



Rail Enhancement Fund Benefit Cost Analysis Model

CTB Rail Committee
Kevin Page



Rail Enhancement Program

- REF was created in 2005 and the public benefits test and criteria was defined - § 33.2-1601. D:

*“Projects undertaken pursuant to this section shall be limited to those the Board has determined will result in public benefits to a region of the Commonwealth or the Commonwealth as a whole that are **equal to or greater than the investment of funds under this section.** Such public benefits shall include the impact of the project on traffic congestion and environmental quality and, whenever possible, **give due consideration to passenger rail capacity on corridors identified by the Board that have existing or proposed passenger rail service.**”*

Benefit Cost Model Background

- Following legislative direction, in 2006, DRPT developed a benefit cost analysis tool to value the public benefits of a Rail Enhancement Fund project.
- Model was reviewed and verified by VA Transportation Research Council
- Model modified in late 2006 by HDR Decision Economics to include a net present value and variable default values
- REF BCA model is updated periodically to include relevant new data and adjustments to usability

Measuring REF Fundamentals

- Accurately and consistently account for all public benefits of each REF application
- Compute total benefits to general public, existing rail users, new rail users, highway users, and environment
- All benefits are incremental and based largely on changes in time savings, and diversion of trucks and cars from the highway system to rail

Benefit Cost Process

Diversion Characteristics

- Diversion is applicant-supplied data:
 - Forecasts of diversion through life of project
 - Forecast diversion is contractually protected through the grant agreement
- Diversion should be consistent with program context, such as:
 - Cost savings for freight (lower shipping costs)
 - Improved access (new intermodal facilities; stations)
 - Time savings and safety (routing efficiencies)
 - Increased options (new corridors, rail lines)

Model for VA Benefits

- Benefit cost model is based on Virginia benefits that match REF investment
- Reported diversions are those passenger vehicle and truck trips that would have traveled by road in VA
 - in REF represent only the share of total corridor benefits that occur in VA
 - Some diverted road users (to rail) passes through VA
 - Diversions may be associated with improvements elsewhere along the corridor – VA Avenue Tunnel

Independent Utility of Projects

- REF projects must have independent utility, especially with respect to diversion
- Independent utility questions to consider:
 - Do two related projects each generate independent and additive levels of diversion?
 - Are the passengers or freight cars the same in each project?
 - Are time savings measured at separate sites on a single line truly additive?
- If independent utility is not satisfied, projects with multiple components are considered as one project

REF Benefits vs. REF Cost

- Benefit Cost Measures
 - Total Discounted Benefits: sum of discounted benefits
 - Total Discounted Costs: sum of discounted costs
 - Benefit/Cost Ratio: Total Discounted Benefits / Costs
 - Net Present Value: Total Discounted Benefits – Costs
 - Payback Period: First year when cumulative annual discounted benefits – costs is positive
- REF Measures
 - Level of DRPT funding participation is compared to the quantified benefits

Key Policy Variables

- Payback period – typically 15 years
- Passenger and freight projects are treated the same
- Includes system-wide benefits
- Risk of estimated diversions is passed into the agreement
 - Payback provision for failure to meet estimated thresholds
 - Both performance and contingent interest ownership are incorporated into the agreement

DRPT Observations

- Passenger projects consume enormous volumes to achieve project benefit
- Verifiability, audit and enforcement must be included in the process
- Passenger projects usually entail a longer payback return on investment to achieve public benefit > 1.0
- Stakeholders have expressed concern about ability to commit new diverted carloads
- Potential effects of economic and transportation factors outside of grantee's control; may be difficult to isolate factors retroactively

Considerations for Future Discussion

- Does the current REF framework work for us?
- How many system wide benefits do you include and what of the model needs to be changed, if anything?
- What aspects of the REF program can be recalibrated based on policy shifts that still meets the law and secures the use of the asset over time?
- Does the current REF benefit-cost model provide the right kind of information needed to prioritize potential projects?

Thank You