Creating Value: Assessing the Return on Investment in Complete Streets

Webinar begins at 1PM EDT
Debra Alvarez
Executive Committee Vice Chair
@CompleteStreets
Senior Legislative Representative
@AARPLivable
Return on Investment in Complete Streets

Return on Investment

Economic

Environmental

Health

Safety

Livability

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Creating Value: Assessing the Return on Investment in Complete Streets
Complete Streets: high value

- Collision & injury costs
- Employment levels
- Property values
- Private sector investment
- Net new businesses

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Creating Value: Assessing the Return on Investment in Complete Streets
Complete Streets: low cost

The cost per mile to build Complete Streets projects vs. an average arterial road

Per-mile comparison (all figures converted to 2013 dollars)
- Cost per mile, Complete Streets project construction
- Average arterial “normal cost” per new lane mile
- Average arterial “high cost” per new lane mile

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Creating Value: Assessing the Return on Investment in Complete Streets
Scott Lane
Senior Community Planner
@Stantec
CREATING VALUE
Assessing the Return on Investment in Complete Streets
National Complete Streets Coalition / Smart Growth America

Streets are a vital part of livable, attractive communities.

Everyone, regardless of age, ability, income, race, or ethnicity, ought to have safe, comfortable, and convenient access to community destinations and public places—whether walking, driving, bicycling, or taking public transportation.
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A Return to Community
WHY ECONOMICS IS IMPORTANT TO COMPLETE STREETS

It helps level the playing field with competing issues.
It helps bring more diverse perspectives into what communities value.
It brings definition to what we mean when we talk about quality of life.
It may even help bring more financial support to a proposed project.
J. Scott Lane, AICP, CPTED

- Planner
- Urban Design, Esp. Transportation & Land Use
- Corridor and Sub-Area Studies
- Long-Range Plans
- League of American Bicyclists Certified Master Instructor (#3102)
- Crime Prevention through Environmental Design
- Returns on Investment and Economic Benefits from Projects, Including some Grant Recipients
  - Transit, Rail and Rail Stations
  - Roadways in Towns from 60 people to 6,000,000
  - Trails and Greenways
What economics is all about
The basics of Why

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Creating Value: Assessing the Return on Investment in Complete Streets
Mea Culpa
WHAT WE DO OVER & OVER AGAIN

Every project has to involve people, places, and issues. But none of them belong to the staff or consultants. We tend to repeat two mistakes.

1. IF YOU ONLY HAVE A HAMMER, EVERYTHING LOOKS LIKE A NAIL. But places vary, people have different issues, and their objectives are often only tangentially related to our scope of work.

2. A FAILURE TO CONNECT THE DOTS. Our work influences a lot in the community, and it can do a lot of good. Or not. The right people and the right tools are critical.
Who’s **Complete**? Changing Over Time

- Pre-1950’s: Accessibility
- 1960’s: Regional Mobility
- 1980’s: Urban (Local) Mobility
- 2000’s: Satisfying Multimodal Users
- 2020’s: Sense of Place
Who’s Complete?
Changing Over Time

Pre-1950’s: Accessibility
1960’s: Regional Mobility
1980’s: Urban (Local) Mobility
2000’s: Satisfying Multimodal Users
2020’s: Sense of Place
PERFORMANCE & R.O.I. & SAFETY
GOING BEYOND LEVEL-OF-SERVICE TO CREATE PLACE

PERFORMANCE
Understanding how performance varies by community, and how to get it on the (level) playing field.

SECURITY
Completing a street does little good if it isn’t safe to walk or ride on it. How good design can help. This one is on many people’s minds today.

RETURN ON INVESTMENT
Maslow was right. It’s about needs first, wants second. Creating better places means better opportunity in many cases.
Economics Isn’t Dismal* and It Isn’t Only about Money

- Adam Smith (“Invisible-Hand Adam” to his friends) is the most famous economist in history, right?
- Actually, he was an 18th Century Moral Philosopher – Not an Economist*
- He said that morality is hardwired into us – we feel some sadness when others are sad (or happy, etc.).*
- He was angered by “monopolists” and others who tried to keep wages low and prices high.*

*usually

If you sport a wig you should at least end up with a better hairline.
Economics (for Me) Is...

...just a way of thinking about the world and why people do what they do. 
...not about money – money just happens to be the vehicle that carries around wishes, values, wants, and needs inside it. 
...a way of helping make some hard decisions. 
...not the only thing anyone should use to make almost any decision. 
(Why that is true is partially explained on the next slide.)

The island of Yap, where people were historically punished for stealing money by piling more money on top of them (not really).
How Much does the Ball Cost???

Junior needs a new baseball bat and a baseball to start his lucrative career in professional sports.

Together, the bat and the ball cost $1.10; the bat costs $1 more than the ball. How much does the ball cost?

A. 5 cents  
B. 10 cents  
C. 15 cents  
D. 25 cents  
E. Free Baseballs!
People aren’t Rational

- **FRAMING** Context matters. A lot.
- **LOSS AVERSION** Finding a $100 bill and losing one are valued differently. To you.
- **PROSPECT THEORY** Good News: Someone is going to win the lottery. Bad News: It won’t be you.
- **FUTURE DISCOUNTING** You want cheesecake and *Fast & Furious #22* now; the gym and *Citizen Kane* next week.
- **INFORMATION ISN’T PERFECT** Even worse, you tend to ignore what you aren’t expecting to see (selective inattention).

Behavioral Economics has made some of these terms popular. In one experiment on selective inattention, groups of people were asked to watch a video to count the number of times that a group of people passed a basketball to each other; 2/3rds of them never noticed the person in the gorilla suit walking across the floor.
Non-residential investment still down by 20% compared to pre-2009 levels

PRIVATE INVESTMENT

SMALL BUSINESSES TOOK A BEATING
2006: 19,700 business filing for bankruptcy
2008: 43,500

$900 BILLION
Spent in 2009 alone by U.S. government to support crippled housing market

PAIN SPREADING
Education, relationships, and health all suffered
Why do Economic Analyses?

- Sustainability
- Define equity
- Priorities
- Create wealth
Action expresses priorities.

Mahatma Gandhi
Economics in Project Planning
The Basics of How
The Basics of Economic Analysis

1. DEFINE THE PROJECT
   - Step 01
   - Where?
   - How Long/Big?
   - Schedule?

2. BENEFIT CATEGORIES
   - Step 02
   - Travel Time
   - Safety
   - Job Access

3. How to quantify benefits?
   - Step 03
   - Comparable Cases
   - "Shelf" Models
   - Create Your Own

4. Quantify the costs
   - Step 04
   - Lifecycle
   - Capital
   - Who Pays How Much?

5. answer & refine
   - Step 05
   - Review (with client)
   - Refine/Correct Inputs
   - Reporting

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Creating Value: Assessing the Return on Investment in Complete Streets
The Basics of Economic Analysis

1. Define the Project
   - Step 01
     - Where?
     - How Long/Big?
     - Schedule?

2. Return on Investment
   - Is the project located in an urban, suburban, or rural area?
   - Bigger / Longer projects typically serve more people and accrue more benefits, but they always cost more.
   - When would the project begin? When does construction end and allow people to use it?
The Basics of Economic Analysis

**BENEFIT CATEGORIES**

- Travel Time
- Safety
- Job Access

1. Who is the project trying to serve?
2. How do these people travel now?
3. Are there transportation facilities or major destinations that are important to the community that this project would serve?
4. Are there safety issues, concerns about stagnant local economies, or other issues that the project would help reduce or improve?
The Basics of Economic Analysis

How to quantify benefits?

STEP 03

- Comparable Cases
- "Shelf" Models
- Create Your Own

• Construction-Era Benefits: Jobs, wages, supplies used to construct (or support the people who construct) your project
  - Economic Input-Output Models
  - Fairly Straightforward

• After Construction: New / Expanded Businesses, Mode Shifts, Travel Time, Crash Reductions, Environmental Benefits, Economic Opportunity / Equity
  - Usually Not So Easy
  - Ground Truthing is Key
**The Basics of Economic Analysis**

**STEP 04**

- **Quantify the costs**

  - Lifecycle
  - Capital
  - Who Pays How Much?

- Capital Cost for Construction, right-of-way, engineering design

- Maintenance and Operations costs, preferably from a local source, can be harder to acquire

- With respect to grants – and probably every project sponsoring agency that ever existed – understanding who pays for what is important
The Basics of Economic Analysis

STEP 05

- Review (with client)
- Refine/Correct Inputs
- Reporting

1. Answer & refine

- Review the results, not just with the client but local experts as well
- Refine and correct the inputs – we strive to have a third party check calculations, written summaries, and assumptions
- When reporting, remember: telling a complete story requires a conveyance of both quantitative and qualitative benefits

Not everything that can be counted counts.
Not everything that counts can be counted.
- William Bruce Cameron

Creating Value: Assessing the Return on Investment in Complete Streets
Case Study: Grand Avenue

Walk Down the Avenue
Making a more complete place

Key Stats:
Design: 2019
Construction: 2020 – 2022
Cost: $16.3 million ($2012)

Commercial Land Use (%): 40%
Residential Land Use (%): 60%
Project Length (miles): 1.9
Daily Volume-to-Capacity (V/C): 78%
Design Completed So Far: 15%

RETURN ON INVESTMENT

DEFINE THE PROJECT
STEP 01
Case Study: Grand Avenue

Key Stats:
Design: 2019
Construction: 2020 – 2022
Cost: $17.3 million ($2017)

Walk Down the Avenue
Making a more complete place

- Commercial Land Use (%): 40%
- Residential Land Use (%): 60%
- Project Length (miles): 1.9
- Daily Volume-to-Capacity (V/C): 78%
- Design Completed So Far: 15%
More Grand Avenue
Not just a route for downtown commuters

Learning
Fewer advanced degrees than the surrounding area

Schools
Two public schools on route

Workers
High jobless rate; Grand Ave links to job-training center

Place
Partially in a historic district; some businesses are faltering

Benefits:
Access to Jobs
More Walking/Biking
Reduce Crashes
Improve Transit Ridership
Benefit Calculations

**FUN WITH NUMBERS**

1. Construction
   - **wages**
     - temporary jobs, wages, tax benefits

2. Job Productivity
   - **jobs**
     - access to training center, better jobs, higher-paying jobs

3. Fewer Crashes
   - **crash**
     - reductions to injuries and delays

4. More Walking
   - **walk**
     - health, transit ridership, pollution

**How to quantify benefits?**

**STEP 03**
Benefits Calculations

Let's Get Our Geek On

**Wages**
- Temporary jobs, wages, tax benefits
- Models like IMPLAN, TREDIS, RIMSII; flat coefficients

**Labor**
- Access to training center, more and higher-paying jobs

**Crash**
- Reductions to injuries and delays
- FHWA crash reduction studies; typical travel time (models, floating car studies)

**Walk**
- Health studies and typical walk rates in more walkable areas (8%-10%)
- Health, transit ridership, pollution

**How to quantify benefits?**

**STEP 03**
Ground-Truthing

ADDING CREDIBILITY, CONFIDENCE, AND VALUE

FOCUS GROUPS

Draw upon the knowledge of local experts to create bounds for results

CASE STUDIES

Check for similarities and differences; helps tell the story and clues to success

SUCCESSES

Don’t stop at a number; talk about ways that improve outcomes

How to quantify benefits?
STEP 03
Benefit Assessment for Rail Reactivation

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- Surveys (21)
- Model (TREDIS)
- Peer Studies

Benefits

- Jobs & Wages
  - Direct
  - Contingent
- Travel Time
  - Environment & Safety
- Revenues
  - Controls
  - Success Factors

Factors

- Controls
- Land Types

RETURN ON INVESTMENT
Summarizing Case Studies

**Blue Ridge Scenic Railway**
- Volunteer Focus: Maintenance, management, marketing, and guides can be volunteer-based, helping offset operating costs.
- High Amenity Focus: In-car dining, air conditioning, and themed rides targeted at higher income shoppers diversify the customer base.
- Freight / Shipping: Rare, but valuable source of income in the case studies; may require additional staffing and facility requirements.
- Tourism Partnerships: Taking advantage of outdoor recreation, downtown tourism, and existing outreach tools leverage marketing funds.
- Innovative Financing: Partnering with museums, maintaining a business-friendly attitude, and leasing arrangements bring additional revenue.
- Private Sector Support: Shared parking with private lot owners can be critical, as can catering, outdoor service, and other partnerships.
- High Value: Orienting travel packages to budget consumers and “day-trippers” helps to diversify and attract ridership.
- Family Focus: Often value-conscious, families look for shorter trips, special packages with hotels, and targeted marketing efforts.

**Durbin & Greenbrier Valley Railroad**

**Great Smoky Mountain Railroad**

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Capital Costs
- Construction
- Design, ROW
- Some models like labor, materials, etc.
- Local is Better

Maintenance Costs
- Repairs
- Operations (e.g., transit services)
- Mowing, clearing, etc. (trails)

value now
### Key Input Description

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Project Cost ($2016)</td>
<td>$14,290,000</td>
</tr>
<tr>
<td>Annualized Maintenance Cost ($2016)</td>
<td>$46,400</td>
</tr>
<tr>
<td>Length of Alberta Pkwy, Phase II (miles)</td>
<td>0.5</td>
</tr>
<tr>
<td>Construction Start Year</td>
<td>2018</td>
</tr>
<tr>
<td>Construction End Year</td>
<td>2019</td>
</tr>
<tr>
<td>First Year of Operation</td>
<td>2020</td>
</tr>
<tr>
<td>End Horizon Year of Project</td>
<td>2045</td>
</tr>
<tr>
<td>Est. Population within half-mile of Project, 2016</td>
<td>7,564</td>
</tr>
<tr>
<td>Population Growth per annum, with &amp; without Proposed Project</td>
<td>0.94%</td>
</tr>
</tbody>
</table>

### PROJECT DETAILS & COSTS

| Emissions-Related Benefits                      | Rail Trips, 2016 (estimated) | 12,509 |
|                                               | Average Intercity Trip Length (miles) | 474 |
|                                               | Increase in ridership, without / with Project | 2.7% |
|                                               | Dollars per person-hour ($2016) | $19.52 |
|                                               | Amount of Time Spent Productively on a Train by Passengers | 75% |

### Development and Redevelopment of Private Property (productivity)

| Current Property Values ($2016) | $242,410,800 |
| Per Annum Increase in Property Values Without / With Project | 0.94% |

### Health-Related Benefits

| GREATER NUMBER OF WALKERS | Trips Reliant on Walking within 1/2-mile of Study Area, No-Build | 378 |
|                          | Additional Walking Trips within 1/2-mile of Study Area, Build v. No-Build | 8% |
|                          | Additional Life Accrued to More Physical Activity (years) | 1.27 |
|                          | Statistical Value of One Year of Life ($2016) | $117,497 |

#### Adjust for NPV (Net Present Value)

At 7%, $1 now is $0.25 in 20 years

**BCR = Revenues / Costs**

**Payback Period = How long it takes to get in the black**

**Summarize and be succinct**

**Show your work (sources)**

---

1. Adjust for NPV (Net Present Value)
   
   At 7%, $1 now is $0.25 in 20 years

2. BCR = Revenues / Costs

3. Payback Period = How long it takes to get in the black

4. Summarize and be succinct

5. Show your work (sources)
### Project Details & Costs

<table>
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<tr>
<th>Value</th>
<th>Notes + Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>$14,290,000</td>
<td>City of Tuscaloosa, AL engineering estimate</td>
</tr>
<tr>
<td>$46,400</td>
<td>Includes added maintenance for all project components. (David T. Hartgen, Ph.D., P.E., Maine, Retired; M. Stantec Consulting Services Inc.)</td>
</tr>
<tr>
<td>0.5</td>
<td>Stantec Consulting Services Inc.</td>
</tr>
<tr>
<td>2018</td>
<td>Stantec Consulting Services Inc.</td>
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<tr>
<td>2019</td>
<td>Stantec Consulting Services Inc.</td>
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<tr>
<td>2020</td>
<td>Stantec Consulting Services Inc.</td>
</tr>
<tr>
<td>2045</td>
<td>ESRI Business Analyst Online, Business Market Profile, 2015 population estimate</td>
</tr>
<tr>
<td>7,564</td>
<td>ESRI Business Analyst Online, Business Market Profile, 2010-2015 population</td>
</tr>
<tr>
<td>0.94%</td>
<td>ESRI Business Analyst Online, Business Market Profile, 2015 population estimate</td>
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**Ready for the Show**

1. Adjust for NPV (Net Present Value)  
   At 7%, $1 now is $0.25 in 20 years

2. BCR = Revenues / Costs

3. Payback Period = How long it takes to get in the black

4. Summarize and be succinct

5. Show your work (sources)

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**Creating Value: Assessing the Return on Investment in Complete Streets**

The degree to which passengers spend their time working on their fellow passengers is represented as a productivity in equivalent time spent in an automobile. Although not all time spent on research conducted in the U.K. places this number at 78%; (75%) was used here to represent the greater number of riders created by increased passenger productivity over the longer period not included in the analysis; only figures used for rail riders.</p>
Crossing the Wires
THE VERY BEST OF INTENTIONS

MESSING UP THE BASICS
This just involves pretty straightforward math, a bunch of spreadsheets, etc. What can possibly go wrong?

MONETIZING RESULTS
This can be hard. Sometimes just telling the qualitative story well (video interviews, surveys) is better than coughing up bad numbers.

MESSING UP DETAILS
Know basic economics, models, transfer benefit exceptions, discount rate, punishment.

COMMUNICATING RESULTS
Pay attention to grant requirements, use infographics, do great chart design, and write it well, clearly, and briefly.

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Creating Value: Assessing the Return on Investment in Complete Streets
High Data-to-Ink Ratio*

Fewer Colors Generally

Tables > Charts > Graphics

A Great Map Needs Little or No Explanation

May Need to Work in Black-and-White, not just Color

Simple is Better

Art of the Chart
Don’t Stumble at the Goal Line

Art of the Chart
Don’t Stumble at the Goal Line

Simple is Better

- High Data-to-Ink Ratio*
- Fewer Colors Generally
- Tables > Charts > Graphics
- A Great Map Needs Little or No Explanation
- May Need to Work in Black-and-White, not just Color

When Numbers Fail
TELLING THE WHOLE STORY

Do the Work
Get Creative
Document Support

Zanetta Illustration

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Creating Value: Assessing the Return on Investment in Complete Streets
How to Get Started
RESOURCES FOR GETTING ECONOMICS INTO YOUR PROJECT

BCA Homework
• American Economics Association
• FHWA, Quah, and (Many) Others
• Ask Questions

Data Sources (cite them)
• Go Local (chamber, past studies)
• Bureau of Labor Statistics
• Business Census (LEHD)
• Research Libraries (e.g., SCOPUS)
• ESRI Business Analyst Online
• Third-Party Data

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Creating Value: Assessing the Return on Investment in Complete Streets
You have **Questions**
We have **Answers**

Call Us:
919.865.7387 | scott.lane@stantec.com
Questions?

Type your questions in the ReadyTalk chat box.
Want to learn more?

Stay tuned for upcoming webinars
Implementation & Equity 201: The Path Forward to Complete Streets

Integrating Complete Streets, Vision Zero, and Transportation Equity

1PM EDT on April 5, 2017

Smart Growth America
National Complete Streets Coalition
Implementation & Equity 201: The Path Forward to Complete Streets

Making the Most of Main Street: Complete Streets and Walkable Communities

1PM EDT on May 17, 2017

Smart Growth America
National Complete Streets Coalition