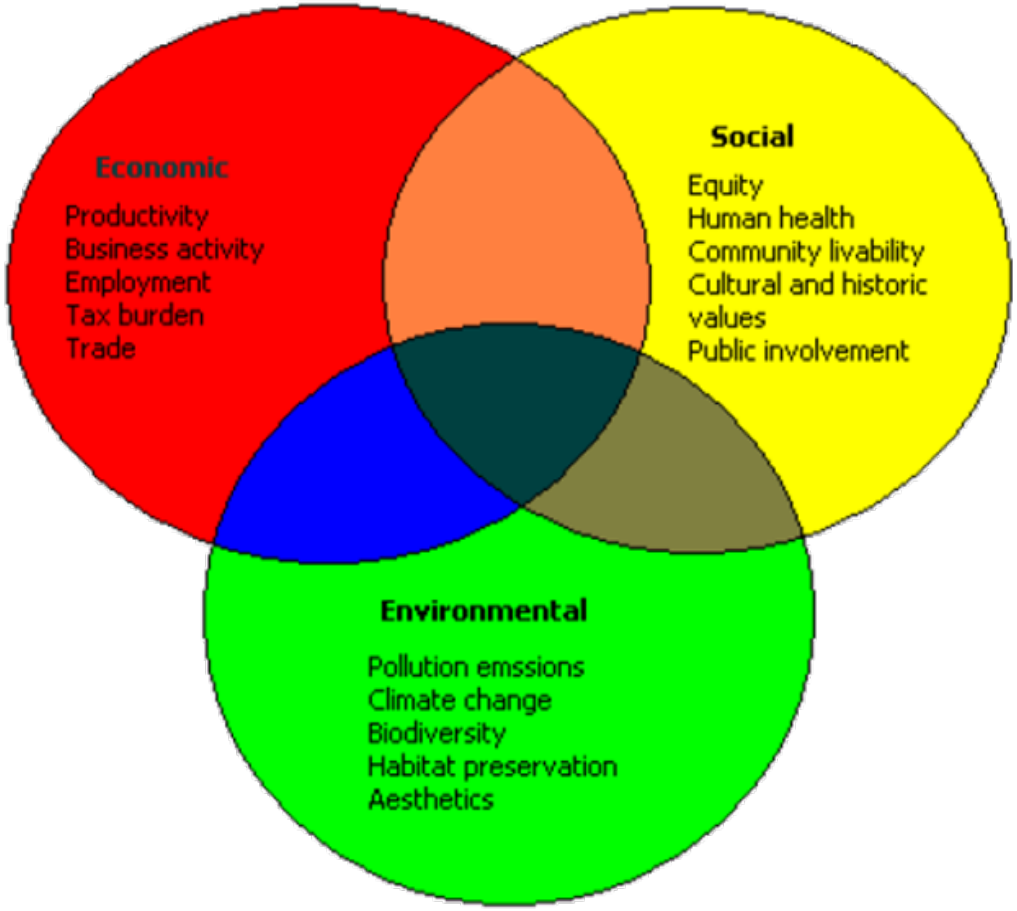
Using Performance Measures/Indicators to Calculate the Triple Bottom Line

Leigh Blackmon Lane and Matthew Watterson
Center for Transportation and the Environment

September 8, 2011

What is Sustainability?
Conceptual Framework



Ramani, T., Zeitsman, J., Gudmundsson, H., Hall, R. and G. Marsden. A Generall Applicable Sustainability Assessment Framework for Transportation Agencies. TRB Presentation. 2011

Presentation Outline

- Currently working on two related research projects to synthesize:
  - Sustainable Return on Investment Tools
  - Place-Specific Sustainability Indicators
- Provide background on the research projects
- Present preliminary findings
- Discuss challenges and opportunities

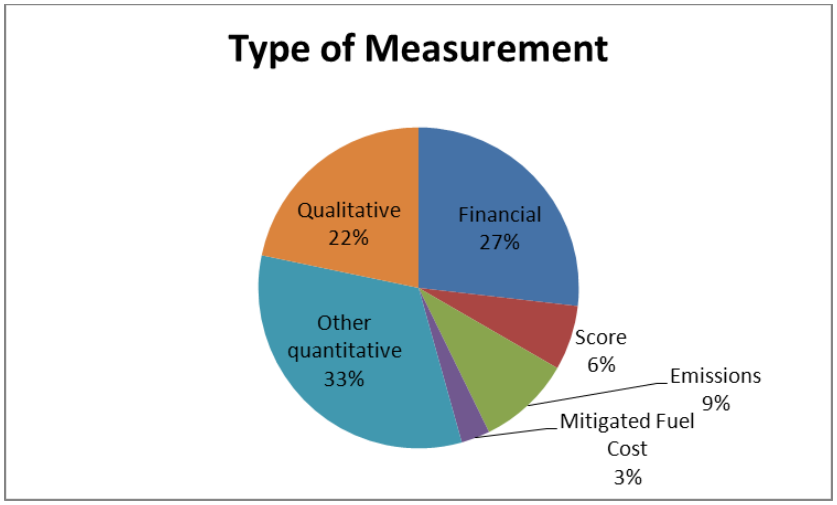
Background:
Origin and Purpose of Research

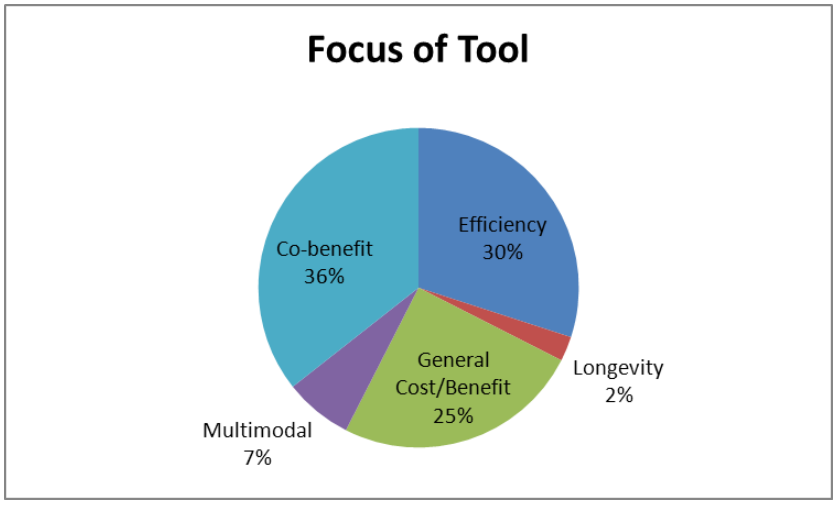
- North Carolina Department Of Transportation's Sustainability Blueprint
  - NCDOT desired a means to ascertain if sustainable practices were justifiable
  - Also interested in indicators of sustainability to be used as performance measures

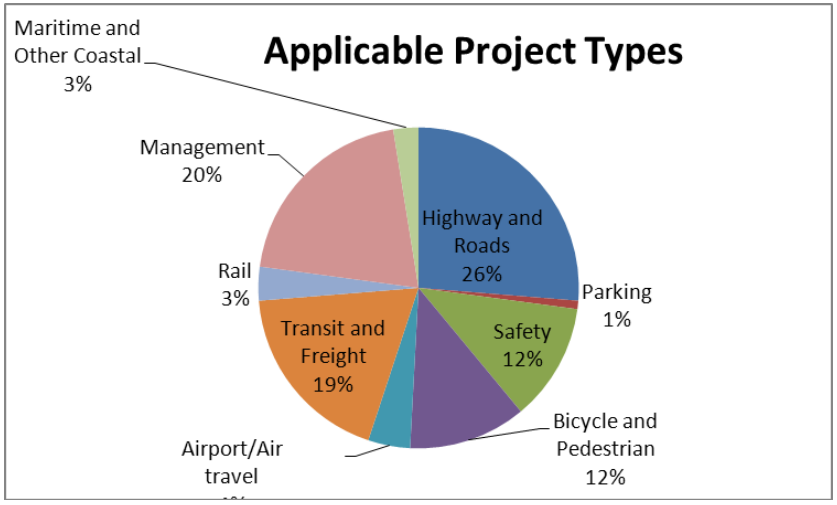
ROI Database Organization:
Categorization of Research Findings

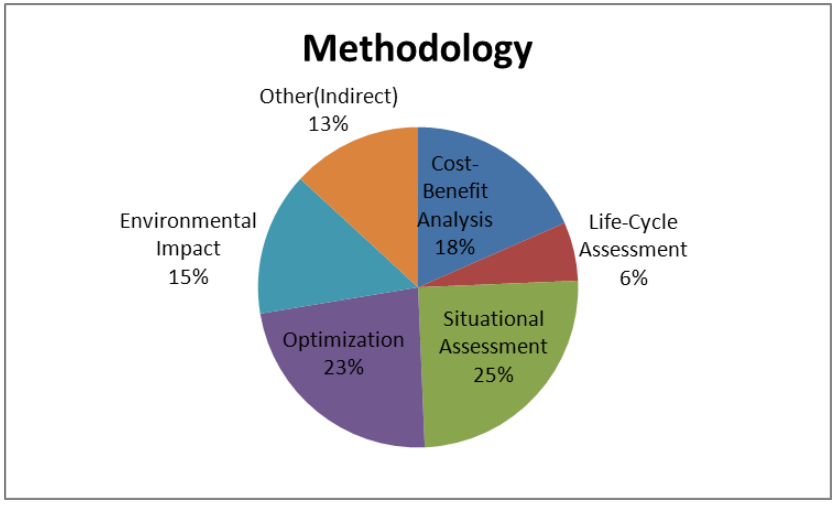
- Searchable Database
- Organized into following descriptive fields
  - Scale
  - Sub-Type of Sustainability
  - Type of Measurement
  - Focus of Tool
  - Applicable Project Types
  - Immediate Applicability to Transportation ROI
  - Transportation Decision-Making Phase
  - Methodology

Distribution of Tools

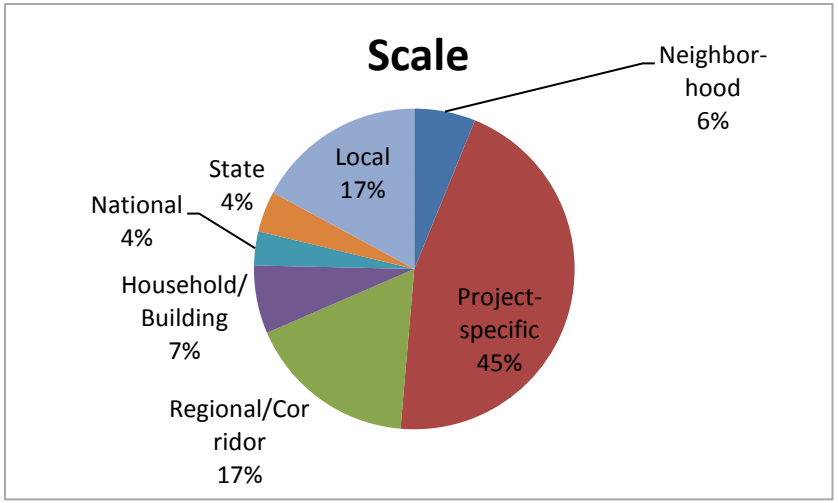


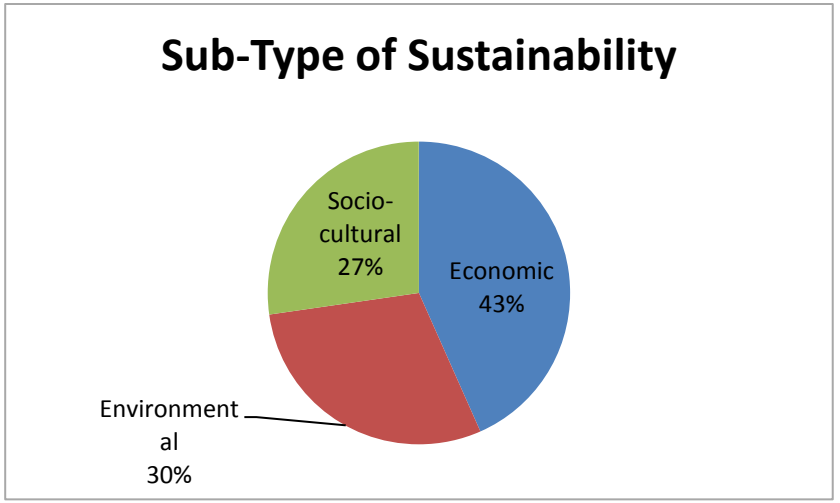


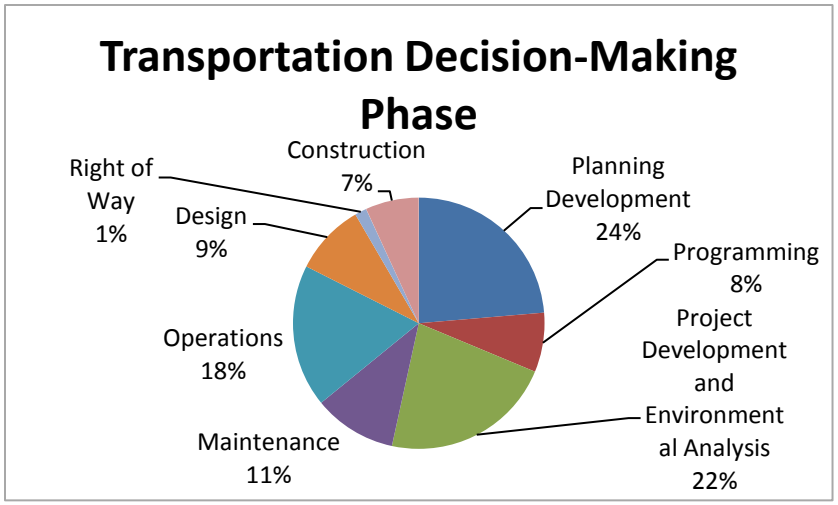


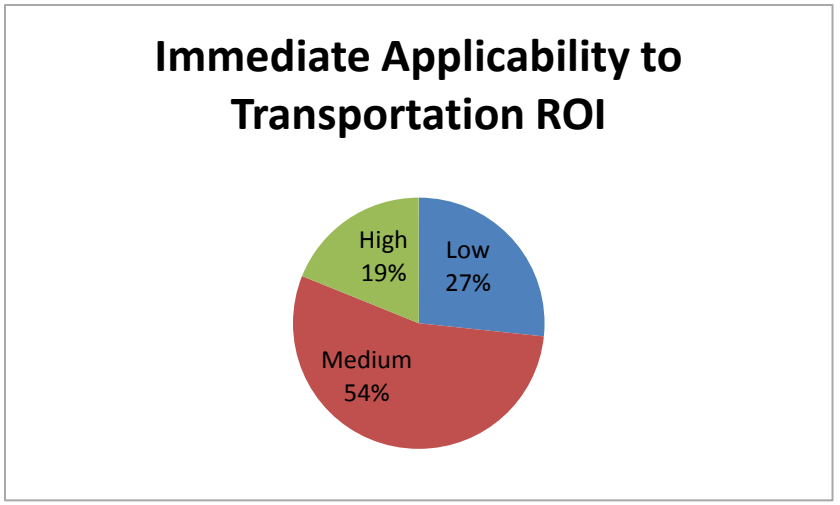


Distribution of Tools









Sustainable Return on Investment: FHWA Sustainable Highways

Project Development Credits

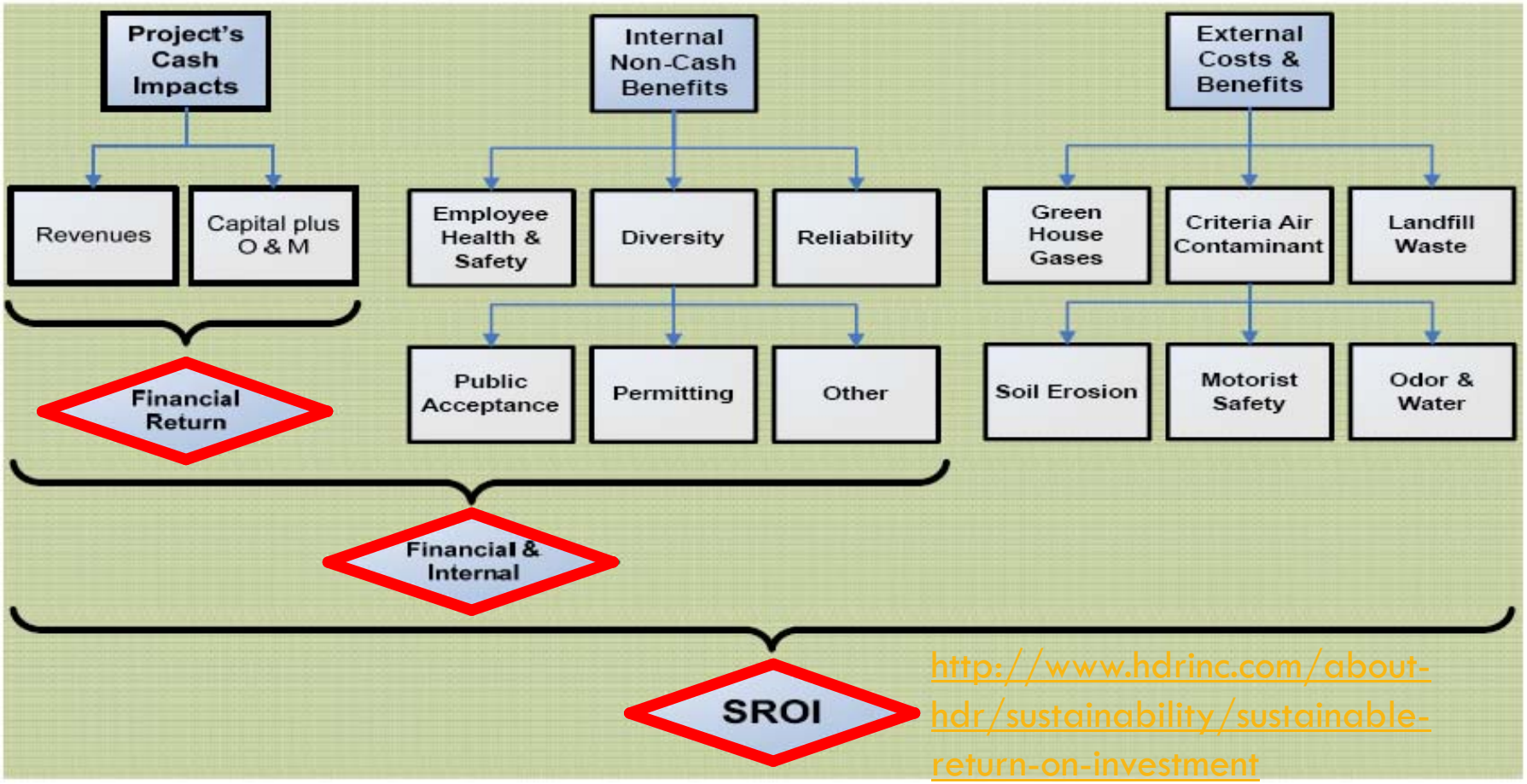
Credit	Title	Score
PD-1	Cost Benefit Analysis	0
PD-2	Highway and Traffic Safety	0
PD-4	Lifecycle Cost Analysis	0
PD-5	Freight Mobility	0
PD-6	Educational Outreach	0
PD-7	Tracking Environmental Commitments	0
PD-8	Habitat Restoration	0
PD-9	Stormwater	0
PD-10	Ecological Connectivity	0
PD-11	Recycle & Reuse Materials	0
PD-14	Pedestrian Access	0
PD-15	Bicycle Access	0
PD-17	Historical, Archaeological, and Cultural Preservation	0
PD-19	Low-Emitting Materials	0
PD-20	Energy Efficient Lighting	0
PD-21	ITS for System Operations	0
PD-22	Long-Life Pavement Design	0
PD-27	Construction Equipment Emission Reduction	0
PD-28	Construction Noise Mitigation	0
PD-29	Construction Quality Control Plan	0
	Project Development Score	**0**

http://www.sustainablehighways.org/

	Number of Points Required for Each Level Basic Scorecard
Total # Points	85
BRONZE (30%)	26
SILVER (40%)	34
GOLD (50%)	43
PLATINUM (60%)	51

Sustainable Return on Investment and the Triple Bottom Line: **HDR's SROI**

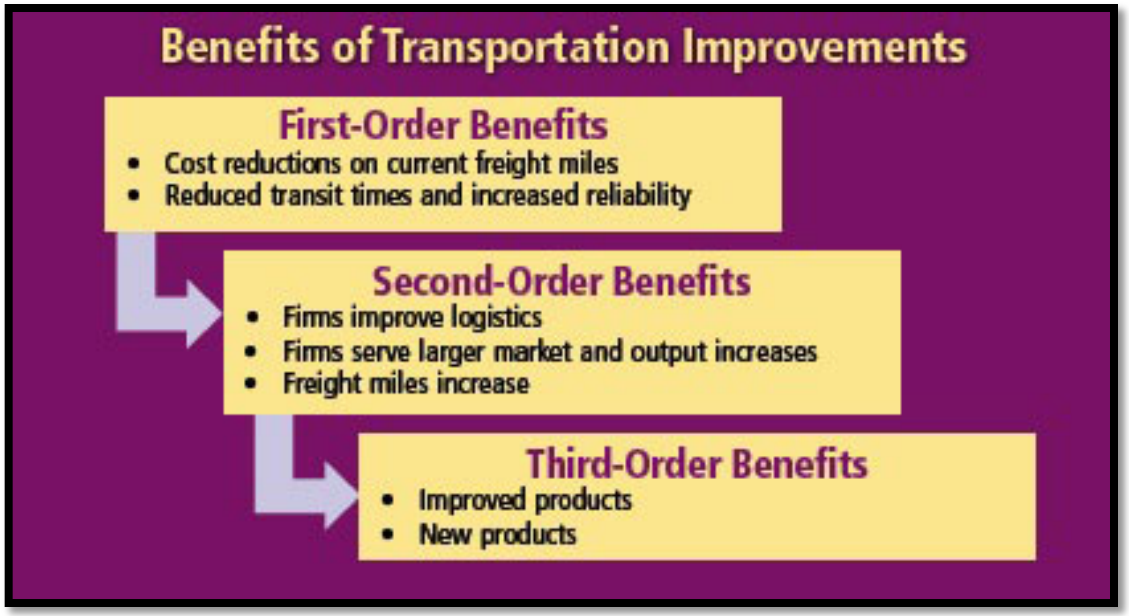
Denver Metro Waste Water - Overview

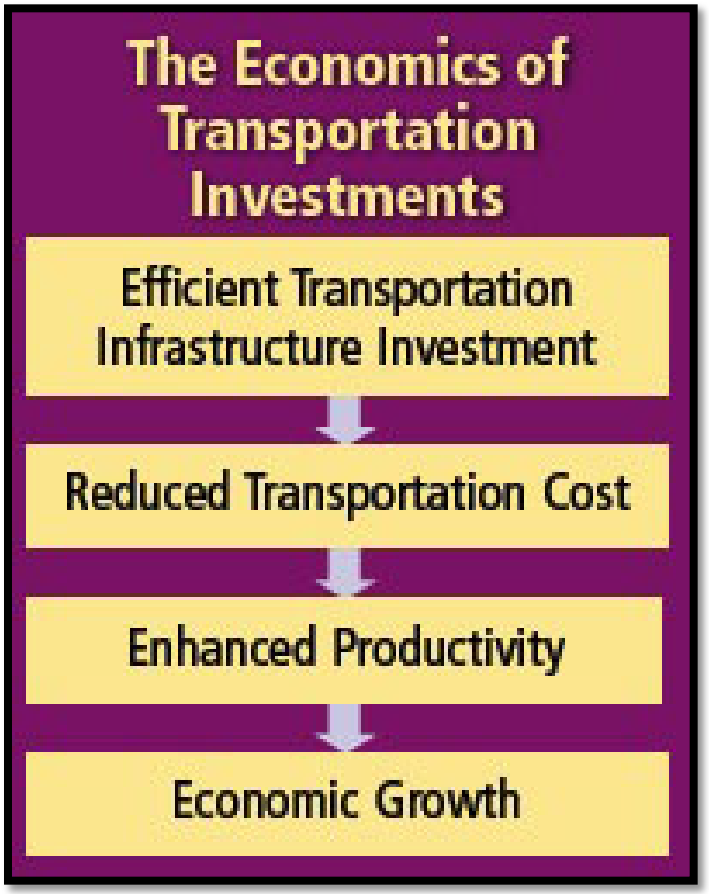


http://www.hdrinc.com/about-hdr/sustainability/sustainable-return-on-investment

Sustainable Return on Investment: Opportunities

- Provide long-term returns
- Identify cascading benefits
- Justify sustainable practices





Images originally produced by FHWA

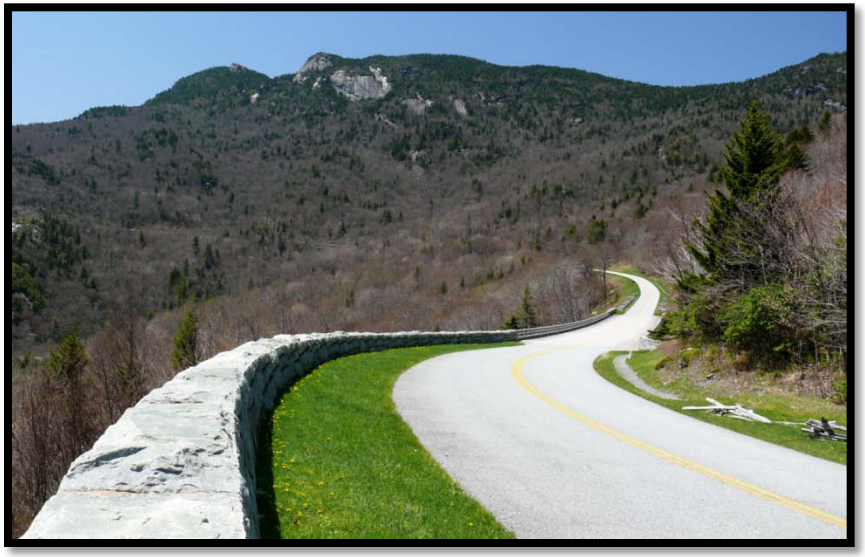
Sustainable Return on Investment: Challenges

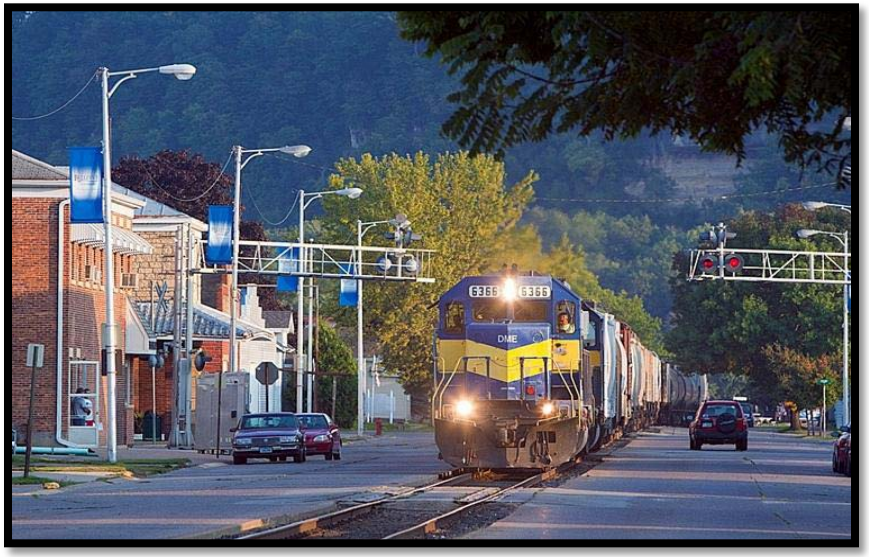
- Differentiating and addressing causal and correlated connections
- Data Needs
- Messaging
- Establishing a means to link indicators to ROI tools

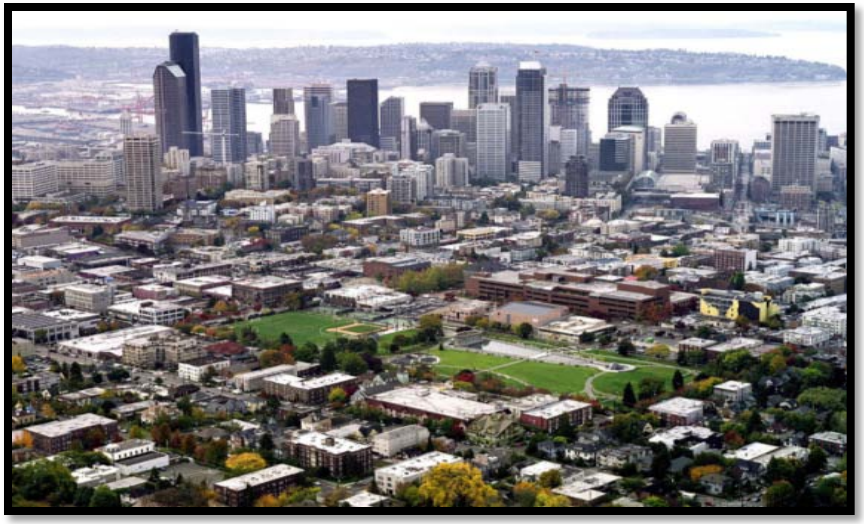
Sustainable Transportation Indicators and ROI: **Overlap**

- Indicators and tools conceptually linked
- An indicator database could inform what tools are used
- Indicators can be generated from ROI tool outputs
- Tools can be improved with a better set of indicators to provide guidance

The Importance of Place







Context Sensitive Transportation Indicators

- Defining Place

Place Type Indicator	Built Environment	Economic Function	Development Suitability
Intersection Density	X		
Patent density		X	
Average lot size	X		X
Ratio of building value to land value			X

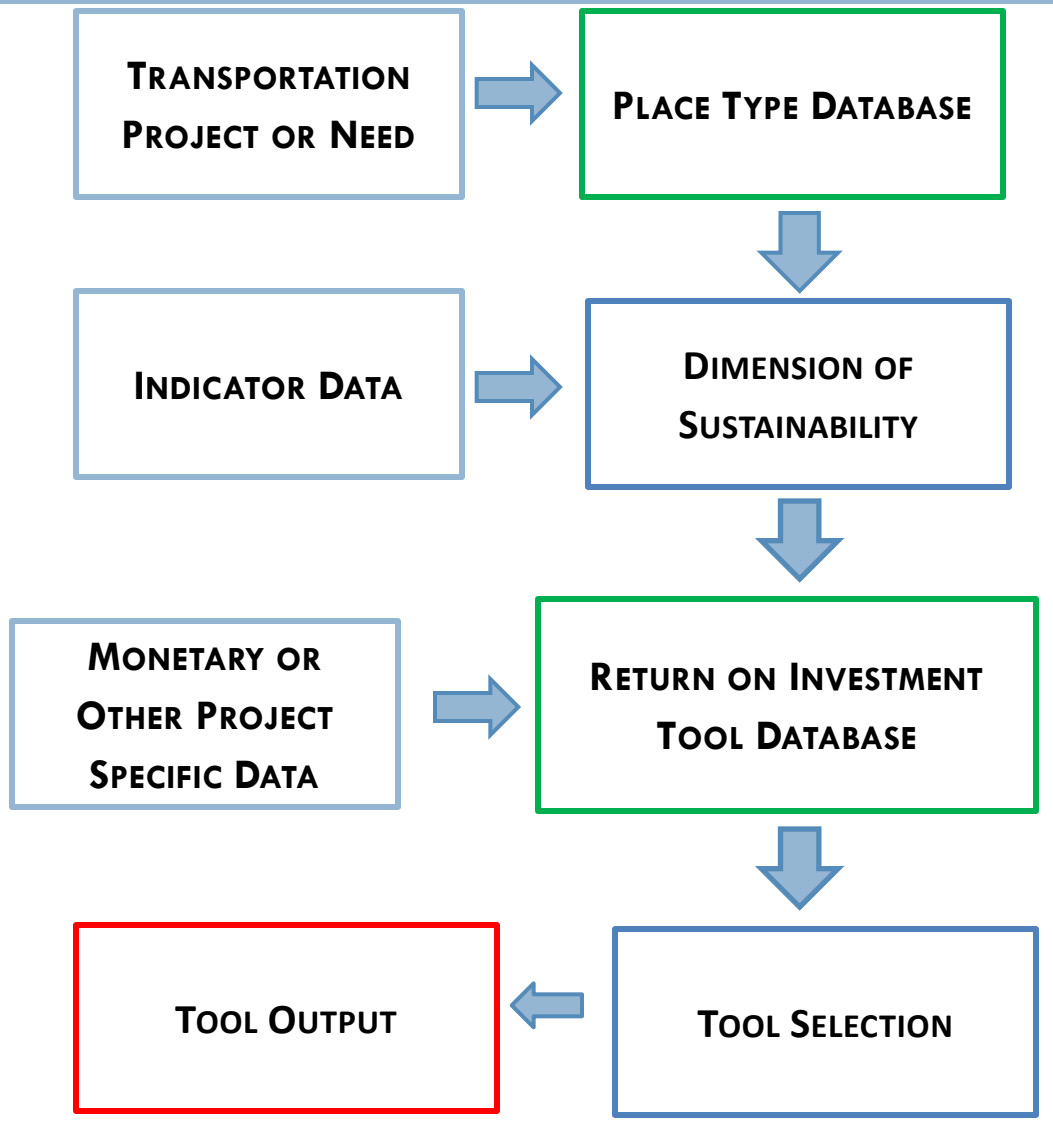
Context Sensitive Transportation Indicators

- Indicator Database

Performance Indicator	Environmental Capital	Human and Social Capital	Financial and Built Capital
Per Capita Impervious Surface	X		
Access to Basic Services		X	
Percentage of Household Income Spent on Transportation		X	X
Network/Intersection Density	X	X	X

Sustainable Transportation Indicators and ROI: **Overlap**

- Research envisioned as an alternative analysis process
- Graphic shown presents one way that the databases will be used
- The specifics of the databases will continue to evolve as research continues



ROI TOOLS AND INDICATORS: WHERE DO WE GO FROM HERE

- Best way to organize tools for integration into phases of transportation decision making
- Identifying useful data sources
- Research on causal links
- Culture change: moving to non-traditional measures for decision making