Sustainable Value Analysis for Transit & Active Transportation Infrastructure
The Benefits of Smart Transportation Choices

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Key Presentation Take-Aways

- Smart transportation choices can accomplish a variety of objectives beyond mobility
- Agencies are interested in leveraging their transportation infrastructure investments to accomplish multiple goals
- Today's transportation investment decision-making may consider significantly more factors than it has historically
- Important to have a well-thought-out process for evaluating projects and identifying this wider range of benefits, including health considerations

Benefits of Transit & Active Transportation (AT)

- Basic mobility
- An affordable transportation option for many
- Access to other modes of transportation – bike to transit, bus to train, etc.
- Physical fitness with walking to/from station
- Physical fitness and personal enjoyment walking/biking on active transportation facilities

Mobility and Other Objectives of Transit & AT Investment

Mobility

- Reduce travel time
- Improve access and connectivity
- Reduce vehicle operating costs

Objectives beyond Mobility

- Improve livability
- Help workers be more productive and generate jobs
- Provide safety enhancements
- Improve community health

How to evaluate?

Sustainability Value Analysis (SVA)

- **Best practices:**
  - Objective, theory-based
  - Peer-reviewed evidence
  - Monetary & non-monetary outcomes
  - Accounts for uncertainty
- **Key Features:**
  - Comprehensive
  - Transparent
  - Tailored to client and context
  - Decision metrics that matter
  - Multiple-objective framework

Sustainability Value Analysis (SVA)

Value-Based Rating Systems:
Value-based frameworks generate simplified approach to evaluating range of option

Economic Impact Analysis:
Input-output model multipliers used to estimate jobs impacts of sustainable solutions
Outcome: Jobs, wages, output

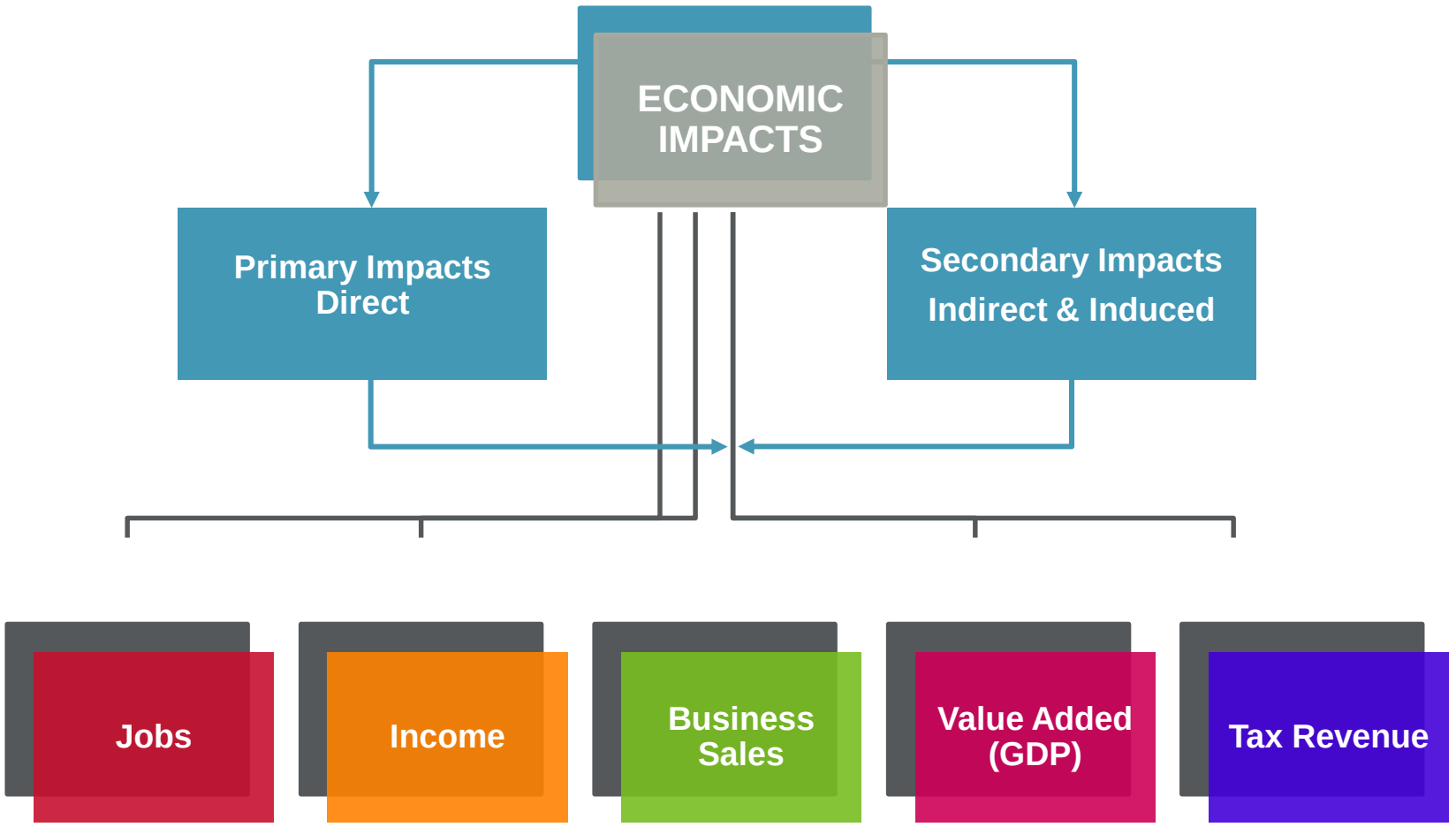
Multi-Objective Decision Analysis:
TBL accounting using multi-criteria analysis but applying economics principles
Outcome: Score

Corporate Sustainability Assessment:
Evaluate corporate initiatives, supply chain mgmt., facility risk using TBL

Lifecycle Cost Analysis:
Builds on lifecycle cost accounting with non-financial indicators in monetary terms
Outcome: discounted total costs

Sustainable Return on Investment:
Assigns dollar values to benefit categories and compares value directly with costs
Outcome: monetized benefits/costs, NPV, BCR

Economic Impact Analysis (EIA)



Economic Impacts of Active Transportation

Construction	• Investments made in construction of active transportation facilities → short-term impacts
Facility maintenance	• Longer term maintenance of bike trails, paths, and other bike/ped facilities → longer-term impacts
User equipment	• Other impacts generated by expenditures on active transportation equipment (e.g., bikes, apparel, maintenance, etc.) generate
Tourism	• UT organizations support a variety of events and activities geared toward tourists who wish to cycle. Expenditures associated with these events (lodging, food, etc.) generate additional economic impacts.
Healthcare savings	• Levels of physical activity may increase leading to subsequent reduction in risk of illness
Reduced employee absenteeism	• From people who are healthier due to walking/riding patterns may result in higher business productivity

Active Transportation & Health Context

- Individuals who are not active at least 150 minutes each week:
  - Miss an average of 0.63 days of work each year [1]
  - Could save $3.07 in annual healthcare costs for every mile they walk or $0.75 for every mile they bike [2]

[1] Asay GRB, Roy K, Lang JE, Payne RL, Howard DH. Absenteeism and Employer Costs Associated with Chronic Diseases and Health Risk Factors in the US Workforce. Preventing Chronic Disease. 2016;13:E141

[2] UD4H, Fehr & Peers, HDR, Economic Impacts of Active Transportation, https://bikeutah.org/atbenefitsstudy

UT Active Transportation Benefits Study Findings

Cycling related businesses generate:

$132 million in direct sales of equipment, supplies, etc

$303.9 million total output

Nearly 2,000 jobs

More than $46 million in income

Bike tourism generates:

$61 million in direct sales

$121 million total output

1,500 jobs

$46 million in income

If 6,410 inactive individuals walked 3 miles or 1 mile/wk, reduced absenteeism would generate:

$2.6 million in total output

16.8 jobs

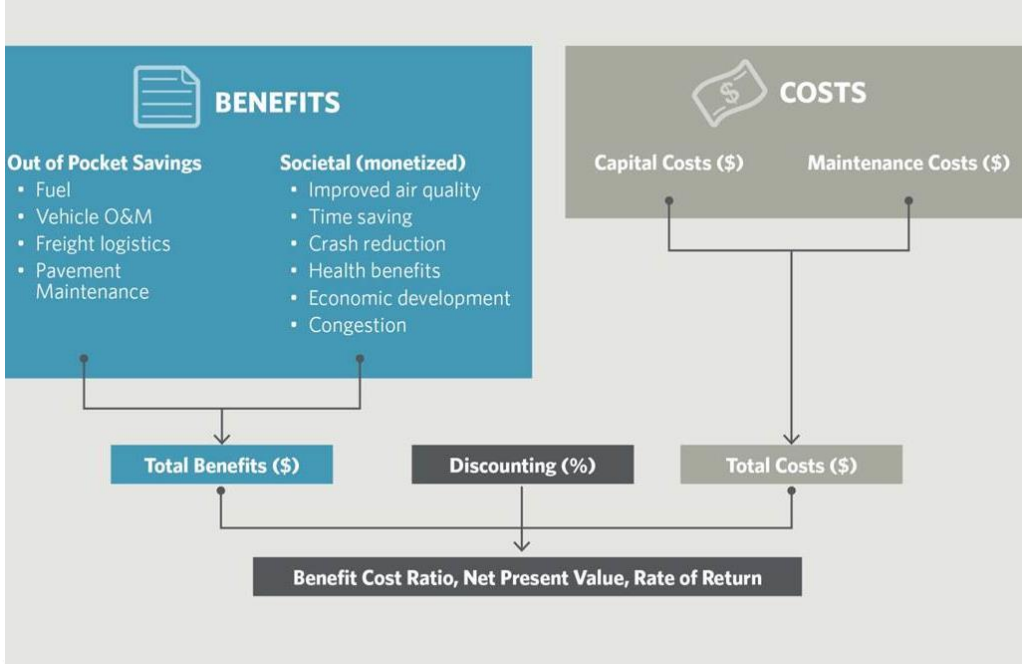
$0.9 million in income

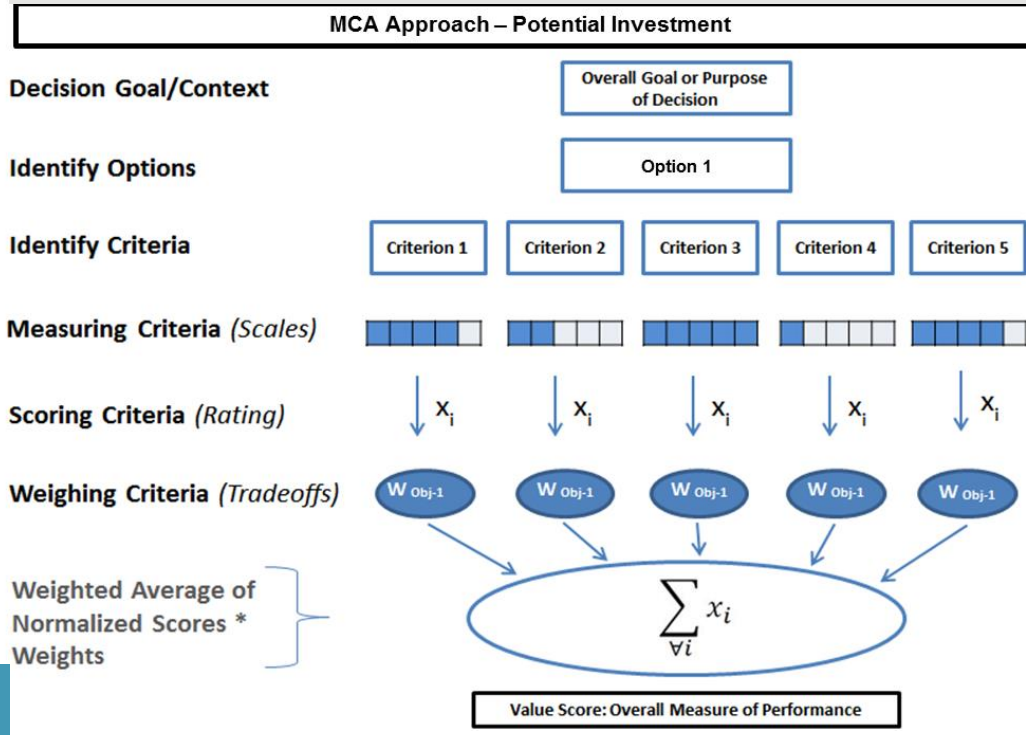
Note: 2015 dollars; Prepared by: UD4H, Fehr & Peers, and HDR, https://bikeutah.org/atbenefitsstudy/

SROI and Multi-Objective Decision Analysis (MODA)

- SROI
  - Provides monetized benefits and costs, including non-traditional considerations
  - Net Present Value
  - Benefit-Cost Ratio

- MODA or Multi-Criteria Analysis (MCA)
  - Incorporates qualitative and/or quantitative considerations that are not monetized
  - Low-Medium-High scoring
  - Numerical scoring





Societal Benefits Analyzed by SROI & MODA approaches

- Time savings
- Economic development opportunity
- Congestion reduction
- Journey quality
- Impact on businesses
- Impact on housing
- Health benefits
- Improved air quality
- Crash reduction

Health Benefits Considerations

Environmental

- Emissions reduction
- Water quality improvements

Improved Access

- # of Hospitals
- # of Doctor and dentist offices
- # of Recreational facilities

Health Hazards

- Impacts on:
  - Obesity
  - High blood pressure
  - Diabetes
  - Coronary heart disease
  - Mental health

Safety Benefits Consideration

Vehicle/Transit	Bike	Ped
• Reduction in number of crashes • Change in crash severity	• # miles of cycle tracks • # of off-road facilities • Crash reduction at intersections	• Crash reduction at improved intersections

SROI and MODA Process

SVA Transit & Active Transportation Accounting Framework - Physical Impacts

	$ Economic/Financial	Environmental	Community
Energy	__ **gallons of fuel** saved annually	___ **fewer cars** on road, in a car equivalent reduction in GHG	___ **fewer people at risk** of air pollutant – related illnesses
Vehicles/ Equipment	___ **% change** in annual operating costs	___ **% change** in stormwater pollutant concentrations	___ **% change** in personal vehicle operating costs
Land Facilities	___ **% change** in annual maintenance costs	___ **acres** of infill land development	__ **numbers** of properties with potential value growth
People	___ **of additional people** employed (full-time equivalent)	___ **induced riders** who divert from autos	__ **fewer** traffic accidents

SVA Transit & Active Transportation Accounting Framework - Monetary Impacts

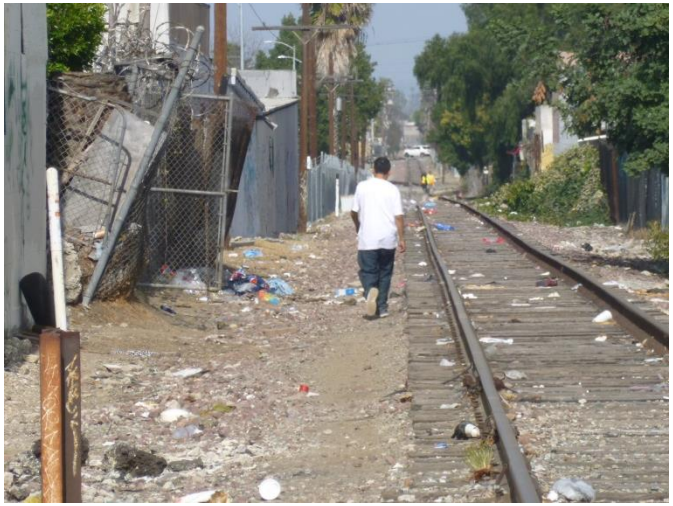
	$ Economic/Financial	Environmental	Community
Energy	**$__ in fuel** saved annually	**$___ reduced** lifecycle GHG	**$___** reduced criteria air contaminants
Vehicles/ Equipment	**$___** in annual operating costs	**$___** in improved water stream quality	**$___** in personal vehicle operating costs
Land Facilities	**$___** in annual maintenance costs	**$___ reduction** in cost of sprawl	**$__** long-term property value increase near stations
People	**$___ in annual income** for locally employed people	**$__** in total new user value	**$__** in safety, convenience, and health benefits

Sustainability Value Analysis Outputs

- Monetary and other values appropriate for use in federal discretionary grant applications (TIGER, FASTLANE, INFRA)
- All values useful for project prioritization or alternatives analyses

LA Metro Bike/Ped TIGER BCAs

- Project improves bike/public transportation linkages
  - 6.4-mile long corridor
  - Underutilized Metro-owned ROW
- Located in several disadvantaged communities in South Los Angeles.
- Benefit-Cost Analysis conducted to support TIGER application
  - Health benefit to new users included in BCA
  - Accident reduction benefits are also included
- TIGER award of $15 million in 2015

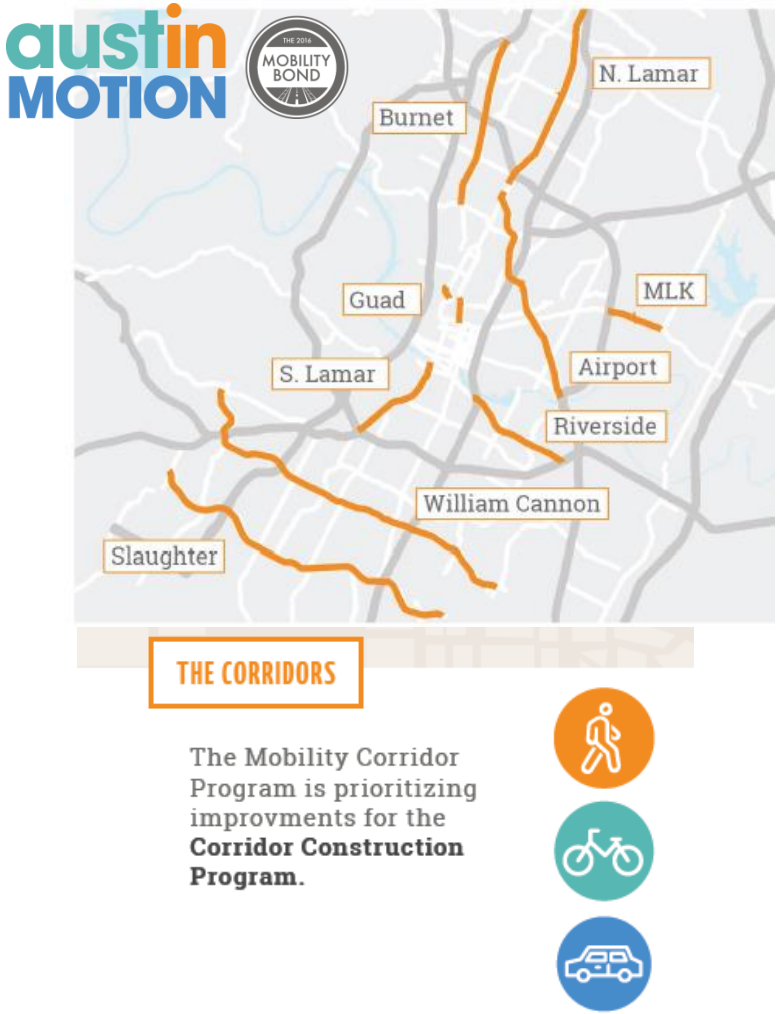


Photos Source: LA Metro

City of Austin Corridor Project Prioritization

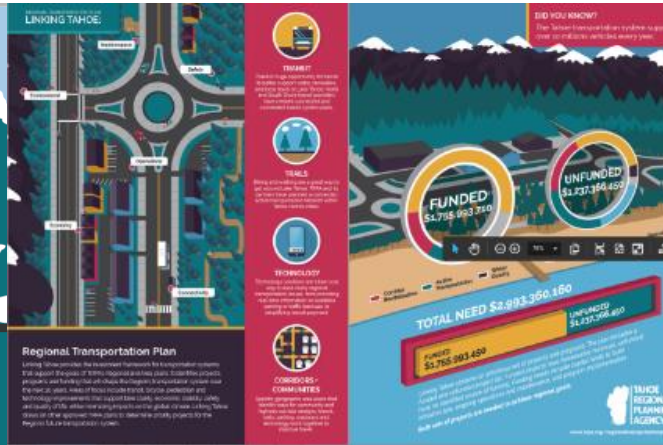
- $382 million available through 2016 Mobility Bond
- Multi-criteria analysis being conducted to determine which Corridor Plan recommendations will be funded first

The Contract with the Voters states: Before any construction funding is appropriated or construction initiated for these projects, the City Manager is directed to bring forth recommendations supported by identifiable metrics for implementation of a "Corridor Construction Program".



Conclusion

- Approaches exist for considering wider benefits of transit and active transportation
- Health benefits estimation continues to be refined
- Helpful to agencies to have approaches that incorporate consideration of wider-than-mobility benefits when identifying investment options
- Economic analysis used for decision making may also be helpful in obtaining discretionary federal funding



Benefits, cont'd.

- Regular physical activity can help: [3]
  - Control your weight
  - Reduce your risk of cardiovascular disease
  - Reduce your risk for type 2 diabetes and metabolic syndrome
  - Reduce your risk of some cancers
  - Strengthen your bones and muscles
  - Improve your mental health and mood
  - Improve your ability to do daily activities and prevent falls, if you're an older adult
  - Increase your chances of living longer

- A recent study found that those who are not active at least 150 minutes per week miss an average of 0.63 days of work each year [1]

- Nearly 45% of Utahans get less than the recommended 150 min/wk week of physical activity
  - Savings of $3.07 in annual healthcare costs for every mile they walk or $0.75 for every mile they bike could be generated[2]

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[3] Center for Disease Control, https://www.cdc.gov/healthyplaces/healthtopics/physactivity.htm