



My Economic Impact: How to Talk About My Numbers



Prepared for American Public Transportation Association

WHO SHOULD USE THIS GUIDE?

Planners and programmers will find this guide particularly useful as they work to communicate the many benefits and value of public transportation to their communities. Public transit communicators will also find this helpful in publicizing the economic analysis results.

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KNOW BEFORE YOU GO:

STRATEGY FOR ANALYSIS AND COMMUNICATION

Why communicate the benefit and value of public transit?

In communities, public transportation is the link between people and possibility. It joins workers and jobs, consumers and businesses and entertainment venues, restaurants and customers. Public transportation is a part of modern society; it provides a range of critical services for people and the communities in which they live. Communities are places where people share a connection with each other. And public transportation is a cornerstone on which these connections are built. Yet, when it comes to justifying and financing public investment in public transit facilities and services, community residents and public leaders need to be reminded of the value that communities receive from this investment. Additionally, public transit agencies themselves may wish to better understand the economic and societal implications of their internal decision-making.

This guide is intended to assist agencies and to be used in conjunction with the companion piece titled “My Economic Impact Tool: How to Use It.” The guide will demonstrate ways that public transit agencies can address local challenges, better demonstrate the value of public transit and disseminate that message without necessarily requiring costly and complicated studies. It does so in three ways:

1. First, by showing how staff of public transit agencies can initially address some issues by themselves, using readily available information to start quantifying and describing public transit’s role within a community;
2. Second, by showing how staff of public transit agencies can then work directly with MPOs (or state DOTs or other governmental partners) to extend the analysis to document further how elements of the economy depend on transit services; and
3. Third, by showing how staff of public transit agencies can make use of universities and consultants to more fully document the economic value and impact of transit investment scenarios.

THE LEVEL OF EFFORT REQUIRED to address these three classes of economic analysis varies according to the level of complexity and technical work involved. The most basic versions of this work can be done by transportation agency staff themselves – at a level of effort involving less than a day of staff time to address each of the items in part 1, and a range of 2-5 days of staff time to address each of the items in part 2. Alternatively, agencies may wish to develop more detailed analyses of part 1 or part 2 topics, complete with local outreach, case studies and community interaction, in which case the cost may rise to a range of \$20,000 to \$50,000. The larger studies in part 3 require contracting to outside experts, with a cost that may range from \$50,000 - \$100,000 or more, depending on the extent of local and neighborhood outreach, interaction and communications.

Communications strategy: who is the audience and what matters to them?

Given the diversity of ways in which public transit supports people and society, it may be tempting to organize your efforts around finding a “perfect” all-encompassing impact or benefit number. However, this strategy is likely to be frustrating without suitably addressing your objective of communicating with key stakeholders. This guide is based on the premise that economic analysis needs to do more than produce a single number. A successful assessment and communications campaign should focus on educating the target audience(s)—whether internal to your agency or external, or both—about the range of ways in which public transit offers benefits to an array of stakeholders, including both users and non-users. This is critical because it is not possible to show the value of every benefit that public transit provides to every segment of society. However, it can be powerful to engage in a multi-faceted effort to progressively demonstrate different types of benefits over time. Moreover, each effort should be understood and discussed in relationship to the broadest possible awareness of public transit’s impact on society.

THE BOTTOM LINE IS THIS: *Public transportation connects and grows our communities. It helps support a thriving economy in communities large and small throughout our nation. It increases property values, creates destinations for businesses and forms the basis for livable, walkable communities.*

Public transit connects people to jobs, education, healthcare, and to restaurants, friends and many essential services. It is the most desirable option for some travelers, a backup option for others, and the only option for yet others. It provides basic mobility for people who cannot, should not or do not have the option to drive. It can also offer efficiencies over other alternatives, including savings in time and travel-related expenses.

Public transit can help ease congestion on roads and it helps limit carbon and other pollutant emissions. Sometimes it can enable government and the public to avoid further investment in auto-oriented infrastructure including roads and parking. It also plays a role in achieving strategic planning and sustainable development goals: it supports economic development through cost savings, broader market access, and facilitation of cluster development. Public transit can encourage investment in economically disadvantaged neighborhoods or communities, providing access to opportunity.

It can further support public policy goals through encouragement of more efficient land development and more livable communities. And the public taxes spent on public transit are also returned to the community in the form of jobs and income that benefit residents and businesses.

This report is organized around a progression of different evaluation methods, moving from simple to more complex. These approaches address the breadth of transit’s impact in a way that is both relatable to a wide range of stakeholders and defensible among economists.

WHERE PUBLIC TRANSPORTATION GOES COMMUNITY GROWS

APTA has developed materials and messaging to support your efforts. The branding of “Where Public Transportation Goes, Community Grows,” is based on comprehensive research that surveyed Americans in communities of all sizes. For additional information go to www.apta.com, and click on Advocacy.



CHAPTER ONE

THE ROLE OF YOUR TRANSIT AGENCY IN THE LOCAL ECONOMY:


EFFECTS THAT AGENCY STAFF CAN CALCULATE THEMSELVES

1-A. The public transit agency impact as a generator of jobs and income (contribution to the local economy)

Why? Many public transit agencies have tight budgets, busy staff and limited or no capability to devote extra time and expertise for conducting economic impact or benefit analyses. However, there are some economic impacts that can be readily shown, most notably the ways that agency investments and spending support jobs and income throughout the local economy. This impact is useful in demonstrating (1) the public transit agency's importance, role and contribution to the local economy and (2) how public financial support for public transportation returns benefits back to the community.

How to do it? Every public transit agency has an annual capital and operating budget. It is commonly reported to FTA and shown online in the National Transit Database. An economic model of the local economy is needed to track these effects and show how they lead to a broad mix of job types, affecting a range of businesses. APTA provides its members with an economic accounting framework and model that can track each agency's unique pattern of capital and operations spending and apply locally-specific economic multipliers to show the broad range of jobs and income generated by it. This tool can be accessed at www.apta.com/myeconomicimpact.

The operations of << Transit Agency >> play a surprisingly significant role in the economy of the << name>> region, according to a recently completed analysis. The agency's ongoing investment in its service operations, maintenance, and capital projects currently supports <<AA> jobs representing \$<BB> million dollars of worker income. This impact can also be seen as supporting \$<CC> dollars of Gross Regional Product or \$<<DD>> of area business sales. This activity includes people employed directly by the agency or in public transit construction projects, as well as jobs at contractors and suppliers who provide goods and materials to the agency. For example, <<Transit Agency>> contracts with <<a local firm>> to provide <<insert example specific to your agency>>. Income earned by employees is also respent in the economy, supporting local businesses such as restaurants and retail stores. Thus, public money invested in public transit not only supports improved access for residents and visitors, it also returns to the community in the form of additional jobs and income. The analysis was based on the current spending budget of <<Transit Agency>> and an economic impact model for the region, which was provided by the American Public Transportation Association.



Notice for Communications: It is important to use the word “impact” rather than “benefit” to describe these effects. This avoids criticism by economists who may argue that the real objective and hence true “benefit” of public transit is providing mobility services and not creating jobs through spending. They can point out that any spending – from construction to parks and schools – can also create jobs. The documentation of transit mobility benefits is described later in this guide. For now, it suffices to say that the spending impact described here is indeed useful information – not just to show the benefits of public transit, but also to help citizens appreciate how agencies support local economies and bring income back to the community.

Care should also be taken to avoid adding together the economic impact measures of Business Sales (Output), Gross Regional Product (GRP) and Worker Income. While all three are dollar measures, they are different ways of describing the same economic activity. GRP is a subset of Business Sales that represents regional worker income + business profit. Worker income is itself a subset of GRP. See graphic on previous page.

1-B. Public transit’s additional role in enabling job access and related business

Why? Some public transit agencies have staff capacity to assemble additional information regarding the ways that transit enables users to engage in broader social and economic activities. This information can provide a “snapshot” of how individuals within a region rely on public transit to get to work, school, the doctor’s office, go shopping, or access a myriad other activities, depending on the depth of available census and rider survey information.

How to do it? There are two primary sources of data for this type of analysis: Census data on commuting patterns and data from rider surveys commonly performed by public transit agencies for planning, customer satisfaction and Title VI compliance. The U.S. Census Bureau’s American Community Survey publishes data on “Means of Transportation to Work by Industry” at a variety of geographic levels including the county and the metropolitan statistical area.¹ This data provides estimates of the total number of people in a given geography who commute to work using public transportation. It further breaks down those estimates into 14 industry sectors.² These counts provide a picture of the scale of the transit-using workforce on which employers depend, as well as insight into certain industries that may be particularly reliant on public transit for access to their workforce. You may also wish to verify the magnitude of transit commuting reported in the ACS with local data sources such as survey data.

1. Data available using American FactFinder: <https://factfinder.census.gov/>

2. Note that data are available by place of residence (the default) or by workplace geography and should be interpreted accordingly. Additionally, the census does not differentiate by public transportation provider; if your agency operates in a geography with other transit service providers, care should be taken to attribute reported data to all public transit services in your area.

Often, public transit agency survey data can also be used to provide further insight into other types of transit-enabled access and economic participation. To do so, surveys must have collected data on trip purpose. Apart from traveling to/from work, surveys often ask about trip making for the purpose of going to school, shopping, accessing medical services, or other social or personal activities. Ensuring affordable access to school and to health care are two critical functions of public transportation. Rider survey data can be used to describe what proportion of trips are made for these purposes. Some agencies also collect data on alternative mode, i.e. the mode that would be used if public transit were unavailable, with answers such as making the trip by car, walking, riding with a friend, taxi, bicycle, or not making the trip at all. The proportion of respondents indicating that they would not make the trip absent transit can be interpreted as the proportion of users who are “dependent” on public transit services and would face significant consequences without them.

Communications message. The following are sample statements summarizing the role of public transit and access. The blanks in these statements are filled in with information for the entire U.S. (You will have to substitute results for your own region in place of the italicized text.)

In addition to the role of its spending in generating area jobs, the services of << Transit Agency >> also support additional jobs that depend on riders, according to a recently completed analysis.

- In the <<United States>>, approximately <<7 million>> people rely on public transit to get to work. These commuters represent people employed in a variety of diverse sectors across the entire economy. The industries that rely most significantly on transit for access to their workforce include educational services and health care (<<21>>% of public transit commuters are employed in this sector); professional, scientific, management and administrative services (<<16>>%); restaurants, hospitality and entertainment (<<14>>%), retail (<<11>>%), and finance, insurance and real estate (10%).³*
- Public transit also provides critical access to education, health care, and other activities that support community livability and contribute to the overall economy. According to survey data compiled by <<APTA>>, <<11%>> of all public transit trips in <<the U.S.>> are made for educational purposes, <<9%>> are for shopping and dining that represent local sales in the economy, and <<3%>> are medical trips that help ensure the continued health of our community.⁴*
- Public transit is particularly important to certain users who cannot, should not or do not have the option to drive or use other alternative modes. If public transportation were unavailable, approximately <<22%>> of users in <<the U.S.>> report that they would not be able to make their trips.⁵*

3. U.S. Census Bureau, American Community Survey 2010-2014 5-year estimates, United States, Means of Transportation to Work.

4. APTA. A Profile of Public Transportation Passenger Demographics and Travel Characteristics Reported in On-Board Surveys. http://www.apta.com/resources/statistics/Documents/transit_passenger_characteristics_text_5_29_2007.pdf

5. APTA. A Profile of Public Transportation Passenger Demographics and Travel Characteristics Reported in On-Board Surveys. http://www.apta.com/resources/statistics/Documents/transit_passenger_characteristics_text_5_29_2007.pdf



CHAPTER TWO

EXTENDED ROLE — BEYOND THE BASICS:

BENEFITS AND IMPACTS THAT PUBLIC TRANSIT AGENCY STAFF CAN SHOW WITH ADDITIONAL SUPPORT

Why? The benefits of public transit go far beyond just the role of providing access to jobs and other economic opportunities. These broader benefits can be documented with more effort, to show the full scale of economic activity associated with that access, as well as the public costs that would otherwise be incurred if that access was not available. This is really a two-part question. The first asks: what is the nature of current economic activity directly or indirectly enabled by transit's role in commuting? The second quantifies the value that businesses and households across the region enjoy as the result of current public transportation services — in contrast to the costs that would be incurred if that service were not present. Together, these analyses describe more completely the role played by public transit in supporting a community on an ongoing basis.

How to do it? Staff of public transit agencies can work directly with MPOs or other supportive government research staff to perform these types of analyses. They are fundamentally based on information that is accessible to an agency, MPO, or other governmental partner but do require additional analytical capacity. They are explained in parts 2A and 2B, which follow.

2-A. Personal and business income that is dependent on public transit access

Building off the analysis in previous part 1B, it is possible to show not only the jobs that depend on public transit riders but also the associated worker income and business sales. Information on the average income of commuters by industry in a region is available from a number of sources, including local rider surveys your agency may have performed, as well as the American Community Survey Public Use Microdata Sample (PUMS).⁶ Business sales associated with the jobs held by public transit users can be estimated using local area data from the U.S. Census.⁷ Simply obtain total numbers on business sales and jobs for applicable industry categories for your area, and calculate the average business sales per worker. Apply these ratios to the number of local workers who depend on transit to get to work (from section 1B).

6. ACS tables available through the U.S. Census American FactFinder tool provide tabulations by mode and one other measure (such as income, industry of employment, or occupation). The Public Use Microdata Sample (PUMS) files allow these relationships to be explored in greater detail.

7. Data available from <http://www.census.gov/econ/geography.html>

8. Regional input-output models such as Implan and RIMS-II may be used; they normally require a knowledgeable analyst who may be based at another government agency, a college or a consulting firm.

The results represent the worker income and business sales that are dependent on public transit and would therefore be at significant risk (but not necessarily lost; see warning below) if service was reduced or eliminated. If desired and available, an input-output accounting model can then be applied to calculate the extent to which the dependent activity is in turn associated with other multiplier effects in the local economy.⁸ This type of analysis would account for the ways in which local businesses are supported by the consumer spending of transit-dependent populations (who might not remain gainfully employed in the absence of public transit). It also accounts for suppliers of businesses whose workforce is significantly dependent on transit.

In addition to these employment and business sales impacts, other costs might be imposed on individuals or the government if services were unavailable, depending on each rider's mobility alternatives. Examples can include avoided costs associated with government unemployment payments or increased health care and social services costs that would be incurred if completely transit dependent populations were unable to access employment or health care via transit. It's important to note that these effects are a valid reporting of socially important impacts, but many of these effects are actually transfers between parties, or from one part of the government budget to another, and as such should not be added together with the other benefits or impacts.

Communications message. Below is sample language that can be used to discuss the results of a broader public transit-enabled accessibility analysis:

Every day, an average of <<EE>> workers in the <<name>> region rely on the services of << Transit Agency >> to get to work. These people earn \$<<FF>> in annual wages, and support an average of \$<<GG> in business sales. Approximately <<HH>> percent of these commuters report that they would not be able to make their trip if public transit was not available. They, and their employers, depend on transit as an effective way of connecting workers and jobs. These <<% dependent x total commuters>> “dependent” commuters directly support \$ <<% dependent x total transit commuter-related business sales>> in annual business sales in the region.

Note: Public transit also provides access to medical and educational services, and lack of transit may lead to additional costs for affected individuals if those services were missed or deferred (e.g. emergency room costs). They are legitimate additional benefits, though they are typically difficult to document, and hence are not covered in this primer.

Notice for Communications. It can be useful to calculate the economic activity associated with workers who depend on public transit, as a way to illustrate the importance of these services. However, it should not be suggested in communications that these jobs would disappear without public transit, since that is unclear. In some cases, the ultimate impact could be much larger, as it could cause some businesses to close or move away. In other cases, the ultimate effect could be much smaller, if workers could find a “second best” way to get to work. So, in most cases it would be better to avoid speculation and not imply anything about whether or not the jobs would actually disappear.

2-B. Public transit's impact on improving overall transportation system efficiency

The economic value of public transit to your region can also be understood by examining the travel efficiencies that it enables, relative to “next best” alternative travel options. To do this, you will need, at a minimum, information on (1) current local area travel conditions (such as road and transit volumes, speeds, travel times and collisions) and (2) how those travel conditions would change under an alternative situation in which public transit services were reduced or eliminated. Comparison of the two reveals public transit's value to travelers by showing how much more time and cost would be incurred by travelers without the availability of transit.

The first situation is generally developed from current traffic measurement and transit ridership data. The second situation is generally developed by using a mode split model or a survey that asks current riders what other option they would select if service was not available (e.g., drive a car, use a taxi or car share service, ride with a friend, walk, bicycle or not make the trip). The changes in travel conditions are typically estimated via a travel model or engineering estimates, both of which are likely to be supported by staff at an MPO (or state DOT if your agency serves a rural area). Use of a travel model is desirable if your agency operates in a region with significant road congestion and associated delays occur on a network-wide basis.

To calculate the economic value of savings in travel time, expense and safety, you can calculate the differences in those values between the two situations and then multiply the results by a set of “unit cost” factors. A discussion of available tools and methods for this can be found in the “Transportation Benefit Cost Analysis” web guide, operated by the Transportation Research Board's Standing Committee on Transportation Economics.⁹ Alternately, you may follow the recommended monetization values and processes outlined in the USDOT Benefit-Cost Analysis (BCA) Resource Guide.¹⁰ The unit values are generally the same across the two sources.

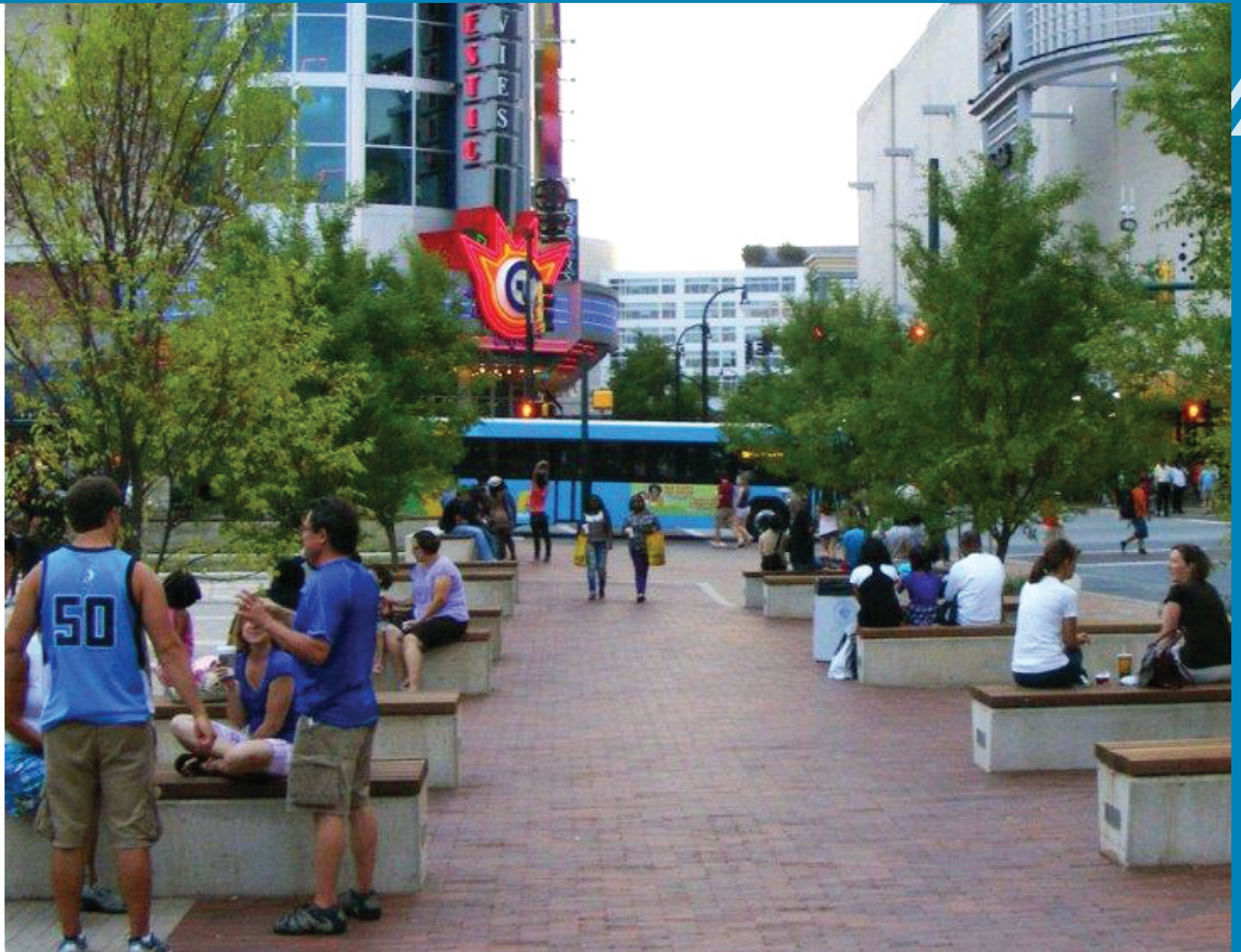
Communications message. The following language can be used to describe findings from a comparison of public transit service alternatives:

A recent study calculated the transportation benefits for residents of the <<name>> region that occur because of services provided by <<Transit Agency>>, in contrast to the costs that would be incurred if services were not present. This analysis makes use of the travel model provided by <<name of MPO or State DOT>>, along with a survey in which public transit riders reported what they would do if service was no longer available. The analysis showed that transit saves time for those who otherwise would need to carpool or use a slower mode (such as walking or riding a bike). It also saves money for those who would be spending more on maintaining and operating a personal car. Finally, public transit reduces vehicle mileage on roads, resulting in less congestion, fewer collisions and less emissions. It is estimated that, overall, the value of these savings total \$<<ll>> millions of dollars every year.

This type of analysis is most useful for showing the incremental costs associated with reducing or temporarily dropping local public transit services. More dramatic structural changes in land development patterns of a downtown commercial center or a broader urban area could also result from a total and permanent loss of all transit services if no other substitute is developed. See Section 4 for how to address the broader, long-term benefits of sustained public transit investment.

9. <http://bca.transportationeconomics.org>

10. <https://www.transportation.gov/sites/dot.gov/files/docs/BCARG2016March.pdf>



PLANNING SCENARIOS AND ALTERNATIVES ANALYSIS:

HOW TO SHOW BROADER SOCIETAL BENEFITS AND REGIONAL ECONOMIC GROWTH IMPACTS.

Why? Many public transit plans and proposals involve alternative future scenarios to answer questions such as: How would my region benefit if we built a new light rail line, instituted a system-wide upgrade in service frequency, invested in newer, more reliable buses, or addressed capacity constraints at a major station? These can be investigated using a scenario or alternatives analysis.


These analyses typically include at least one scenario that portrays what would happen if a proposed action is taken (sometimes called a “build” case). That investment scenario is then compared to another scenario in which the proposed action is not taken. The latter scenario is commonly viewed as a “base case” (“no build”) scenario.

Scenario analysis is a powerful tool for planning as it allows for a rigorous and internally consistent comparison of alternate investment strategies or policy regimes. Actions considered can range from individual projects to large-scale investment packages. The results enable public transit agencies and their funding partners to articulate the outcomes of pursuing an investment strategy and—in a case where multiple alternative actions are analyzed—to explain why one investment strategy might be preferable to another.

How to do it? Due to constraints on in-house resources and training, public transit agencies will typically need to secure help from outside experts to collect the necessary data and apply appropriate travel and economic models to fully assess impacts of alternatives scenarios. These experts are usually faculty at universities or expert planning and analysis consultants. The discussion below outlines the work that should be cited in a Request for Proposals (RFP) or specification of needed assistance. These topics are also important to understand if you decide to pursue a scenario analysis using internal or partner agency research staff.

3-A. Define scenarios for comparison

The findings on public transit project impacts will depend greatly on how the “build” (new investment) and “base case” (no new investment) scenarios are defined. For the “build” case, you need to define the nature of the investment(s), its timing, and the affected users or geography. If you are considering more than one project, think about whether you wish to do (1) project-level analysis – requiring a new scenario for every project or (2) long range planning scenarios – showing the aggregate (and potentially mutually supportive) effects of a set of projects assembled together into a package of investments.




This is an important consideration as you will only be able to report benefits and impact at the level of analysis that you select—e.g., if you bundle a light rail line with supportive bus service alterations, you will not then be able to uncouple effects of each of these individually. This thought process is also an important determinant of expected level of effort, as each distinct scenario will require a separate “turn of the crank” for all applied tools and methods.

Additionally, define your “base case” as accurately as possible, as a more realistic representation of the costs of a base case scenario can make the public transit alternative look more attractive. The base case should represent what would happen if your alternative scenario is not pursued. It is usually not reasonable to claim that a base case would see no further investment at all. Rather, a base case will usually mean no additional funds beyond what is already secured, committed or would otherwise be expected to happen in the future if current trends continue. Even base cases tend to have non-zero operations and maintenance costs, and sometimes they may even require more cost for ongoing upkeep than if new facilities and services are implemented.

3-B. Select the type(s) of economic analysis

There are fundamentally two types of economic analysis that can be relevant to a public transit agency’s constituency: (1) the valuation of societal benefits or benefit-cost analysis, and (2) analysis of impacts on the economy of the metropolitan or transit service area. Both types of analysis may be desired since they each serve a very different purpose. The former is a measure of investment efficiency, while the latter is used to assess the extent to which a project addresses the strategic policy goal of improving jobs and income in a region.

- **Monetary Value of Societal Benefits:** Benefit measures quantify the dollar value of outcomes for both users and non-users of a public transit system. Typically, benefit evaluations calculate effects on various incidence factors for both transit riders and car travelers (e.g., reductions in accidents, emissions, travel time, etc.) and then apply unit valuations to those factors to generate their value to people. Unit valuations are derived either from observed prices (such as average costs of labor time, fuel used or collision repairs), or from “willingness-to-pay” surveys (often used in the case of valuing personal time and comfort effects). Some studies itemize these benefits for a specific time, while others place them in the context of a benefit-cost calculation. Formal benefit-cost analysis (BCA) requires the calculation of a discounted stream of project benefits and costs over a given time period, and adopts an “all society” perspective that excludes distributional shifts among parties.
- **Monetary Impacts on the Economy of an Area:** Economic impact measures represent levels of business sales, jobs and income occurring in the economy of a specified region (usually the metropolitan or public transit service area). Construction spending can directly generate local jobs in the short term, while transportation cost savings and enhanced labor market access can improve a region’s competitiveness and attract more investment and economic growth in the longer term. Changes in business productivity and household spending can also shift economic growth patterns among areas and among industries over time. These impacts are typically reported in terms of business sales (output), Gross Regional Product (value added), worker income and jobs generated.



Beyond helping a region's overall economy, public transit investments can be particularly helpful in bringing investment, amenity and livability benefits to neighborhoods by improving their access and making them more attractive as a place to live and work. These “localized” impacts, and their consequences for land use and development, are discussed later in Section 4B.

There are good policy reasons for choosing each of these types of analyses and they should not be regarded as substitutes for each other. You may wish to pursue both kinds of analysis. However, be careful to distinguish between the two when communicating with potential research partners and the public.

Coverage of Benefits and Impacts. Both societal benefit and economic impact measures are driven by the same set of transportation system changes, including changes in travel times, distances, volumes, accessibility, reliability and safety. However, they differ in their breadth of coverage and ways they measure outcomes:

- Both types of analysis count travel-related savings in vehicle operating costs, business-related labor time costs and accessibility effects that generate scale economies and enhanced productivity for businesses.
- Only societal benefit analysis (including benefit-cost analysis) counts improvements to the environment, savings in personal travel time and safety, and social/livability factors – all of which have a value to society but do not change the flow of money in the economy.
- Only economic impact analysis counts spatial shifts that bring flows of investment and business activity into an area because of its enhanced economic competitiveness (enabled by cost savings and other productivity effects).

Capital and O&M costs are viewed differently by the two types of analysis. In societal benefit analysis, these costs are viewed as an offset that reduces net long-term benefits, and they form the denominator of the benefit/cost ratio. In economic impact analysis, spending on these costs is seen as generating jobs and income, though analysts typically separate these short-term spending effects from the longer-term effects of improving a region's economic productivity and competitiveness.

3-C. Define input data requirements

The next important step is to understand input requirement for your scenario analysis and to come up with a clear picture of which inputs can be generated in-house, which may be available through other governmental partners, and which may require separate analysis by outside academics or consultants.

For both types of analysis, the first step is to develop estimates of (1) project costs (both capital investment and ongoing operations + maintenance costs) and (2) transportation conditions (at least data on volumes, travel times and travel distances by mode, and possibly also data on safety, reliability, fares and accessibility) for both build and base case scenarios. Project cost information may be available in-house. Transportation inputs are typically generated using a travel forecasting model but can be also approximated via engineering estimates.


Before embarking on an analysis or drafting an RFP, reach out to your MPO or other governmental research partners to determine whether there are prior studies that address the transportation condition changes of your scenario(s) of interest. If either of these is true, this can reduce the level of effort required by university researchers or consultants in assessing social benefits or impacts on the economy.

3-D. Conduct analysis process

The next step in a successful scenario analysis is to understand, at least at a high level, the analysis steps and the tools required for them, even if you will not be executing them yourself in-house. This is important to ensure that (a) your agency achieves the desired insights, (b) you can plan for the resources required for analysis, and (c) you can explain findings to stakeholders. The table which follows summarizes step-by-step processes for predicting impacts on the economy and for analyzing societal benefits associated with a given alternative investment strategy.¹¹

1. Develop measures of project costs (capital as well as operating + maintenance) and transportation conditions (including volumes, travel times and distances by mode/vehicle types) for the build and base case scenarios. Estimate timing for project completion and measurement of project benefits.	
2. Translate step 1 outcomes into changes in project spending outlays over time and costs for various classes of users. This requires that direct impacts be allocated among classes of trip purpose and vehicle types. Those allocations provide a basis for calculating the monetary value to users from travel time, cost, safety, reliability, and accessibility changes.	
IMPACT ON THE ECONOMY	SOCIETAL BENEFIT
3. Convert step 2 impacts into cost savings and productivity gains for businesses and households. 4. Apply an economic model to step 3 results to calculate (a) effects of project spending on the economy and (b) effects of transportation improvements on regional economic competitiveness, inward investment and business output (adjusting for shifts in supply, demand and costs for workers and materials). 5. Package step 4 results by portraying them as annual impacts on jobs and income for specific areas at specific future times.	3. Apply coefficients to step 2 outcomes to calculate additional non-user effects, including emissions rates, and if desired also effective density changes. 4. Convert step 2 and 3 impacts into money values of all benefits. This requires the application of unit cost factors (or in some cases accessibility impact elasticities that represent impacts on land values or business productivity). 5. Package step 4 results by portraying annual benefits, or by calculating the net present value of benefit and cost streams in a benefit-cost analysis (BCA).

11. Adapted from Weisbrod, Stein, Duncan, and Blair, TCRP SH-17 Practices for Evaluating the Economic Impacts and Benefits of Transit, Transportation Research Board, 2016.



Each type of analysis requires a different type of tool. Regional economic impact studies typically rely on a region-specific model that is sensitive to the economic growth effects of transportation cost changes over time (such as REMI-TranSight or TREDIS). A societal benefit analysis (or benefit-cost analysis) can be accomplished using simpler spreadsheet-style tools. Free tools for benefit-cost analysis are discussed in the “Transportation Benefit Cost Analysis” web guide operated by the Transportation Research Board’s Standing Committee on Transportation Economics.¹²

Not all economic models are alike. Sometimes agencies run into trouble because they do not differentiate between the two types of economic models commonly used in public transit system evaluations. The first type, static input-output model, is useful for “snapshot in time” analyses of the role of agency expenditures in a regional economy (as discussed in section 1A) or of economic activity associated with commuting that is dependent on transit (see section 2A). In contrast, scenario analyses as laid out here in section 3 require model systems or equations describing industry responses to shifts in labor and transportation costs. This is important because it is incorrect to assume, for example, that a dollar saved in business operating cost translates into an additional dollar of business output (sales).

3-E. Guidelines for seeking outside assistance

The following are some simple guidelines that should help you structure a focused and clear request should you decide to seek outside assistance to conduct a scenario analysis:

- Explain your need: What triggered your agency’s desire for this analysis? Is this an extension of prior efforts or something brand new? Do you wish findings to be tailored to a specific audience or to focus on effects for a specific area? Are there regulatory requirements or specific decision points in your planning process that affect how the analysis should be conducted?
- Outline the types of effects that you wish to understand: Clarify whether you are interested in societal benefits or impacts on the economy, or both. Be specific about any other effects or policy questions you wish to be able to address with your analysis.
- Be clear about data and tool availability: State clearly whether you have access to a travel model (and staff) or economic model at partner agencies. If completed prior studies or travel model runs are relevant to your scenarios, reference these.

Communications message. The messaging for economic impact studies and for societal benefit studies is very different. The following language can be used as a model to describe findings from each form of analysis for proposed public transit investment scenarios. In all cases, it is assumed that the communications would be accompanied by some further description of the project and its timing, as well as the study area and year(s) selected for reporting on benefits after the project has been completed.

12. Adapted from Weisbrod, Stein, Duncan, and Blair, TCRP SH-17 Practices for Evaluating the Economic Impacts and Benefits of Transit, Transportation Research Board, 2016.

Sample for Reporting Economic Impact Findings.

A study was conducted by <<name>> to calculate how the proposed <<name >> project would affect the economic growth of the region, compared to what would occur without it. The study examined effects on the region's business productivity and economic competitiveness, which would result from changes in travel times, congestion, reliability and costs for public transit riders as well as for cars and trucks on the region's roads.

It found that economic growth would lead to around \$<<JJ>> million more in annual business activity (measured by GRP or value added) by the year <<a future year after project completion>>, supporting <<KK>> additional jobs and \$<<LL>> million more in annual wages.

(If available, also present more detailed results on jobs by industry and/or occupation, and growth in jobs over time.)

Notice for Communications: In the economic impact analysis, do not add dollar values for business sales, GRP (value added) and/or income (wages), as explained in the Section 1A communications note. Also avoid confusing annual recurring impacts from one time impacts or the sum over a period of period. Finally, if reporting benefits, it may be helpful to differentiate actual changes in monetary expense (e.g. fares, parking costs) from benefits that have been monetized based on willingness-to-pay assumptions. Across these various categories, report authors should endeavor to be clear.

Sample for reporting Societal Benefit findings.

A study was conducted by <<name>> to calculate the benefits of implementing the proposed <<name >> project. The study examined effects on travel times and costs for transit riders, as well as for cars and trucks on the region's roads. It also examined effects on the energy, environment, health and public service costs. It found that over the time from <<start to end years >>, travelers in the region could be saving <<MM>> million person-hours of time from faster speeds and reduced delays. It also found that over this same period, the project would save <<NN>> tons of pollution and save <<OO>> gallons of fuel. The overall value of benefits would grow over time and by <<end year>>, it would be the equivalent (in today's dollars) of \$<<PP>> million/year saved.

(If applicable add.) The study also compared overall project benefits and costs over time, and found that the investment would lead to a <<QQ>> benefit/cost ratio.

Notice for Communications. For the societal benefit analysis, it is best to present discussions of future benefits to audiences in terms of constant dollars that represent today's value of money. This means that values are not increased by expected future inflation nor are they discounted by the time value of money. However, for reporting benefit-cost comparisons, it is necessary to calculate a discounted present value of future benefit and cost streams to allow for the difference in timing of costs (which typically occur in early years) and benefits (which typically occur later, after the project is completed).



INVESTIGATING ADDITIONAL EFFECTS: UNDERSTANDING LOCALIZED AND LONG-TERM EFFECTS

Why? Having read through the methodologies outlined in Sections 1 through 3 of this guide, you may find yourself thinking, “that’s not the whole story.” You are right! There are many ways that public transit influences the general well-being of people, the sustainability of our environment and the livability of our communities and neighborhoods. Some of these effects are more difficult to quantify or are not traditionally accounted for in standard economic analyses. These include:

- **Sustainable, long-term effects on communities:** These are effects related to shifting land use or modal reliance patterns that are more pronounced in future years or change gradually over time. These shifts can affect long-term demands for infrastructure, future community livability, and resource consumption and environmental degradation. These effects may be deemphasized by the discounting of future effects in a benefit-cost analysis. They may also be difficult to forecast using traditional modelling techniques because they represent fundamental and transformational shifts in the functioning of local transportation systems, economies, land use and human activity patterns.
- **Area or group-specific effects that are of strategic policy interest:** Some of the effects of public transit are concentrated among particular groups of people or in specific geographic areas. These effects may be overly diluted when considered within traditional aggregate evaluation methods, or may in fact represent cases where some gains for a particular group come at the expense of losses for another group. Noise impacts are one example of an effect that may be too localized to appear in regional economic analysis. In a similar vein, transit station area development can be of strong policy interest but often represent redistribution of activity within a region. Similarly, you may wish to consider income gains or quality of life improvements for specific disadvantaged populations or neighborhoods.

How to do it? Each of the above effects involve either long-term futures or specific areas, sectors of the economy, or population groups that are of strategic concern for public policy. There are precedents for measuring them. However, they all involve perspectives that are outside of the bounds of the more common analysis practices that focus on societal-wide benefits or region-wide economic impacts, and the present value of future benefits. Analysis methods for analyzing these are discussed next.

4-A. Sustainable, Long-Term Impacts

Impacts of Policy Interest. Public transit investments today can contribute to cumulative, longer-term outcomes of strategic importance for public policy. These may include:

- **future urban development and density patterns** (a product of cumulative land development over time, which is affected by modal options and accessibility patterns);
- **future car ownership patterns** (a product of sustained expansion of public transit services to make it feasible for households in some metropolitan areas to reduce car ownership);
- **future levels of greenhouse gases** in the atmosphere (a cumulative effect of carbon emissions in earlier years);
- **future growth of specialized business clusters in a community** (a result of sustained access to wider labor markets with specialized workforce skills to support cluster growth).

Measurement Methods. There are three methodological elements required for analysis of the economic benefits and impacts of the above factors: (1) the specification of a sustained effect - they all require a change in public transit investment and transportation conditions that is fully specified and continued over time; (2) the achievement of cumulative results - they each require that the sustained effect leads to a cumulative change or improvement over time that achieves specified threshold levels; and (3) measurable changes in desired outcomes - they all require that the achievement of certain cumulative results will lead to a change in certain broader environmental, social or livability conditions that can be measured. The second and third steps can be accomplished using travel demand models, along with factors that translate transportation changes into time, cost and environmental impacts that have corresponding economic values (as previously described in Section 3, step 2).

For example, APTA's report, "The Economic Impact of Public Transportation,"¹³ highlights a national scenario in which there is a sustained, high level of public transit investment in major cities -- which achieve levels of service sufficient to enable a reduction in car ownership levels. As households decide to forgo buying replacement cars, they can save money on costs of car ownership, operations and parking. There can also be broader public and private benefits if incremental costs of transit funding are offset by savings in spending on expanding and maintaining road systems, home driveways and garages, and business parking lots and parking garages. The methodology for calculating the economic benefits is shown in that report. However, it cannot be applied for local areas without substituting applicable local inputs concerning public transit ridership levels, investment requirements and associated costs to achieve target service levels, and savings in expected costs for roads, homes and business parking facilities.

Interpretation and Presentation of Findings. The foundational assumption underlying all of these long-term analyses is that we as a society care about inter-generational impacts and want to leave future generations with communities (and a world) that are better (or at least not any worse) off than today. Each of the impact and benefit outcomes illustrated by the preceding bullets is a cumulative result of conditions in prior years and hence are not easy to reverse. Consequently, economic impacts and societal benefits are calculated and presented for long-term future years or periods of time, without the discounting of future year results, as is typically done in benefit-cost analysis.

13. Economic Impact of Public Transportation: 2014 Update, APTA. <http://www.apta.com/resources/reportsandpublications/Documents/Economic-Impact-Public-Transportation-Investment-APTA.pdf>

Communications message. The following is sample language that can be used to discuss long-term sustainability benefits of public transit investments:

A study was conducted by <<name>> to calculate the long-term benefits of the proposed <<name >> project. The study examined region-wide effects on public transit use, car ownership, urban development patterns and carbon emissions (affecting greenhouse gases in the atmosphere). The analysis findings were that public transit ridership will increase because this project will lead to greater impacts over time. As a result, by << future year >>, travelers in the region would be saving <<RR>> person-hours of time each year, generating <<SS>> fewer tons of pollutants per year, <<TT>> less carbon per year, and save <<UU>> gallons of fuel per year. The overall value of benefits would be the equivalent (in today's dollars) of \$<<PP>> million/year saved.

4-B. Distributional effects on specific areas or groups

Impacts of Policy Interest. Public transit investments can be targeted to: (a) benefit disadvantaged areas and population groups, or (b) support desired economic growth in specific areas and industries. Examples of the former include impacts on low income neighborhoods, economically distressed industrial and commercial districts, and housing developments for the elderly. Examples of the latter include effects on promoting transit-oriented development and greater development densities around public transit stations, and support for community economic development strategies that seek to attract and grow technology-based business clusters that provide more job growth and higher-paying jobs. If any of these issues are relevant, then the methods described next should be applied to address them.

Measurement Methods. To analyze effects on specific areas and groups, it is possible to adapt the basic methods for measuring societal impacts and modeling economic impacts (described in section 3, step 2) and apply them just for subsets of the population and economy. These subsets may be residents and businesses in specific metropolitan areas, counties, cities or neighborhoods. It is also possible to conduct those analyses for specific industries, occupations and/or income groups.

To carry out these methods for specific areas or groups, additional steps should be conducted:

- Identify incidence of effects. The incidence of public transit impacts must be determined in terms of the portion of total benefits or impacts that apply to the specified area or population groups. For instance, travel demand models and origin-destination surveys may show the portion of travelers who live or work in a specified area, or whose trips originate or end there. That information may be used to determine the extent to which time, cost and access benefits accrue to residents or businesses in specific areas within the region. Economic models or surveys may also be used to establish the incidence of effects among industries, occupations and/or socio-demographic groups.

- Measure localized effects. The impact on specific areas or target population and business groups should be identified separately, as some of these impacts may disappear when viewed from a regional or statewide perspective. For instance, some environmental effects of public transit projects, such as noise and pollution from vehicles, are typically localized in neighborhoods near public transit lines, stations and vehicle maintenance facilities. Those effects are entirely diluted when viewed at a regional or state scale. Other types of transit impacts on land, such as transit-oriented development (TOD) and high-tech business cluster development, reflect local access benefits that may be highly desired by local communities, but seen as mere spatial redistributions of economic activity when viewed from the lens of society-wide benefits. Since these local effects do not affect region-wide or statewide totals, it is important to separately measure and report them from a local viewpoint.
- Assess disproportionate impact. In some cases, there is an interest in whether some groups are disproportionately and unfairly hurt by a particular public transit project. To address that concern, analysts typically compare the relative incidence and magnitude of localized outcomes to corresponding effects on other parts of the region. If the entire region benefits, but a local neighborhood benefits even more, then there is no “loser” and the outcome should be characterized as an overall benefit for all.


A word on TOD and neighborhood development impacts. Public transit can spur investment in neighborhoods by improving access to/from them, making them more attractive for investment and leading to more jobs and income. While these are local shares of regional economic impacts, an analysis of neighborhood-level impacts should also consider two other factors:

- Market Analysis. A local assessment should incorporate two additional considerations: (a) What do we know from neighborhood development cases elsewhere – which provide benchmarks (comparables) for establishing a range of possible outcomes, and (b) How do local market factors (available land, zoning, amenities, prices and existing activities in this neighborhood) compare with those of competing locations for business investment – which will determine how local impacts are likely to occur in this case compared to the benchmarks. Note: (Benchmark case studies are discussed and shown in TCRP Report 186¹⁴ and AASHTO’s EconWorks web page.¹⁵
- Impact Metrics. Neighborhood development impacts tend to unfold over time. An increase in local property values is an indication of enhanced interest in a local neighborhood for home or business locations, but it is not benefit by itself. (After all, who would want to pay higher rents, higher costs of housing and higher costs of business location with all else equal?) However, an increase in property values can be interpreted as an indicator of the market value associated with increased public transit access, which ultimately should lead to increased jobs and income in the neighborhood.

Interpretation and Presentation of Findings. While the measurement of local effects (benefits and economic impacts) generally rely on the same calculation methods as applied for analyzing society-wide effects, the analysis perspective is changed. The question of perspective (what economists refer to as “who has standing”) is changed from a society-wide view to a localized view. That allows local community impacts and benefits to be recognized, measured and reported even though they would be viewed as essentially zero (either too small or else zero sum shifts among areas or parties) from a regional, state or national perspective.

14. Economic Impact Case Study Tool for Transit, TCRP Report 186, Transportation Research Board, 2016. www.nap.edu/login.php?action=guest&record_id=23525

15. EconWorks Case Study Search, <https://planningtools.transportation.org/223/case-study-search.html>



Findings on local area impacts and group-specific benefits can be represented in either of two formats:

1. In the form of a multiple account evaluation that explicitly lays out the many different types of impacts benefitting many different types of stakeholders, without attempting to sum them up, or
2. As a social return on investment analysis that explicitly focuses on summing benefits for a specific set of stakeholders.

By acknowledging carefully delineated perspectives, this approach allows for an assessment of progress towards a variety of long-term planning or policy objectives that are outside of the efficiency-oriented perspective of a classic BCA and do not show up as changes in a broader region's economic activity.

Communications Message. There is no “one way” to communicate localized effects or the distribution of impacts on particular stakeholder groups. However, the following guidelines may help you determine an appropriate approach for your agency:

- Present results with explicit disclosure of the stakeholder perspective, boundaries of study areas, and explanation as to how project characteristics have disproportionate consequences for the selected stakeholders or neighborhood.
- Present these specific group or area findings as a complement to, and not a replacement for, broader regional impact or societal benefit analyses.
- Be as clear as possible about the ways in which expected outcomes are predicted, as well as any caveats regarding their accuracy (for example, if you are basing your expectations on experience elsewhere, try to describe how other communities are similar to, or different from, your own).



GUIDELINES FOR SUCCESS:

MAKING SURE YOUR RESULTS ARE CLEARLY AND SUCCESSFULLY COMMUNICATED


5-A. Ensuring Credibility

This guide began with the assertion that economic analyses need to do more than place a single number next to a dollar sign. Credibility of an analysis stems from clear communication of results. Many ways to ensure this have been addressed in previous sections, but high-level guidelines are reiterated here for emphasis, along with some additional points:

1. Be careful not to conflate different types of measures: the dollar valuation of (non-money) social benefits should not be confused with impacts on the flow of actual income earned in a specific region.
2. Be clear about the perspectives and coverage of effects in the analysis results you are reporting. This means enumerating the types of effects included and the definition of scenarios involved in your analysis, if applicable. It also means maintaining clarity of perspective (e.g., benefits to riders vs. residents of a neighborhood or all taxpayers in a state), and clearly defining any impact geographies and timelines.
3. Inoculate yourself against criticism. Acknowledge effects not captured in your analysis. Note that in any analysis, findings should be viewed as a reasonable expectation given currently available information, though it is not possible to anticipate future events that could increase or decrease the estimated impacts you've predicted.
4. Make it real! Wherever possible, connect quantitative results to “real world” experience and observations that are specific to your agency and market. This can make otherwise opaque numbers more tangible and more connected to the actual experience of key stakeholders. It can also provide a means of validating your results.

5-B. Ensuring Accuracy

Last, but not least, don't be afraid to get your feet wet! The myth of a “perfect” analysis should not prevent you from getting started and harnessing economic analysis to make better decisions and connect with your agency's constituency. No analysis study is perfect, but an analysis effort that follows the guidelines of this document will at least represent a reasonable effort and one that is definitely better than having no analysis at all!



There are just three simple guidelines to help you:

- **Be careful when using results from national studies.** Make sure to say they are national numbers. For instance, the APTA Guide, “Economic Impact of Public Transportation,” cites the figure that every dollar of transit investment generates 3.7 dollars of business in the U.S. economy. While that figure is correct, it only applies to the national economy. The actual numbers for any given city or metropolitan region will be very different from the U.S. number, and will probably be smaller. The actual numbers for your region will depend on the characteristics of its economy and the extent to which it contains manufacturers and suppliers of equipment and materials for public transit agencies. That is why local or region-specific economic models are needed, and that is precisely why the APTA economic impact tool provides this information specifically for each agency’s service area.
- **Do not take findings from studies of other cities and neighborhoods and assume that they also equally apply for your city or neighborhood.** There are many success stories of public transit projects that generated economic development impacts, but that does not mean that the same results will occur everywhere else. There may be important differences in the level of services, characteristics of affected areas, and underlying population and business trends. The methods described in this report provide a way to account for those factors, and thus are much more likely to yield accurate and credible results than referring to success stories elsewhere.
- **Do not take estimates of money saved by travelers and assume that regional business will grow by that same amount.** That does not make logical sense, yet it is sometimes assumed by analysts who do not want to take the time and effort to use an economic model that will accurately calculate these effects specifically for a local area or region. This report makes it abundantly clear that tools are widely available and widely used.

The bottom line is that, with this guide and the resources noted in its footnotes, any public transit agency can start documenting its economic benefits and regional economic impacts on its own, and later move to more complex studies to be completed with the help of specialists.



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