS | 2012

This series brings together University of Michigan faculty, representatives from community organizations, Ann Arbor city commissioners, city staff, and the public to discuss local sustainability concepts and efforts—past, present and future.

Join this community forum at the Ann Arbor District Library in downtown Ann Arbor (343 South Fifth Ave.) from 7:00 p.m. to 8:30 p.m. on the second Thursday of each month from January through April, 2012.

Sponsored by the City of Ann Arbor and the Ann Arbor District Library.



JANUARY 12, 2012
RESOURCE MANAGEMENT
including natural areas, waste reduction, recycling, compost, urban forestry, water and air quality.

FEBRUARY 9, 2012
LAND USE AND ACCESS
including transportation designs, infrastructure, land uses, built environment, and public spaces.

MARCH 8, 2012
CLIMATE AND ENERGY
including an overview of Ann Arbor's climate action plan, climate impacts, renewable and alternative energy, energy efficiency and conservation.

APRIL 12, 2012
COMMUNITY
including housing, public safety, recreation, outreach, civic engagement, and stewardship of community resources.

For more information, check www.a2gov.org/sustainability and Ann Arbor's State of Our Environment Report at www.a2gov.org/soe.



Why Create an Action Plan?

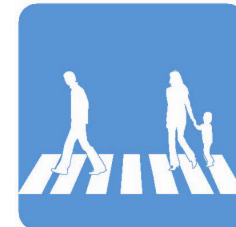
- Connect Sustainability Framework goals to targets and actions
- Mechanism to track progress
- Increase staff accountability and collaboration
- Connect staff and city commissions
- Communicate current projects to the public



Climate and Energy



Community



Land Use and Access



Resource Management

Action Plan Organization

Goal

Target

Action

Indicator

Sustainable Energy

Improve access to and increase use of renewable energy by all members of our community



Target CE 1: Use 30% renewable energy in municipal operations by 2015 (Energy Challenge)

Actions

- Maintain and expand solar projects within municipal facilities and properties (new)
- Install solar and geothermal projects at public housing sites (Housing Commission)

Indicators

- Renewable Electricity Generation
- Number of Renewable Energy Projects

Engaged Community

Ensure our community is strongly connected through outreach, opportunities for engagement, and stewardship of community resources



Target CM 1: Increase effectiveness of communication and service delivery (Administrator's Office Budget Goal)

Actions

- Evaluate Citizen Participation Ordinance and implement resulting recommendations (new - Planning and Development)
- Identify communication tools to use within neighborhoods (new - Communications)
- Launch an improved and redesigned City website with enhanced information architecture and search by June 30, 2014 (IT Budget Goal)

Indicators

- Visits to City Websites
- Members Registered on A2 Open City Hall

Targets and Actions

Where did they come from?

- Budget goals
- Staff one-on-ones
- Existing plans and resolutions

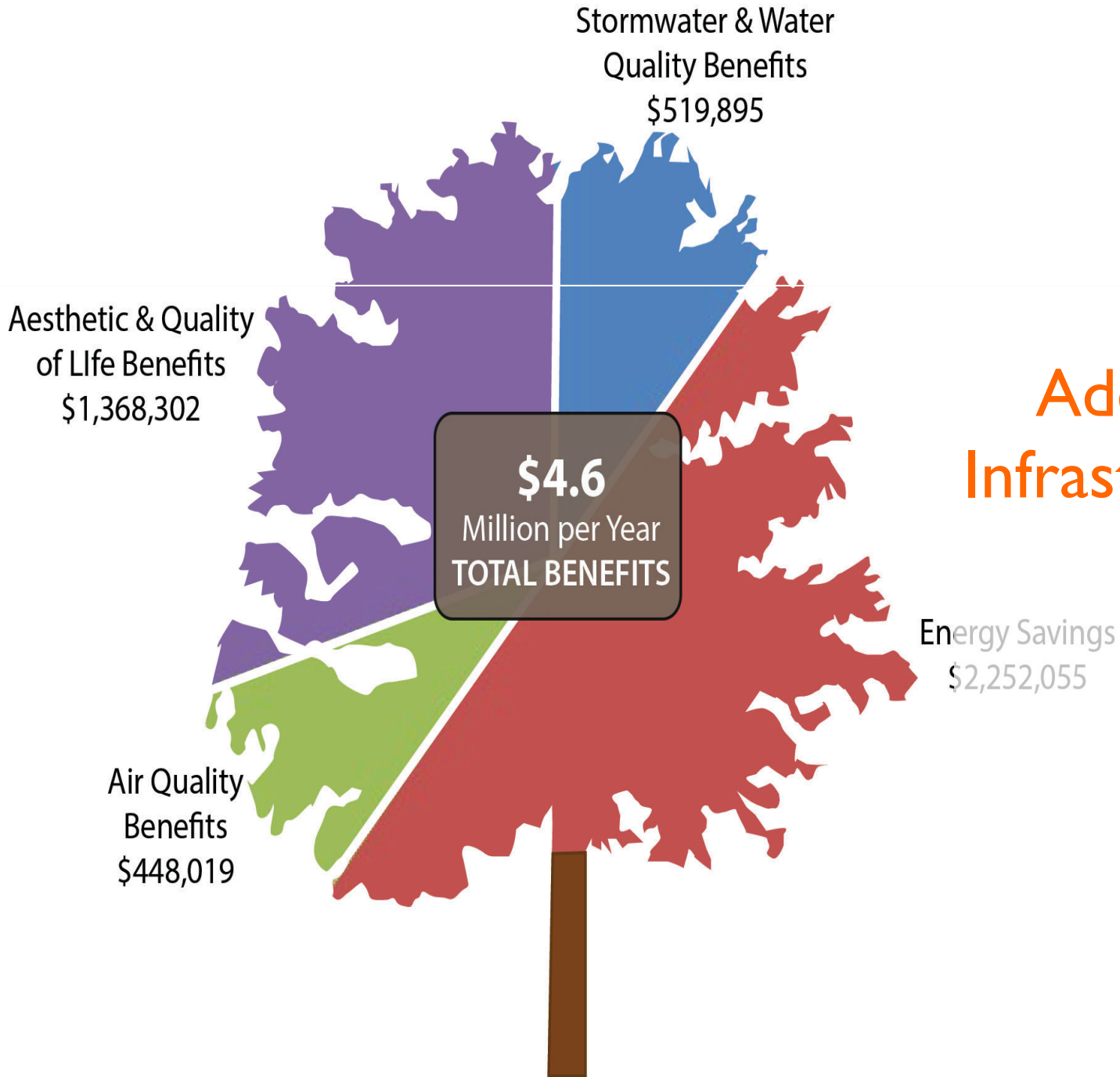
Target Source(s)
Energy Challenge Resolution (R-11-142), Climate Action Plan, Housing Commission, City Council Resolution (R-13-283), new
Climate Action Plan, Budget Goals, new
Solar Roofs Resolution (R-342-7-06), Downtown Zoning Incentives, Climate Action Plan, Washtenaw County Sustainable Communities Challenge Grant, new
Budget Goals, new
Housing Commission, Budget Goals
Housing Commission, Budget Goals



Stormwater
Utility









**\$6 million
annual
revenue**

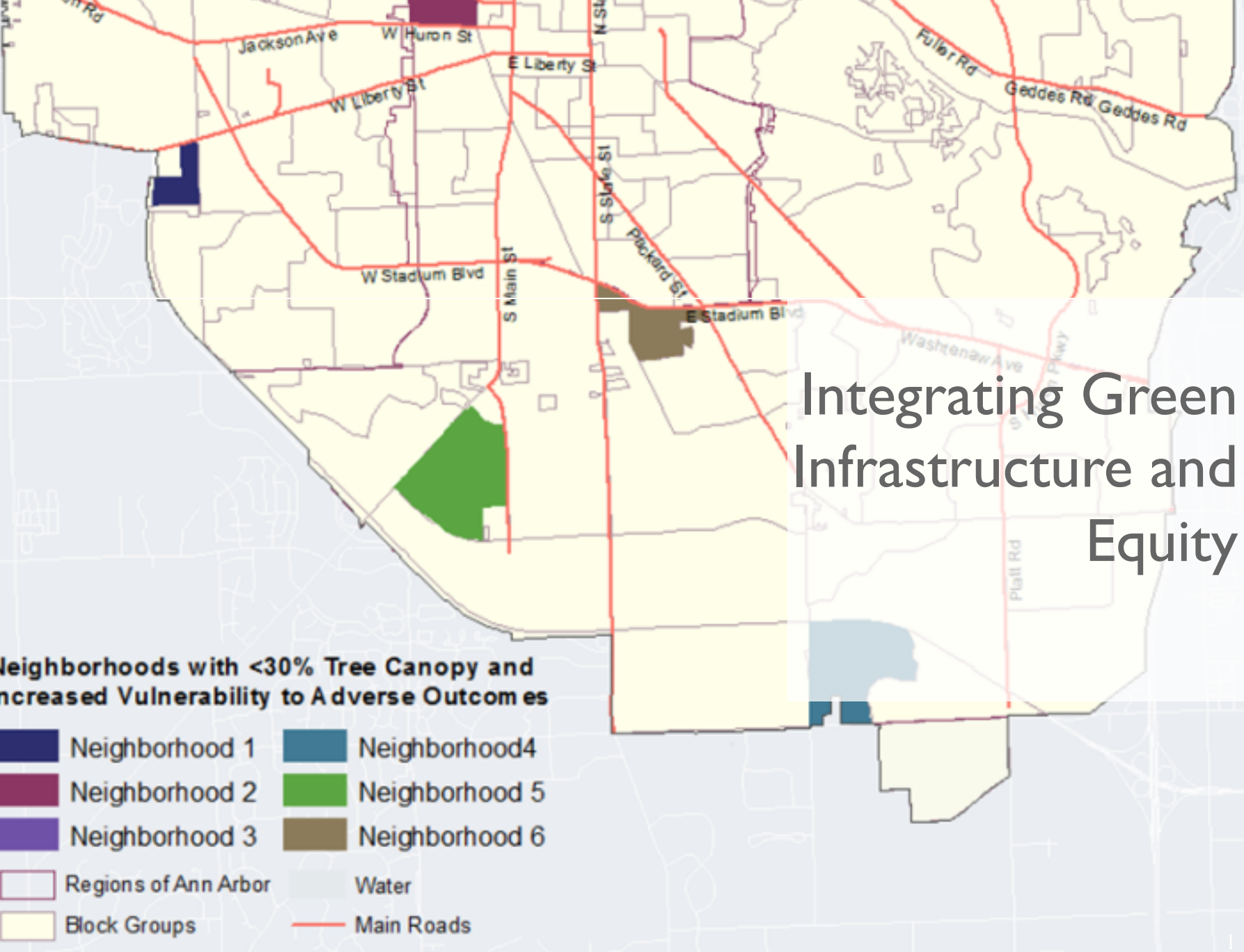


Adding Green Infrastructure to the Utility

Integrating Green Infrastructure and Equity

Neighborhoods with <30% Tree Canopy and Increased Vulnerability to Adverse Outcomes

- | | |
|---|--|
|  Neighborhood 1 |  Neighborhood 4 |
|  Neighborhood 2 |  Neighborhood 5 |
|  Neighborhood 3 |  Neighborhood 6 |
|  Regions of Ann Arbor |  Water |
|  Block Groups |  Main Roads |



Precipitation Event	Bulletin 17	Atlas 14	Used to determine...
2 year, 24 hour (bankfull)	2.26"	2.35 (+4%)	Development standards for site detention and retention
10 year, 12 hour	2.72"	2.9 (+7%)	Sizing of storm conveyance pipes
100 year, 24 hour	4.36"	5.11 (+17%)	Floodplain boundary. Detention basin capacity.
500 year, 24 hour		6.74	Flood maps. Safety. ID critical facilities for insurance purposes.

Use the Right Data

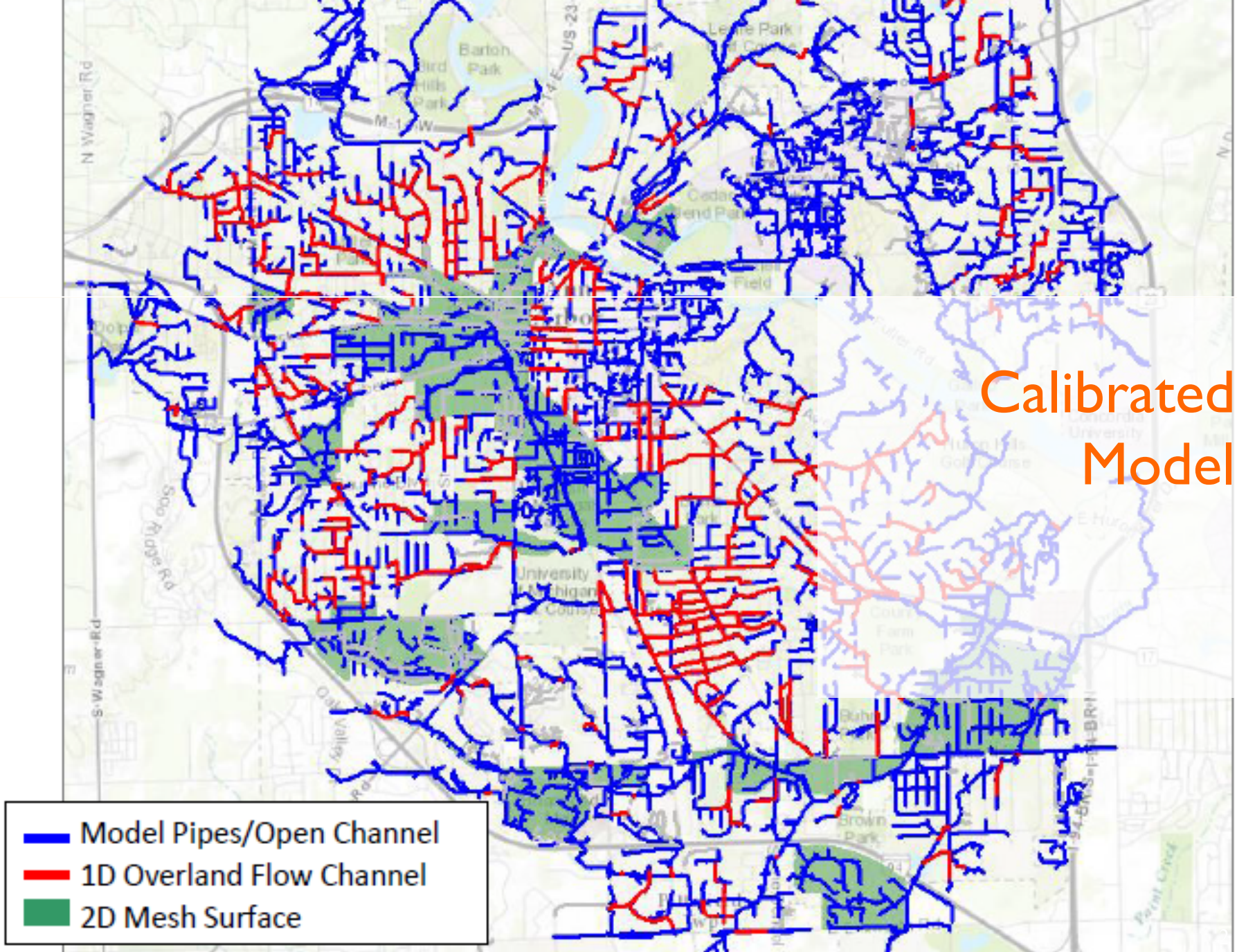
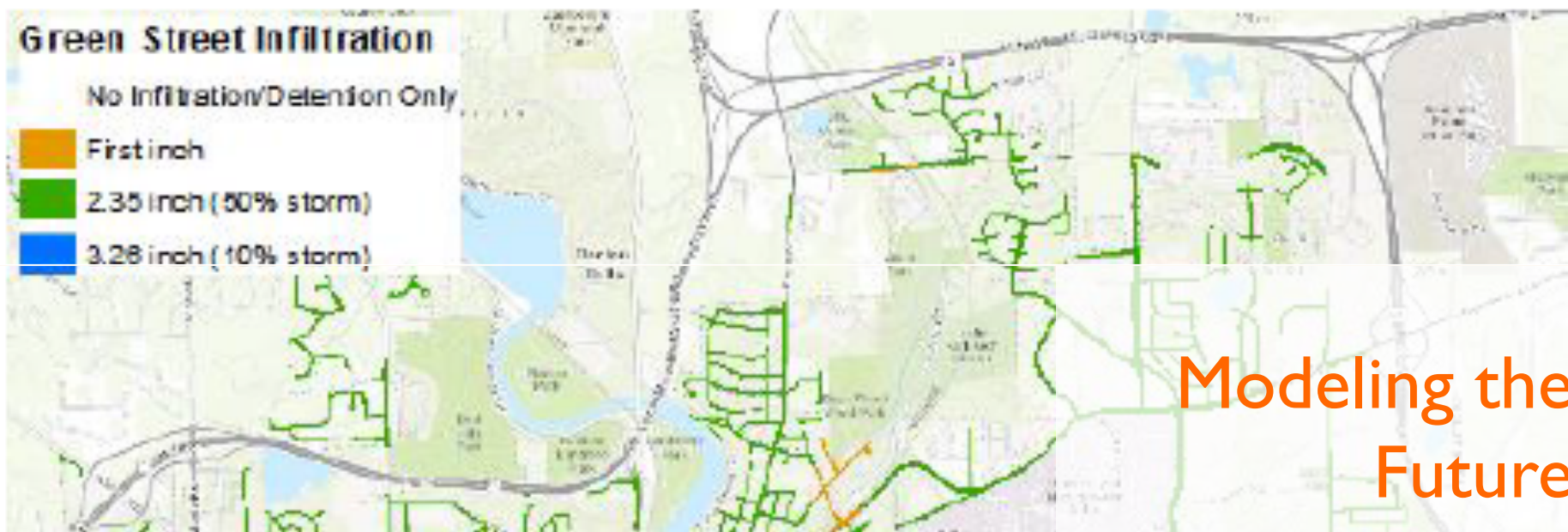


Figure 5-1 – Potential Infiltration for Green Street Application



Modeling the Future

Table 5-2 – Future Scenarios Assumptions for Stormwater Management Strategies

Future Scenario	2040	2065	2115
Green Streets	25%	50%	100%
Residential Rain Gardens	50%	100%	100%
University Redevelopment	50%	100%	100%
Downtown Storage and Infiltration	25%	50%	100%
Commercial and Multi-Family Redevelopment	45%	85%	100%



Matthew Naud
mnaud@a2gov.org

www.a2gov.org/storm
www.a2gov.org/sustainability
www.a2energy.org/climate