DEMAND FORECASTS

Uptown Transit Project
Demand Forecasts

Forecasted Ridership for Post Oak Boulevard Dedicated Bus Lanes

- % of total ridership using Park & Ride service: 52%
- % of total ridership work related: 67%
- % of workers using transit: 8-10%

Daily Ridership

Forecast Year	2018	2035
Post Oak Boulevard DBL with NWTC and BUTC	14,100	20,500
Post Oak Boulevard DBL with NWTC and BUTC Plus IH610 DBL	19,100	27,700

Utilized the existing H-GAC Travel Demand Model

- Computer Model
  - 40 year history with H-GAC / TxDOT / METRO
  - Continuously updated, calibrated & refined
  - H-GAC Data Sets: Population, Employment & Land Use Forecasts
- Integrated Effort:
  - H-GAC (total trip making; highway traffic forecasts)
  - METRO (transit ridership forecasts)
- TPC and FTA / FHWA accept results
  - Major investment studies
  - TPC uses results to rank TIP projects for funding
  - Regional Transportation Plan / EPA Conformity Findings
- TPC-Required Analysis for TIP (May / June 2013)
  - Multi-Agency Task Force: H-GAC, TxDOT, TTI, METRO, Uptown
  - Used METRO's Modeling Consultant
  - Determined Post Oak Boulevard DBL and BUTC viable with / without West Loop Elevated Exclusive Bus Lanes

Travel Time Savings
PM Peak

	Automobile	Dedicated Bus Lanes
Richmond to 610	17 minutes	12 minutes*
Transit Center to Transit Center	33 minutes	19 minutes*

** Includes travel time and dwell time for loading and unloading passengers*

Ridership Forecasting for the Uptown Dedicated Bus Lanes
H-GAC's Demographic and Land Use Forecasting Process

Introduction

The Houston-Galveston Area Council (H-GAC) develops and releases an updated forecast of the population, employment and land use for the 13-county H-GAC region on a quarterly basis. The forecasting system produces outputs in annual increments from 2011 through 2040. The base year for the forecast is 2010.

The forecast is produced in phases.

1. H-GAC forecasts the total number of people and households in the region.
2. Based on the future labor force, H-GAC forecasts the number of jobs.
3. The model makes predictions about the location, type, and size of residential and non-residential development projects which would be needed to accommodate the expected growth in households and jobs.
4. The expected growth in households and jobs is allocated to different areas in such a way that each household has a home (housing unit) and each job has a work site.

These phases correspond to different components of H-GAC's forecasting system:

- Demographic Evolution Model
- Employment Model
- Real Estate Development Model
- Household Location Model
- Employment Location Model

There are several important features of the H-GAC forecasting system: disaggregation, interrelation, and property of being data-driven. *Disaggregation* means that H-GAC's models deal with individual elementary entities: people, households, jobs, land parcels, and buildings. All summary statistics, such as county population or total jobs in a census tract, are derived from data on the individual entities. For a future year, that data is not observed but rather created in a process known as "simulation". A simulation is a computational game-like technique which aims to imitate the dynamics of real life by setting up the "players" (entities or agents) and "rules" (propensities or parameters) and then letting the action unfold over time. In that respect, when H-GAC develops a forecast, H-GAC constructs long lists of plausible future events for millions of entities.

Interrelation means that the different models are connected:

- Population determines the short-term supply of labor force;
- Change in the number of households determine the demand for housing;
- The development industry responds to demand for housing and non-residential buildings; and
- Employers' and households' location choices are limited to what is available at the moment.

Data-driven means that inside each model there are dozens of tables with data elements that control the "rules" which govern the simulation. In that respect, the forecast can be viewed as a particular "what if" scenario predicated upon thousands of very specific "assumptions." That makes it very easy to make updates when new information becomes available or when a correction is needed.

Demographic Evolution Model

Population change over a period of time in any area stems from either addition or removal of residents, as compared with the previous time period. The sources of addition are births to local residents and in-migration of people from other areas. The sources of removal are deaths of local residents and out-migration of local residents to other areas. Our model represents all four processes and estimates directly the number of births, deaths, in-migrants, and out-migrants in the area. Additionally, the model represents the household formation and dissolution processes.

The Demographic Evolution Model is a computer simulation which uses the probabilistic approach to imitate both the biologic events (dying, giving birth) and social events (marriage, divorce, migrating in or out of the area) for the synthesized individuals and households.

Population in the model is stratified into four race/ethnicity categories (non-Hispanic White, Hispanic White, Black, and Other), two sex categories (male, female) and 111 age categories (single year, from 0 through 110). The base-year data is constructed from the block-level 2010 Census data (SF1 tables). The base-year data consist of a list of individuals and a list of households. The two biological parameters, survival rates and birth (fertility) rates, are provided by demographers at the Texas State Data Center. H-GAC uses these rates as event probabilities (the likelihood that a person will live another year), and the likelihood that a female will give birth in a given year. These rates change over time, reflecting the trends for longer life spans and decreasing fertility.

Migration probabilities or rates control the in-flow and out-flow of households. There are three separate migration rates dealing with different origins and destinations of the

flows: domestic in-migration, domestic out-migration, and foreign in-migration. Some foreign out-migration does occur; however, H-GAC does not modeling it explicitly due to lack of data). H-GAC constructed the migration rates from the American Community Survey (ACS) Public Use Microdata Sample (PUMS) records. H-GAC used the same source to construct the two parameters that control the household dynamics -- marriage and divorce rates -- as well as a set of auxiliary probabilities, which are used to "match" brides and grooms.

The essence of the simulation technique is in comparing, for each individual, event probabilities with a randomly generated number. If certain conditions are met, the event (death, birth, migration) “occurs”. For example, an individual’s survival rate could be 0.95 (there is 5% probability that a person will not survive into the next year).

The Demographic Evolution Model creates a virtual accounting of all people and households in the region in the future years. H-GAC uses the outputs of the Demographic Evolution Model to create regional totals for population and households.

Employment Model

In the short run, the workforce (and jobs) is constrained by the resident population. Due to age, disability, family responsibilities or other factors, some people do not seek employment. The parameter that controls this attrition is the labor force participation rate (LFPR). Other people cannot find work and remain unemployed. The parameter that controls this imbalance is the average (overall) unemployment rate (UR). Therefore, in the short-term framework, employment can be estimated given the population and the rates (LFPR and UR). H-GAC uses the ACS PUMS data to derive LFPR and UR specific for age and ethnicity cohorts. While LFPR is not expected to fluctuate over time, that is not true with respect to the UR, which reflects macroeconomic conditions.

These macroeconomic conditions are represented with an average (as opposed to cohort-specific) unemployment rate. For forecasting purposes, H-GAC assumes that the future average unemployment rate will be 5.8% (a historical long-term regional average). Once the labor force (based on the resident population) is established by applying the LFPR to the population, the total employment can be calculated and distributed back to the cohorts using the UR. Total jobs in the region are then allocated to 20 two-digit NAICS sectors using the shares derived from the employment forecast produced by Woods & Poole Economics, Inc.

Further, the total jobs by sector are converted to "location-specific" jobs which include wage and salary jobs and some self-employment jobs. “Location-specific” refers to jobs being tied to individual buildings. In the base year (2010), firm-level jobs derived from

the Texas Workforce Commission and other employment data sources are linked to specific locations (individual buildings) by matching company and parcel addresses.

Real Estate Development Model

The Real Estate Development Model generates predictions for specific projects on specific parcels, given the physical availability / suitability of land and economic feasibility.

First, H-GAC estimates annual demand for housing units and non-residential space based on the forecasted change in the number of households and jobs. With respect to demand for housing, H-GAC makes an assumption about the future shares of the single-family and multi-family housing. In the current specification, H-GAC uses constant shares, so that 70% of the total demand will be for single-family units and 30% for multi-family units. These shares are based on the historical data for building permits issued in the region. Demand for non-residential space is determined by distributing the forecasted two-digit NAICS-sector jobs into different building types (office, retail, warehouse, etc.) and then applying building type-specific space consumption ratios (square feet per employee).

Second, H-GACs break the aggregate demand into different classes of projects (small single-family residential subdivision, medium-size apartment complex, large office building, etc.).

Third, H-GAC reduces the demand estimates to account for the supply coming from "known developments" (announced, planned, or under construction projects). H-GAC uses various sources to compile information on such projects, including information supplied by Uptown Houston for the 2018 forecast year.

Fourth, once the quantity of different classes of projects is established, the model generates a large number of development "proposals." These proposals cover all possible combinations of projects that could be developed on the available parcels, irrespective of the economic feasibility. For each proposal, H-GAC calculates a total cost, which includes the cost of land and construction cost (per square foot cost multiplied by the square feet of the project), plus the cost of the existing buildings and demolition in the case of redevelopment. Data related to parcels and buildings is derived primarily from the appraisal records. Our database includes over two million parcels. For each parcel, H-GAC knows the land use type, value of land, and value and type of buildings. The construction costs are based on the recent industry survey and published data.

Fifth, H-GAC calculates the expected sale price of a project using the coefficients from a series of regression models. These models establish the relationships between the per square foot prices for different types of buildings and various intra-urban proximity and accessibility measures.

Six, the profitability (return on investment) for all the proposals is calculated (relating the expected sale price to the total costs). Finally, from a pool of most profitable, proposals are selected for "construction" until the demand is met.

H-GAC uses additional procedures to analyze the distribution of retail and service jobs in primarily residential locations and to locate retail and service buildings to ensure adequate levels of access to local retail and services in areas that experience growth in residential buildings. H-GAC uses a similar procedure to place new schools and hospitals.

Future land use changes generated using these procedures are called "model predictions." The other type of future land use changes is called "known developments." Both types appear as layers in Regional Land Use Information System (RLUIS), our web mapping application.

Household Location Model

Individual households are not assigned to individual housing units. Imputation of total number of household and population in households is done in aggregate for Traffic Analysis Zones (TAZs), and separately for Census Tracts. For each TAZ, H-GAC calculates its share of the regional total of new housing units. Then, the net change in the regional total for the number of households is allocated to TAZs using these shares. Finally, the regional total for the household population is allocated to TAZs in proportion to allocated households and controlled for the average household size.

Employment Location Model

In the current specification, new jobs are assigned to available space inside buildings controlling for the type of building and applying building type-specific space consumption ratios. This ensures that, for example, retail jobs are assigned to retail buildings and there is enough space to accommodate these jobs. With respect to the locational aspect, the probabilistic assignments designed to maintain the existing sectoral composition of jobs.

TRAVEL DEMAND FORECASTING PROCESS

Ridership projections for this study were developed using the H-GAC regional demographic forecasts and travel forecasting model. Our results indicate under the mixed flow option on West Loop, the opening year ridership (2018) on the Dedicated Bus Lane (DBL) line, running from Northwest Transit Center (NWTC) to Bellaire / Uptown Transit Center (BUTC) would be 14,100 daily boardings. In the long term (2035), the projected ridership is about 19,800 daily boardings. Under the Elevated busway option on the IH 610 West Loop, the DBL ridership is projected to be 18,400 trips in 2018 and 25,800 in 2035.

Methodology

This section presents a general description of the analysis method used in forecasting the daily ridership for all the transit alternatives considered in the Uptown Transit Improvement Study. Travel demand was forecast for the years 2018 and 2035 using computer-based supply and demand models. These models account for future study area population, projected employment in the Central Business District and other major activity centers, socio-economic characteristics of study area residents, travel time and cost characteristics of the competing highway and transit modes of travel.

The model set simulates travel on the entire highway and transit system in the Houston Metropolitan area containing all transit services provided by the Metropolitan Transit Authority of Harris County (METRO); local bus, express bus, commuter bus and METRORAIL. The model contains information on service frequency (i.e. how often trains and buses arrive at any given transit stop), routing, intermodal connections, travel time and transit fares for all transit lines. The highway system includes all express highways and principal arterial road ways as well as minor arterial and local roadways. Outputs of the model set contain detailed information relating to the transportation system. The highway side of the model provides output data on traffic volumes, congested travel speeds, vehicle miles traveled, and average travel times on the roadway links. The transit side provides output information relating to the average weekday ridership on different transit sub modes (rail, local buses, express buses and commuter buses), station boardings, park-and-ride demand, and peak load volumes. The following text describes the modeling methodology in greater detail.

Transit Patronage Modeling

Daily ridership for all the transit alternatives was estimated using H-GAC's long range travel demand model set. This set of models was developed for H-GAC by outside consultants and has been used by H-GAC and Houston METRO extensively in the past.

These models are the same type as those used in most large urban areas in North America. They are based on the traditional four-step, sequential process known as:

- trip generation;
- trip distribution;
- mode choice; and
- trip assignment.

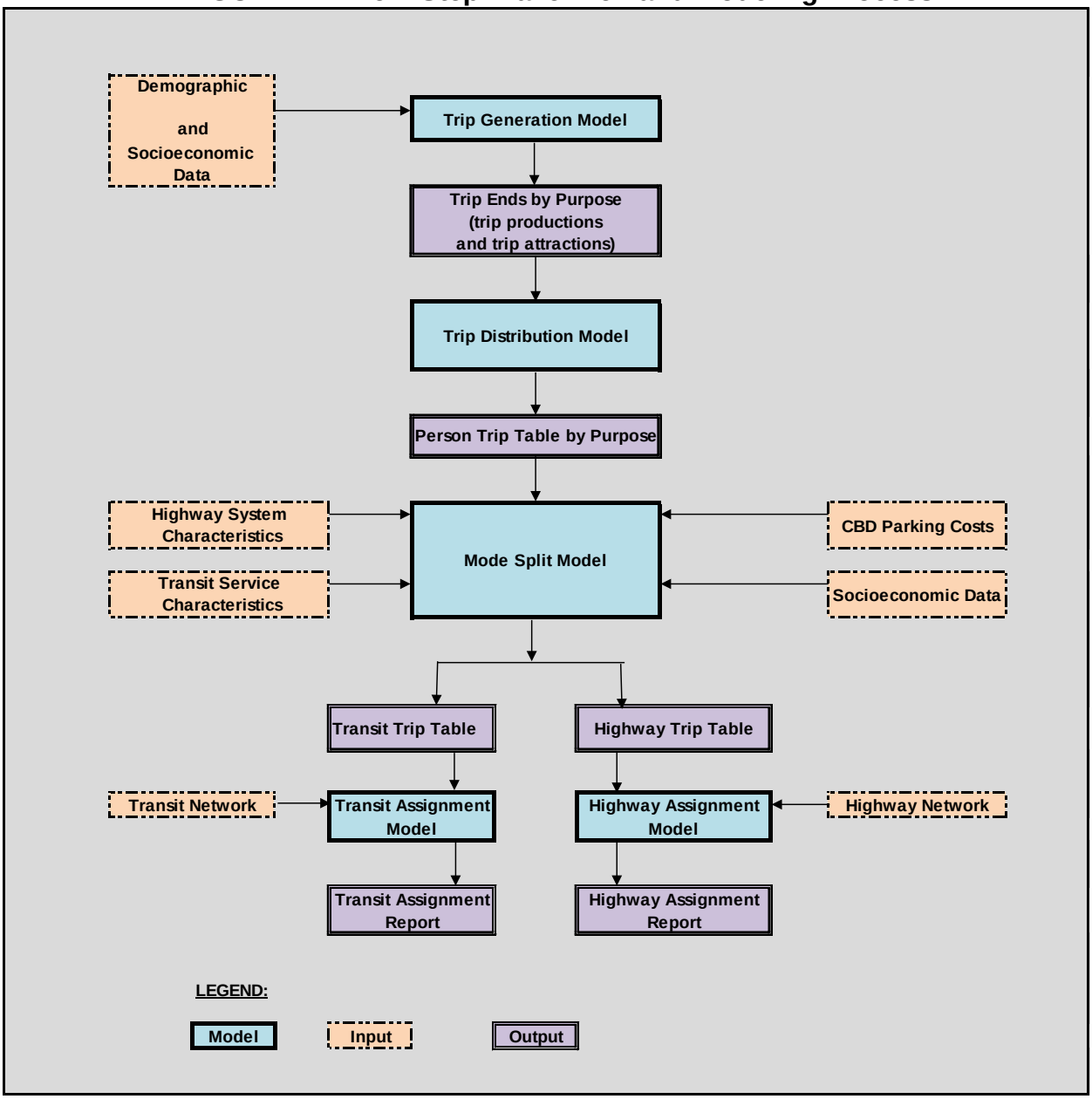
The Four-Step process is used to estimate the average daily transit ridership, based on the best available population and employment forecasts, projected highway travel conditions (including downtown parking costs) and projected transit service.

The geographic area represented in H-GAC's model, is divided into smaller areas known as traffic analysis zones (TAZs). All calculations in the travel model are performed at the TAZ level. There are approximately 3,000 such TAZs in our modeling system. A brief description of the Four-Step process is given below.

The Four-Step Process

A schematic representation of the Four-Step modeling process is shown in **Figure 1**.

FIGURE 1: The 4-Step Travel Demand Modeling Process



Source: HDR Engg

Step 1 - Trip Generation: In the first step, the model estimates the number of trips produced in and attracted to each traffic zone. To accomplish this, the model uses estimates of projected population, employment and other socioeconomic and household characteristics of each zone. Trips are divided in to three major categories, home-based work trips, home-based other trips and non-home based trips. A trip generation model run is executed for each trip purpose. The output of the trip generation model feeds into the rest of the model chain. Therefore, great care is taken to ensure that the demographic and socio-economic data are as error-free as possible to prevent the propagation of errors in the remaining model steps.

Step 2 - Trip Distribution: In this step, the distribution model links the trip ends[1] estimated from trip generation to form zonal trip interchanges[2]. The output of the second step is a trip table, a matrix containing the number of trips occurring between every origin-destination zone combination. Trip distribution is performed for each trip purpose. In a system of 3,000 zones, 9 million trip origin to destination combinations are possible.

Step 3 - Mode Choice: In this step, the mode choice model allocates the person trips estimated from the trip distribution step to the two primary competing modes; automobile and transit. This allocation estimates the desirability or utility of each choice a traveler faces, based on the attributes of that choice and the characteristics of the individual. The resulting output of the mode choice model is the percentage of trips that use the automobile and transit for each trip interchange. The transit trips are further divided into two modes of access: walk-access transit trips and drive-access transit trips (park-and-ride trips). The auto trips are further divided into single-occupancy and multiple occupancy trips.

The mode choice model set consists of three models, one for each trip purpose. Inputs to the mode choice model, transit travel times and costs and highway travel times, socio-economic data are supplied by the computerized transit and highway networks.

Step 4 - Trip Assignment: In this final step, the model assigns the transit trips to different transit modes such as Local Bus, Express Bus, Commuter Bus, METRORail, etc. The model uses all the available transit paths from one zone to another. This path may involve just one transit mode, such as Local bus or Commuter bus or multiple modes, such as Local bus with a transfer to MERTORail line. Highway trips are assigned to the highway network. Thus, future year traffic volumes on highways and forecasted transit ridership on transit lines can be obtained from the model outputs.

[1] Trip ends represent the point from which the trip is produced or to which it is attracted.
[2] Movements between two zones.

Population and employment are key inputs to the demand forecasting process and are developed by H-GAC. The real cost of parking downtown was assumed to increase in the future. The future year transit fare structure is assumed to be similar to the current year fare structure. The models assume that people, as a rule, wish to minimize transfers, as well as minimize their overall cost of travel in terms of time and money.

Model Setup

The base year travel model represents the 2010/11 transportation system and the corresponding system demand. As a first step, the model inputs were checked thoroughly to ensure the inputs accurately represented the current level of service both on the highway and transit system. Next, the 2010 transit ridership generated by the model in the study area was compared with the average observed daily ridership collected by Houston METRO in 2010 to ensure the differences between simulated and observed ridership levels were within accepted margins of error.

As a part of model validation on the highway side, observed travel speed data were collected on West Loop and Post Oak Boulevard and compared with peak congested speeds estimated by the travel model. The Gunda Corporation and Texas Transportation Institute (TTI) provided the roadway speed data for various segments of the corridor during the morning and afternoon peak periods. In general, the estimated highway speeds in the model compared reasonably well with observed data. Based on these validation checks, it was concluded the model was ready for forecasting purposes.

Forecast years

Two forecast years were considered in this study, as follows:

- Near term: (Opening year): 2018 and
- Long term: 2035

Alternatives Tested

The calibrated and validated travel model was applied to generate projections of travel demand for four alternatives:

- 2018 transit service from NWTC to BUTC. Service in a dedicated bus lane on Post Oak Boulevard and in Mixed Flow on West Loop frontage roads
- 2018 transit service from NWTC to BUTC. Service in a dedicated bus lane on Post Oak Boulevard and in elevated busway on the IH 610 West Loop
- 2035 transit service from NWTC to BUTC. Service in a dedicated bus lane on

Post Oak Boulevard and in Mixed Flow on West Loop frontage roads

- 2035 transit service from NWTC to BUTC. Service in a dedicated bus lane on Post Oak Boulevard and in an elevated busway on West Loop

Under all alternatives, existing Route 33 would not serve the segment between NWTC and the BUTC. Since Route 33 is assumed to terminate at the Bellaire Transit Center (BTC) in this alternative, a shuttle service would be provided between BUTC and the BTC, running at 15 minute headways.

- 2018 DBL from NWTC to BUTC, Busway and Mixed Flow Operations

  This alternative assumes a short headway, dedicated bus service connecting the existing NWTC and the planned BUTC through the Uptown study area on the DBL. From BUTC to the West Loop, the service would run in the DBL on Post Oak Boulevard. From the intersection of Post Oak Boulevard and IH 610 to Memorial Drive, the transit service would operate in mixed traffic on the West Loop frontage roads. From Memorial Drive to NWTC, the service would operate on North Post Oak. .
- 2018 DBL from NWTC to BUTC, Busway on Post Oak and Elevated Busway on West Loop

  This alternative assumes a short headway, dedicated bus service connecting the planned BUTC and NWTC through the Uptown study area. From the BUTC to the West Loop, the DBL servicet would run in the DBL on Post Oak Boulevard. From Post Oak to NWTC, the alignment would be on an elevated busway running in the middle of IH 610
- 2035 DBL from NWTC to BTC, Busway and Mixed Flow operations

  See the 2018 description above
- 2035 DBL from NWTC to BUTC, Busway on Post Oak and Elevated Busway on West Loop

  See the 2018 description above

DBL Service Assumptions Used in the Build Scenarios

The following assumptions for the DBL service were used in the model:

- Average speed on the DBL service is 13 MPH on the entire alignment. Speeds on Post Oak Boulevard DBL would be on the order of 14 MPH. This average speed includes station dwell times. This speed assumption is based on recommendation made by Houston METRO staff.
- Bus speeds in mixed flow on the West Loop frontage roads are based on highway

congested speeds

- DBL fare would be: $1.25. Free transfers from / to Park and Ride and local buses.
- Transfer time at NWTC: 1 min
- Transfer time at BUTC: 2 min
- Transfer time at BTC: 1 min
- DBL Peak and off-peak headways would be: 5 min
- No capacity constraints on DBL

Tables 1 and 2 provide a summary of travel speeds for various segments of the DBL alignment.

Table 1: DBL Speed Assumptions (Mixed flow on West Loop Frontage Roads)

Alternative	**DBL speeds on Post Oak Boulevard**		**DBL speeds on West Loop Frontage Roads**	
	Peak Period	**Off-Peak Period**	**Peak Period**	**Off-Peak Period**
DBL on Post Oak Boulevard, Mixed Flow on West Loop Frontage Roads	14 MPH	14 MPH	12.5 MPH between Post Oak Boulevard and Memorial Drive	14 MPH between Post Oak Boulevard and Memorial Drive
			14 MPH on N. Post Oak	16 MPH on N. Post Oak
Average DBL speed in the entire alignment: 13 MPH in peak period				

Table 2: DBL Speed Assumptions (Elevated Busway on West Loop)

Alternative	DBL speeds on Post Oak Blvd		DBL speeds on West Loop Bus Lanes	
	Peak Period	**Off-Peak Period**	**Peak Period**	**Off-Peak Period**
DBL on Post Oak Boulevard, Elevated Busway on West Loop	14 MPH	14 MPH	45 MPH between Post Oak and NWTC	45 MPH between Post Oak and NWTC
Average DBL speed in the entire alignment: 19.5 MPH in peak period				

The priority treatments for buses on Post Oak Boulevard (the DBL) and the IH 610 Busway are expected to significantly reduce travel times for those traveling by transit in the study area. For example, the current round trip travel time on Bus Route 33 between the vicinity of BUTC and NWTC is approximately 54 minutes. In the Mixed Flow Busway option, this travel time would be reduced to 42 minutes. In the Elevated Bus way option, the round trip travel time will further reduce to 28 minutes. This information is presented in **Table 3**.

Table 3: Travel Times on the Proposed DBL Service

Option	**Round trip travel time**
Current local Bus Route 33	54 min
DBL in Mixed Flow on West Loop	42 min
DBL in Elevated Bus way on West loop	28 min

Park and Ride Bus Service Improvements in the Build Scenario

In the Northwest and Katy corridors, all Park and Ride routes that operate peak headways between 4 and 15 minutes were assumed to stop at the NWTC. In the Westpark Corridor, all routes that operate peak headways between 15 and 30 minutes would stop at the BUTC. In the Southwest Corridor, all Park and Ride routes that operate with peak headways between 4 and 12 minutes would stop at the BUTC. **Table 4** identifies the Park and Ride route characteristics.

Table 4: Park and Ride Service in the Build Scenarios

Corridor/Type	Route	Description	Direction	Headway		Comments
				Peak	Off-Peak	
Northwest	214	Northwest Station	Inbound	5	N/A	No Change
			Outbound	5	N/A	Stops at NWTC
	216	W. Little York / Pinemont	Inbound	12	N/A	Stops at NWTC
			Outbound	12	N/A	Stops at NWTC
	217	Cypress	Inbound	10	N/A	Stops at NWTC
			Outbound	10	N/A	Stops at NWTC
	286	W. Little York	To Galleria	15	N/A	Stops at NWTC
			From Galleria	15	N/A	Stops at NWTC
Katy	221a	Kingsland	Inbound	5	N/A	Stops at NWTC
			Outbound	5	N/A	Stops at NWTC
	221b	Kingsland	Inbound	20	N/A	Stops at NWTC; Pk Hdwy
			Outbound	20	N/A	Improved Peak Headway
	222	Grand Parkway	Inbound	5	N/A	Stops at NWTC
			Outbound	5	N/A	Stops at NWTC
	228	Addicks	Inbound	6	N/A	Stops at NWTC
			Outbound	6	N/A	Stops at NWTC
	229	Kingsland / Addicks	Inbound	N/A	45	No Change
			Outbound	N/A	45	No Change
	298a	Addicks / NWTC	To TMC	20	N/A	Stops at NWTC
			From TMC	20	N/A	Stops at NWTC
	298b	Addicks / NWTC	To TMC	20	N/A	No Change
			From TMC	20	N/A	No Change
	274	Westchase / Gessner	Inbound	15	N/A	Stops at BUTC

Corridor/Type	Route	Description	Direction	Headway		Comments
				Peak	Off-Peak	
Southwest	262a	Westwood	Inbound	10	N/A	Stops at BUTC
			Outbound	10	N/A	Stops at BUTC
	262b	Westwood	Inbound	30	N/A	No Change
			Outbound	30	N/A	No Change
	265a	West Bellfort	Inbound	5	N/A	Stops at BUTC
			Outbound	5	N/A	Stops at BUTC
	265b	West Bellfort	Inbound	5	N/A	Stops at BUTC
			Outbound	5	N/A	Stops at BUTC
	269	Westwood/West Bellfort	Inbound	N/A	5	No Change
			Outbound	N/A	5	No Change
	292	West Bellfort/Westwood / TMC	To TMC	15	N/A	No Change
			From TMC	15	N/A	No Change

PART 2: Ridership Forecasts

Ridership forecasts for each alternative described in Part 1 were estimated by running H-GAC's regional travel demand model, implemented in CUBE software. These forecasts are for an average weekday condition. They include commuter work trips as well as non-work trips. The model produces ridership by peak period (AM and PM combined) and off-peak period.

Presented in **Table 5** are the projected ridership estimates for each alternative.

As seen in **Table 5**, under the mixed flow option on West Loop, the DBL service running from NWTC to BUTC is projected to generate about 14,100 daily boardings in 2018 and 19,800 daily boardings in 2035. Under the elevated busway option on the West Loop, the DBL is projected to carry 18,400 trips in 2018 and 25,800 trips in 2035.

Approximately 56 percent of these boardings would occur in AM and PM peak periods combined and the remaining 44 percent would be distributed during the mid day and late evening. The maximum peak passenger loads projected during the peak AM and PM hours are shown in **Table 6**.

Table: 5 DBL Ridership Forecasts (Boardings) for 2018 and 2035

	DBL from NWTC to BUTC (Mixed flow on West loop)		DBL from NWTC to BUTC (Elevated bus way on West Loop)	
	2018	**2035**	**2018**	**2035**
BUTC	2,600	4,300	3250	5400
Richmond	1,750	2,900	2300	3800
Fairdale	250	400	350	500
West Alabama	500	1,250	600	1550
Westheimer	1,950	1,350	2500	1750
Guilford Court	450	650	550	800
Ambassador Way	500	700	650	900
San Felipe	1,150	1,600	1500	2100
Four Oaks	350	450	450	600
Uptown Park (Hollyhurst)	800	1,000	1000	1250
Memorial	500	600	not applicable	not applicable
NWTC	3,300	4,600	5250	7150
Total	**14,100**	**19,800**	**18,400**	**25,800**

Source: HDR Engg

Table 6: Maximum Peak Passenger Loads

	2018	**2035**
AM Peak Hour		
Southbound from NWTC	950	1,400
Northbound from BUTC	800	1,100
PM Peak Hour		
Northbound to NWTC	850	1,300
Southbound to BUTC	700	1,050

Source: HDR Eng

A thorough analysis of the ridership results indicate nearly 52 percent of the DBL ridership would come from the Commuter buses using the HOV lanes in the IH 10, US 290, and US 59 corridors. About 16 percent of the ridership would be those trips using the park and ride lots located at NWTC and BUTC. Transfers to and from the local bus system would make up an additional 26 percent and the remaining 6 percent would be trips that would access the DBL using walk mode both on the origin and destination ends (i.e. – trips beginning and ending entirely within Uptown Houston).