About Central Houston, Inc.
Central Houston, Inc. (CHI) is a private, nonprofit corporation supported by memberships of businesses and institutions with an interest in downtown and the central city. CHI's members are concerned with urban planning, economic development, transportation issues, public safety, governmental affairs, and cultural and entertainment programs.

About the Downtown Commute Survey
CHI is committed to enhancing excellent access to and within downtown Houston for employees, visitors, tourists, and residents. CHI has conducted six surveys of downtown workers – in 1987, 1999, 2002, 2006, 2009, and 2013 – to better understand travel behavior.

Download the report
The Downtown Commute Survey and maps are available online: http://downtownhouston.org.

Media contact for questions concerning this report:
Central Houston, Inc.
909 Fannin St., Suite 1650 Houston, TX  77010-1024
info@centralhouston.org  (713) 650-1470

Report authors
Robin Holzer, Louis Cutaia, and Emily Braswell Henderson, Central Houston, Inc.

Report editors
Laura Van Ness, Director of Business Development, Central Houston, Inc.
Bob Eury, President, Central Houston, Inc.

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Thanks to Central Houston, Inc.’s Transportation Committee:

Working group chairs Committee members
Edwin Friedrichs Steve Burkett, Doug Childers, Mark Cover, Dan Gilbane
John Hawkins Laura Hannusch, Dave Johnson, Andrius Kontrimas, Pam Matula
John Huff Peter McStravick, Peter M. Oxman, Stewart Robinson
Christof Spieler Louis Rosenthal II, Anton Sinkewich, Frank Staats, Sandy Weiner

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Linda Cherrington, Transit Mobility Program Manager, Texas A&M Transportation Institute
Alan Clark, MPO Director, Director of Transportation, Houston-Galveston Area Council
Donald R. Glenn, P.E., Vice President, RS&H, Inc.
Ashby Johnson, Deputy Director of Transportation, Houston-Galveston Area Council
Carol A. Lewis, Ph.D., Director, Center for Transportation Training & Research at TSU
Tim Lomax, Ph.D., Senior Research Engineer, Texas A&M Transportation Institute
Kurt Luhrsen, Vice President of Planning, Metropolitan Transit Authority
David E. McMaster, Director of Commuter Services, Metropolitan Transit Authority
Vincent Sanders, Lead Transportation Systems Planner, Metropolitan Transit Authority

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EXECUTIVE SUMMARY

Centrally located in the City of Houston, the downtown central business district is the largest activity center in the 8-county metropolitan Houston region. As of 2010, the Houston-Galveston Area Council (H-GAC) estimated that 150,195 people worked downtown within the area bounded by IH-10, IH-45, and US-59.

According to the U.S. Census, downtown employers draw workers from across Houston. In fact, the downtown commute shed includes every zip code in the 8-county region.

Distribution of downtown employees by Census block from 2011 Longitudinal Employer-Household Dynamics (LEHD) shows downtown’s commute shed spans the region.

About the 2013 Downtown Commute Survey

Central Houston, Inc. conducted a survey of downtown employees from March through May of 2013 as part of a continuing effort to understand and improve access to and within downtown for employees. 13,810 employees completed the survey. Their responses provide insights regarding commute behavior that may benefit employers, downtown property owners, transportation planners, and public policy makers.
**Commute mode split**

Survey participants were asked, "How do you usually commute to/from downtown?"
Among the 12,701 qualifying respondents who completed this primary mode question:

- **56.8% drive alone** to work each day in a single-occupant vehicle (SOV)
- **32.0% choose public transit**, including park-and-ride commuter bus, local bus, and/or local rail
- **9.3% share rides** in a carpool or vanpool
- **1.5% use active transportation**, walking or bicycling to work each day

More than 40% of survey respondents use alternative transportation; 56.8% drive alone.

The overwhelming majority of survey respondents – **97.3%** – **complete their trip to work on foot**. One third – 33.2% – walk the rest of the way to work at street level.

Further, if the broader pool of downtown employees behaves similarly to survey respondents – walking to work at street level – then one third of 150,195 workers would be approximately 50,000 people making **100,000 pedestrian trips a day** on downtown streets. The importance of maintaining a high-quality pedestrian environment becomes readily apparent.

**Downtown achieves the strongest commute mode split in the region**

Downtown Houston continues to achieve the strongest mix of public transit, vanpools, carpools, and other alternative commute modes in the entire Houston region.
According to the latest 3-year estimate from the U.S. Census for the 8-county Metropolitan Statistical Area (Houston-Sugar Land-Baytown MSA), 80% of all workers drove alone to work in 2010-2012. Downtown’s solo driving share at 56.8% was 23 percentage points lower than the region’s.

Conversely, across the 8-county MSA, approximately 2.4% of the region’s workers used public transit to commute to work. Downtown Houston’s transit share was more than 13 times higher, with 32% of downtown workers using park-and-ride bus, local bus, and/or local rail service for their daily commute.

Downtown employees continue to report the highest rate of transit use, and the lowest rate of solo driving, in the region.

Also note that most downtown bus riders are choosing to ride transit. Only 3% report they have no other way to get to work. Similar data from METRO’s 2011 onboard survey showed 88% of park-and-ride commuters have access to a vehicle they could use for the same trip, but choose a park-and-ride bus instead.

*Industries that drive the most and least*

The following charts depict the distribution of use of each primary commute mode by industry, sorted by rates of solo driving.

- Survey respondents from the Energy, Transportation, and Housekeeping sectors reported the lowest rates of solo driving (SOV). Downtown employers in these sectors enjoy the lowest demand for employee parking.
- Transportation employees report the highest rates of carpool/vanpool ride sharing.
- Other Professional Services employees report the highest rates of walking and bicycling to work, followed by Accounting employees.
- Respondents from the Transportation and Energy industries report the highest rates of park-and-ride use, at 35% and 34%, respectively.
- Housekeeping, Hospitality, and Nonprofits are the only industries in which respondents make higher use of local bus and rail than park-and-ride transit.
Please note: approximately 4% of respondents work in the Finance, Insurance, or Real Estate industries, which have been grouped together as “FIRE” for ease of reporting.

Industry ranking: Energy, Transportation, and Housekeeping industry employees report the lowest rates of solo driving.

Types of transit: 35% of Transportation and 34% of Energy employees choose park-and-ride bus service; 60% of Housekeeping workers use local buses and/or rail.
**Commute distance**

Employers located in downtown Houston draw employees from across Houston. In fact, the downtown commute shed includes every zip code in the entire 8-county Houston-Galveston region. 2013 respondents reported a **median commute distance of 20-29 miles** one way from home to work:

- Nearly one tenth of survey respondents – 9.8% – live within 5 miles of work.
- More than half – 53.6% – live between 10 and 29 miles away.
- Approximately 6.3% of survey respondents commute 40 miles or more each day.

**Commute distance shapes choice of commute mode.**

Among 2013 survey respondents, commute distance shapes choice of commute mode:

- For respondents who live within 10 miles of downtown, the overwhelming majority – more than 70% – choose to drive alone each day.
- METRO serves downtown with a vast array of **local bus** routes, and the most-frequent bus routes serve the central part of Houston. METRO rail provides frequent urban transit along the Main Street corridor, on a light rail line that extended 7 miles at the time the 2013 survey was conducted. 43% of respondents who rely on local bus and/or rail for their daily commute live less than 10 miles from downtown. Three quarters of local bus/rail riders – 74% – commute less than 20 miles.
- METRO, the Brazos Transit District (Woodlands Express), and Fort Bend County (Fort Bend Express) operate high-quality commuter bus service from more than 30 **park-and-ride** lots arrayed along the radial highways that connect the region to central Houston. While a handful of commuter lots are 7-10 miles from downtown, the vast majority are 15 or more miles away. As a result, the respondents most likely to choose park-and-ride bus service are those who live farther out.
- Nearly all of the “active transportation” – walking and biking – commutes are less than 5 miles from home to work. The majority – 63% – of workers who live downtown (within 1 mile of work) walk or bike to work each day.
**Focus on transit: success of park-and-ride, opportunity for locals**

Transit is most compelling when buses or trains run frequently all day, every day. As frequencies increase, wait times come down, and riders no longer need a schedule.

For workers who live 10 or more miles from downtown, buses depart park-and-ride lots as often as every 5 minutes; access HOV lanes, often by direct connector ramps that keep them out of mixed traffic; flow directly into downtown mobility lanes; and disembark riders in front of offices. In the afternoon, a reverse process returns to the original lots.

In 2013, METRO’s park-and-ride buses carried more people than many cities’ commuter rail systems. Setting aside old transit giants like New York, Chicago, Philadelphia, and San Francisco, the most-successful modern commuter rail system in the U.S. is Los Angeles, which boasted 42,700 boardings per day on 500+ miles of heavy rail. **Houston’s commuter bus system averaged 31,670 boardings**, or more than the Austin, Dallas, San Diego, and Salt Lake commuter rail systems combined.

Workers who live closer in look to local bus and rail transit. In 2013, METRO operated about a dozen high-frequency bus routes – that run at least every 15 minutes all day – connecting downtown to neighborhoods. The detailed excerpt below from Map 12 – High-Frequency Transit with SOV Commuters Surveyed, shows the distribution of respondents who drove alone relative to METRO’s network of highest-frequency routes. Many of the zip codes with the highest concentrations of solo drivers have access to public transit, but are not served well by existing high-frequency transit routes.

In 2014, METRO will complete a Transit System Reimagining effort to optimize the entire network of bus routes and integrate it with expanding rail service. With more high-frequency routes, more all-day, every day service, and an easier to understand network, the project is poised to dramatically expand access to convenient, high-frequency transit service and thus, significantly increase ridership.

**Map:** Many areas with the highest concentrations of solo drivers have some access to public transit, but are not served well by METRO’s existing high-frequency routes.
Age

The respondents with the highest rate of solo driving are the 20-29-year olds. Rates of solo driving fell with increasing age up to age 55-59. Conversely, 20-24-year olds report the lowest rate of park-and-ride bus use. Park-and-ride use rose with age up to 65-69.

Older employees drive alone at lower rates and more often choose park-and-ride buses.

There is a significant gap – a 20- to 50-point spread in utilization – between solo driving and park-and-ride use, with many possible explanations:

- **Commute distance** – Older workers are more likely to have long commutes that are served well by park-and-ride transit. Younger workers often live closer to work.
- **Awareness of transit** – Older workers, who have worked downtown longer, may be more aware of park-and-ride transit options and understand how they work.
- **Tolerance of drive time** – Younger workers may be more tolerant of driving commute experiences and less motivated to consider alternative commute options.
- **Responsibility for dependents** – Parents and caregivers sometimes perceive they need the independence driving offers to respond to the needs of children or elders.

PM mode split with dependents: Compared to those who commute nonstop, workers who stop to care for children or elders are somewhat more likely to drive alone, but more than 20% use transit and 9-12% share rides in a carpool at rates similar to nonstop trips.
Young “Millennial” workers are making different commute decisions than older “Generation X” and “Baby Boomer” workers

It is possible to group survey respondents by age into higher-level generation buckets:

<table>
<thead>
<tr>
<th>Generation</th>
<th>n</th>
<th>&lt;19 years</th>
<th>20-24 years</th>
<th>25-29 years</th>
<th>30-34 years</th>
<th>35-39 years</th>
<th>40-44 years</th>
<th>45-49 years</th>
<th>50-54 years</th>
<th>55-59 years</th>
<th>60-64 years</th>
<th>65-69 years</th>
<th>70 to 75 years</th>
<th>&gt;75 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Millennials</td>
<td>1,476</td>
<td>30-34</td>
<td>35-39</td>
<td>40-44</td>
<td>45-49</td>
<td>50-54</td>
<td>55-59</td>
<td>60-64</td>
<td>65-69</td>
<td>70 to 75</td>
<td>&gt;75</td>
<td>n = 101</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generation X</td>
<td>5,581</td>
<td>30-34</td>
<td>35-39</td>
<td>40-44</td>
<td>45-49</td>
<td>50-54</td>
<td>55-59</td>
<td>60-64</td>
<td>65-69</td>
<td>70 to 75</td>
<td>&gt;75</td>
<td>n = 5,128</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baby Boomers</td>
<td>5,128</td>
<td>30-34</td>
<td>35-39</td>
<td>40-44</td>
<td>45-49</td>
<td>50-54</td>
<td>55-59</td>
<td>60-64</td>
<td>65-69</td>
<td>70 to 75</td>
<td>&gt;75</td>
<td>n = 101</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silent</td>
<td>101</td>
<td>30-34</td>
<td>35-39</td>
<td>40-44</td>
<td>45-49</td>
<td>50-54</td>
<td>55-59</td>
<td>60-64</td>
<td>65-69</td>
<td>70 to 75</td>
<td>&gt;75</td>
<td>n = 101</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please note: for the following analysis, the 101 respondents who were 70 or over were grouped with the Baby Boomer group.

Millennial workers are locating closer to work

The chart below, of the distribution of respondent ages by commute distance, shows younger workers are locating closer to downtown employers than older cohorts:

- **“Millennials”** – respondents under age 30 – comprised 12% of the survey sample, and yet, they accounted for 28% of those who commute less than 5 miles and 20% of those who commute 5-9 miles from home to work.
- **“Generation X”** – respondents aged 40-49 and aged 50-59 – accounted for 24% and 30% of the sample respectively, but they comprised 28% and 33% of those who commute 30 miles or more each day.
- **“Baby Boomers”** – respondents aged 60 and up – comprised 12% of the survey sample and accounted for between 10% and 13% of commutes at each distance

These findings are consistent with trends observed across the U.S. Nielsen, a leading consumer insight firm, noted Millennials “prefer to live in dense, diverse urban villages where social interaction is just outside their front doors.” Urban Land Institute reported the Millennial generation is “more likely than older Americans to prefer living in a big city, and shows the strongest preference among the generations for communities with a mix of uses, with shops, offices, and housing together (62%).”

Shortest commutes are disproportionately made by younger workers; longest commutes are reported most from workers aged 50-59.
Is there unmet demand for transit?

One good way to understand which transportation options an employee will consider using is to identify which options they actually use when their preferred mode is unavailable. Out of the 4,745 solo drivers who answered this question:

- nearly one third – 31.9% – choose bus or rail transit, and
- two out of five – 42.7% – share a ride in a carpool on the days they do not drive.

The following table is grouped by primary commute mode, and shows the percentage of respondents who use each backup travel mode.

Table shows back-up commute mode preferences by primary commute mode.

<table>
<thead>
<tr>
<th>Primary Back-up</th>
<th>SOV</th>
<th>Carpool/Vanpool</th>
<th>Motorcycle/Scooter</th>
<th>Park &amp; Ride</th>
<th>Local Bus/Rail</th>
<th>Bicycle</th>
<th>Walk</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOV</td>
<td>-</td>
<td>72.3%</td>
<td>63.0%</td>
<td>77.3%</td>
<td>71.6%</td>
<td>47.4%</td>
<td>48.0%</td>
</tr>
<tr>
<td>Carpool/Vanpool</td>
<td>42.7%</td>
<td>-</td>
<td>10.9%</td>
<td>14.5%</td>
<td>16.1%</td>
<td>5.3%</td>
<td>7.8%</td>
</tr>
<tr>
<td>Telecommute</td>
<td>20.2%</td>
<td>2.2%</td>
<td>0.0%</td>
<td>7.3%</td>
<td>5.2%</td>
<td>0.0%</td>
<td>7.8%</td>
</tr>
<tr>
<td>Bus</td>
<td>25.1%</td>
<td>23.4%</td>
<td>26.1%</td>
<td>-</td>
<td>-</td>
<td>36.8%</td>
<td>27.5%</td>
</tr>
<tr>
<td>Rail</td>
<td>6.8%</td>
<td>0.6%</td>
<td>*</td>
<td>-</td>
<td>-</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Bicycle</td>
<td>1.9%</td>
<td>0.4%</td>
<td>0.0%</td>
<td>0.1%</td>
<td>2.0%</td>
<td>-</td>
<td>8.8%</td>
</tr>
<tr>
<td>Walk</td>
<td>1.8%</td>
<td>0.3%</td>
<td>0.0%</td>
<td>0.2%</td>
<td>4.2%</td>
<td>10.5%</td>
<td>-</td>
</tr>
<tr>
<td>Motorcycle/Scooter</td>
<td>1.6%</td>
<td>0.8%</td>
<td>-</td>
<td>0.6%</td>
<td>0.8%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

n = 4,745, 1,116, 46, 3,177, 496, 38, 102

* For Motorcycle, Bicycle, and Walk commuters, “Bus/Rail” was listed as a combined option.

Further, when asked what might motivate changing modes, significant numbers of solo drivers say that they would switch to transit if it were more convenient to home:

- more than 1,600 solo drivers said they would switch to bus transit if there were a park-and-ride or express bus route more convenient to their home, and
- more than 2,000 solo drivers said they would switch to rail transit if there were convenient rail service near home.

What can employers do to encourage transit use?

As discussed further in Section 20 on employer subsidies, workers use transit at higher rates when their employer provides a transit incentive and does not subsidize parking:

- more than 1,800 respondents said increasing parking costs would get them to switch to another mode,
- more than 800 respondents said a transit incentive from their employer would get them to switch to bus or rail alternatives, and
- more than 400 respondents said that access to a vehicle for work trips would allow them to use transit for their daily commute.
Employer transportation incentives

Central Houston asked respondents for each mode, “How much does your employer subsidize your parking / bus or rail trip / vanpool / bicycle parking?”

- 41% of employees who drive alone reported their employer pays 100% of their parking cost. 58% of solo drivers surveyed receive some level of parking subsidy.
- 31% of respondents who choose bus and/or rail transit reported their employer pays 100% of their transit fare cost. 70% of all transit users reported they received some level of transit incentive.
- Less than 3% of respondents who share rides in a carpool or vanpool reported their employer pays 100% of vanpool costs. Less than 10% of workers who share rides receive any level of van/carpool incentive.
- 30% of respondents who bicycle to work reported their employer covers 100% of the cost of bicycle parking.

Employer incentive schemes shape commute mode splits

In order to understand the effect that different transportation incentive schemes have on employee commute decisions, one can review the commute mode split among the firms that offer incentives. In 2013, 58 entities had two or more survey respondents who reported that their employer subsidizes their commute. These 58 companies accounted for 11,637 survey respondents, including respondents who did not report taking advantage of subsidies.

Among these 58 entities, the type of transportation incentives an employer offered demonstrably shaped the commute choices of their employees. As shown in the chart below, the firms that only pay for parking incurred the highest rate of solo driving.

The firms that only pay for transit have the highest rates of bus and rail commuting. Note also, these firms that fund transit and do not pay for parking also have the highest share of employees who walk or bicycle to work daily.

Highest rates of transit use were reported in firms which provide only transit incentives.

<table>
<thead>
<tr>
<th>Mode Split by Type of Subsidy</th>
<th>SOV</th>
<th>Combined Transit</th>
<th>Carpool/Vanpool</th>
<th>Active Walk/Bike</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking only</td>
<td>21%</td>
<td>6%</td>
<td>1.2%</td>
<td>9%</td>
</tr>
<tr>
<td>Parking and Transit</td>
<td>28%</td>
<td>6%</td>
<td>1.7%</td>
<td>9%</td>
</tr>
<tr>
<td>Parking, Transit and Van/Carpool</td>
<td>33%</td>
<td>10%</td>
<td>1.2%</td>
<td>9%</td>
</tr>
<tr>
<td>Parking and Van/Carpool</td>
<td>34%</td>
<td>9%</td>
<td>1.8%</td>
<td>9%</td>
</tr>
<tr>
<td>Transit only</td>
<td>29%</td>
<td>0.0%</td>
<td>5.9%</td>
<td></td>
</tr>
</tbody>
</table>

n = 11,637
**AM peak travel times**

The majority of all respondents – 58.8% – report leaving home each day by 7:00 am and 84.8% leave home before 8:00 am.

- However, 60% of park-and-ride bus riders, and 57% of shared carpool/vanpool riders leave home between 5:30 am and 6:59 am, earlier than solo drivers, possibly because they tend to commute longer distances.

- 61% of solo drivers and 57% of local bus/rail transit riders leave home between 6:00 am and 7:59 am, possibly because they tend to travel shorter distances.

- Survey respondents reported a median AM commute duration of 30-39 minutes, with transit and other shared-ride commutes lasting longer, and active walk and bicycle commutes concluding sooner. Active walks and bicycle trips are shortest; park-and-ride bus commutes last longest.

- Just one in five respondents – 20% – make one or more stops on their way to work, which is included in their travel time.

**AM departure times:** Park-and-ride and carpool/vanpool riders tend to leave home earlier than solo drivers and local bus/rail commuters.
**PM peak travel times**

More than half of all respondents – 64% – report leaving work before 5:30 pm each afternoon. 95% have left downtown by 7:30 pm each night.

- 62% of **park-and-ride** bus riders, and 56% of shared **carpool/vanpool** riders, leave work between 4:30 and 5:59 pm, earlier than solo drivers, in part because they tend to commute longer distances.
- 60% of **solo drivers**, and 56% of **local bus/rail** transit riders, leave work between 4:30 pm and 6:29 pm.
- Survey respondents reported a **median PM commute duration of 40-49 minutes**, with longer transit and other shared-ride commutes, and shorter active commutes.
- Significantly more respondents – **30%** – make one or more stops on their way home from work in the evening, up from 20% in the morning.

**PM departure times:** As in the morning, park-and-ride and carpool/vanpool commuters tend to leave work earlier than solo drivers and local bus/rail commuters.
Has the downtown commute mode split changed since 2009?

From 2009 to 2013, the downtown commute mode split appeared unchanged for active commutes by walking and bicycling, and also for motorcycles/scooters. However, the predominant travel modes among survey respondents shifted. More downtown workers drove alone, and fewer chose public transit, vanpools, or carpools.

2013 marked an 8-point shift away from transit and shared modes toward driving alone.

Several aspects of the two survey samples may explain some of the apparent shift:

1. more participation by government workers and women, who drive at higher rates; less participation by retail, hospitality, and healthcare workers, who drive less often.

However, some of the shift in commute mode split is real and meaningful. Each survey represents a snapshot of commute behavior at a particular time, and Central Houston’s 2009 survey of downtown commuters reflected a remarkable situation:

2. In 2008, a strong Houston economy and low unemployment drove high levels of roadway congestion and travel delays among solo drivers, and

3. significant roadway congestion coupled with record-high retail gas prices spurred record numbers of commuters to choose park-and-ride transit or vanpooling.

December 2008 brought rising unemployment to Houston, but the region began adding jobs in February 2010, pushing unemployment toward pre-recession levels.
The Texas A&M Transportation Institute (TTI) reported that Houston region delays from roadway congestion peaked in 2008 and then fell dramatically with the recession.

Then, the "Great Recession" hit Houston hard through 2009:

4. A struggling economy and rising unemployment not only eliminated significant numbers of workers who previously chose transit or vanpools, but also,

5. decreased roadway congestion and reduced average travel delays by 9%, making it more attractive for workers to drive alone.

In 2010 and 2011, delays from congestion per commuter grew only slightly, and METRO’s park-and-ride boardings continued to fall, finally plateauing in 2012. Downtown’s 2013 survey results reflect this nadir of park-and-ride usage.

During this same interval, HCTRA opened the Katy Managed Lanes along IH-10, and METRO converted three HOV facilities to HOT lanes. Allowing solo drivers to pay a toll to gain access to HOT/managed lanes affected transit use in several ways:

6. Demand for park-and-ride bus service is directly related to levels of roadway congestion in the corridor. Managed lanes allow some solo drivers to avoid main lane congestion by paying a toll instead of switching to transit or vanpool.

7. Demand for the managed lanes is fairly elastic and is inversely related to toll rates. When congestion in the corridor is high and the toll rate is too low, an abundance of toll-paying solo drivers can exceed the capacity in the managed lanes and cause congestion. Congestion in the managed lanes reduces transit’s advantage by causing delays and reducing travel time reliability.

The 2013 Downtown Commute Survey results are consistent with large numbers of commuters taking advantage of toll access to HOT and managed lanes to drive alone. Since the survey, both HCTRA and METRO have increased toll rates during peak hours, which improved travel times and reliability, and spurred more people to choose transit.

Outside of work commutes, Texans have been choosing to drive less per capita since 2006, consistent with a similar trend nationwide. Downtown is a well-connected activity center which offers high-quality jobs, diverse residential options, shopping, and entertainment, and is surrounded by vibrant urban neighborhoods. Downtown has much to offer this changing market and is well-positioned for growth going forward.
1. **WHO PARTICIPATED IN THE 2013 DOWNTOWN COMMUTE SURVEY?**

**About downtown Houston**

Centrally located in the City of Houston, downtown is the largest activity center in the 8-county metropolitan Houston region. According to 2010 data from the Houston-Galveston Area Council (H-GAC), **150,195 people worked downtown** within the area bounded by IH-10, IH-45, and US-59.¹

Map 1. Downtown Houston is centrally located in the heart of the Houston region.
1. Survey methodology

**Commute survey study area**

For the purpose of this survey, the downtown study area is defined as those businesses or residences bounded within the elevated portions of IH-45, IH-10, and US-59. The study area includes portions of zip codes 77002, 77003, 77020, and all of 77010.

Out of 13,810 respondents who completed the survey, the majority – 12,849 – work in the 77002 zip code. Map 2 shows that 77002 extends southwest, beyond the downtown highway ring, but the number of respondents from this area appears to be minimal.

**Map 2: Downtown commute study area is bounded by IH-45, IH-10, and US-59.**

[Map image showing the study area and data for each zip code.]

(Number of Respondents who Work in Zip Code / Number of Respondents who Live in Zip Code)
Survey methodology

Over 26 years, Central Houston, Inc. has conducted six surveys of downtown commuters, specifically in 1987, 1999, 2002, 2006, 2009, and 2013. The earlier surveys through 2006 employed various methodologies and were implemented by multiple providers. The 2009 and 2013 surveys were conducted by Central Houston staff and were designed to improve validity and enable longitudinal analysis.

From March through May of 2013, Central Houston conducted a survey of downtown workers, asking how they get to work (commute mode), what time they leave, trip duration, how many stops they make during their commute and why, and much more. The purpose of the survey is to identify trends in how downtown commuters are commuting to downtown, including current commute mode split and other information, and use that information to:

- communicate the extent to which downtown commuters can and do choose alternate modes of transportation, and
- identify ways to further improve employee access to downtown.

Survey instruments were available both online and on paper

The 2013 Downtown Commute Survey was deployed in two formats:

- Web-based survey at http:// surveymonkey.com, the world’s largest provider of online surveys, and
- Paper surveys in both English- and Spanish-language versions.

Survey participants were recruited by downtown employers and Central Houston

Central Houston staff emailed the survey URL to CHI’s more than 110 member employers, Houston Downtown Management District (HDMD) board members, key contacts in the City of Houston and Harris County, downtown Human Resource (HR) managers, downtown property managers, and individuals in the CHI database with downtown work zip codes. Property managers were requested to forward the survey URL to their tenants, and employers were requested to forward the survey URL to their downtown employees. Employees elected to participate or not, and as a result, the survey sample is not random.

In addition, HDMD included an announcement and link to the survey in its Downtown Happenings weekly e-blast and on the District’s Facebook page.

In addition to the internet survey, paper versions of the survey were developed in both English and Spanish, and supplied to downtown hotels and downtown property managers. The intent was to reach service employees who might not have internet access and/or might need a Spanish-language version.

Survey completion rates reflect both a streamlined instrument and a wider net

In 2013, Central Houston made several changes to improve response rates. A shorter survey instrument with fewer redundancies contributed to a 15% increase in the number of completed surveys versus 2009.

Second, Central Houston staff undertook a more targeted effort to include government employees by reaching out to the City of Houston and Harris County. Thanks to strong
encouragement from elected leaders, this resulted in a 20% increase in government respondents.

Finally, although more than 18,000 respondents began the survey, a subset of **13,810 respondents work or live in downtown**. The 4,574 respondents who did not work or live in downtown were generally those who worked for employers who distributed the survey link broadly and were unable to segregate their employees by downtown versus non-downtown work locations, and are not included in the results.

<table>
<thead>
<tr>
<th>Completion rate</th>
<th>2009</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Began survey</td>
<td>13,008</td>
<td>18,390</td>
</tr>
<tr>
<td>Completed survey</td>
<td>12,008</td>
<td>13,810</td>
</tr>
<tr>
<td>Survey Monkey internet site</td>
<td>11,607</td>
<td>13,341</td>
</tr>
<tr>
<td>Paper survey instrument</td>
<td>401</td>
<td>469</td>
</tr>
<tr>
<td>English</td>
<td>189</td>
<td>211</td>
</tr>
<tr>
<td>Spanish</td>
<td>212</td>
<td>258</td>
</tr>
</tbody>
</table>

Table 3. Comparison of response counts by survey instrument type for 2009 and 2013.
Demographic characteristics of survey respondents

Age

Survey respondents were asked to identify their current age in one of 13 age groups:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 19 years</td>
<td>30 to 34 years</td>
</tr>
<tr>
<td>20 to 24 years</td>
<td>35 to 39 years</td>
</tr>
<tr>
<td>25 to 29 years</td>
<td>40 to 44 years</td>
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<tr>
<td>30 to 34 years</td>
<td>50 to 54 years</td>
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<tr>
<td>35 to 39 years</td>
<td>60 to 64 years</td>
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<tr>
<td>40 to 44 years</td>
<td>65 to 69 years</td>
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<tr>
<td>45 to 49 years</td>
<td></td>
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<tr>
<td>50 to 54 years</td>
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<tr>
<td>55 to 59 years</td>
<td></td>
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<tr>
<td>60 to 64 years</td>
<td></td>
</tr>
<tr>
<td>65 to 69 years</td>
<td></td>
</tr>
<tr>
<td>&gt; 75 years</td>
<td></td>
</tr>
</tbody>
</table>

Among 2013 respondents, the distribution of respondent ages forms a vaguely bell-shaped curve around a median age group of 45-49 years old, as it did also in 2009:

- More than one tenth – 12.0% – of employees surveyed were under 30 years of age.
- Nearly half – 45.4% – of respondents were between 30 and 49 years old.
- Two fifths – 41.7% – of respondents were 50-69 years old.
- Less than 1% of respondents were 70 years or older.

Figure 4. Median age of 2013 survey respondents is 45-49 years old.

According to 2011 Longitudinal Employer-Household Dynamics (LEHD) data from the U.S. Census, 63.4% of downtown workers are between 30 and 54 years old, very similar to 61.0% of the 2013 survey. The distribution of survey respondents is slightly skewed toward older workers.

Figure 5. Median age distribution in downtown sample is similar to 2011 LEHD data.
1. Survey methodology

It may also be useful to group survey respondents into higher-level generational cohorts:

<table>
<thead>
<tr>
<th>Millennials</th>
<th>Generation X</th>
<th>Baby Boomers</th>
<th>Silent Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>n = 1,476</td>
<td>n = 5,581</td>
<td>n = 5,128</td>
<td>n = 101</td>
</tr>
<tr>
<td>&lt;= 29 years</td>
<td>30 to 49 years</td>
<td>50 to 69 years</td>
<td>70 + years</td>
</tr>
</tbody>
</table>

Generation X and the Baby Boomer generations, which form the majority of the active workforce, are both well represented in the 2013 commute survey sample. The under-30 Millennials, who form the up-and-coming workforce, are also represented, comprising 12% of the survey sample.

To the extent that Millennials make different commute choices than older cohorts, both employers and planners have an opportunity to anticipate and accommodate the Millennials’ location and travel preferences.

Gender

For the first time, the Downtown Commute Survey respondents were asked to report their gender. In 2013, out of 11,871 respondents who answered the question, 48.7% were male and 51.3% were female.

In contrast, the broader downtown workforce is much significantly more male. According to 2011 Longitudinal Employer-Household Dynamics (LEHD) data from the U.S. Census, the gender split in the downtown labor force is 56.9% male and 43.1% female.

Thus, the 2013 survey oversampled female respondents. To the extent women and men make different commute decisions, this difference will tend to skew the overall commute mode split of the survey.

For reference, according to 2012 estimates from the U.S. Census, the gender split in the population for both the City of Houston and the broader Houston-Sugar Land-Baytown MSA is approximately even. The City of Houston is 50.2% male and 49.8% female; the MSA is 49.8% male and 50.2% female.

Figure 6. With respect to gender, the 2013 survey somewhat oversampled female respondents.
Household income

Survey participants were asked to report their household income level for the first time in 2013. Out of more than 13,000 survey respondents, only 9,544 answered the household income question. As shown in Figure 7 below, the distribution of income among respondents is somewhat bimodal:

- The median household income range was $100,000 to $124,999.
- However, there were significant outliers at the high end, with one in six respondents reporting household income of $200,000 per year or more.
- One in four respondents reported household incomes less than $75,000 per year.

Fully 16% of respondents report household incomes in excess of $200,000, which is consistent with the large share of professional occupations located downtown and well represented in the survey. More than half of survey respondents report household incomes in excess of $100,000, and fall into the highest quintile (top 20%) of all households in the region.

To the extent high income households are able to make different commute decisions than lower income households, the disproportionate share of higher income households may tend to shift the overall commute mode split of the survey.

Figure 7. Distribution of respondents by household income includes many high earners.

For comparison, median household income levels reported by downtown workers were significantly higher than the medians for the City of Houston and the broader Houston-Sugar Land-Baytown MSA. According to 2012 American Community Survey 3-year estimates from the U.S. Census, the median household income level in the City of Houston was $43,792, and the median household income in the broader MSA was $56,080.
1. Survey methodology

**Geographic coverage of survey respondents**

**Downtown’s commute shed spans the region**

According to the U.S. Census Center for Economic Studies, employers located in Houston’s downtown business district draw employees from across the Houston region. In fact, the downtown commute shed includes every zip code in the entire 8-county Houston-Galveston region.

**Map 1 – Downtown Employees**, found in Appendix B, shows the distribution of all downtown employees by Census block. This data was drawn from the 2011 Longitudinal Employer-Household Dynamics (LEHD) which is part of the Local Employment Dynamics (LED) program of the U.S. Census Bureau. Based on this data, the densest concentrations of downtown employees can be found west of the central business district and inside the IH-610 loop, and westward along the IH-10, Westpark Toll Road, and US-59 highway corridors.

**Survey drew responses from across the region**

Central Houston geocoded survey responses to prepare a series of GIS maps which show the distribution of downtown employees across the region, the distribution of 2013 survey respondents, and the density of survey respondents who use each travel mode. These twelve maps are presented in Appendix B.

For comparison, **Map 2 – Downtown Employees Surveyed**, shows the distribution of respondents for the 2013 Downtown Commute Survey. This map illustrates a similar distribution among respondents as among downtown employees (Map 1), validating geographic coverage.

Every major residential subdivision in the 8-county region is represented among the 2013 survey responses. Every zip code in Harris County and every zip code in Waller County is represented. Just 21 zip codes from the peripheries of Brazoria, Chambers, Fort Bend, Galveston, Liberty, and Montgomery counties are not represented.

Among the respondents who live downtown, a little over 200 live in the downtown core, within the highway loop formed by IH-10, IH-45, and US-59. More than 1,000 respondents live in zip codes in the urban half-mile buffer immediately adjacent to downtown: 77003, 77004, 77006, 77007, 77009, 77019, and 77020.

As reference for overall perspective, the population distribution for the Houston region is illustrated in **Map 3 – Houston Region Population, 2013**. The highest population concentrations are found west of the central business district, both inside the IH-610 loop, and extending northwest, west, and southwest toward Beltway 8 along the IH-10, Westpark Toll Road, and US-59 highway corridors. The densest residential neighborhoods are found in Gulfton, Montrose, Sharpstown, and Tanglewood.⁴

**References**

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From trains and buses to highways and bikeways, downtown Houston benefits from the richest array of transportation options in the region. Map 8 provides an overview of the many ways downtown employees get to work.

Map 8: Downtown’s rich street grid is well-served by highways, arterials, and rail transit
2. Downtown travel options

**Unparalleled automobile access**

Downtown Houston is located at the confluence of IH-10, IH-45, and US-59, the federal highways forming the backbone of the region’s transportation network. Downtown enjoys easy access to/from these highways, via two dozen ramps connecting highway travelers directly to the downtown street grid. Map 8 shows the many connections.

Downtown also enjoys easy connections to nearby neighborhoods including Midtown, Montrose, EaDo, the East End, the Near Northside, and Washington Avenue.

**Extensive HOV and HOT highway network**

Houston region commuters enjoy one of the most-extensive transitway networks in the nation. Downtown benefits from more than $1 billion invested by the Texas Department of Transportation (TxDOT) and the Metropolitan Transit Authority of Harris County (METRO) to construct more than **110 miles of high-occupancy vehicle (HOV) lanes** in the middle of the region’s six busiest radial highways. These managed lanes are predominantly separated by barriers from the main travel lanes.

This busway network is shared by commuter park-and-ride buses, vanpools and carpools, and motorcycles. During September 2013, Houston’s HOV network carried more than 1.9 million carpool, vanpool, and non-METRO passengers, in addition to METRO park-and-ride bus passengers.5

In addition, many of these transitways have been expanded to function as high-occupancy toll (HOT) lanes, and are now open to solo commuters who pay a toll.

**Figure 9.** METRO park-and-ride bus on the US-59 Southwest Freeway HOV lane.

![Photo credit: Christof Spieler.](image)

**High quality park-and-ride express bus service**

Employees who live in the suburbs can board express commuter buses at any one of **34 park-and-ride lots** located along ten of the radial highways connecting the Houston region. Houston METRO and Brazos Transit District (Woodlands Express) both operate commuter bus service to downtown, and Fort Bend County Public Transportation operates commuter bus service that connects to METRO’s service at West Bellfort.

On weekday mornings, buses depart park-and-ride lots as often as every 5 minutes; access HOV lanes, often by direct connector ramps that keep them out of mixed traffic;
flow directly into downtown mobility lanes; and disembark riders conveniently in front of office buildings. On weekday afternoons, a reverse process returns to the original lots.

In 2013, Houston METRO’s HOV park-and-ride bus service carried more commuters than many cities’ commuter rail systems. Setting aside long-time transit giants like New York, Chicago, Philadelphia, and San Francisco, the most-successful modern commuter rail system in the U.S. is Los Angeles, which boasted 42,700 boardings per day on more than 500 miles of heavy rail. **Houston’s commuter bus system averaged 31,670 boardings per day**, or more than the Austin, Dallas, San Diego, and Salt Lake commuter rail systems combined.\(^6\)

**Figure 10. Of modern commuter rail systems, only Los Angeles boasted more weekday boardings in 2013 than Houston METRO’s park-and-ride commuter bus network.**

![Bar chart showing average weekday boardings (000s) for various cities](image)

**METRO rail and local bus service**

METRO’s Main Street light rail line forms a north-south backbone of local transit service. From the University of Houston-Downtown campus to the Downtown Transit Center, trains run every 6 minutes on weekdays from 4:30 am to 7:30 pm, serving five downtown stations. METRO rail connects downtown to the Texas Medical Center, the Museum District, Reliant Center, and neighborhoods including Midtown and the Near North Side. Since the 2013 survey, rail service now extends north of IH-610 to Northline Mall.

In addition to rail, METRO operates more than a dozen high-frequency local bus routes that run every 15 minutes or more often all day, and serve downtown destinations. Local buses connect downtown to nearby Midtown, Montrose, EaDo, the East End, the Near Northside, and Washington Avenue, as well as myriad places across town.

For up-to-date information on local or park-and-ride commuter transit service including routes, schedules, and current fares, please contact the transit operators directly:

- **Houston METRO**
  - [http://ridemetro.org](http://ridemetro.org)
- **Brazos Transit District**
  - [http://www.btd.org](http://www.btd.org)
- **Fort Bend County Public Transit**
  - [http://fbctransit.org](http://fbctransit.org)
2. Downtown travel options

Figure 11. Downtown travelers along the Main Street Square light rail platform.

Photo credit: Katya Horner

**Greenlink**

Since June 2012, downtown workers have enjoyed free and quick service to popular destinations via the Greenlink circulator service. In spring 2013, Greenlink served an average of approximately 1,000 trips a day.

From 6:30 am to 6:30 pm on weekdays, Greenlink buses roll every 7-10 minutes, connecting downtown workers to restaurants, shopping, and entertainment, as well as METRO rail stations and bus service.

The service is currently sponsored by BG Group, Houston First, and the HDMD, and is operated by METRO.

**Vanpools**

In 2012, more than 7,000 individuals shared ~700 vans through the METRO STAR regional vanpool program. The program provides a 12–15 passenger van or 7-9 passenger mini-van along with insurance, maintenance, roadside assistance, and administrative coordination. Volunteers within the vanpool groups do the driving, and riders enjoy lower commute costs and reduced wear-and-tear on personal vehicles.
Vanpool costs are subsidized by federal Congestion Mitigation and Air Quality (CMAQ) and Surface Transportation Program (STP) funds. Vanpool expenses are often further reduced by cash incentives from employers.

Learn more about the METRO STAR vanpool program at: http://ridemetro.org/services/carvanpool/van.aspx

**Carpools and NuRide**

Carpooling is a simple way for individuals and employees to split driving expenses, and reduce travel time by using HOV lanes. By sharing a ride, carpoolers also reduce parking demand and expense.

NuRide is the nation's largest rewards program for individuals who participate in commute alternatives by carpooling, vanpooling, biking, walking, telecommuting, and taking public transportation. NuRide allows commuters to plan trips online and get rewarded for riding together.

Like booking an airline ticket, users sign up online -- where they want to go, when they want to go, whether they want to ride or drive, and other criteria. NuRide can be used once or daily, one-way or round-trip.

NuRide offers a free matching service that can help employees find carpool partners within or even outside of their company. NuRide is set up through employers, which allows the program to verify each rider’s identity so users can feel safe and secure with everyone in the system. It also includes a rating system to find out how other NuRiders have rated others.

Learn more about NuRide and other commute solutions at: http://www.commutesolutionshouston.org

**Map 12. More than 7 miles of tunnels and skybridges connect many destinations.**

*Image credit: Houston Downtown Management District.*
2. Downtown travel options

Pedestrian access via skyways, tunnels, and sidewalks

At street level, downtown enjoys a rich, walkable street grid with wide sidewalks, shade trees, and other urban amenities. More than 40 downtown city blocks are connected underground by more than 7 miles of climate-controlled tunnels. Another two dozen blocks are connected by skybridges. These connections link downtown workers to services, shops, dining, local government, and other downtown destinations. Map 12 on the prior page shows part of HDMD’s Above & Below map of downtown destinations.

Bikeways and B-cycle bikeshare network

The City of Houston boasts more than 300 miles of both on- and off-street bikeways, with bike lanes, bike routes, signed-shared lanes, and shared “hike-and-bike” trails.

Since May 2012, downtown has been the hub of Houston’s B-Cycle bikeshare network, a public bike sharing system for short trips in and around downtown Houston and nearby urban neighborhoods.

By October 2013, downtown travelers were checking out between 600 and 900 bikes per week from one of 13 downtown B-Cycle stations. The entire network is attracting an average of more than 1,000 bike checkouts per week and sometimes as many as 1,700 bike checkouts per week.

Taxicabs, jitneys, and pedicabs

With 30 designated hail-a-cab “stands” and new hail-a-cab apps for smart phones, it’s easier than ever to use taxi service downtown.

“Six in the City” means $6 taxicab rides anywhere downtown. Whether from a curbside cab stand, a downtown hotel, a streetside hail, or front-door pickup, fixed-price taxi fares makes short trips around downtown easy and affordable.

The $6 taxicab fare applies to a trip, pick-up and drop-off, anywhere within the downtown core, bounded by IH-45, IH-10, and US-59.

Downtown travelers also benefit from access to fixed-route local jitneys and pedicabs.

References

6 National Transit Database. 2013. Commuter rail system average daily boardings.
10 Houston B-cycle. 2013. Houston B-cycle Downtown Stations weekly bike checkout data.
3. WHAT IS THE DOWNTOWN COMMUTE MODE SPLIT, AND HOW DOES IT COMPARE TO THE REGION?

Commute mode split among 2013 respondents

In 2013, survey participants were asked, “How do you usually commute to/from downtown?” and asked to select one of the following six transportation modes:

<table>
<thead>
<tr>
<th>Drive alone</th>
<th>Carpool/Vanpool</th>
<th>Bicycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus/Rail</td>
<td>Motorcycle/Scooter</td>
<td>Walk</td>
</tr>
</tbody>
</table>

Among the 12,701 qualifying respondents who completed this primary commute mode question:

- 43% use alternative transportation modes to reach work everyday.
- 56.8% of employees surveyed drive alone in a single-occupant vehicle (SOV).
- Approximately one third – 32% – choose public transit for their daily commute. More than a quarter of downtown commuters surveyed take advantage of the region’s extensive park-and-ride bus network, and another 6% choose local bus or rail daily.
- Nearly one in ten downtown workers – 9% – share a ride in a carpool or vanpool.
- Nearly 2% of downtown workers surveyed choose active transportation, including walking or bicycling to work.

Figure 13. More than 40% of downtown survey respondents use alternative transportation modes to reach work daily.
3. Commute mode split

Figure 14: Number and percentage of 2013 respondents for each commute mode.

<table>
<thead>
<tr>
<th>Commute mode</th>
<th>Number of respondents</th>
<th>Percentage by mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single occupant vehicle (SOV)</td>
<td>7,208</td>
<td>56.8%</td>
</tr>
<tr>
<td>Park and ride bus (P&amp;R)</td>
<td>3,280</td>
<td>25.8%</td>
</tr>
<tr>
<td>Local bus/Rail</td>
<td>786</td>
<td>6.2%</td>
</tr>
<tr>
<td>Carpool/Vanpool</td>
<td>1,187</td>
<td>9.3%</td>
</tr>
<tr>
<td>Walk</td>
<td>152</td>
<td>1.2%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>41</td>
<td>0.3%</td>
</tr>
<tr>
<td>Motorcycle/Scooter</td>
<td>47</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

\[ n = 12,701 \] \[ 100\% \]

**Downtown achieves the strongest commute mode split in the region**

Downtown Houston continues to support the strongest mix of public transit, car/vanpools, and other alternative commute modes in the entire Houston region.

According to the latest 3-year estimate from the U.S. Census for the 8-county Metropolitan Statistical Area (Houston-Sugar Land-Baytown MSA), 80\% of all workers drove alone to work in 2010-2012. The region’s solo driving share was 41\% higher than downtown’s solo driving share at 57\%.  

Conversely, across the 8-county MSA, approximately 2.4\% of the region’s workers used public transit to commute to work. Downtown Houston’s transit share was more than 13 times higher, with 32\% of downtown workers using park-and-ride bus, local bus, or local rail service for their daily commute.

Figure 15: Downtown employees reported the highest rate of transit use, and the lowest rate of solo driving, in the region.

**Reference**

\[\text{Reference}\]

\[11\text{ U.S. Census Bureau. 2010-2012. American Community Survey 3-year estimate.}\]
4. **DOES DISTANCE AFFECT HOW WORKERS COMMUTE?**

**How far do employees travel to work downtown?**

In 2013, survey respondents were invited to self report the one-way distance in miles of their daily commute from home to work, within the following 11 buckets:

<table>
<thead>
<tr>
<th>Distance Range</th>
<th>&lt; 1 mile</th>
<th>1 to 2 miles</th>
<th>3 to 4 miles</th>
<th>5 to 9 miles</th>
<th>10 to 19 miles</th>
<th>20 to 29 miles</th>
<th>30 to 39 miles</th>
<th>40 to 49 miles</th>
<th>50 to 59 miles</th>
<th>60 to 69 miles</th>
<th>70+ miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Respondents</td>
<td>1.4%</td>
<td>3.1%</td>
<td>5.3%</td>
<td>11.8%</td>
<td>20.8%</td>
<td>18.5%</td>
<td>3.9%</td>
<td>1.6%</td>
<td>0.5%</td>
<td>0.3%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Among 2013 survey respondents, the distribution of commute distance forms a reasonable bell curve around a **median commute distance of 20-29 miles**:

- Nearly one tenth – 9.8% – live within 5 miles of downtown.
- Another 11.8% commute between 5 and 9 miles daily.
- More than half – 53.6% – live between 10 and 29 miles from downtown.
- About one fifth – 18.5% – of respondents commute 30-39 miles daily.
- Approximately 6.3% of respondents commute 40 or more miles daily.

**Figure 16. The median commute distance from home to downtown is 20-29 miles.**

**Distance shapes travel mode**

For respondents who live within 10 miles of downtown, the majority – more than 70% – choose to **drive alone** every day.

METRO serves downtown with a vast array of **local transit** routes, and the richest array of local routes serve the central part of Houston. METRO rail offers frequent urban transit along the Main Street corridor. 43% of respondents who rely on local bus and/or rail for their daily commute live less than 10 miles from downtown. Three quarters of local bus/rail riders – 74% – commute less than 20 miles.

METRO and the Brazos Transit District (Woodlands Express) operate express commuter bus service from 27 **park-and-ride** lots arrayed along the radial highways that
4. Commute distance

connect the region to central Houston. Additionally, some Fort Bend County (Fort Bend Express) riders transfer to METRO’s service. A handful of commuter lots are 7-10 miles from downtown, but the majority are 15 or more miles away. Respondents with longer commutes are more likely to choose transit. In fact, park-and-ride buses are the most-preferred commute option among respondents who live 30 to 49 miles away.

So-called “active transportation” – walking and biking – is dependent on people power. It is therefore unsurprising that the employees most likely to bike or walk daily are those who live closest to work. More than 90% of survey respondents who walk or bike to work live less than 5 miles from downtown.

Figure 17. Commute distance distinctly shapes choice of commute mode.

Table 18. Commute mode split for each commute distance.

<table>
<thead>
<tr>
<th>Commute Distance</th>
<th>&lt;1 mile</th>
<th>1-4</th>
<th>5-9</th>
<th>10-19</th>
<th>20-29</th>
<th>30-39</th>
<th>40-49</th>
<th>50-59</th>
<th>60-69</th>
<th>&gt;70</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOV</td>
<td>27%</td>
<td>75%</td>
<td>82%</td>
<td>70%</td>
<td>49%</td>
<td>41%</td>
<td>38%</td>
<td>48%</td>
<td>52%</td>
<td>56%</td>
</tr>
<tr>
<td>Park &amp; Ride Bus</td>
<td>1%</td>
<td>1%</td>
<td>3%</td>
<td>16%</td>
<td>37%</td>
<td>45%</td>
<td>47%</td>
<td>37%</td>
<td>29%</td>
<td>32%</td>
</tr>
<tr>
<td>Local Bus/Rail</td>
<td>6%</td>
<td>12%</td>
<td>8%</td>
<td>7%</td>
<td>2%</td>
<td>2%</td>
<td>1%</td>
<td>2%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Carpool Vanpool</td>
<td>2%</td>
<td>6%</td>
<td>6%</td>
<td>7%</td>
<td>12%</td>
<td>11%</td>
<td>14%</td>
<td>12%</td>
<td>17%</td>
<td>12%</td>
</tr>
<tr>
<td>Motorcycle Scooter</td>
<td>0%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>2%</td>
<td>2%</td>
<td>1%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Walk</td>
<td>63%</td>
<td>4%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

n = 12,086

Please note that only 6.3% of survey respondents commute 40 miles or more each day.
Table 19. Distribution of commute distances by primary commute mode.

<table>
<thead>
<tr>
<th>Miles</th>
<th>SOV</th>
<th>Park &amp; Ride</th>
<th>Bus</th>
<th>Carpool</th>
<th>Vanpool</th>
<th>Motorcycle Scooter</th>
<th>Bicycle</th>
<th>Walk</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 mile</td>
<td>0.7%</td>
<td>0.0%</td>
<td>2.0%</td>
<td>0.3%</td>
<td>0.0%</td>
<td>8.3%</td>
<td>73.6%</td>
<td></td>
</tr>
<tr>
<td>1-4</td>
<td>11.0%</td>
<td>0.2%</td>
<td>21.9%</td>
<td>5.2%</td>
<td>12.8%</td>
<td>52.8%</td>
<td>24.3%</td>
<td></td>
</tr>
<tr>
<td>5-9</td>
<td>17.0%</td>
<td>1.3%</td>
<td>19.5%</td>
<td>7.2%</td>
<td>12.8%</td>
<td>27.8%</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>10-19</td>
<td>25.4%</td>
<td>12.2%</td>
<td>30.9%</td>
<td>16.2%</td>
<td>10.6%</td>
<td>11.1%</td>
<td>0.7%</td>
<td></td>
</tr>
<tr>
<td>20-29</td>
<td>28.2%</td>
<td>44.9%</td>
<td>16.3%</td>
<td>40.2%</td>
<td>36.2%</td>
<td>0.0%</td>
<td>1.4%</td>
<td></td>
</tr>
<tr>
<td>30-39</td>
<td>13.2%</td>
<td>31.5%</td>
<td>7.2%</td>
<td>21.9%</td>
<td>25.5%</td>
<td>0.0%</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>2.6%</td>
<td>6.8%</td>
<td>1.3%</td>
<td>5.8%</td>
<td>2.1%</td>
<td>0.0%</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>50-59</td>
<td>1.3%</td>
<td>2.2%</td>
<td>0.7%</td>
<td>2.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>60-69</td>
<td>0.4%</td>
<td>0.5%</td>
<td>0.2%</td>
<td>0.9%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>&gt;70</td>
<td>0.3%</td>
<td>0.3%</td>
<td>0.0%</td>
<td>0.3%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td></td>
</tr>
</tbody>
</table>

n = 12,086 | 6,926 | 3,231 | 553 | 1,145 | 47 | 36 | 148

100% 100% 100% 100% 100% 100% 100%

In Table 19 above, highlighting denotes the median commute distance among those who use each primary commute mode. In Table 20 below, highlighting denotes the median trip duration among respondents who travel each distance. Note trip durations below include the 20-30% of respondents who make stops at other destinations, such as child care or the gym, en route between home and work, as discussed in the next section.

Table 20. Distribution of AM trip durations by commute distance.

<table>
<thead>
<tr>
<th>Miles</th>
<th>&lt;5</th>
<th>5-9</th>
<th>10-19</th>
<th>20-29</th>
<th>30-39</th>
<th>40+</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5 minutes</td>
<td>45.7%</td>
<td>3.0%</td>
<td>0.1%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.1%</td>
</tr>
<tr>
<td>5 to 9 mins</td>
<td><strong>30.4%</strong></td>
<td>34.3%</td>
<td>3.9%</td>
<td>0.2%</td>
<td>0.0%</td>
<td>0.2%</td>
</tr>
<tr>
<td>10 to 14 mins</td>
<td>8.7%</td>
<td><strong>42.1%</strong></td>
<td>20.1%</td>
<td>2.3%</td>
<td>0.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>15 to 19 mins</td>
<td>8.7%</td>
<td>13.5%</td>
<td><strong>32.2%</strong></td>
<td>10.5%</td>
<td>0.8%</td>
<td>0.3%</td>
</tr>
<tr>
<td>20 to 24 mins</td>
<td>0.0%</td>
<td>4.3%</td>
<td>22.3%</td>
<td>20.1%</td>
<td>5.3%</td>
<td>0.9%</td>
</tr>
<tr>
<td>25 to 29 mins</td>
<td>2.2%</td>
<td>1.8%</td>
<td>12.7%</td>
<td><strong>20.8%</strong></td>
<td>13.9%</td>
<td>2.5%</td>
</tr>
<tr>
<td>30 to 39 mins</td>
<td>2.2%</td>
<td>0.5%</td>
<td>6.4%</td>
<td>23.1%</td>
<td><strong>25.6%</strong></td>
<td>18.6%</td>
</tr>
<tr>
<td>40 to 49 mins</td>
<td>2.2%</td>
<td>0.3%</td>
<td>1.9%</td>
<td>15.0%</td>
<td><strong>27.1%</strong></td>
<td>29.7%</td>
</tr>
<tr>
<td>50 to 59 mins</td>
<td>0.0%</td>
<td>0.1%</td>
<td>0.2%</td>
<td>5.7%</td>
<td>16.6%</td>
<td>22.9%</td>
</tr>
<tr>
<td>60 to 74 mins</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.2%</td>
<td>2.0%</td>
<td>9.1%</td>
<td>18.7%</td>
</tr>
<tr>
<td>75+ mins</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.1%</td>
<td>0.3%</td>
<td>1.5%</td>
<td>6.2%</td>
</tr>
</tbody>
</table>

n = 6,906 | 46 | 762 | 1,172 | 1,751 | 1,946 | 910 | 319

100.0% 100.0% 100.0% 100.0% 100.0% 100.0% 100.0%
While the majority of commutes less than 20 miles are made by solo drivers, less than half of commutes longer than 20 miles are made by solo drivers. Three quarters of park-and-ride users commute 20 miles or more, and park-and-ride bus service is the most-popular choice for commutes between 30 and 49 miles long. As a result, the average park-and-ride trip is 10 miles longer than the average solo driving trip.

Figure 21. The median park-and-ride trip is 10 miles longer than the median SOV trip.

Map 22. Distance in miles from key parts of the Houston region to downtown.
What time do downtown employees leave home in the morning?

Another key commute characteristic is the time of day when commuters leave home to go to work. More than half of all respondents – 59% – report leaving home before 7:00 am. 95% have departed home to commute to work by 9:00 am.

Figure 23 shows for each commute mode the percentage of commuters who leave home at each time of day. Interestingly, each mode shows a somewhat different peaking pattern:

- **Solo drivers** (SOV) are distributed along a normal bell curve with a broad, flat peak. 61% of solo drivers leave home between 6:00 am and 7:59 am.
- **Local Bus/Rail** riders report commuting at very similar times to solo drivers. 57% of local transit riders also leave home between 6:00 am and 7:59 am.
- **Park-and-Ride** and **Carpool/Vanpool** commuters are distributed along a taller, steeper, bell curve with an earlier primary peak departure time between 6:00 and 6:29 am. 60% of park-and-ride users leave home between 5:30 am and 6:59 am. 57% of shared carpool/vanpool riders leave home between 5:30 am and 6:59 am.
- **Motorcycle/Scooter** riders are distributed bimodally around two peaks, with the first one between 5:00 and 5:29 am and the second peak between 7:00 and 7:29 am, during the same time SOV and local bus/rail commuters finish peaking. Motorcycles/Scooters show a distinctive dip in departures that corresponds to the shared peak of the other four modes of travels between 6:00 and 6:29 am. 64% of motorcycle/scooter riders leave home between 5:30 am and 8:29 am.

**Figure 23.** Park-and-ride and carpool/vanpool commuters leave home earlier than solo drivers.
5. AM peak travel time

- **Active commuters** – employees who walk or bicycle to work – generally leave home later in the morning than employees using any other travel mode.

- **Bicycle** commuters are distributed along a tighter curve with later morning departures and a peak between 7:30 and 8:00 am. None of the cyclists surveyed leave home before 5:30 am. 61% of cyclists leave home between 6:30 and 8:29 am.

- **Walk** commutes are distributed along the most compact curve, with a peak between 7:30 and 8:00 am. 59% of walkers leave home between 6:30 am and 7:59 am.

Compared to other modes, a larger share of workers who use active transportation are able to depart home after 9:00 am.

Table 24. Cumulative percentage by time of day shows half of all respondents depart home for work by 7:00 am.

<table>
<thead>
<tr>
<th>Leave home</th>
<th>SOV</th>
<th>Park &amp; Ride</th>
<th>Local Bus/Rail</th>
<th>Carpool/ Vanpool</th>
<th>Motorcycle/Scooter</th>
<th>Bike</th>
<th>Walk</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 4:00 am</td>
<td>0.6%</td>
<td>0.0%</td>
<td>0.9%</td>
<td>0.3%</td>
<td>0.0%</td>
<td>2.4%</td>
<td>0.0%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Before 4:30 am</td>
<td>1.9%</td>
<td>1.4%</td>
<td>1.7%</td>
<td>0.8%</td>
<td>0.0%</td>
<td>2.4%</td>
<td>1.3%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Before 5:00 am</td>
<td>4.2%</td>
<td>4.9%</td>
<td>4.3%</td>
<td>2.4%</td>
<td>4.3%</td>
<td>2.4%</td>
<td>2.0%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Before 5:30 am</td>
<td>10.5%</td>
<td>17.1%</td>
<td>11.1%</td>
<td>12.3%</td>
<td>19.1%</td>
<td>2.4%</td>
<td>4.0%</td>
<td>12.4%</td>
</tr>
<tr>
<td>Before 6:00 am</td>
<td>18.7%</td>
<td>33.9%</td>
<td>19.1%</td>
<td>27.5%</td>
<td>31.9%</td>
<td>9.8%</td>
<td>9.4%</td>
<td>23.4%</td>
</tr>
<tr>
<td>Before 6:30 am</td>
<td>34.1%</td>
<td>57.7%</td>
<td>35.9%</td>
<td>50.1%</td>
<td>38.3%</td>
<td>24.4%</td>
<td>15.4%</td>
<td>41.6%</td>
</tr>
<tr>
<td>Before 7:00 am</td>
<td>50.1%</td>
<td>77.2%</td>
<td>50.9%</td>
<td>69.6%</td>
<td>48.9%</td>
<td>39.0%</td>
<td>32.2%</td>
<td>58.8%</td>
</tr>
<tr>
<td>Before 7:30 am</td>
<td>66.3%</td>
<td>90.7%</td>
<td>67.9%</td>
<td>85.1%</td>
<td>63.8%</td>
<td>53.7%</td>
<td>50.3%</td>
<td>74.3%</td>
</tr>
<tr>
<td>Before 8:00 am</td>
<td>79.4%</td>
<td>96.6%</td>
<td>75.9%</td>
<td>92.7%</td>
<td>74.5%</td>
<td>73.2%</td>
<td>74.5%</td>
<td>84.8%</td>
</tr>
<tr>
<td>Before 8:30 am</td>
<td>88.6%</td>
<td>99.1%</td>
<td>82.0%</td>
<td>96.1%</td>
<td>83.0%</td>
<td>85.4%</td>
<td>87.9%</td>
<td>91.6%</td>
</tr>
<tr>
<td>Before 9:00 am</td>
<td>93.4%</td>
<td>99.7%</td>
<td>83.8%</td>
<td>97.6%</td>
<td>89.4%</td>
<td>92.7%</td>
<td>96.0%</td>
<td>94.8%</td>
</tr>
<tr>
<td>Before 4:00 pm</td>
<td>97.7%</td>
<td>99.8%</td>
<td>89.5%</td>
<td>98.1%</td>
<td>93.6%</td>
<td>97.6%</td>
<td>100%</td>
<td>97.8%</td>
</tr>
</tbody>
</table>

In Table 24, highlighting denotes the time of day by which at least half of the respondents using each mode have left home to commute to work.

It’s important to note that on average, park-and-ride and shared ride commuters are traveling a longer distance to get to work, which may contribute to their earlier morning departure times. In addition, the majority of park-and-ride routes discontinue morning peak service by 9:00 am. Many of the regional park-and-ride lots close and secure their gates by 9:00 am, which will curtail not only park-and-ride use but also car/vanpool departures. Less than 1% of park-and-ride commuters, and approximately 2% of carpool/vanpool users, leave home after 9:00 am.

**Flexible hours, and second and third shift**

The vast majority of 2013 respondents work during ordinary business hours. 94.4% travel to work during the AM peak between 4:00 am and 8:59 am. Approximately 3% of respondents report a later start, leaving home between 9:00 am and 3:59 pm.
A relatively small portion of commute survey respondents appear to work second or third shift jobs, leaving for work between 4:00 pm and 9:59 pm. Less than 3% of respondents report leaving home overnight, between 10:00 pm and 3:59 am.

**How long do employees spend getting to work?**

2013 survey respondents reported a **median AM commute duration of 30-39 minutes**, with longer transit and other shared-ride commutes, and shorter active commutes.

20% of survey respondents report making one or more stops on their way to work in the morning, which is included in their travel time. Note: as a result, it is difficult to draw conclusions regarding distance and travel time.

**Figure 25. Median AM trip duration is 30-39 minutes. Walks and bike trips are shortest; park-and-ride bus commutes are longest.**

**Figure 26. In the AM, active walk/bike trips are short; most shared rides are longer.**
5. AM peak travel time

How many employees make stops on their way to work?

To some extent, shorter average morning commute durations reflect more employees traveling directly to work without stopping for other purposes. Only 20% of respondents make stops on their way to work in the morning, compared to 30% on the way home.

Figure 27. In the AM, 80% of respondents proceed directly to work nonstop, compared to 70% who stop in the PM.

In order to assess whether needing to visit other destinations on the way to work drives employees not to use transit, Figure 28 below presents the commute mode split for workers who commute to work nonstop versus those who stop for various purposes:

- Employees who commute to work nonstop report the lowest rate of solo driving and the highest rate of park-and-ride utilization.
- Employees who stop to address the needs of children or elder dependents report driving alone at somewhat higher rates, but many still use transit.
- Employees who stop for food or beverages reports the highest rates of driving alone.

Figure 28. Commute mode by AM stop type: employees who make stops en route to work are more likely to drive alone, but many still use transit.
6. **WHEN DO WORKERS LEAVE WORK IN THE PM PEAK, AND HOW LONG DOES IT TAKE TO GET HOME?**

*What time do downtown employees leave work in the afternoon?*

More than half of all respondents – 64% – report leaving work before 5:30 pm each afternoon. 95% have departed downtown Houston by 7:30 pm each night. The majority of respondents who leave later commute by solo vehicle or walking.

Figure 29 shows for each commute mode the percentage of commuters who leave work at each time of day. Interestingly, each mode shows a somewhat different pattern:

- **Solo drivers** (SOV) are distributed along a broad, flatter, bell curve with a peak between 5:00 pm and 5:29 pm. 60% of solo drivers leave work between 4:30 pm and 6:29 pm.

- **Local Bus/Rail** transit riders report commuting at very similar times to solo drivers. 56% of local transit riders also leave work between 4:30 pm and 6:29 pm.

- **Park-and-Ride and Carpool/Vanpool** commuters are both distributed along a taller, steeper, bell curve with an earlier primary peak departure time between 4:30 and 4:59 pm. 62% of park-and-ride users leave work between 4:30 pm and 5:59 pm. The earlier departures of both park-and-ride and carpool/vanpool commuters are shaped by the route schedule and availability of both commuter bus service and suburban park-and-ride lots. 56% of shared carpool/vanpool riders leave work between 4:30 and 5:59 pm.

- **Motorcycle/Scooter** riders – like park-and-riders and carpool/vanpool riders – are distributed normally around an earlier peak, between 4:30 and 4:59 pm. 61% of motorcycle/scooter riders leave work between 4:00 pm and 5:59 pm.

- **Bicycle** commutes to home are distributed bimodally around two peaks, with an earlier peak between 4:00 and 4:29 pm, and the second peak between 5:00 and 5:29 pm, during the same peak departure window as solo drivers and local transit riders. 56% of bicycle riders leave work between 4:30 pm and 6:29 pm.

- **Walk** commuters generally leave work later in the afternoon than employees using any other travel mode. Walking departures peak between 5:30 and 5:59 pm, and 62% of walkers leave work between 5:00 pm and 6:29 pm.
6. PM peak travel time

Figure 29. Park-and-ride and carpool/vanpool commuters leave work earlier than solo drivers.

Table 30. Cumulative percentage by time of day shows half of all respondents depart work for home by 5:30 pm.

<table>
<thead>
<tr>
<th>Leave work</th>
<th>SOV</th>
<th>Park &amp; Ride</th>
<th>Local Bus Rail</th>
<th>Carpool Vanpool</th>
<th>Motorcycle/Scooter</th>
<th>Bike</th>
<th>Walk</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 3:29 pm</td>
<td>2.1%</td>
<td>0.2%</td>
<td>3.6%</td>
<td>0.9%</td>
<td>4.3%</td>
<td>2.4%</td>
<td>0.7%</td>
<td>1.6%</td>
</tr>
<tr>
<td>By 3:59 pm</td>
<td>11.6%</td>
<td>8.9%</td>
<td>9.1%</td>
<td>9.4%</td>
<td>15.2%</td>
<td>4.9%</td>
<td>3.4%</td>
<td>10.4%</td>
</tr>
<tr>
<td>By 4:29 pm</td>
<td>25.0%</td>
<td>28.1%</td>
<td>23.0%</td>
<td>31.9%</td>
<td>26.1%</td>
<td>24.4%</td>
<td>12.8%</td>
<td>26.2%</td>
</tr>
<tr>
<td>By 4:59 pm</td>
<td>38.5%</td>
<td>50.3%</td>
<td>36.2%</td>
<td>53.9%</td>
<td>52.2%</td>
<td>34.1%</td>
<td>20.1%</td>
<td>42.7%</td>
</tr>
<tr>
<td>By 5:29 pm</td>
<td>58.6%</td>
<td>74.8%</td>
<td>58.6%</td>
<td>76.5%</td>
<td>63.0%</td>
<td>61.0%</td>
<td>45.0%</td>
<td>64.4%</td>
</tr>
<tr>
<td>By 5:59 pm</td>
<td>73.7%</td>
<td>89.8%</td>
<td>70.0%</td>
<td>88.0%</td>
<td>76.1%</td>
<td>75.6%</td>
<td><strong>67.8%</strong></td>
<td>79.0%</td>
</tr>
<tr>
<td>By 6:29 pm</td>
<td>85.1%</td>
<td>96.7%</td>
<td>79.2%</td>
<td>95.0%</td>
<td>80.4%</td>
<td>80.5%</td>
<td>82.6%</td>
<td>88.6%</td>
</tr>
<tr>
<td>By 6:59 pm</td>
<td>90.9%</td>
<td>99.0%</td>
<td>81.5%</td>
<td>96.6%</td>
<td>80.4%</td>
<td>87.8%</td>
<td>90.6%</td>
<td>92.9%</td>
</tr>
<tr>
<td>By 7:29 pm</td>
<td>93.5%</td>
<td>99.7%</td>
<td>82.3%</td>
<td>97.4%</td>
<td>87.0%</td>
<td>90.2%</td>
<td>97.3%</td>
<td>94.8%</td>
</tr>
<tr>
<td>By 7:59 pm</td>
<td>94.5%</td>
<td>99.8%</td>
<td>82.5%</td>
<td>97.4%</td>
<td>87.0%</td>
<td>90.2%</td>
<td>98.7%</td>
<td>95.4%</td>
</tr>
<tr>
<td>Between 8 pm and 3:59 am</td>
<td>98.4%</td>
<td>99.9%</td>
<td>99.3%</td>
<td>99.5%</td>
<td>95.7%</td>
<td>100.0%</td>
<td>99.3%</td>
<td>99.0%</td>
</tr>
</tbody>
</table>

All Day | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

In Table 30, highlighting denotes the time of day by which half or more of the respondents using each mode have departed work to go home.
How long do employees spend getting home?

2013 survey respondents reported a median PM commute duration of 40-49 minutes, with longer transit and other shared-ride commutes, and shorter active commutes.

30% of survey respondents report making one or more stops on their way home from work in the evening, which is included in their travel time. Note: as a result, it is difficult to draw conclusions regarding distance and travel time.

Figure 31. Median PM trip duration is 40-49 minutes; ten minutes longer than AM trips.

Figure 32. In the PM, active trips are unchanged, but commutes by all other modes take longer.
6. PM peak travel time

**How many employees make stops on their home from work?**

To some extent, longer afternoon commute durations reflect more employees stopping for other purposes on their way home from work, such as for dinner or to exercise. Nearly one third – 30% – of respondents make stops on their way home from work, compared to 20% in the morning.

**Figure 33. In the PM, 30% of respondents stop on their way home, compared to 20% who stop in the AM.**

![Pie chart showing types and percentages of stops](image)

In order to assess whether needing to visit other destinations on the way home drives employees not to use transit, Figure 34 below presents the commute mode split for workers who commute home nonstop versus those who stop for various purposes:

- As in the morning, employees who commute home nonstop report the lowest rate of solo driving and the highest rate of park-and-ride utilization.
- The mode split for those who tend to children is essentially the same am and pm.
- Employees who exercise after work report higher rates of driving alone than those who work out before work.

**Figure 34. Commute mode by PM stop type: employees who make stops on the way home report driving alone at higher rates than those who make stops in the morning.**

![Bar chart showing commute mode by stop type](image)

- Drive alone
- Park & Ride
- Local Bus/Rail
- Carpool/Vanpool
- Active Walk/Bike
7. **How Does the Commute Mode Split Vary by Industry?**

*Industries included*

Workforce characteristics vary among industries, and consequently, there is variation among industries with respect to the commute choices made by employees. As a result, industry is of primary interest when analyzing employee commute mode choices.

In 2013, survey respondents were invited to self identify as a member of one of 13 area industries, or provide a free response under Other:

<table>
<thead>
<tr>
<th>Industry</th>
<th>Other Industry (please specify)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>Government</td>
</tr>
<tr>
<td>Education</td>
<td>Healthcare</td>
</tr>
<tr>
<td>Energy</td>
<td>Hospitality</td>
</tr>
<tr>
<td>Finance</td>
<td>Housekeeping</td>
</tr>
<tr>
<td></td>
<td>Insurance</td>
</tr>
<tr>
<td></td>
<td>Legal</td>
</tr>
<tr>
<td></td>
<td>Nonprofit</td>
</tr>
<tr>
<td></td>
<td>Real Estate</td>
</tr>
<tr>
<td></td>
<td>Other</td>
</tr>
</tbody>
</table>

In addition to the 13 industries listed, two industries emerged from the free responses. The industry reported most frequently under “Other” was Transportation (n=526, 3.8%). The next most-frequent responses were architecture (n=244, 1.8%), engineering (n=52, 0.4%), and consulting (n=24, 0.18%), which have been grouped in the following analysis under *Other Professional Services* (n=320, 2.3%).

Central Houston staff drew from past experience and data heuristics to more completely and accurately sort respondents into industries. After data cleanup and recategorization, fewer than 100 respondents remained in “other/non-specified.”

*Which industries were most represented?*

More than half of 2013 survey respondents – 58% – report employment in the Energy industry, up from 50% in 2009. To the extent energy employees make particular commute mode choices (e.g. choose park-and-ride transit at a higher rate than most other industries), they will tend to skew the mode split of the entire survey.

Almost a quarter of 2013 respondents – 22% – work in the Government sector, up from 5% in 2009, reflecting strong desire to participate from City and County leaders. Again, to the extent that the participating agency employees use a particular mode (i.e. must drive agency vehicles as part of their jobs), they will skew the mode split of the survey.

Nearly a tenth of respondents – 8% – work for Legal firms, down from 11% in 2009.

Approximately 4% of respondents work in the Finance, Insurance, or Real Estate industries, which have been grouped together as “FIRE” for ease of reporting. Their representation is down from 7% in 2009. Among downtown Houston employers, the primary constituents of FIRE work in banking.

Approximately 2% of respondents work for public Accounting firms.

In the 2013 survey, three industries – Education, Healthcare, and Retail – attracted fewer than a dozen respondents each (<0.08% of the sample), and have been excluded from subsequent analysis by industry.

Response rates by industry, for both 2009 and 2013, are shown in Figure 35. Note that in 2009, nonprofit respondents were grouped with government respondents.
7. Industry

Figure 35. Energy, government, and legal industries account for 82% of responses.

<table>
<thead>
<tr>
<th>Industry</th>
<th>2009</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>-</td>
<td>0.03%</td>
</tr>
<tr>
<td>Energy</td>
<td>50%</td>
<td>53.39%</td>
</tr>
<tr>
<td>Finance, Insurance, and Real Estate (FIRE)</td>
<td>7%</td>
<td>3.13%</td>
</tr>
<tr>
<td>Government*</td>
<td>5%</td>
<td>21.85%</td>
</tr>
<tr>
<td>Hospitality</td>
<td>4%</td>
<td>2.29%</td>
</tr>
<tr>
<td>Housekeeping</td>
<td>-</td>
<td>1.82%</td>
</tr>
<tr>
<td>Legal</td>
<td>11%</td>
<td>7.15%</td>
</tr>
<tr>
<td>Medical/Healthcare</td>
<td>2%</td>
<td>0.07%</td>
</tr>
<tr>
<td>Nonprofit*</td>
<td>-</td>
<td>0.94%</td>
</tr>
<tr>
<td>Other Professional Services</td>
<td>-</td>
<td>2.38%</td>
</tr>
<tr>
<td>Other/non-specified</td>
<td>19%</td>
<td>0.70%</td>
</tr>
<tr>
<td>Public Accounting</td>
<td>3%</td>
<td>2.34%</td>
</tr>
<tr>
<td>Retail</td>
<td>-</td>
<td>0.07%</td>
</tr>
<tr>
<td>Transportation</td>
<td>-</td>
<td>3.84%</td>
</tr>
</tbody>
</table>

* In 2009, respondents from Government and Nonprofit employers were grouped together.
How does Census distribution of industries compare to the 2013 survey?

The U.S. Census Bureau’s Center for Economic Studies partners with states to gather Unemployment Insurance earnings data and Quarterly Census of Earnings and Wages (QCEW) data, in order to develop detailed information about local economies. LEHD data includes statistics on workers, employers, and job flows by geography and industry.

LEHD categorizes business establishments by the North American Industry Classification System (NAICS), under 20 high-level industry sectors:

- 11 Agriculture, forestry, fishing, and hunting
- 21 Mining, quarrying, and oil and gas extraction
- 22 Utilities
- 23 Construction
- 31-33 Manufacturing
- 42 Wholesale trade
- 44-45 Retail trade
- 48-49 Transportation and warehousing
- 51 Information
- 52 Finance and insurance
- 53 Real estate rental and leasing
- 54 Professional, scientific, and technical services
- 55 Management of companies and enterprises
- 56 Administrative and support and waste management and remediation services
- 61 Educational services
- 62 Health care and social assistance
- 71 Arts, entertainment, and recreation
- 72 Accommodation and food services
- 81 Other services
- 91 Public administration

By mapping NAICS categories to survey industries, one can compare the distribution of responses to the downtown workforce. A handful of industries were underrepresented.

Figure 37. Comparison of distribution of industries in the survey sample to Census estimate of downtown employment by industry from 2011 LEHD data.
How does the 2013 commute mode split vary by industry?

When a company’s workforce takes advantage of public transit and other modes that reduce demand for parking, both employers and employees benefit. The following profiles of commute mode split by industry may be used by employers who are located or considering locating in downtown Houston, to estimate the commute mode choices of employees, or to compare their experience to peer employers.

Among 2013 survey respondents, utilization of transit, and in turn, demand for parking, varies significantly across industries. The mode splits by industry yield some interesting insights into commute behavior which point toward action items that can be implemented by individual employers.

Industries that drive the most and least

Figure 38 depicts the distribution of use of each primary commute mode by industry, sorted by rates of solo driving.

- Survey respondents from the Energy, Transportation, and Housekeeping sectors reported the lowest rates of solo driving (SOV). Downtown employers in these sectors enjoy the lowest demand for employee parking.
- Transportation employees report the highest rates of carpool/vanpool ride sharing.
- Other Professional Services employees report the highest rates of walking and bicycling to work, followed by Accounting employees.

Figure 38. Energy, Transportation, and Housekeeping industry employees report the lowest rates of solo driving.
Figure 39 depicts the distribution of use of each type of public transit and ride sharing, sorted by rates of park-and-ride use:

- Respondents from the Transportation and Energy industries reported the highest rates of park-and-ride use, at 35% and 34%, respectively.
- Housekeeping, Hospitality, and Nonprofit workers are the only respondents who reported higher use of local bus and rail than park-and-ride transit.

Table 40. Ten industries surveyed with the percentage of respondents who use each travel mode.

<table>
<thead>
<tr>
<th>Industry</th>
<th>SOV</th>
<th>Park &amp; Ride</th>
<th>Local Bus &amp; Rail</th>
<th>Carpool Vanpool</th>
<th>Motorcycle Scooter</th>
<th>Walk</th>
<th>Bike</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>65%</td>
<td>19%</td>
<td>9%</td>
<td>3%</td>
<td>0.7%</td>
<td>2.4%</td>
<td>0.3%</td>
<td>295</td>
</tr>
<tr>
<td>Energy</td>
<td>49%</td>
<td>34%</td>
<td>4%</td>
<td>10%</td>
<td>0.3%</td>
<td>1.4%</td>
<td>0.3%</td>
<td>6,594</td>
</tr>
<tr>
<td>FIRE</td>
<td>69%</td>
<td>15%</td>
<td>6%</td>
<td>8%</td>
<td>0.0%</td>
<td>0.5%</td>
<td>0.2%</td>
<td>424</td>
</tr>
<tr>
<td>Government</td>
<td>68%</td>
<td>16%</td>
<td>5%</td>
<td>9%</td>
<td>0.5%</td>
<td>0.2%</td>
<td>0.3%</td>
<td>2,982</td>
</tr>
<tr>
<td>Hospitality</td>
<td>65%</td>
<td>6%</td>
<td>22%</td>
<td>6%</td>
<td>0.4%</td>
<td>0.7%</td>
<td>0.7%</td>
<td>285</td>
</tr>
<tr>
<td>Housekeeping</td>
<td>31%</td>
<td>0%</td>
<td>60%</td>
<td>9%</td>
<td>0.0%</td>
<td>0.4%</td>
<td>0.0%</td>
<td>246</td>
</tr>
<tr>
<td>Legal</td>
<td>67%</td>
<td>19%</td>
<td>3%</td>
<td>8%</td>
<td>0.2%</td>
<td>2.1%</td>
<td>0.1%</td>
<td>892</td>
</tr>
<tr>
<td>Nonprofit</td>
<td>68%</td>
<td>11%</td>
<td>13%</td>
<td>4%</td>
<td>0.0%</td>
<td>1.8%</td>
<td>0.9%</td>
<td>114</td>
</tr>
<tr>
<td>Other Prof. Services</td>
<td>69%</td>
<td>10%</td>
<td>5%</td>
<td>10%</td>
<td>0.7%</td>
<td>3.6%</td>
<td>1.6%</td>
<td>307</td>
</tr>
<tr>
<td>Transportation</td>
<td>49%</td>
<td>35%</td>
<td>3%</td>
<td>12%</td>
<td>0.8%</td>
<td>0.8%</td>
<td>0.0%</td>
<td>474</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>56.7%</td>
<td>25.9%</td>
<td>6.2%</td>
<td>9.4%</td>
<td>0.4%</td>
<td>1.2%</td>
<td>0.3%</td>
<td>12,635</td>
</tr>
</tbody>
</table>
Reasons for driving vary by industry

Respondents who drive alone each day were presented a list of possible reasons for driving and asked to identify all that apply. Across all respondents who drive alone:

- 55% prefer independence and flexibility,
- 39% report an unpredictable work schedule, and
- 29% need a vehicle during the day.

The second and third issues vary somewhat by industry: Figure 41 below depicts the share of respondents in each industry who cited each of these reasons for driving alone, sorted by need for a vehicle during the day. While not a perfect fit, high rates of needing a vehicle during the day most closely align with high rates of driving alone.

To the extent employees drive alone to work because they need a vehicle during the day for work purposes, employers may be able to mitigate this issue. When employers provide access to company pool vehicles and/or low-cost, nearby auto rental for daytime trips, employees may be freed to use transit or other means for their daily journey between home and work.

Figure 41: Among reasons given for driving alone, high rates of needing a vehicle during the day come closest to aligning with high rates of drive alone (SOV) commutes.
## Commute mode split for each industry represented in the 2013 survey

The following pages present charts showing the commute mode split for each of the ten industries represented among the 2013 commute survey respondents, as well as a discussion of the highlights:

<table>
<thead>
<tr>
<th>Industry</th>
<th>Highlights of the commute mode split</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Accounting</strong></td>
<td>Approximately two thirds of public accounting employees – 65.4% – drive solo for their daily commute. More than a quarter choose public transit, with 19.0% on park-and-ride buses and 8.8% on local buses or rail. Just 3.4% of public accounting employees surveyed share rides in a carpool or vanpool. 2.4% of public accounting employees surveyed walk to work everyday, the second highest rate of walking in the survey.</td>
</tr>
<tr>
<td><img src="image" alt="Accounting Commute Mode Split" /></td>
<td><img src="image" alt="Accounting Commute Mode Split" /></td>
</tr>
<tr>
<td><strong>Energy</strong></td>
<td>More than half of energy employees use alternative transportation to reach work everyday. Only 49.3% drive solo. Approximately two out of five energy firm employees choose public transit for their daily trips between home and work, with 35% on park-and-ride commuter buses, and 4% on local buses or rail. One tenth of energy employees surveyed – 670 respondents – share rides in a carpool or vanpool daily. Approximately 2% of energy employees surveyed use active transportation, choosing to walk or bike to work daily.</td>
</tr>
<tr>
<td><img src="image" alt="Energy Commute Mode Split" /></td>
<td><img src="image" alt="Energy Commute Mode Split" /></td>
</tr>
</tbody>
</table>
### Industry

<table>
<thead>
<tr>
<th>Highlights of the commute mode split</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nearly one third of finance, insurance, and real estate employees use alternative transportation to reach work everyday. Just over two thirds – 69.3% – drive solo for their daily commute, the highest rate surveyed.</td>
</tr>
<tr>
<td>More than one fifth of FIRE employees – 22% – choose public transportation, with 15% on park-and-ride buses, and 7% on local buses or rail.</td>
</tr>
<tr>
<td>8.3% share rides in a carpool or vanpool.</td>
</tr>
<tr>
<td>Less than 1% of FIRE employees surveyed choose active transportation, walking or biking to work each day.</td>
</tr>
</tbody>
</table>

**Finance, Insurance, and Real Estate (FIRE)**

![Pie chart showing commute mode split for Finance, Insurance, and Real Estate (FIRE) with SOV 69%, Park & Ride 15%, Bus/Rail 7%, Carpool/Vanpool 8%, Walk 1%, Bicycle 0.24%.]

**Government**

![Pie chart showing commute mode split for Government with SOV 68%, Park & Ride 16%, Bus/Rail 5%, Carpool/Vanpool 9%, Walk 0.23%, Bicycle 0.34%, Motorcycle/Scooter 0.47%.]

<table>
<thead>
<tr>
<th>Highlights of the commute mode split</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nearly one third of government workers surveyed use alternative transportation to reach work everyday. Just over two thirds – 68.0% – drive solo daily. Note many government workers reported operating agency vehicles that they were required to drive home each day.</td>
</tr>
<tr>
<td>More than one fifth – 21.8% – choose public transportation, with 16.3% on park-and-ride buses, and 5.5% on local buses or rail.</td>
</tr>
<tr>
<td>Approximately one out of ten government workers – 9.2% – share daily rides in a vanpool or carpool.</td>
</tr>
<tr>
<td>Less than 1% of government employees surveyed report choosing active transportation, walking or biking to work.</td>
</tr>
</tbody>
</table>
### Hospitality

More than one third of hospitality employees use alternative transportation to reach work everyday. Nearly two thirds – 64.9% – drive solo for their daily commute.

One in four workers chooses public transit, with 5.6% on park-and-ride buses and 22.1% on local buses or rail.

Nearly 6% of hospitality employees share rides in a carpool or vanpool.

More than 1% of workers choose active transportation, walking or biking to work each day.

### Housekeeping

More than two thirds of housekeeping workers use alternative transportation to reach work everyday. Only 30.9% drive solo, the lowest rate in the 2013 survey.

Three out of five workers surveyed ride local bus or rail to reach work daily, the highest rate of local transit surveyed. None of the housekeeping employees surveyed report using park-and-ride service.

Nearly one tenth of housekeeping workers – 8.9% – share rides daily in a vanpool or carpool.

Less than 1% of housekeeping workers surveyed report walking to work each day, and none report bicycling.
Nearly one third of legal firm employees surveyed use alternative transportation to reach work everyday. Just over two thirds – 67.5% – drive solo daily. One in five workers chooses public transit, with 18.8% on park-and-ride buses and 3.5% on local buses or rail.

7.7% share rides in a carpool or vanpool. More than 2% of legal industry employees surveyed report walking to work daily, among the highest rates of walking in the 2013 survey.

Nearly one third of nonprofit employees surveyed use alternative transportation to reach work everyday. Just over two thirds – 68.4% – drive solo daily. Approximately one quarter of nonprofit workers choose public transportation, with 11.4% on park-and-ride routes, and 13.2% on local buses or rail.

4.4% share rides in a carpool or vanpool. Almost 3% use active transportation, choosing to walk or bike to work each day.
### Industry

#### Other Professional Services

<table>
<thead>
<tr>
<th>Mode</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Park &amp; Ride</td>
<td>10%</td>
</tr>
<tr>
<td>Bus/Rail</td>
<td>5%</td>
</tr>
<tr>
<td>Carpool/Vanpool</td>
<td>10%</td>
</tr>
<tr>
<td>Walk</td>
<td>4%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>2%</td>
</tr>
<tr>
<td>Motorcycle/Scooter</td>
<td>1%</td>
</tr>
<tr>
<td>Other Professional Services</td>
<td>n = 307</td>
</tr>
</tbody>
</table>

Just over two thirds – 69.1% – of the architecture, engineering, and consulting employees surveyed drive solo for their daily commute.

At the same time, these professional services employees were more likely to use active transportation than any other industry in the survey. Nearly 4% walk and nearly 2% bike to work each day.

More than 15% choose public transit for daily trips between home and work.

One tenth – 9.8% – of professional services employees share rides in a carpool or vanpool.

### Transportation

<table>
<thead>
<tr>
<th>Mode</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Park &amp; Ride</td>
<td>35%</td>
</tr>
<tr>
<td>Bus/Rail</td>
<td>3%</td>
</tr>
<tr>
<td>Carpool/Vanpool</td>
<td>12%</td>
</tr>
<tr>
<td>Walk</td>
<td>1%</td>
</tr>
<tr>
<td>Motorcycle/Scooter</td>
<td>1%</td>
</tr>
<tr>
<td>Aviation</td>
<td>n = 474</td>
</tr>
</tbody>
</table>

More than half of transportation employees use alternative transportation to reach work everyday. Only 48.9% drive solo.

More than one third of transportation firm employees take advantage of park-and-ride commuter bus service for daily trips between home and work.

Nearly 12% of transportation employees share rides in a carpool or vanpool, the highest rate in the survey.

Nearly 1% of transportation employees surveyed report walking to work daily. None report bicycling to work.
8. **How Does Occupation Affect Commute Mode Decisions?**

In addition to industry, occupation is a demographic attribute that affects commute decisions. Several aspects of occupation and role, such as time of day, customer-facing role, occupational environment, etc., can impact when and how employees travel to and from work.

In 2013, survey respondents were invited to self-identify as a member of one of ten occupations, or provide a free response under Other:

<table>
<thead>
<tr>
<th>Administrative</th>
<th>Executive</th>
<th>Sales</th>
<th>Technical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrator/managerial</td>
<td>Paralegal</td>
<td>Service/retail</td>
<td>Other (please specify)</td>
</tr>
<tr>
<td>Attorney</td>
<td>Professional</td>
<td>Student</td>
<td></td>
</tr>
</tbody>
</table>

In addition to the 10 occupations listed, 995 respondents wrote in an occupation under ‘Other.’ Of these, the most-frequent responses were law enforcement, police officer, and sheriff’s deputy, which accounted for ~165 respondents, or 1.2% of the sample.

**Which occupations are represented in the 2013 survey?**

Approximately 12,000 employees identified their work occupation. Nearly half of these respondents described themselves as a Professional. To the extent these workers are more likely to choose a particular travel mode, their preference will tend to shift the entire survey mode split.

The distribution of occupations in the sample is comparable between 2009 and 2013 with no outstanding differences in any category.

**Table 42: Nearly half of survey respondents describe their occupation as Professional.**

<table>
<thead>
<tr>
<th>Occupation</th>
<th>2009</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional</td>
<td>42%</td>
<td>44%</td>
</tr>
<tr>
<td>Administrative</td>
<td>16%</td>
<td>15%</td>
</tr>
<tr>
<td>Technical</td>
<td>13%</td>
<td>14%</td>
</tr>
<tr>
<td>Administrator/Managerial</td>
<td>10%</td>
<td>12%</td>
</tr>
<tr>
<td>Attorney</td>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td>Service/Retail</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>Executive</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Paralegal</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Sales</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>Student</td>
<td>0.4%</td>
<td>0.3%</td>
</tr>
</tbody>
</table>
8. Occupation

*Which occupations are most likely to drive, use transit, or share rides?*

The mode split by occupation is essentially the same in 2013 as in 2009. Figure 43 below shows the share of workers in each occupation who use each of four primary modes: drive alone, ride public transit, share rides in a car/vanpool, or walk/bike.

- As in 2009, the occupations with the highest rates of driving alone are Attorneys and Executives, with four out of five in SOVs.
- Fully 44% of Service/Retail workers report using public transit for their daily commute. However, Technical workers reported the highest park-and-ride bus use.
- Students were most likely to choose active transportation, including both bicycling and walking. However, Attorneys reported the highest levels of walking to work daily.

Figure 43: Technical workers reported least solo driving, while Attorneys reported most.

Table 44: Commute mode split by occupation.

<table>
<thead>
<tr>
<th>Occupation</th>
<th>SOV</th>
<th>Park &amp; Ride</th>
<th>Bus</th>
<th>Vanpool</th>
<th>Motorcycle</th>
<th>Scooter</th>
<th>Walk</th>
<th>Bicycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative</td>
<td>53.6%</td>
<td>27.7%</td>
<td>7.1%</td>
<td>11.2%</td>
<td>0.2%</td>
<td>0.2%</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>Administrator/Managerial</td>
<td>56.4%</td>
<td>28.0%</td>
<td>3.1%</td>
<td>11.5%</td>
<td>0.4%</td>
<td>0.6%</td>
<td>0.1%</td>
<td></td>
</tr>
<tr>
<td>Attorney</td>
<td>86.4%</td>
<td>5.1%</td>
<td>2.4%</td>
<td>3.4%</td>
<td>0.2%</td>
<td>2.4%</td>
<td>0.2%</td>
<td></td>
</tr>
<tr>
<td>Executive</td>
<td>79.6%</td>
<td>13.8%</td>
<td>0.9%</td>
<td>4.2%</td>
<td>0.0%</td>
<td>1.5%</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>Paralegal</td>
<td>62.7%</td>
<td>25.3%</td>
<td>3.7%</td>
<td>6.0%</td>
<td>0.0%</td>
<td>1.8%</td>
<td>0.5%</td>
<td></td>
</tr>
<tr>
<td>Professional</td>
<td>55.6%</td>
<td>28.2%</td>
<td>4.4%</td>
<td>9.3%</td>
<td>0.5%</td>
<td>1.5%</td>
<td>0.5%</td>
<td></td>
</tr>
<tr>
<td>Sales</td>
<td>66.2%</td>
<td>21.8%</td>
<td>2.1%</td>
<td>9.2%</td>
<td>0.0%</td>
<td>0.7%</td>
<td>0.0%</td>
<td></td>
</tr>
<tr>
<td>Service/Retail</td>
<td>47.0%</td>
<td>5.7%</td>
<td>38.3%</td>
<td>8.2%</td>
<td>0.0%</td>
<td>0.2%</td>
<td>0.6%</td>
<td></td>
</tr>
<tr>
<td>Student</td>
<td>59.1%</td>
<td>9.1%</td>
<td>22.7%</td>
<td>4.5%</td>
<td>0.0%</td>
<td>2.3%</td>
<td>2.3%</td>
<td></td>
</tr>
<tr>
<td>Technical</td>
<td>46.5%</td>
<td>34.8%</td>
<td>5.5%</td>
<td>10.6%</td>
<td>0.6%</td>
<td>1.5%</td>
<td>0.6%</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>56.1%</td>
<td>26.4%</td>
<td>6.1%</td>
<td>9.5%</td>
<td>0.4%</td>
<td>1.2%</td>
<td>0.3%</td>
<td></td>
</tr>
</tbody>
</table>

n = 12,000
9. Do long work hours affect how one gets to/from work?

How many hours do employees work in a week?

Survey respondents were asked to report how many hours per week they usually work, using the following ten options as well as a free response:

<table>
<thead>
<tr>
<th>Hours per Week</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 4 hours</td>
<td>13 to 16 hours</td>
</tr>
<tr>
<td>5 to 8 hours</td>
<td>17 to 20 hours</td>
</tr>
<tr>
<td>9 to 12 hours</td>
<td>21 to 25 hours</td>
</tr>
<tr>
<td>26 to 30 hours</td>
<td>31 to 35 hours</td>
</tr>
<tr>
<td>36 to 40 hours</td>
<td>&gt; 40 hours</td>
</tr>
</tbody>
</table>

Among 2013 respondents, the median work week is more than 40 hours long:

- Fewer than 8% of respondents work part time up to 35 hours per week, among the first eight options.
- 92.3% of respondents work 36 or more hours per week, in the final two options.

More than 70 respondents who work for energy firms, explained in the comments that they work a “9/80” schedule, alternating between working 36 hours during short/4-day weeks, and working 44 hours during long/5-day weeks. Note that other respondents may work similar schedules, but reported simply the average of “40” hours per week.

The available survey response options did not differentiate between those who work a typical 40-45 hours per week and others who may work 50, 60, 70, or 80+ hours/week. However, more than 35 respondents specified in the comments they routinely work from 50 hours/week up to 80 hours. 80 hours appears to be the natural limit of work reported per week. Note that more respondents may work similarly long hours, but without describing them in the comments.

Figure 45: Nearly two-thirds of 2013 respondents work more than 40 hours per week.
**Does working longer hours change how employees commute?**

The intent of capturing hours worked per week was to facilitate determining whether working longer hours causes employees’ choice of commute mode to shift from shared modes like transit and carpools toward solo driving or motorcycles.

Figure 46 below depicts the commute mode split among part-time workers, full-time workers, and those who work more than 40 hours per week. Those who work the longest hours do report the highest rate of solo driving and the lowest rates of shared modes like public transit and van/carpool. It is unclear whether these differences are statistically significant.

**Figure 46. Differences in commute mode split by hours worked per week appear small.**

![Commute Mode Split by Hours Worked](image)

It is possible employees who work especially long hours report still higher rates of driving alone. However, the available survey response options did not differentiate between those who work a predictable 40-45 hours per week and others who may work 50, 60, 70, or 80+ hours/week.

**Can employees work long hours and commute by park-and-ride bus?**

Each morning, METRO’s earliest park-and-ride buses are scheduled to reach downtown destinations between 5:10 and 5:20 am. Their latest nonstop buses are scheduled to leave downtown between 6:30 and 6:50 pm each evening. Allowing 10 minutes to walk to/from work and time for lunch each day, someone could work at least 53 to 57 hours per week and still commute by nonstop park-and-ride bus.

With nonstop bus schedules, a park-and-ride commuter’s work day will tend to be shifted toward leaving home well before dawn and returning home before 7:30 pm. However, for employees who want or need to commute midday or stay at work later into the evening, METRO also operates multi-stop routes that serve several park-and-ride lots.

As an example, Figures 47, 48, and 49 show excerpts from METRO’s park-and-ride bus schedules for the 217 Cypress and 219 routes, which serves the US-290 corridor.

For up-to-date information on park-and-ride commuter bus service including routes, schedules, and current fares, please contact the transit operators directly:

- **Houston METRO**
  [http://ridemetro.org](http://ridemetro.org)
- **Brazos Transit District**
  [http://www.btd.org](http://www.btd.org)
- **Fort Bend County Public Transit**
  [http://fbctransit.org](http://fbctransit.org)
Figure 47. METRO’s first #217 Cypress park-and-ride buses arrive downtown by 5:45 am.

Figure 48. METRO’s last #217 nonstop park-and-ride buses depart downtown by 7:05 pm; however, multi-stop buses leave as late as 9:43 pm for northwest park-and-ride lots.
9. Work hours

Figure 49. METRO’s multi-stop #219 park-and-ride buses serve downtown during the middle of the day and depart downtown as late as 9:43 pm to connect commuters to the Northwest, West Little York, and Northwest Station park-and-ride lots.

### 219 Northwest Station/West Little York
**Weekday Inbound / Día de Semana Hacia la Ciudad**

<table>
<thead>
<tr>
<th></th>
<th>Northwest Station Park &amp; Ride</th>
<th>West Little York Park &amp; Ride</th>
<th>Northwest Transit Center</th>
<th>Smith &amp; Preston</th>
<th>Louisiana &amp; St Joseph Pkwy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Midday</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:00</td>
<td>9:10</td>
<td>9:30</td>
<td>9:40</td>
<td>9:50</td>
<td></td>
</tr>
<tr>
<td>10:00</td>
<td>10:10</td>
<td>10:30</td>
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<td>11:00</td>
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<td>11:35</td>
<td>11:45</td>
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<td>12:00</td>
<td>12:10</td>
<td>12:35</td>
<td>12:45</td>
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<td>1:00</td>
<td>1:10</td>
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<td>2:00</td>
<td>2:10</td>
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</tr>
<tr>
<td>2:57</td>
<td>3:07</td>
<td>3:32</td>
<td>3:42</td>
<td>3:52</td>
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<tr>
<td><strong>Evening</strong></td>
<td></td>
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<tr>
<td>7:50</td>
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<td></td>
<td></td>
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<td>8:20</td>
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<tr>
<td>9:32</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10:00</td>
</tr>
</tbody>
</table>

### 219 Northwest Station/West Little York
**Weekday Outbound / Día de Semana Hacia las Afueras de la Ciudad**

<table>
<thead>
<tr>
<th></th>
<th>Louisiana &amp; St Joseph Pkwy</th>
<th>Louisiana &amp; Lamar</th>
<th>Louisiana &amp; Capital</th>
<th>Louisiana &amp; Congress</th>
<th>Northwest Transit Center</th>
<th>West Little York Park &amp; Ride</th>
<th>Northwest Station Park &amp; Ride</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Midday</strong></td>
<td></td>
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<tr>
<td>8:05</td>
<td>8:09</td>
<td>8:11</td>
<td>8:13</td>
<td>8:25</td>
<td>8:45</td>
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<tr>
<td>1:05</td>
<td>1:09</td>
<td>1:11</td>
<td>1:13</td>
<td>1:25</td>
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<td>1:55</td>
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<tr>
<td>2:05</td>
<td>2:09</td>
<td>2:11</td>
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<td>2:25</td>
<td>2:45</td>
<td>2:55</td>
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<tr>
<td><strong>Evening</strong></td>
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<td></td>
</tr>
<tr>
<td>7:05</td>
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<td>7:11</td>
<td>7:13</td>
<td>7:25</td>
<td>7:43</td>
<td>7:50</td>
<td></td>
</tr>
<tr>
<td>7:35</td>
<td>7:39</td>
<td>7:41</td>
<td>7:43</td>
<td>7:55</td>
<td>8:13</td>
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<tr>
<td>8:35</td>
<td>8:39</td>
<td>8:41</td>
<td>8:43</td>
<td>8:55</td>
<td>9:17</td>
<td>9:27</td>
<td></td>
</tr>
</tbody>
</table>
10. **How does gender shape commute behavior?**

*What can the 2013 survey tell us about gender and travel?*

For the first time, downtown survey respondents were asked to report their gender. Out of 11,871 respondents who answered the question, 48.7% were male and 51.3% were female.

In contrast, the broader downtown workforce is much significantly more male. According to 2011 Longitudinal Employer-Household Dynamics (LEHD) data from the U.S. Census, the gender split in the broader labor force for downtown Houston is 56.9% male and 43.1% female.¹²

More broadly, the gender distributions for the City of Houston and the MSA are essentially even. For comparison, Houston METRO's 2011 onboard passenger survey found that 56% of all METRO transit riders were female.

**Figure 50. Gender split of downtown survey respondents varies from LEHD and METRO.**

---

**Gender split by preferred commute mode**

It appears women and men do make different commute decisions, to some extent:

- Among downtown employees surveyed, solo drivers and carpoolers were more likely to be female.
- Employees who walk, bike, or ride motorcycles were more likely to be male.
- Park-and-ride bus commuters were more likely to be male.
- Only local bus/rail transit riders were evenly split by gender.

The gender split for each primary commute mode is presented in Figure 51:
Gender split for transit skewed by mostly-male downtown workforce

As shown in the chart above, the gender split for transit among downtown respondents is somewhat different from what one might expect. Nationally, the American Public Transportation Association (APTA) has found transit is chosen more often by female users13. In this primary transit industry source document from 2007, researchers reported that more than 55% of all transit trips are taken by women.

Likewise, Houston METRO’s 2011 onboard passenger survey found that 56% of all METRO transit riders were female.14 Among weekday park-and-ride users, the split was similar: 58% were female.

Some of this apparent disparity may be accounted for by the underlying gender split among all downtown workers. The downtown workforce is skewed toward male workers – 57% male / 43% female – which may tend to shift the commute mode split found in the survey. Some of this difference may lie in the survey sample, which may not have reached industries with more female transit riders (e.g. hospitality, housekeeping, and retail). Finally, some of this disparity may be explained by other factors intrinsic to the downtown transit market.

Do men and women make different stops on their way to/from work?

Four out of five male respondents typically commute to and from work without stopping for any purpose. In contrast, nearly one quarter of women make stops on the way to work and approximately 40% of women make stops on the way home from work.

Among the respondents who make stops during their work commute, women handle the vast majority of care for children and elders.
Figure 52. Gender split for stops on the way to work shows men more likely to exercise.

Figure 53. Gender split for PM stops on the way home from work shows women handle majority of child care and elder care.
10. Gender

Among the survey respondents who report making stops during their commute to tend to the needs of children, Figure 54 shows the distribution of commute distance by generation. The distribution forms a bell-shaped curve around the overall survey sample’s median commute distance of 20-29 miles. Differences between generations appear to be fairly small.

Figure 54. Among workers who make stops for children, most are clustered around the median 20-29-mile commute distance, and differences between generations appear small.

Section 11 will address how Age relates to commute choices and location, including further focus on the commute behavior of parents as well as differences between generations.

References

11. **Does age affect location and how people commute?**

Among 2013 commute survey respondents, the median age was 45-49 years old. Every age group from 25 to 69 was well represented in the sample. The following sections examine how mode choice and commute distance vary by age.

**How does the downtown commute mode split vary by age?**

Figure 55 below shows the 2013 survey distribution of commute mode by age:

- **Solo driving** is reported at the highest rates among the 20- to 24-year olds. The percentage of respondents who choose to drive alone falls with each consecutive age group up to age 55-59.

- **Park-and-Ride** express buses are used least by the 20- to 24-year olds. The percentage of respondents who choose park-and-ride transit rises with each consecutive age group up to age 65-69.

- **Local Bus and Rail** transit were used most by the respondents age 19 and younger, and also by those age 70 and older. The 20- to 29-year old respondents choose local buses and/or rail for their daily commute at approximately twice the rate of 30- to 49-year olds (9.2% and 4.7%, respectively), but at lower rates than park-and-ride buses.

- **Carpool/Vanpool** utilization increased marginally in older age groups, remained fairly constant near 10% of commuters from age 30 to 59, then declined to age 69.

It’s important to note this survey provides a single point-in-time snapshot of the commute behavior of many disparate generational groups. These demographic groups differ not only by age and employment but also with respect to many lifestyle preferences and aspirations. One cannot and should not assume that today’s 20- to 24-year olds will make the same choices as the 40- to 44-year olds twenty years from now.

*Figure 55: Young workers drive alone at highest rates; older workers are less likely to drive alone and more likely to choose park-and-ride buses.*

PLEASE NOTE THE VERY YOUNGEST AND VERY OLDEST AGE BRACKETS ARE NOT SIGNIFICANT, BECAUSE THE 2013 SURVEY SAMPLE INCLUDED JUST 16 RESPONDENTS AGE 19 OR YOUNGER, AND JUST 17 RESPONDENTS AGE 75 OR OLDER.
**Significant gap in transit utilization**

Among 2013 respondents, there is a significant and persistent gap – a 20- to 50-point spread in utilization – between solo driving and alternative transportation modes that persists, and narrows by the 55-59 age group. Specifically, older respondents are less likely to drive solo and more likely to choose park-and-ride transit.

There are many possible explanations for this gap in transit utilization, which include:

- **Commute distance** – Older workers are more likely to have long commutes that are served well by park-and-ride transit. Younger workers tend to live closer to work.

- **Awareness of transit** – Older workers may be more aware of park-and-ride transit options and understand how they work. The longer someone has worked downtown, the more likely they are to know others who choose park-and-ride service.

- **Tolerance of drive time** – Younger workers may be more tolerant of driving commute experiences and less motivated to consider alternative commute options.

- **Responsibility for dependents** – Parents and caregivers may perceive they need the independence driving offers in order to respond to the needs of young children or elders. According to the U.S. Census, in 2010-2012, there were 2.1 million households in the 8-county Houston-Sugar Land-Baytown MSA, and 40% of these households include one or more children under the age 18. In addition, some in this age bracket may also tend to the needs of elders.15 Figure 56 compares the mode split of those who care for dependents to those who commute nonstop.

**Figure 56: PM mode split with dependents**: Compared to those who commute nonstop, workers who stop to care for children or elders drive alone at higher rates, but more than 20% use transit and 9-12% share rides in a carpool at rates similar to nonstop trips.

Focus on parents of young children and others with dependents

One in ten survey respondents – 9.8% – reported stopping on their way to or from work to tend to child care. Figure 57 shows the distribution of respondents who report stops related to children forms a classic bell curve around a median age group of 35-39 years. Less than 1% – 53 respondents – report stopping to care for elders. While elder care stops were reported across all three generations represented, the age group with the
highest rate of stops for elder care was 55-59. As the population ages, the share of employees who must address elder needs is likely to increase.

Figure 57: Distribution of AM stops by age shows 35-39 year olds most likely to care for children.

Figure 58. Distribution of PM stops by age shows all but one age group more likely to stop during their drive home, especially for food and/or beverage.
Are young “Millennial” workers making different commute decisions than older “Generation X” and “Baby Boomer” workers?

It is possible to group survey respondents by age into higher-level generation buckets:

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Millennials</th>
<th>Generation X</th>
<th>Baby Boomers</th>
<th>Silent Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-24 years</td>
<td>1,476</td>
<td>5,581</td>
<td>5,128</td>
<td>101</td>
</tr>
<tr>
<td>25-29 years</td>
<td>30 to 34 years</td>
<td>50 to 54 years</td>
<td>70 to 75 years</td>
<td></td>
</tr>
<tr>
<td>30-34 years</td>
<td>35 to 39 years</td>
<td>55 to 59 years</td>
<td>&gt; 75 years</td>
<td></td>
</tr>
<tr>
<td>35-39 years</td>
<td>40 to 44 years</td>
<td>60 to 64 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-44 years</td>
<td>45 to 49 years</td>
<td>65 to 69 years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: For the following set of analyses, the 101 respondents who were 70 or over have been grouped with the Baby Boomer group.

Shortest commutes are disproportionately made by young workers

The distribution of respondent ages by commute distance, presented in Figure 59, shows younger workers are locating closer to downtown employers than older cohorts:

- **“Millennials”** – respondents under age 30 – comprised 12% of the survey sample, and yet, accounted for 28% of those who commute less than 5 miles and 20% of those who commute 5-9 miles from home to work.

- **“Generation X”** – respondents aged 40-49 and aged 50-59 – accounted for 24% and 30% of the sample respectively, but they comprised 28% and 33% of those who commute 30 miles or more each day.

- **“Baby Boomers”** – respondents aged 60 and up – comprised 12% of the survey sample and accounted for between 10% and 13% of commutes at each distance.

Figure 59: Shortest commutes are disproportionately made by young workers; longest commutes are reported most from workers aged 50-59.
Figure 60. 64% of Millennials commute less than 20 miles; 63% of Baby Boomers commute 20 miles or more.

Figure 61: More young workers live close to work; 50-59-year-olds travel farthest.

How do downtown survey findings compare to broader trends?
The finding from this survey that Millennial workers are locating closer to work and enjoying shorter commute distances is consistent with trends across the U.S.

- Nielsen, a leading consumer insight firm, noted in a 2014 report that Millennials, “prefer to live in dense, diverse urban villages where social interaction is just outside their front doors.”

- Urban Land Institute reported in 2013 that the Millennial generation is “more likely than older Americans to prefer living in a big city, and shows the strongest preference among the generations for communities with a mix of uses, with shops, offices, and housing together (62%).”
The widespread preferences of Millennials for more urban locations and travel options show in travel research as well, and are of note for employers and developers alike.

**National Household Travel Survey found Millennials are driving less**

The Federal Highway Administration (FHWA) conducts research on travel behavior and how it varies from cohort to cohort, as people age. FHWA’s 2011 report, “The Next Generation of Travel: Research, Analysis and Scenario Development,” observed that travelers under age 30 [“Millennials”] drove less than expected:

“The 2009 National Household Travel Survey (NHTS) data, for instance, was collected during 2008, a peak recession year, which is believed to account for significant drops in travel, as shown in the table below. The travel of respondents under the age of 30; however, has been declining for some time, which raises the question as to whether there may be other reasons for the steady drop in travel among younger populations, even in times when total population is steadily increasing.”

**Transit Cooperative Research Program found Millennials want to live close and use transit**

Similarly, research on “Millennials and Mobility” conducted in 2013 by the Transit Cooperative Research Program, looked at travel behavior and lifestyle preferences among 1,000 respondents under the age of 30 in six cities. The study identified several interesting trends and preferences:

- 69% typically use more than one transportation option (e.g. walking and transit) to reach a destination a few times a week or more, and 42% say they use multiple transportation options to save time and save money.
- 49% say that they have public transit service within 2 blocks of their home, and 36% say that they chose to live in an area because “there are plenty of public transit options available.”
- 32% say they walk or bike part of the way in order to get more exercise.
- 14% say they live “right downtown” and another 20% live “near downtown.”
- 40% do not currently own a car, and one quarter of those who do not own a car (9% of all surveyed) have no plans to buy a car in the immediate future.
- 42% of Millennial parents (of children 18 or under living in their household) surveyed say “having a family doesn’t mean you have to move out of the city, and 36% say “having a family doesn’t mean you have to rush out and buy a car.”

**References**


17 Urban Land Institute. 2013. “Americans’ Views on their Communities, Housing, and Transportation.”


12. **DOES HOUSEHOLD INCOME AFFECT LOCATION AND COMMUTE MODE?**

*Why does household income matter?*

Household income is widely regarded as a primary determinant of how far and how often people will travel. Citing research by The National Surface Transportation Policy and Revenue Study Commission, the Federal Highway Administration (FHWA) observed:

> "Income is also a strong indicator of how much a people travel. Historical trends have shown that as real personal incomes have risen, so has vehicle miles traveled (VMT). Higher incomes contribute to increased car ownership and expenditures on transportation and can influence the length and number of trips people take as they may commute longer distances from areas of choice housing and/or take more discretionary trips."  

*What can the 2013 survey tell us about income and commute choices?*

For the first time, many survey respondents were asked to categorize their approximate average household income at one of 9 levels:

<table>
<thead>
<tr>
<th>Income Range</th>
<th>$0 - $24,999</th>
<th>$25,000 - $49,999</th>
<th>$50,000 - $74,999</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$75,000 - $99,999</td>
<td>$100,000 - $124,999</td>
<td>$125,000 - $149,999</td>
</tr>
<tr>
<td></td>
<td>$150,000 - $174,999</td>
<td>$175,000 - $199,999</td>
<td>$200,000 and up</td>
</tr>
</tbody>
</table>

Out of more than 13,000 survey respondents, only 9,544 answered the household income question. Just over 9,000 of these answered the commute distance question as well, and the following analysis is based on their responses.

The median household income range was **$100,000 to $124,999**. However, there were significant outliers at the high end, with one in six respondents reporting household income of $200,000 per year or more. As discussed above, these higher income households are more likely to own cars and more likely to drive more.

*Does income relate to commute distance?*

As discussed in Section 4 on Distance, the distribution of commute distances among 2013 survey respondents forms a reasonable bell-shaped curve around a **median commute distance of 20-29 miles**. However, that distribution varies by income level.

The distribution of commute distance by household income forms a U-shaped curve, as depicted in Figure 62 below. That is, shorter commute distances are more common at both the lowest-income and highest-income levels.

- At the lowest-income levels, transportation costs represent a more significant portion of household expenses. To the extent that transportation costs rise with commute distance, they exert pressure to live near work and vice versa, compelling low-income workers to seek work near home.
- As income rises, the marginal value of time often increases as well, exerting pressure to minimize travel time. At the highest-income levels, employees can afford the cost of choice housing to allow living in neighborhoods more convenient to work.
12. Household income

Figure 62. Lowest-income and highest-income households report the most short commutes; middle-income households more frequently reported longer commutes.

Please note that just 6.3% of all respondents commute 40 miles or more, and fewer than 1% of respondents commute 60 miles or more.

Table 63. Distribution of commute distances by household income strata.

<table>
<thead>
<tr>
<th>Income Strata</th>
<th>&lt;1 mile</th>
<th>1-4</th>
<th>5-9</th>
<th>10-19</th>
<th>20-29</th>
<th>30-39</th>
<th>40-49</th>
<th>50+</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;$25k</td>
<td>1%</td>
<td>10%</td>
<td>23%</td>
<td>26%</td>
<td>24%</td>
<td>11%</td>
<td>4%</td>
<td>2%</td>
<td>140</td>
</tr>
<tr>
<td>$25 - 49.9k</td>
<td>1%</td>
<td>6%</td>
<td>13%</td>
<td>31%</td>
<td>31%</td>
<td>14%</td>
<td>4%</td>
<td>2%</td>
<td>1228</td>
</tr>
<tr>
<td>$50 - 74.9k</td>
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<td>12%</td>
<td>26%</td>
<td>32%</td>
<td>15%</td>
<td>3%</td>
<td>2%</td>
<td>914</td>
</tr>
<tr>
<td>$75 - 99.9k</td>
<td>1%</td>
<td>6%</td>
<td>9%</td>
<td>23%</td>
<td>35%</td>
<td>19%</td>
<td>4%</td>
<td>3%</td>
<td>735</td>
</tr>
<tr>
<td>$100 - 124.9k</td>
<td>1%</td>
<td>9%</td>
<td>10%</td>
<td>18%</td>
<td>38%</td>
<td>18%</td>
<td>4%</td>
<td>3%</td>
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<td>$125 - 149.9k</td>
<td>1%</td>
<td>7%</td>
<td>9%</td>
<td>20%</td>
<td>36%</td>
<td>20%</td>
<td>3%</td>
<td>3%</td>
<td>1502</td>
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<td>$150 - 174.9k</td>
<td>2%</td>
<td>7%</td>
<td>9%</td>
<td>18%</td>
<td>39%</td>
<td>20%</td>
<td>4%</td>
<td>2%</td>
<td>1085</td>
</tr>
<tr>
<td>$175-199.9k</td>
<td>1%</td>
<td>9%</td>
<td>10%</td>
<td>14%</td>
<td>35%</td>
<td>22%</td>
<td>5%</td>
<td>3%</td>
<td>1631</td>
</tr>
<tr>
<td>$200k+</td>
<td>2%</td>
<td>11%</td>
<td>17%</td>
<td>18%</td>
<td>27%</td>
<td>20%</td>
<td>4%</td>
<td>1%</td>
<td>1302</td>
</tr>
</tbody>
</table>
Figure 64 shows the distribution of household income by distance, and includes a strong bell curve. One may observe that 60% or more of respondents with commutes less than 5 miles report household incomes of $100,000 or more. However, the sample includes a large share of higher-income households and very few low-income households.

Figure 64. The majority of short commutes are reported by highest-income households.

Please note that just 6.3% of all respondents commute 40 miles or more.

**Does income relate to commute mode choice?**

The distribution of commute mode by household income varies for each of the five primary commute modes:

- **The highest rates of driving alone** (SOV) are reported by respondents from the highest income households. Fully 70% of respondents from households that earn $200,000 or more annually drive alone each day. The lowest rates of driving alone were reported by respondents from the lowest-income households. Less than half of those that earn less than $25,000 per year drive alone.

- **Park-and-ride commuters** are distributed along a fairly smooth bell curve with the lowest rate of park-and-ride use reported by the households with the lowest and highest income levels. Among respondents from the median income bracket, 29% choose park-and-ride buses for their daily commute.

- The **highest rates of local bus/rail transit** use were reported by respondents with the lowest household incomes. Fully 40% of respondents from households that earn less than $25,000 per year use local bus or rail transit to get to work.

- Across all household income brackets, **rates of carpooling and vanpooling** ranged between 6% and 13%. However, the highest rates of ride sharing were reported by respondents from households that earn $150,000 to $174,999 per year.

- Notably, **active walk and bike commutes** are reported at all income levels. However, respondents from the highest-income households report the highest rate – 2.3% – of walk/bike commutes, and respondents from households that earn $25,000 to $49,999 report the lowest rate – 0.5% – of walk and bike commutes.
12. Household income

Figure 65. Households with more income use less local transit, and more park-and-ride.

Figure 66. Notably, sharing rides in a carpool and active walk and bike commutes are reported across all income levels.

Reference

13. WHO DRIVES ALONE TO WORK DOWNTOWN AND WHY?

Out of more than 12,000 survey respondents, about 7,200 – 56.8% – drive alone to work downtown each day.

Where are the highest concentrations of solo drivers?

Central Houston geocoded survey responses to prepare a series of GIS maps which show the distribution of survey respondents across the 8-county Houston-Galveston region. These maps can be found in Appendix B.

Map 4 – SOV Commuters surveyed, shows the distribution of respondents who drive alone to work each day. The very highest concentrations of solo drivers are found in the close-in zip codes west of the central business district, inside the IH-610 loop. High concentrations of solo drivers also originate in the zip codes west of IH-610 along IH-10, the Westpark Toll Road, and US-59.

According to 2011 data from the U.S. Census Center for Economic Studies, the downtown commute shed includes every zip code in the entire 8-county Houston-Galveston region. The 2013 survey responses included solo drivers from every zip code in Harris County and every zip code in Waller County. Only 21 zip codes at the edges of Brazoria, Chambers, Fort Bend, Galveston, Liberty, and Montgomery counties are unrepresented.

What motivates individuals to drive alone?

In order to understand why downtown travelers make the travel decisions they do, survey respondents were presented a list of possible motivations and asked to check all that apply. The reasons for driving alone cited most frequently were:

- More than half – 55% – prefer the independence/flexibility of driving.
- Nearly half – 47% – say driving alone is convenient.
- More than a third – 39% – say their unpredictable work schedule necessitates driving.
- A third – 34% – each say driving alone is comfortable and faster than other options.
The number and percentage of respondents who cited each reason for driving alone are presented in Table 67.

**Table 67: About half of solo drivers cited independence, convenience as reason to drive.**

<table>
<thead>
<tr>
<th>Preference for SOV</th>
<th>Responses</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prefer independence/flexibility</td>
<td>3,943</td>
<td>55%</td>
</tr>
<tr>
<td>Convenience</td>
<td>3,392</td>
<td>47%</td>
</tr>
<tr>
<td>Unpredictable work schedule</td>
<td>2,796</td>
<td>39%</td>
</tr>
<tr>
<td>Personal comfort</td>
<td>2,467</td>
<td>34%</td>
</tr>
<tr>
<td>Faster</td>
<td>2,452</td>
<td>34%</td>
</tr>
<tr>
<td>Bus/rail not convenient to my house</td>
<td>2,291</td>
<td>32%</td>
</tr>
<tr>
<td>Need a vehicle during the day</td>
<td>2,111</td>
<td>29%</td>
</tr>
<tr>
<td>Need to make stops going to or from work</td>
<td>2,014</td>
<td>28%</td>
</tr>
<tr>
<td>Parking paid by employer</td>
<td>1,824</td>
<td>25%</td>
</tr>
<tr>
<td>Personal safety</td>
<td>966</td>
<td>13%</td>
</tr>
<tr>
<td>Too close to work</td>
<td>867</td>
<td>12%</td>
</tr>
<tr>
<td>Bus/rail schedule not convenient</td>
<td>857</td>
<td>12%</td>
</tr>
<tr>
<td>Other reasons</td>
<td>783</td>
<td>11%</td>
</tr>
<tr>
<td>Not enough people for carpool/vanpool</td>
<td>758</td>
<td>11%</td>
</tr>
<tr>
<td>Bus/rail not convenient to my work</td>
<td>706</td>
<td>10%</td>
</tr>
<tr>
<td>Bad weather conditions</td>
<td>669</td>
<td>9%</td>
</tr>
<tr>
<td>Cost</td>
<td>190</td>
<td>3%</td>
</tr>
<tr>
<td>Traffic congestion</td>
<td>156</td>
<td>2%</td>
</tr>
<tr>
<td>Status</td>
<td>97</td>
<td>1%</td>
</tr>
</tbody>
</table>
Figure 68. More than half of employees who drive alone commute less than 20 miles, and 82.2% commute less than 30 miles.

Figure 69. Distribution of respondent age by commute distance among solo drivers shows young workers tend to commute shorter distances; the majority of commutes over 20 miles are reported by workers aged 40 to 59.

Reference

14. WHO Chooses Bus OR RAIL TRANSIT SERVICE AND WHY?

Nearly one third of 2013 survey respondents – 32.0% – choose bus and/or rail transit service to reach downtown each day.

- Approximately one out of twenty downtown employees surveyed – 6.2% – ride local bus and/or rail.
- More than one quarter of respondents – 25.8% – choose park-and-ride commuter bus.

Where are the highest concentrations of transit riders?
Central Houston geocoded survey responses to prepare a series of GIS maps which show the distribution of survey respondents across the 8-county Houston-Galveston region. These maps can be found in Appendix B.

Park-and-ride bus riders
Map 5 – Park & Ride Bus Commuters Surveyed, shows the distribution of respondents who choose park-and-ride bus service for their daily commute. Park & Ride respondents include individuals who ride both service operated by METRO and also the Woodlands Express service to Montgomery County operated by the Brazos Transit District.

The very highest concentrations of park-and-ride commuters originate in suburban zip codes clustered around the farthest ends of the park-and-ride route network. More broadly, high concentrations of park-and-ride commuters live in the neighborhoods along the ring formed by SH-6 and FM-1960 around the southwest, west, and northwest areas of the region. These are employees who live comparatively far from their downtown employers, and yet enjoy convenient access to park-and-ride service.

Local bus and rail transit riders
Map 6 – Local Bus & Rail Transit Commuters Surveyed, shows the distribution across the 8-county region of survey respondents who choose local bus or rail transit service each day.

The very highest concentration of local transit riders originate in the zip codes along METRO’s Main Street light rail line: 77002, 77004, 77006, 77030, and 77054.
14. Who chooses bus or rail transit?

The next-highest concentrations of local transit riders originate in zip codes near light rail or that are well-served by METRO’s highest-frequency bus routes: 77003, 77004, 77009, 77019, 77025, 77056, 77057, 77063, 77076, and 77088.

**Map 11 – High-Frequency Transit with Local Bus & Rail Commuters Surveyed**

shows the distribution of respondents who choose transit relative to METRO’s network of highest-frequency bus routes and rail line. Refer to Map 70 below for a detailed view from Map 11.

**Map 70. Areas with highest concentrations of local transit commuters are served by METRO’s highest-frequency bus and rail transit routes.**

---

**What motivates individuals to choose bus or rail transit?**

In order to understand why downtown travelers make the travel decisions they do, survey respondents were presented a list of possible motivations and asked to check all that apply. The reasons for choosing bus or rail transit cited most frequently were:

- Four out of five – 81% – want to avoid driving in traffic.
- More than three quarters – 77% – like to save gas.
- Three out of four – 76% – like to reduce wear and tear on my car.
- More than half – 58% – enjoy having access to use HOV lanes.

The number and percentage of respondents who cited each reason for choosing bus or rail transit are presented in Table 71.
Table 71: Four out of five bus and rail riders choose transit to avoid driving in traffic.

<table>
<thead>
<tr>
<th>Preference for Bus and/or Rail</th>
<th>Responses</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid driving in traffic</td>
<td>3,276</td>
<td>81%</td>
</tr>
<tr>
<td>Saves gas</td>
<td>3,123</td>
<td>77%</td>
</tr>
<tr>
<td>Reduces wear and tear on my car</td>
<td>3,097</td>
<td>76%</td>
</tr>
<tr>
<td>Use HOV lanes</td>
<td>2,359</td>
<td>58%</td>
</tr>
<tr>
<td>Costs less</td>
<td>2,265</td>
<td>56%</td>
</tr>
<tr>
<td>Convenience</td>
<td>2,203</td>
<td>54%</td>
</tr>
<tr>
<td>Faster trip</td>
<td>1,511</td>
<td>37%</td>
</tr>
<tr>
<td>Environmental concerns</td>
<td>1,289</td>
<td>32%</td>
</tr>
<tr>
<td>Other reasons</td>
<td>447</td>
<td>11%</td>
</tr>
<tr>
<td>No other way to get to work</td>
<td>108</td>
<td>3%</td>
</tr>
</tbody>
</table>

Choice riders

Note that these downtown commuters are choosing to ride transit. Only 3% report that they have no other way to get to work. Similar data from METRO’s 2011 onboard passenger survey showed that 88% of park-and-ride commuters do have access to a vehicle they could use for the same trip, but choose a park-and-ride bus instead.

Figure 72. METRO rail train and downtown travelers near Preston Station on Main Street.

Photo credit: Christof Spieler
14. Who chooses bus or rail transit?

Figure 73. Distribution of respondent age by commute distance among park-and-ride bus riders shows the majority of park-and-ride commuters are over 50 at nearly all distances.

Figure 74. Distribution of respondent age by commute distance among local bus and rail transit users shows younger workers commute shorter distances, and longer commutes are made more often by older workers.
15. **WHO SHARES RIDES IN CARPOOLS OR VANPOOLS AND WHY?**

Approximately one out of ten survey respondents – 9.3% – share rides in a carpool or vanpool to reach downtown each day.

Where are the highest concentrations of carpool and vanpool riders?

Central Houston geocoded survey responses to prepare a series of GIS maps which show the distribution of survey respondents across the 8-county Houston-Galveston region. These maps can be found in Appendix B.

**Map 7 – Carpool/Vanpool Commuters Surveyed**, shows the distribution of survey respondents who share rides to work downtown each day.

Home location matters

While carpool and vanpool riders originate in every county in the region, the very highest concentrations of carpoolers live in the denser urban neighborhoods just west and east of downtown, including Montrose, the Washington Avenue corridor, and the East End.

Carpools and vanpools are also more prevalent in residential areas outside of METRO’s service area, such as Spring, Sugar Land, Pearland, and Baytown. Notably, the two highest suburban concentrations of carpoolers are:

- **Spring** zip code 77382 in Montgomery County, and
- **Sugar Land** zip code 77479 in Fort Bend County.

These carpool and vanpool riders often use existing park-and-ride lots as their meeting point to ride together each day. They may also represent additional untapped demand for nonstop, fixed route commuter park-and-ride transit service to downtown.

Employer location matters, too

While carpools benefit employers almost anywhere, vanpool utilization is limited among downtown employers, in large part because park-and-ride commuter bus service is so compelling. However, employers located in downtown areas that are not immediately adjacent to park-and-ride routes are more likely to take advantage of vanpools.
15. Who shares rides in carpools or vanpools?

According to METRO, 542 downtown employees participated in the regional vanpool program in May 2013. These commuters shared rides in 54 vans and represented more than 17,700 person-trips per month.22

**What motivates individuals to share rides each day?**

In order to understand why downtown travelers make the travel decisions they do, survey respondents were presented a list of possible motivations and asked to check all that apply. The reasons for sharing rides in a carpool or vanpool cited most frequently were:

- Two thirds – 66% – take advantage of access to the region’s **HOV lane network**.
- About half – 53% – enjoy that sharing rides **saves gas** versus driving alone.
- About half – 48% – said that sharing rides is more **convenient**.
- One in five respondents said that both local bus/rail and park-and-ride bus – 23% and 20% respectively – **transit options were not convenient** to their home.
- One in ten respondents said that both local and park-and-ride – 11% and 9% respectively – transit **routes were not convenient to their downtown workplace**.
- More than one tenth – 13% – said their **employer subsidizes vanpools** and/or carpools.

The number and percentage of respondents who cited each reason for sharing rides in a carpool or vanpool are presented in Table 75 below:

**Table 75: Two thirds of carpool/vanpool respondents cited access to HOV lanes as reason to share rides.**

<table>
<thead>
<tr>
<th>Preference for Carpool/Vanpool</th>
<th>Responses</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use HOV lanes</td>
<td>780</td>
<td>66%</td>
</tr>
<tr>
<td>Saves gas</td>
<td>632</td>
<td>53%</td>
</tr>
<tr>
<td>Convenience</td>
<td>566</td>
<td>48%</td>
</tr>
<tr>
<td>Reduces wear and tear on car</td>
<td>508</td>
<td>43%</td>
</tr>
<tr>
<td>Costs less</td>
<td>504</td>
<td>42%</td>
</tr>
<tr>
<td>Bus/Rail not convenient to home</td>
<td>269</td>
<td>23%</td>
</tr>
<tr>
<td>Someone else needs a ride</td>
<td>244</td>
<td>21%</td>
</tr>
<tr>
<td>Environmental concerns</td>
<td>235</td>
<td>20%</td>
</tr>
<tr>
<td>P&amp;R not convenient to home</td>
<td>237</td>
<td>20%</td>
</tr>
<tr>
<td>Other reasons</td>
<td>205</td>
<td>17%</td>
</tr>
<tr>
<td>Employer subsidizes carpool/vanpool</td>
<td>158</td>
<td>13%</td>
</tr>
<tr>
<td>Bus/Rail not convenient to work</td>
<td>128</td>
<td>11%</td>
</tr>
<tr>
<td>P&amp;R route not convenient to work</td>
<td>108</td>
<td>9%</td>
</tr>
<tr>
<td>No other way to get to work</td>
<td>53</td>
<td>4%</td>
</tr>
</tbody>
</table>
Employees are more likely to share rides in a vanpool when:

- Employer provides a vanpool incentive,
- Employer allows employees to use pre-tax income to cover vanpool expense,
- Employer provides preferred or reduced-cost parking for carpools and vanpools,
- Employer assigns a staff member or allows a volunteer transportation coordinator to facilitate vanpool rider matching,
- Employer’s culture encourages ride sharing as part of its “green” initiatives, and
- Employee’s role does not regularly require daytime travel.

Figure 76. The distribution of commute distances among carpool and vanpool riders was very similar to the distribution of commute distances among all respondents.

Figure 77. Distribution of respondent ages by commute distance among carpool riders shows half of close-in riders are under 40, and half of 20+ mile carpoolers are over 50.
15. Who shares rides in carpools or vanpools?

Reference

22 STAR Regional Vanpool program. 2014. Vanpool ridership.
16. **Who rides motorcycles or scooters?**

Out of more than 12,000 survey respondents, 47 – 0.4% – ride a motorcycle or scooter to work downtown each day.

**Where are the highest concentrations of motorcycle/scooter commuters?**

Central Houston geocoded survey responses to prepare a series of GIS maps which show the distribution of survey respondents across the 8-county Houston-Galveston region. These maps can be found in Appendix B.

**Map 8 – Motorcycle/Scooter Commuters Surveyed**, shows the distribution of commuters who ride motorcycles or scooters to a downtown workplace each day. Approximately half of these commute from within, or just outside, the IH-610 west loop.

However, the rest make among the longest commutes surveyed, from outside the ring defined by SH-6 and FM-1960, originating in zip codes with access to the farthest extents of the region’s HOV lane network.

**What motivates individuals to ride motorcycles or scooters?**

In order to understand why downtown travelers make the travel decisions they do, survey respondents were presented a list of possible motivations and asked to check all that apply. The reasons for riding motorcycles or scooters cited most frequently were:

- Three quarters – 74% – enjoy that a motorcycle costs less to operate than a car.
- About three quarters – 72% – prefer independence/flexibility.
- Two thirds – 68% – take advantage of access to the region’s HOV lane network.
- More than half – 62% – say their motorcycle trip is more convenient and faster.

The number and percentage of respondents who cited each reason for riding a motorcycle or scooter are presented in Table 78.
Table 78: 74% of commuters who ride motorcycles/scooters value that it costs less.

<table>
<thead>
<tr>
<th>Preference for Motorcycle/Scooter</th>
<th>Responses</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Costs less</td>
<td>35</td>
<td>74%</td>
</tr>
<tr>
<td>Prefer independence/flexibility</td>
<td>34</td>
<td>72%</td>
</tr>
<tr>
<td>Use of the HOV lanes</td>
<td>32</td>
<td>68%</td>
</tr>
<tr>
<td>Convenience</td>
<td>29</td>
<td>62%</td>
</tr>
<tr>
<td>Faster trip</td>
<td>29</td>
<td>62%</td>
</tr>
<tr>
<td>Parking space subsidized by employer</td>
<td>14</td>
<td>30%</td>
</tr>
<tr>
<td>Unpredictable work schedule</td>
<td>13</td>
<td>28%</td>
</tr>
<tr>
<td>Live close to work</td>
<td>9</td>
<td>19%</td>
</tr>
<tr>
<td>Bus or rail not convenient to my home</td>
<td>8</td>
<td>17%</td>
</tr>
<tr>
<td>Environmental concerns</td>
<td>8</td>
<td>17%</td>
</tr>
<tr>
<td>Other Reasons</td>
<td>8</td>
<td>17%</td>
</tr>
<tr>
<td>Need to make stops going to or from work</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td>Bus or Rail schedule is not convenient</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td>Bus or rail not convenient to my work</td>
<td>2</td>
<td>4%</td>
</tr>
</tbody>
</table>

n = 47 100%
17. Who actively bicycles or walks to work and why?

Nearly 200 survey respondents – 1.5% – choose active transportation, either walking or bicycling to work downtown each day.

**Where are the highest concentrations of bicycle and pedestrian commuters?**

Central Houston geocoded survey responses to prepare a series of GIS maps which show the distribution of survey respondents across the 8-county Houston-Galveston region. These maps can be found in Appendix B.

**Map 9 – Walk Commuters Surveyed** shows the distribution of respondents who choose to walk to work each day. Essentially all of these live within the IH-610 loop. 72% walk less than one mile and 93% walk less than two miles. The handful who report longer commutes may ride transit or carpool part way to work, and walk the remainder.

**Map 10 – Bicycle Commuters Surveyed** shows the distribution of respondents who choose to bicycle to work each day. 37% bicycle less than two miles and 34% commute more than 5 miles. Some may bring their bikes along on bus or rail transit, as well.

**Figure 79:** 61% of active commute distances are shorter than 1 mile.
17. Who bicycles or walks?

**How old are the employees who choose to walk or bike?**

Active commutes are made by employees of all ages. Among the respondents who walk or bike to work each day:

- 30.6% – are under 30 “Millennials” and equally likely to walk or bicycle.
- 32.6% – are 30-49 “Generation X” and more likely to bicycle than walk.
- 33.2% – are 50 or older “Baby Boomers” and more likely to walk than bicycle.

Figure 80: Active commutes are made by employees of all ages, but are reported most often by Millennials.

![Bar chart showing distribution of active commutes by age](image)

**What motivates individuals to choose Active Transportation?**

In order to understand why downtown travelers make the travel decisions they do, survey respondents were presented a list of possible motivations and asked to check all that apply. The reasons for choosing active transportation cited most frequently were:

- More than four fifths – 88% – of bicycle commuters cite exercise/health as a primary reason, while a little more than half – 56% – of walkers cite exercise/health.
- Nine out of ten – 93% – of those who walk live close to work, and 71% of those who bicycle live close to work.
- Nearly two thirds – 66% – of bicycle commuters cite environmental concerns as a reason, while only 22% of those who walk cite the environment.
- About half of those who bicycle say their commute is more convenient (54%) and faster (49%) than other commute options.
- About one quarter of these respondents say that walking to work is faster (25%) than other options and that driving is not convenient (24%).

The number and percentage of respondents who cited each reason for bicycling or walking to work are presented in Tables 79 and 80.
### Table 81: Exercise/health is the most-cited reason for bicycling to work.

<table>
<thead>
<tr>
<th>Preference for Bicycle</th>
<th>Responses</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise/health</td>
<td>36</td>
<td>88%</td>
</tr>
<tr>
<td>Live close to work</td>
<td>29</td>
<td>71%</td>
</tr>
<tr>
<td>Environmental concerns</td>
<td>27</td>
<td>66%</td>
</tr>
<tr>
<td>Costs less</td>
<td>25</td>
<td>61%</td>
</tr>
<tr>
<td>Prefer Independence/Flexibility</td>
<td>23</td>
<td>56%</td>
</tr>
<tr>
<td>Convenience</td>
<td>22</td>
<td>54%</td>
</tr>
<tr>
<td>Faster trip</td>
<td>20</td>
<td>49%</td>
</tr>
<tr>
<td>Bicycle parking provided by my employer</td>
<td>19</td>
<td>46%</td>
</tr>
<tr>
<td>Other reasons</td>
<td>13</td>
<td>32%</td>
</tr>
<tr>
<td>Bus or rail not convenient to my home</td>
<td>7</td>
<td>17%</td>
</tr>
<tr>
<td>Bus or rail not convenient to my work</td>
<td>6</td>
<td>15%</td>
</tr>
<tr>
<td>Unpredictable work schedule</td>
<td>5</td>
<td>12%</td>
</tr>
<tr>
<td>Need bicycle during day</td>
<td>1</td>
<td>2%</td>
</tr>
</tbody>
</table>

\[n = 41\] 100%

### Table 82: Living close to work is the most-cited reason for walking to work

<table>
<thead>
<tr>
<th>Preference for Walk</th>
<th>Response</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live close to work</td>
<td>142</td>
<td>93%</td>
</tr>
<tr>
<td>Exercise/Health</td>
<td>85</td>
<td>56%</td>
</tr>
<tr>
<td>Costs less</td>
<td>62</td>
<td>41%</td>
</tr>
<tr>
<td>Convenience</td>
<td>54</td>
<td>36%</td>
</tr>
<tr>
<td>Faster trip</td>
<td>38</td>
<td>25%</td>
</tr>
<tr>
<td>Driving not convenient</td>
<td>37</td>
<td>24%</td>
</tr>
<tr>
<td>Environmental concerns</td>
<td>33</td>
<td>22%</td>
</tr>
<tr>
<td>Bus or rail not convenient to my home</td>
<td>12</td>
<td>8%</td>
</tr>
<tr>
<td>Other reasons</td>
<td>12</td>
<td>8%</td>
</tr>
<tr>
<td>Bus or rail not convenient to my work</td>
<td>8</td>
<td>5%</td>
</tr>
<tr>
<td>No other way to work</td>
<td>3</td>
<td>2%</td>
</tr>
</tbody>
</table>

\[n = 152\] 100%
17. Who bicycles or walks?

*Most downtown commuters complete their trip to work on foot*

Survey respondents were asked some variation of, “After you park/complete your primary bus or rail trip/etc., how do you complete your trip to work?” and selected all that apply from the following list:

<table>
<thead>
<tr>
<th>Walk on street level</th>
<th>Bus</th>
<th>Private shuttle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk in tunnels/skywalks</td>
<td>Rail</td>
<td>BicycLe</td>
</tr>
<tr>
<td>GreenLink</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In 2013, 11,883 respondents drive alone, ride bus or rail, or share a ride in a vanpool or carpool as their primary way to work. To complete their journey to work:

- More than 3,900 respondents – 33.2% – walk at street level the rest of the way to work.
- Nearly two thirds – 64.1% – use climate-controlled tunnels or skywalks to get to work.
- Nearly 200 respondents – 1.7% – ride some form of transit – bus, rail, or GreenLink – to complete their journey.
- More than 100 – 1.0% – access a private shuttle to get the rest of the way to work.

The overwhelming majority of survey respondents – 97.3% – complete their trip to work on foot. Further, if the broader pool of downtown employees behaves similarly to survey respondents – walking to work at street level – then one third of 150,195 workers would be approximately 50,000 people making 100,000 pedestrian trips a day on downtown streets. The importance of maintaining a high-quality pedestrian environment is readily apparent.

Table 83: More than 97% of survey respondents complete their trip to work on foot.

<table>
<thead>
<tr>
<th></th>
<th>Drive alone</th>
<th>%</th>
<th>Bus Rail</th>
<th>%</th>
<th>Carpool Vanpool</th>
<th>%</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk in Tunnels and/or Skywalks</td>
<td>3,950</td>
<td>54.0%</td>
<td>3,547</td>
<td>83.9%</td>
<td>116</td>
<td>34.2%</td>
<td>7,613</td>
<td>64.1%</td>
</tr>
<tr>
<td>Walk on Street Level</td>
<td>3,206</td>
<td>43.8%</td>
<td>554</td>
<td>13.1%</td>
<td>183</td>
<td>54.0%</td>
<td>3,943</td>
<td>33.2%</td>
</tr>
<tr>
<td>Private Shuttle</td>
<td>97</td>
<td>1.3%</td>
<td>21</td>
<td>0.5%</td>
<td>2</td>
<td>0.6%</td>
<td>120</td>
<td>1.0%</td>
</tr>
<tr>
<td>Bus</td>
<td>25</td>
<td>0.3%</td>
<td>51</td>
<td>1.2%</td>
<td>26</td>
<td>7.7%</td>
<td>102</td>
<td>0.9%</td>
</tr>
<tr>
<td>Rail</td>
<td>22</td>
<td>0.3%</td>
<td>40</td>
<td>0.9%</td>
<td>6</td>
<td>1.8%</td>
<td>68</td>
<td>0.6%</td>
</tr>
<tr>
<td>Greenlink</td>
<td>8</td>
<td>0.1%</td>
<td>13</td>
<td>0.3%</td>
<td>6</td>
<td>1.8%</td>
<td>27</td>
<td>0.2%</td>
</tr>
<tr>
<td>Bicycle</td>
<td>6</td>
<td>0.1%</td>
<td>4</td>
<td>0.1%</td>
<td>0</td>
<td>0.0%</td>
<td>10</td>
<td>0.1%</td>
</tr>
</tbody>
</table>

\[ n = 7,314 \quad 4,230 \quad 339 \quad 11,883 \quad 100.0\% \]
18. How do downtown residents get to work?

Who lives downtown?

Across the nation, downtowns in a broad range of American cities are strengthening, revitalizing, and adding urban residents. Millennial workers – under age 30 – are especially likely to prefer both to live and work in bustling, urban, downtowns.

Downtown Houston is the tenth most-dense employment node in the U.S. The Houston-Galveston Area Council (H-GAC) estimated that by 2010, there were more than 1,800 households located downtown within the highway loop of IH-10, IH-45, and US-59. Another 6,600 households are located within a ½-mile buffer of downtown.

Working from U.S. Census’ 2011 LEHD data, the International Downtown Association estimated that 22.2% of the wage and salary workers who live in the downtown core, and 12.3% of those who live within one mile of downtown, also work within downtown.

How do downtown residents get to work?

Among 2013 survey respondents, 261 report that they live in one of the three primary downtown zip codes:

- 45% of respondents who live in zip code 77002 walk to work.
- 37% of all respondents who live downtown walk or bicycle to work.
- 17% of employees who live in zip codes 77002 or 77003 use transit each day.

Table 84: Commute mode split for downtown residents by home zip codes: 37% walk or bike to work.

<table>
<thead>
<tr>
<th>Home zip code</th>
<th>SOV</th>
<th>Park &amp; Ride</th>
<th>Local Bus/Rail</th>
<th>Carpool</th>
<th>Vanpool</th>
<th>Bicycle</th>
<th>Walk</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>77002</td>
<td>33%</td>
<td>6%</td>
<td>11%</td>
<td>4%</td>
<td>1%</td>
<td>45%</td>
<td></td>
<td>181</td>
</tr>
<tr>
<td>77003</td>
<td>67%</td>
<td>0%</td>
<td>17%</td>
<td>12%</td>
<td>2%</td>
<td>3%</td>
<td></td>
<td>66</td>
</tr>
<tr>
<td>77010</td>
<td>29%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>71%</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>Downtown combined</td>
<td>41%</td>
<td>4%</td>
<td>12%</td>
<td>6%</td>
<td>1%</td>
<td>36%</td>
<td></td>
<td>261</td>
</tr>
</tbody>
</table>

New residential development

According to 2010 U.S. Census data, there were approximately 2,410 residential units located in downtown Houston, within the highway loop. In order to grow this housing supply, in August 2012, Houston City Council approved an incentive program for downtown residential development, administered by the Downtown Redevelopment Authority (DRA) and the Houston Downtown Management District (HDMD).

Armed with these incentives, in response to growing demand for downtown residential units, developers are working on at least ten new projects. As of March 2014, four new residential development projects totaling more than 1,200 units were already under construction. Another 2,250 residential units were in pre-development.
18. How do downtown residents get to work?

When built, the availability of new, high-quality downtown housing will enable more workers to live downtown, and in turn, facilitate an increase in the rates of transit, bicycles, and walking to work.

Figure 85. Ten residential projects are expanding opportunities for downtown living.
18. How do downtown residents get to work?

<table>
<thead>
<tr>
<th>EXISTING</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Dakota Lofts</td>
<td>53 Units</td>
<td></td>
</tr>
<tr>
<td>2 White Oak Lofts</td>
<td>12 Units</td>
<td></td>
</tr>
<tr>
<td>3 Bayou Lofts</td>
<td>106 Units</td>
<td></td>
</tr>
<tr>
<td>4 Franklin Lofts</td>
<td>62 Units</td>
<td></td>
</tr>
<tr>
<td>5 Herman Lofts</td>
<td>33 Units</td>
<td></td>
</tr>
<tr>
<td>6 Tennison Lofts</td>
<td>39 Units</td>
<td></td>
</tr>
<tr>
<td>8 Hogg Palace</td>
<td>79 Units</td>
<td></td>
</tr>
<tr>
<td>9 Post Rice Lofts</td>
<td>312 Units</td>
<td></td>
</tr>
<tr>
<td>10 St. Germain</td>
<td>109 Units</td>
<td></td>
</tr>
<tr>
<td>11 Capitol Lofts</td>
<td>37 Units</td>
<td></td>
</tr>
<tr>
<td>12 Club Quarters</td>
<td>70 Units</td>
<td></td>
</tr>
<tr>
<td>13 Commerce Towers</td>
<td>132 Units</td>
<td></td>
</tr>
<tr>
<td>14 Sabine Street Lofts</td>
<td>198 Units</td>
<td></td>
</tr>
<tr>
<td>15 Houston House</td>
<td>394 Units</td>
<td></td>
</tr>
<tr>
<td>16 Beaconsfield Condos</td>
<td>18 Units</td>
<td></td>
</tr>
<tr>
<td>19 2016 Main</td>
<td>353 Units</td>
<td></td>
</tr>
<tr>
<td>20 San Jacinto Lofts</td>
<td>16 Units</td>
<td></td>
</tr>
<tr>
<td>21 Foley Building</td>
<td>2 Units</td>
<td></td>
</tr>
<tr>
<td>22 1414 Congress</td>
<td>57 Units</td>
<td></td>
</tr>
<tr>
<td>23 D'George at Union Station</td>
<td>100 Units</td>
<td></td>
</tr>
<tr>
<td>24 Byrd's Lofts</td>
<td>5 Units</td>
<td></td>
</tr>
<tr>
<td>27 Keystone Lofts</td>
<td>31 Units</td>
<td></td>
</tr>
<tr>
<td>28 Kirby Lofts</td>
<td>65 Units</td>
<td></td>
</tr>
<tr>
<td>31 One Park Place</td>
<td>348 Units</td>
<td></td>
</tr>
<tr>
<td>32 Four Seasons Lofts</td>
<td>106 Units</td>
<td></td>
</tr>
<tr>
<td>33 City View Lofts</td>
<td>57 Units</td>
<td></td>
</tr>
<tr>
<td>34 Eller Wagon Works</td>
<td>32 Units</td>
<td></td>
</tr>
<tr>
<td>35 New Hope Housing</td>
<td>130 Units</td>
<td></td>
</tr>
<tr>
<td>37 Lofts at the Ballpark</td>
<td>375 Units</td>
<td></td>
</tr>
<tr>
<td>38 Plaza &amp; Peacock Apartments</td>
<td>32 Units</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNDER CONSTRUCTION</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>15 Block 334</td>
<td>207 Units</td>
<td></td>
</tr>
<tr>
<td>16 SkyHouse Houston</td>
<td>336 Units</td>
<td></td>
</tr>
<tr>
<td>28 Old Texaco Building</td>
<td>270 Units</td>
<td></td>
</tr>
<tr>
<td>36 500 Crawford</td>
<td>397 Units</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PLANNED</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7 Block 35-BMS</td>
<td>463 Units</td>
<td></td>
</tr>
<tr>
<td>24 Hines Market Square</td>
<td>289 Units</td>
<td></td>
</tr>
<tr>
<td>26 Block 52-Marquette Land Investment</td>
<td>380 Units</td>
<td></td>
</tr>
<tr>
<td>29 Block 98-Trammel Crow</td>
<td>518 Units</td>
<td>*Current as of 2/13/14</td>
</tr>
<tr>
<td>39 Block 330 &amp; 346-Camden</td>
<td>518 Units</td>
<td></td>
</tr>
<tr>
<td>40 Block 384-Allied Orion Group</td>
<td>302 Units</td>
<td></td>
</tr>
</tbody>
</table>

Note: Downtown Houston residential development project list current as of February 2014.
18. How do downtown residents get to work?

Figure 86. Downtown offers a variety of living options at all price points – from penthouse apartments to cool and funky lofts – to young urban professionals working downtown, empty nesters, reverse commuters, and small families.

WalkScore rated main downtown zip code as a “Walker’s Paradise”

WalkScore.com, an independent business which evaluates and promotes walkable neighborhoods, rated downtown zip code 77002 with a score of 92 out of 100. They described this area – which includes the vast majority of downtown Houston – as a “Walker’s Paradise” and asserted that “daily errands do not require a car.” Downtown’s walkability is contributing to strong demand for new residential development.

WalkScore partners with real estate firms across the United States in order to make it easy for people to evaluate walkability and transportation when choosing where to live. More than 30,000 websites – including Zillow, Trulia, and ForRent.com – incorporate WalkScore data services.

References


19. **Is there an untapped market for transit?**

**How many commuters choose transit on the days they don’t drive?**

One good way to understand which transportation options an employee will consider using is to identify which options they actually use when their preferred mode is unavailable. Survey respondents were asked about their back-up transportation choices. The 2013 survey asked, “When you do not drive alone / carpool or vanpool / take bus or rail / use a motorcycle or scooter / bicycle / walk, how do you prefer to get to and from work?” and invited respondents to select one of the following six transportation modes:

<table>
<thead>
<tr>
<th>Drive alone</th>
<th>Carpool/Vanpool</th>
<th>Bicycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus/Rail</td>
<td>Motorcycle/Scooter</td>
<td>Walk</td>
</tr>
</tbody>
</table>

Out of the 4,745 solo drivers who answered this question:
- nearly one third – 31.9% – **choose bus or rail transit**, and
- two out of five – 42.7% – **share a ride in a carpool** on the days they do not drive.

Out of the 1,116 respondents who usually share a ride in a carpool or vanpool, nearly one quarter – 24% – **choose bus or rail transit** on the days they are not in a car.

Among the solo drivers, **3.7% walk or bicycle** on the days they do not drive. This implies that these employees live close enough for active transportation to be a meaningful commute alternative, but they choose to drive alone instead.

Table 87 is grouped by primary commute mode, and shows the percentage of respondents who use choose each backup travel mode.

**Table 87: Back-up commute mode preferences by primary commute mode.**

<table>
<thead>
<tr>
<th>Back-up</th>
<th>Primary</th>
<th>SOV</th>
<th>Carpool/Vanpool</th>
<th>Motorcycle/Scooter</th>
<th>Park &amp; Ride</th>
<th>Local Bus/Rail</th>
<th>Bicycle</th>
<th>Walk</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOV</td>
<td>-</td>
<td>72.3%</td>
<td>63.0%</td>
<td>77.3%</td>
<td>71.6%</td>
<td>47.4%</td>
<td>48.0%</td>
<td></td>
</tr>
<tr>
<td>Carpool/Vanpool</td>
<td>42.7%</td>
<td>-</td>
<td>10.9%</td>
<td>14.5%</td>
<td>16.1%</td>
<td>5.3%</td>
<td>7.8%</td>
<td></td>
</tr>
<tr>
<td>Telecommute</td>
<td>20.2%</td>
<td>2.2%</td>
<td>0.0%</td>
<td>7.3%</td>
<td>5.2%</td>
<td>0.0%</td>
<td>7.8%</td>
<td></td>
</tr>
<tr>
<td>Bus</td>
<td>25.1%</td>
<td>23.4%</td>
<td>26.1%</td>
<td>-</td>
<td>-</td>
<td>36.8%</td>
<td>27.5%</td>
<td></td>
</tr>
<tr>
<td>Rail</td>
<td>6.8%</td>
<td>0.6%</td>
<td>*</td>
<td>-</td>
<td>-</td>
<td>*</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Bicycle</td>
<td>1.9%</td>
<td>0.4%</td>
<td>0.0%</td>
<td>0.1%</td>
<td>2.0%</td>
<td>-</td>
<td>8.8%</td>
<td></td>
</tr>
<tr>
<td>Walk</td>
<td>1.8%</td>
<td>0.3%</td>
<td>0.0%</td>
<td>0.2%</td>
<td>4.2%</td>
<td>10.5%</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Motorcycle/Scooter</td>
<td>1.6%</td>
<td>0.8%</td>
<td>-</td>
<td>0.6%</td>
<td>0.8%</td>
<td>0.0%</td>
<td>0.0%</td>
<td></td>
</tr>
</tbody>
</table>

n = 4,745 1,116 46 3,177 496 38 102

* For the Motorcycle, Bicycle, and Walk commuter sections of the survey, “Bus/Rail” was listed as a single combined option.
**How many respondents say they would switch to transit and why?**

In order to understand better how increased use of alternative transportation modes might be encouraged, survey respondents were presented a list of possible motivations that might cause them to choose another way to get travel to and from their downtown workplace, and asked to select all that apply. The most-frequent responses may represent levers for encouraging additional use of transit.

**Table 88: Percentage of solo drivers who would switch to an alternative travel mode for a given reason.**

<table>
<thead>
<tr>
<th>I would choose another way to get to/from downtown because:</th>
<th>Responses</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Economics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased prices</td>
<td>2,630</td>
<td>13%</td>
</tr>
<tr>
<td>Increased parking costs</td>
<td>1,870</td>
<td>9%</td>
</tr>
<tr>
<td>Increased vehicle costs</td>
<td>1,339</td>
<td>6%</td>
</tr>
<tr>
<td>Loss of income</td>
<td>1,443</td>
<td>7%</td>
</tr>
<tr>
<td>Employer subsidy of Bus/Rail</td>
<td>822</td>
<td>4%</td>
</tr>
<tr>
<td>Employer subsidy of Carpool/Vanpool</td>
<td>500</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Transit system route convenience</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More convenient Rail line near home</td>
<td>2,065</td>
<td>10%</td>
</tr>
<tr>
<td>More convenient P&amp;R near home</td>
<td>1,654</td>
<td>8%</td>
</tr>
<tr>
<td>More convenient Express Bus Route near home</td>
<td>1,141</td>
<td>5%</td>
</tr>
<tr>
<td>More convenient Local Bus Route near home</td>
<td>846</td>
<td>4%</td>
</tr>
<tr>
<td>More convenient Rail line near work</td>
<td>799</td>
<td>4%</td>
</tr>
<tr>
<td>More convenient P&amp;R near work</td>
<td>644</td>
<td>3%</td>
</tr>
<tr>
<td>More convenient Express Bus Route near work</td>
<td>510</td>
<td>2%</td>
</tr>
<tr>
<td>More convenient Local Bus Route near work</td>
<td>411</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Daytime flexibility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to vehicle for personal trips</td>
<td>557</td>
<td>3%</td>
</tr>
<tr>
<td>Access to vehicle for work trips</td>
<td>427</td>
<td>2%</td>
</tr>
<tr>
<td>Other reasons</td>
<td>617</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Barriers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live closer to work</td>
<td>1,255</td>
<td>6%</td>
</tr>
<tr>
<td>Enough people for carpool/vanpool</td>
<td>676</td>
<td>3%</td>
</tr>
<tr>
<td>Shower facilities at work</td>
<td>394</td>
<td>2%</td>
</tr>
<tr>
<td>Access to bicycles at work</td>
<td>200</td>
<td>1%</td>
</tr>
</tbody>
</table>
Table 88 presents the responses of solo drivers. While more than a quarter of solo drivers reported that they do use bus or rail transit as their backup transportation option on the days that they do not drive, it’s important to note that when asked what would motivate them to change their preferred mode, the vast majority – 87% – of solo drivers did not identify any factor that would motivate them to commute another way.

That being said, significant numbers of solo drivers say that they would switch to transit if it were more convenient to home:

- more than 1,600 solo drivers said they would switch to bus transit if there were a park-and-ride or express bus route more convenient to their home, and
- more than 2,000 solo drivers said they would switch to rail transit if there were convenient rail service near home.

**What can employers do to encourage transit use?**

As discussed further in section 20 on employer subsidies, workers use transit at higher rates when their employer provides a transit incentive and does not subsidize parking. Among 2013 respondents across all modes:

- more than 1,800 respondents said increasing parking costs would get them to switch to another mode,
- more than 800 respondents said a transit incentive from their employer would get them to switch to bus or rail alternatives, and
- more than 400 respondents said that access to a vehicle for work trips would allow them to use transit for their daily commute.

**Do carpools and vanpools represent demand for transit?**

As discussed in Section 15, there are two suburban high concentrations of carpoolers:

- zip code 77382 in Montgomery County, and
- zip code 77479 in Fort Bend County.

These carpool and vanpool riders may be using existing park-and-ride lots as their meeting point to ride together each day, and may represent demand for new or additional nonstop, fixed route park-and-ride service to downtown.

Also discussed in Section 15, the very highest concentrations of carpool and vanpool riders live in the denser urban neighborhoods just west and east of downtown Houston, including Montrose, the Washington Avenue corridor, and the East End. While these areas have access to local bus routes, they may not currently enjoy sufficiently high-frequency or convenient transit routes.

**METRO’s high-frequency bus network**

In general, transit ridership increases when buses or trains run more frequently. As frequencies increase, wait times come down, and riders no longer need a schedule to use transit. Transit is a more-compelling alternative along high-frequency transit routes.
Historically, METRO has operated about a dozen high-frequency bus routes – that run at least every 15 minutes all day – connecting downtown to adjacent neighborhoods.

Map 89 below is a detailed view from Map 12 – High-Frequency Transit with SOV Commuters Surveyed, which shows the distribution of respondents who drive alone relative to METRO’s network of highest-frequency bus routes and rail line. Many of the zip codes with the highest concentrations of solo drivers have some access to public transit, but are not served well by existing high-frequency transit routes.

In 2014, METRO will complete a Transit System Reimagining effort to optimize the entire network of bus routes and integrate it with expanding rail service. The project scope includes sweeping elements that will dramatically improve transit service:

- improving the frequency of service to reduce wait times and reliance on schedules,
- shifting routes to better align transit coverage with development patterns, and
- improving potential connections, especially with new light rail lines.

METRO will launch the first set of new route improvements in the fall of 2014. With more high-frequency routes and an easier to understand network, it is likely that some who drove alone to work in 2013 will choose local transit in the near future.

Map 89. Many areas with the highest concentrations of solo drivers have some access to public transit, but are not served well by METRO’s existing high-frequency routes.
20. Do employer subsidies affect how employees get to work?

Why do employers subsidize transportation?
Offering a rich array of competitive transportation benefits helps companies attract and retain the best employees, while reducing demand for parking, reducing taxes, and exhibiting global corporate citizenship. For fiscal 2014, most employers may provide to their employees tax-free:

- transit, vanpool, and carpool benefits up to $130 per month,
- bicycle commuter benefits up to $20/month, and/or
- parking costs up to $250 per month.

Employers save on payroll related taxes, and employees save on federal income taxes. Section 132 (f) of the Internal Revenue Code identifies qualified transportation fringe benefits. In 2012 and 2013, a short-lived “rule of parity” made the combined limit for transit and vanpooling the same as for parking, however that rule expired. Congress may yet extend the rule of parity for 2014.

What transportation incentives do employers offer?
Many employers subsidize parking. Other employers cash out the value of parking and provide a flexible transportation allowance that gives employees a choice of options.

Employers offer a variety of transportation-related subsidies:

- employer-paid tax-free transit passes, vanpool passes, or carpool passes
- parking cash-out, which enables workers to trade free parking for its cash equivalent
- preferred or reduced-cost parking for carpools and vanpools
- ridesharing or carpool matching
- reimbursement for emergency rides home
- access to pool vehicles and/or low-cost, nearby auto rental for daytime trips
- provide bike racks, lockers, and showers or gym access
- private shuttles to and from transit stations
- workplace charging stations for plug-in electric vehicles
- compressed work weeks and flexible work schedules
- strong telework programs

Best Workplaces for Commuters is a nationwide program that identifies best practices and recognizes employers who offer outstanding commuter benefits. Chevron, Akari Energy, and the Houston-Galveston Area Council (H-GAC) are among the Houston companies who have met the national standard of excellence developed by the National Center for Transit Research (NCTR) and U.S. Environmental Protection Agency (EPA).

Learn more about Best Workplaces for Commuters at: http://www.bestworkplaces.org/
What can the 2013 survey tell us about employer transportation incentives?

In 2013, Central Houston asked respondents for each mode, “How much does your employer subsidize your parking / bus or rail trip / vanpool / bicycle parking?” and respondents selected one of the following eight options:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>0%</th>
<th>1 to 20%</th>
<th>21 to 40%</th>
<th>41 to 60%</th>
<th>61 to 80%</th>
<th>81 to 99%</th>
<th>100%</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2013</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Parking subsidies

The majority – 80% – of survey respondents who drive solo daily park their vehicle in a garage structure. It is common for downtown employers to help employees cover the cost of parking.

Parking costs vary significantly. Daily parking rates range from $5/day up to $40/day depending on location and parking type. Monthly contract rates for garage parking can range from $110 per month upwards, depending on location and whether one reserves a specific parking space.

Out of the 6,832 respondents who completed the SOV parking subsidy question, 58% report receiving some level of parking incentive from their employer. More than 40% of respondents report that their employer pays 100% of their parking cost. Figure 91 shows the distribution of parking subsidies reported by solo drivers surveyed.

When employers subsidize parking, driving solo becomes somewhat more attractive as a commute option. To the extent that employers do not subsidize parking, employees are free to choose the most competitive travel alternative.

Figure 91. 80% of solo drivers park in garage structures nestled among the towers.
Figure 92. 58% of solo drivers received some level of parking subsidy from employer.

How much does it cost to drive solo each day?

Respondents who drive solo were asked to estimate and report the daily cost of their commute trip, including fuel, vehicle costs, tolls, and parking. They were asked to categorize their approximate daily commute costs at one of 9 levels:

- $< 5.00 per day
- $5.00 to $9.99
- $10.00 to $14.99
- $15.00 to $19.99
- $20.00 to $24.99
- $25.00 to $29.99
- $30.00 to $39.99
- $40.00 to $49.99
- $> 50.00

Figure 93 shows the distribution of reported commute costs among 6,707 solo drivers:

- One quarter report commute costs less than $5.00 per day.
- Half of all solo drivers report that their commute costs less than $10.00 per day.
- More than two thirds – 69% – report spending less than $15.00 per day.

Figure 93. Solo drivers reported a median daily commute cost between $5.00 and $9.99.
Among solo drivers surveyed, the median daily commute cost was between $5.00 and $9.99. However, it is unclear whether the 58% of these respondents who receive a parking subsidy included the value of that subsidy in their daily cost calculation.

6% of respondents report spending $40 or more per day. Given the wide range of commute costs, it is likely that some respondents reported only daily cash costs, such as parking and tolls, others included infrequent recurring expenses for fuel, insurance, maintenance, and amortized depreciation expenses. It is also possible that some respondents, such as consulting professionals, use rental cars for their daily drive.

One can safely assume that some employees are more sensitive than others to the costs associated with driving solo. To the extent that an individual is not cost-sensitive, they may be less likely to consider less expensive transportation alternatives.

**Transit incentives**

Out of the 3,806 respondents who completed the Bus/Rail subsidy question, fully 70% report receiving some level of transit subsidy from their employer. More than 30% of respondents report that their employer pays 100% of their transit fare cost. Figure 94 shows the distribution of incentives reported by transit commuters.

**Figure 94.** 70% of bus and rail riders surveyed receive some level of transit incentive.
Carpool and vanpool incentives

Out of the 1,867 respondents who completed the Car/Vanpool subsidy question, more than 70% reported that their employer does not provide financial support for vanpools or carpools. Less than 10% of respondents report receiving any level of vanpool subsidy from their employer, and only 3% report that their employer pays 100% of vanpool costs. Figure 95 shows the distribution of incentives reported by carpool and vanpool users.

Bicycle commuting incentives

Among the respondents who bicycle to work each day, approximately 30% reported that their employer covers 100% of the cost of bicycle parking, and about half report that their employer does not subsidize bicycle parking.

Figure 96. 30% of bike commuters said that their employer pays 100% of bike parking.

Motorcycle and scooter subsidies

Among the 47 respondents who ride motorcycles or scooters to work each day, 40% reported that their employer covers the full cost of parking. Nearly half – 47% – received some level of parking subsidy.

Figure 97. 40% of motorcycle/scooter commuters said that their employer pays 100% of parking costs.
Do employer subsidies affect commute decisions?

A significant number of downtown employees state that they would choose another way to get to work if their employer subsidized the option:

- More than 1,000 survey respondents, across all primary commute modes, said that they would choose transit instead if their employer provided a financial incentive.
- More than 900 respondents said they would share rides in a carpool or vanpool if their employer subsidized it.

Table 98. More than 1,900 respondents said they would use transit or share rides if their employer provided a financial incentive.

<table>
<thead>
<tr>
<th>Employer subsidy of:</th>
<th>SOV</th>
<th>Transit</th>
<th>Carpool</th>
<th>Motorcycle</th>
<th>Walk</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus/Rail</td>
<td>822</td>
<td>160</td>
<td>9</td>
<td>10</td>
<td></td>
<td>1,001</td>
</tr>
<tr>
<td>Carpool/Vanpool</td>
<td>500</td>
<td>436</td>
<td></td>
<td></td>
<td></td>
<td>936</td>
</tr>
<tr>
<td>Parking</td>
<td>574</td>
<td></td>
<td>14</td>
<td></td>
<td></td>
<td>588</td>
</tr>
</tbody>
</table>

In order to fully explore the impact of employer transportation subsidies on employee commute behavior, a commute survey would need to ask every respondent whether their employer subsidizes each of the travel modes in question: parking, transit, carpool/vanpool, or active transportation (walking/biking).

In 2013, Central Houston only asked survey respondents whether their employer subsidizes the commute mode they routinely use. That is, the survey asked individuals who drive solo whether their employers subsidize parking, and asked individuals who choose park-and-ride or local bus/rail whether their employers subsidize transit, etc.

That being said, by analyzing the survey data for organizations with more than one employee represented, it is possible to draw some preliminary observations about the distribution and effect of transportation subsidies.

58 firms represented in the survey offer transportation subsidies

While survey respondents did not identify their employer, more than 140 unique entities are represented among the responses. Out of these, 58 companies had 2 or more survey respondents who reported that their employer subsidizes their commute. Table 99 below shows the number of firms represented by 2013 survey respondents who reportedly offer various combinations of transportation incentives.

Table 99. Multiple respondents from 58 companies reported commute subsidies.

<table>
<thead>
<tr>
<th>Types of subsidies reported</th>
<th>Count of companies</th>
<th>Count of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsidize parking, transit, and van/carpools</td>
<td>20</td>
<td>5,385</td>
</tr>
<tr>
<td>Subsidize parking and transit</td>
<td>22</td>
<td>899</td>
</tr>
<tr>
<td>Subsidize parking and van/carpools</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Subsidize parking only</td>
<td>13</td>
<td>161</td>
</tr>
<tr>
<td>Subsidize transit only</td>
<td>2</td>
<td>11</td>
</tr>
</tbody>
</table>

58 n = 6,463
Commute mode splits vary under different incentive schemes

In order to understand the effect that different transportation incentive schemes have on employee commute decisions, one can review the commute mode split among the firms that offer incentives. These 58 entities account for 11,637 respondents, including respondents who did not report taking advantage of subsidies.

Among these 58 entities, the type of transportation incentives an employer offered demonstrably shaped the commute choices of their employees. The firms that only pay for parking have the highest rate of solo driving.

The firms that only pay for transit have the highest rates of bus and rail commuting. Note also, these firms that fund transit and do not pay for parking also have the highest share of employees who walk or bicycle to work daily.

**Figure 100.** Highest rates of transit use were reported in firms which provide only transit incentives.

Examples of how transit subsidies increase rates of transit utilization

In early 2012, Central Houston interviewed representatives from two dozen downtown employers, in order better understand the relationship between transportation incentives and commute mode split.

These companies varied widely with respect to transportation subsidies offered to employees for parking, bus/rail transit, and car/vanpool. However, some generalizations can be made. Employees with the following characteristics were more likely to use transit:

- Employer provides a transit subsidy
- Employee is offered a lower subsidy for parking than transit
- Employer’s culture encourages public transit as part of its “green” initiatives
- Employee’s job does not regularly require daytime travel
- Workforce is highly administrative, technical, service, or professional
- Employee lives farther than 20 miles from downtown
- Employee is younger than 25 or older than 45
Typically at least 20% of a company’s employees used transit even with no subsidy, while some companies achieved 45-65% employee use of transit. The result: employers did not need to commit to one parking space per employee, and with their downtown location, they could draw from a larger labor pool.

Each of the points in Figure 101 below represents one of the downtown firms interviewed in 2012. Central Houston can provide additional details and connect employers with downtown firms to discuss subsidies and transit.

**Figure 101. Employers who subsidized transit saw higher rates of employee transit use.**

![Graph showing the relationship between transit subsidy and transit use.](image)

**References**


21. Has downtown’s commute mode split changed since 2009?

Over the last 27 years, Central Houston, Inc. has conducted six surveys of downtown workers, specifically in 1987, 1999, 2002, 2006, 2009, and the most recent in 2013. Each survey represents a snapshot of commute behavior by a particular sample group, at a particular time, using various survey methodologies.

**How does 2013 compare to 2009?**

For active commutes by walking and bicycling, and also for motorcycles/scooters, there is no difference in mode share between the 2009 and 2013 samples. However, use of the predominant travel modes appears to have shifted between the two samples:

- **56.8%** of respondents **drove alone**, an increase compared to 48.4% in 2009.
- **32%** chose **public mass transit**, a decline compared to 36.7% in 2009.
- **9.3%** share rides in a **vanpool/carpool**, a decrease compared to 12.6% in 2009.

Some of the apparent shift between modes may be explained by differences between survey samples, and some is real and meaningful, as discussed throughout this section.

**Figure 102.** Comparing mode splits among 2009 and 2013 samples shows apparent shifts: 56.8% of respondents drove alone to work in 2013, up from 48.4% in 2009.
Survey characteristics mitigate some of the apparent shift in mode split

Figure 103 shows the shift in percentage points for each commute mode between the 2009 and 2013 surveys. While the 2013 results appeared to mark an 8-point shift away from transit and shared modes toward driving alone, some aspects of the survey samples may explain some of the apparent shift:

- **More Government workers participated** – 21.8% of respondents work in the Government sector, up from 5% in 2009, reflecting strong encouragement to participate from City and County leaders. Government respondents reported among the highest rates of solo driving. This may be in part because law enforcement professionals and others reported that they operate agency vehicles which they are required to drive home each day, precluding use of an alternative mode of travel. To the extent that the responding agency employees are more likely to drive alone, they will tend to skew the mode split of the entire survey.

- **More women participated** – While the majority of downtown workers are male – 57% male / 43% female – the 2013 survey sample is disproportionately female: 48.7% male and 51.3% female. Among 2013 respondents, women drove alone at higher rates than men, which may shift the overall commute mode split found in the survey.

- **Fewer Service workers participated** – In 2009, respondents from the Hospitality, Food & Beverage industry reported the highest rates of local bus and/or rail use. These respondents comprised 4% of the 2009 survey sample, helping to increase the mode share for transit somewhat. In 2013, the Hospitality industry accounted for just 2.3% of the sample, potentially undercounting transit use.

- **Fewer Healthcare workers participated** – In 2009, respondents from the Healthcare sector made up 2% of the survey sample and reported among the highest rates of carpooling, with 12% of respondents sharing rides. In 2013, Healthcare workers accounted for 0.07% of the sample, making a negligible contribution to the overall mode split.

While differences between the survey samples may explain some of the variation between Central Houston’s 2009 and 2013 results, some of the shift in commute mode split is real and meaningful. The following sections assess this further.

Figure 103. 2013 appeared to mark an 8-point shift away from transit and shared modes toward driving alone.
Gasoline prices and consumer sentiment

Transportation planners differ regarding the extent to which gasoline prices impact travel behavior. However, research suggests that sustained increases in fuel prices suppress driving, spur increased use of transit and ride sharing, and lead to increased efficiency.\textsuperscript{29}

Central Houston’s 2009 Downtown Commute Survey responses were collected in the spring of 2009. The preceding year saw Gulf Coast retail gas prices nearly double to a record high $3.97 per gallon in July 2008.\textsuperscript{30} At the same time, the economy had begun shrinking and estimates of consumer sentiment were declining.

In 2008, METRO saw record high ridership on its park-and-ride use bus system as well as the regional vanpool network. The popularity of both transit and ride sharing were well reflected in the 2009 downtown commute mode split.

Figure 104: By 2009, gas prices had doubled and consumer sentiment had plummeted. By 2013, gas prices were stable near $3.50 and consumer sentiment was improving.

Figure 105. By 2009, the “Great Recession” marked drops in the total regional workforce and all travel modes, but transit use, carpool ride sharing fell harder than solo driving.\textsuperscript{31}
Recession economy of 2009 showed strong growth by 2011

Per capita personal income

One good measure of a metropolitan economy is per capita income as reported by the U.S. Department of Commerce. Their Bureau of Economic Analysis computes and reports income measures including wages and salaries, proprietors’ income, transfers to individuals, and income from dividends, interest, and rent. Per capita personal income data is available for metropolitan statistical areas (MSAs) and other geographic levels.

Figure 106 shows the percent growth in Houston’s per capita income from one annual period to the next for the 8-county MSA. From 2008 to 2009, the “Great Recession” dropped per capita personal income by 10.9%.32

Central Houston’s 2009 Downtown Commute Survey gathered responses during this time, and measured record high levels of transit use and ride sharing. In spring 2009, less than half – 48% – of downtown workers surveyed drove alone to work each day. This commute behavior is consistent with a workforce that is sensitive to – and has less available income to expend on – the costs of driving alone.

Figure 106. The “Great Recession” of 2009 dropped per capita personal income in the Houston MSA by more than 10%, but the effect was short-lived. Since then, Houston has recovered and incomes have risen.

Unemployment

Central Houston’s 2009 survey was in the field in spring 2009, early in the recession. With unemployment beginning to rise from December 2008, it is likely that effects of unemployment were minimally apparent in the 2009 survey results.

Subsequently, the region was hit hard by the “Great Recession,” losing more than 150,000 jobs. Unemployment affects travel behavior in several ways:

- Individuals who stop working also stop commuting, by transit or any other means. Figure 105 shows that the Houston region workforce shrank from 2008 to 2011.
- Some workers with jobs, who are concerned by economic changes, may choose more cost-effective commute modes, such as public mass transit or vanpooling.
- Other workers may perceive reduced highway congestion, due to fewer total commuters during peak travel times, and choose to drive alone.
Figure 107 shows that Houston’s unemployment rate peaked in 2010 and has improved annually since. By spring of 2013, Houston’s economy was recovering well. In fact, Houston recovered faster than any major U.S. metropolitan area. Economist Patrick Jankowski, VP of Research for the Greater Houston Partnership noted:

“Houston was the first among the nation’s major metro areas to recover all the jobs it lost in the recession. The region lost 153,100 jobs between December ’08 and January ’10. Growth resumed in February ’10 and the region has since created 362,000 jobs, or 2.4 jobs for every one job lost.”

Downtown’s current commute survey was in the field in spring 2013. The commute behavior documented likely reflected the choices of a strong and growing workforce, with more people working and more income to expend on driving, coupled with highway congestion that had not yet resumed pre-recession levels.

Figure 107. December 2008 brought rising unemployment to Houston, but job growth resumed in February 2010, pushing unemployment toward pre-recession levels.

Please note: In the chart above and those that follow, a gray bar denotes the period of regional economic recession.

Major employers and transit sponsors relocated personnel

Many of the largest U.S. corporations used the recession as an opportunity to restructure and become more efficient. Downtown’s largest employers were no exception.

Historically, park-and-ride transit use is strongest among employers who serve as Ride Sponsors with METRO and/or subsidize transit. Between 2009 and 2013, several of the largest downtown employers merged, consolidated, downsized, or relocated personnel, including Continental Airlines, El Paso Energy, Kinder Morgan, and Devon Energy.

In addition, the G.T. "Mickey" Leland Federal Building temporarily dispersed Congressional offices, passport services, and other tenants across the city while the building is completely renovated.

Many of these employers advocated transit use by employees. While some of these shifts were offset by workforce growth at other downtown employers – including Chevron and KBR – they have not necessarily translated into additional transit use.
Urban roadway mobility and congestion

In their annual *Urban Mobility Report*, researchers from the Texas A&M Transportation Institute (TTI) present data-driven measures of mobility and roadway congestion for cities across the U.S. These measures enable transportation planners, decision-makers, and the public to understand congestion problems and the role of possible solutions.

Figure 108 shows how two measures of roadway congestion changed in the Houston region from 2005 to 2011, the most-recent year for which data is available:

- **Total delay** – in thousands of person-hours – measures the total travel time above that necessary for all travelers to complete trips at free-flow speeds, and
- **Annual delay per commuter** – in person-hours – is a yearly sum of all the per-trip delays for individuals who travel in the peak periods (6 to 10 am and 3 to 7 pm).

In the Houston region, travel delays due to roadway congestion peaked in 2008, the same year that retail gas prices peaked near $4 per gallon. 2008 is also when both METRO and the Brazos Transit District saw record high park-and-ride transit boardings. Downtown’s commute survey, which was in the field in early 2009, reflected this peak.

Through 2009, the average travel delay per peak auto commuter plummeted 9%, from 55 to 50 person-hours per year, as the recession reached Houston and unemployment began to rise. During this time, METRO’s park-and-ride boardings fell 5.0% through the end of 2009.

In 2010 and 2011, delays from congestion per commuter grew only slightly – 2% per year – but did not reach the prior high. METRO’s park-and-ride boardings continued to fall into 2011 and plateaued through 2012. Downtown’s 2013 commute survey results reflect this nadir of park-and-ride usage.

Figure 108. TTI’s analysis of urban mobility across the Houston region shows that delays from roadway congestion peaked in 2008 and then fell dramatically with the recession.

*Please note: In the chart above, a gray column denotes the regional economic recession.*

More recently, since the downtown survey, TTI researchers indicate that roadway congestion increased through 2012 and 2013 as Houston’s economy improved. Similarly, METRO reports that park-and-ride boardings increased through 2013, as well.

Learn more about TTI’s *Urban Mobility Report*: [http://mobility.tamu.edu/ums/](http://mobility.tamu.edu/ums/)
Transit use rose nationally, and recently ticked up across Houston

Across the U.S., commuting by public transit has increased slowly and steadily in recent years. It's important to note that growth in transit use is occurring despite capacity constraints in transit systems across the country.

In the Houston region, transit commuting fell markedly from 2008 to 2009 with the economic downturn, rising unemployment, and lessening roadway congestion. Since 2009, commuting to work via public transit – including local bus and rail – has risen, both in the City of Houston and across the Houston region.

Census estimates of modest increases in transit commuting from 2009 to 2012 appear inconsistent with the decrease reported among the 2013 downtown survey respondents. It is likely that the downtown survey did not adequately include respondents from some industries with high rates of local transit use, such as Retail, Hospitality, and Students.

Figure 109. National transit commuting rates continue to tick up slowly and steadily; in Houston, transit use dipped significantly through the recession and is slowly rising again.

METRO deployed new “Q card” fare media in early 2008

In February 2008, METRO introduced a new electronic fare medium called the Q card. Riders prepay fares which are stored on the smart card and deducted at the time of travel. Transfers are handled electronically. The Q card replaced a bewildering array of magnetic media and discounted passes, with the result that some riders paid more to ride. By April 1, 2008, all riders had to present a Q card or cash payment.

METRO’s new fare media were in use for more than ten months before the 2009 Commute Survey. The Q card rollout is unlikely to explain differences in transit usage between the 2009 and 2013 surveys of downtown commuters.

METRO increased transit fares in late 2008

Later the same year, in November 2008, METRO explicitly increased base transit fares for the first time in 14 years, to $1.25, up from $1.00 for local trips. Park-and-ride fares increased more significantly, from 25 to 33%, depending on the “zone” or travel distance. One-way fares on commuter buses ranged from $2 to $4.50.
21. Changes from 2009 to 2013

Figure 110. METRO’s weekday average boarding data shows that park-and-ride use increased in every highway corridor from 2012 to 2013, as congestion levels returned, but had not yet returned to 2008 peak boarding levels.

Table 111. METRO’s park-and-ride boardings history shows ridership peaked in 2008 in all but one corridor. Ridership grew from 2012 to 2013, but did not reach prior peak.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>621</td>
<td>3,581</td>
<td>4,228</td>
<td>5,898</td>
<td>6,520</td>
<td>5,190</td>
<td>3,909</td>
<td>718</td>
</tr>
<tr>
<td>2008</td>
<td>857</td>
<td>3,709</td>
<td>4,568</td>
<td>6,509</td>
<td>6,068</td>
<td>5,896</td>
<td>4,595</td>
<td>817</td>
</tr>
<tr>
<td>2009</td>
<td>758</td>
<td>3,614</td>
<td>4,224</td>
<td>6,452</td>
<td>5,537</td>
<td>5,580</td>
<td>4,521</td>
<td>687</td>
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<tr>
<td>2010</td>
<td>659</td>
<td>3,260</td>
<td>3,639</td>
<td>5,571</td>
<td>4,955</td>
<td>4,912</td>
<td>4,050</td>
<td>558</td>
</tr>
<tr>
<td>2011</td>
<td>630</td>
<td>2,998</td>
<td>3,487</td>
<td>5,292</td>
<td>4,489</td>
<td>4,526</td>
<td>3,624</td>
<td>466</td>
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<tr>
<td>2012</td>
<td>593</td>
<td>3,087</td>
<td>3,519</td>
<td>5,279</td>
<td>4,475</td>
<td>4,656</td>
<td>3,282</td>
<td>414</td>
</tr>
<tr>
<td>2013</td>
<td>643</td>
<td>3,265</td>
<td>3,783</td>
<td>5,790</td>
<td>4,672</td>
<td>5,082</td>
<td>3,617</td>
<td>479</td>
</tr>
</tbody>
</table>

FY2008 to FY2013

| Change     | (214) | (444) | (784) | (718) | (1,396) | (814) | (978) | (338) |
| %          | -25%  | -12%  | -17%  | -11%  | -23%    | -14%  | -21%  | -41%  |

FY2009 to FY2013

| Change     | (115) | (349) | (441) | (662) | (865) | (498) | (904) | (208) |
| %          | -15%  | -10%  | -10%  | -10%  | -16%  | -9%   | -20%  | -30%  |

FY2012 to FY2013

| Change     | 50    | 178   | 264   | 511   | 197    | 426   | 335   | 65    |
| %          | 8%    | 5%    | 7%    | 9%    | 4%     | 8%    | 9%    | 13%   |
METRO park-and-ride boardings peaked in October 2008, immediately before the fare increase, and declined steadily through fall 2011, as the recession hit Houston, before flattening out in 2012 and beginning to tick up again in 2013.

It is possible that higher park-and-ride fares may have contributed to declining use of commuter park-and-ride buses from 2009. However, Houston METRO continues to have among the lowest transit fares in the nation.

Table 111 presents METRO’s weekday average park-and-ride boardings history by highway corridor. From 2012 to 2013, ridership on all of the METRO park-and-ride routes that serve downtown grew between 4 and 13%, as roadway congestion returned. However, compared to 2009, ridership in the busiest corridors is still down 9 to 16%.

By comparison, the Brazos Transit District (BTD) operates “Woodlands Express” park-and-ride bus service between downtown and Montgomery County. BTD also lost riders between 2008 and 2010 — during the recession — but not to the same extent as METRO.

Figure 112. Compared to Fort Bend and Brazos Transit’s commuter service, ridership on METRO’s park-and-ride routes was slow to recover after the 2009 recession.

TxDOT completed IH-10 reconstruction in 2008

Commuter demand for park-and-ride bus service is directly related to levels of roadway congestion in the corridor. When travel times come down on the general purpose lanes, there is less travel time advantage from transit or carpool ridesharing in the HOV lanes.

On the west side of Houston, TxDOT completed a major five-year reconstruction of a 12-mile section of the Katy Freeway from west of SH-6 to the IH-10/IH-610 interchange in October 2008. The $2.8 billion project doubled the number of “free” main lanes.

It is likely that the opening of additional highway capacity – “free” and relatively uncongested main lanes – led some westside commuters who previously chose park-and-ride buses to switch to driving alone.
**HOV transitways opened to toll-paying solo drivers**

Most of Houston’s successful commuter bus service relies on barrier-separated, high-occupancy vehicle (HOV) lanes in the middle of the highway. These lanes are intended to move transit, carpools, and vanpools well even as daily peak traffic congestion slows the main general purpose lanes.

Then, between the 2009 and 2013 Commute Surveys, four of the region’s HOV facilities opened to toll-paying solo drivers. HCTRA opened the Katy Managed Lanes along IH-10 in 2009. METRO subsequently opened the IH-45 Gulf HOV, US-59 Southwest HOV, and IH-45 North HOV lanes to toll payers in 2012.

METRO subsequently opened the region’s two remaining HOV facilities – the US-290 Northwest HOV and US-59 Eastex HOV – to toll-paying solo drivers in summer 2013. These conversions occurred after Central Houston’s 2013 Commute Survey and did not affect the results.

**HCTRA’s Katy Managed Lanes opened in 2009**

Prior to reconstruction of IH-10, METRO park-and-ride buses operated within a single reversible HOV lane located in the center of the highway. HOV traffic flowed inbound during the morning commute, and reversed to flow outbound for the evening commute.

The TxDOT project replaced the HOV lane with four bidirectional “managed lanes” and shifted operation to the Harris County Toll Road Authority (HCTRA). The Katy Managed Lanes extend from SH-6 to IH-610 West, and are open not only to carpools and mass transit buses, but also to solo drivers who pay a toll to access the potential time savings. This was the first managed lane project constructed in Texas.

**Figure 113.** Since 2009, the Katy Managed Lanes along IH-10 serve toll-paying solo drivers as well as transit buses, vanpools, carpools, and motorcycles.

*Photo credit: Harris County Toll Road Authority*
The Katy Managed Lanes opened in April 2009, while Central Houston’s 2009 Commute Survey was already in the field. Any changes in travel behavior prompted by the new lanes should appear in the 2013 survey results.

Toll access to managed lanes affects transit mode share in several ways:

- As previously noted, demand for park-and-ride bus service is directly related to levels of roadway congestion in the corridor. Managed lanes allow some solo drivers to avoid main lane congestion by paying a toll instead of switching to transit or vanpool.

- Demand for the managed lanes is fairly elastic and is inversely related to toll rates. When congestion in the corridor is high and the toll rate is too low, an abundance of toll-paying solo drivers can exceed the capacity in the managed lanes and cause congestion. Congestion in the managed lanes reduces transit’s advantage by causing delays and reducing travel time reliability.

In 2009, the Katy Managed Lanes performed for transit users much the way the preceding HOV lane had, with reliable travel times and minimal delays. Figures 114, 115, and 116 present annualized speed chart data from Houston TranStar.

Traffic volumes in the managed lanes doubled from 2009 to 2011, such that carpools and toll-paying vehicles made up more than 95% of the traffic volume. As vehicle volumes increased, performance degraded significantly, with average operating speeds falling below 40 mph during peak hours. The resulting congestion penalized transit users, vanpools, carpools, and toll payers alike.

With park-and-ride buses increasingly stuck in managed lane congestion, travel times not only grew longer but also became less reliable, reducing transit’s advantage. It is likely that some west side commuters opted to drive rather than choose park-and-ride.

HCTRA successfully improved one serious operational challenge to the Katy Managed Lanes. A merge at the westbound entry near IH-610 caused congestion during the PM rush and degraded average speeds from more than 60 mph to near 30 mph. In July 2012, HCTRA restriped the pavement to eliminate the merge and provide two westbound lanes at the Post Oak Road entry. Removing this bottleneck restored average speeds to more than 60 mph, as shown in Figure 114.

Figure 114. Speed charts from Houston TranStar for the Katy Managed Lanes show that from 2010 to 2012, an operational bottleneck at the Post Oak Road westbound entry reduced average speeds significantly during the PM rush. In 2013, after HCTRA restriped the entry to remove the merge, average speeds returned to 2009 levels.
However, as utilization of the Katy Managed Lanes grew from 2009 to 2012, the facility neared capacity and other problem spots emerged that remain to be addressed:

- Near the Addicks park-and-ride lot east of SH-6, where the “T-ramp” accesses the managed lanes, traffic volumes are high enough during peak hours that there are insufficient gaps for vehicles from the ramp to merge into the managed lanes, causing recurring congestion.

- Near Gessner east of the Sam Houston Tollway/Beltway 8, in the “cross facility weaving area,” travelers who exit must make six (or seven) lane changes over a short distance—through traffic on the IH-10 main lanes—to reach the tollway.

Figures 115 and 116 present speed charts for the Katy Managed Lanes at these locations. As more solo drivers have chosen to pay tolls and traffic volumes have increased, average speeds have decreased since 2009, increasing delays. The resulting congestion has penalized transit users, vanpools, carpools, and toll payers alike.

Figure 115. Speed charts from Houston TranStar for the Katy Managed Lanes show bottlenecks like the T-ramp near SH-6 reduce speeds, increase delays in the AM rush.

Figure 116. Speed charts from Houston TranStar for the Katy Managed Lanes show exiting through the IH-10 main lanes at Gessner slows westbound users in the PM rush.
METRO opened three HOV lanes to toll-paying solo drivers in 2012

METRO operates the HOV lanes in the region’s other five busiest highway corridors. In 2009, at the time of the prior survey of downtown commuters, HOV lanes were accessed for free by transit riders, vanpools, carpools, and motorcycles.

During 2012, METRO opened three of these facilities – IH-45 Gulf HOV, US-59 Southwest HOV, and IH-45 North HOV – to solo drivers who pay a toll. Any effect of this conversion to High-Occupancy Toll (HOT) lanes should be apparent in the 2013 results.

METRO reported that by spring of 2013, more than 6,000 toll-paying vehicles used the HOT lanes daily. Similar to the Katy Managed Lanes, METRO reported that average use of the HOT lanes doubled between 7 and 8 am. As a result, congestion increased significantly, affecting transit users, vanpools, carpools, and toll-paying drivers alike.

Officially, HOT lanes are reserved for transit, vanpools, and carpools between 7 and 8 am; however, METRO reported that a significant number of solo drivers pay the toll to access their facilities just before the 7 am cut-off, contributing to congestion and delays for transit and ride-sharing users during the peak hour. Figures 117 and 118 present speed charts for portions of these three HOT lanes.

**Figure 117. Speed charts from Houston TranStar for the IH-45 Gulf HOV and US-59 Southwest HOV lanes show growing congestion during AM peak commute hours reduced speeds and increased delays in 2012 and 2013.**
Figure 118. Speed chart from Houston TranStar for the IH-45 North HOV lane shows growing congestion during AM peak commute hours reduced speeds in 2012 and 2013.

Higher toll rates improved performance in 2013 and 2014

The intent of adding toll access to HOV facilities was to take advantage of unused capacity in the lanes and give commuters another mobility option. However, federal statute 23 U.S. Code § 166 - HOV facilities in Federal Aid Highways – requires that HOT lanes continue to operate at 45 miles per hour or more a minimum of 90% of the time.38

Both HCTRA and METRO have seen more demand from toll-paying solo drivers than their managed lanes had capacity available:

- Along the IH-45 Gulf HOV, between 7 and 8 am, the number of cars using the lane nearly doubled from ~18,000 to ~33,000 per month. The average monthly speed fell below 45 mph in April 2012 less than two months after the lane opened to solo drivers, and declined further since then.

- Along the Katy Managed Lanes westbound at the Eldridge Parkway toll plaza, by August 2013, more than 2,000 vehicles typically used the toll lane and another 1,400 used the HOV lane. HCTRA said each lane could handle 1,800 to 2,000 vehicles and still operate at 45 mph under optimal conditions.

Tom Lambert, who was then interim METRO president and CEO, said in a statement:

“The lanes are first and foremost HOV lanes and we don’t want to compromise the benefit of the HOV system for those who ride the bus, vanpool or carpool.”

In a practice called congestion pricing, toll operators increase tolls at peak times in order to shift travel demand to shoulder-peak or off-peak times. Commuters who don’t want to pay more to travel during peak hours can pay less to travel earlier or later, or avoid tolls altogether by sharing rides or switching to transit.

To keep the lanes moving, both HCTRA and METRO recently raised peak-hour tolls:

- In September 2013, HCTRA increased toll prices on the Katy Managed Lanes during peak hours from $5 to $7 to travel the entire 12-mile length one way. After the increase, METRO boardings increased at the Grand Parkway park-and-ride lot by 15% and at the Kingsland lot by 4%. The number of drivers choosing to pay tolls fell about 9%, use of the HOV lane rose about 2%.
In January 2014, METRO increased peak-hour toll prices on all five of its HOT lane facilities by $2 to $6.50 or $7, depending on the corridor and expanded carpool-only access during the morning rush by 30 minutes to 6:30 am. Comparing October 2013 to January 2014 (to factor out seasonal variation), METRO park-and-ride boardings increased 2.8% during peak hours after the toll increase. The number of drivers choosing to pay tolls fell 9.7% and use of the HOV lane decreased by 5.3%. Raising peak toll rates had the desired effect of shifting demand from driving alone toward riding carpools, vanpools, or transit. Further, as daily vehicle counts came down, average operating speeds increased, improving trips for all users of the managed lanes.

Going forward, as the population grows and the economy strengthens further, roadway congestion is likely to increase, spurring additional demand for the HOT/managed lanes. Additional increases to peak hour toll rates will likely be necessary to maintain HOT lane performance and keep transit, vanpools, carpools, motorcycles, and toll payers moving. Both HCTRA and METRO are likely to consider real-time, dynamic toll pricing, as well.

**Driving trends changed across the US and Texas**

What does Census data suggest about commute trends from 2005-2012?

The U.S. Census’ American Community Survey (ACS) distributes annual estimates regarding how workers age 16 and over travel between home and work. Across the country, rates of solo driving from home to work have stayed flat or fallen since 2005.

In contrast, both across Texas and across the Houston region, rates of driving alone to work rose from 2006 to 2011. More recently, rates of driving alone fell from 2011 to 2012, but did not dip below 2009 levels.

Census estimates of the change in solo commuting from 2009 to 2012 appear smaller than the increase reported by 2013 downtown survey respondents.

Figure 119. Across the U.S., rates of solo driving commutes remained relatively flat, while they rose across the Houston region from 2006 through 2011, before dipping in 2012.
More broadly, driving is on the decline across the U.S.

Commute trips between home and work account for just 15.6% of all trips. Any discussion of how workers travel to their jobs must come in a broader context of how individuals travel in general, and whether travel behavior is changing. There is much discussion among transportation planners regarding whether we have hit “Peak Travel.”

Two important questions are whether demand for auto travel is changing and if so, how strongly? Evidence suggests that travel patterns are changing. Figure 120 presents traffic volume data from the Federal Highway Administration:

- Across the U.S., driving has leveled off after decades of steady growth, as measured by total vehicle miles traveled (VMT). This shift began before the recession and has continued during the economic recovery.
- U.S. driving peaked in late 2007, when Americans logged approximately 3 trillion total vehicle miles. From 2007 to 2012, the average annual change in total VMT is -0.03%, at a time when the average change in population is 0.07%.
- More importantly, the average American is driving less, as measured by VMT per capita. The charts in Figures 120 and 121 use the U.S. Bureau of Labor Statistics’ Civilian Noninstitutional Population Age 16 and Over as the deflator to adjust total miles driven for population growth. U.S. VMT per capita peaked in June 2005 at approximately 13,000 miles/person, and has since fallen 7.4% to average just over 12,000 miles/person in 2013.

Figure 120. Across the U.S., vehicle miles traveled (VMT) per capita peaked in June 2005, well before the recession, and has declined significantly since.

Results of the 2009 National Household Travel Survey (NHTS) show similar trends:

- From 2001 to 2009, average annual VMT per household fell 6.3% for all trip purposes, including shopping, family and personal errands, and social and recreational trips; and
- average annual VMT per household for trips to or from work fell 3.7%.

Please note: Gray bars denote periods of economic recession.
Driving is on the decline in Texas, too

In many regards, Texas performs differently than the nation in aggregate. Strong local economies, a young and growing population, expansive development patterns, and auto-centric transportation infrastructure all contribute to the importance of automobiles.

However, evidence suggests that travel patterns are changing in Texas as well. Figure 121 presents traffic volume data for Texas from the Federal Highway Administration:

- Across Texas, total driving has continued to grow, with Texans logging more than 246 billion miles traveled in 2013. Total vehicle miles traveled (VMT) continued to grow from 2006 through 2012, but at a much slower rate. Total VMT grew strongly from 2012 into 2013. The combination of a strong economy and a younger, growing population is likely to drive continued growth in total VMT across Texas.

- However, similar to the U.S. trend, the average Texan is driving less, as measured by VMT per capita. Texas VMT per capita peaked in May 2006, slightly later than the U.S. peak, at 20,849 miles/person, and has since fallen 9.3% to average 18,920 miles/per person in 2013.

- The average Texan still drives considerably more than the average American. It’s noteworthy that both Americans and Texans are driving less now than previously.

Figure 121. Across Texas, vehicle miles traveled (VMT) per capita peaked in May 2006, slightly later than the U.S. peak, and declined significantly from 2008 to 2012.

![Graph showing VMT per capita in Texas from 2004 to 2013](image)

The broad population includes those who travel very little and those who travel far and often. What’s noteworthy is that enough individuals are choosing to drive less that the shift is readily apparent in aggregate travel data. The implications of this shift are broad and significant for employers, property owners, developers, and individuals alike.

Downtown location supports a variety of travel preferences

Downtown Houston is well-positioned to enable changes in travel preferences. As the largest employment center in the region, with a growing residential base and an adjacent array of vibrant urban neighborhoods, downtown offers both work and lifestyle options to satisfy individuals who choose to live close to work and travel less. Downtown is the place where public transit service and sidewalks are most prevalent, and offers a wide variety of travel choices other than driving, to those for whom it’s important. Downtown
and its adjacent urban neighborhoods represent the kind of accessible and sustainable community that the market is increasingly demanding.

At the same time, downtown Houston is situated at the central hub of a strong and diverse transportation network, with highway, tollway, and commuter transit access. Downtown remains accessible to the entire Houston region.

**Vanpool ride sharing remained flat from 2009 to 2013; carpooling declined**

Prior to 2007, METRO operated the METROVan program and H-GAC operated the miniPOOL program. In May 2007, these two programs were united and rebranded to form the STAR Regional Vanpool program, and operational control shifted to METRO.

Across the region, vanpool ridership rose through the early 2000s and peaked in 2008 with record high fuel prices. Similar to transit use, ride sharing fell through the recession into 2010. Vanpool use has risen only marginally since 2010, and 2013 levels are very similar to 2009 levels.43

Figure 122. STAR regional vanpool ridership peaked in 2008, fell with the recession, and has risen only marginally since 2010.

Please note: Vanpool data above combines METROVan ridership from FY04 through April 2007 with miniPOOL ridership from May 2004 through April 2007. These programs were united to form the “STAR” regional vanpool program effective May 1, 2007.

Vanpool utilization is limited among downtown employers, in large part because park-and-ride commuter bus service is so compelling. Anecdotally, employers located in downtown areas that are not immediately adjacent to park-and-ride routes are more likely to take advantage of vanpool ride sharing.

**Table 123. Downtown employers supported more vans and riders in 2013 than in 2009.**

<table>
<thead>
<tr>
<th>Month</th>
<th>Vans</th>
<th>Riders</th>
<th>Monthly trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 2009</td>
<td>47</td>
<td>524</td>
<td>14,524</td>
</tr>
<tr>
<td>May 2013</td>
<td>54</td>
<td>542</td>
<td>17,774</td>
</tr>
</tbody>
</table>

Source: METRO Star Regional Vanpool program.
Vanpool use by downtown commuters actually increased between May 2009 and May 2013, the two time periods during which commute surveys were in the field. Going forward, there are opportunities to expand utilization of vanpools further:

- First, a small number of large employers account for the vast majority of vanpools. To the extent that employers experienced staff reduction and employee turnover in the recession, existing vanpools were likely disrupted. Any renewed internal effort to recruit vanpool participants – post-recession – is likely to yield positive results.

- Second, prior to 2007, the METROVan and miniPOOL programs had 9 team members assigned to business development and customer service functions. Since 2007, the combined STAR vanpool program has 3 team members deployed to these tasks, limiting staff availability for employer recruitment and rider education. In order to grow vanpool utilization, the regional program may require additional resources.

That being said, vanpools account for only a portion of those who share rides. Many more commuters share rides in carpools. The shift in the downtown commute mode split is likely to reflect decreased use of smaller carpools, rather than vanpools.

The U.S. Census’ American Community Survey (ACS) data indicates that ride sharing – including both carpools and vanpools – declined from 2008 to 2011 across the nation as well as across the Houston region. More recently, ride sharing increased across the Houston region between 2011 and 2012.

The Census estimates that ride sharing – both carpooling and vanpooling – declined from 2009 to 2012 by just one point or two; less than the decrease reported among 2013 downtown survey respondents. It is possible that the 2013 survey sample did not adequately include participants from some of the industries with higher rates of carpooling and vanpooling, such as healthcare workers.

Nonetheless, with lower levels of roadway congestion from 2009 to 2011, it is also likely that some who previously shared rides began driving alone.

Figure 124. Nationally, rates of sharing rides in a carpool or vanpool declined from 2008 to 2010 before stabilizing. Across the Houston region, rates of ride sharing fell between 2008 and 2011, then climbed again in 2012, as roadway congestion increased.
Working from home remained flat

Across the 8-county MSA in 2012, the American Community Survey reported approximately 98,000 workers – 3.5% of the regional workforce – worked from home, the same rate as the prior peak in 2008. Said differently, more than 96% of Houston-area workers travel daily to their employer’s workplace.

Figure 125. Across the U.S., the small share of employees who work from home has grown steadily; in the Houston region, 96.5% of workers continue to commute daily.

With the vast majority of employees commuting daily, workplace flexibility options like telework, compressed work weeks, and flexible start and end times allow workers to avoid at least one peak-time commute each week. These programs have many benefits:

- participating employees enjoy shorter travel times and endure less commute stress,
- employers benefit from more-productive employees, and
- other area commuters enjoy shorter travel times and less roadway congestion.

In 2006, a pilot study called “Flex in the City” was championed by former Houston Mayor Bill White and measured the effects of flexible work hours on roadway congestion and travel times. Participating employees shifted from a typical 8 am to 5 pm, Monday through Friday work week, to a 9/80 schedule, working 80 hours in 9 working days and having every other Friday off. Shifting start or end times reduced peak-hour travel.

Approximately 10,000 Houston-area employees participated and the effects were significant. During the two-week initiative, flexible workplace initiatives not only benefited the participants, but also had a positive measurable impact on general purpose traffic, reducing highway travel times on IH-45 for all travelers by an average 6% or 2 minutes.44
More changes ahead: opportunities looking forward...

Car sharing. By late 2013, ZipCar offered hourly car rental in the downtown market, and Enterprise Car Share was poised to join them. These membership-based car sharing programs serve both individuals and business accounts, complementing other modes of transportation with convenient vehicles available by the hour.

Car share programs work similarly to bike share systems. Vehicles are parked in designated spots around town. Member-users can reserve a car online or via a smart phone app, unlock the car with their RFID member card, pay by the hour to drive, and return the vehicle to the original spot.

Among commute survey respondents, 43% arrived at their downtown workplace without a personal vehicle. Car sharing will give these workers yet another option for quick trips during the workday. Car sharing can be a cost-effective and convenient alternative to company-owned autos, with online scheduling and accounting.

Downtown Living Initiative. In response to strong demand for downtown living and armed with incentives, developers were working on at least ten new residential projects. With 1,200 units already under construction in March 2014 and another 2,250 units in pre-development, availability of new, high-quality downtown housing is poised to double. By enabling more workers to both live and work downtown, these new residences are likely to facilitate an increase in the share of workers who can commute without a car.

Dynamic, real-time toll pricing. Through 2013, both HCTRA and METRO set toll rates and carpool occupancy requirements by time of day. Figure 126 shows sample tolls:

<table>
<thead>
<tr>
<th>Time</th>
<th>Sun</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri</th>
<th>Sat</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:00 a.m.</td>
<td>CLOSED</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>CLOSED</td>
</tr>
<tr>
<td>6:00 a.m.</td>
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<td>$6.50</td>
<td>$6.50</td>
<td>$6.50</td>
<td>$6.50</td>
<td>$6.50</td>
<td>CLOSED</td>
</tr>
<tr>
<td>6:30 a.m.</td>
<td>CLOSED</td>
<td>HOV 2+ Only</td>
<td>HOV 2+ Only</td>
<td>HOV 2+ Only</td>
<td>HOV 2+ Only</td>
<td>HOV 2+ Only</td>
<td>CLOSED</td>
</tr>
<tr>
<td>8:00 a.m.</td>
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<td>$4.50</td>
<td>$4.50</td>
<td>$4.50</td>
<td>$4.50</td>
<td>$4.50</td>
<td>CLOSED</td>
</tr>
<tr>
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<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>CLOSED</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>CLOSED</td>
<td>$1.00</td>
<td>$1.00</td>
<td>$1.00</td>
<td>$1.00</td>
<td>$1.00</td>
<td>CLOSED</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
</tbody>
</table>

Figure 126. METRO’s schedule of tolls by time of day for solo drivers in the IH-45 Gulf HOV/HOT lane as of February 2014.
21. Changes from 2009 to 2013

The price is highest during peak travel times and lowest in off-peak times. These static rates and requirements do help to shift demand from peak travel hours to "shoulder-peak" hours, which generally helps the managed lanes perform better.

However, demand for managed lanes varies day to day, and increases dramatically when traffic incidents or inclement weather affect the main lanes. When these occur, sudden increases in managed lane volumes can cause traffic flow to break down. The lanes experience periodic congestion and unreliable performance.

Time of day pricing is blunt, and unresponsive to weather or traffic events. In some circumstances, the result can penalize both user groups:

- solo drivers may pay a toll to access HOT/managed lanes without receiving a travel advantage compared to the general purpose lanes, and
- HOV user may choose transit or ride sharing and experience similar traffic congestion and travel delays as solo drivers.

An alternative may be to employ dynamic pricing, adjusting toll rates in near real time according to traffic conditions in the lanes. Dynamic tolls would regulate demand for the lanes and keep them operating at high speeds. As traffic increases in the managed lanes, the tolls rise. At higher toll rates, fewer solo drivers choose the lanes, thinning out traffic in real time. By late 2013, real-time, dynamic toll pricing was already in use across the nation in Atlanta, Dallas, Los Angeles, and Washington, DC.

**Extension of HOV lanes.** Most of Houston’s successful commuter bus service relies on barrier-separated, HOV lanes in the middle of the highway. These lanes effectively move transit vehicles, carpools, and vanpools even as daily peak traffic congestion slows the main general purpose lanes.

However, key roadway sections – such as IH-10 inside the IH-610 loop between TC Jester and Taylor – lack dedicated lanes for HOVs. Figure 127 shows how growing roadway congestion has dropped average speeds and increased delays along IH-10 inside the IH-610 loop as traffic volumes increased from 2009 to 2013.

Extending HOV lanes toward the downtown business district and other job centers will help ensure commuter buses, vanpools, and carpools can maintain their travel time advantage and complete trips without getting caught in mixed traffic.

**Figure 127.** Speed chart from Houston TranStar shows westbound IH-10 commuters are increasingly stuck in stop-and-go traffic inside the loop during the PM rush.
Additional HOV infrastructure elements are helpful as well:

- Direct connector ramps from park-and-ride lots to HOV and managed lanes ensure that commuter buses, vanpools, and carpools do not get stuck in mixed traffic.
- Barriers separating HOV lanes from highway main lanes reduce cheating, and help ensure that the transitway continues to perform when main lane incidents like crashes might encourage solo drivers to jump in and oversubscribe the facility.

**Federal transportation reauthorization.** MAP-21, the two-year federal legislation which authorized federal transportation spending, passed in July 2012 and expires September 30, 2014. The formulas that Congress enacted in MAP-21 to apportion federal dollars significantly reduced the amounts available for incentives and projects in the Houston region, especially for expanding and operating public transit.

Congress must act by August 2014, either to extend MAP-21 or negotiate the next federal transportation bill. The provisions of this legislation will affect future funding for expansion of downtown access and transportation across the Houston region.

**METRO system reimagining.** In 2014, METRO will complete an effort to redesign the bus network from the ground up, to better meet the region's changing needs and priorities. The project scope is intended to dramatically improve transit service:

- improving the frequency of service to reduce wait times and reliance on schedules,
- shifting routes to better align transit coverage with development patterns, and
- improving potential connections, especially with new light rail lines.

METRO will launch the first set of new route improvements in the fall of 2014. With more high-frequency routes and an easier to understand network, it is likely that some who drove alone to work in 2013 will choose local transit in the near future.

**Minivan procurement authorization.** For some commuters, the option to share rides with five others in a minivan – “mini POOL” – rather than in a larger van is an attractive introduction to vanpooling. Vanpool vans and minivans, like other federally-funded transit vehicles, must comply with federal “Buy America” procurement provisions.

However, as of 2012, none of the popular minivans available in the U.S. market were certified by the U.S. Department of Transportation (US DOT) for procurement. Until one of the major minivan manufacturers seeks and gains certification, or FHWA grants a waiver, the Star Regional Vanpool program will return to larger, 8-12-passenger vans.

**Rule of parity.** Section 132 (f) of the Internal Revenue Code identifies qualified transportation fringe benefits that companies may offer employees, free of taxes. For fiscal 2014, most employers may provide to their employees tax-free:

- transit, vanpool, and carpool benefits up to $130 per month,
- bicycle commuter benefits up to $20/month, and/or
- parking costs up to $250 per month.

Solo drivers have been granted a higher pre-tax benefit. For 2012 and 2013, Congress enacted a short-lived “rule of parity” which made the combined limit for transit and vanpooling the same as for parking. However, that rule expired. Congress may yet extend the rule of parity for 2014, leveling the playing field between solo drivers and individuals who choose other transportation alternatives. Both vanpool and transit ridership increase when either federal or employer incentives increase.
Conclusion

From 2009 to 2013, the downtown commute mode split appears unchanged for active commutes by walking and bicycling, and also for motorcycles/scooters. However, the predominant travel modes among survey respondents shifted. More downtown workers drove alone, and fewer chose public transit, vanpools, or carpools.

Several aspects of the two survey samples may explain some of the apparent shift: more participation by government workers and women, who drive at higher rates; less participation by retail, hospitality, and healthcare workers, who drive alone at lower rates.

However, some of the shift in commute mode split is real and meaningful. Each survey represents a snapshot of commute behavior at a particular time, and Central Houston’s 2009 survey of downtown commuters reflected a remarkable situation:

- In 2008, a strong Houston economy and low unemployment drove high levels of roadway congestion and travel delays among solo drivers, and
- significant roadway congestion coupled with record-high retail gas prices spurred record numbers of commuters to choose park-and-ride transit or vanpooling.

Then, the “Great Recession” hit Houston hard through 2009:

- A struggling economy and rising unemployment not only eliminated significant numbers of workers who previously chose transit or vanpools, but also,
- decreased roadway congestion and reduced average travel delays by 9%, making it attractive for more workers to drive alone.

In 2010 and 2011, delays from congestion per commuter grew only slightly, and METRO’s park-and-ride boardings continued to fall, finally plateauing in 2012. Downtown’s 2013 survey results reflect this nadir of park-and-ride usage.

During this same interval, HCTRA opened the Katy Managed Lanes along IH-10, and METRO converted three HOV facilities to HOT lanes. Allowing solo drivers to pay a toll to gain access to HOT/managed lanes affected transit use in several ways:

- Demand for park-and-ride bus service is directly related to levels of roadway congestion in the corridor. Managed lanes allow some solo drivers to avoid main lane congestion by paying a toll instead of switching to transit or vanpool.
- Demand for the managed lanes is fairly elastic and is inversely related to toll rates. When congestion in the corridor is high and the toll rate is too low, an abundance of toll-paying solo drivers can exceed the capacity in the managed lanes and cause congestion. Congestion in the managed lanes reduces transit’s advantage by causing delays and reducing travel time reliability.

The 2013 Downtown Commute Survey results are consistent with large numbers of commuters taking advantage of toll access to HOT and managed lanes to drive alone. Since the survey, both HCTRA and METRO have increased toll rates during peak hours, which improved travel times and reliability, and spurred more people to choose transit.

Outside of work commutes, Texans have been choosing to drive less per capita since 2006, consistent with a similar trend nationwide. Downtown is a well-connected activity center which offers high-quality jobs, diverse residential options, shopping, and entertainment, and is surrounded by vibrant urban neighborhoods. Downtown has much to offer this changing market and is well-positioned for growth going forward.
References


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42 Federal Highway Administration. 2011. “2009 National Household Travel Survey (NHTS).”

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44 CA Lewis, I Joskowicz, A Voigt. 2009. “Mobility Measurements of the City of Houston Flextime Initiative.”


A1. **Primary online survey instrument**

The 2013 survey is divided into 10 sections. All respondents were asked the following introductory questions.

**Introductory questions**

### 2013 Downtown Houston Commute Survey

#### Live or Work Downtown Houston

Please answer the following question.

1. **Do you WORK or LIVE in downtown Houston?**
   - Yes
   - No

#### Days per week

Please answer this questions about how often you commute to or from downtown.

2. **How many days per week do you usually commute to or from downtown?**
   - <1
   - 1
   - 2
   - 3
   - 4
   - 5
   - 6
   - 7

   **Comment:**

#### Fewer than 5 days per week

Please answer these questions if you commute to or from downtown fewer than 5 days per week.

3. **On the days you do not commute to or from downtown, where do you work?**

   - [ ] Home
   - [ ] Company work site
   - [ ] Field work
   - [ ] Client work site
   - [ ] Other (please specify)

4. **What is the zip code of this secondary work location?**


General work trip questions

All respondents were asked the following general questions about what time they commute to/from work, how far they travel, how many minutes it takes them, and whether they stop at other destinations along the way.

2013 Downtown Houston Commute Survey

General Work Trip Questions

Please answer the following questions about your usual commute.

5. What time do you usually leave home to go to work?

- 4:00 a.m. to 4:29 a.m.
- 4:30 a.m. to 4:49 a.m.
- 5:00 a.m. to 5:29 a.m.
- 5:30 a.m. to 5:59 a.m.
- 6:00 a.m. to 6:29 a.m.
- 6:30 a.m. to 6:59 a.m.
- 7:00 a.m. to 7:29 a.m.
- 7:30 a.m. to 7:59 a.m.
- 8:00 a.m. to 8:29 a.m.
- 8:30 a.m. to 8:59 a.m.
- 9:00 a.m. to 3:59 p.m.
- 4:00 p.m. to 9:59 p.m.
- 10:00 p.m. to 3:59 a.m.

6. How many stops do you usually make on your way to work?

- 0
- 1
- 2
- 3
- 4 or more

7. What types of stops do you usually make on your way to work?

- Beverage/food
- Gym/Exercise
- Child Care
- Elder Care

Other (please specify)

8. How many minutes does it usually take you to get to work?

- <5 minutes
- 5 to 9 minutes
- 10 to 14 minutes
- 15 to 19 minutes
- 20 to 24 minutes
- 25 to 29 minutes
- 30 to 39 minutes
- 40 to 49 minutes
- 50 to 59 minutes
- 60 to 74 minutes
- 75 to 89 minutes
- >90 minutes

9. How many miles do you travel to work?

- <1 mile
- 1 to 2 miles
- 3 to 4 miles
- 5 to 9 miles
- 10 to 19 miles
- 20 to 29 miles
- 30 to 39 miles
- 40 to 49 miles
- 50 to 59 miles
- 60 to 69 miles
- >70 miles
### 2013 Downtown Houston Commute Survey

#### 10. What time do you usually leave work to go home?

- [ ] 3:30 p.m. to 3:59 p.m.
- [ ] 4:00 p.m. to 4:29 p.m.
- [ ] 4:30 p.m. to 4:59 p.m.
- [ ] 5:00 p.m. to 5:29 p.m.
- [ ] 5:30 p.m. to 5:59 p.m.
- [ ] 6:00 p.m. to 6:29 p.m.
- [ ] 6:30 p.m. to 6:59 p.m.
- [ ] 7:00 p.m. to 7:29 p.m.
- [ ] 7:30 p.m. to 7:59 p.m.
- [ ] 8:00 p.m. to 3:59 a.m.
- [ ] 4:00 a.m. to 7:59 a.m.
- [ ] 8:00 a.m. to 3:29 p.m.

#### 11. How many stops do you usually make on your way home from work?

- [ ] 0
- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4 or more

#### 12. What type of stops do you usually make going home from work?

- [ ] Beverage/Food
- [ ] Gym/Exercise
- [ ] Child Care
- [ ] Elder Care

Other (please specify)

#### 13. How many minutes does it usually take to get from work to home?

- [ ] <5 minutes
- [ ] 5 to 9 minutes
- [ ] 10 to 14 minutes
- [ ] 15 to 19 minutes
- [ ] 20 to 24 minutes
- [ ] 25 to 29 minutes
- [ ] 30 to 39 minutes
- [ ] 40 to 49 minutes
- [ ] 50 to 59 minutes
- [ ] 60 to 74 minutes
- [ ] 75 to 89 minutes
- [ ] >80 minutes

#### 14. How many hours per week do you usually work?

- [ ] <4 hours
- [ ] 4 to 8 hours
- [ ] 9 to 12 hours
- [ ] 13 to 16 hours
- [ ] 17 to 20 hours
- [ ] 21 to 25 hours
- [ ] 26 to 30 hours
- [ ] 31 to 35 hours
- [ ] 36 to 40 hours
- [ ] >40

Other (please specify)

### Mode Question

*Please answer the following question about your commute to or from downtown.*

#### 15. How do you usually commute to/from downtown?

- [ ] Drive alone
- [ ] Bus/Rail
- [ ] Carpool/Vanpool
- [ ] Motorcycle/Scooter
- [ ] Bicycle
- [ ] Walk
Drive alone commute questions

The following questions were only asked of the respondents who prefer to drive solo.

<table>
<thead>
<tr>
<th>2013 Downtown Houston Commute Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive Alone Commute Questions</td>
</tr>
</tbody>
</table>

Please answer these questions about your usual commute.

16. I drive alone because of the following (check all that apply):

<table>
<thead>
<tr>
<th>Option</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need a vehicle during the day</td>
<td>Bad weather conditions</td>
</tr>
<tr>
<td>Need to make stops going to or from work</td>
<td>Cost</td>
</tr>
<tr>
<td>Prefer independence/flexibility</td>
<td>Convenience</td>
</tr>
<tr>
<td>Unpredictable work schedule</td>
<td>Status</td>
</tr>
<tr>
<td>Too close to work</td>
<td>Faster</td>
</tr>
<tr>
<td>Bus/rail not convenient to my home</td>
<td>Parking paid by employer</td>
</tr>
<tr>
<td>Bus/rail not convenient to my work</td>
<td>Personal safety</td>
</tr>
<tr>
<td>Bus/Rail schedule not convenient</td>
<td>Personal comfort</td>
</tr>
<tr>
<td>Not enough people for carpool/vanpool</td>
<td>Traffic congestion</td>
</tr>
</tbody>
</table>

Other (please specify)

17. What is your daily cost for your commute trip? Please include such costs as fuel, vehicle costs, tolls, and parking. Or, you may use the commute calculator: [click here](#)

<table>
<thead>
<tr>
<th>Cost per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>$&lt;5.00</td>
</tr>
<tr>
<td>$5.00 to $9.99</td>
</tr>
<tr>
<td>$10.00 to $14.99</td>
</tr>
<tr>
<td>$15.00 to $19.99</td>
</tr>
<tr>
<td>$20.00 to $24.99</td>
</tr>
<tr>
<td>$25.00 to $29.99</td>
</tr>
<tr>
<td>$30.00 to $39.99</td>
</tr>
<tr>
<td>$40.00 to $49.99</td>
</tr>
<tr>
<td>$50.00 to $79.99</td>
</tr>
</tbody>
</table>

Other (please specify)

18. How much does your employer subsidize your parking?

<table>
<thead>
<tr>
<th>Subsidy Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
</tr>
<tr>
<td>1 to 20%</td>
</tr>
<tr>
<td>21 to 40%</td>
</tr>
<tr>
<td>41 to 60%</td>
</tr>
<tr>
<td>61 to 80%</td>
</tr>
<tr>
<td>81 to 99%</td>
</tr>
<tr>
<td>100%</td>
</tr>
<tr>
<td>Don't know</td>
</tr>
</tbody>
</table>

19. Where do you usually park?

<table>
<thead>
<tr>
<th>Parking Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garage</td>
</tr>
<tr>
<td>Surface Lot</td>
</tr>
<tr>
<td>On-street</td>
</tr>
</tbody>
</table>

Other (please specify)
### 2013 Downtown Houston Commute Survey

#### 20. After you park, how do you complete your trip to work (Check all that apply)?
- [ ] Walk on Street Level
- [ ] Walk in Tunnel(s)/Skywalk(s)
- [ ] Bus
- [ ] Rail
- [ ] GreenLink
- [ ] Private Shuttle
- [ ] Bicycle

#### 21. After you park, how many minutes does it usually take for you to get to work?
- [ ] <5 minutes
- [ ] 5 to 9 minutes
- [ ] 10 to 14 minutes
- [ ] >15 minutes

#### 22. When you do not drive alone, how do you prefer to get to and from work?
- [ ] Bus
- [ ] Vanpool
- [ ] Walk
- [ ] Rail
- [ ] Motorcycle/Scooter
- [ ] Telework/Telecommute
- [ ] Carpool
- [ ] Bicycle

Other (please specify)

---

#### 23. I would choose another way to get to and from downtown because of the following (check all that apply):

- [ ] Increased gas prices
- [ ] Increased vehicle costs
- [ ] Increased parking costs
- [ ] Loss of income
- [ ] Employer subsidy of Bus/Rail
- [ ] Employer subsidy of Carpool/Vanpool
- [ ] More convenient Park & Ride near home
- [ ] More convenient Local Bus Route near home
- [ ] More convenient Express Bus Route near home
- [ ] More convenient Rail line near home
- [ ] More convenient Park & Ride near work
- [ ] More convenient Local Bus Route near work
- [ ] More convenient Express Bus Route near work
- [ ] More convenient Rail line near work
- [ ] Live closer to work
- [ ] Shower facilities at work
- [ ] Access to bicycles at work
- [ ] Access to vehicle for work trips
- [ ] Access to vehicle for personal trips
- [ ] Enough people for carpool/vanpool

Other (please specify)
Bus and rail commute questions

The following questions were only asked of the respondents who commute by park-and-ride bus, local bus, local rail, or some combination of the three.

2013 Downtown Houston Commute Survey

Bus/Rail Questions Commute Questions

Please answer these questions about your usual commute.

24. I usually travel to work on the following bus or rail transit service (check all that apply):

- [ ] METRO Local Bus (Route #001 to 099)
- [ ] METRO Express Bus (Route #100 to 199)
- [ ] METRO Park & Ride (Route #200 to 299)
- [ ] METRO Rail
- [ ] Woodlands Express Bus
- [ ] Fort Bend County Public Transportation Bus

Other (please specify)

25. I take the bus/rail because of the following (check all that apply):

- [ ] Saves gas
- [ ] Reduces wear and tear on my car
- [ ] Use HOV lanes
- [ ] Environmental concerns
- [ ] No other way to get to work
- [ ] Avoid driving in traffic
- [ ] Convenience
- [ ] Costs less
- [ ] Faster trip

Other (please specify)

26. How much does your employer subsidize your bus or rail trip?

- [ ] 0%
- [ ] 1 to 20%
- [ ] 21 to 40%
- [ ] 41 to 60%
- [ ] 61 to 80%
- [ ] 81 to 90%
- [ ] 91 to 99%
- [ ] 100%
- [ ] Don't know
2013 Downtown Houston Commute Survey

27. After you complete your primary bus or rail trip, how do you complete your trip to work?
   - Walk on street level
   - Walk in tunnel(s)/skywalk(s)
   - Bus
   - Rail
   - Greenlink
   - Private Shuttle
   - Bicycle
   Other (please specify)

28. How many minutes does it take you to get from where you exit the bus or rail, to complete your trip to work?
   - <5 minutes
   - 5 to 9 minutes
   - 10 to 14 minutes
   - >15 minutes

29. When you do not take bus or rail, how do you prefer to get to and from work?
   - Drive Alone
   - Motorcycle/scooter
   - Walk
   - Carpool/Vanpool
   - Bicycle
   - Telework/telecommute
   Other (please specify)

30. I would choose another way to get to and from work because of the following (check all that apply):
   - Increased bus or rail fares
   - Employer subsidy for parking
   - Employer subsidy for carpool/vanpool
   - Bus/Rail schedule changes
   - Home or work location changes
   - Added stop(s) to my bus/rail route
   - Added transfer(s) to my bus/rail route
   - Vehicle available
   Other (please specify)
Carpool/Vanpool commute questions

The following questions were only asked of the respondents who share rides each day in a carpool or vanpool.

<table>
<thead>
<tr>
<th>31. I carpool/vanpool because (check all that apply):</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Bus/Rail not convenient to home</td>
</tr>
<tr>
<td>□ Bus/Rail not convenient to work</td>
</tr>
<tr>
<td>□ Park &amp; Ride not convenient to home</td>
</tr>
<tr>
<td>□ Park &amp; Ride Route not convenient to work</td>
</tr>
<tr>
<td>□ Saves gas</td>
</tr>
<tr>
<td>□ Reduces wear and tear on car</td>
</tr>
<tr>
<td>□ Environmental concerns</td>
</tr>
<tr>
<td>□ Use HOV lanes</td>
</tr>
<tr>
<td>□ Employer subsidizes carpool</td>
</tr>
<tr>
<td>□ Employer subsidizes vanpool</td>
</tr>
<tr>
<td>□ No other way to get to work</td>
</tr>
<tr>
<td>□ Someone else needs a ride</td>
</tr>
<tr>
<td>□ Convenience</td>
</tr>
<tr>
<td>□ Costs less</td>
</tr>
<tr>
<td>Other (please specify)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>32. Does your carpool or vanpool drop you at your work address?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Yes</td>
</tr>
<tr>
<td>□ No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>33. If your carpool or vanpool does not drop you at your work address, how do you complete your trip to work (Check all that apply)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Walk on street level</td>
</tr>
<tr>
<td>□ Walk in tunnels/skywalks</td>
</tr>
<tr>
<td>□ Bus</td>
</tr>
<tr>
<td>□ Rail</td>
</tr>
<tr>
<td>□ GreenLink</td>
</tr>
<tr>
<td>□ Private shuttle</td>
</tr>
<tr>
<td>□ Bicycle</td>
</tr>
<tr>
<td>Other (please specify)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>34. If your carpool or vanpool does not drop you at your work address, how many minutes does it usually take for you to complete your trip to work?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ &lt;5 minutes</td>
</tr>
<tr>
<td>□ 5 to 9 minutes</td>
</tr>
<tr>
<td>□ 10 to 14 minutes</td>
</tr>
<tr>
<td>□ &gt;15 minutes</td>
</tr>
</tbody>
</table>
### 2013 Downtown Houston Commute Survey

#### 35. How much does your employer subsidize your carpool?
- 0%
- 1 to 20%
- 21 to 40%
- 41 to 60%
- 61 to 80%
- 81 to 99%
- 100%
- Don't know

#### 36. How much does your employer subsidize your vanpool?
- 0%
- 1 to 20%
- 21 to 40%
- 41 to 60%
- 61 to 80%
- 81 to 99%
- 100%
- Don't know

#### 37. When you do not carpool or vanpool, how do you prefer to get to and from work?
- Drive Alone
- Bus
- Rail
- Motorcycle/Scooter
- Bicycle
- Walk
- Telework/telecommute
- Other (please specify)

#### 38. I would choose another way to get to and from work because of the following (check all that apply):
- Increased carpool/vanpool costs
- Employer subsidy of Bus/Rail
- More convenient Park & Ride near work
- More convenient Park & Ride near home
- More convenient Local Bus Route near work
- More convenient Express Bus Route near home
- More convenient Rail Line near work
- Not enough people to carpool/vanpool
- Another way to get to work
- Other (please specify)
Motorcycle/Scooter commute questions
The following questions were only asked of the respondents who ride a motorcycle or motorized scooter to work each day.

2013 Downtown Houston Commute Survey

Motorcycle/Scooter Commute Questions

Please answer these questions your usual commute.

39. I drive/take a motorcycle or scooter to work because (check all that apply):
- Need vehicle during day
- Need to make stops going to or from work
- Prefer independence flexibility
- Unpredictable work schedule
- Bus or Rail not convenient to my home
- Bus or Rail not convenient to my work
- Bus or Rail schedule is not convenient
- Other (please specify)

40. How much does your employer subsidize your parking?
- 0%
- 1 to 20%
- 21 to 40%
- 41 to 60%
- 61 to 80%
- 81 to 99%
- 100%
- Don't know

41. Where do you usually park?
- Garage
- Surface lot
- On-street
- Other (please specify)

42. After parking, how do you complete your trip to work?
- Walk
- Rail
- GreenLink
- Bus
- Private Shuttle
- Bicycle
- Other (please specify)

43. After you park, how many minutes does it take you to get to work?
- <5 minutes
- 5 to 9 minutes
- 10 to 14 minutes
- >15 minutes
### 2013 Downtown Houston Commute Survey

**44. When you do not use a motorcycle or scooter, how do you prefer to get to and from work?**

- Drive alone
- Carpool/Vanpool
- Walk
- Bus/Rail
- Bicycle
- Telework/Telecommute

Other (please specify)  

**45. I would change the way that I go to and from work because of the following (check all that apply):**

- New Bus/Rail route
- Faster trip
- Change in home location
- New Bus/Rail schedule
- Safer trip
- Change in work location
- New Carpool/Vanpool
- Less cost
- Vehicle available
- Employer subsidy
- Convenience
Bicycle commute questions
The following questions were only asked of the respondents who choose to bicycle to work each day.

<table>
<thead>
<tr>
<th>Bicycle Commute Questions</th>
</tr>
</thead>
</table>

Please answer these questions about your usual commute.

46. I bicycle to work because of the following (check all that apply):
   - Need bicycle during day
   - Need to make stops going to or from work
   - Prefer independence/flexibility
   - Unpredictable work schedule
   - Bus or rail not convenient to my home
   - Bus or rail not convenient to my work
   - Costs less
   - Convenience
   - Environmental concerns
   - Faster trip
   - Bicycle parking provided by my employer
   - Exercise/Health
   - Live close to work
   - No other way to get to work
   Other (please specify)

47. Where do you usually park?
   - Garage bike rack
   - Building bike rack
   - Surface lot bike rack
   - On-street bike rack
   Other (please specify)

48. How much does your employer subsidize bicycle parking at work?
   - 0%
   - 1 to 20%
   - 21 to 40%
   - 41 to 60%
   - 61 to 80%
   - 81 to 99%
   - Don't know

49. After parking, how do you complete your trip to work?
   - Walk
   - Bus
   - Rail
   - GreenLink
   - Private Shuttle
   Other (please specify)

50. After parking, how many minutes does it usually take you to get to work?
   - <5 minutes
   - 5 to 9 minutes
   - 10 to 14 minutes
   - >15 minutes
### 2013 Downtown Houston Commute Survey

**51. When you do not bicycle to work, how do you prefer to get to and from work?**

- [ ] Drive alone
- [ ] Bus/Rail
- [ ] Carpool/Vanpool
- [ ] Motorcycle/Scooter
- [ ] Walk
- [ ] Telework/Telecommute

Other (please specify): __________

**52. I would change the way that I go to and from work because of the following (check all that apply):**

- [ ] New Bus/Rail route
- [ ] New Bus/Rail schedule
- [ ] New Carpool/Vanpool
- [ ] Faster trip
- [ ] Safer trip
- [ ] Less cost
- [ ] Convenience
- [ ] Change in home location
- [ ] Change in work location

Other (please specify): __________
Walk commute questions
The following questions were only asked of the respondents who choose to walk to work each day.

<table>
<thead>
<tr>
<th>2013 Downtown Houston Commute Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk to Work Commute Survey Questions</td>
</tr>
<tr>
<td>Please answer these questions if you usually walk to and from work.</td>
</tr>
<tr>
<td>53. I walk to work because of the following (check all that apply):</td>
</tr>
<tr>
<td>☐ Live close to work.</td>
</tr>
<tr>
<td>☐ Driving not convenient.</td>
</tr>
<tr>
<td>☐ Bus or rail not convenient to my home</td>
</tr>
<tr>
<td>☐ Bus or rail not convenient to my work</td>
</tr>
<tr>
<td>☐ Convenience</td>
</tr>
<tr>
<td>Other (please specify)</td>
</tr>
<tr>
<td>☐ Yes</td>
</tr>
<tr>
<td>54. Are there sidewalks all along your walking route to and from work?</td>
</tr>
<tr>
<td>☐ Yes</td>
</tr>
<tr>
<td>55. Where are sidewalks missing?</td>
</tr>
<tr>
<td>Missing from/to</td>
</tr>
<tr>
<td>Missing from/to</td>
</tr>
<tr>
<td>Missing from/to</td>
</tr>
<tr>
<td>Missing from/to</td>
</tr>
<tr>
<td>Missing from/to</td>
</tr>
<tr>
<td>☐ Yes</td>
</tr>
<tr>
<td>56. Are the sidewalks in good condition along your walking route to and from work?</td>
</tr>
<tr>
<td>☐ Yes</td>
</tr>
<tr>
<td>57. Where are the sidewalks not in good condition?</td>
</tr>
<tr>
<td>Condition from/to</td>
</tr>
</tbody>
</table>
### 2013 Downtown Houston Commute Survey

#### 58. When you do not walk, how do you prefer to get to and from work?

- Drive alone
- Carpool/Vanpool
- Bicycle
- Bus/Rail
- Motorcycle/Scooter
- Telework/Telecommute

Other (please specify) [ ]

#### 59. I would change the way that I go to and from work because of the following (check all that apply):

- New Bus/Rail route
- New Bus/Rail schedule
- New Carpool/Vanpool
- Employer Subsidy for parking
- Employer Subsidy for bus/rail
- Employer Subsidy for carpool/vanpool
- New Bicycle
- Faster trip
- Safer trip
- Convenience
- Change in home location
- Change in work location

Other (please specify) [ ]
Appendix A1 – Online survey instrument

Socio-demographic questions
All respondents were asked to complete the following socio-demographic questions.

2013 Downtown Houston Commute Survey
Socio-demographic Commute Survey Questions

Please answer the following questions about yourself and your work.

60. What is your current age?

- <19 years
- 20 to 24 years
- 25 to 29 years
- 30 to 34 years
- 35 to 39 years
- 40 to 44 years
- 45 to 49 years
- 50 to 54 years
- 55 to 59 years
- 60 to 64 years
- 65 to 69 years
- 70 to 75 years
- >75 years

61. What is your gender?

- Female
- Male

62. What is the street address of your primary work location?


63. In what ZIP code is your work located? (enter 5-digit ZIP code; for example, 77000)


64. In what ZIP code is your home located? (enter 5-digit ZIP code; for example, 77000)


65. What is your approximate average household income?

- $0-$24,999
- $25,000-$49,999
- $50,000-$74,999
- $75,000-$99,999
- $100,000-$124,999
- $125,000-$149,999
- $150,000-$174,999
- $175,000-$199,999
- $200,000 and up

66. How would you describe the industry in which you work?

- Energy
- Legal
- Finance
- Insurance
- Real Estate
- Accounting
- Retail
- Healthcare
- Education
- Government
- Nonprofit

Other (please specify)
67. Which of the following best describes your current occupation?

- Attorney
- Executive
- Sales
- Paralegal
- Administrator/Managerial
- Student
- Professional
- Service/Retail
- Administrative
- Technical

Other (please specify)

68. Please add any comments or suggestions that you would like to offer in the space below:
# A2. Paper survey instrument in English

## Paper Surveys

1. What is the zip code where you work?  
   
   [ ]  
   Other (please specify)  
   
   [ ]

2. What is your work address?  
   
   [ ] 1201 Louisiana / Total Plaza  
   [ ] 1111 Louisiana  
   [ ] 1100 Louisiana  
   [ ] 1000 Louisiana - Wells Fargo Plaza  
   [ ] 1301 Fannin  
   [ ] 1200 Louisiana, Hyatt  
   [ ] 1600 Lamar, Hilton

3. What is your home zip code?  
   
   [ ]

4. How many days do you usually work each week?  
   
   [ ] 1  
   [ ] 2  
   [ ] 3  
   [ ] 4  
   [ ] 5  
   [ ] 6  
   [ ] 5 to 6  
   [ ] 7

5. What time do you usually leave home to go to work?  
   
   [ ] 4:00 am to 4:29 am  
   [ ] 4:30 am to 4:59 am  
   [ ] 5:00 am to 5:29 am  
   [ ] 5:30 am to 5:59 am  
   [ ] 6:00 am to 6:29 am

   [ ] 6:30 am to 6:59 am  
   [ ] 7:00 am to 7:29 am  
   [ ] 7:30 am to 7:59 am  
   [ ] 8:00 am to 8:29 am  
   [ ] 8:30 am to 8:59 am

   [ ] 9:00 am to 3:59 pm  
   [ ] 4:00 pm to 9:59 pm  
   [ ] 10:00 pm to 3:59 am

6. What time do you usually leave work to go home?  
   
   [ ] 3:30 pm to 3:59 pm  
   [ ] 4:00 pm to 4:29 pm  
   [ ] 4:30 pm to 4:59 pm  
   [ ] 5:00 pm to 5:29 pm

   [ ] 5:30 pm to 5:59 pm  
   [ ] 6:00 pm to 6:29 pm  
   [ ] 7:00 pm to 7:29 pm  
   [ ] 7:30 pm to 7:59 pm

   [ ] 8:00 pm to 3:59 am  
   [ ] 4:00 am to 7:59 am  
   [ ] 8:00 am to 3:29 pm
Appendix A2 – Paper survey in English

Paper Surveys

7. How do you usually go to and from downtown?
   - Drive Alone
   - Bus or Rail
   - Carpool/Vanpool
   - Motorcycle/Scooter
   - Bicycle
   - Walk

8. I usually drive alone because

9. I usually take bus or rail because

10. I usually carpool or vanpool because

11. I usually take motorcycle/scooter because

12. I usually bicycle because

13. I usually walk because

14. If you park downtown where do you usually park?
   - Garage
   - Surface
   - On-Street

15. The cost of my trip to work and back is

16. Does your employer help pay for your parking?
   - 0%
   - 1% to 20%
   - 21% to 40%
   - 41% to 60%
   - 61% to 80%
   - 81% to 99%
   - 100%
### Paper Surveys

#### 17. Does your employer help pay for your bus or rail?
- 0%  
- 1% to 20%  
- 21% to 40%  
- 41% to 60%  
- 61% to 80%  
- 81% to 99%  
- 100%

#### 18. Does your employer help pay for your carpool or vanpool?
- 0%  
- 1% to 20%  
- 21% to 40%  
- 41% to 60%  
- 61% to 80%  
- 81% to 99%  
- 100%

#### 19. What is your current age?
- <19  
- 20-24  
- 25-29  
- 30-34  
- 35-39  
- 40-44  
- 45-49  
- 50-54  
- 55-59  
- 60-64  
- 65-69  
- 70-74  
- >75

#### 20. What is your average household income?
- $0-$24,999  
- $25,000-$49,999  
- $50,000-$74,999  
- $75,000-$99,999  
- $100,000-$124,999  
- $125,000-$149,999  
- $150,000-$174,999  
- $175,000-$199,999

#### 21. How would you describe the industry in which you work?
- Hospitality  
- Housekeeping  
- Retail  
- Energy  
- Legal  
- Insurance  
- Healthcare  
- Government  
- Finance/Accounting  
- Real Estate  
- Education  
- Nonprofit

#### 22. How would your occupation?
- Service/Retail  
- Administrative  
- Student  
- Administrator/Managerial  
- Attorney  
- Paralegal  
- Professional  
- Executive  
- Sales  
- Technical
23. Please add any comments or suggestions that you would like to offer in the space below:
A3. Paper survey instrument in Spanish

Encuesta de Desplazamiento al Centro
2013

1. ¿Cuál es la zona postal donde usted trabaja?
   _____ 77002 _____ 77003 _____ 77010 Otro, favor de especificar____

2. ¿Cuál es la dirección de su trabajo?

3. ¿Cuál es la zona postal del área adonde usted vive?

4. ¿Cuántos días por semana trabaja usted en el centro?

5. ¿A qué horas generalmente sale usted de la casa para ir a su trabajo? _____ de la mañana / de la tarde

6. ¿A qué horas generalmente sale usted de su trabajo para ir a la casa? _____ de la mañana / de la tarde

7. ¿Qué medio de transporte utiliza usted generalmente para ir y regresar del centro de la ciudad?
   _____ Maneja solo _____ Autobús o tren _____ Maneja con compañero o comparte el transporte con otros
   _____ Motocicleta / scooter _____ Bicicleta _____ Camina

8. Favor contestar solamente una de las siguientes:
   a. Generalmente manejo solo porque________________________
   b. Generalmente tomo el autobús o el tren porque________________________
   c. Generalmente manejo con compañero o voy en transporte compartido porque________________________
   d. Generalmente voy en motocicleta o scooter porque________________________
   e. Generalmente voy en bicicleta porque________________________
   f. Generalmente camino porque________________________

9. Si usted estaciona en el centro, ¿dónde estaciona generalmente?
   _____Garaje _____ Parqueadero _____ En la calle

10. El costo de mi desplazamiento diario al trabajo y de regreso a la casa es_____ (incluya gasolina, peaje, costos del vehículo, estacionamiento)

   Central Houston
Appendix A3 – Paper survey in Spanish

Encuesta de Desplazamiento al Centro
2013

11. ¿Recibe usted dinero de su empleador para estacionamiento?

Sí ___ No ___

Si su respuesta es afirmativa:

___ 1% a 20%  ___ 61% a 80%
___ 21% a 40%  ___ 81% a 99%
___ 41% a 60%  ___ 100%

12. ¿Recibe Ud. dinero de su empleador para autobús o tren?

Sí ___ No ___

Si su respuesta es afirmativa:

___ 1% a 20%  ___ 61% a 80%
___ 21% a 40%  ___ 81% a 99%
___ 41% a 60%  ___ 100%

13. ¿Recibe Ud. dinero de su empleador para manejar con compañero o ir en transporte compartido?

Sí ___ No ___

Si su respuesta es afirmativa:

___ 1% a 20%  ___ 61% a 80%
___ 21% a 40%  ___ 81% a 99%
___ 41% a 60%  ___ 100%

14. ¿Cuántos años tiene usted?___

15. ¿Cuántos son sus ingresos familiares?

___ $0-$24,999  ___ $100,000-$124,999
___ $25,000-$49,999  ___ $125,000-$149,999
___ $50,000-$74,999  ___ $150,000-$174,999
___ $75,000-$99,999  ___ $175,000-$199,999

16. ¿Cómo describiría usted el sector en el cual trabaja?

___ Hostalidad  ___ Legal  ___ Finanzas/Contabilidad

Central Houston

2
Encuesta de Desplazamiento al Centro 2013

____ Servicio de limpieza  ____ Seguros  ____ Industria inmobiliaria
____ Comercial  ____ Área de la salud  ____ Educación
____ Energía  ____ Gobierno  ____ Sector no lucrativo

Otro, favor de especificar: ______________________________

17. ¿Cómo describiría usted su ocupación?

____ Servicios/comercio  ____ Abogado  ____ Ejecutivo
____ Administrativo  ____ Asistente jurídico  ____ Ventas
____ Estudiante  ____ Profesional  ____ Técnico
____ Administrador/gerencial

Otro, favor de especificar: _______________________________

18. Por favor incluya cualquier comentario o sugerencia que le gustaría hacer en el siguiente espacio:

Central Houston
Central Houston geocoded survey responses to prepare a series of GIS maps which show the geographic distribution of survey respondents across the 8-county Houston-Galveston region. These large-format maps are included in the following pages.

**Map 1 – Downtown employees by Census block from 2011 LEHD data**
This map shows the distribution of all downtown employees by Census block. This data was drawn from the 2011 Longitudinal Employer-Household Dynamics (LEHD) which is part of the Local Employment Dynamics (LED) program of the U.S. Census Bureau.

**Map 2 – Downtown employees surveyed in 2013 by zip code**
This map shows the geographic distribution by home zip code of respondents from the 2013 Downtown Commute Survey sample.

**Map 3 – Houston region population, 2013 estimate**
This map presents the population distribution for the 8-county Houston region. This data was drawn from the Houston-Galveston Area Council’s 2013 population estimate.

**Map 4 – SOV commuters surveyed**
This map shows the distribution of respondents who drive alone to work each day.

**Map 5 – Park & Ride bus commuters surveyed**
This map shows the distribution of respondents who choose park-and-ride bus service for their daily commute.

**Map 6 – Local Bus & Rail transit commuters surveyed**
This map shows the distribution of survey respondents whose daily commute includes local bus and/or rail transit.

**Map 7 – Carpool/Vanpool commuters surveyed**
This map shows the distribution of survey respondents who share rides in a vanpool or carpool to reach work downtown each day.

**Map 8 – Motorcycle/Scooter commuters surveyed**
This map shows the distribution of survey respondents who ride motorcycles or scooters to a downtown workplace each day.

**Map 9 – Active Walk commuters surveyed**
This map shows the distribution of respondents who walk to work each day.

**Map 10 – Active Bicycle commuters surveyed**
This map shows the distribution of respondents who bicycle to work each day.

**Map 11 – High-frequency transit with Local Bus & Rail commuters surveyed**
This map shows the distribution of respondents who choose local bus and/or rail transit, overlaid with METRO’s network of highest-frequency bus and rail routes. Note this map includes only the 7-mile rail line that was in service at the time of the 2013 survey.

**Map 12 – High-frequency transit with SOV commuters surveyed**
This map shows the distribution of respondents who drive alone each day, overlaid with METRO’s network of highest-frequency bus and rail routes. Note this map includes only the 7-mile rail line that was in service at the time of the 2013 survey.
Central Houston, Inc. (CHI) is a private, nonprofit corporation supported by memberships of businesses and institutions with an interest in downtown and the central city. CHI’s members are concerned with urban planning, economic development, transportation issues, public safety, governmental affairs, and cultural and entertainment programs.

For more information and to join Central Houston, please contact:
Central Houston, Inc.
909 Fannin St., Suite 1650 Houston, TX 77010-1024
info@centralhouston.org (713) 650-1470