

# Using Economic Impact Analysis To Develop Supportable Transportation Decisions – Across All Planning Stages

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## The Disconnects Surrounding Economic Impact Analysis

**Attention to Economic Impacts** – During the past two decades, there has been a continuing progression of research studies that have both identified the ways

in which transportation infrastructure investment lead to economic impacts and defined frameworks

for calculating them. During this same time, politicians across the political spectrum have increasingly opined on the importance of our nation’s transportation system for maintaining commerce as well as national and international competitiveness.

**Increasingly, transportation is recognized as a key to national and international competitiveness.**

**Limited Use to Date** – Yet at the same time, the reality is that use of economic impact studies (and benefit/cost analyses that consider wider economic factors) has lagged far behind the frequency of public rhetoric about the importance of economic impacts. Some state and regional agencies have been reluctant to acquire economic impact analysis tools or fund economic impact studies in periods of limited resources, even while continuing to spend large sums on tools for modeling, forecasting and planning other aspects of transportation systems.

**The use of economic impact studies lags the frequency and volume of public rhetoric.**

**Confusion over the Purpose of Use** – Misconceptions abound, particularly concerning the resources required and potential importance of economic impact results. Most telling is the outcome of workshops for economic impact practitioners that were held at both the 2011 TRB Annual Conference and the 2011 ITED Conference, organized by TREDIS.<sup>1</sup> At both workshops, there was significant discussion about difficulty communicating the meaning and potential usefulness of economic impact findings to legislators, agency officials, stakeholders and the general public. A follow-up research effort conducted by staff of TREDIS software came to the conclusion that a large

**When economic analysis is communicated well, you can develop more highly supported decisions. Read on to learn how.**

<sup>1</sup> (Summaries of these workshops are available at [www.tredis.com/articles/news/user-group-may-2011.html](http://www.tredis.com/articles/news/user-group-may-2011.html) and [www.tredis.com/articles/news/user-group-jan-2011.html](http://www.tredis.com/articles/news/user-group-jan-2011.html))

part of the problem centers on confusion or uncertainty about why economic impact analysis is being conducted or how the results can effectively be used. We can do better, and this white paper is a first step towards laying out a clear framework of how economic impact analysis can be used as a factor in decision-making across every planning stage – and when communicated well – leads to more highly supported decisions. Regardless of whether you are responsible for leading the decisions-making process across the various planning stages or you are involved in a specific analytic review at a specific stage, by being cognizant of the planning stage and associated stakeholders and message opportunities, your decision-making efforts can be more effective.

### Economic Impact Results Are Useful In Every Stage

An economic impact analysis tool (such as TREDIS) can be used to inform decisions at all four of the planning stages (see column at right). However, for it to be

**Economic analysis doesn't have to be expensive or time intensive – the trick is to match the level of analysis and data to the decisions that need to be made at that stage.**

useful, it is necessary to first clearly distinguish the analysis issues to be addressed at each stage and then apply the same economic impact tool in different ways depending on the stage at which it is to be used. Appropriately defined and applied, economic impact analysis can be of substantial value at any of these stages without necessarily being expensive or demanding of staff or consultant resources. The trick is to ensure that the analysis is targeted to address the fundamental decision issue at hand at each stage, and carried out in a way that enables its results to affect conclusions and findings.

Failure to tailor analysis to address the decision factors at each stage can lead to economic impact studies that are overly resource intensive and/or of little practical value. For instance, our discussions with practitioners revealed a common perception that economic impact analysis is optional because it merely accentuates measured benefits and does not change fundamental decision priorities. This is a somewhat valid perception because if an over-simplified economic impact analysis is carried out by taking user benefits

### Distinct Stages in Transportation Planning and Decision-Making Processes

Across America, there is a generally accepted set of procedures for transportation infrastructure planning, much set by federal and state regulations. The Congressionally –funded Strategic Highway Research Program, project #C01 (conducted by ICF International) developed a web site that identifies formal decision-making steps for budgeting, planning and public review processes.<sup>2</sup> While the site describes 42 discrete steps in the process, for our own purposes it can be more useful to boil the process down to four key stages, which are shown below.

#### Key Phases of Transportation Planning Processes that Call for Different Forms of Economic Impact Assessment



Ideally, each of the stages is informed by traffic engineering factors, social and environmental considerations – as well as economic impact analysis. Because the purpose of each stage is fundamentally different, the specificity of options being considered is very different. In addition, the level of detail of information available and form of supporting analysis that can be done is also very different.

<sup>2</sup> Steps in the collaborative decision-making process are shown in [www.transportationforcommunities.com/shrpc01/framework\\_application\\_kdps/21/0](http://www.transportationforcommunities.com/shrpc01/framework_application_kdps/21/0)

and simply multiplying them to reflect broader impacts, then the total benefit may appear larger but it is unlikely that there will be any change in the relative benefit ranking of alternative scenarios or projects.

**Overly simplified analysis doesn't allow you to differentiate between alternatives, but appropriate analysis can demonstrate dramatic differences and help you make much better – and more supportable – decisions.**

However, if TREDIS is used in a way that recognizes changes in cost, reliability, access or connectivity among different impact areas and scenarios, then the economic impact results can lead to dramatic differences in the ranking of alternatives.<sup>3</sup> And that finding can be highly useful in informing public discussion, assisting in prioritization processes, and in making project selection decisions.

## **Effective Economic Impact Analysis and Communication Considerations at Each Phase**

To better understand how economic impact studies using TREDIS can be tailored to be most efficient and useful at each stage in the transportation planning process, the following section outlines the unique objectives of each stage, corresponding differences in data analysis to address those objectives, and the various audiences and key messages that should be taken into account if you want to define problems and develop solutions that stakeholders can understand and support.

### **Stage 1: Public Policy Development and Conceptualization of Strategy Elements**

**Objective.** It starts when somebody proposes a solution concept (or set of solutions) to address a need. For example, the need may be growing traffic congestion or air pollution, or economic competitiveness, or safety and quality of life considerations. The proposed concept for public policy or public agency strategy may involve expanding public transportation services or pedestrian/bicycle facilities, or imposing tolls or fees, or changing the balance of preservation vs. new capacity projects, or building added road, transit or airport facilities. To establish a basis for further public discussion, there must be some information establishing the stakes involved. And for planners at a State DOT or MPO to even consider any such concept proposal in their future plans, they first need to generate some rough magnitude estimate of the associated cost and benefit, to screen out infeasible proposals.

**You have to help stakeholders understand what's at stake – and then determine if they really care.**

**What is known at the start of this step.** Typically, there is only rough information on the nature of the problem or need (typically the magnitude of travelers affected and constraint on available access, service or capacity). Little or nothing may be known about likely cost or economic impact at the start.

**Available Tools.** State and regional agencies often rely on in-house staff to either: (a) develop illustrative but realistic examples of proposed policies, programs or projects, and then (b) screen them for reasonableness in terms of potential cost and user benefit.

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<sup>3</sup> This is illustrated in a 2011 TRB paper by Glen Weisbrod: "Incorporating Economic Impact Metrics in Transportation Project Ranking and Selection Processes" [http://www.edrgroup.com/attachments/410\\_Hwy-Ranking-Criteria.pdf](http://www.edrgroup.com/attachments/410_Hwy-Ranking-Criteria.pdf)

Economic benefit are often also claimed though they may be portrayed in qualitatively terms, or else quantified for illustrative scenarios.

**Practical Use.** Economic impact analysis can help to assess the relative benefits of proposed policies or strategic directions, and make a stronger case for the stakes involved and repercussions of action or inaction. This can occur insofar as the economic impact analysis helps to “tell a story” and explain why actual impacts on non-users may be significantly different (larger or smaller, and broader or narrower) than direct user benefits. For that kind of finding to emerge, the economic impact analysis must be defined in a way that recognizes the basic motivation for proposed actions or solutions, and represents it as affecting some aspect of access, connectivity, mobility, reliability, contingent development or cost for specific elements of the population or economy. In other words, is the problem bad enough and does it impact enough people that action is clearly required. To assess a specific policy or strategy direction in this way, TREDIS may be utilized at a sketch planning level -- to illustrate the magnitude of potential costs and economic impacts associated with some illustrative scenarios (or examples of actions taken).

**Think about headline appeal – is the problem bad enough and does it impact enough people that action is clearly required?**

**Audience and Key Message Considerations.** It’s a mistake to think the technical analysis about the problem must complete before engaging key stakeholders. In fact, the opposite is true. It’s important to engage key stakeholders from the very earliest stages so that your analysis focuses on issues that will ultimately resonate with public – which may or may not align with the technical analysis you might traditionally conduct. The first step is to identify key stakeholders and assess their level of concern about the problem or need. Typically at this stage, key stakeholders include those who have a vested interest in the health and vitality of the community, region or state and might include legislators, elected executives (e.g., the Governor or Mayor) and other elected officials, business and non-governmental organization leaders, and other thought/opinion leaders.

**It’s a mistake to think your technical analysis must be complete before engaging stakeholders – in fact, the opposite is true.**

As you discuss the problem or need with them, carefully listen to the way they frame the problem and the exact language they use. For example, your agency may characterize the problem in terms like “by 2040 the volume to capacity ratio will far exceed acceptable standards resulting in an unacceptable level of service.” Perhaps your stakeholders would say, once understanding the traffic projections and resulting levels of congestion, *“Commute times along Corridor One Big Mess will increase 45 minutes – pushing commuters and truck drivers to the brink of road rage.”*

**Remember the old adage – begin where they are, not where you are. Use your stakeholders’ language.**

After conducting a series of interviews with community leaders and determining their level of interest in and support for addressing the problem, and assuming the agency has decided

**Create a public record so your inquiry into the problem is transparent.**

to tackle the problem, it's time to create a "public record" about the problem so that the agency is transparent about the inquiry into the problem. This can be accomplished by an agency leader raising the issue at a

public gathering or regularly scheduled meeting (e.g., Chamber of Commerce meeting or city council meeting), calling a press conference or issuing a press release or any number of options. The most effective option depends on the relationships the agency leader has developed within the community and media, the size of the problem, previous work that may have been done on the problem, existing community concerns and the credibility of the agency.

Regardless of how you create a public record, it's critical to position the problem in an understandable and compelling way. No one will support a solution if the problem doesn't resonate. It's a good idea to be very clear about the economic toll the problem has taken to date as well as the projected impact. Telling the story of the problem in both in expected and unexpected ways will help it resonate and be

**Position the problem in an understandable and compelling way.**

remembered. For example, use statistics that are meaningful (based on information you gathered during the community interviews) – and then put a "face" or "faces" on the story by profiling people who have been affected by the problem.

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**More on Using TREDIS for Public Policy**

Examples of TREDIS uses for public policy include national organizations such as the American Public Transit Association; American Society of Civil Engineers and US Conference of Mayors; governmental bodies such as the City of Ft. Worth, TX and Missouri Dept. of Economic Development; and business organizations such as the Portland Business Alliance, Chicago Metropolis 2020 and Vancouver Gateway Council. The TREDIS web site provides case studies describing how TREDIS has been applied to examine transit expansion, preservation funding, development fee and congestion pricing options. [www.tredis.com/articles/case-studies-of-tredis-use/list-by-purpose.html](http://www.tredis.com/articles/case-studies-of-tredis-use/list-by-purpose.html)



Additional information about proposed highway capacity projects can be found in the TPICS database ([www.tpics.us](http://www.tpics.us)) which provides a library of case study examples around the US. It provides information on the typical range of cost and economic impact associated with specific types of built projects, and issues affecting project implementation and impacts. However, this tool and database is not a substitute for TREDIS as it is not sensitive to the severity of traffic delays or other local problems, nor the magnitude of affected traffic volumes, nor differences in local economic conditions.

## Stage 2: Strategic Plan Scenarios

**Objective and Process.** Once passing the Stage 1 screening, surviving concept proposals become candidates for short-term implementation plans, long-term strategic plans and/or specific funding programs. At this stage, agency staff develops specifications for realistic yet representative scenarios. They do this by defining potential modes involved, locations of facilities to be considered, areas to be served and rough costs. The resulting project packages often include alternatives representing the range of potential details including budget levels (e.g., low vs. high funding) and relative priorities (e.g., preservation vs. capacity expansion, or transit-oriented vs. highway oriented plans). For each scenario, costs and economic consequences of the plan (as a package) are then evaluated in terms of how they rate relative to goals. Plan scenarios that have unacceptable ratings can be screened out, and those remaining can be considered for future funding and implementation in Phase 3.

**Surviving concepts become candidates for funding and implementation in Phase 3.**

**What is known at the start of this step.** Cost is roughly estimated in terms of total construction and annual operating dollars, usually with no further breakdown. Timing is generally in terms of a range of years with no specific start/end or phasing. Traffic forecasts are in terms of a single out-year (typically 20 or 30 years out). Spatial location and alignments are specified in only very vague terms as it is premature for specific design decisions at this point.

**Available Tools.** Transportation system performance impacts may be forecast by sketch planning spreadsheet or travel models for regional-level sketch plans (representing entire bundles of projects). Depending on the type of strategic plan being considered (e.g., freight plan, multimodal plan, highway plan or airport plan), the transportation performance impacts may include impacts on travel time and cost, impacts on safety and reliability, and/or impacts on market access and transport system connectivity.

**Practical Use.** Economic impact analysis can be of critical importance in showing how alternative future scenarios can change a region's or state's economic future, as the various (above-cited) elements of transportation performance translate into changes in productivity, competitiveness, economic cluster development and facilitation of new and growing industries. For that type of outcome to occur, the economic impact model must identify unique aspects of the economic base of the affected area, and then show how that affects the distribution of beneficiaries and nature of broader impacts on economic activities.

**Economic analysis at this stage shows how the scenarios can change the region's or state's economic future.**

**Audience and Key Message Considerations.** Through the course of this stage, audiences and key stakeholders are likely to shift as some scenarios are screened out and other scenarios are advanced. Pay close attention to the proponents of the scenarios that are screened out to determine if they will actively oppose the scenarios that are being advanced or if they lose interest in the problem. It's likely that the overall range of audiences will narrow (e.g., legislators whose

**While the range of audiences narrows, the depth of the remaining audiences increases.**

districts would have been impacted by a scenario that isn't advanced may lose interest) but the depth of the remaining audiences will increase as it becomes clearer who will be impacted.

In terms of communication and collaboration at this stage, it's important to *educate* – and even better to *collaborate* with key stakeholders in the screening analysis to help build support for decisions:

1. Educate – make sure the analysis is explained in a way so that stakeholders can understand the full range of factors that were considered and demonstrate that those factors reflect what community leaders said were most important in Stage 1 through community interviews. **Education is good, but collaboration is better for building supportable decisions.**
2. Collaborate – to build a more publicly compelling economic analysis, work with key stakeholders to determine:
  - a. How economic factors compare to other factors (e.g., economic factors are more/less important than environmental factors or engineering considerations). It's best to have these “philosophical” discussions before you develop and apply a screening formula. That way, scenario proponents don't try to “do the math” in advance in an effort to shape the analysis so that their project does well in the screening and is thereby advanced to the next stage. By seeking input from the full range of stakeholders about the factors which should be considered and the relative importance of the factors, credibility is built for the full analysis process – including the economic impact analysis.
  - b. In terms of economic factors to be considered, determine what stakeholders literally want to accomplish economically and consider how those goals could be factored into the analysis. For example, are stakeholders most interested in creating short term jobs or long term jobs, or increasing the tax base or helping one economic sector or region over other sectors or regions? Whatever the goal – and however the agency decides to use the input – make sure you explain the analysis in the terms of what matters most to your stakeholders. **Invite others to shape decisions, within established constraints. It's not loss of control – it's actually better positioning to accomplish long-term goals.**

- c. Make sure economically diverse areas and different business sectors are represented during the discussions about the screening factors. It's not just about determining and then touting the economic benefits of the proposal itself, it's about demonstrating that among the many scenarios considered, that a reasonable process was used to select the best option(s) to fund and that the economic factors which stakeholders said are important were taken into account.

**It's not just about touting the economic benefits of a scenario; it's about demonstrating a reasonable process was used to select the best option.**

### **More on TREDIS as a Sketch Planning Tool**

TREDIS has been widely used as a sketch planning tool at this level, and in fact, it was first built to address this specific type of application. Examples of TREDIS uses for strategic and long-term plans include studies by public agencies of the economic impacts of multi-state regional plans (e.g., Appalachian Regional Commission and Northeast CanAm Connections); statewide multimodal investment plans (e.g., Maine DOT long-range plan and Virginia DOT six-year plan); and local or metropolitan growth and development plans (e.g., Richland County, SC and Chicago Metropolitan Agency for Planning.) The TREDIS web site provides case studies describing how TREDIS has been applied to examine state and regional plans ranging from 5-year plans to 30-year plans.

[www.tredis.com/articles/case-studies-of-tredis-use/list-by-purpose.html](http://www.tredis.com/articles/case-studies-of-tredis-use/list-by-purpose.html)



### Stage 3: Programming: Project Prioritization and Selection

**Objective.** Once a program plan is has been developed and its reasonableness determined in Stage 2, each individual component (project) typically goes through a state DOT or MPO process that considers plan requirements (costs and other actions) and potential benefits (for users and/or wider economy) relative to other competing proposals. Phase 3 selects best projects to fit within future funding plan constraints, while Phase 4 prioritizes them. While travel flow efficiency (user benefit) measures have traditionally been used as a basis for establishing potential benefits, a large and growing number of state DOTs and MPOs are expanding their analysis to also consider wider economic impacts in their prioritization and selection processes.

**Travel flow efficiency has been the traditional measure of benefit but DOTs and MPOs are finding broader economic measures resonate better with stakeholders.**

**What is known at the start of this step.** With a specific project plan, there is typically a detailed budget estimate breakdown and specific start/end/phasing proposal. Projections of trip generation, mode split and traffic conditions are usually available by this phase. Sometimes there are travel demand models to generate information on travel impacts, though sometimes there are no such models and engineering estimates or sketch planning travel impact tools (“rules of thumb”) are used.

**Available Tools.** The number of projects to be considered in a project prioritization system may be as few as a dozen or as many as several hundred. In any case, the state DOT or MPO is likely to keep information about the various projects, costs and travel impacts in a spreadsheet or database file. When large numbers of projects are being considered, a custom script may automate the passing of project travel impact data to the economic impact model. The economic impact results are typically fed into some form of benefit/cost or multi-criteria accounting (or related scoring) system (developed by the state DOT and MPO) to select and prioritize proposed projects.

**Practical Use.** Economic impact assessment, when done right, can dramatically change the ranking and relative benefits and costs of various proposed projects. It can identify proposed projects that particularly affect regionally significant economic factors. If desired, the assessment can also recognize projects in rural and isolated areas where potential benefits relate more to connectivity and access than traffic flow performance).

**Adjustments can be made for rural projects so that benefits related to connectivity and access are appropriately recognized, instead of too much emphasis on improvements in traffic flow.**

**Audience and Key Message Considerations.** Relatively few shifts in the range of key stakeholders occur in this phase, as project advocates and stakeholders with specialized knowledge (e.g., mayors, public works directors, Chamber of Commerce presidents) tend to want to engage with agency staff or leadership and advocate on behalf of their project. Because the assessment at this stage so clearly produces “winners and losers” in terms of projects which are selected for funding and then scheduled for construction/implementation, it’s important that the results of the analysis – including the economic impact analysis – don’t feel like they jumped out of the proverbial black

**Because the assessment so clearly produces “winners and losers,” don’t let the results feel like they jumped out of a “black box.”**

box. You need to build understanding, credibility and ultimately acceptance of the overall analysis with stakeholders to reach a supportable decision. Steps to consider for building credibility for your economic analysis include:

1. Establish an external stakeholder group to vet the selection of an economic impact assessment tool and the economic parameters that will be considered to select and prioritize projects. The stakeholder group could be established at this stage or at an earlier stage. The time that staff invests with helping the working group learn about various tools and the inputs that drive the economic models can pay large dividends later in terms of credibility. It's much more impactful if stakeholders vouch for the appropriateness of the tool instead of relying exclusively on agency staff. Make sure your group broadly represents those stakeholders who would be interested economic impact analysis and/or could be impacted by the project selection process, such as: rural and urban interests, a well-respected, independent economist from the home state, and business and Chamber of Commerce leaders.  
**External stakeholders are often more credible spokespeople for the “fairness” of the economic analysis than agency staff.**
2. Consider seeking feedback on the inputs into the model from project sponsors. While there's some risk in this approach - in that staff will have to evaluate the feedback and may have to dispute or reject some of the feedback, this approach can build tremendous support for the economic impact results since proponents helped feed the model.  
**While it can be risky, allowing project proponents to comment on inputs builds understanding and support for the results.**
3. Clearly communicate the results of the economic impact analysis (in whatever fashion makes sense) and then demonstrate how those results were used in the overall prioritization and programming of projects.

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### More on Using TREDIS in Project Prioritization Processes

TREDIS is increasingly being adopted by state DOTs and MPOs for use in project prioritization processes, in which economic competitiveness impacts are one factor in a broader scheme for rating competing projects. Examples of TREDIS use for project prioritization and selection include processes adopted by state DOTs (e.g., Kansas DOT, North Carolina DOT and Wisconsin DOT) and by MPOs (e.g., Chicago Metropolitan Agency for Planning and Pikes Peak Area COG.) A similar process is used for selection of projects within statewide freight plans (e.g., Massachusetts and Vermont). The TREDIS web site provides case studies describing how TREDIS has been applied as part of broader scoring systems for highway and public transportation project prioritization.

[www.tredis.com/articles/case-studies-of-tredis-use/list-by-purpose.html](http://www.tredis.com/articles/case-studies-of-tredis-use/list-by-purpose.html)



## Stage 4: Design: Alternatives Analysis and EIS

**Objective.** Once a project has been formally added to a program and received budget priority to allow for more detailed planning, “alternatives analysis” is typically required to ensure that modal and location alternatives are fully considered in project design. There is a technical comparison of the costs, benefits and wider economic and environmental impacts of design alternatives. Frequently there is also public input. A “preferred alternative” is then selected. For larger projects, a further EIS process may be required leading to further refinement and re-analysis of the preferred alternative.

**Once a project is selected for funding, an alternatives analysis is typically required.**

**What is known at the start of this step.** Detailed physical plans for alignments and structures are established at the start, to support detailed budgets and implementation phasing plans. The project details also support spatial analysis of traffic network and land use or development location impacts.

**Available Tools.** Various forms of benefit assessment are employed to establish user benefit and wider neighborhood or economic impacts, usually in some quantitative terms. Some form of benefit/cost analysis or scoring system is employed to establish the preferred alternative.

**Practical Use.** The consideration of economic impacts is only one part of the full process for assessing project design alternatives. However, it can be particularly important as it provides a way to select and refine project design alternatives so that they can best support and enhance the competitiveness and growth of local economic activities (including commerce, industry and job creation).

**Audience and Key Message Considerations.** During this stage, the key stakeholder group typically expands from community leaders and project proponents to now include specific property owners, neighborhoods and business districts which stand to gain or lose by the selection of one alternative over another. The data used to run the economic model and the results of the economic impact analysis will be further scrutinized. To help develop support for the selection process – and ultimately the selected alternative – it’s important to demonstrate how the selection process – including the economic analysis – was responsive to stakeholder input. At this stage, it is more important than ever to work with stakeholders and community leaders to manage expectations of the short-term and long-term economic impacts associated with the project. It’s also a good time to collect baseline economic data that could be used in the future to assess the actual impact of the transportation investment in the project.

**The stakeholder group typically expands to include property owners, neighborhoods and business districts.**

### More on TREDIS in Project Prioritization Processes

TREDIS is broadly used at this stage for a wide variety of projects, including a broad range of consultants conducting highway corridor studies for state DOTs, as well as alternatives analysis for regional public transportation agencies and/or airport authorities. In each case, the analysis of economic impacts is carried out using detailed information on changes in traffic volumes and conditions. The resulting studies that have used TREDIS range from highway corridor improvements (e.g., Ontario MOT corridors, I-70 Corridor, I-95 Corridor, Delaware Rt.113 Corridor, NYS Rt. 17 and Penn I-80); to transit and commuter rail enhancements (e.g., Durham Transit, MassDOT's South Coast Rail, and Toronto Metrolinx); intercity passenger and freight rail investments (e.g., California and Midwest High Speed Rail ; Illinois and Wisconsin Freight Facilities) and airport expansions (e.g., Atlanta and Vancouver). The TREDIS web site provides case studies describing how TREDIS has been applied to assess the economic impacts of alternative scenarios for various modal facilities and services.

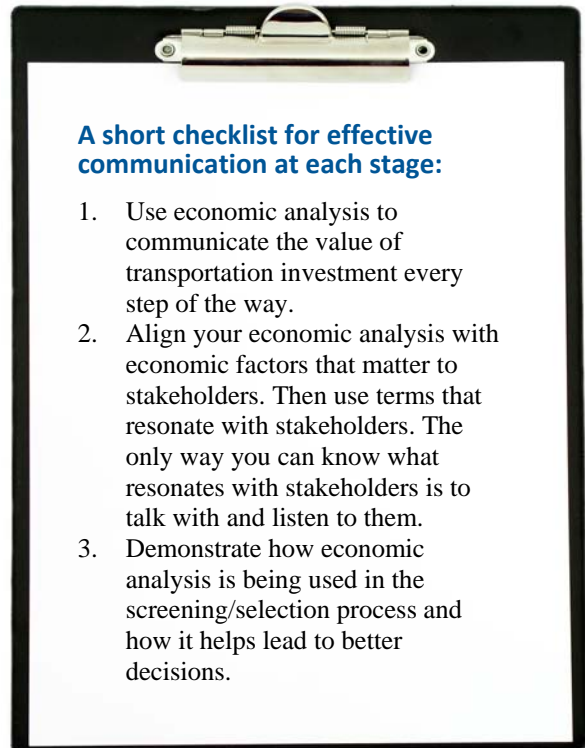
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### Implications for Use of Economic Impact Analysis

There are three key findings to take from the discussion and cases cited here.

- The types of decisions to be made and input factors to be considered can differ substantially among the four stages. The first stage may rely on illustrative scenarios, while the second stage requires realistic but representative scenarios. The third and fourth stages often require detailed figures on volumes of affected travelers (or vehicles) and estimates of the change in travel conditions (time, cost, reliability, and access). As we move along the stages, the data requirements become more specific, but the breadth of options become more narrow. These factors all help to limit requirements for data collection and analysis and make them less onerous.



- The range of cases and examples cited here include some states and local agencies that have highly detailed travel demand models, but an equal number that have relied solely on sketch planning spreadsheets or engineering estimates. All have tailored analysis to the problem at hand and then applied economic impact analysis to demonstrate how alternative policies toward transportation investment and alternative designs for projects can lead to changes in economic impacts.

- The case studies offered on the TREDIS web site show how economic impact analysis can make a significant difference in policy, planning and design decisions. By enabling consideration of intermodal impacts, spatial shift impacts and inter-industry impacts, TREDIS use in these cases has demonstrated that economic impacts can differ substantially from travel user impacts in both magnitude and relative size. By considering economic impacts alongside other engineering and environmental factors, the relative benefits of specific projects and design alternatives can be affected. And by providing a library of case examples, newcomers can learn from previous successful applications of economic impact analysis conducted elsewhere.

Moving forward, TREDIS will be developing national webinars and future workshops to further discussion of these issues. Meanwhile, we encourage reaction to this draft white paper via our TREDIS Forum ([www.tredis.com/tredisforum](http://www.tredis.com/tredisforum)) or by e-mail ([info@tredis.com](mailto:info@tredis.com)). For more information regarding strategic transportation services, as well as this paper, visit Burns & McDonnell's Transportation Strategy website ([www.burnsmcd.com/transstrategy](http://www.burnsmcd.com/transstrategy)).