Using LED to Locate Transit Demand for Park & Ride Facilities in Houston, TX

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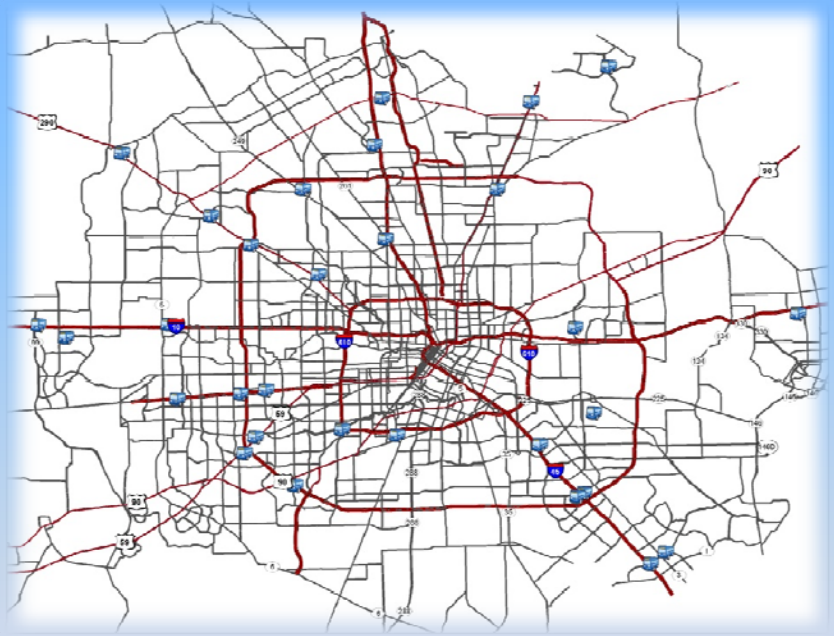
Background

Since 1980, The Goodman Corporation (TGC) has assisted private and public entities plan, finance and implement various land use and mobility projects throughout the nation.

On behalf of its Houston-based clients, TGC is analyzing the demand for park & ride facilities within the city's loop system with services to major destinations.



City of Houston Major Roadway Network

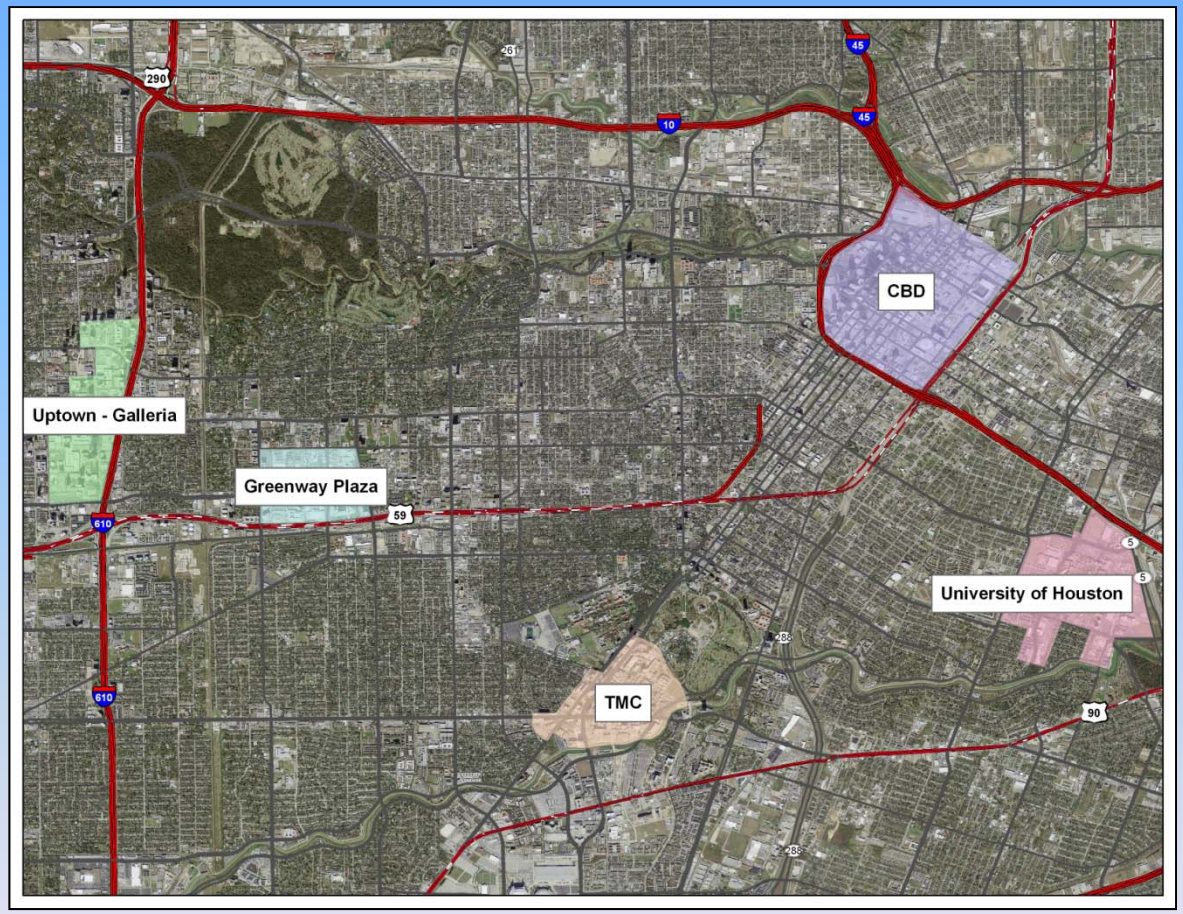
Agenda

- Major destination areas in Houston. (Utilizing the LED program)
- Types of park & rides and transit in Houston.
- Methodology for determining transit and park & ride demand. (Utilizing the LED program)
- Example of demand estimation in Houston. (Utilizing the LED program)
- Benefits and challenges of using LED for park & ride demand estimating.

Hwy 59 in Houston, Texas

Major Destination Areas in Houston

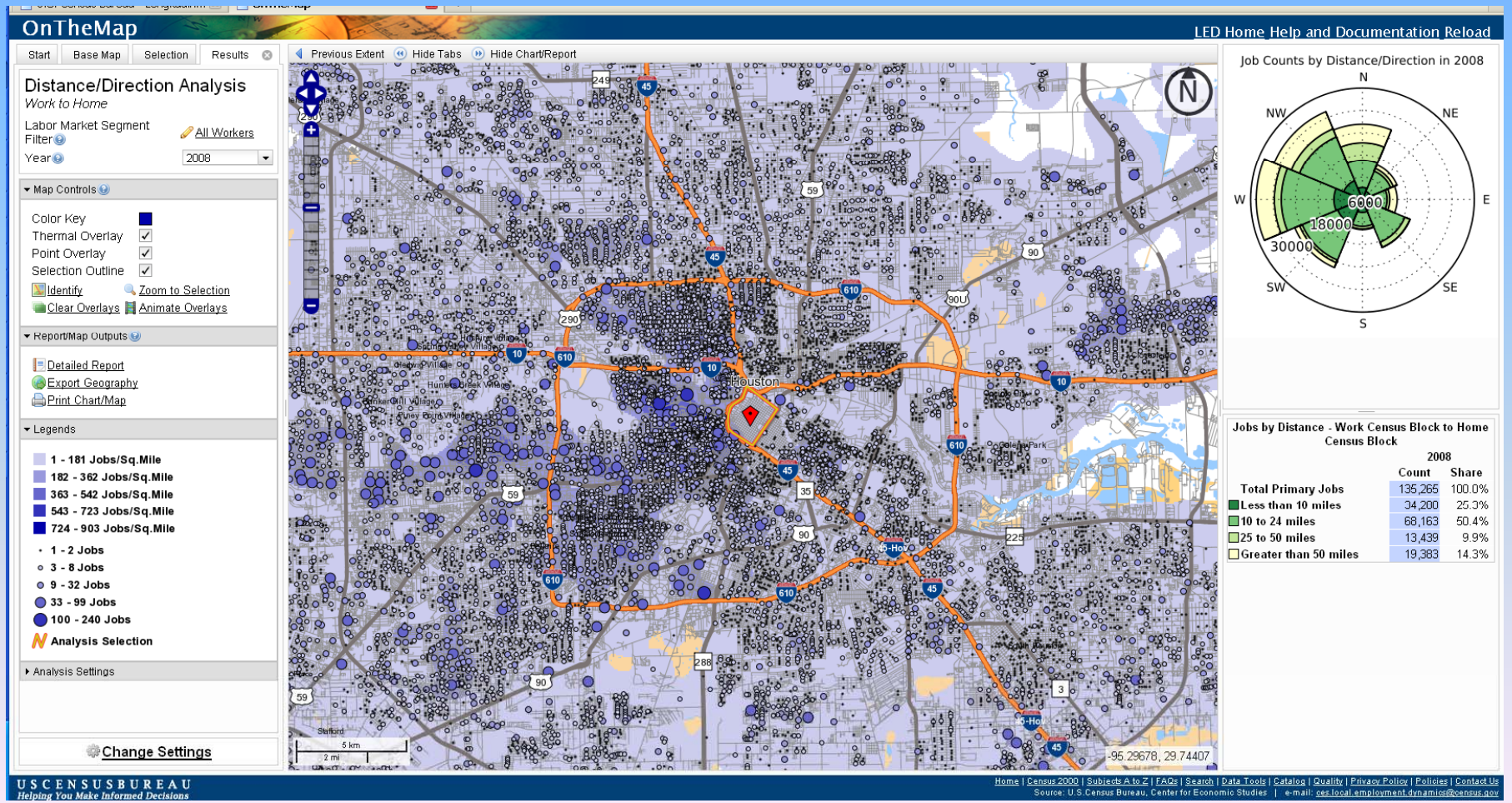
- Central Business District (CBD)
- Texas Medical Center (TMC)
- Uptown - Galleria
- Greenway Plaza
- University of Houston



Destination within Houston's Loop System

Major Destination Worker Profile

To review worker profiles in major destination areas, TGC imported Geographic Information System (GIS) files into the 2008 LED database.

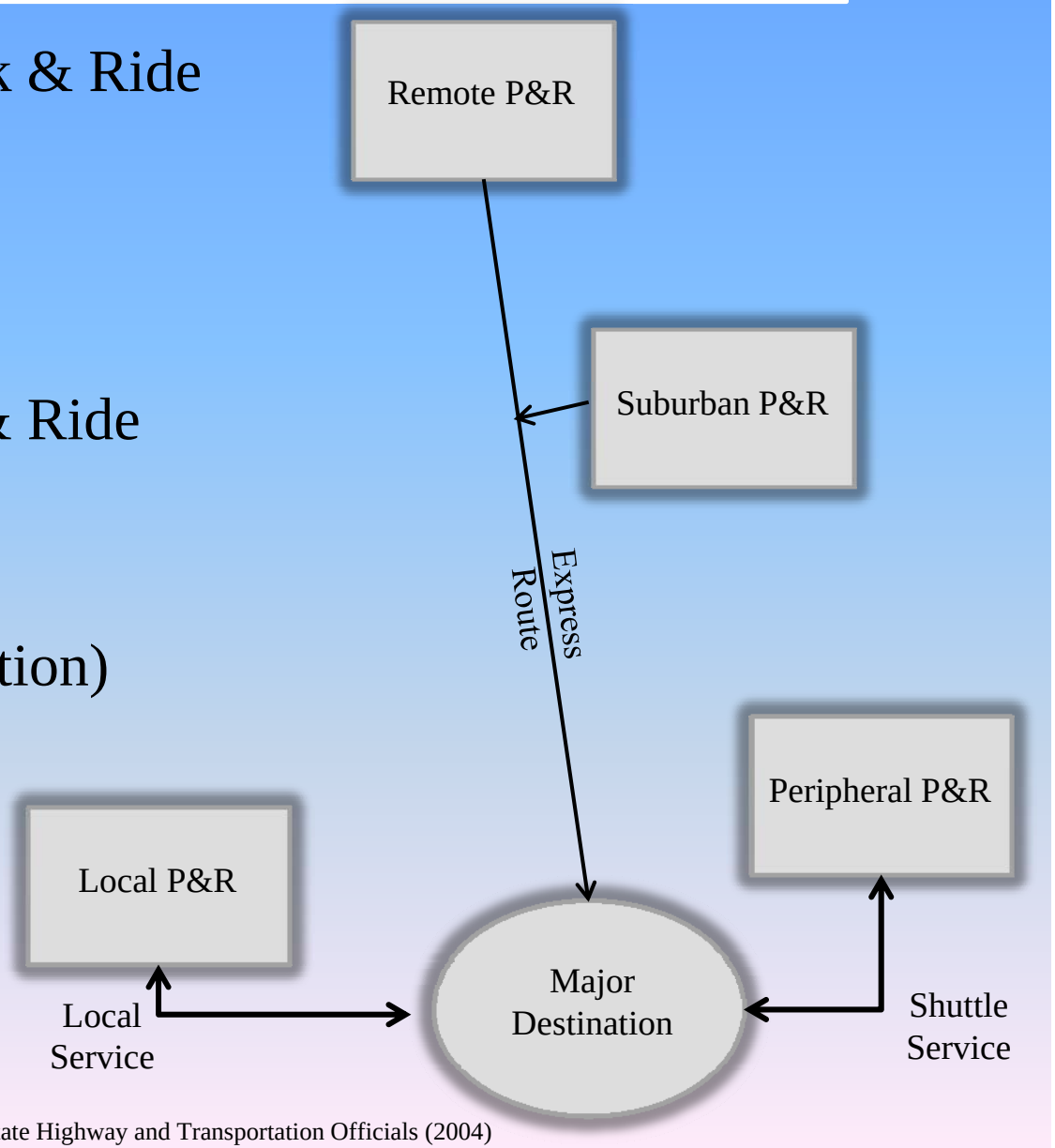


Generating Data for Characteristics of Workers within Major Destinations

Major Destination Area	CBD	Greenway	TMC	Uptown	U of H
Total All Jobs					
Total All Jobs	139,972	58,098	55,329	46,067	15,032
Jobs by Worker Age					
Age 29 or younger	28,027	9,733	10,699	13,635	3,722
Age 30 to 54	88,911	34,632	35,501	25,598	7,814
Age 55 or older	23,034	13,733	9,129	6,834	3,496
Jobs by Earnings					
$1,250 per month or less	16,598	7,328	3,994	9,026	4,785
$1,251 to $3,333 per month	32,930	15,669	19,089	12,112	5,068
More than $3,333 per month	90,444	35,101	32,246	24,929	5,179
Jobs by NAICS Industry Sector					
Agriculture, Forestry, Fishing and Hunting	103	16	0	16	0
Mining, Quarrying, and Oil and Gas Extraction	16,200	3,392	2	3,915	0
Utilities	6,618	1,106	0	17	0
Construction	6,222	507	113	1,559	9
Manufacturing	7,614	79	24	2,453	0
Wholesale Trade	3,083	590	134	1,399	1
Retail Trade	2,028	398	52	6,476	140
Transportation and Warehousing	8,278	405	0	1,121	2
Information	2,501	1,726	110	834	16
Finance and Insurance	8,827	2,688	246	5,871	22
Real Estate and Rental and Leasing	1,381	602	68	1,815	57
Professional, Scientific, and Technical Services	19,583	4,149	855	5,914	106
Management of Companies and Enterprises	1,715	205	87	1,428	1
Administration & Support, Waste Management and Remediation	13,974	2,018	547	3,817	88
Educational Services	3,325	37,022	11,044	1,257	13,951
Health Care and Social Assistance	5,178	616	40,652	887	69
Arts, Entertainment, and Recreation	2,810	800	36	340	2
Accommodation and Food Services	4,518	1,093	483	6,267	391
Other Services (excluding Public Administration)	1,841	380	512	439	53
Public Administration	24,173	306	364	242	124

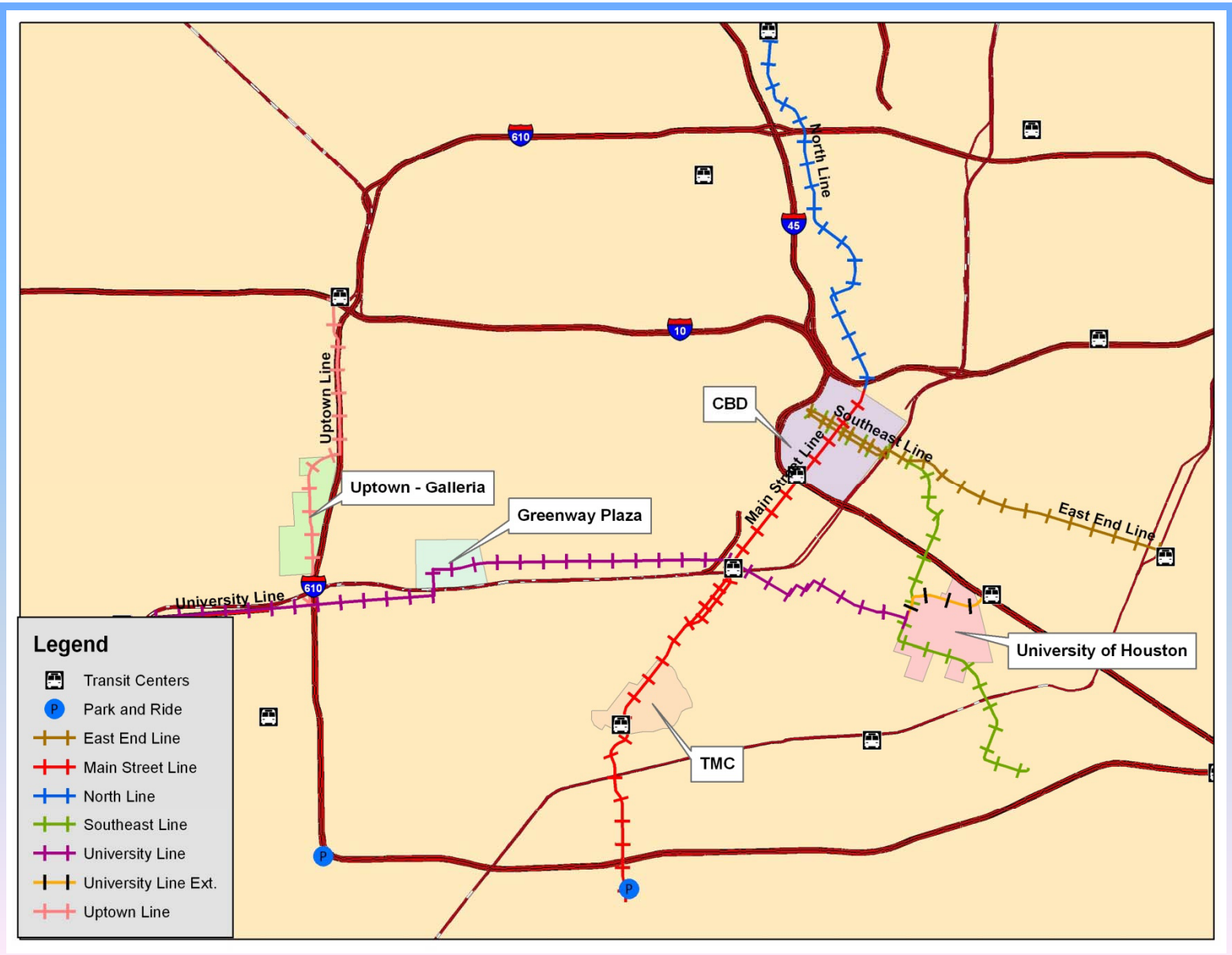
Types of Park & Ride Facilities

- Remote Long-Distance Park & Ride
  Distance - (40-80 miles)
- Suburban Park & Ride
  Distance - (4-30 miles)
- Local Service Urban Park & Ride
  Distance - (1-4 miles)
- Peripheral Park & Ride
  Distance - (Edge of Destination)



Source: Guide For Park-and-Ride Facilities. American Association of State Highway and Transportation Officials (2004)

Current and Planned Light Rail in Houston

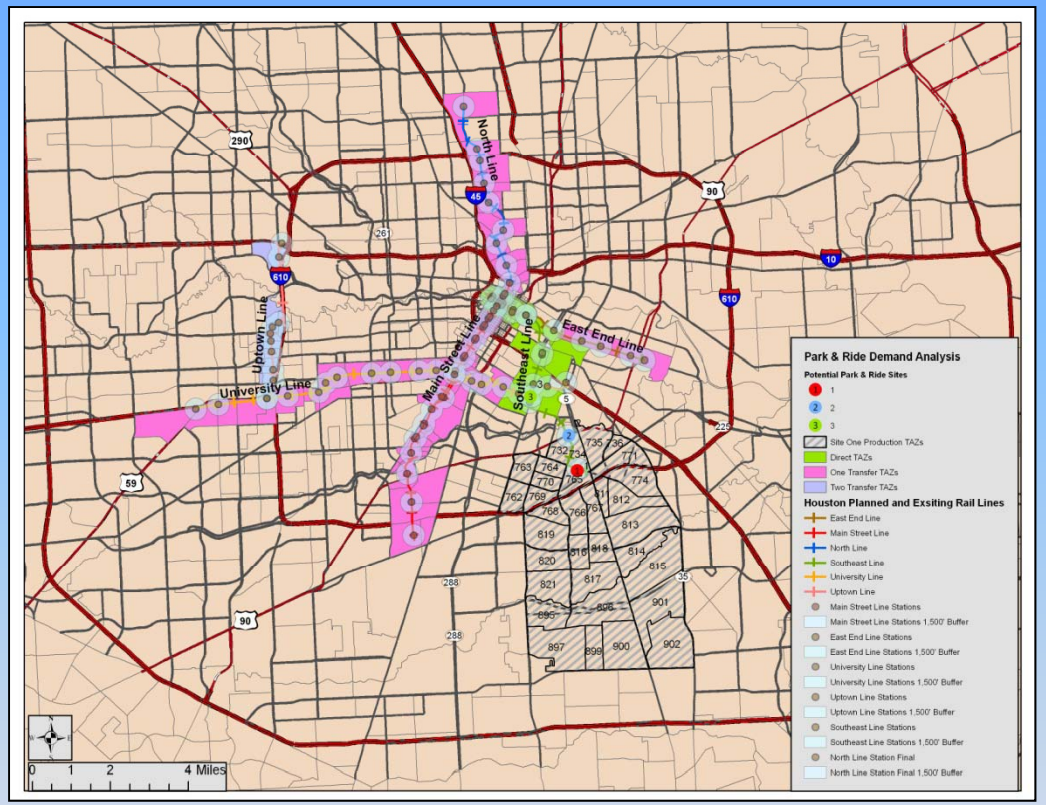


Methodology Overview for Estimating P&R Demand

- Determine the type of park & ride – distant, suburban, local, or peripheral.
- Survey availability of parking currently available with proposed project area.
- Examine roadway networks to identify where trips are originating and terminating. Identify traffic analysis zones (TAZs) for both origins and destinations. (Typically, commuters will walk a maximum of a ¼ mile from a station. Because of this limitation, large TAZ's must be analyzed differently – without LED, TAZ-splitting would be necessary).
- Examine the demographics of the capture area and destination area (as demonstrated, the LED program provides users with profiles of workers).
- Estimate home-to-work trips using LED and MPO Travel Demand model.
- Apply Level-of-Service penalties for transfers.
- Apply a modal split factor for new and/or improved service.
- Apply a car-pooling factor for patrons that car-pool to the facility.

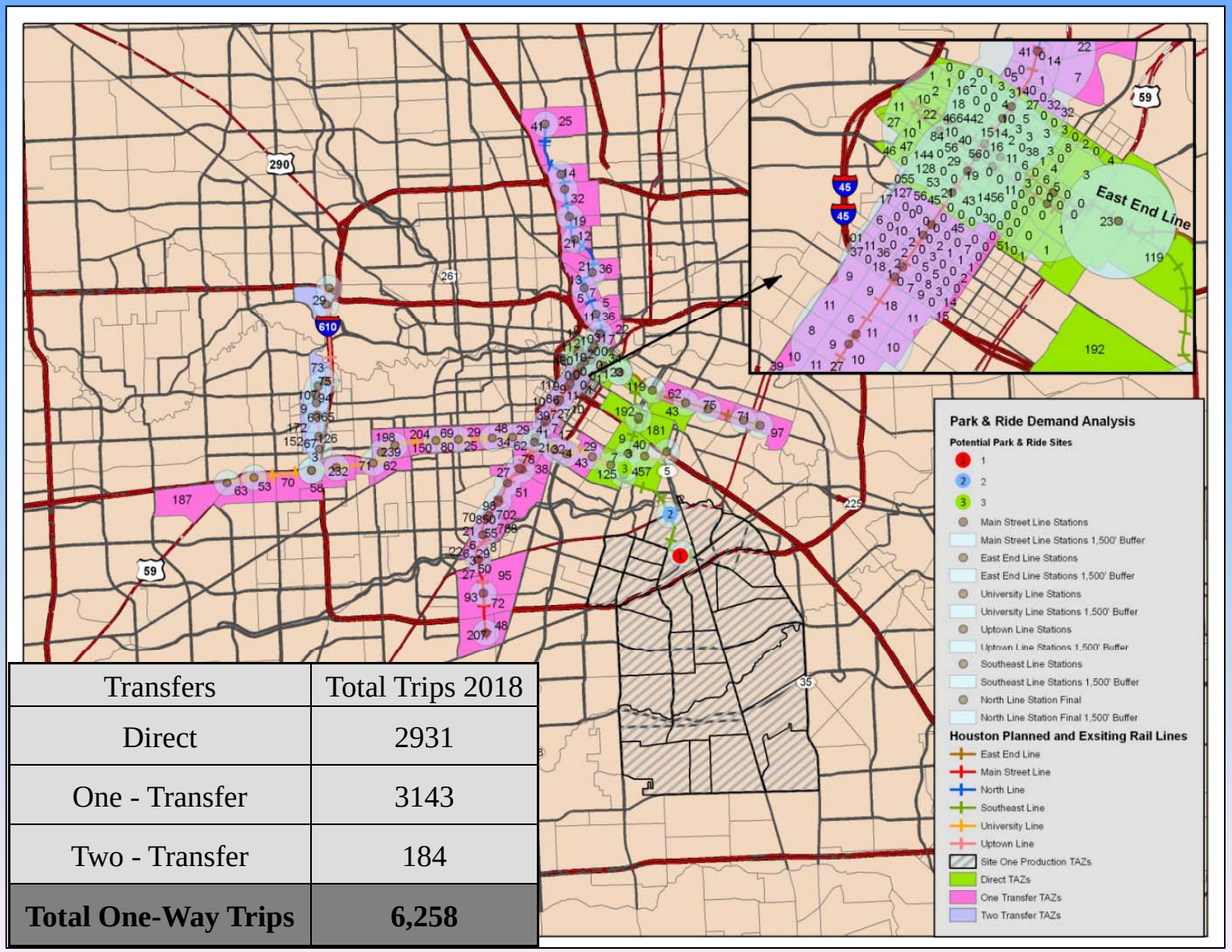
Example of P&R Demand Methodology

- Type - Local Service, served by local routes and light rail.
- Large private lot next to light rail station.
- Roadway network shows a capture area to the south of the proposed facility.
- The worker profile of the capture area shows that this a low income area.



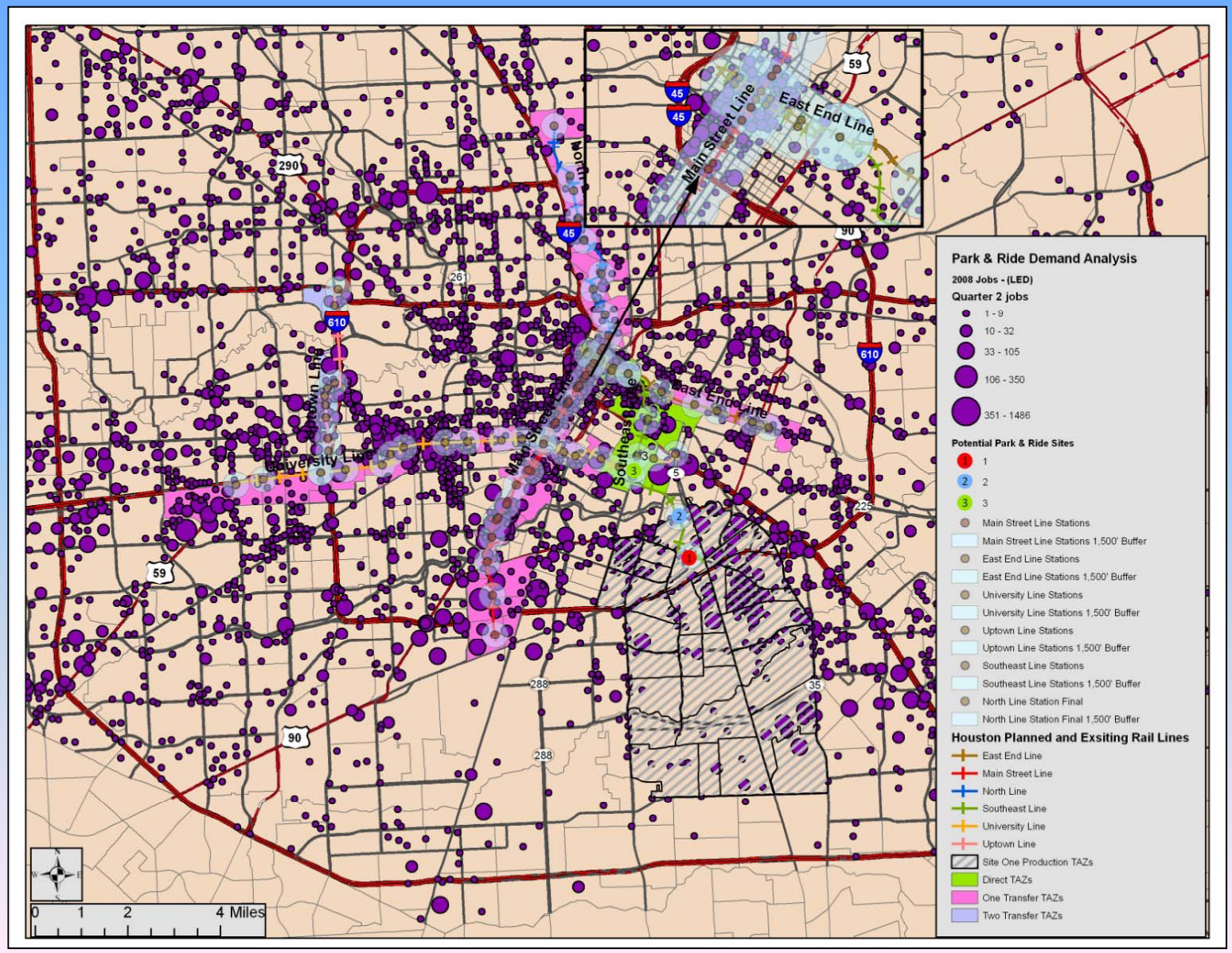
Earnings	Count	Share
$1,250 per month or less	10,937	31.3%
$1,251 to $3,333 per month	15,834	45.3%
More than $3,333 per month	8,204	23.5%

MPO Travel Demand – Home base Work Trips

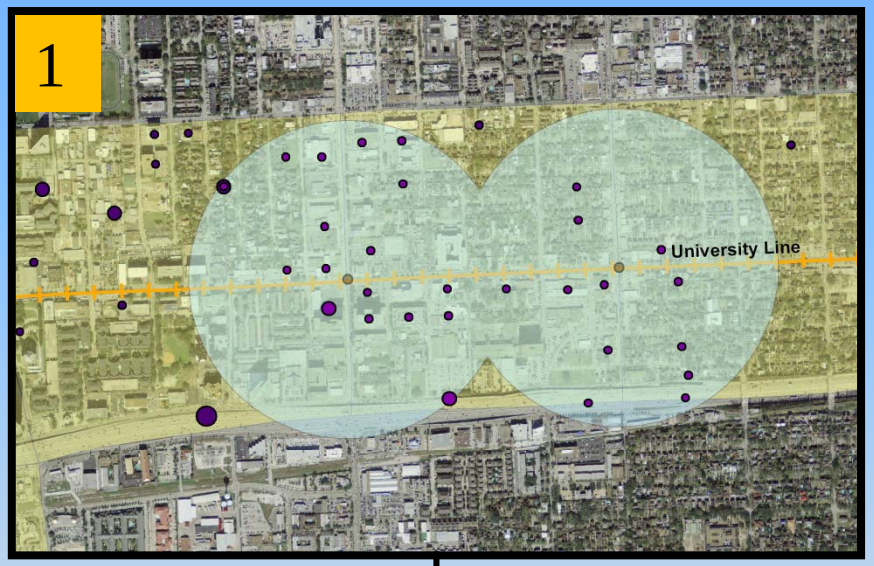


Transfers	Total Trips 2018
Direct	2931
One - Transfer	3143
Two - Transfer	184
Total One-Way Trips	**6,258**

LED Home-Base Work Trips



LED “1/4 Mile Walking Limitation” Factor



Transfers	Total Trips 2018
Direct	1,417
One - Transfer	3,068
Two - Transfer	97
Total One-Way Trips	**4,582**

Comparison of Resulting Estimates

LED Data 2008	
110	←Demand
1.25 Passenger Per Car Factor	1.25
HBW Trips	4,582
Modal Split	3.0%

TDF Travel Forecast Model 2018	
156	←Demand
1.25 Passenger Per Car Factor	1.25
HBW Trips	6,516
Modal Split	3.0%

LED Benefits and Challenges in Park & Ride Studies

- Benefits - The study area can be any polygon desired and worker profile data is useful in transit analyses. Also, the distance/direction tool can provide useful information in travel flow patterns.

- Challenges – Payroll data does not necessarily correlate with employment location, which can be especially problematic when working within a small-scale study area.

Photo Source: Houston METRO

Re-Cap

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- Example of demand estimation in Houston.
- Benefits and challenges of using LED in the park & ride demand estimations.

Questions/Comments:

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