Using GTFS, Big Data
Alex Rixey, AICP, Senior Transportation Planner, Fehr & Peers, Washington, DC

ABSTRACT TEXT: Generating ridership forecasts that are compelling enough to motivate re-prioritization of ROW for enhanced transit is a major challenge for transit planners. Forecasts produced by regional travel demand models are contested by transit supporters and opponents alike, and in the context of rapid technology change, horizon year forecasts are treated skeptically. To address these challenges, a more market-oriented approach is needed that measures the number, and describes the geography, of transit-serveable auto trips being made currently; compares travel time and reliability of transit trips and transit serve-able auto trips; and defines the characteristics of transit service that could successfully divert actual auto trips being made to transit.

The proposed presentation would describe the methodology Fehr & Peers has developed to define corridor-level transit demand using a GTFS schedule-based transit shed network analysis combined with origin-destination patterns derived from GPS-enabled device movements. This methodology defines a transit-serveable geography using network analysis of GTFS data and transit network access time parameters; identifies GPS-enabled device movements that are occurring entirely within the transit-serveable geography; describes travel time and reliability statistics for these movements by automobile and transit modes; and uses this information to set transit quality of service parameters that need to be met for enhanced transit to meet policy objectives for diversion of automobile trips to transit.

Data Science Approach to Forecasting Bus Ridership
Catherine Lawson, Associate Professor, University at Albany, Albany, NY

ABSTRACT TEXT: Transit agencies with limited budgets and incomplete ridership data need low-cost ways to accurately forecast bus ridership to meet the needs of local communities. This research developed a transit demand estimation methodology that yields a robust model for bus ridership using Census Transportation Planning Products (CTPP) data modified with American Community Survey (ACS) data to generate origin-destination tables for bus trips taken in NJ Transit market areas. Microsimulation of AM- and PM-peak ridership was conducted using a transit scheduling specification, General Transit Feed Specification (GTFS), and Open Trip Planner (OTP), an open source routing engine.

The results were validated against agency farebox data from NJ Transit. Analyses of model output and farebox data for the Atlantic City transit market area and a scenario analysis of service reduction in the Princeton/Trenton transit market area are presented to illustrate the use of a data science approach to modeling transit.

Incorporating Transit into a Statewide Model Using a Multi-resolution GIS Network Database
Jonathan Avner, Senior Project Planner, Whitman Requardt & Associates, LLP, Austin, TX

ABSTRACT TEXT: The Maryland State Highway Administration (SHA) owns and maintains a suite of travel demand models to support transportation planning decisions across the state. Constantly evolving planning requirements and funding sources for transportation improvements mean that SHA must be able to evaluate all modes of transportation with their tools, including its robust public transit system; Maryland’s public transit system covers much of the state including providing commuter options into both Baltimore and the Washington D.C. region, so intelligent transit planning is a must for its long term sustainability.

To support transit planning efforts, WRA assisted SHA with the development of a multi-resolution network and GIS platform for the management of networks and transit data. Completing this task came with significant challenges due to the sheer volume of data that needed to be reconciled with the multi-resolution network statewide. This data came from several agencies operating across state borders. The team brought transit
into the GIS platform using GTFS as the data protocol. The GIS platform produces a network at the desired resolution paired with the appropriate transit routes from ultra-fine resolution networks for local project analysis to coarser, aggregate networks for the entire state. This method allows flexibility in informing planning decisions.

The key advantage to this approach is the ability to expedite transit planning scenarios for future route and service changes. The goal of this presentation is to improve the understanding of how existing transit data within a GIS system can be integrated into databases for ease of use in travel demand modeling. This presentation will discuss three issues related to the transit model development, including: (1) the GIS platform for data management; (2) development of model transit inputs through both GTFS and local transit agency data; (3) the use of the route information stored in the database to create model input data beyond the route information including walk and drive access, more accurate travel times and competing costs.