## x.x Demand Forecast Accuracy of Contemporary Transit Projects

This section will describe the accuracy of major transit projects that were recently constructed in the United States. The information in this section reflects projects funded by FTA through its “New Starts” funding program, and reported in their annual Before/After Studies. The projects reflect the past 5- and 10-year periods, with the most recent projects reflecting the most recent year information is publicly available.

Accuracy is described in terms of the ratio created by dividing actual observed ridership by the forecasted ridership. Thus, a value at or close to 1.0 indicates a very accurate forecast. Values less than 0.80 or greater than 1.20 indicate strongly under- or over-estimated forecasts, respectively. A project’s transit demand forecasts are generally considered to be accurate for planning purposes if actual demand with 20% of forecasted demand, although this is not a standardized threshold.

The formula for computing the average accuracy for a 5- or 10-year period is shown below in Equation X, where *n* is the number of projects in the group.

Equation x: Demand Accuracy for a Project Group

This formula is helpful way to discern accuracy of demand forecasts during planning stages, when one is determining likely ridership outcomes when only forecasted ridership and project plans/designs are available.

### x.x.x Projects Constructed in the Past 10 Years

Over the past 10 years in which data is available, the transit forecasting industry has produced an accuracy ratio of 0.68. This means over the past 10 years, actual ridership is, on average, 32% lower than forecasted ridership for the 32 projects in that sample. Two-thirds of the sampled projects have been over-forecasted, while 31% have been forecasted accurately.

Figure x: Breakdown of Demand Forecast Accuracy (Past 10 Years)

Fortunately, the accuracy of the project assumptions and exogenous forecasts used to develop the demand forecast were available for this sample. Project assumptions include the project's service levels, travel time, and fare. The assumed supporting and competing transit networks is also included. Also recorded is the general accuracy from the population and employment estimates, whose forecasts are generally done by agencies external to the project team. A general assessment of macro-economic conditions is also recorded. Each project assumption and exogenous forecast was assigned one of five categories that related its actual level to the level assumed at the time the forecast was made. The five categories are collapsed into three groups:

* Optimistically biased, defined as a ~10+% variation that would artificially increase demand,
* Conservatively biased, defined as a ~10+% variation that would artificially decrease demand, and
* Accurately assumed, defined as neither optimistically nor conservatively biased.

While many items were described quantitatively, in many cases the actual values were qualitatively described. In these cases, a professional transit demand forecaster provided his best assessment of the Before/After Study text and assigned the categories accordingly. Items not mentioned were assigned an 'unknown' category and excluded from analysis. It should be noted that the details and analyses provided are unevenly reported among the various reports. No project reports the details on all 10 project assumptions and exogenous forecasts.

Table X describes the accuracy of the project assumptions and exogenous forecasts for projects constructed over the past 10 years. All but two assumptions/forecasts have been optimistically biased, indicating that the information being provided to transit forecasters is not accurate. Given the limitations of sample size, this analysis will focus on the two project assumptions and one exogenous forecast that reflect at least 10 projects: employment estimates, the supporting transit network and project service levels.

Over the past 10 years, the employment estimates provided to transit forecasters has been optimistically biased in 9 of 11 projects that provided some level of employment information. The service levels of the supporting transit network, routes that feed into the project, have been optimistically biased in 8 of 14 projects reporting this characteristic. Project service levels have been optimistically biased in 12 of 27 projects. Artificially high assumptions of these characteristics will generally produce artificially high demand forecasts, all other things being equal.

Table x: Accuracy of Project Assumptions & Exogenous Forecasts (Past 10 Years)



*Note: Highlighted cells represent aspects or forecasts reflecting at least 10 constructed projects*

### x.x.x Projects Constructed in the Past 5 Years

Over the past five years in which data is available, the transit forecasting industry has produced an accuracy ratio of 0.85. This means over the past five years, actual ridership is, on average, 15% lower than forecasted ridership for the 12 projects in that sample. The breakdown of the 12 projects is shown in Figure X. Nearly 60% of the projects have been accurate; that is, the actual ridership has been within 20% of the forecasted demand.

Figure x: Breakdown of Demand Forecast Accuracy (Past 5 Years)

Table X describes the accuracy of the project assumptions and exogenous forecasts for projects constructed over the past five years. All but three assumptions/forecasts have been optimistically biased, indicating that the information being provided to transit forecasters is not accurate. Given the limitations of sample size, this analysis will focus on the two project assumptions that reflect at least 10 projects: the project and supporting transit network service levels.

Over the past five years, the project service levels have been optimistically biased in 6 of 11 projects that provided the actual service levels. The service levels of the supporting transit network, routes that feed into the project, have been optimistically biased in 5 of 11 projects reporting this characteristic. Artificially high assumptions of these characteristics will generally produce artificially high demand forecasts, all other things being equal.

Table X: Accuracy of Project Assumptions & Exogenous Forecasts (Past 5 Years)



*Note: Highlighted cells represent aspects or forecasts reflecting at least 10 constructed projects*