Memorandum

CITY OF DALLAS

DATE October 20, 2017

TO The Honorable Members of the Mobility Solutions, Infrastructure and Sustainability Committee: Lee M. Kleinman (Chair), Rickey D. Callahan (Vice-Chair), Sandy Greyson, Adam Medrano, Casey Thomas, II and Tennell Atkins

SUBJECT **Transportation Equity and Access to Opportunity for Transit-Dependent Population in Dallas**

On October 23, 2017, the Mobility Solutions, Infrastructure and Sustainability committee will be briefed on Transportation Equity and Access to Opportunity for Transit-Dependent Population in Dallas by Dr. Shima Hamidi from the University of Texas at Arlington and Chief of Resilience Theresa O'Donnell. The briefing materials are attached.

Please contact my office at 214-670-3309 should you have any questions.

Theresa O'Donnell
Chief of Resilience

c: Honorable Mayor and Members of the City Council
T.C. Broadnax, City Manager
Larry Casto, City Attorney
Craig D. Kinton, City Auditor
Billerae Johnson, City Secretary (Interim)
Daniel F. Solis, Administrative Judge
Kimberly Bizor Tolbert, Chief of Staff to the City Manager
Majed A. Al-Ghafry, Assistant City Manager

Jo M. (Jody) Puckett, Assistant City Manager (Interim)
Jon Fortune, Assistant City Manager
Joey Zapata, Assistant City Manager
M. Elizabeth Reich, Chief Financial Officer
Nadia Chandler Hardy, Chief of Community Services
Raquel Favela, Chief of Economic Development & Neighborhood Services
Directors and Assistant Directors

Transportation Equity and Access to Opportunity for Transit-Dependent Population in Dallas

Mobility Solutions, Infrastructure and Sustainability Committee
October 23, 2017

Theresa O'Donnell,
Chief Resilience Officer
City of Dallas

Dr. Shima Hamidi
University of Texas at Arlington

Presentation Overview

- Background information on Resilient Dallas

- Transportation Equity Study by Dr. Shima Hamidi, University of Texas at Arlington

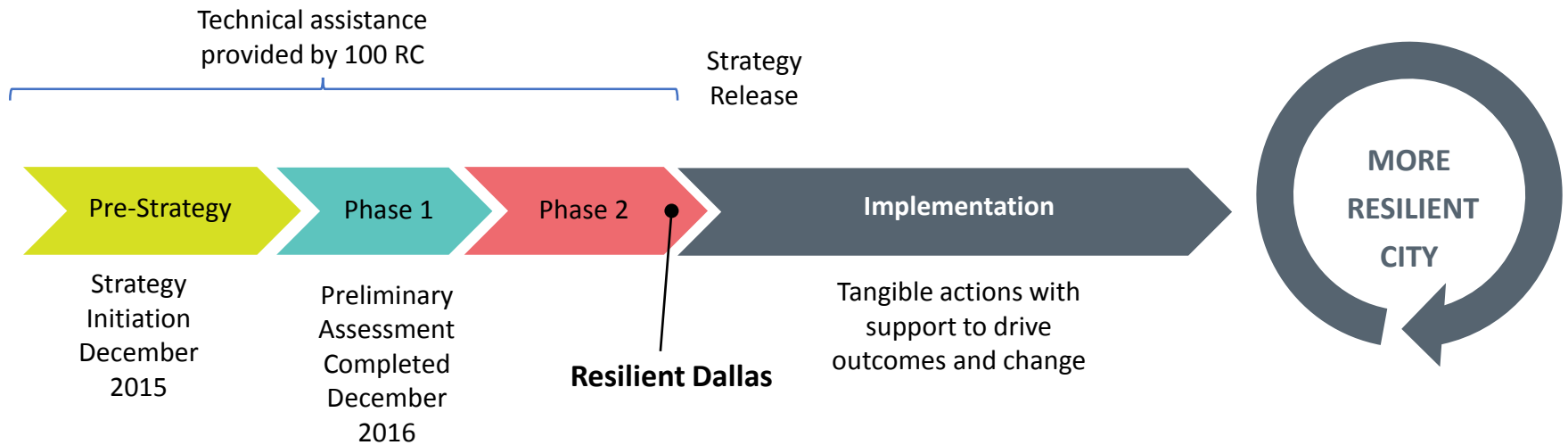- Next Steps and Questions

City of Dallas

100RC partners with cities around the world to help them become more resilient to the social, economic and physical challenges that are a growing part of the 21st century.
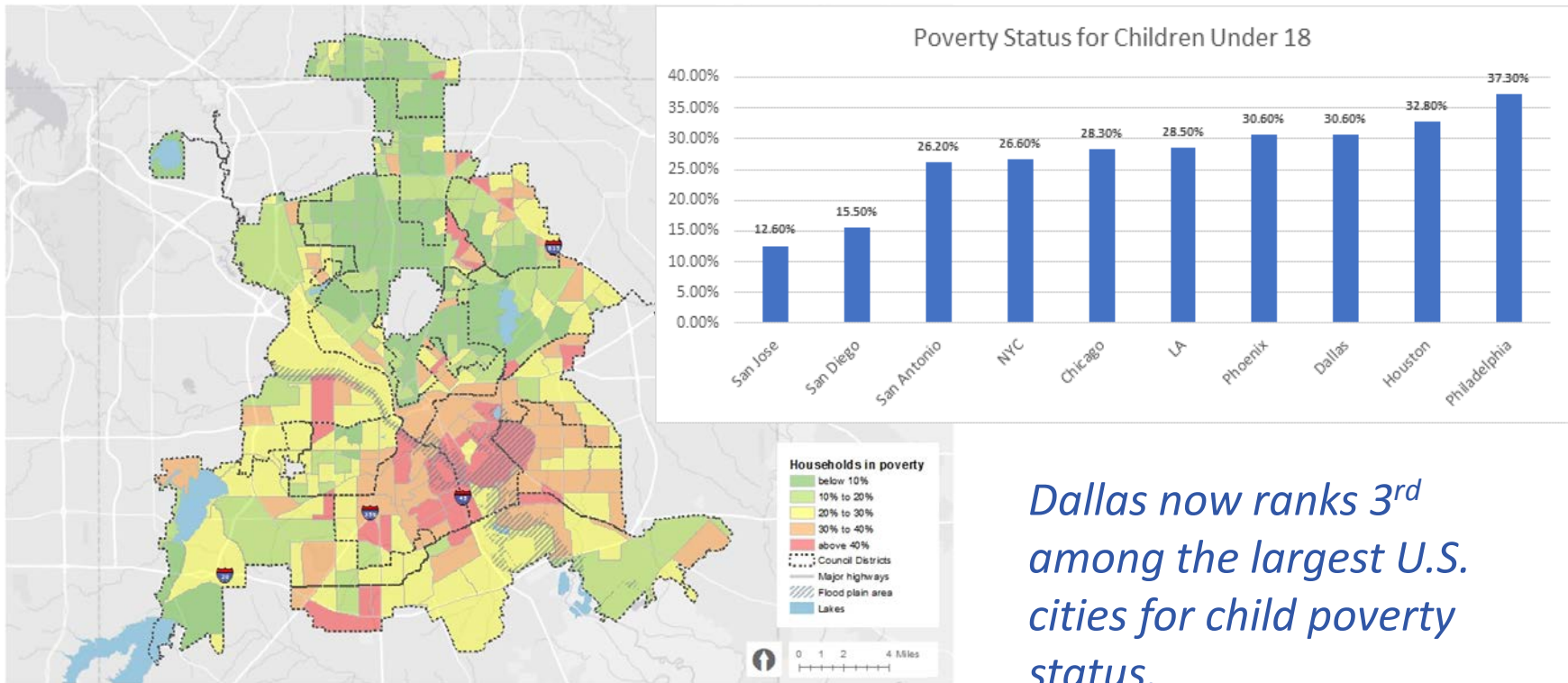
We are here

The Resilience Strategy is a tactical roadmap that articulates priorities and specific initiatives for implementation

Reducing the Epidemic of Poverty and Ending the Opportunity Gap

DALLAS
MAYOR'S TASK FORCE ON POVERTY

Poverty Status for Children Under 18

San Jose 12.60%, San Diego 15.50%, San Antonio 26.20%, NYC 26.60%, Chicago 28.30%, LA 28.50%, Phoenix 30.60%, Dallas 30.60%, Houston 32.80%, Philadelphia 37.30%

Households in poverty
- below 10%
- 10% to 20%
- 20% to 30%
- 30% to 40%
- above 40%
- Council Districts
- Major highways
- Flood plain area
- Lakes

0 1 2 4 Miles

Source: U.S. Census Bureau, Census 1990, 2000, 2010; American Community Survey 2015 5-Year Estimates. Map produced by City of Dallas Department of Planning and Urban Design

Dallas now ranks 3rd among the largest U.S. cities for child poverty status.

2015

City of Dallas

Significant impact of the social and economic stresses on Dallas residents

- Dallas is one of the most segregated cities in the country in terms of race and income.
  Pew Research Center, 2015

- Dallas has the highest level of overall neighborhood-by-neighborhood inequality in the United States.
  Urban Institute, 2015

- Dallas has the 3rd highest rate of child poverty (30%) of cities in the United States with populations over 1 million. *Census Data*

City of Dallas

Building an Equitable Dallas

Foundational principle of the Resilient Dallas Strategy is building a more Equitable Dallas

- **No magic bullet, no single solution**
- Solutions must be holistic and comprehensive
- Build from our strengths and leverage partnerships
- Major urban "systems" have been examined in an inter-related and coordinated
  - Economy
  - Housing
  - Transportation
  - Healthcare
  - Education
  - Social Cohesion
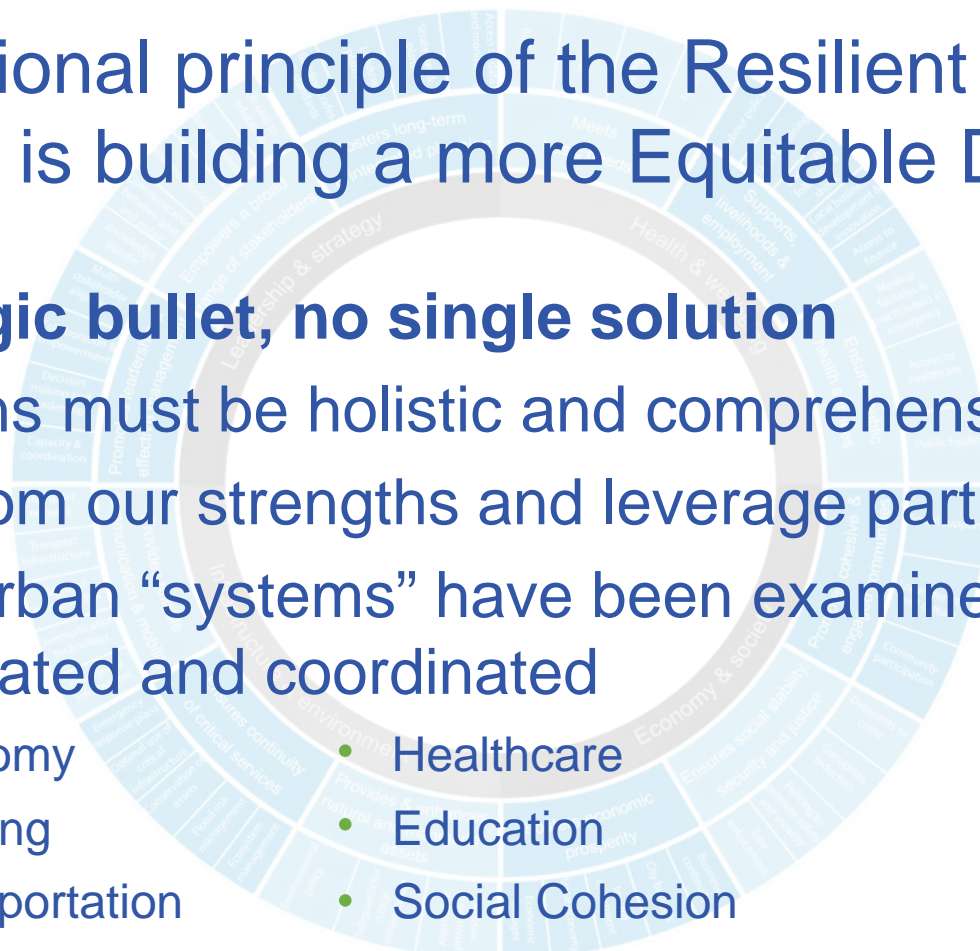
Four Discovery Areas

- Harnessing the power of the robust North Central Texas economy to be more inclusive and create economic resilience for Dallas residents

- Exploring opportunities to improve Public Health outcomes and decrease health disparity

- Assessing the conditions in Dallas neighborhoods, and understanding the impacts of climate change on the natural and built environment

- Preparing for a 21st century Urban Mobility by leveraging the region's transportation investment to expand mobility options, and improve transportation equity

Transportation Equity
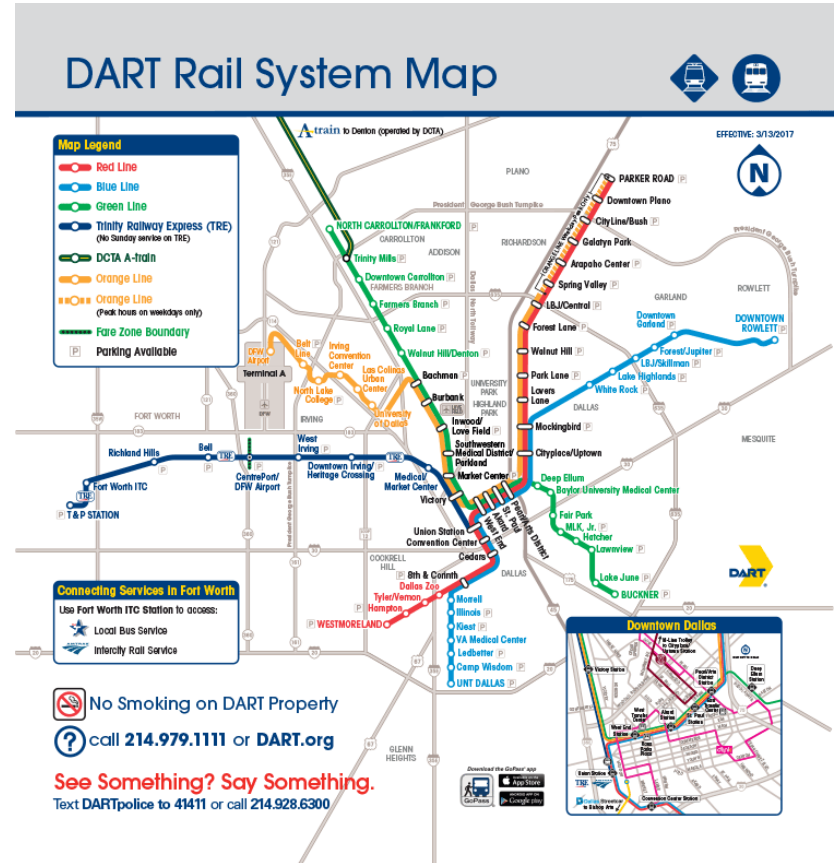
Transportation Equity

- What is the current state of transportation equity for Dallas residents?
- What projects or policies could Dallas' transit providers implement to provide transit dependent populations with improved access to employment, education, healthcare and basic retail services while also balancing the need to attract new riders?

- **Partners** - University of Texas at Arlington, AECOM, Staff

- **Stakeholders** - UTA, Dallas Area Rapid Transit, North Central Texas Council of Governments, Brunk Government Relations Services.

- **Deliverables** -
- Comprehensive policy analysis and quantitative study of transportation metrics including; transportation affordability, job accessibility by mode, transit coverage, transit quality, and accessibility
- Prioritized list of recommendations to improve bus coverage and accessibility to vulnerable populations and strategies for solving last mile transportation issues

City of Dallas

Transportation Equity

Understand how Dallas can leverage transportation investment to strengthen access to economic opportunities and improve the quality of life in low- and moderate-income neighborhoods.

Transportation Equity and Access to Opportunity in Dallas

Principal Investigator

Dr. Shima Hamidi, Director of the Institute of Urban Studiers and Director of the Center for
Transportation Equity, Decisions and Dollars (CTEDD) at the University of Texas Arlington

Transit Ridership for the Top 20 Transit Agencies with Light Rail Transit Services

Dallas

9th
most populous city in the U.S and the largest City in DFW region.

DART®
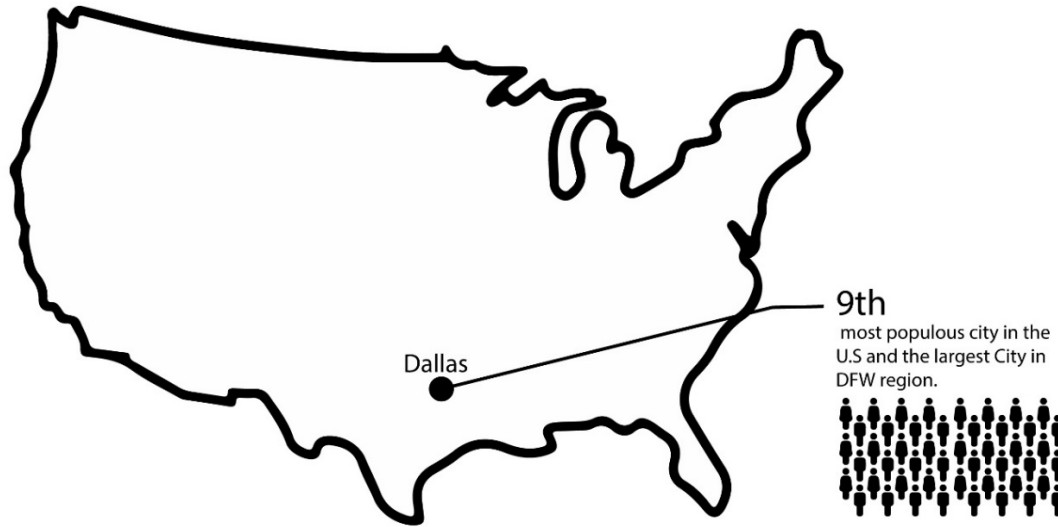
Ranks 23 out of 39
large and medium sized transit agencies in the U.S. in terms of bus passenger miles per capita (APTA, 2014).

Ranks 15 out of 20
largest transit agencies in terms of light rail average transit trips per mile in the U.S. in terms of bus passenger miles per capita (APTA, 2014).

Transit Ridership for the Top 20 Transit Agencies with Light Rail Transit Services

	System	Largest city served	Annual Ridership (2016)	System length	Avg. daily boardings per mile (Q4 2016)	Year opened	Stations
1	MBTA light rail:	Boston	69,236,700	26	8,711	1897	74
2	Muni Metro	San Francisco	52,597,300	35.7	4,602	1912	152
3	METRO LRT	Minneapolis-St. Paul	22,963,500	21.8	3,344	2004	37
4	Central Link	Seattle	19,121,621	20.4	3,245	2009	16
5	Hudson–Bergen LRT	Jersey City	15,450,736	17	3,051	2000	24
6	Metro Rail light rail	Los Angeles	65,829,000	88.1	2,403	1990	80
7	METRORail	Houston	18,335,800	23.8	2,378	2004	44
8	San Diego Trolley	San Diego	38,068,600	53.5	2,140	1981	53
9	MAX Light Rail	Portland	40,240,300	60	2,070	1986	97
10	Valley Metro Rail	Phoenix	16,322,800	26.3	1,947	2008	35
11	TRAX (UTA)	Salt Lake City	19,220,300	46.8	1,374	1999	56
12	Denver RTD:	Denver	24,585,000	58.5	1,297	1994	62
13	SEPTA light rail	Philadelphia	25,127,600	68.4	1,199	1906	>100
14	RTA Streetcars	New Orleans	8,084,400	22.3	1,117	1835	
15	DART	Dallas	29,619,500 Rank = 6/20	94 Rank =1/20	1,091 Rank = 15/20	1996	64
16	MetroLink	St. Louis	15,343,900	46	996	1993	37
17	Sacramento RT LRT	Sacramento	12,286,600	42.9	963	1987	53
18	The T: Pittsburgh LRT	Pittsburgh	7,783,100	26.2	814	1984	53
19	Santa Clara VTA LRT	San Jose	9,931,100	42.2	709	1987	62
20	Baltimore Light Rail	Baltimore	6,888,500	33	691	1992	33

Affordability

Is transportation affordable in Dallas? How much do Dallas residents pay for transportation? Are DART transit fares affordable for transit dependent populations?

Coverage

How much of the Dallas population is covered by transit? Is it equitable?

Frequency

How much of the Dallas population has access to quality transit? Is it equitable?

Accessibility

How many jobs could Dallas residents reach by transit versus driving?

Study Area

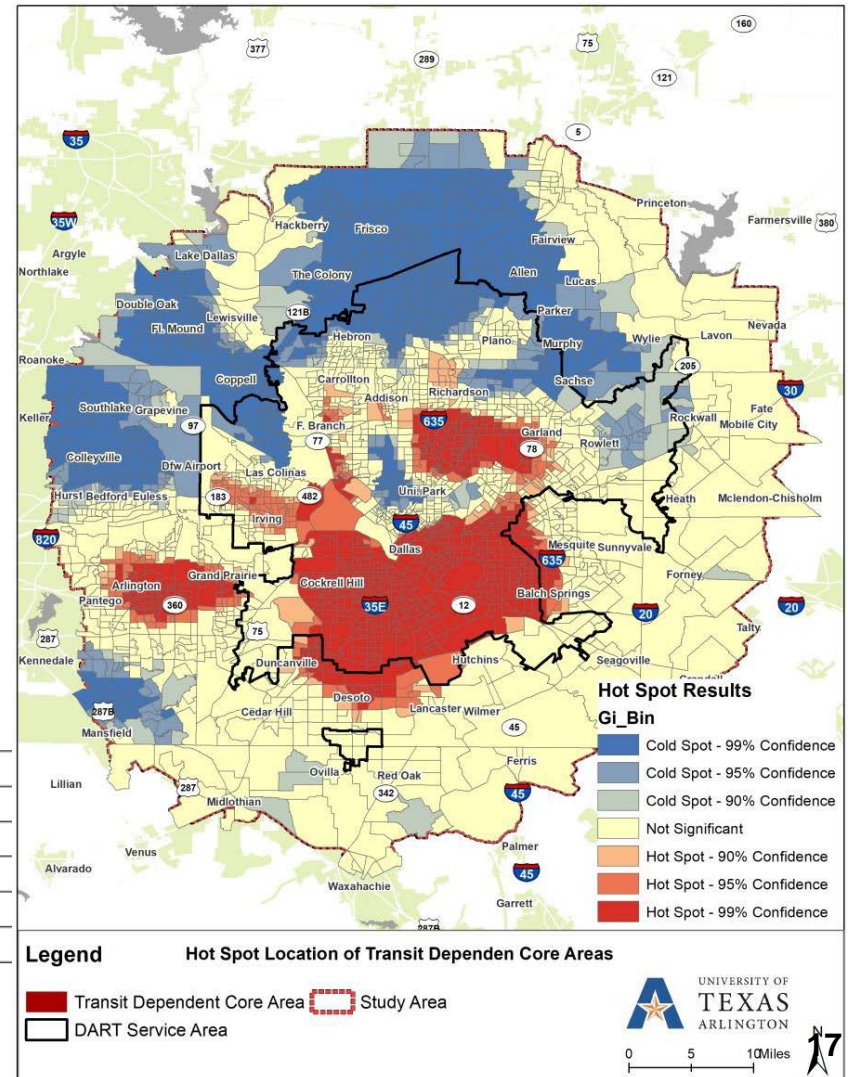- **City of Dallas**
- **DART service area**
- **The extended suburban area**
- **Transit Dependent Core**

Study Area Location Map

DART Service Area
Transit Dependent Core
Study Area
City of Dallas

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0   5   10 Miles

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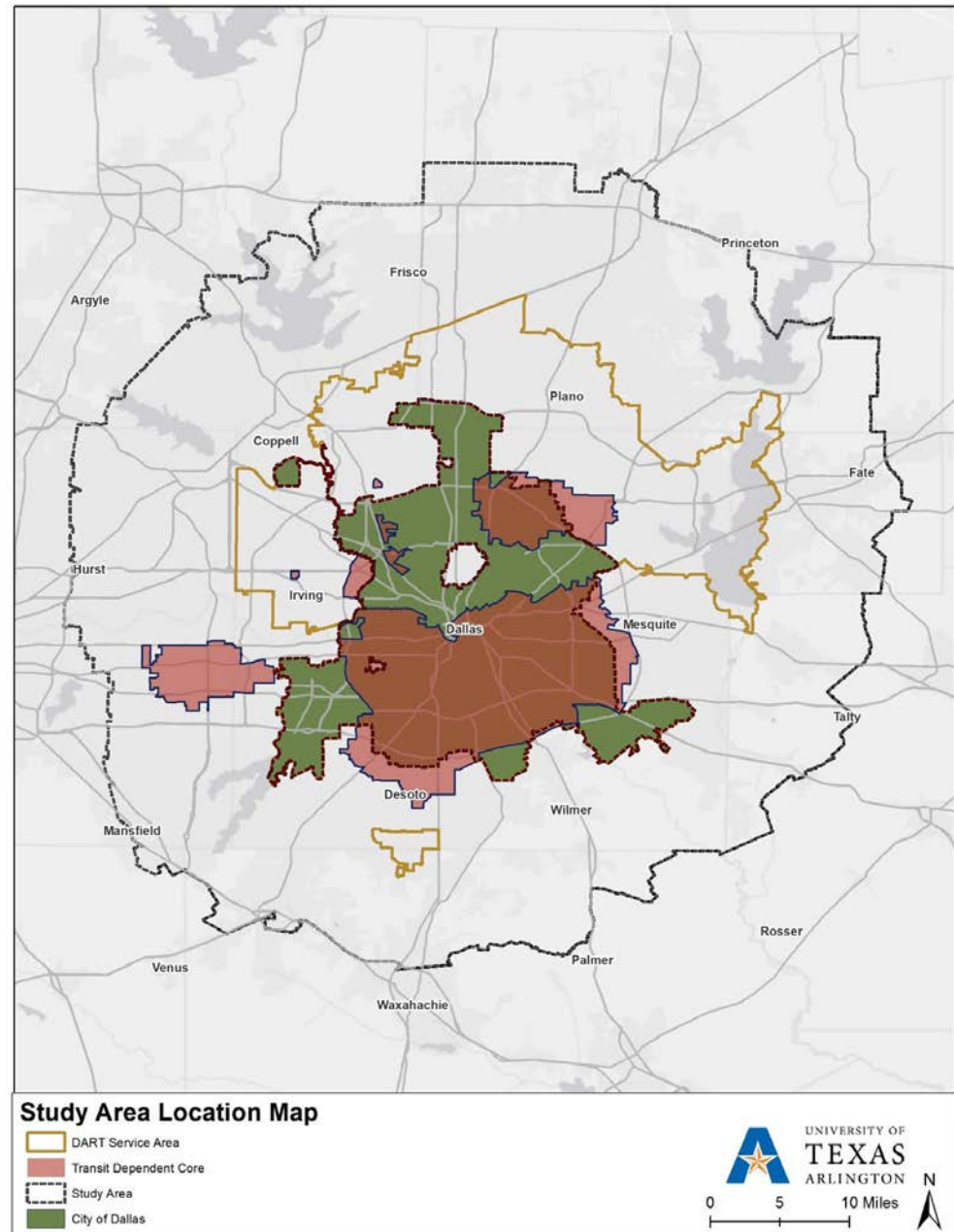
Who is Transit Dependent?

- Minority groups
- Senior population
- Low-income groups
- People with disabilities and without a license to drive.

black	% of African American population	ACS 2014 - 5 Year Estimates
hisp	% of Hispanic population	ACS 2014 - 5 Year Estimates
senior	% of senior population (age over 65 years)	ACS 2014 - 5 Year Estimates
noveh	% of households without car	ACS 2014 - 5 Year Estimates
poverty	% of population below poverty level	ACS 2014 - 5 Year Estimates
lowrk	% of low wage workers	LEHD 2014

Hot Spot Transit Dependent Locations

Hot Spot Location of Transit Dependen Core Areas

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Component 1: Transit Affordability

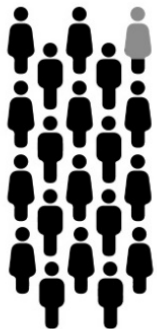## Is Transportation Affordable in Dallas?

What Percentage of Income Do Dallas Residents Pay for Transportation?

Affordability Threshold
15%

Dallas residents pay (in average)
19%

Dart Service Area (in average)
20%

Transportation is unaffordable to:

97.44%
of population in Dallas
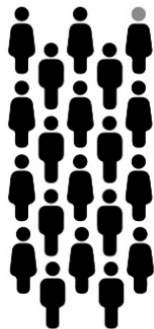
99.10%
of of population in Transit Dependent Core

Transportation Affordability For a Typical Regional Household

Affordale	Not Affordable
Transit Dependent Core	
Study Area	
City of Dallas	
DART Service Area	

Source: HUD, H+T Index Data

0 5 10 Miles

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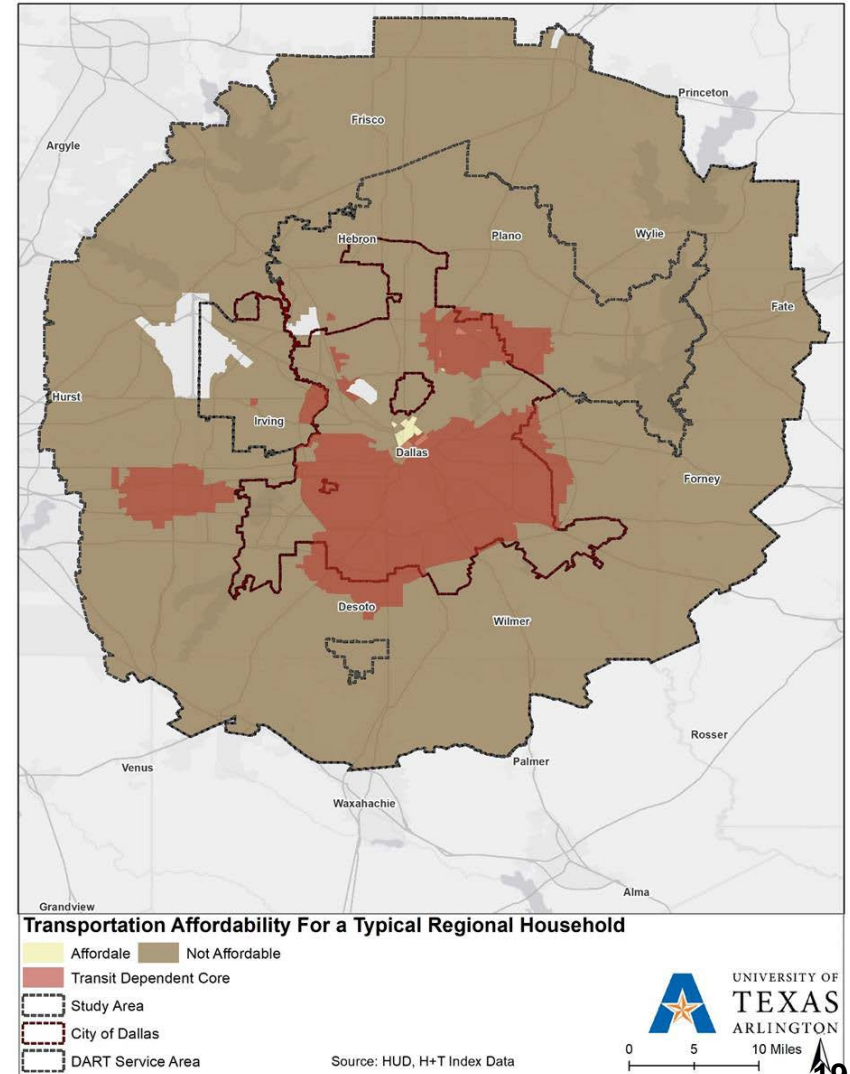
Disparities In Transportation Affordability

Transportation Costs range from 14% to 26% of household income.

More than 73% of Section 8 Multifamily **Affordable** Housing properties in Dallas are **unaffordable** with regards to transportation costs.
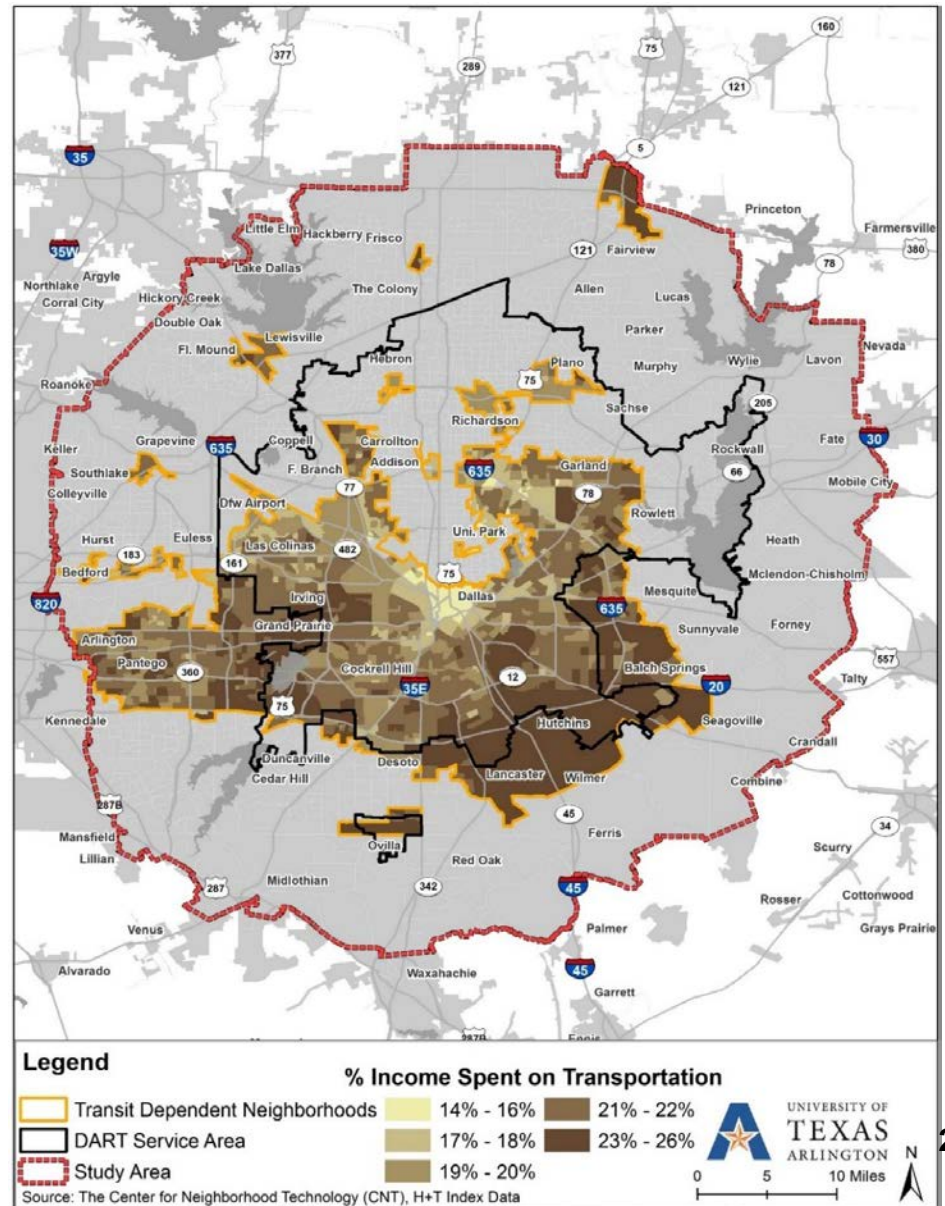
Are DART Transit Fares Affordable for Transit Dependent Populations?

- DART fare options are relatively affordable.

- Still, according to our case study analysis, there are more aggressive policies that could be adopted by DART to provide affordability for target groups of the population who need it the most.

- It is likely that fare affordability may not be a key contributor to the relatively low transit ridership rate in Dallas.

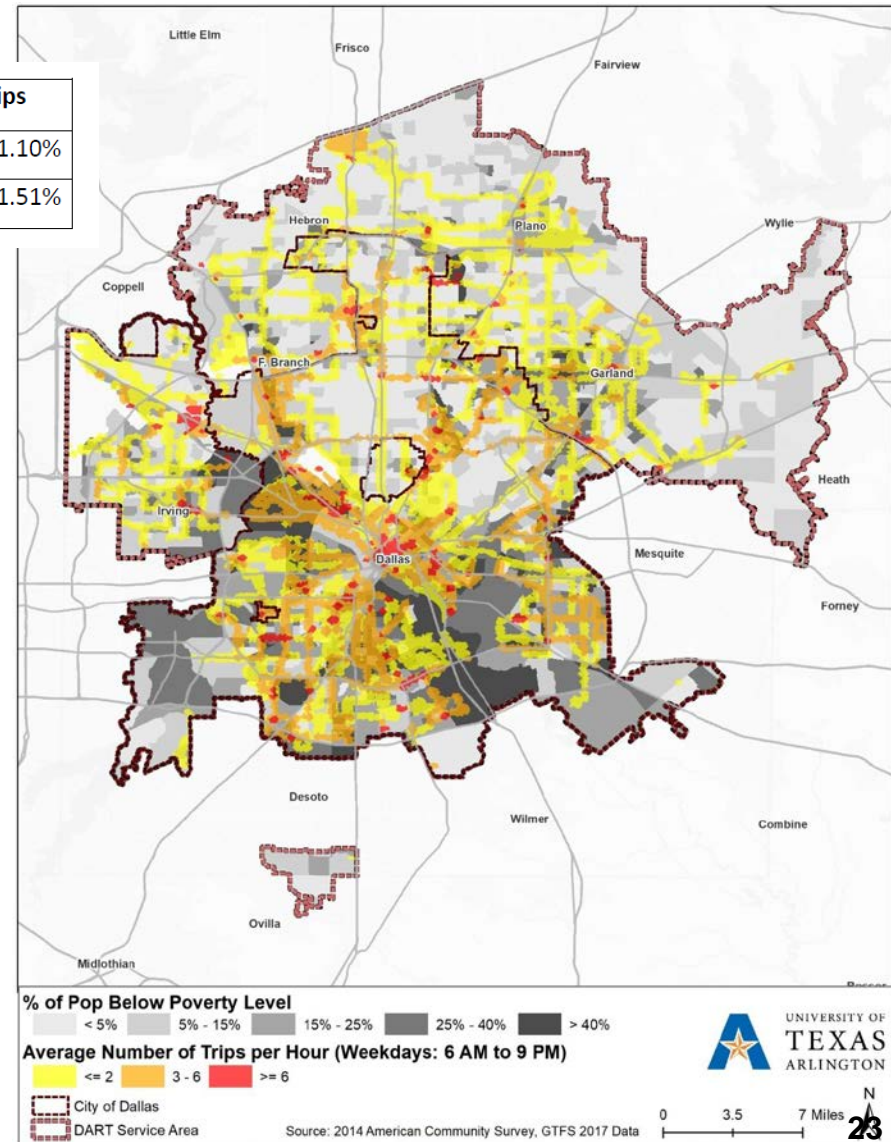| | Fare Option | Day Pass | | 7 Day Pass | Monthly Pass | | Annual Pass |
		cost per pass	% of annual income		cost per pass	% of annual income	
Dallas DART	Local	$5	10.3%	$25	$80	5.4%	$800
	Regional	$10	20.7%	$50	$160	10.9%	$1,600
	Reduced*	$2.5	5.2%	-	$40	2.7%	
LA Metro	Local	$5	11.8%	$25	$100	5.5%	-
	Reduced*	$2.5		-	$40		
New York City MTA	Local	$5.5	8.7%	$32	$121	6.5%	-
	Reduced*	$2.75		$16	$60		
Chicago CTA	Local	$10	19.2%	$28	$100	6.3%	
	Reduced*	FREE		FREE	FREE		
Houston Metro	Local	$3	13.2%	-	-		-
	Reduced*	-		-	-		
Phoenix Valley Metro	Local	$4	8.9%	$20	$64	3.3%	
	Regional	$5.2	11.7%	-	-		
	Reduced*	$2		$10	$32		
San Diego MTS	Local	$5	8.3%	$22	$72	2.3%	
	Regional	$12	20.0%	-	$100	3.2%	-
	Reduced*	-		-	$18-36		
San Jose	Local	$6	7.6%	-	$70		$770
	Regional	$12	15.2%	-	$140	1.7%	-
	Reduced*	$2.5-5		-	$25-45	3.5%	$275-495

Component 2: Transit Coverage

How Much of the Dallas Population Is Covered By Transit?

Is It Equitable?

Spatial Distribution of Transit Coverage

	0 trips	>2 trips	3-6 trips	<6 trips
City of Dallas	36.83%	36.24%	25.83%	1.10%
Transit Dependent Core	32.34%	35.05%	31.11%	1.51%

- About **a third** of residents in Dallas and the transit dependent core do not have walking access (0.25 mile for bus and 0.5 mile for rail) to a transit station.

- Walking Access to the transit station does not guarantee walkability

- Physical distance to transit stations could be a major barrier of transit use for **a third** of the population.

% of Pop Below Poverty Level
< 5% | 5% - 15% | 15% - 25% | 25% - 40% | > 40%

Average Number of Trips per Hour (Weekdays: 6 AM to 9 PM)
<= 2 | 3 - 6 | >= 6

City of Dallas
DART Service Area

Source: 2014 American Community Survey, GTFS 2017 Data

0   3.5   7 Miles

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Component 3: Transit Frequency

## How Much of the Dallas Population Has Access to Quality Transit?

Is It Equitable?

We Computed the Average Transit Frequency for 6 Time Frames for All Census Blocks in the Study Area As Shown Below:

- Weekday morning peak hour: 6 am – 9 am
- Weekday afternoon peak hour: 4 pm – 7 pm
- Weekday off-peak hour: 11am – 1 pm
- Weekday evening and night hour: 9 pm – 11 pm
- Average weekday: 6 am – 9 pm
- Average weekend: 6 am – 9 pm

Transit Frequency	Average Headway	
High	More than 10 Services per Hour	Less than 6 min
Medium	4 - 10 Services per Hour	From 6 min to 15 min
Low	Less than 2-4 Services per Hour	More than 15 min-30
Very low	Less than 2 Services per Hour	More than 30 min
Transit deserts	No Service	No operation

Classification of Transit Service Quality by Frequency Based on Bok & Kwon (2016) study
(Source: GTFS Data, 2017)

Average Weekday

Average Weekend
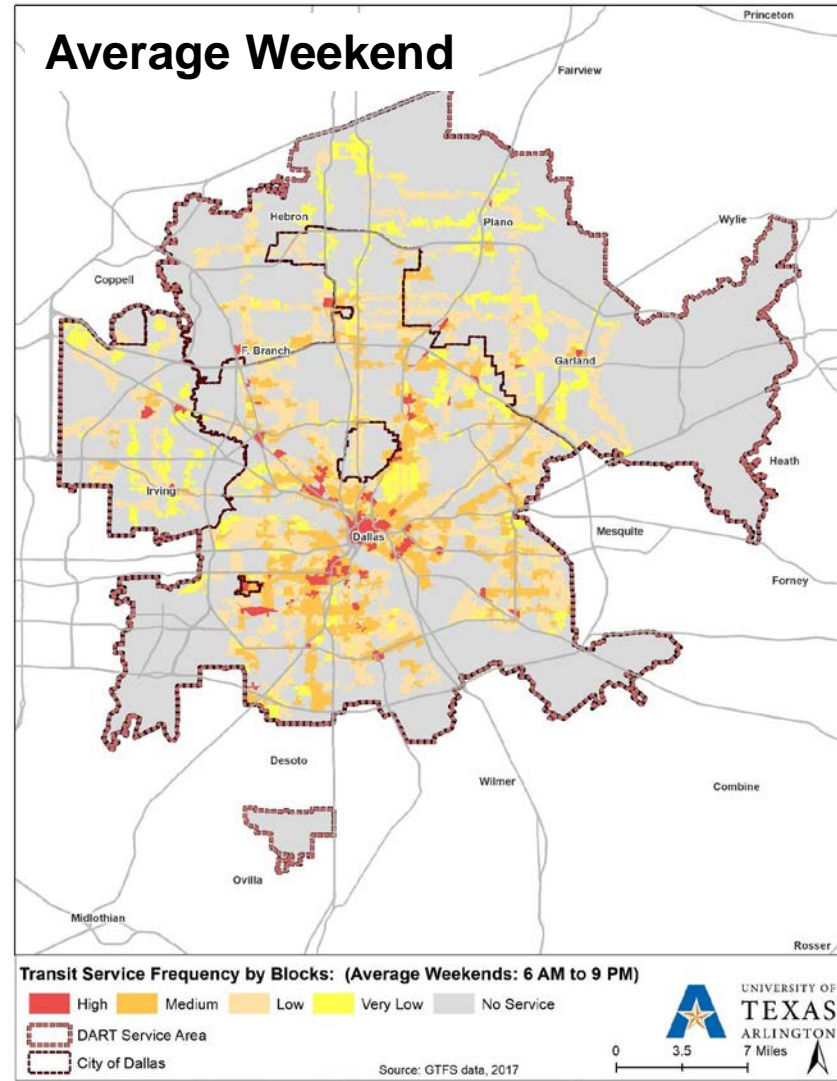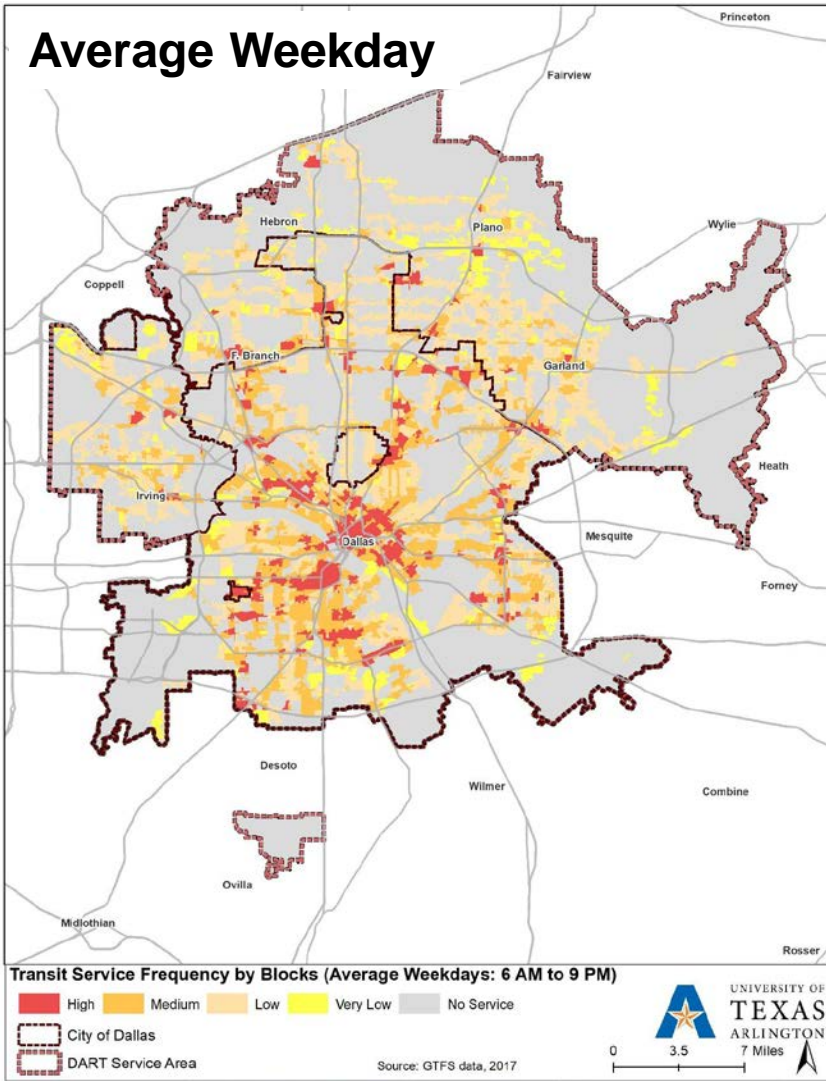
- All maps show similar spatial patterns of frequency distribution.

- Except for a few places, residents in a significant part of the transit dependent core have to wait for more than 15 minutes for transit.

- The frequency of transit service in late hours (9pm – 11pm) decreases considerably. The same applies to off-peak early morning service frequency (4am - 6am).

- This is a challenge for low-income and transit dependent populations who don't work a 9am - 5pm schedule.

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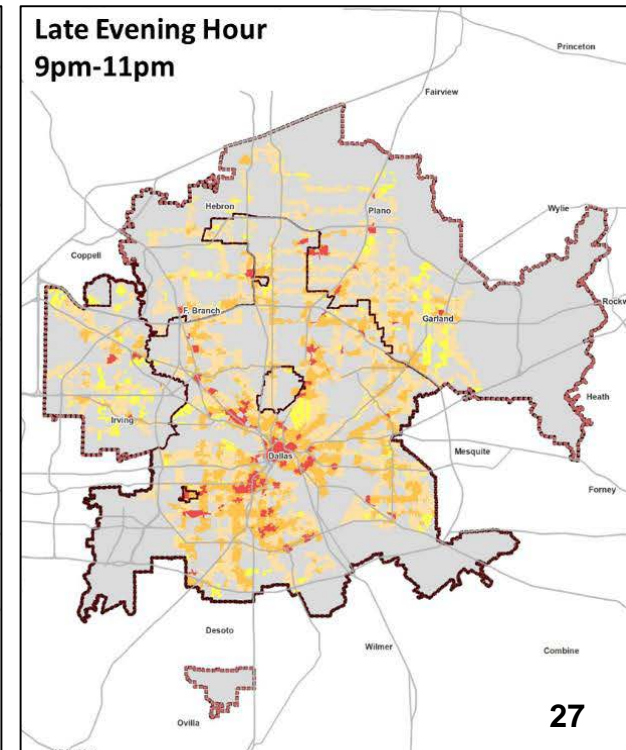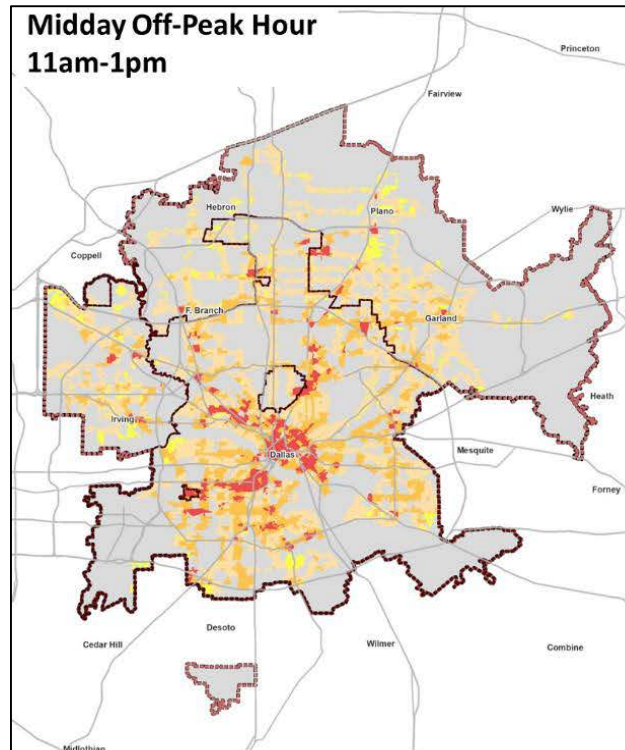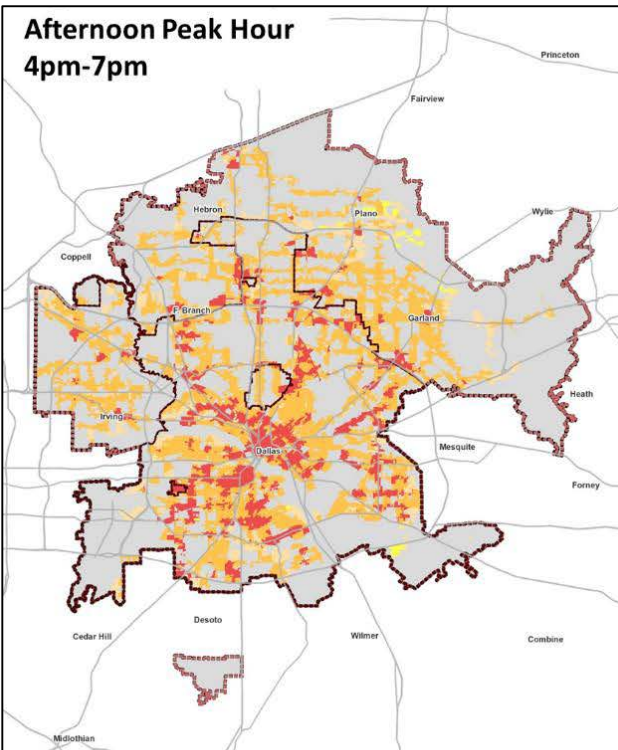
With respect to access to high quality transit, one of the challenges is the transition from peak to off-peak hours, particularly in the late evening hours.

Peak hours

- On average, **18% and 22%** of the population in Dallas have access to *high* frequency transit during the morning and afternoon peak hours, respectively. Another **40% and 42%** have access to *medium* frequency service (6-10 min. waiting time) during the morning and afternoon peak hours, respectively.

Off-peak hours

- However, when transitioning to off-peak hours, only **9%** of the Dallas population has access to *high* frequency (less than 6 min. waiting time) transit and only **26%** has access to *medium* quality (6-15 min. waiting time).

Late evening hours

- This is even worse for late evening trips when more than half of the population in Dallas has to wait 30+ minutes for transit or has no transit service at all.

Transit Frequency (as % of Population in Each Category) for Weekday Versus Weekend by Council District in Dallas

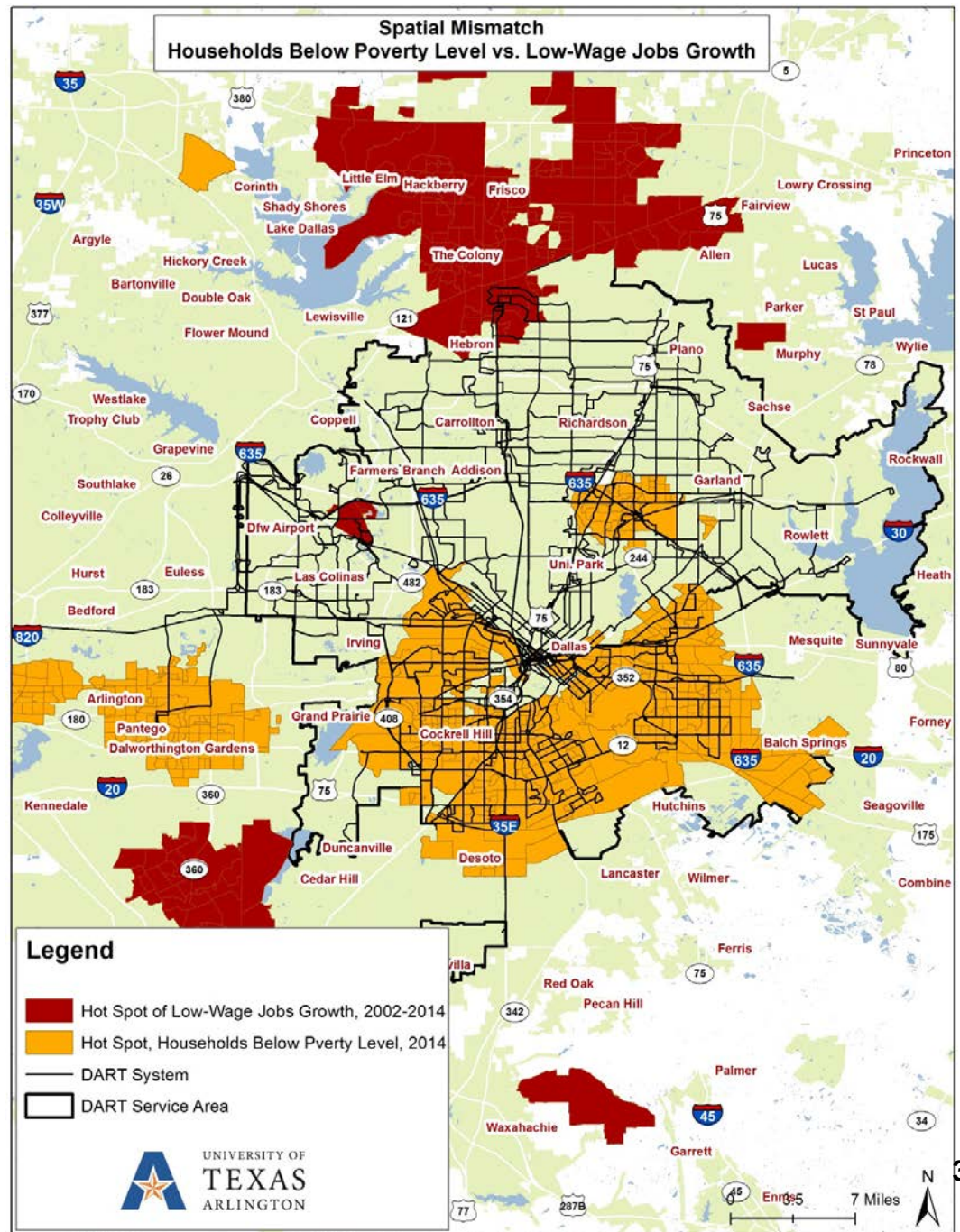| Transit Frequency	Average weekday					Average weekend				
	High	Medium	Low	Very Low	Transit Desert	High	Medium	Low	Very Low	Transit Desert
Council District 1	33	37	17	1	12	15	48	12	12	12
Council District 2	17	38	34	2	9	7	30	27	27	9
Council District 3	3	23	17	13	44	0	11	13	18	58
Council District 4	14	46	20	6	14	1	37	16	28	17
Council District 5	8	29	31	4	28	1	21	13	37	28
Council District 6	18	29	23	7	24	1	22	11	39	27
Council District 7	14	38	15	5	27	3	29	11	28	29
Council District 8	4	20	20	8	48	0	15	8	22	54
Council District 9	3	24	33	1	39	0	18	32	11	39
Council District 10	14	29	21	8	29	1	22	19	26	32
Council District 11	3	22	40	10	25	0	20	15	39	27
Council District 12	4	6	30	4	56	0	4	2	30	63
Council District 13	6	27	21	2	44	2	23	10	17	47
Council District 14	32	32	30	2	4	12	43	25	16	4

Transit Frequency (as % of Population in Each Category) for Four Different Time Frames of a Typical Weekday by Council District in Dallas

Transit Frequency	6am - 9am					11am - 1pm					4pm - 7pm					9pm - 11pm				
	High	Medium	Low	Very Low	Transit Desert	High	Medium	Low	Very Low	Transit Desert	High	Medium	Low	Very Low	Transit Desert	High	Medium	Low	Very Low	Transit Desert
Council District 1	42	44	1	0	12	29	38	9	12	12	45	41	1	1	12	17	45	4	21	12
Council District 2	28	48	13	2	9	15	29	27	20	9	28	60	1	2	9	10	28	12	41	9
Council District 3	7	28	10	11	44	1	25	6	14	54	13	28	5	10	44	0	20	9	17	54
Council District 4	24	49	7	5	15	7	39	25	13	16	25	50	6	5	14	6	43	16	19	16
Council District 5	16	39	13	4	28	1	24	10	37	28	19	44	6	4	28	1	24	10	37	28
Council District 6	21	40	8	6	24	11	25	16	23	25	21	43	4	7	25	9	17	24	19	31
Council District 7	20	44	5	5	27	10	32	6	24	28	24	42	2	5	27	4	31	1	36	28
Council District 8	7	28	9	8	48	1	14	11	23	51	13	28	4	7	48	0	13	7	24	55
Council District 9	7	46	7	1	39	1	22	20	18	39	16	43	1	1	39	0	22	7	33	39
Council District 10	17	47	1	6	29	8	33	6	22	31	19	45	1	6	29	1	28	3	37	31
Council District 11	5	44	16	10	25	1	20	11	42	25	11	52	1	10	25	0	24	1	49	25
Council District 12	4	33	4	3	56	4	4	2	34	56	6	34	2	3	56	4	4	2	34	56
Council District 13	21	26	7	2	44	3	27	14	13	44	21	32	1	2	44	2	25	13	16	44
Council District 14	32	47	14	2	4	34	29	15	18	4	45	48	0	2	4	11	43	9	29	8

Component 4: Transit & Job Accessibility

How Many Jobs Could Dallas Residents Reach By Transit versus Driving?

Hot Spot Analysis of Low Wage Jobs and Low Income Population

Spatial Mismatch
Households Below Poverty Level vs. Low-Wage Jobs Growth

Legend
- Hot Spot of Low-Wage Jobs Growth, 2002-2014
- Hot Spot, Households Below Pverty Level, 2014
- DART System
- DART Service Area

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To measure job accessibility by transit, we developed a **unique multimodal transit network** that measures **door-to-door travel time** for block groups in the study area.

Block Group
45 Minutes Transit Commute
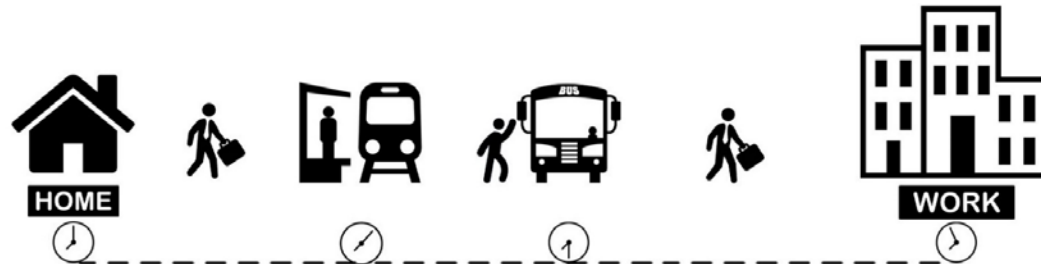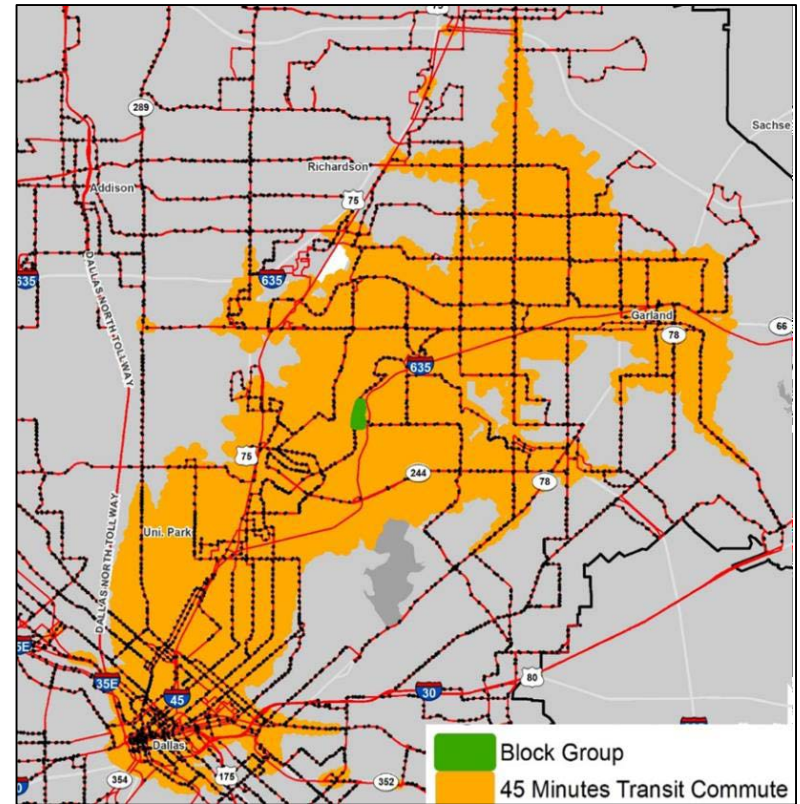
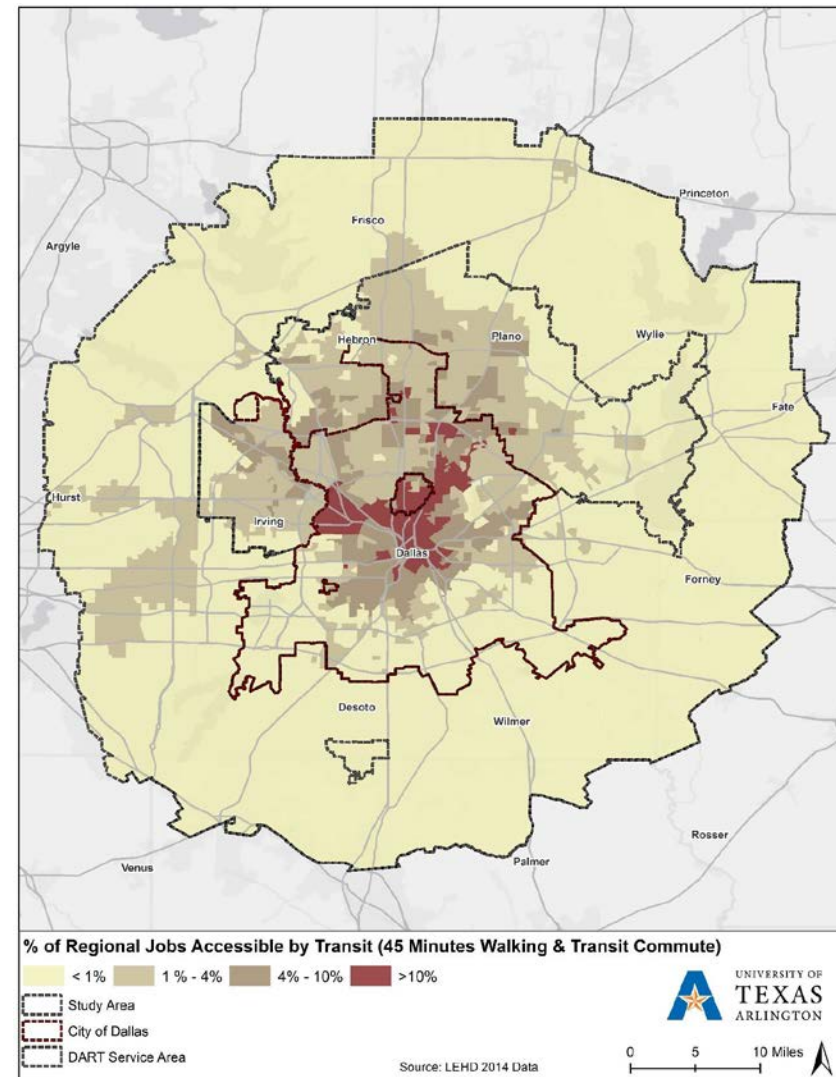# Job Accessibility by Transit

	access to less than 1% of jobs	access to 1-4% of jobs	access to 4-10% of jobs	access to more than 10% of jobs
DART Service Area	37.06%	33.41%	20.31%	9.22%
City of Dallas	30.41%	24.61%	29.64%	15.34%
Transit Dependent Core	41.57%	23.83%	26.95%	7.66%

More than **65% of residents** living in the transit dependent core have access to less than **4% of regional jobs** by a 45-minute transit (and walking) commute time

% of Regional Jobs Accessible by Transit (45 Minutes Walking & Transit Commute)
< 1%   1% - 4%   4% - 10%   >10%
Study Area
City of Dallas
DART Service Area
Source: LEHD 2014 Data
0   5   10 Miles

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Job Accessibility by Transit by Council District

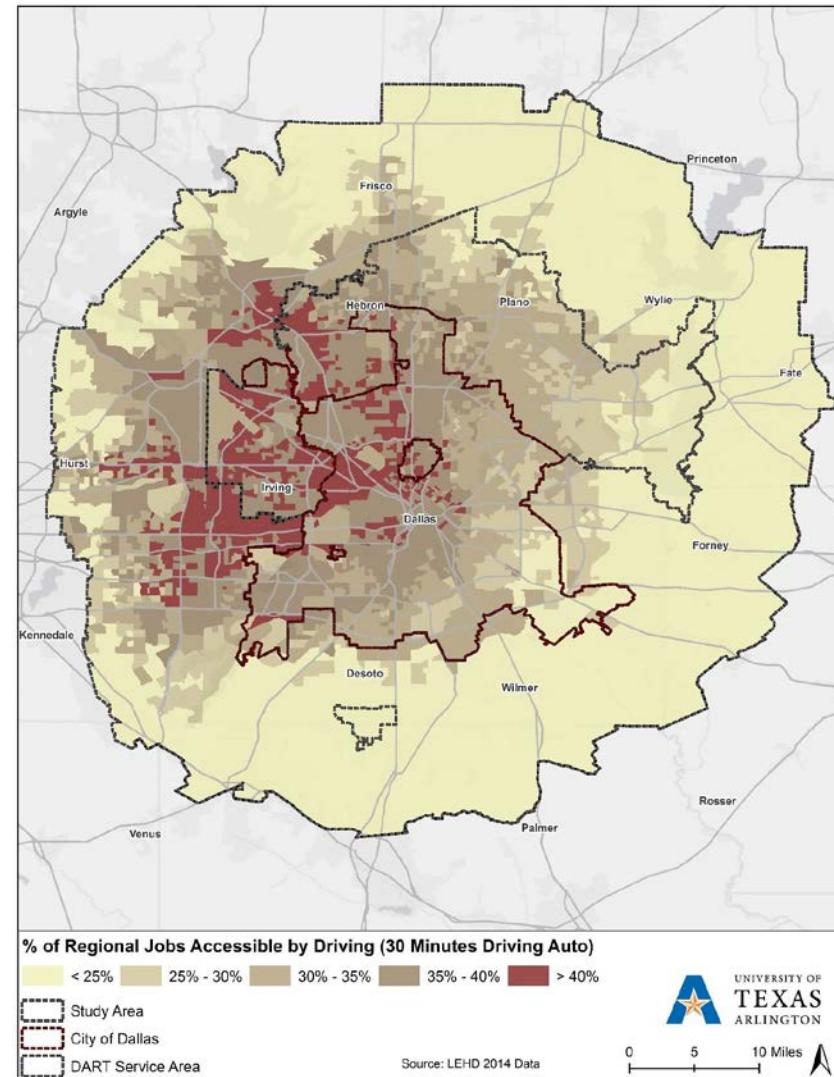| Council District	access to less than 1% of jobs	access to 1-4% of jobs	access to 4-10% of jobs	access to more than 10% of jobs
Council District 11	0%	52%	40%	8%
Council District 14	1%	1%	43%	55%
Council District 10	2%	46%	42%	9%
Council District 2	4%	12%	48%	35%
Council District 13	8%	42%	39%	11%
Council District 1	13%	12%	68%	6%
Council District 6	29%	29%	39%	3%
Council District 7	32%	15%	51%	2%
Council District 9	36%	30%	32%	3%
Council District 4	38%	26%	34%	3%
Council District 12	41%	52%	7%	0%
Council District 5	72%	24%	4%	0%
Council District 3	80%	14%	6%	0%
Council District 8	92%	8%	0%	0%

% of Regional Jobs Accessible by Transit
(45 Minutes Walking & Transit Commute)

< 1%   1% - 4%   4% - 10%   >10%

Council Districts

Source: LEHD 2014 Data

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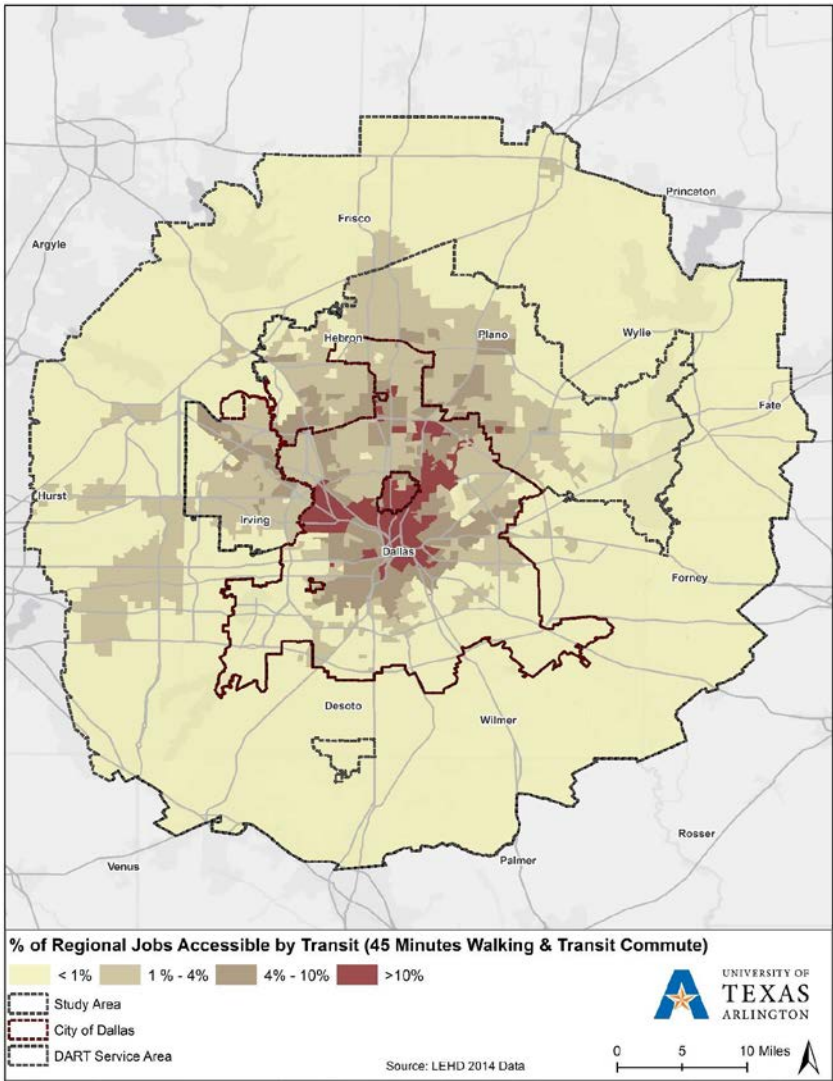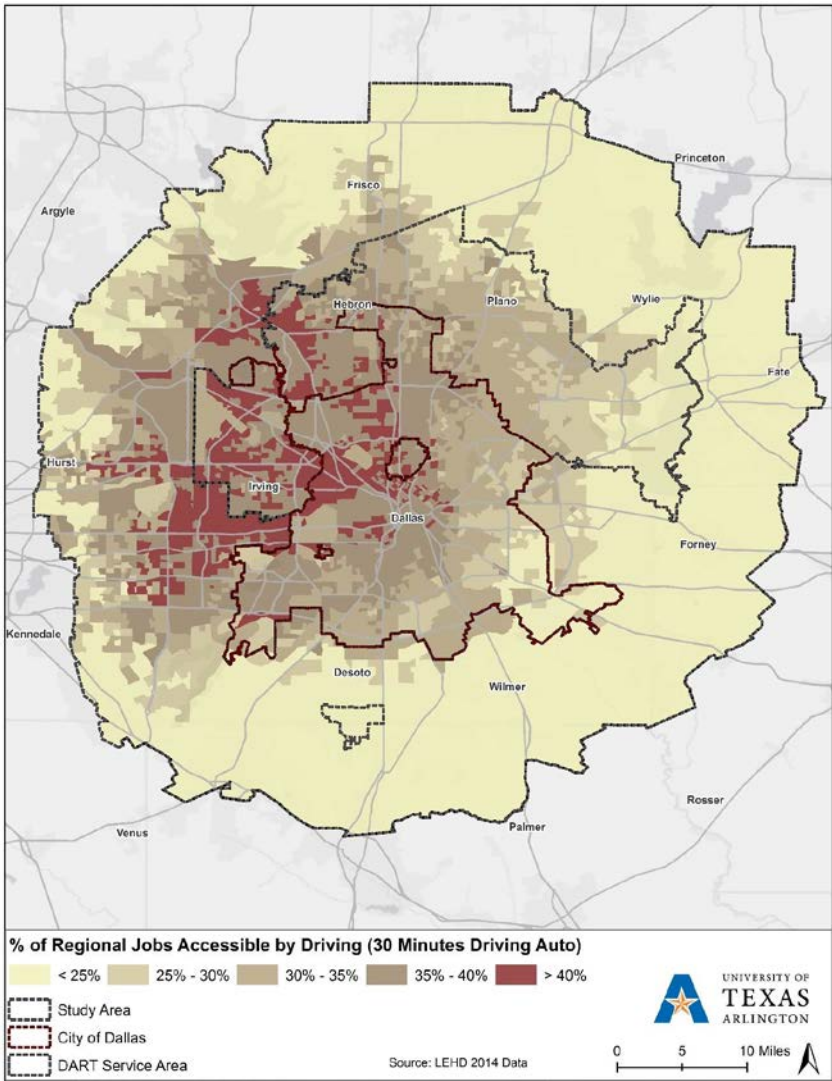
0   2.75   5.5 Miles

35
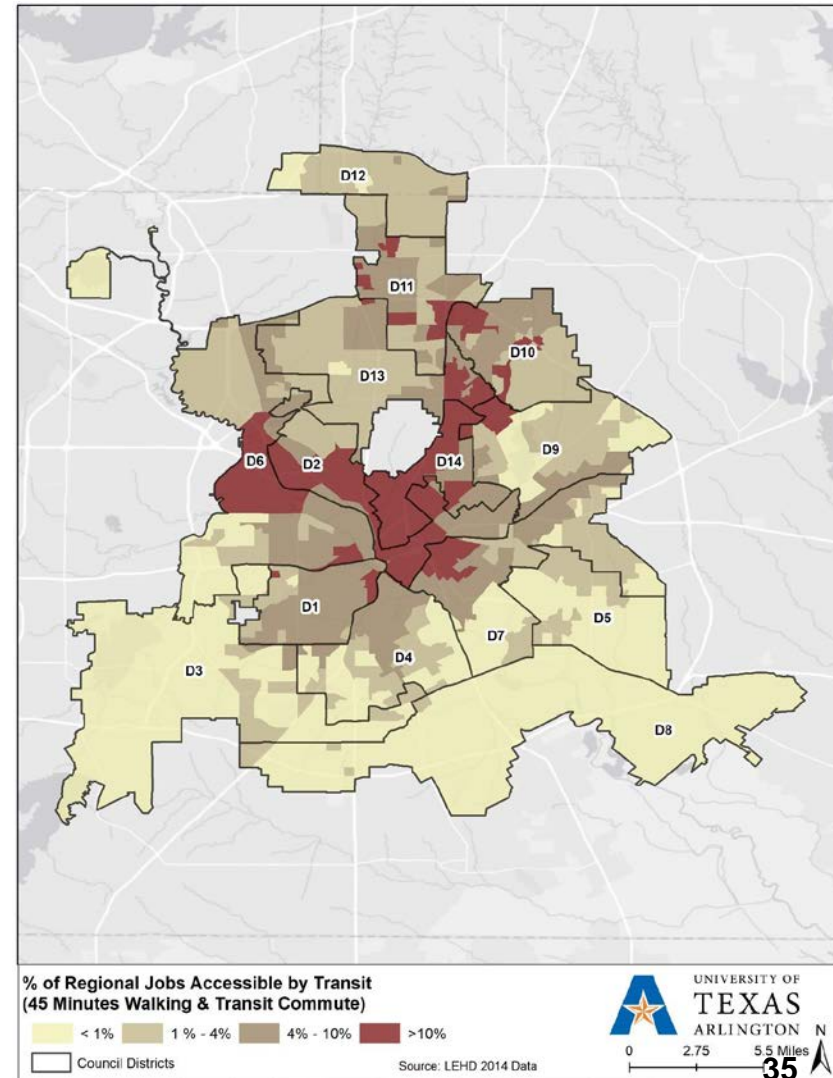
Job Accessibility by Driving

	access to less than 25% of jobs	access to 25-30% of jobs	access to 30-35% of jobs	access to 35-40% of jobs	access to more than 40% of jobs
DART Service Area	7.72%	16.70%	30.44%	33.17%	11.97%
City of Dallas	6.01%	11.53%	31.36%	40.86%	10.23%
Transit Dependent Core	7.68%	17.36%	35.24%	31.18%	8.55%

- On average, **34% of jobs** can be reached in 30 minutes of driving for Dallas residents.

- When categorizing jobs by income, we found no significant difference between access to jobs from different income categories (ranging from 34%-35%).

% of Regional Jobs Accessible by Driving (30 Minutes Driving Auto)
< 25%   25% - 30%   30% - 35%   35% - 40%   > 40%
Study Area
City of Dallas
DART Service Area
Source: LEHD 2014 Data

UNIVERSITY OF TEXAS ARLINGTON

% of Regional Jobs Accessible by Driving (30 Minutes Driving Auto)

⬜ < 25%	⬜ 25% - 30%	⬜ 30% - 35%	⬜ 35% - 40%	🟥 > 40%			

Study Area
City of Dallas
DART Service Area

Source: LEHD 2014 Data

0   5   10 Miles

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% of Regional Jobs Accessible by Transit (45 Minutes Walking & Transit Commute)

⬜ < 1%	⬜ 1 % - 4%	⬜ 4% - 10%	🟥 >10%

Study Area
City of Dallas
DART Service Area

Source: LEHD 2014 Data

0   5   10 Miles

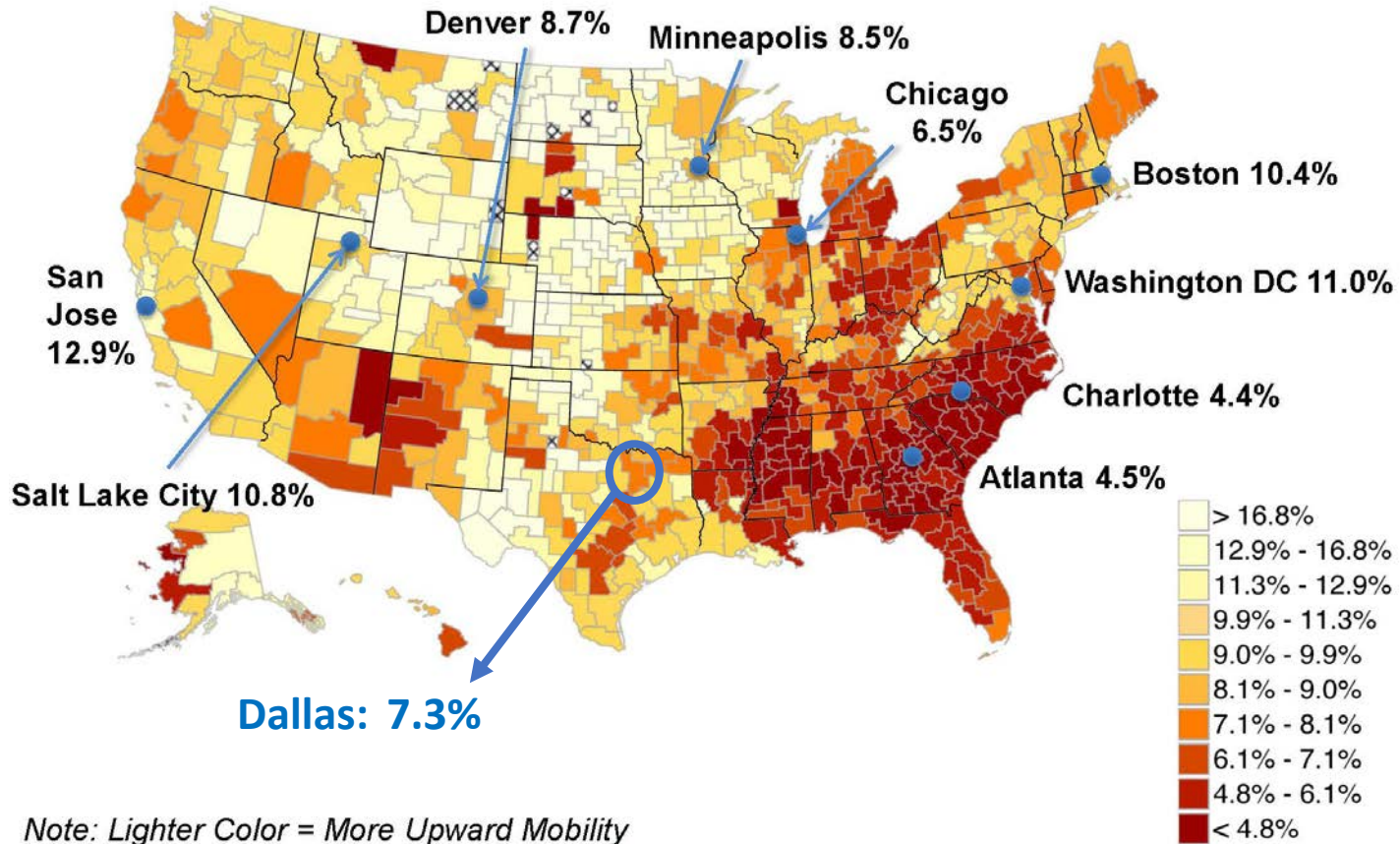UNIVERSITY OF
TEXAS
ARLINGTON

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The Outcomes:

Since 2000, the poverty rate in the City of Dallas has increased approximately **22%** while the City's total population only increased by about **9.7%**.

Poverty Rates
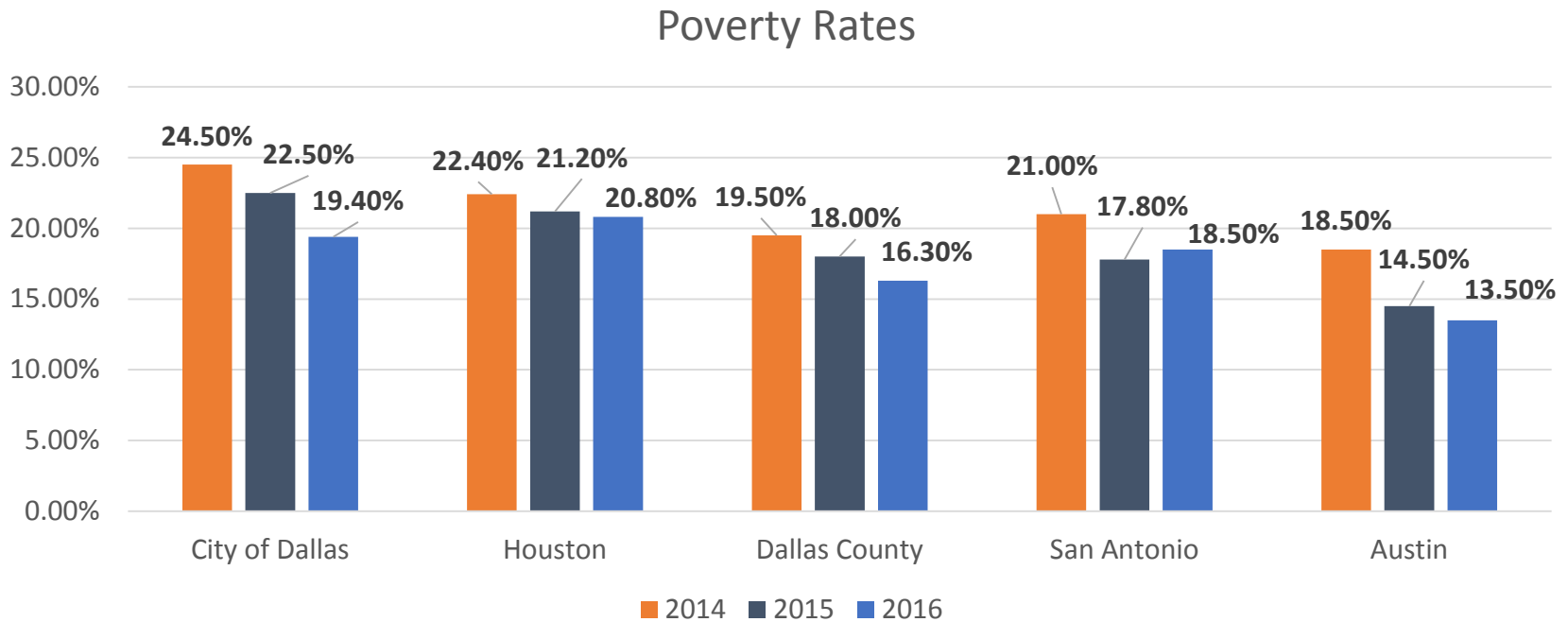
The Geography of Upward Mobility in the United States
Chances of Reaching the Top Fifth Starting from the Bottom Fifth by Metro Area

Denver 8.7%
Minneapolis 8.5%
Chicago 6.5%
Boston 10.4%
San Jose 12.9%
Washington DC 11.0%
Charlotte 4.4%
Atlanta 4.5%
Salt Lake City 10.8%
Dallas: 7.3%

> 16.8%
12.9% - 16.8%
11.3% - 12.9%
9.9% - 11.3%
9.0% - 9.9%
8.1% - 9.0%
7.1% - 8.1%
6.1% - 7.1%
4.8% - 6.1%
< 4.8%

Note: Lighter Color = More Upward Mobility

UTA Recommendations to the City of Dallas

- In-depth analysis of transportation needs and demands by communities in Dallas

- Innovative shared mobility options

- Land-use & transportation policy analysis

- Long-range Dallas mobility plan

Transportation Equity

Ideas for preliminary recommendations were presented to HSN Committee on October 16, 2017. Staff will use today's committee input and work with our partners to finalize our policy recommendations.

DART

- More efficiency out of system
- Improved frequency and timing for off-peak workers
- Last mile/first mile solutions
- Mobility on demand pilots
- Transit amenities and facilities condition
- Contracting with non-member cities for Dallas residents to access jobs

Dallas

- Transportation/Mobility Strategy
- Consider transit when granting Economic Development and Housing projects and programs
- Infrastructure investments that support transit (sidewalks)
- Utilize TIF/PIDs to encourage employment center shuttles for first mile/last mile solutions

City of Dallas

Next Steps and Questions

- Present final recommendations to the City Council Committee on Human and Social Needs.

Transportation Equity and Access to Opportunity for Transit-Dependent Population in Dallas

Mobility Solutions, Infrastructure and Sustainability Committee
October 23, 2017

Theresa O'Donnell,
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City of Dallas

Dr. Shima Hamidi
University of Texas at Arlington