

SOUTH COAST RAIL
ECONOMIC DEVELOPMENT AND LAND USE
CORRIDOR PLAN

Appendix **G**

Background on Economic Models Used for the Corridor Plan

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Background on Economic Models Used for the Corridor Plan

A. Forms of Impacts on the Economy

The study team used TREDIS – the Transportation Economic Development Impact System – as the framework to show how the transportation changes resulting from proposed South Coast Rail Alternatives will translate into economic benefits for the South Coast region and the Commonwealth.

The TREDIS modeling approach yields a comprehensive forecast of total economic impacts (direct +indirect +induced) as measured by changes in business output, employment, and household income attributable to the proposed transportation investments. These are distinguished from land-use impacts which are treated separately.

Impacts fall into five categories.

- Some existing bus riders who now travel along the study corridor can benefit from faster travel and more convenient service.
- New rail and rapid bus travelers who switch from car travel can save time and they can also save money, as the new transit option costs them less than what they currently spend on car operating costs (tires, fuel, oil and parking), and they can use that additional money to purchase other consumer products and services as they desire.
- Travelers who continue to drive or ride in cars, as well as truck drivers, can also benefit from reduced peak period traffic congestion, which leads to direct savings in vehicle operating costs. Households can use the savings to purchase other consumer products and services as desired (and have more leisure time).
- Insofar as traffic congestion gets reduced along the corridor, some businesses can gain productivity from fewer late arrivals due to traffic delay, and reduced need to pay higher wages or accept shorter work hours to attract workers in those congested areas. The net effect is a reduction in the cost of doing business.
- Businesses can also gain productivity as a result having access to larger labor markets with more diverse and specialized skills. That can allow businesses to draw on a better match between available workers and required skill needs, and it can also allow some industries to achieve greater economies of scale. Reduction in the growth of traffic congestion can also enable more productive truck deliveries.
- Direct effects on business growth occur as the greater productivity and changes in consumer spending lead to more business sales and attraction of new business activity. There are further impacts as the directly-affected businesses that grow also buy more from suppliers within the region (“indirect economic effects”), and the additional worker income is re-spent on more consumer purchases within the region (“induced effects”).

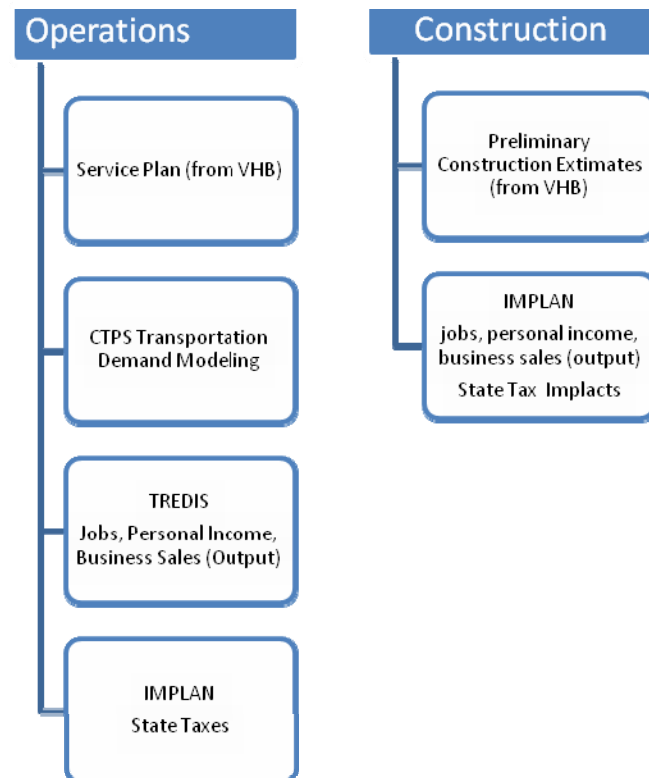
All six of these impacts are benefits to residents and businesses within the region. The additional impact of expanded access to consumer and labor markets in the region takes place by strengthening linkages of labor and employer markets between the South Coast and Suffolk County/Cambridge.

B. Economic Impact Analysis Methodology

Supporting data for the TREDIS framework are described below. In addition, Exhibit 2 illustrates the flow of the analysis.

1. Transportation demand model output developed by the Central Transportation Planning Staff (CTPS) for each alternative as well as a base case based on levels of service and other factors. This included detailed information on commuting patterns and other travel patterns within the region.
2. Economic data sets detailing industry specific economic profiles of the two distinct South Coast sub-regions, Suffolk County/Cambridge and the rest of Massachusetts. These data sets included the economic structure of each region, and applicable multipliers to estimate indirect and induced economic activities by industry.

Exhibit 1. Flow of Modeling Process



3. We applied TREDIS to calculate these broader impacts. The system incorporates an IMPLAN input-output model to trace how changes in household spending patterns and business costs flow through the economy. TREDIS also incorporates econometric equations to represent industry growth responses to price and cost changes (“elasticities”), and effects of regional changes in travel time reliability and labor market access on business productivity over time.
4. The IMPLAN input-output model was also used outside of TREDIS to perform a separate calculation of the indirect and induced impacts on the rest of Massachusetts and to estimate state tax revenues as a result of the South Coast alternatives.

Steps in the Analysis Process

The analysis process used by the consultant team involved three steps. They are:

First, the information regarding the implementation of a South Coast Rail (or Rapid Bus) alternative was translated into specific transportation user changes. Projections of employment and population by regional planning agencies for communities in the South Coast region, service plans developed by Vanasse Hangen Brustlin, Inc. (VHB), and transportation demand modeling by the Central Transportation Planning Staff (CTPS) formed the starting basis for our analysis. For each alternative, TREDIS was used to assess time changes (and the value of that time) for forecast on-the-clock and commuter traffic by auto or transit.

Second, the above user travel impacts were analyzed. The changes in vehicle-hours and vehicle-miles of travel are translated into changes in travel time, vehicle operating cost and other out of pocket expenses (transit fares). Ultimately, all of these changes involving either rail or motor vehicle traffic affect business travel, commuting trips and personal trips. Those effects are then translated into changes in the dollar value of total user (time and operating) costs.

Third, calculations were made using TREDIS for the South Coast study area and Suffolk County/ Cambridge to identify how the user impacts allocate to the regions' households and the regions' industries (as the business cost and productivity implications are differentially incurred). Those cost impacts are used to estimate resulting changes throughout the economy in jobs and associated changes in levels of labor income and business output. The

IMPLAN model was then used to calculate potential total direct, indirect, and induced business supplier and consumer sales that occur in the rest of Massachusetts that stem from the impacts of the South Coast Rail in the South Coast to Boston corridor. An overview of the TREDIS system is presented in Exhibit 2, and a more detailed flow chart is shown below as Exhibit 3.

Exhibit 2. Overview of TREDIS Components

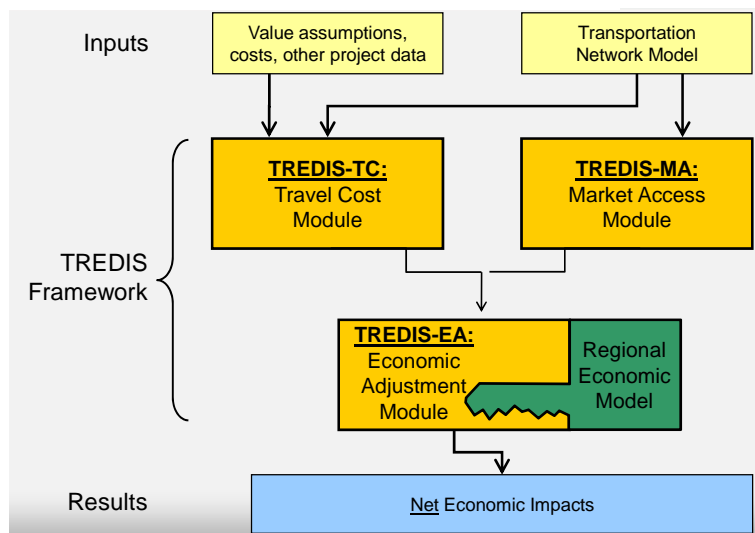


Exhibit 3. Flow Chart of Transportation Economic Development Impact System

