



Origin-Destination Analysis Memo

I-45N: North Houston to Conroe

April 2020

Introduction

The Origin-Destination (O-D) analysis was conducted to understand the travel patterns of vehicles in the study area. During Phase I, completed in 2017, Bluetooth technology was utilized to collect O-D data. Five days of data were collected in 2017 by deploying Bluetooth sensors at selected origin and destination locations along the study corridor to collect vehicle O-D data. In Phase II, the new big data and analytics platform, Streetlight, was used to collect O-D data and analyze the travel patterns. The new data platform provides improved data quality and flexibility in analyzing multiple O-D locations. Thirteen months of data were collected using Streetlight data.

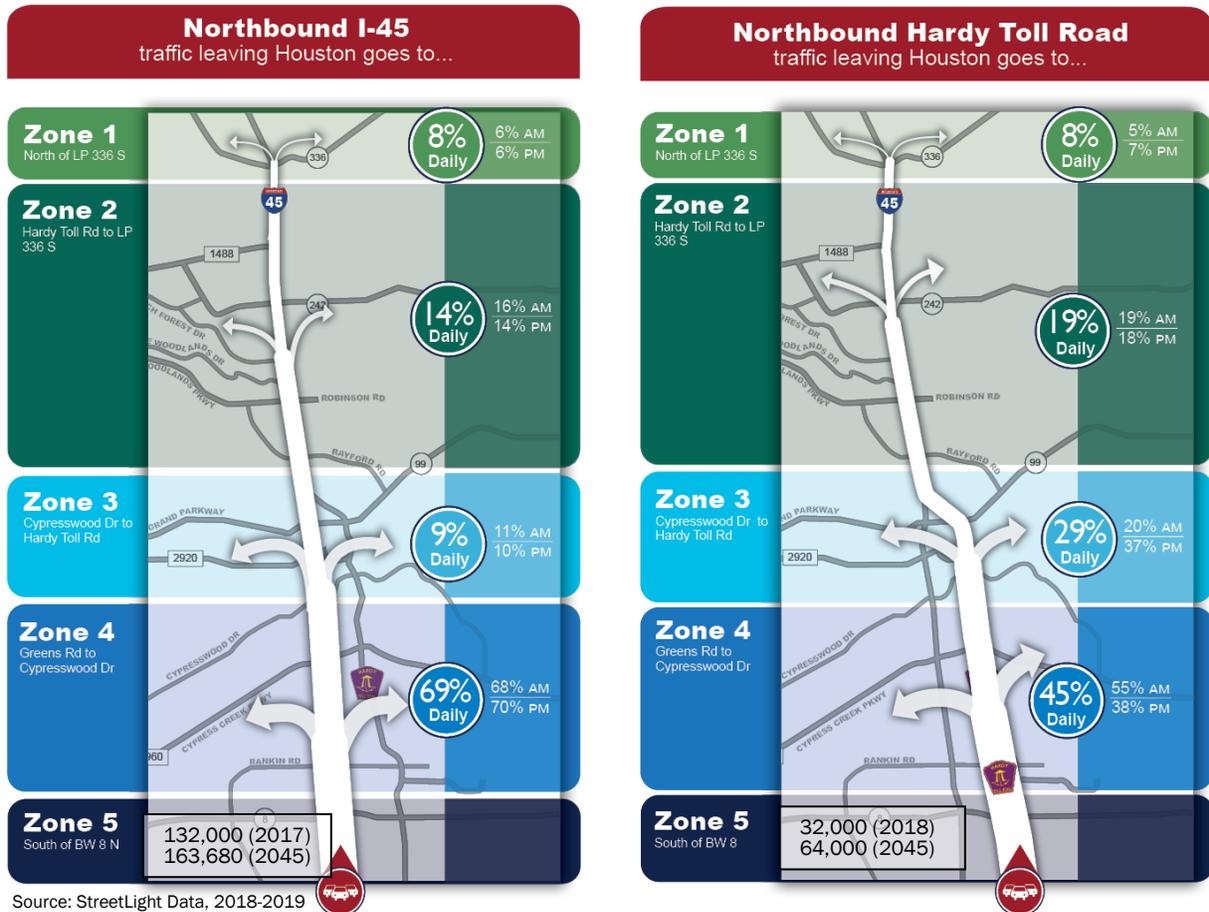
Travel Patterns

Key Corridor Trends

- As both a major roadway connecting Houston and Dallas and a major north-south commuter route in the Houston region, I-45N is heavily traveled by both short- and long-distance travelers.
- The typical travel patterns in the corridor demonstrate that I-45N provides important access and connects cities along the corridor and beyond.
- For daily trip traveling northbound on I-45, approximately **69%** of the daily traffic, south of Beltway 8, are *short-distance trips* (less than 6 miles) destined to land uses between Greens Road and Cypresswood Drive, and about **8%** are *through trips* that traveled north of Loop 336 South in Conroe.
- For daily trips traveling *southbound* on I-45, north of LP 336 South, about **57%** are *local short-distance trips* (less than 12 miles) ending between LP 336 South and Hardy Toll Road, and about **19%** are *through trips* that traveled south of Beltway 8 in Houston.

Figure 1 illustrates the northbound travel patterns for vehicles that enter the study area at the south end of I-45 and Hardy Toll Road collected from 13 months of Streetlight data.

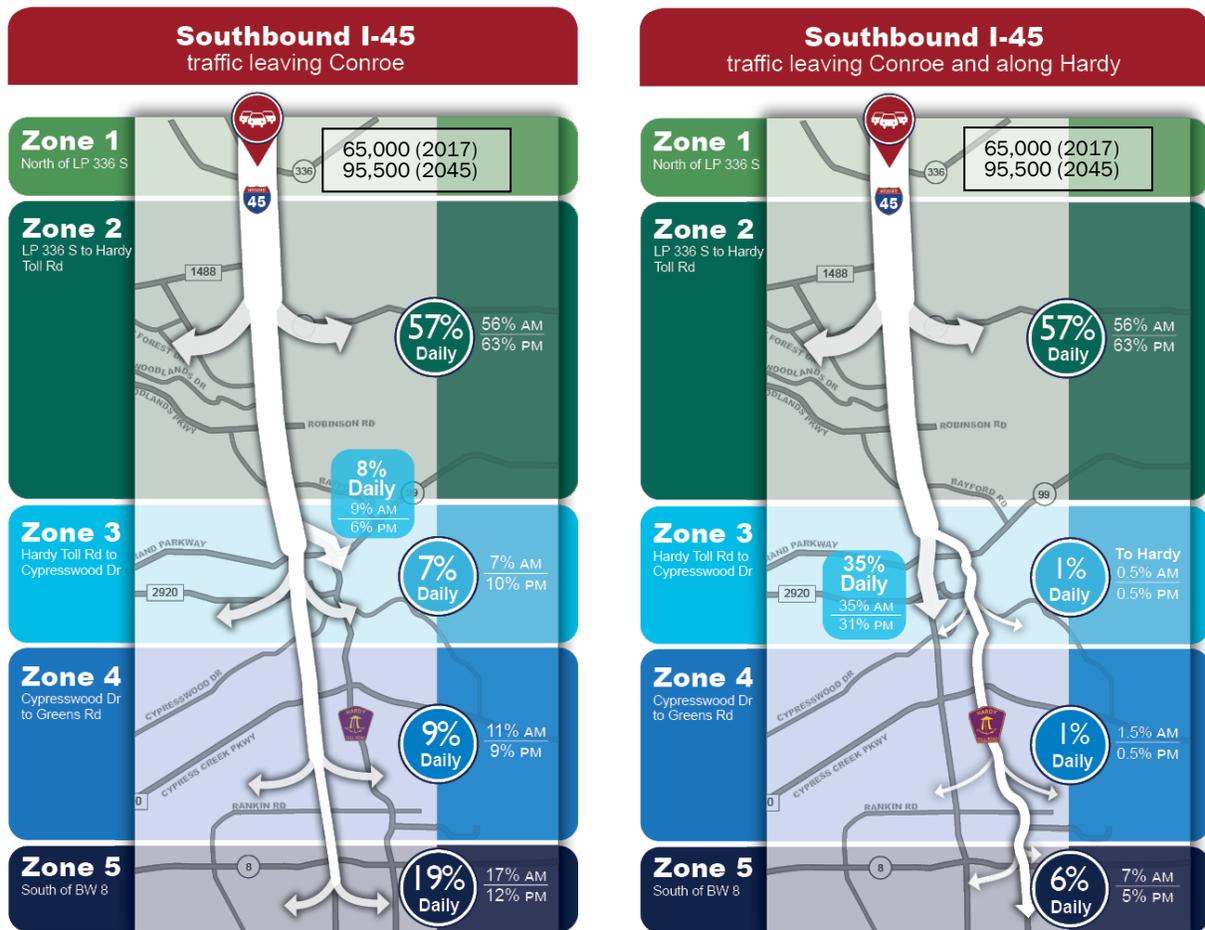
Figure 1 – Northbound Travel Patterns: I-45N vs. Hardy Toll Road (Streetlight Data)



Key Takeaways	
NB from I-45 South of BW 8	NB from Hardy South of BW 8
8% of the traffic is through traffic to north of LP 336 (DHV 1,050 by 2045 – 50% utilization of 1-lane)	8% of the traffic is through traffic to north of LP 336 (DHV 410 by 2045)
69% of the traffic is local traffic with destinations within Cypresswood Dr (less than 8 miles)	45% of the traffic is local traffic with destinations within Cypresswood Dr (less than 8 miles)
	74% of the traffic disperses before connecting to I-45 (12% on BW 8, 11% on SH 99)
	19% of the traffic travels to destinations in-between Hardy Toll Road and LP 336

Figure 2 illustrates the southbound travel patterns for vehicles that enter the study area at the north end of I-45 in Conroe.

Figure 2 –Southbound Travel Patterns: I-45 vs. Hardy Toll Road (Streetlight Data)

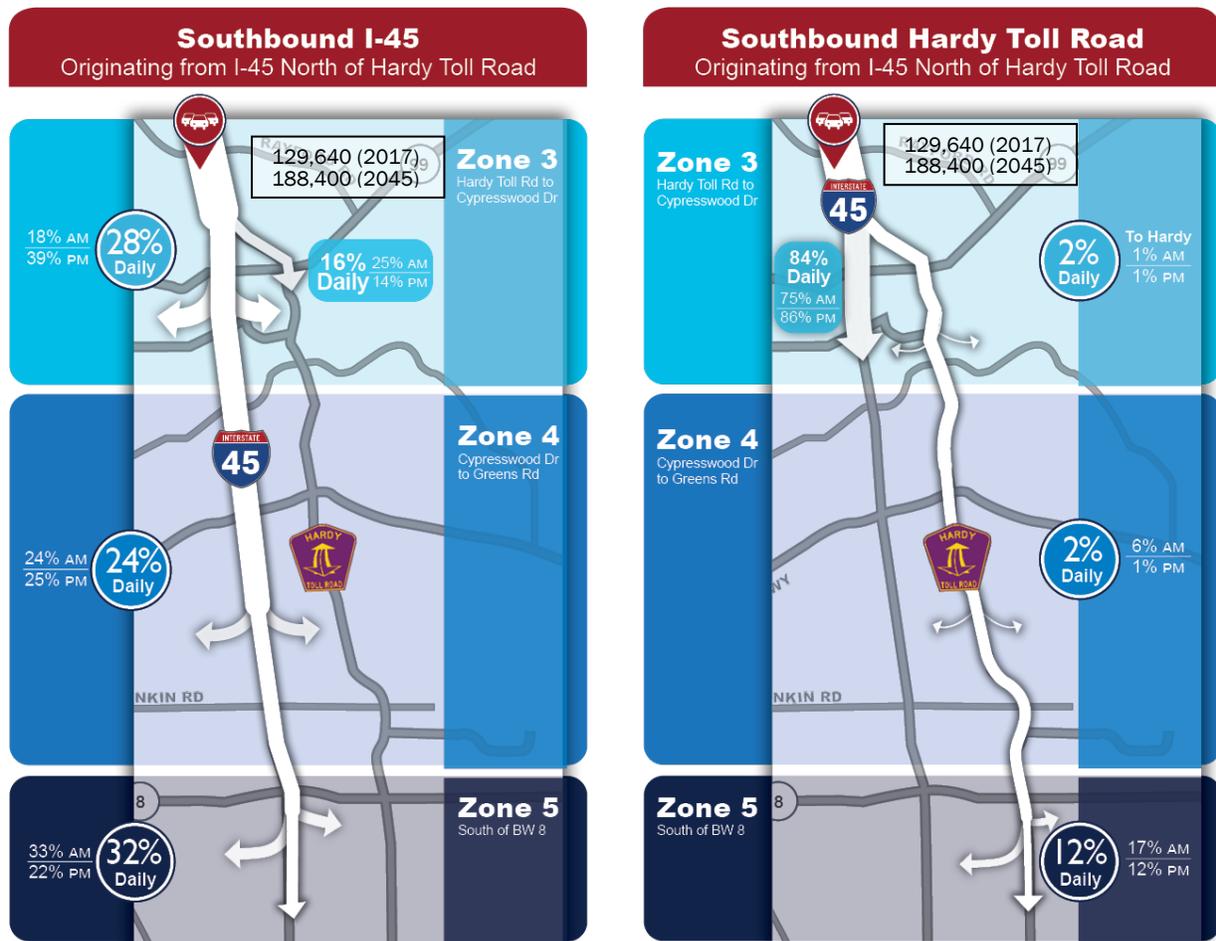


Source: StreetLight Data, 2018-2019

Key Takeaways	
SB from I-45 North of LP 336 S along I-45	SB from I-45 North of LP 336 S along Hardy Toll Road
19% of the traffic is through traffic to south of Beltway 8 (DHV 1,500 by 2045 – 60% utilization of 1-lane)	6% of the traffic through traffic to south of Beltway 8 (DHV 460 by 2045)
57% of the traffic is local traffic with destinations within Hardy Toll Road (less than 12 miles)	57% of the traffic is local traffic that disperses before getting on Hardy Toll Road
36% of the traffic continues on I-45 & 7% of the traffic takes Hardy Toll Road	36% of the traffic continues on I-45 & 7% of the traffic takes Hardy Toll Road
	2% of the traffic or less exit between SH 99 and BW 8

Figure 3 shows the travel patterns for vehicles that originate from I-45 just north of the Hardy Toll Road to destination zones via I-45 or Hardy Toll Road.

Figure 3 – Southbound Travel Patterns, from South of Rayford/Sawdust: I-45 vs. Hardy Toll Road
(Streetlight Data)

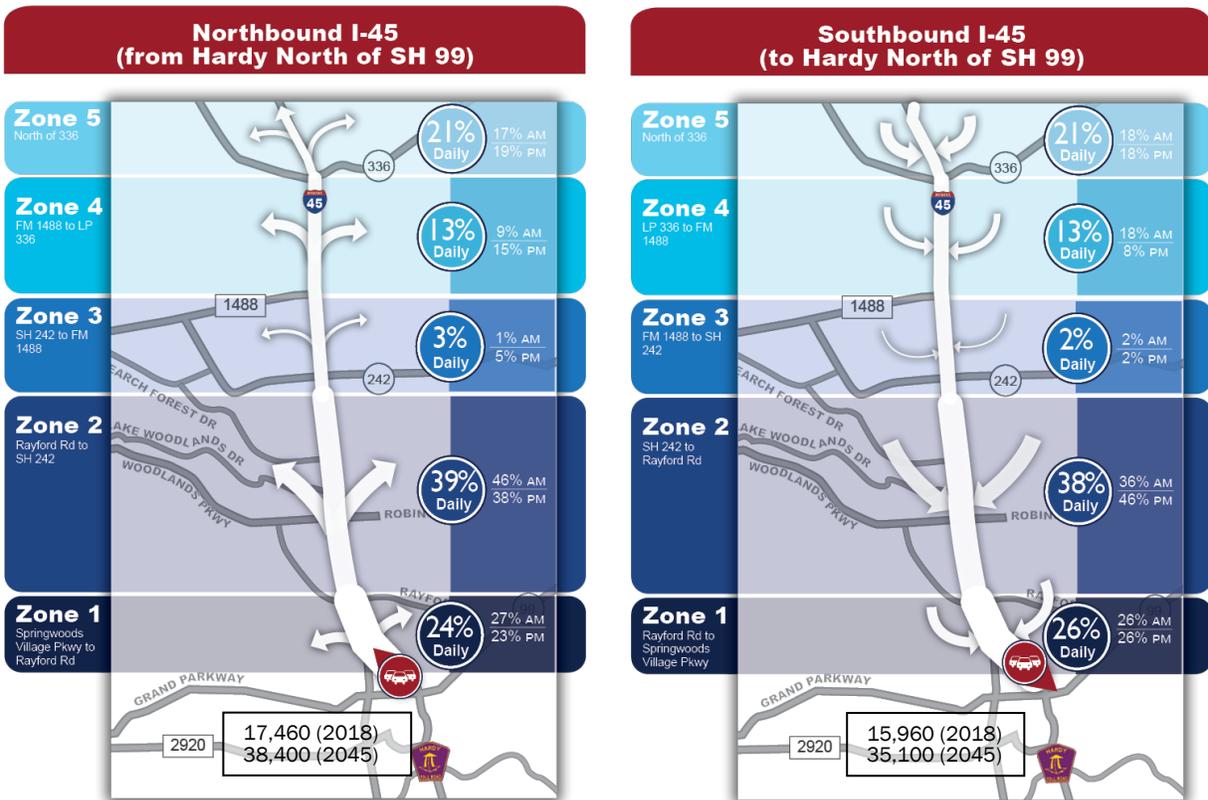


Source: StreetLight Data, 2018-2019

Key Takeaways	
SB from I-45 South of Rayford Rd along I-45	SB from I-45 South of Rayford Rd along Hardy Toll Rd
32% of the traffic is through traffic to south of Beltway 8 (DHV 4,820 by 2045 – 2 lane demand)	12% of the traffic is through traffic to south of Beltway 8 (DHV 1,810 by 2045 – 1 lane demand)
84% of the traffic continues on I-45 & 16% of the traffic takes Hardy Toll Road	84% of the traffic continues on I-45 & 16% of the traffic takes Hardy Toll Road
Traffic along I-45 is uniformly distributed to land uses along the corridor	Traffic along Hardy Toll Rd is mostly through traffic to Houston

Figure 4 shows the northbound travel pattern for vehicles that originate from Hardy Toll Road just south of the DC to I-45, and the southbound travel pattern for vehicles that originate from different zones to the north to Hardy Toll Road just south of the DC from I-45. There is one-Lane Demand from Hardy to serve short-trips between Rayford and Research Forest

Figure 4 – Northbound Travel Pattern - Origination from Hardy Toll Road (Left)
 Southbound Travel Pattern - Destination to Hardy Toll Road (Right)
 (Streetlight Data)



Source: StreetLight Data, 2018-2019

Key Takeaways	
NB from Hardy Toll Rd North of SH 99	SB to Hardy Toll Rd North of SH 99
24% of the traffic disperses to destinations within Rayford/Sawdust (2045 DHV ~ 740)	26% of the traffic originates from destinations within Rayford/Sawdust area (2045 DHV ~ 730)
39% of the traffic have destinations between Sawdust and Research Forest (2045 DHV ~ 1,200)	38% of the traffic originates between Sawdust and Research Forest (2045 DHV ~ 1,070)
21% of the traffic is through traffic with destinations north of LP 336 (2045 DHV ~ 650)	21% of the traffic is through traffic with origins north of LP 336 (2045 DHV ~ 590)