

National Capital Region Transportation Planning Board

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M E M O R A N D U M

TO: FY 2011 TPB TIGER Grant Project Proposers

FROM: Eric Randall
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SUBJECT: Benefit-Cost Analysis in support of the TPB's FY 2011 TIGER Grant Application.

DATE: August 17, 2011

Application for TIGER funding requires a thorough benefit-cost analysis of the proposed projects, quantifying both transportation and other factors. Specifically, each of the five long term outcomes specified in the Notice of Funding Availability (NOFA) must be analyzed: 1) state of good repair, 2) economic competitiveness, 3) livability, 4) environmental sustainability, and 5) safety. This will require information on the affected population, long-term operating and maintenance costs, forecast travel demand, and other data.

Project proposers will need to collect and submit the necessary information to enable accurate calculation of the benefits and costs of the proposed projects. This includes both qualitative information: including project descriptions, changes in zoning, affected populations (i.e., characteristics), and any special factors; and quantitative data:

Benefits		Costs
<u>Base (No-Build)</u>	<u>Build</u>	<i>by quarter</i>
Users (riders) by mode		Capital Costs
Travel time / Congestion		O & M Costs
Accidents		
Emissions		
Land Use (value, parcels)		

Project Proposers are requested to research and submit available information by **Friday, August 26.**

The August 31 meeting will summarize the data available and refine the BCA inputs, specifying additional needed data. Project proposers will then have through September 14 to supply the needed data, which will be used to finalize the TIGER Grant application benefit-cost analysis.

TPB has consultant services available to provide expert assistance in applying current best practices in calculating the benefits and costs of such factors as safety, greenhouse gases and other emissions, travel time savings, discount rates, and other parameters. Following is a memorandum summarizing the recommended inputs and methodology for preparing the benefit-cost analysis.

Sub: TIGER III - Data Need for Cost Benefit Analysis

This memorandum lays out the data needs required to complete the Cost Benefit Analysis (CBA) for station level access improvement projects provided in the Proposed Application Concept for TPB TIGER Application. The U.S. Department of Transportation (DOT) has established a set of primary selection criteria in the Notice of Funding Availability (NOFA) for the FY2011 TIGER Discretionary Grant Program.

Cost Benefit Analysis (CBA) is often used in the evaluation of the economic value or economic merits of investment projects. The analysis involves a comprehensive account of project benefits and costs over the entire project life cycle and a “side-by-side” comparison of costs and benefits to determine the magnitude of net benefits and their relation to project costs.¹

The cost benefit framework offers an opportunity to recognize and include in the evaluation all social and economic impacts, both positive and negative, without an unintended bias towards certain solutions or unintended ad hoc conclusions formulated based on a belief of difficulties in measuring and comparison of project costs and benefits.

In Table 1, we provide a list of the potential benefit categories identified for inclusion in the CBA with each of the individual benefit category outcomes to be highlighted within the Primary Selection Criteria section of the application.

Table 1. Benefit Categories Mapped to Primary Selection Criteria

Primary Selection Criteria	Benefit Categories
State of Good Repair	Reduced Operating & Maintenance Costs
Economic Competitiveness	Short term employment, Transit Oriented Development, Congestion Savings
Livability	Travel cost savings (riders), Congestion savings ² (non-riders), Affordable Mobility and Cross-Sector Benefits
Sustainability	Emission reductions
Safety	Accident reductions (from reduced VMT and improved Access)

TIGER grant applications will be review at multiple levels within the US DOT and awards are highly competitive. A comprehensive CBA allows the evaluation committees to understand the impacts of a project. It is not necessary for a project to have benefits in each of the primary selection criteria; however the CBA is evaluated based on its usefulness as a part of the evaluation process. In Table 2, we provide the list of data needs required in order to assessment and monetize the impact of the proposed list of projects.

¹ Life-cycle is defined as the useful life of the proposed project, typically a period of 20 to 30 years.

² Congestion savings are the travel time savings for remaining road users. This benefit estimates the savings on highways and arterials to road users based on the increase in transit use, while travel cost savings, for riders, estimates the reduction in costs (including time) for riders that switch to transit from automobiles.

Table 2. Benefit Assessment – Data Needs

Benefit Assessment - Data Needs	
Baseline & Alternative	Comments
Summary Trip Table - Transit	Riders, travel times, access/egress times by impacted stations
Summary Trip Table - Highway	VMT/VHT summary
Growth in riders	Average annual growth rates and the mode from which growth is expected to come from (auto, bus, bicycle, pedestrian)
Riders – Distribution by HH income	By station
Induced Demand (%)	By station
Trip Purpose Distribution	Breakdown of trips by purpose (work, leisure, medical, etc.)
Bike Access Share of Transit (%)	By station
Walk Access Share of Transit (%)	By station
Proposed Access Improvements	Qualitative description such as improved paving, covered walkways, shortened access paths
Potential Reduction in Accidents – Bike Access	At station areas - not captured in the VMT-based accident estimates
Potential Reduction in Accidents - Pedestrian	At station areas – not captured in the VMT-based accident estimates

The table provided above is a list of *ideal* data needed to perform a comprehensive CBA, but US DOT recognizes that not all data is readily available. Data that is determined to be unavailable by an agency should be quickly identified. In these cases, assumptions and alternative methodologies will be developed, with the assistance of the agency, to approximate the data in order to complete the CBA. This is likely to be the case in some of the build case data needs.

It is important to note that the Summary Trip Table information for both the “no build” or baseline and the “build” or alternative are essential elements in the development of the CBA. The application will need to discuss the projects not as a group of independent efforts bundled together, but rather as having a network impact on the Washington DC metro area³. Thus the CBA will need to take a network level view of the benefits and costs. From these Summary Trip Tables, benefit categories relating to: congestion, time savings, emission reductions, VMT based accident reductions will be estimated. Safety improvements at the station, for bicyclist and pedestrians, resulting from improved access will require historical information for the base case (if available) and an assumption on the improvement in the alternative case.

The next set of benefits associated with these improvements relates to Transit Oriented Development (TOD) or Economic Development around the stations, which will impact both residential and commercial properties. In Table 3, we provide a list of data needs required in order to estimate TOD benefits associated with the project.

³ If the part or phase of the project funded by a TIGER Discretionary Grant does not have independent utility, then the applicant must first demonstrate that funding is committed for the entire project (or for an entire portion of the project, including the TIGER Discretionary Grant-funded portion, that has independent utility). In this case, the applicant should compare the benefits and costs of the entire project (or the entire portion of the project that has independent utility).

Table 3. Transit Oriented Development – Data Needs

Transit Oriented Development		
	Data	Comments
Residential	Number of parcels	Recommended ½ mile radius around each station
	Avg. of value per parcel	Tax assessment based
	Value Growth rate (historical)	Tax assessment based
	Number of Parcels - Growth rate (historical)	
	Land Use Information	Changes in zoning, etc.
Commercial	Number of parcels	Recommended ½ mile radius around each station
	Avg. of value per parcel	Tax assessment based
	Value Growth rate (historical)	Tax assessment based
	Number of Parcels - Growth rate (historical)	
	Land Use Information	Changes in zoning, etc.

The final list of data needs related to the costs, which will be used in the development of the Economic Impacts Assessment (EIA) and the cost portion of the CBA. The US DOT has requested that Economic Impacts (short⁴ and long term jobs, tax revenues) be identified by quarter, which means that cost data will need to be provided in this manner. Table 4 shows the cost related data needs.

Table 4. Cost – Data Needs

Costs	Comments
Capital - Construction	Estimated cost and duration (number of months)
Capital - Professional Services	Estimated cost and duration (number of months)
Capital - Equipment	Estimated cost and duration (number of months)
Capital - Other	Estimated cost and duration (number of months)
Operations & Maintenance	Schedule of costs - Both baseline and alternative

⁴ A value of one job per \$92,000 expenditures – a value that was developed by White House Council of Economic Advisers (CEA) for estimating jobs for the American Recovery and Reinvestment Act (ARRA) of 2009.