# Miami-Dade Social Return on Investment

*Calculating equitable, responsible cost to benefit ratios for transportation and public space investments in Miami-Dade County.*

## I. Background

Our overarching goal in cities is to improve the quality of life for community members. Local governments identify various ways to measure attainment of this goal through key performance indicators such as safety, air quality, mobility, and economic opportunity. A constant objective is to decrease costs while increasing benefits, yet this takes place in an incredibly dynamic ecosystem with millions of inputs and outputs and limited resources.

In this complex environment, it can be especially hard for governments to appropriately weigh the long term and hard-to-measure impacts of an investment. On top of a natural human bias toward the short-term, easily quantifiable components of a decision (i.e. the cost of a project), the Yerkes-Dodson law instructs us that people's decision-making abilities get further impeded when thinking about big and complicated challenges, such as the economic and environmental risks associated with climate change.

Breaking big problems down into tangible first steps to catalyze larger change is crucial. Assigning value to these steps can help to prioritize.

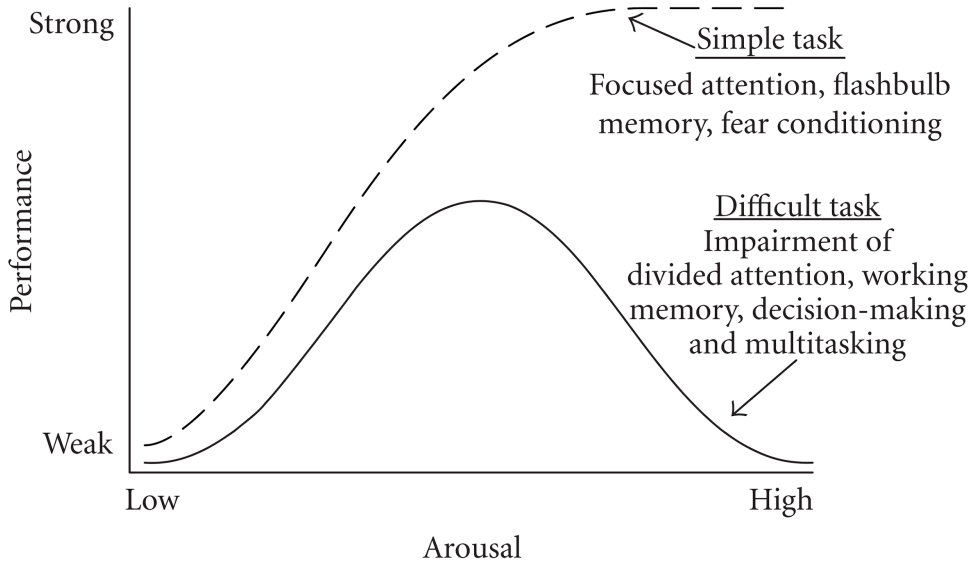



*Figure 1. The Yerkes-Dodson Law. Source: Yerkes and Dodson 1908 - Diamond DM, et al. (2007)*

As such, in this analysis we focus on the SMART plan's potential for quick, opportunistic forward movement, to establish "wins" that address Miami-Dade's most critical priorities. The objective of this analysis and our visual approach is to assist staff with decision-making and communicating with stakeholders. We do this by more closely aligning a comprehensive

understanding of values to outcomes, simplifying the challenges of weighing trade-offs in decision-making.

## II. Approach & Analysis

We began with a qualitative review of Miami's priorities and best practice indicators of a thriving, equitable city to identify guiding values and key social benefits to aim for.

**Guiding Values**

- Health
  - Air quality
  - Activity
  - Mental health
- Safety
  - Accidents
  - Perception of safety
- Environment
  - Climate change
  - Noise
- Resiliency
  - Ability to evacuate
- Economy
  - Job / wage growth
  - Taxes
  - Tourism
  - Productivity
- Equity
  - Mobility access
  - Job access
- Happiness
  - Cost saving
  - Residential satisfaction

**Social Utility Score of Individual Transportation Modes**

Using these guiding values, we developed a ranking of the overall social benefit, or social utility of different modes of transportation in relation to one another based on informed value judgments. We began with transportation modes to lay the groundwork for an analysis of a transportation infrastructure investment. Finding that transit scored highest in social benefit on an individual level, we focus the next analysis on Bus Express Rapid Transit.

Each mode is ranked on a scale of 1 to 10 based on a set of criteria:

Social Utility Score:

- 1 to 4: Negative effect on society
- 5: Neutral effect on society
- 6 to 10: Positive effect on society

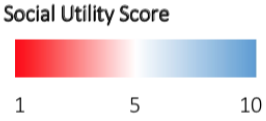
The criteria used to evaluate the social utility of each mode included:

- Space efficiency when in motion/ congestion
- Accessibility
- Equity

- Vehicle miles traveled (VMT)
- User cost
- Parking requirements and land use
- Curb space management
- Potential for car-free and car-lite lifestyles
- Healthy/active lifestyle related to use of services
- Greenhouse gas (GHG) emissions

*Table 1: Social Utility by Mode*

| CRITERIA | TRANSPORTATION MODE | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Single Occ Vehicle (SOV) | Carshare | Rideshare/ Taxi or For-Hire Vehicle | Ridesplit or Carpool | Private Shuttles | Micro-transit | Micro-mobility | Transit |
| Space Use When in Motion / Congestion | 1 | 2 | 3 | 4 | 6 | 5 | 7 | 8 |
| Vehicle Miles Traveled / Congestion | 1 | 3 | 3 | 4 | 7 | 7 | 10 | 9 |
| Cost to User | 1 | 3 | 4 | 7 | 9 | 7 | 9 | 8 |
| Curbspace | 1 | 6 | 7 | 7 | 6 | 6 | 8 | 6 |
| Car-free Lifestyle | 1 | 7 | 7 | 7 | 7 | 7 | 6 | 8 |
| Health/ Active lifestyle related to use of service | 1 | 7 | 1 | 1 | 5 | 5 | 10 | 7 |
| Accessibility | 5 | 5 | 4 | 4 | 5 | 5 | 3 | 10 |
| Equity | 2 | 6 | 4 | 5 | 3 | 5 | 7 | 9 |
| GHG Emissions | 1 | 3 | 3 | 4 | 7 | 7 | 10 | 9 |
| Social Utility Rating | Low | Medium | Low | Medium | Medium | Medium | High | High |
| Suburban Applicability | Yes | Limited | Yes | No | Limited | No | Limited | Yes |
| Distance | High | High | Medium | Medium | Medium | Medium | Low | High |




Through this exercise, we gained a broad understanding of the relative costs and benefits of shared mobility in relation to single occupancy vehicles (SOVs) and each other. We identified that all

shared mobility modes have a higher social utility (or public benefit) in comparison to SOV ownership. Transit and micro-mobility provide the highest social utility in relation to the rest of the private shared mobility modes but have limitations in market capabilities. Based on this preliminary assessment, this suggests the value of considering strategies that include:

1. Investing in transit and micro-mobility, and

2. Continued efforts to pursue partnerships with shared mobility providers, especially to support shared, high-occupancy modes.

We also learned a few lessons to adjust our approach in the next iteration. First, considering equity (such as access to transportation services for people with different economic and social statuses – including those who are unbanked or digitally impoverished) and accessibility (access to transportation services for people with disabilities) identifies disparities between modes for different users.

Second, the ranking of factors is highly context specific. For instance, if an area does not have congestion issues, then carshare may rank as a better approach than micro-transit or micro-mobility on grounds of accessibility and equity. To account for issues associated with context specificity, we assumed a high-density urban environment. Holding transit-oriented land use and urban form constant allowed for a comparison among all modes and a base understanding of the function of shared mobility, but it also introduces limitations.

Third, we found that individual costs and benefits vary greatly and conflate with preferences. For example, one person may enjoy the walk to the bus stop and therefore does not think of that as a cost, whereas someone else may see travel time as 100% cost, and everywhere in between. Similarly, one person may calculate the active lifestyle associated with micro-mobility as an individual benefit, while another may not think of it at all (a question that gets particularly tricky when we think about motorized micro-mobility). Even the price of a service, and its flipside, consumer savings, is a highly individualized cost/benefit as it depends on the person's price sensitivity and the value they feel they get from the mobility option.

This insight, in addition to the fact that people tend to automatically weigh their individual costs and benefits when making a decision, led us to remove Cost to User in the next iteration and focus on external, or social utility to remove subjectivity where we could.

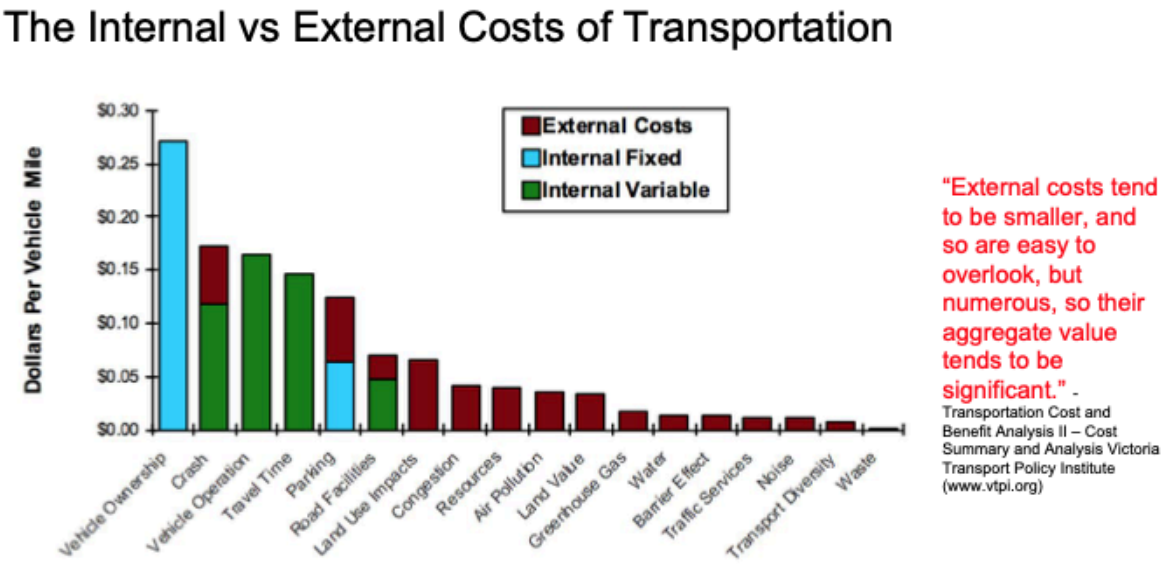



*Figure 2. Example of the numerous external costs often ignored in favor of obvious internal costs. We therefore focus the remainder of our analysis wholly on bringing external costs to light.*

## Analysis of SMART Transportation Return on Investments

Leveraging the research and social utility index values gathered prior, plus a literature review of cost/benefit studies from similar investments, we then began estimating the return on investment for one of the major infrastructure investments in the SMART plan: Bus Rapid Transit.

We estimated ROI values in terms of ratios over the course of the project lifespan as compared to the initial capital investment. We use round numbers in order to convey the large margin of error around such estimates and communicate most simply to community members.

Herein, we explain our rationale for individual data points below. For maximum transparency and engagement, we also display the bases of our estimates in the tool itself.

Project assumptions

Route: South Dade TransitWay Corridor, 20 miles
Life span: 30 years
Initial Capital Investment: 250M[1]

[1] Mid-range for FDOT estimate of 4-20 mil per mile http://www.fdotmiamidade.com/27thAvenueRapidTransit.html, low range of South Dade Corridor preliminary evaluation matrix https://www.miamidade.gov/transit/library/preli-alternative-eval-matrix.pdf

| Social Impact | Social ROI | Rationale | Sources |
|---|---|---|---|
| Decrease traffic accidents | 1x | The average crash fatality rate for buses is .2 deaths per billion passenger miles, compared to 6.53 deaths per bpm in an average automobile. The "Value of a Statistical Life" typically ranges from $7-12M. The Vehicle Miles Traveled (VMT) Reduction for the BRT South Corridor project was estimated as 160,000 to 175,000 through 2040. For such a small stretch of land, projections become impossible to make with confidence and traffic fatality data collected through the project lifetime may reflect any number of causes. We round the ROI to 1x to make it visible, as over the span of the entire SMART plan, the difference in safety between buses and cars becomes significant. | Transportation Fatalities by Mode<br><br>Denver Vision Zero value of a statistical life - 9.6M<br><br>South Corridor Draft Report |
| Improve mobility access | 10x | Providing more equitable and convenient mobility access is one of the main goals in Miami's SMART plan. We reason that addressing the greatest need generates a significant return for the government and society, so estimate an order-of-magnitude ROI. | Miami Dade SMART Plan<br><br>Getting to Work: Transportation Policy and Access to Job Opportunities |
| Reduce pollution | 10x | Mass transit reduces passenger-mile emissions by an average of 50% according to an analysis by the US Department of Transportation. Of particular note on this project, while the heavy- or light-alternatives considered by Miami-Dade would require excavation along the entire 20 mile long Transitway, with risks of contamination, | Transportation Cost Analysis - Air Pollution<br><br>Public Transportation's Role in Responding to Climate Change - USDOT<br><br>Economic Impact of Out-of-State Visitors in Florida<br><br>Economic risks of climate change |

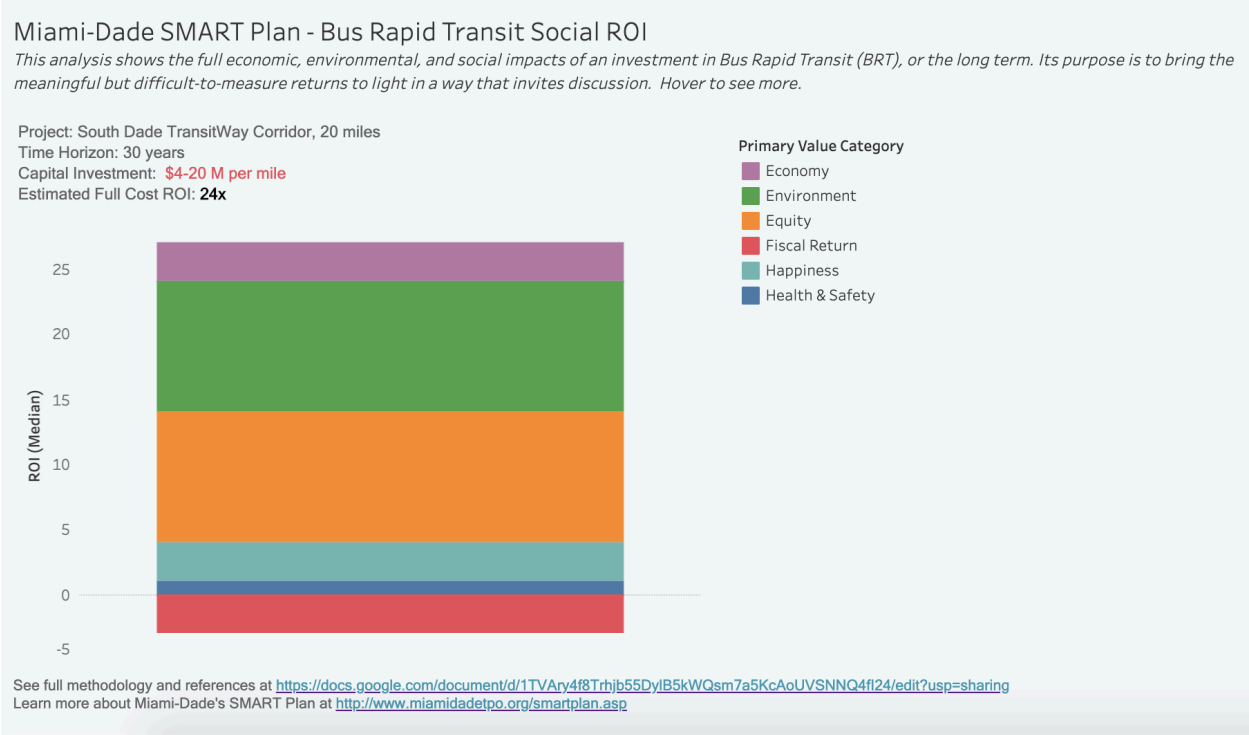
| | | | |
|---|---|---|---|
| | | the BRT alternative only affects the existing stations.<br><br>Also contributing to our analysis is the impact of emissions on mitigating climate change- related risks. Since Miami's economy is so tied to tourism, natural disasters can cost billions (or one can say that mitigating these risks can save billions). Finally, reducing congestion by removing vehicles from the road saves healthcare costs due to improved air quality and thus lower asthma rates, and drives the economy by reducing commute time. We estimate the combination of environmental, health, and economic impacts to be at least an order of magnitude larger than the initial investment, so we round the ROI to 10. | Climate Impact Lab study on social costs |
| Increase resident satisfaction | 3x | Willingness-to-pay surveys find improved public transit returns to be greater than 3 per dollar invested, due to convenience, reduced travel time, and cost savings. We propose running original survey research to improve this estimate. | A Cost-Benefit of Smart Transit Features at Small Scale Transit Operations<br><br>EDAPTS Cost-Benefit Evaluation<br><br>Kansas City SOAR Dashboard: Residential Satisfaction |
| Net operation and maintenance | -3x | The South Corridor draft report includes an estimate of $15M in O&M per year based on assumed service. While this category also includes the ability to recoup capital through ticket fees, we find that net operation and maintenance of public investments are consistently underestimated and therefore only look at the $15/year estimated O&M and round up to an ROI of -3 compared to the upfront capital investment. | South Corridor Draft Report<br><br>The More We Build, The Poorer We Get<br><br>Average Loss per Passenger Ride by U.S. Metro Rail System (2013) |

| | | | |
|---|---|---|---|
| Bring economic value | 3x | We anticipate an increase in jobs and sales tax revenue over the long term due to increased mobility access and competitiveness in attracting business. Our estimate is based on a full return on initial investment each decade of the assumed project lifespan. | Economic Impact of Public Transportation Investments (Weisbrod, 2009)<br><br>Economic Impact of Senate Bill 1 in California<br><br>Transit Service, Physical Agglomeration and Productivity in US Metropolitan Areas |

## III. Visualization

In order to make the analysis most actionable for you and helpful to Miami-Dade community members to understand government decisions in providing services and infrastructure, we built a visual and interactive tool we call the Social Benefit Calculator.

The Social Benefit Calculator's purpose is to bring the meaningful but difficult-to-measure social impacts of investments to the forefront of people's minds in a clear way that invites discussion. As such, the Calculator is most helpful at the start of a project or initiative during the ideation and planning phases to gain stakeholder buy-in and input. Throughout the implementation phase, it should then be used to monitor new information and take actions to realize the projected social benefits.




*Basic Example - Social Benefit Calculator. Analysis of Bus Rapid Transit showing an estimated return of 24x investment over the next 30 years. Live tool accessible here.*

The key features of the Calculator include:

- Makes the invisible visible - Focus on naming and broadly estimating all significant social costs and benefits keep the decision-making process rooted in reality and attentive to typically overlooked factors related to equity, quality of life, and the environment.

- Flexible, open-source framework allows staff and community members to make adjustments over time to take new information into account, as well as apply the framework to different policies and investments

- Long-term time horizon (30 years for infrastructure, 10 years for add-on investments) helps guide smart decisions

- Simple, visual interface maximizes community engagement and informed discussion

## IV. Applications

In order to make the calculator as usable and transparent as possible for government staff and community members alike, we use Google Sheets to input all values. The structure is meant to be flexible, so that the framework and Calculator may be applied to investments well beyond transportation and the SMART Plan. The template includes instructions as well as examples, which we expand on below.

| **Bus Express Rapid Transit** | | | | | |
|---|---|---|---|---|---|
| 30 Year Time Horizon. $s in millions | | | | | |
| **Social Impact** | **Primary Category** | **Secondary Categories** | **Monetary Ratios (Median)** | **Total Estimated ROI (Median)** | **Rationale** |
| Decrease traffic accidents | Safety | | 1 | $60 | The average crash fatality rate for buses is .2 deaths per billion passenger miles, c |
| Decrease congestion | Health | Environment, Qua | 10 | $600 | Buses and trains have the highest capacity (people per square foot) relative to othe |
| Improve mobility access | Equity | Economy, Happir | 10 | $600 | Providing more equitable and convenient mobility access is one of the main goals |
| Mitigate climate change associated risks | Environment | Economy, Safety | 30 | $1,800 | Given the massive scale of Miami's tourism industry on sales revenue and jobs, an |
| Bring joy | Happiness | | 3 | $180 | Willingness-to-pay surveys find improved public transit returns to be greater than $ |
| Increase perception of safety | Safety | Happiness | 0 | $0 | N/A |
| Opportunity cost of net operation & maintenance | Fiscal Return | Economy, Safety | -30 | -$1,800 | Similar to the economic impacts of climate change, we find that net operation and |
| Bring economic value | Economy | | 3 | $180 | We anticipate an increase in jobs and sales tax revenue over the long term due to |
| | | | | | |
| | | | | | |
| Initial Capital Investment | | | | 60 | In the low end of the range for BERT estimated by FDOT |

*Google Sheets framework - basic example for Bus Express Rapid Transit.*

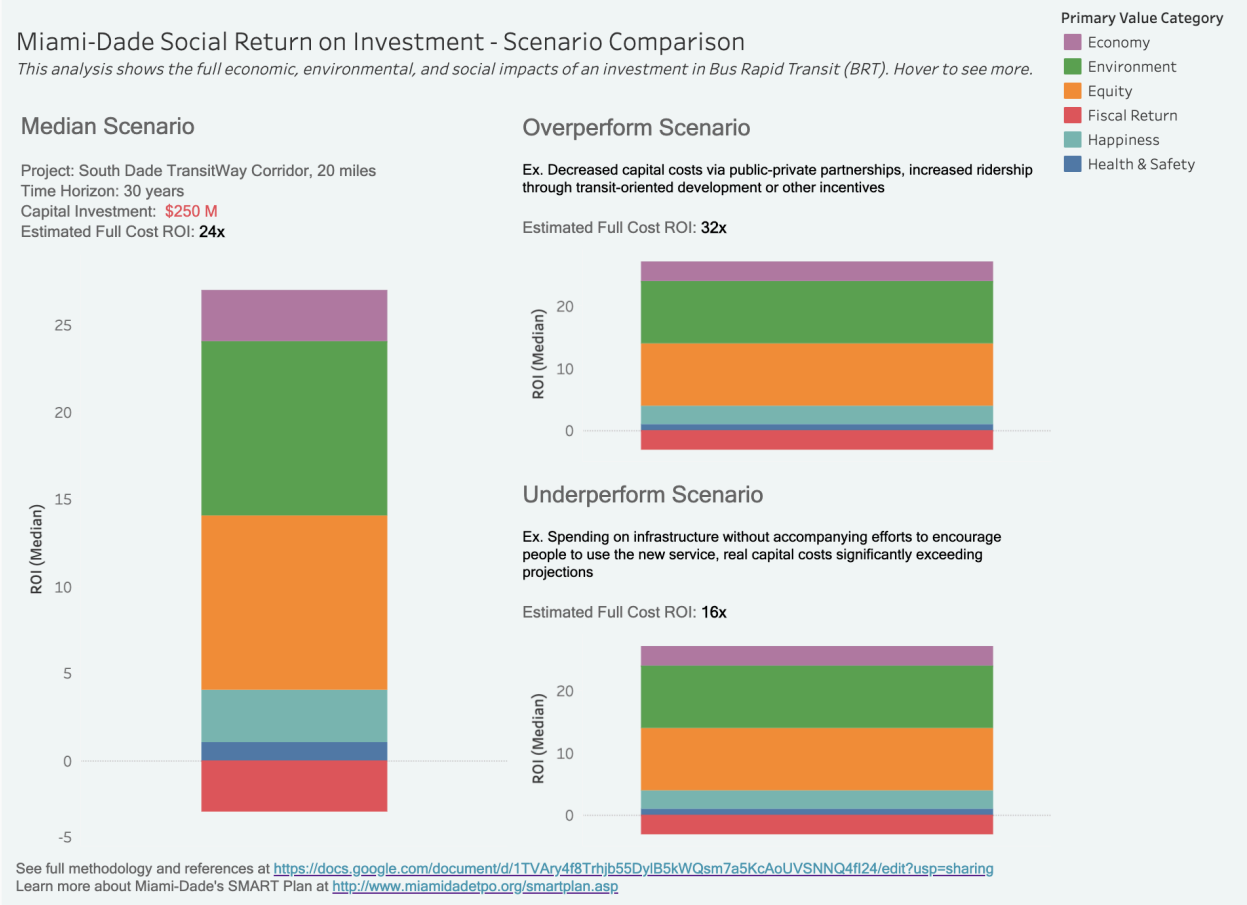
The information a user needs to fill in includes the top social impacts of an investment or policy, value categories for those impacts, a broad-strokes estimate of the initial capital investment, long-term (30 year) social benefit estimates as compared to that investment, and documentation explaining the rationale. All such information should be updated over the course of the project lifespan as new information becomes available.

### **Scenario Building**

Given the many complex variables in the urban environment, we recognize that an investment may unfold differently from projections. Even in the course of implementing a single project, things can change, particularly as we consider the high degree of uncertainty over the course of the project lifespan. We therefore also want to demonstrate some alternate scenarios that could enhance or impede social return on investment.

The first is an “Overperform Scenario,” where we imagine capital costs decreasing through public-private partnerships, or, on the benefits side, increasing ridership such as through

transit-oriented development. Indeed, public-private partnerships are already underway for SMART Plan Demonstration Projects. The second is an "Underperform Scenario" where we imagine spending on the infrastructure without accompanying policies or marketing efforts to encourage people to use the new service, or real capital costs significantly exceeding projections.



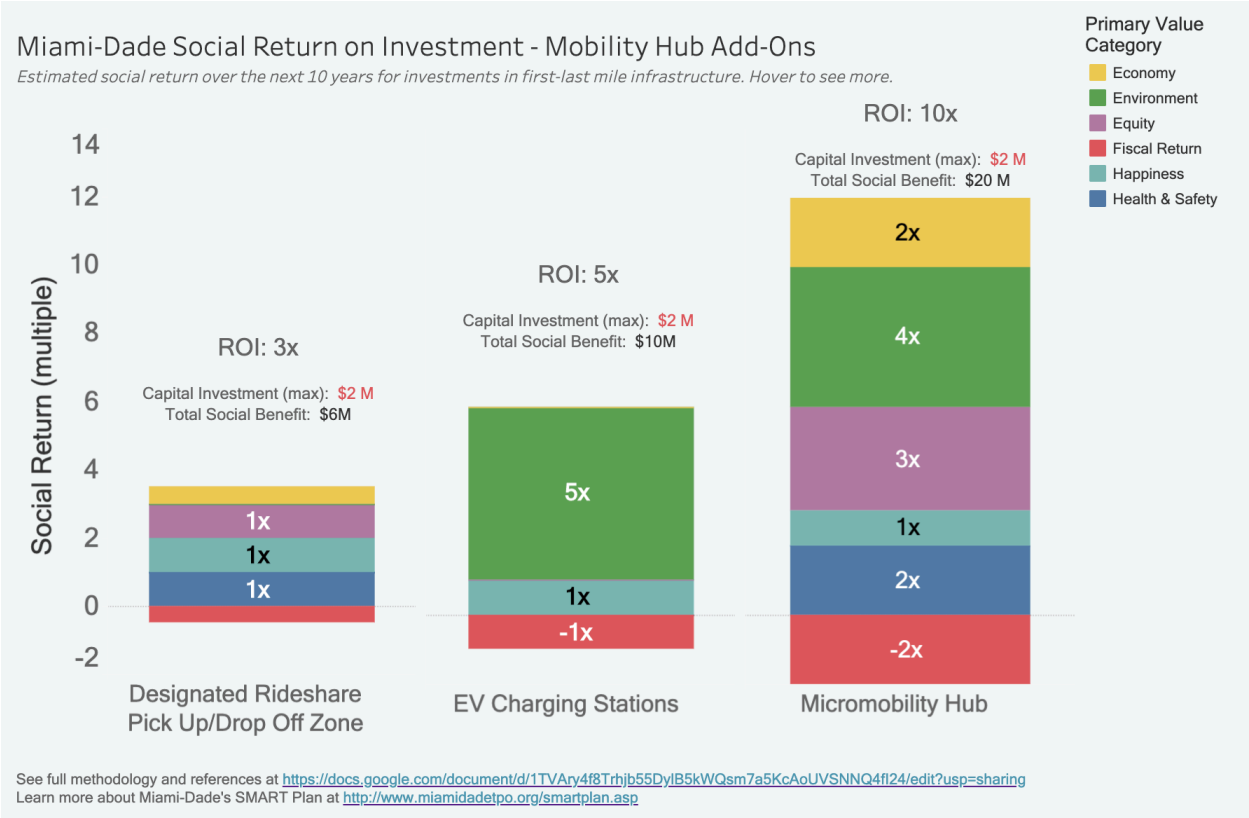

*Alternate Scenario Cost/Benefit Analyses of Bus Express Rapid Transit. Live tool accessible here.*

## Investment Comparison

In addition to showing the merits of a given investment in relative terms (multiple of investment), and analyzing scenarios that may unfold over the course of implementation, it is also important for any decision support and communication tool to be able to compare options.

For Miami-Dade, we focused the comparison on SMART Plan Demonstration Projects, specifically "first-last mile demonstration solutions." These investments are all less capital-intensive than transit and serve as a complement rather than an alternative to Bus Rapid Transit. Indeed, the three options we compare below- a designated rideshare pick up and drop off zone, electric vehicle charging stations, and a micro-mobility (bike and scooter) hub- would each be well situated at a transit station for maximum visibility and use.

While the investments are certainly not mutually exclusive (combining multiple SMART demonstration projects may even create a multiplier effect on social benefits), we find it is helpful to know where to start putting resources in order to get the most social return.




*Cost/Benefit Comparison of SMART Plan Add-On Investments. Live tool accessible here.*

Our methodology for assigning these values was similar to investigating Bus Rapid Transit for Miami-Dade's South Corridor. Additional research and references listed here:

SMART Demonstration/"Add-On Investment" assumptions

Location: The Dadeland South Metrorail Station sits on one end of the new South Corridor Bus Rapid Transit Line. The line then extends to the SW 344th Street Park-and-Ride/Transit Terminal and provides a mobility connection between the Miami Central Business District and the Village of Pinecrest, the Village of Palmetto Bay, Town of Cutler Bay, City of Homestead, and Florida City.[2]
Life span: 10 years
Initial Capital Investment: 2M each

| Social Impacts Considered | SROI: Designated rideshare pick up and | Rationale | Sources |
|---|---|---|---|

[2] While these broad-strokes estimates are meant to be applicable across transit stops in varying locations, it is helpful to have a particular location in mind to recognize needed adjustments.

| | drop off zone, EV charging stations, and Micro-mobility hub | | |
|---|---|---|---|
| Decrease traffic accidents | 0, 0, 0 | Not enough information, particularly regarding the impact the investments would have on total vehicle miles traveled. | Passenger Fatalities per Billion Passenger-Miles, 2000-2014 (BTS)<br><br>Victoria Transit Policy Institute: Social Costs of Congestion<br><br>Bike-share schemes improve safety<br><br>The Safety of Bikeshare Systems |
| Improve mobility access | 1, 0, 3 | Providing more equitable and convenient mobility access is one of the main goals called out in Miami's SMART plan.<br><br>We anticipate a designated rideshare zone would improve the experience of getting to and from transit stations for handicapped individuals/paratransit services.<br><br>Small transportation devices such as bikes and scooters are inexpensive compared to larger vehicles, whether shared or privately owned, which helps more people to get around. We estimate this total benefit as 5x investment, split between economic value (as more people can access jobs), and equity (getting around in general). | Miami Dade SMART Plan<br><br>CityLab - benefits of ridesharing for seniors and the disabled<br><br>Vox - "The Scooter Stampede of 2018 Is Great News for Urban Transportation"<br><br>Mobility Benefits of Dockless Scooters in Chicago |
| Reduce Pollution | 0, 5, 4 | Not enough information, particularly regarding the impact this would have on total vehicle miles traveled. | Vox - Economic Risks of Climate Change |

| | | | |
|---|---|---|---|
| | | Building the infrastructure to push the widespread adoption of electric vehicles can go a long way in reducing transportation-related emissions, which both improves air quality as a direct impact, and mitigates the risks associated with climate change. Given the massive scale of Miami's tourism industry on sales revenue and jobs, and the increasing frequency and extremity of natural disasters, we reason that the savings in mitigating risk generates a return of .5 for each year in the assumed project lifespan.<br><br>Making it convenient for people to choose active transportation over vehicles reduces transportation-related emissions. Given the massive scale of Miami's tourism industry on sales revenue and jobs, and the increasing frequency and extremity of natural disasters, we reason that the savings in mitigating risk at least generates a return of .5 for each year in the assumed project lifespan. | The Guardian: Cost of Climate Change to Society<br><br>Wired: "Let's Count The Ways E-Scooters Could Save The City<br><br>Impact of Bikesharing in New York City<br><br>Impact of Bikesharing in Beijing<br><br>Electrical Bikes and Scooters for Delivery of Goods and Passenger Transport in Urban Areas |
| Increase Resident Satisfaction | 1, 1, 1 | A well-lit, clearly labeled designated zone would improve the mobility experience of getting to and from transit or major centers of activity, as people feel safer and more comfortable getting dropped off or picked up. We estimate a full return on investment between the safety and happiness categories, which we believe is conservative given | A Cost-Benefit of Smart Transit Features at Small Scale Transit Operations<br><br>EDAPTS Cost-Benefit Evaluation<br><br>LADOT Transportation Happiness Initiative<br><br>Kansas City SOAR Dashboard: Residential Satisfaction |

| | | | |
|---|---|---|---|
| | | similar studies of labeling and signage investments. We recommend gathering customer feedback to validate or adjust.<br><br>Aside from mitigating the risks associated with climate change, reducing transportation-related emissions improves air quality, and thereby quality of life.<br><br>Some community members will love the introduction of more bikes and scooters, some will hate it. We think over a 10-year span though, people will get used to them being there and the net sentiment will be positive. | |
| Increase perception of safety | 1, 0, 0 | A well-lit, clearly labeled designated zone would improve the mobility experience of getting to and from transit or major centers of activity, as people feel safer and more comfortable getting dropped off or picked up. We estimate a full return on investment between the safety and happiness categories, which we believe is conservative given similar studies of labeling and signage investments. We recommend gathering customer feedback to validate or adjust.<br><br>Unknown/negligible<br><br>Unknown/negligible | Bikesharing and Bicycle Safety<br><br>Bike-Share Success in Bed-Stuy<br><br>Effectiveness of crime prevention through environmental design (CPTED) in reducing robberies<br><br>The Cost of Crime to Society: New Crime-Specific Estimates for Policy and Program Evaluation |
| Net operation and maintenance | -.5, -1 -2 | Minimal maintenance anticipated over 10 years. The operation and maintenance cost could go up with additional | ITDP - Bike Share Planning Guide |

| | | | |
|---|---|---|---|
| | | features such as restroom facilities, which would also impact the ensuing benefits.<br><br>Operation and maintenance costs for electric vehicle charging infrastructure includes electricity consumption and demand charges, management time, preventative and corrective maintenance, and repairs (scheduled and unscheduled.) There is also some opportunity to recuperate investment costs with fees.<br><br>Bikes and scooters require maintenance of the equipment as well as roads, sidewalks, and bike lanes. | SAQMD - Bike Share Business Plan<br><br>City of Baton Rouge Bike Share Business and Implementation Plan |
| Bring economic value | .5, 0, 2 | TNCs create jobs, as there is a low barrier to entry to become a driver. We assume a small increase in TNC activity as a result of investing in infrastructure that improves the ridesharing experience.<br><br>Negligible<br><br>Small transportation devices such as bikes and scooters are inexpensive compared to larger vehicles, whether shared or privately owned, which helps more people to get around. We estimate this total benefit as 5x investment, split between economic value (as more people can access jobs), and equity (getting around in general). | Economic contribution of bikesharing in Ireland<br><br>Electrical Bikes and Scooters for Delivery of Goods and Passenger Transport in Urban Areas |

| | | | |
|---|---|---|---|
| Healthcare savings | 0, 0, 6 | Unknown/negligible<br><br>Unknown/negligible<br><br>Bikes and scooters encourage a more active lifestyle. More research needed. | Health effects of London's bikeshare system<br><br>Impact of bikesharing in Beijing |

## V. Recommended Implementation Plan

- Operationalize the tool:
    - Document and share the process for updating the Social Benefit Calculator and applying the framework to different investments using the google sheets back-end.
    - Adopt a regular timeframe to evaluate this tool and make updates (e.g. quarterly, annually, etc.).
    - Assign responsibility to key staff to manage tool and updates.
    - Document lessons learned when applying the tool to inform future updates.
    - Consider strategy of sharing lessons learned both internally and externally as a thought leader.
- Build support:
    - Develop a brief presentation as a "roadshow" to inform key stakeholders including policymakers, government and partner agency staff, partners, and the general public about the calculator, how it will be used, and the advantages it provides to Miami.
    - Provide online information and incorporate this tool analysis in future communications about infrastructure and service changes to help build an understanding of a more data-driven approach to decision-making in these areas.
    - Consider establishing an FAQ online to track and respond to questions and ideas that may come up regarding this tool.
    - Considering developing a dashboard to track ongoing analysis of the benefits and trade-offs of infrastructure and service decision-making to compare initial considerations with ongoing impacts.
- Sustain the tool:
    - Inventory available data that can further support this evaluation tool; identify what might be missing and establish a "wish list" for future data for future iterations of this tool.

- Establish data-sharing agreements with third parties and a work plan for government-owned data to support this tool in the future.

- Develop training module to share the tool and encourage use by key decision-makers and potential partners.

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## VI. Appendix

### Examples of Full Cost Accounting

**SEMCOG** — **SIMPLIFIED ECONOMIC ANALYSIS TOOL**

| DIRECT USER BENEFITS (mil. 2010$) | 25-Year Total | Annual Average |
|---|---|---|
| Travel Time Savings | $932.3 | $37.3 |
| Vehicle Operating Cost Savings | $84.0 | $3.4 |
| Safety Improvements | $0.0 | $0.0 |
| Emissions Cost Savings | -$20.1 | -$0.8 |
| TOTAL USER BENEFITS | $996.2 | $39.8 |
| BENEFIT-COST RATIO | 3.3 | |
| NET PRESENT VALUE (mil. 2010$) | $696.7 | |

*Note: Impacts on the SEMCOG regional economy do not include short-term construction impact*

| IMPACTS ON SEMCOG REGIONAL ECONOMY | 25-Year Total | Annual Average |
|---|---|---|
| Gross Regional Product (mil. 2010$) | $2,139.3 | $85.6 |
| Real Personal Income (mil. 2010$) | $2,404.6 | $96.2 |
| Employment (job-years) | 16,744 | 670 |
| Natural Resources, Mining & Utilities | 32 | 1.3 |
| Construction | 1,139 | 45.6 |
| Manufacturing (other than Motor Vehicles) | 281 | 11.2 |
| Motor Vehicles, Bodies & Parts Manuf. | 22 | 0.9 |
| Wholesale & Retail Trade | 1,601 | 64.0 |
| Transportation and Warehousing | 606 | 24.2 |
| Information, Finance & Real Estate | 1,804 | 72.2 |
| Management, Prof. Services, Education | 1,569 | 62.8 |
| Health Care & Social Assistance | 2,595 | 103.8 |
| Accomodation & Food Services | 1,370 | 54.8 |
| Other Services | 3,260 | 130.4 |
| Government | 2,466 | 98.6 |

Vancouver Cost of Commute Calculator

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# LADOT's Core Principles for Transportation Happiness

ACCESSIBILITY

## Freedom to Get Around

I have the flexibility to select among safe, easy-to-understand, and universally-designed options to help me get to where I need to be in a timely manner.

RELIABILITY

## Freedom from Disruptions

I can get where I need to go, when I need to go, with seamless infrastructure and responsive services, whether on my daily commute or on a spontaneous trip.

SAFETY & COMFORT

## Freedom from Harm

I can enjoy my trip free from harassment and harm, using a safe, comfortable, and intuitive system.

CULTURE & COMMUNITY

## Freedom to Connect

I feel connected to my neighborhood and can celebrate our city's cultural diversity and unique places.

EQUITY & TRANSPARENCY

## Freedom from Exclusion

I can rely on LADOT to respect and empower communities through transparent decision-making and clear operations, to invest equitably, and to avoid disproportionate impact.

Do you have feedback on this document? Submit via email to ladot.innovation@lacity.org, or use the hashtag #TransportationHappiness or #TranspoHappiness on your favorite social media platform and tag @ladotofficial!

# Transportation Happiness Metrics will help LADOT track how well the Core Principles are being upheld.

### Accessibility

1.1
**I can get around without disruptions**
*Infrastructure/service is contiguous and regularly available*

1.2
**I can start my trip without delay**
*Infrastructure/service can be accessed quickly*

1.3
**I can get around without encountering barriers**
*Infrastructure/service is ADA-compliant or follows principles of universal design*

1.4
**I know what's going on when I travel**
*Real-time information about the service or status of the infrastructure is available*

1.5
**I have options for what I need and how much I pay**
*Services/modes span a range of costs, with viable, high-quality options at all price points citywide*

### Reliability

2.1
**I can count on similar travel conditions every day**
*Infrastructure/service performance is consistent*

2.2
**I can travel in about the same amount of time every day**
*Travel time is consistent*

2.3
**I have options for how I get places**
*Modal redundancy and flexibility exist*

### Safety & Comfort

3.1
**I'm protected when I travel**
*Infrastructure/service provides protections for my physical safety and freedom from harassment*

3.2
**I'm secure when I travel**
*Infrastructure/service provides protections that ensure my personal and digital security*

3.3
**I can expect well-maintained travel conditions**
*Infrastructure/service is in good condition and well-maintained*

3.4
**I can expect cleanliness when I travel**
*Infrastructure/service is clean*

3.5
**I can travel comfortably**
*Infrastructure/service does not detract from quality of life (noise, temperature, smell)*

### Culture & Community

4.1
**I'm respected when I travel**
*People using the transportation system are treated with respect and inclusiveness*

4.2
**I receive quality service when I travel**
*Customer service is consistently high quality*

4.3
**I'm impressed with my travel conditions**
*System/service achieves a high overall "net promoter" score (i.e., "I would recommend this to others")*

4.4
**My community is respected by LADOT's processes**
*Infrastructure/service is regularly assessed and improved*

4.5
**I enjoy the places where I travel**
*Public spaces encountered while using infrastructure/services are high quality*

### Equity & Transparency

5.1
**I can count on LADOT to be open and honest**
*LADOT regularly shares with the public, in plain terms and multiple languages, its goals, progress, and status of investments in infrastructure and services*

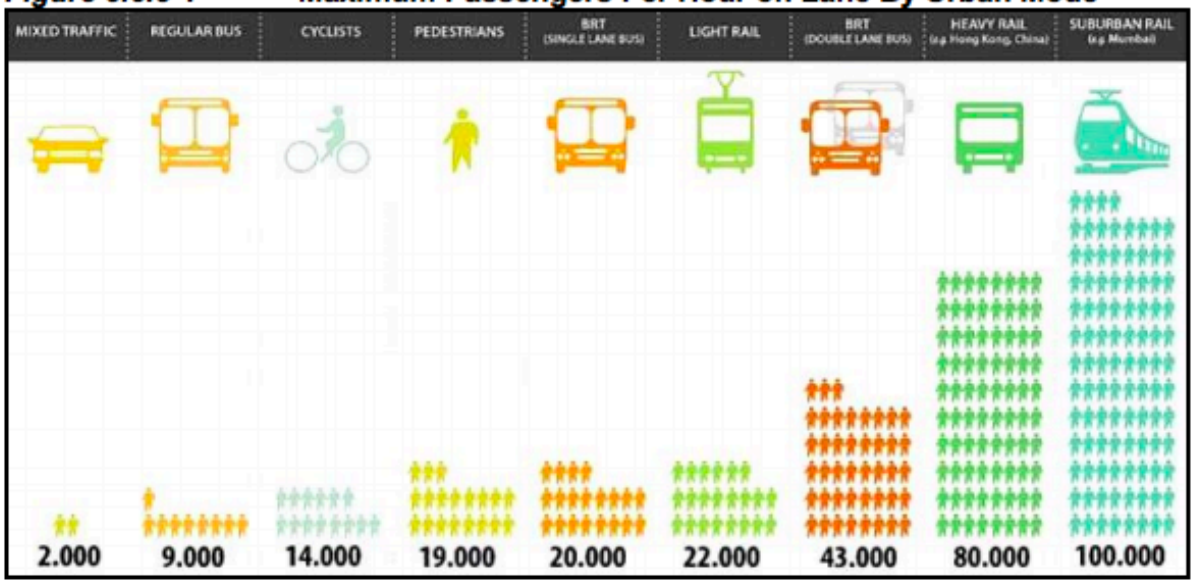
5.2
**I can tell LADOT what I need**
*LADOT engages with all communities to build local capacity to articulate and advocate for social inclusion, transportation needs, and long-term community goals*

5.3
**I can expect LADOT to serve those who are most vulnerable**
*Infrastructure/service investments are prioritized for areas with have vulnerable populations, defined by the City of LA Health Atlas*

LADOT

Victoria Transit Policy Institute: Transportation Cost and Benefit Analysis

***Figure 5.5.3-1*** **Maximum Passengers Per Hour on Lane By Urban Mode[13]**




*The maximum number of passengers that a 3.5-meter urban road lane can carry varies significantly by mode and load factor (number of passengers per vehicle). Automobiles are generally least space-efficient. This does not account for the additional space required for vehicle parking.*

## Definitions

**Traffic congestion costs** consist of incremental delay, vehicle operating costs (fuel and wear), pollution emissions and stress that result from interference among vehicles in the traffic stream, particularly as traffic volumes approach a road's capacity. 1 , 2 Reduced congestion is often described as increased mobility. 3

These are external costs to other users, vs. internal costs borne by the driver such as vehicle cost, insurance etc.

**Level of service** (**LOS**) is a qualitative measure used to relate the quality of motor vehicle traffic **service**. **LOS** is used to analyze roadways and intersections by categorizing traffic flow and assigning quality **levels** of traffic based on performance measures like vehicle speed, density, congestion, etc. (Wikipedia). LOS does not however measure costs, just congestion intensity and therefore is rife with problems and does not account for sprawl and other impacts.

**Generated Traffic** Impacts Congestion reduction impact evaluation is complicated by the fact that urban congestion tends to maintain equilibrium: traffic volumes grow until delays discourage additional peak-period trips. Expanded roadway capacity tends to fill with generated traffic, some of which consists of induced travel (absolute increases in vehicle mileage).

Generated traffic has three economic impacts: 1. It reduces roadway expansion congestion reduction benefits. 2. It increases external costs, including parking costs, accidents, pollution and sprawl. 3. The additional peak-period travel provides user benefits, but these tend to be small because the additional travel consists to lower-value vehicle-miles that users are most willing to forego if their costs increase. (VTPI)

**Costing** (direct and indirect) are monetary amounts outlaid to acquire goods or services.

**Direct costs** can be specifically assigned to a particular good, service, function or activity – e.g. the labour and material costs associated with operating a Community Wastewater Management Systems (CWMS) or Waste Service Charge.

**Indirect costs (or overheads)** are all other costs that support the provision of a range of goods, services, functions or activities – e.g. the supervision of staff, part of which will be allocated to the CWMS function.

**Fixed and Variable costs** are also factors

1 Susan Grant-Muller and James Laird (2007), International Literature Review Of The Costs Of Road Traffic Congestion, Scottish Executive (www.scotland.gov.uk); at www.scotland.gov.uk/Publications/2006/11/01103351/0. 2 OECD/ECMT (2007), Managing Urban Traffic Congestion, Economic Co-operation and Development (OECD) and European Conference of Transport Ministers (ECMT); at www.internationaltransportforum.org/Pub/pdf/07Congestion.pdf 3 Phil Goodwin (1997) Solving Congestion, Inaugural lecture for the professorship of transport policy, University College London; at www2.cege.ucl.ac.uk/cts/tsu/pbginau.htm.

Additional/Overarching Sources:

Miami Dade SMART Plan

Victoria Transit Policy Institute

American Public Transportation Association

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