

DOES LOCATION MATTER?

Performance Analysis of the Affordable Housing Programs in Dallas-Fort Worth Metropolitan Area

PRINCIPAL INVESTIGATOR

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Transportation Research Center
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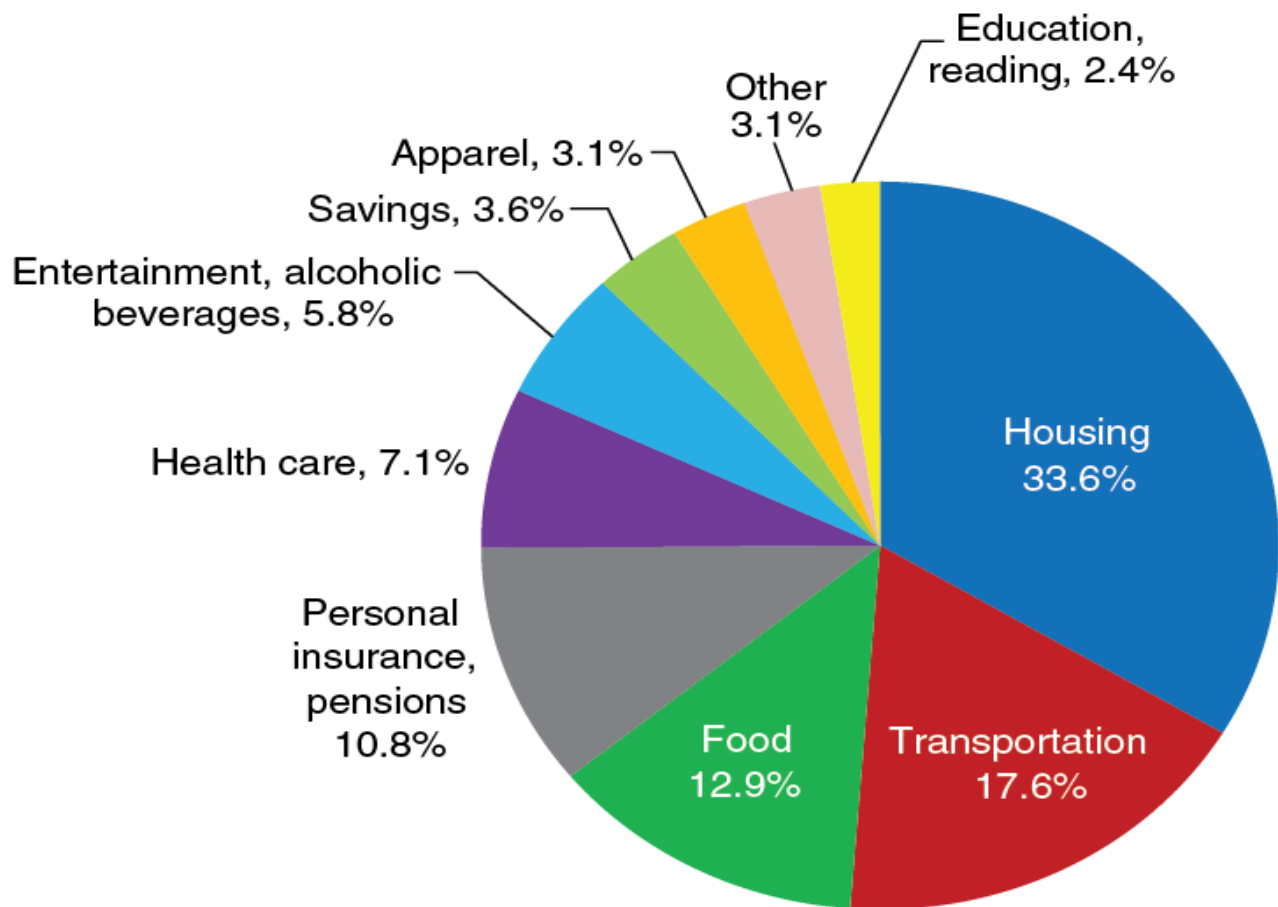
HUD's Measure of Housing Affordability

Total housing costs **at or below 30%** of gross annual income

- It is considered the definition of housing affordability nationally and internationally
- It is also the legislative standard used to qualify applicants for housing assistance (no less than 30%, no more than 40%)

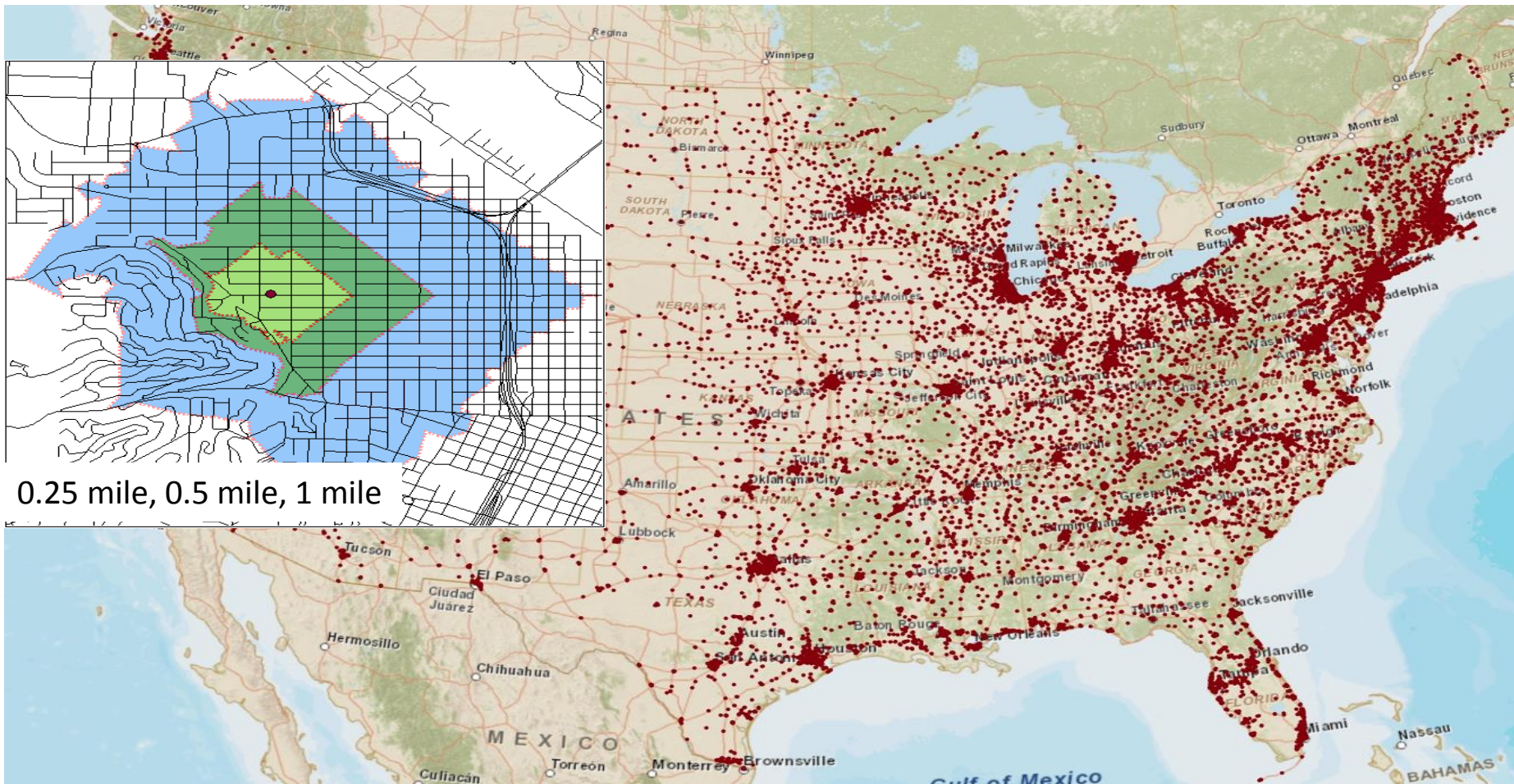
But how about **Transportation Costs**?

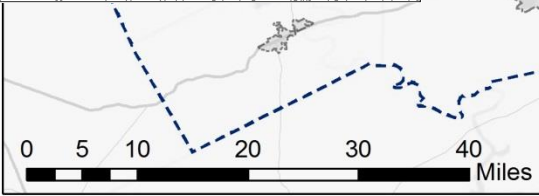
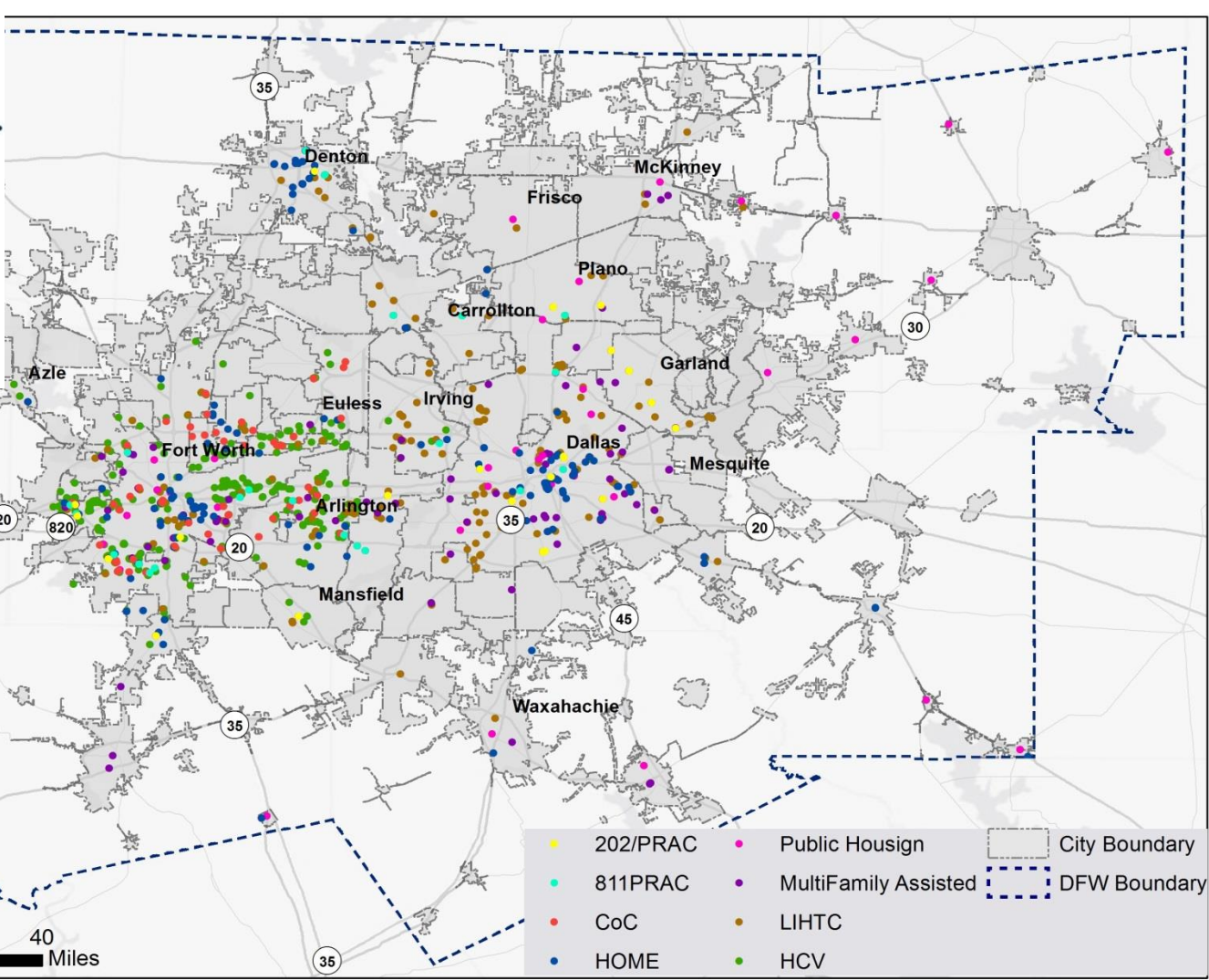
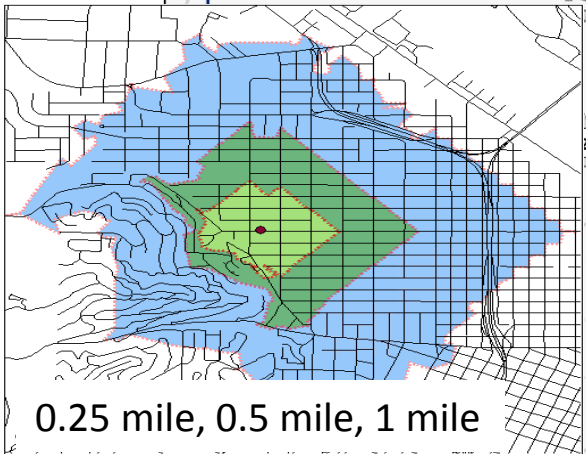
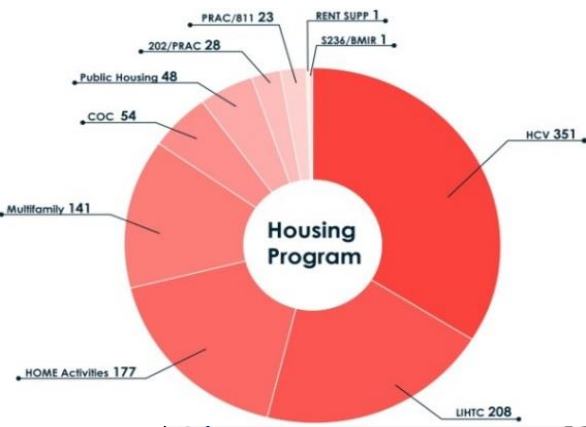
Share of U.S. household consumer expenditures by major categories, 2013



This study seeks to determine whether the **major affordable housing programs** provide “affordable housing” when transportation costs are factored in.

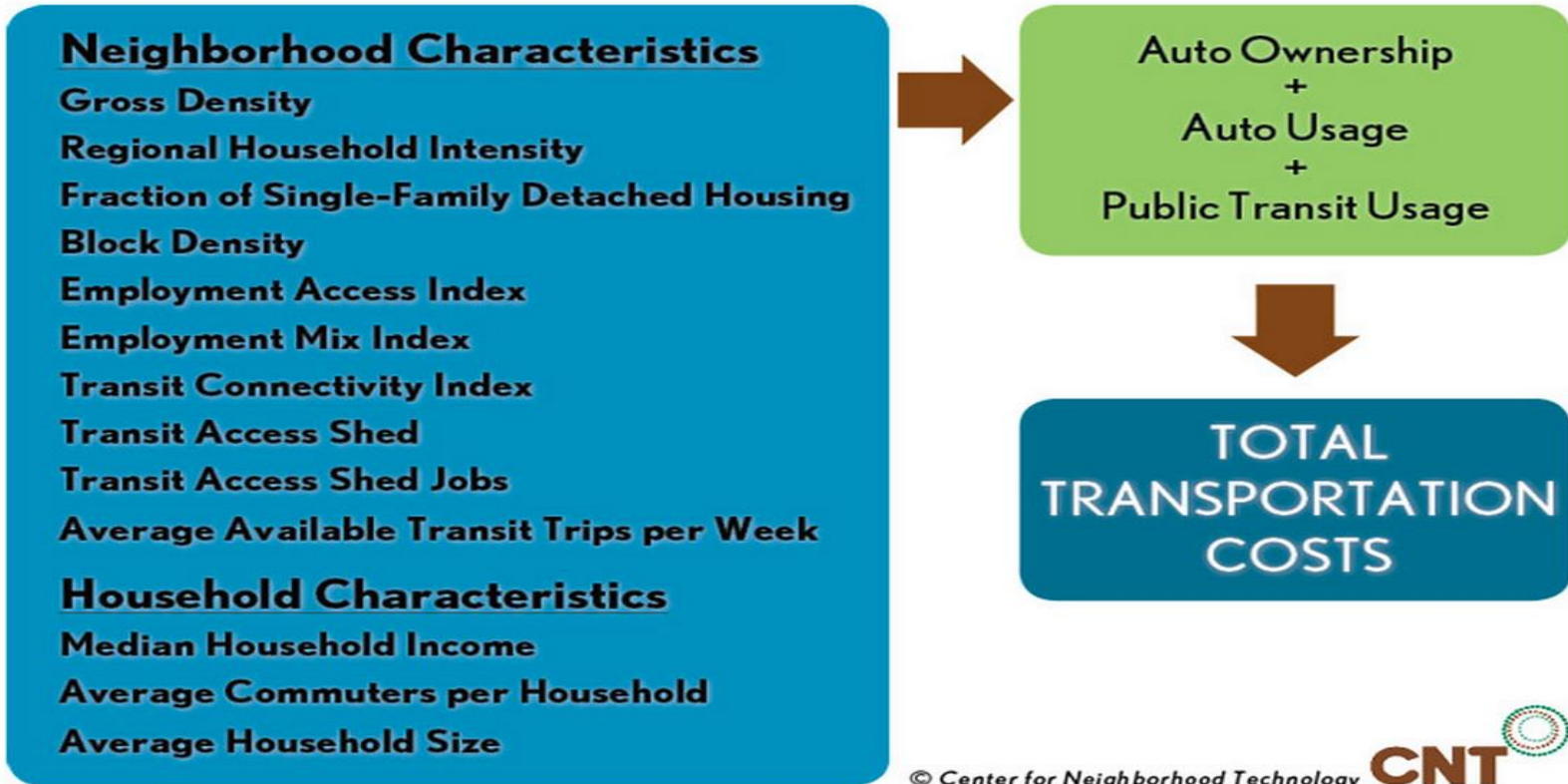
LIHTC and Sec 8 Multifamily Portfolio Dataset



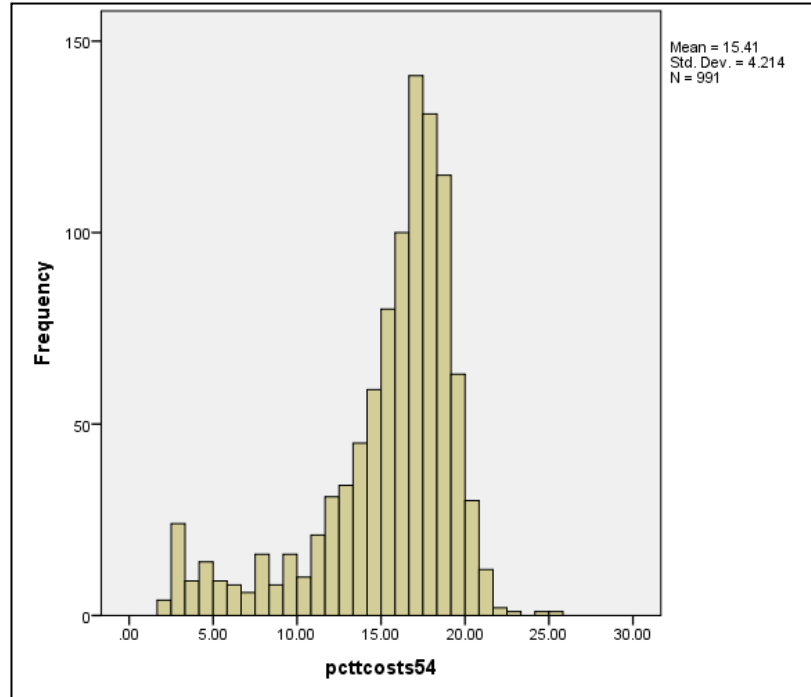


Variables Used in the Household Transportation Cost Calculations

Category	Symbol	Definition	Level
Outcome variables	<u>vmt</u>	Household VMT	Household
	<u>transit</u>	Household number of transit trips	Household
	<u>veh</u>	Number of household vehicles	Household
Household sociodemographic variables	<u>hsize</u>	Number of household members	Household
	<u>emp</u>	Number of household workers	Household
	<u>inc</u>	Household income (in 1982 dollars)	Household
Built environmental variables	<u>actden</u>	Activity density within a half mile (sum of population and employment divided by gross land area in square miles)	Household
	<u>entropy</u>	Land use mix within a half mile of a household (entropy index based on net acreage in different land use categories that ranges from 0, where all developed land is in one use, to 1, where developed land is evenly divided among uses)	Household
	<u>intden</u>	Intersection density within a half mile (number of intersections divided by gross land area in square miles)	Household
	<u>int4way</u>	Proportion of 4-way intersections with a half mile (4-or-more-way intersections divided by total intersections)	Household
	<u>emp10</u>	Proportion of regional employment accessible within a 10-minute travel time via automobile	Household
	<u>sf</u>	Single-family housing unit (dummy variable; yes=1, no=0)	
	<u>tfreq</u>	Aggregate frequency of transit service within a quarter mile of block group boundary per hour during evening peak period	Block group

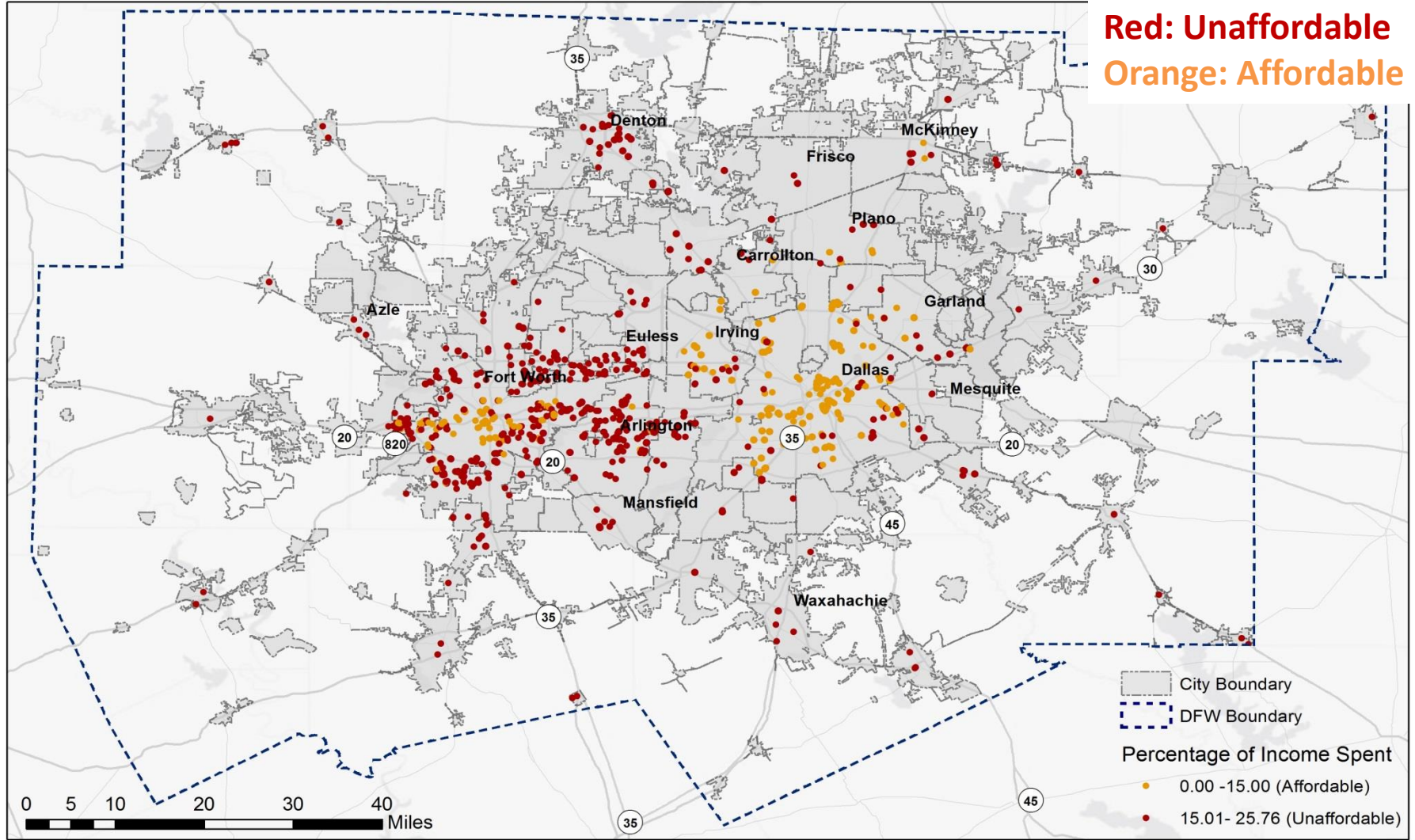


A location is affordable if total transportation costs **at or below 15%** of gross annual income



Frequency distribution of predicted transportation affordability (percentage of income spent for transportation costs) in DFW

Red: Unaffordable
Orange: Affordable

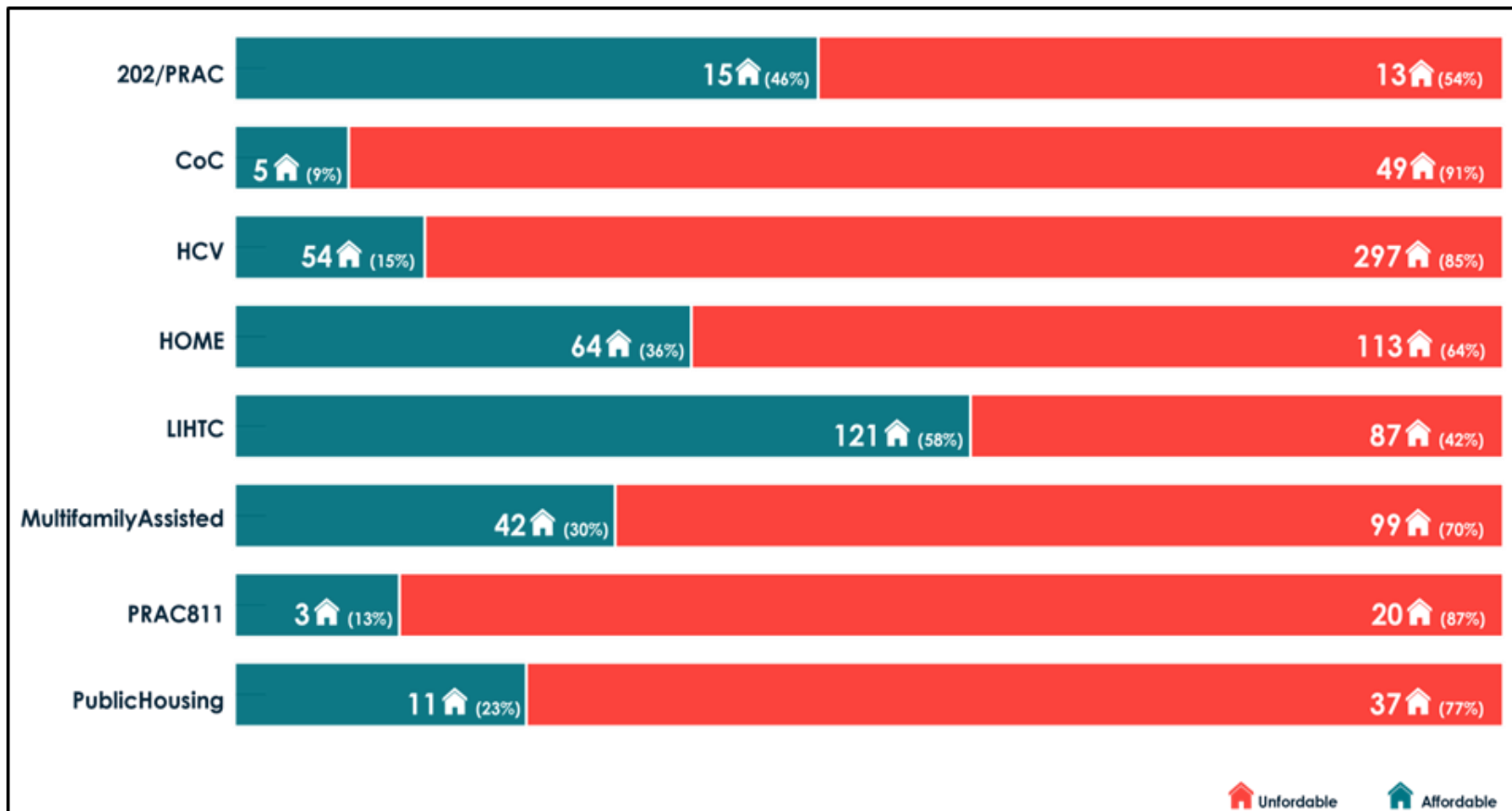


Percentage of Affordable Units With Regard To Transportation Costs in DFW Metro Area

City	Total Number of Housing Properties	Number of Affordable Properties	% of Affordable Project
Dallas	199	172	86.4%
Plano	17	12	70.6%
Irving	26	16	61.5%
Garland	16	8	50%
McKinney	6	2	33.3%
Fort Worth	361	99	27.4%
Carrollton	4	1	25%
Arlington	105	3	2.9%
Grand Prairie	15	0	0%
Mesquite	2	0	0%
Frisco	2	0	0%
Denton	42	0	0%
Richardson	3	0	0%
Lewisville	9	0	0%
North Richland Hills	17	0	0%

Note: We analyzed the Voucher Choice Program only for cities in Tarrant County due to data availability

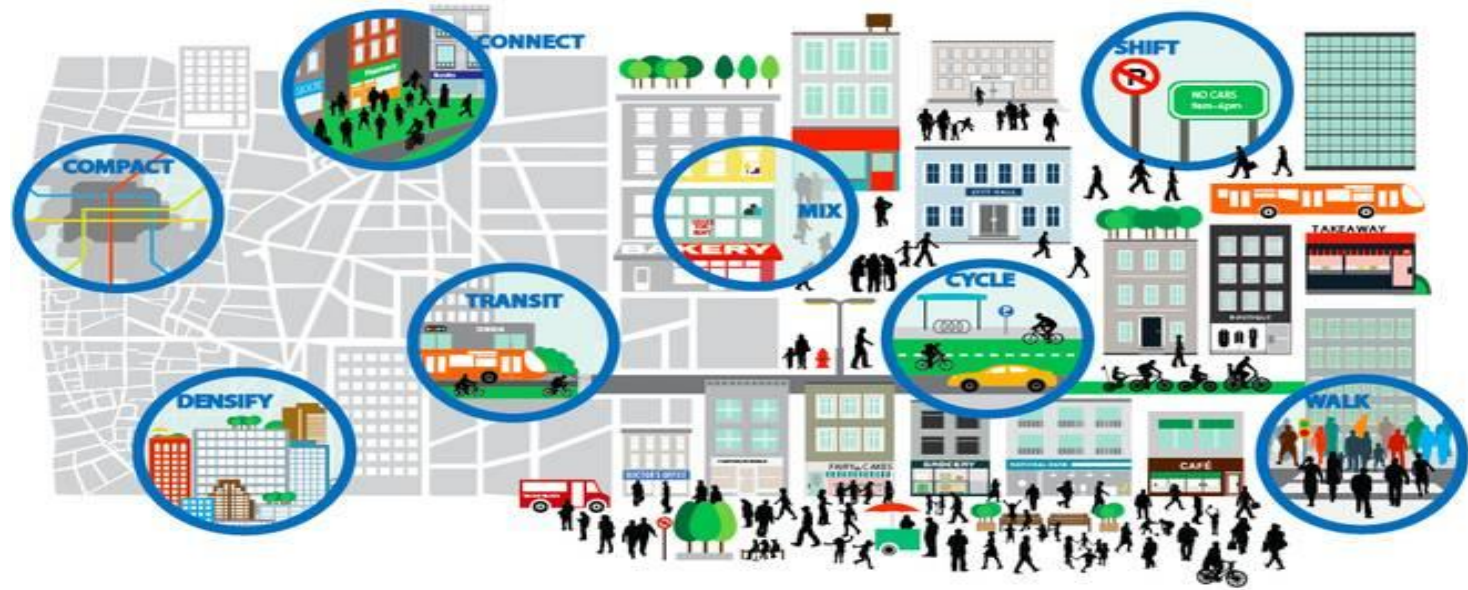
Number Of Affordable And Unaffordable Properties In 15 Large DFW Cities



Descriptive Statistics of Transportation Costs by Program in DFW

Housing Program	Mean	Minimum	Maximum
LIHTC	11.74	2.42	25.76
Public Housing	15.2	4.7	20.09
202/PRAC	15.49	7.71	20.31
HOME	15.69	2.14	22.55
Multifamily Assisted	16.17	4.14	21.61
HCV	16.82	3.88	24.41
PRAC811	17	12.14	20.02
<u>CoC</u>	17.03	9.35	20.88

Our findings suggest that **location matters**, housing developments in auto-dependent and inaccessible areas, are not holistically affordable



Directing developments to better (**more compact, walkable, and transit-served**) locations

Smarter Decisions

Map of Opportunity Areas

- Measuring Access to Major destinations for all census blocks in DFW
 - Access to jobs
 - Access to high quality schools
 - Access to health care facilities
 - Access to Health food
 - Access to amenities

Opportunity Score

ESRI Business Analyst

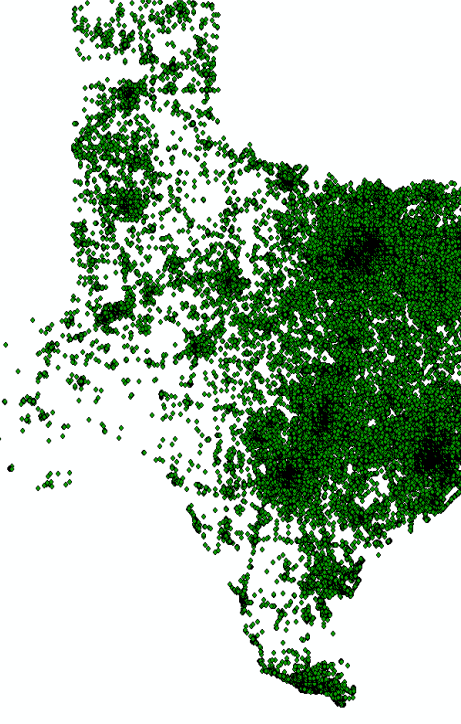
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Local Businesses search... Address Coder

Business Analyst Evaluate Site Maps Territory Design Network Analyst

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- Layers
 - Default Group Layer
 - Hospital_Clinic
 - Business Analyst Network Barriers



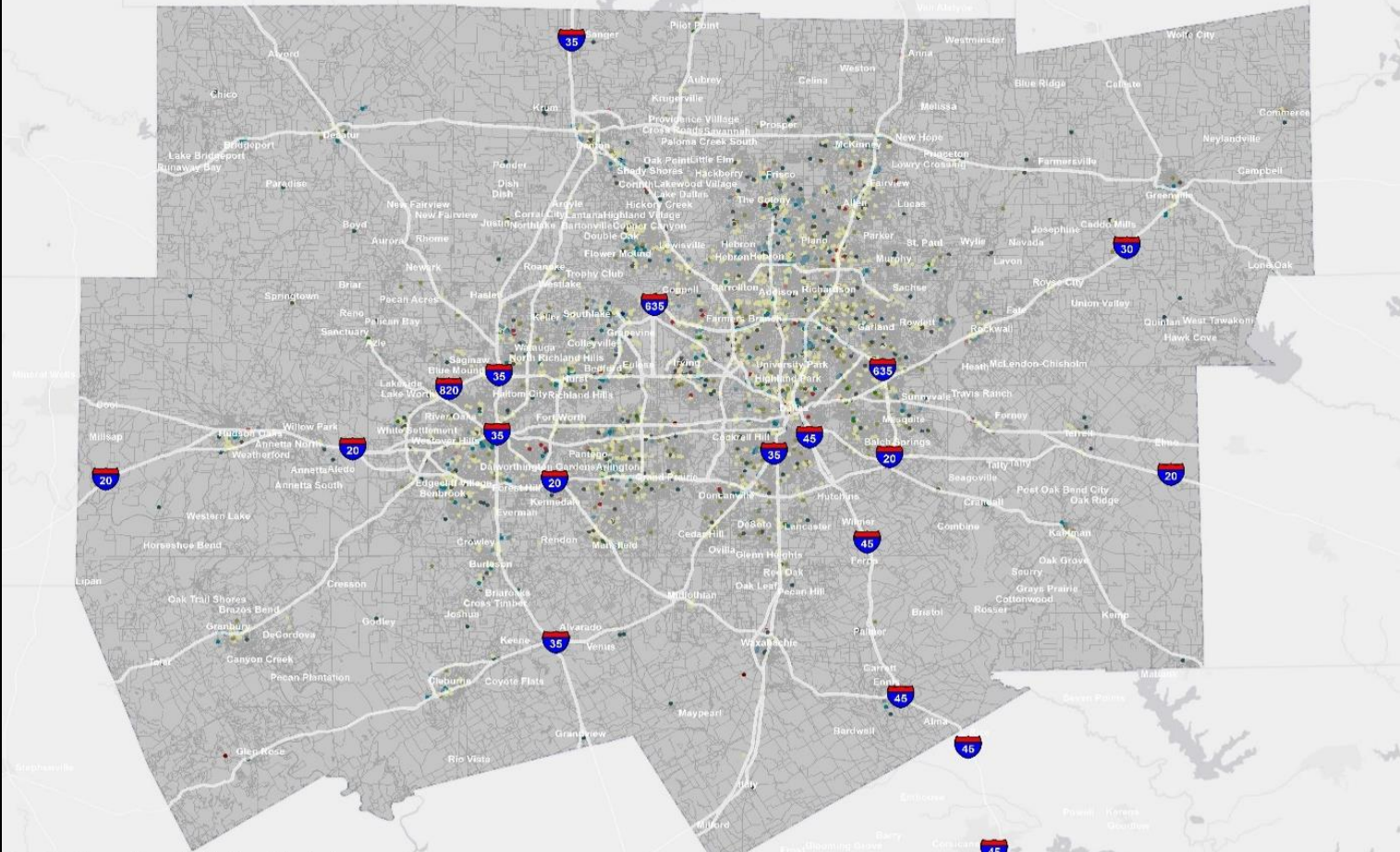
Table

CONAME*	STREET*	CITY*	STATE*	STATE_NAME*	ZIP*	ZIP4*	NAICS*	SIC*	SALESVOL*
LNARES AUTO SALES	W EXPRESSWAY 83	LA JOYA	TX	Texas	78560	4140	44112005	551103	1531
PENITAS POLICE DEPT	S MAIN ST	PENITAS	TX	Texas	78576		92212003	922104	0
MOTEL EL ARBOLITO	EXPRESSWAY 83	PENITAS	TX	Texas	78576		72111002	701101	91
ANGELS OF MERCY HOME HEALTH	E EXPRESSWAY 83	LA JOYA	TX	Texas	78560	8302	82161001	808201	785
STATE FARM INSURANCE	E EXPRESSWAY 83	LA JOYA	TX	Texas	78560	4189	52421001	641112	1800 2
PLCC CHILD CARE CTR	E EXPRESSWAY 83	LA JOYA	TX	Texas	78560	4178	62441003	835101	432
LAJOYA DENTAL ASSOC PA	EXPRESSWAY 83	PENITAS	TX	Texas	78576	2227	62121003	802101	1044
COMPASSION ADULT DAYCARE	EXPRESSWAY 83	PENITAS	TX	Texas	78576		62412002	832210	0
HDALGO COUNTY IRRGTN DSTRCTS	MILITARY RD	PENITAS	TX	Texas	78576		42382016	508305	43885
J T QUICK STOP	TOM GILL RD	PENITAS	TX	Texas	78576		44512001	541103	280
L LANTERA SANDOVAL	EXPRESSWAY 83	PENITAS	TX	Texas	78576	2235	30821201	753401	282
ATLAS CREDIT CO INC	W EXPRESSWAY 83	LA JOYA	TX	Texas	78560	4024	52229103	614101	2295
JUAREZ LINCOLN HIGH SCHOOL	N COYOTE DR	LA JOYA	TX	Texas	78560	4010	81111007	821103	0
SABIZ MEDICAL PHARMACY	EXPRESSWAY 83	PENITAS	TX	Texas	78576	2257	44511009	591205	2512
ADVANCE AUTO PARTS	E EXPRESSWAY 83	LA JOYA	TX	Texas	78560	4137	44131011	553111	1516 2
EXTREME CYCLES	EXPRESSWAY 83	PENITAS	TX	Texas	78576	2225	44122008	557106	1250
O'REILLY AUTO PARTS	E EXPRESSWAY 83	LA JOYA	TX	Texas	78560	4144	44131011	553111	1516 2
HEAVENLY HEALTH CARE	BUENAVISTA ST	PENITAS	TX	Texas	78576	2247	62161001	808201	235
SECURITY FINANCE CORP	W EXPRESSWAY 83	LA JOYA	TX	Texas	78560	4024	52229103	614101	3060 2
DOLLAR GENERAL	TOM GILL RD	PENITAS	TX	Texas	78576	8402	45299013	533101	920 2
PENITAS DENTAL CLINIC	EXPRESSWAY 83	PENITAS	TX	Texas	78576	8399	62149301	801104	365
CNE SOUTH DE MEXICO	PO BOX 147	LA JOYA	TX	Texas	78560	0147	51211008	781205	5892
B & O AUTO SALES	EXPRESSWAY 83	PENITAS	TX	Texas	78576	8316	44111001	551102	765
ELITE CRITICAL CARE EMS LLC	E EXPRESSWAY 83	LA JOYA	TX	Texas	78560	4252	82191002	411902	65
FOUNTAIN AT PENITAS RV PARK	PO BOX 910	PENITAS	TX	Texas	78576	0910	44121005	559103	2281
LEON'S DRIVE IN	W EXPRESSWAY 83	LA JOYA	TX	Texas	78560		44119005	554101	2089
DOMINO'S	EXPRESSWAY 83	PENITAS	TX	Texas	78576	8335	72251115	581222	729 2
DAVE WILLIAMS & CO	FISHERMANS WHARF	LA JOYA	TX	Texas	78560	9002	54161030	874899	156
RGV AMBULANCE SVC LLC	E EXPRESSWAY 83	LA JOYA	TX	Texas	78560	4252	62191002	411902	394
LA PICOZITA	W EXPRESSWAY 83	LA JOYA	TX	Texas	78560		72251117	581208	243
PENITAS PUBLIC LIBRARY	S MAIN ST	PENITAS	TX	Texas	78576		51912006	823106	0
LA JOYA POLICE DEPT	W EXPRESSWAY 83	LA JOYA	TX	Texas	78560	4128	92212003	922104	0
WALMART BAKERY	EXPRESSWAY 83	PENITAS	TX	Texas	78576	8333	31181102	546102	247 2
HLERBERLA SANTA ROSA	TOM GILL RD	PENITAS	TX	Texas	78576	2255	44529914	549913	124
SUBWAY	E EXPRESSWAY 83	LA JOYA	TX	Texas	78560	3909	72251117	581208	389 2
ALLSTATE INSURANCE	EXPRESSWAY 83	PENITAS	TX	Texas	78576	2200	52421001	641112	558 2
REDBOX	EXPRESSWAY 83	PENITAS	TX	Texas	78576	8333	53223009	784108	0 2
LA MANSON DE LA JOYA	S LEO AVE	LA JOYA	TX	Texas	78560	4090	53111002	851303	514
MAURO L RETINA ILLAW OFFICES	EXPRESSWAY 83	PENITAS	TX	Texas	78576		54111002	811103	124
LAJOYA PEDIATRIC	E EXPRESSWAY 83	LA JOYA	TX	Texas	78560	3909	62149301	801104	1461
SUPER TLE LLC	EXPRESSWAY 83	PENITAS	TX	Texas	78576	2254	23834005	174301	1856
UNIVERSITY-COSMETOLOGY ARTS	E EXPRESSWAY 83	LA JOYA	TX	Texas	78560	4018	61151102	723105	171
PENITAS INCOME TAX	EXPRESSWAY 83	PENITAS	TX	Texas	78576	2231	54121301	729101	99
CRICKET WIRELESS AUTH RETAILER	EXPRESSWAY 83	PENITAS	TX	Texas	78576	8334	51721014	481207	2752 2
LA FIANNO'S MEXICAN RESTAURANT	TOM GILL RD	PENITAS	TX	Texas	78576	8368	73951117	581208	340

0 (out of *2000 Selected)

Households' Major Destinations

Categories	Detailed Categories	Categories	Detailed Categories
Bank, Credit Unions and Insurance	Monetary Authorities-Central Bank	Fitness	Fitness and Recreational Sports Centers
	Credit Unions	Entertainment and Recreation	Museums
	Mortgage and Nonmortgage Loan Brokers		Historical Sites
	Direct Health and Medical Insurance Carriers		Zoos and Botanical Gardens
K1-K12	Elementary and Secondary Schools		Nature Parks and Other Similar Institutions
	Higher Education	Junior Colleges	Amusement and Theme Parks
Colleges, Universities, and Professional Schools		Healthy Food Store	Supermarkets and Other Grocery (except Convenience) Stores
Health Care Non-Mental Specialists	Offices of Physicians (except Mental Health Specialists)		Full-Service Restaurants
Health Care Mental Specialists	Offices of Physicians, Mental Health Specialists		Limited-Service Restaurants
Health Care Laboratories	Medical Laboratories		Cafeterias, Grill Buffets, and Buffets
Hospital and Clinic	General Medical and Surgical Hospitals	Unhealthy Food Store	Snack and Nonalcoholic Beverage Bars
	Freestanding Ambulatory Surgical and Emergency Centers		Convenience Stores
	Nursing Care Facilities (Skilled Nursing Facilities)		Snack and Nonalcoholic Beverage Bars
Child and Youth Facilities	Child Day Care Services	Social and Religious Services	Drinking Places (Alcoholic Beverages)
	Elementary and Secondary Schools		Full-Service Restaurants
	Child and Youth Services		Limited-Service Restaurants
Elderly and Disability Facilities	Services for the Elderly and Persons with Disabilities	Community Food Services	Religious Organizations
	Nursing Care Facilities (Skilled Nursing Facilities)		Civic and Social Organizations
	Assisted Living Facilities for the Elderly		
Pharmacies	Pharmacies and Drug Stores		



Destinations Density In the Study Area

1 Dot = 4	ChildYoth	Fitness	School	NonMental	Healthy
pharmacy	Elderly	Higher Education	Labratorie	Service	Highway
Bank	Amusement	Hospital	Mental	Unhea	Census Blocks

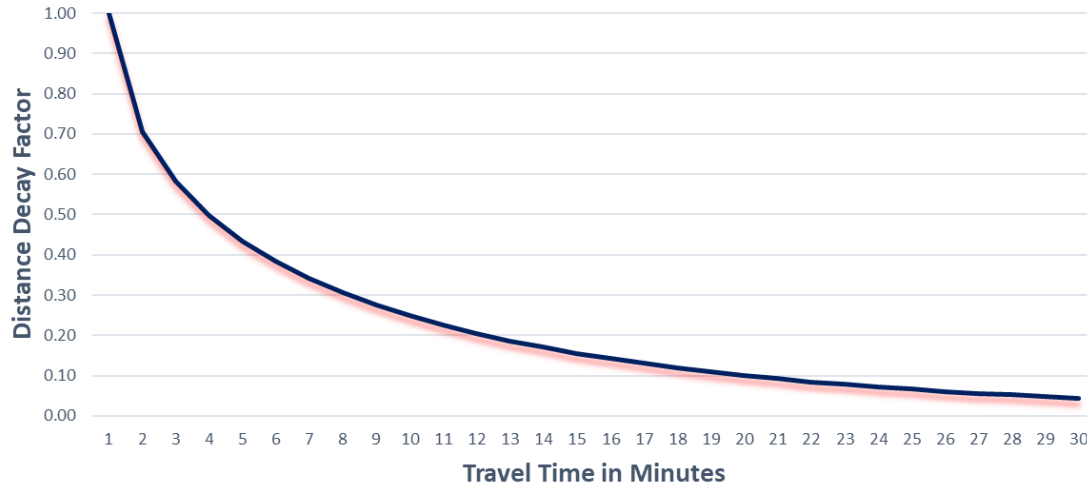
5 2.5 0 5 10 15 20 Miles

Gravity Modeling for

- Walking
- Transit
- Driving

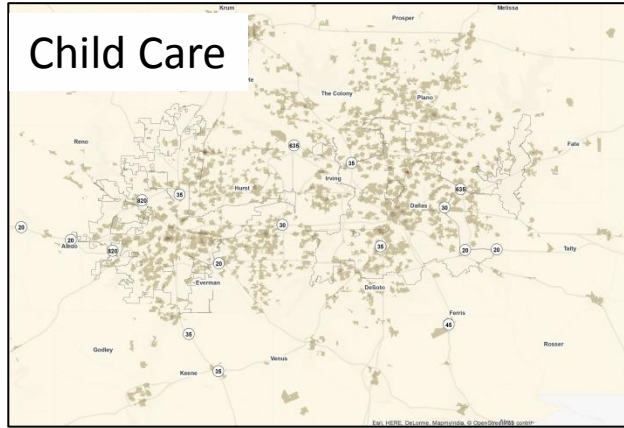


Distance Decay Curve (Source: NCHRP 365)

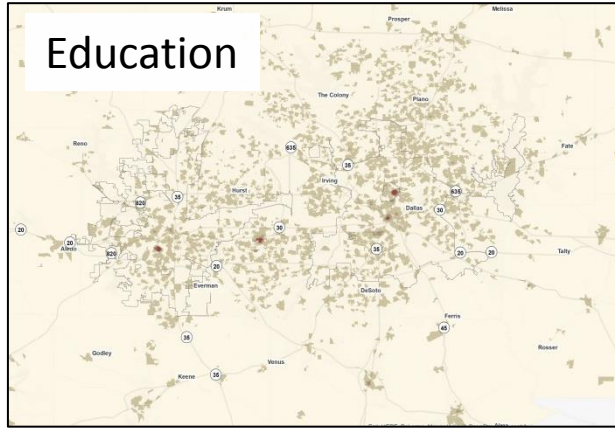


Access to Opportunity Score/ Walking

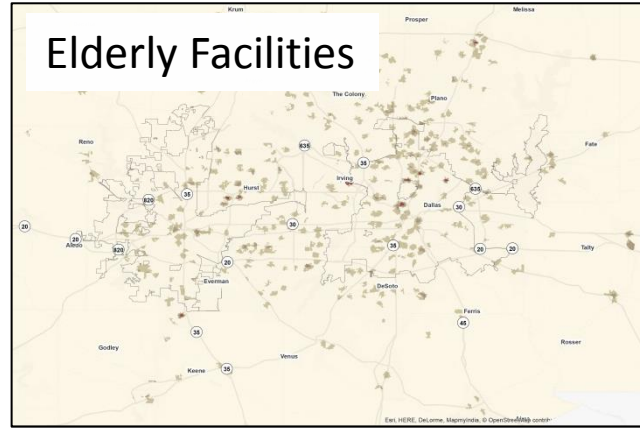
Child Care



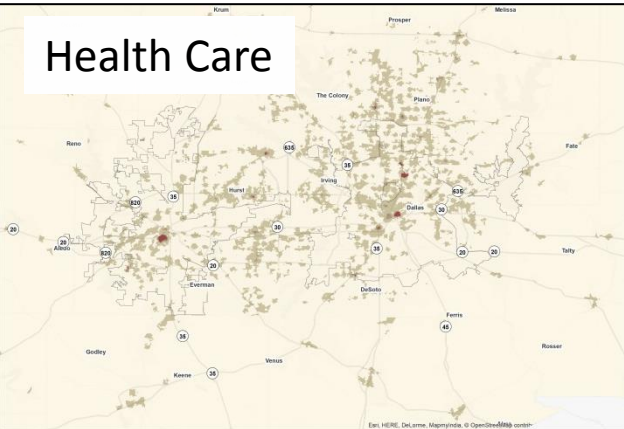
Education



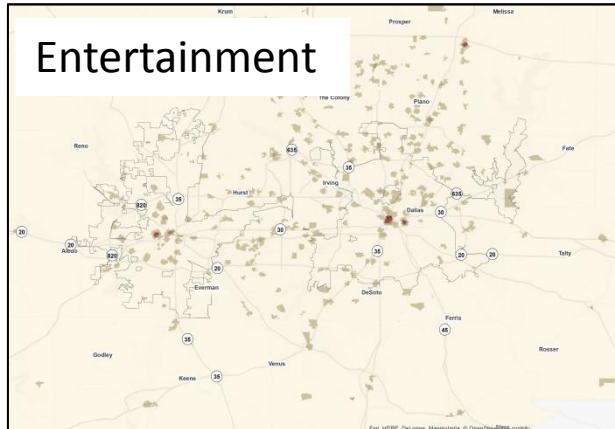
Elderly Facilities



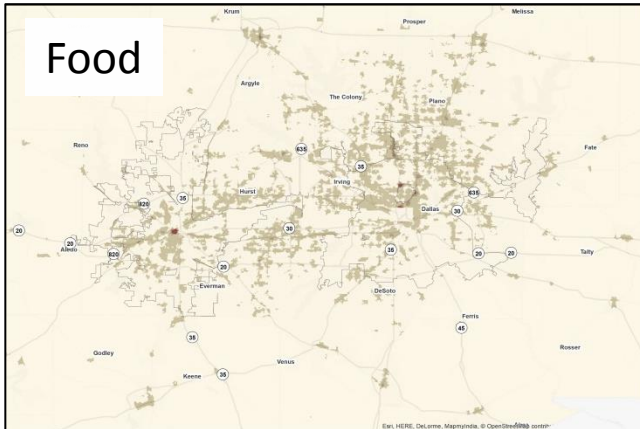
Health Care



Entertainment

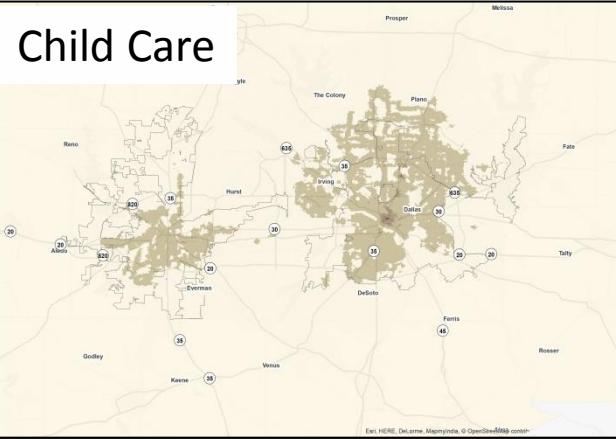


Food

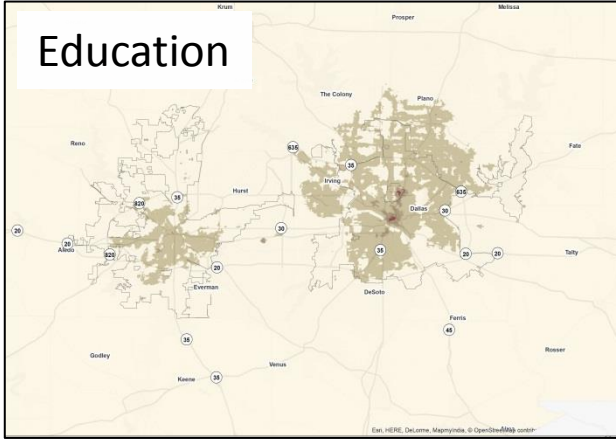


Access to Opportunity Score/ Transit

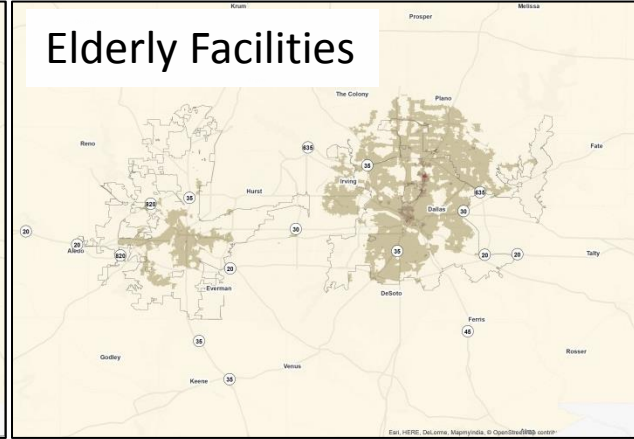
Child Care



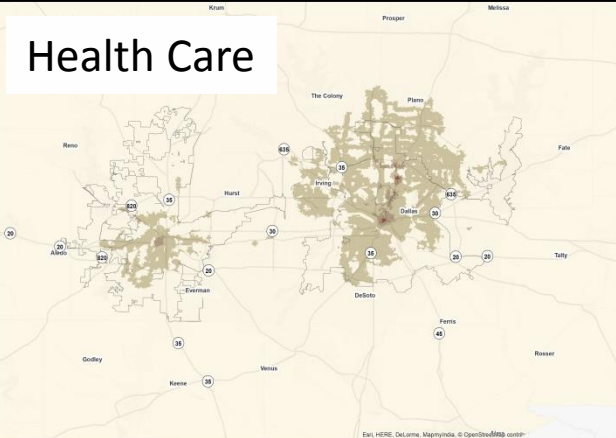
Education



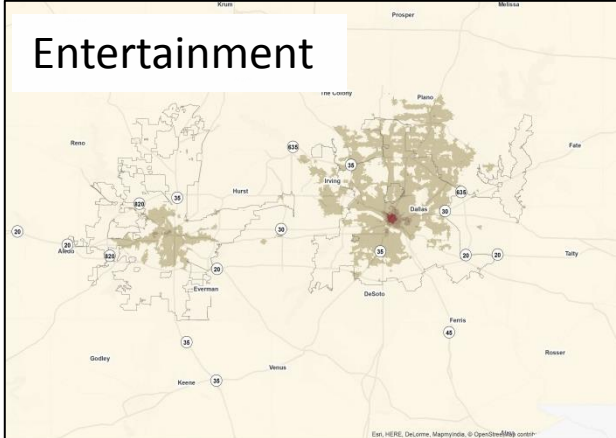
Elderly Facilities



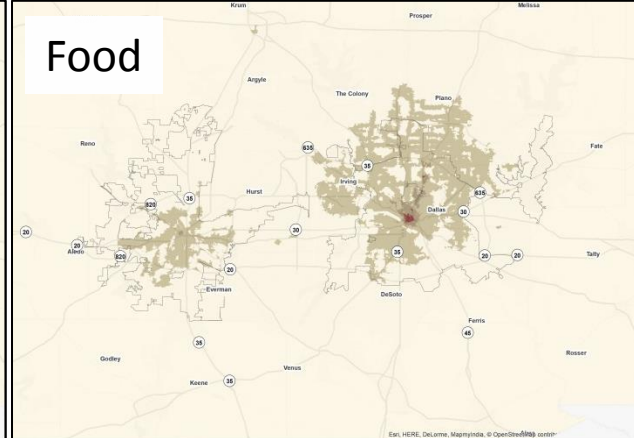
Health Care



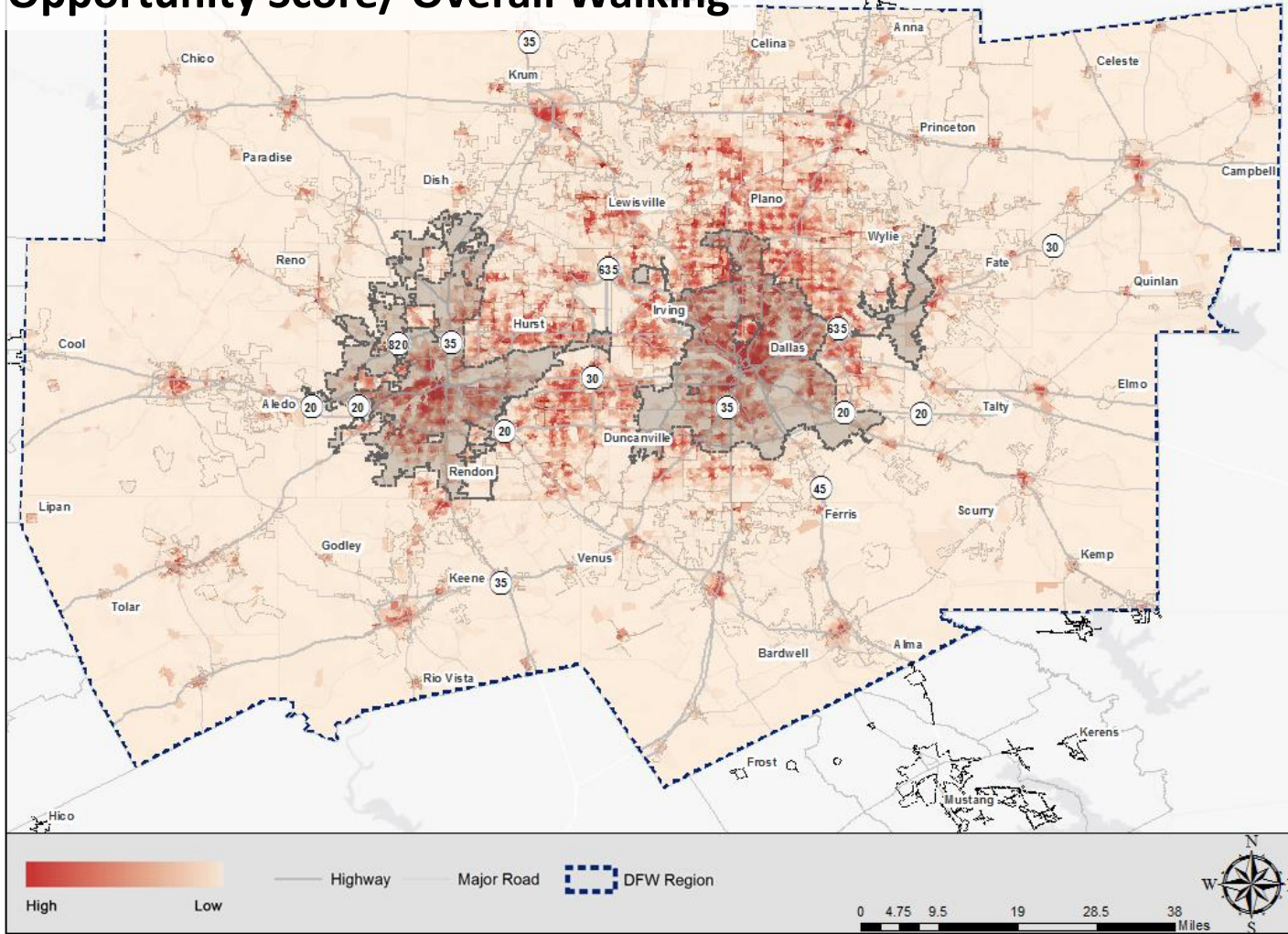
Entertainment



Food



Access to Opportunity Score/ Overall Walking

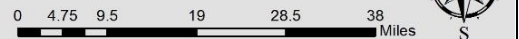
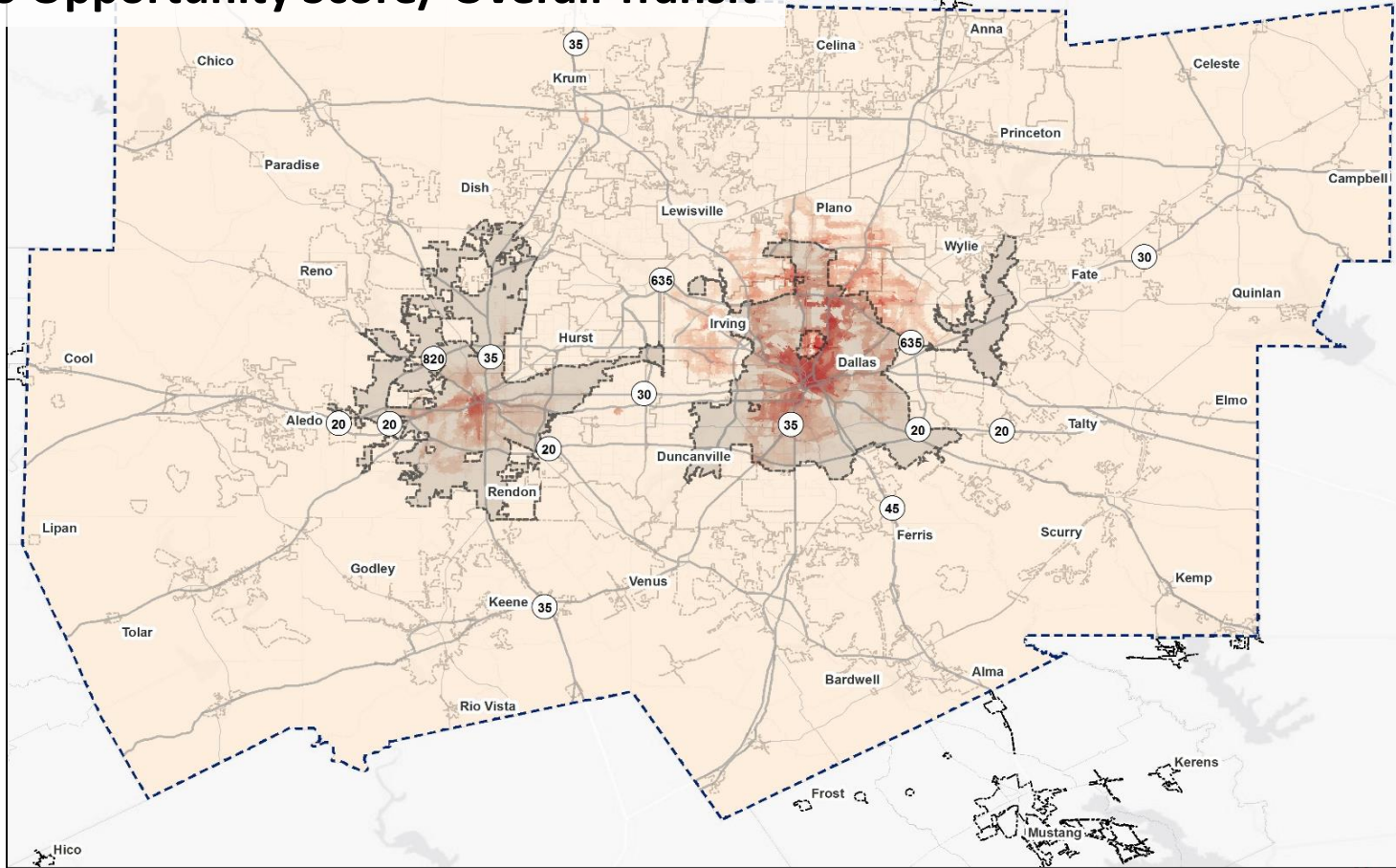


Percentage of population living in high access to opportunity areas

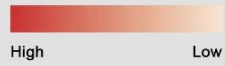
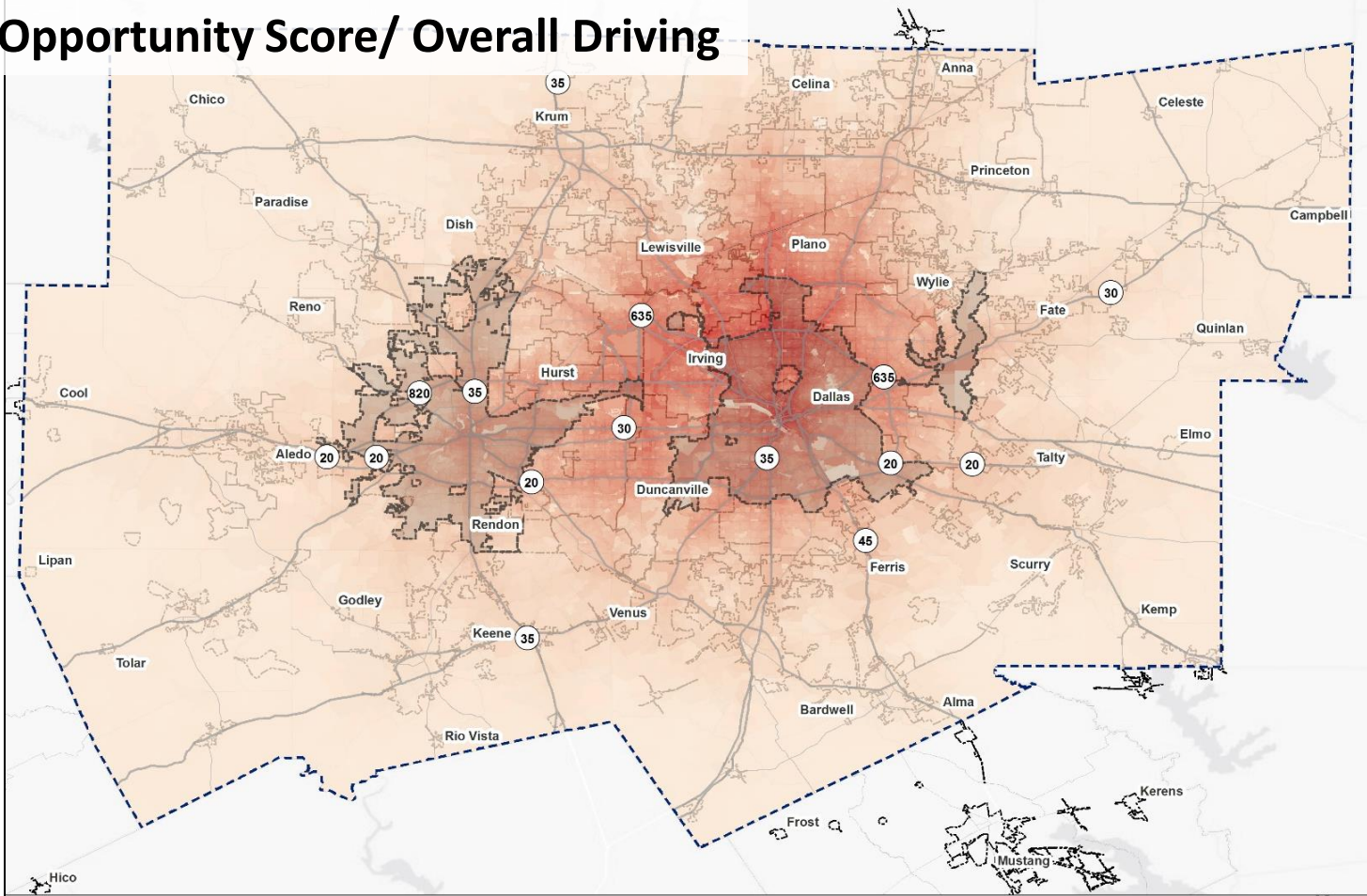
Walking

Rank	City Names	Overall Opportunity	Jobs	Health Care	Food Outlets	Education	Entertainment	Service	Child Care	Elderly Care
1	Dallas	47.3%	38.8%	35.6%	43.8%	43.6%	9.7%	42.3%	43.7%	18.2%
2	Irving	44.3%	40.1%	35.6%	41.2%	46.2%	6.8%	33.1%	34.5%	11.8%
3	Richardson	42.4%	35.4%	39.0%	35.1%	49.2%	15.7%	33.0%	36.8%	22.2%
4	Denton	37.1%	28.6%	29.1%	29.5%	34.4%	15.3%	29.6%	31.2%	21.2%
5	Garland	34.1%	29.2%	21.9%	34.5%	43.2%	7.9%	34.9%	33.0%	16.1%
6	Arlington	34.1%	28.0%	32.2%	33.9%	37.0%	7.8%	26.2%	37.6%	14.0%
7	Fort Worth	33.5%	26.7%	22.5%	31.4%	38.6%	7.7%	35.2%	39.9%	10.2%
8	Plano	33.5%	31.0%	32.7%	28.3%	38.6%	13.6%	20.3%	39.8%	12.8%
9	Mesquite	31.9%	20.8%	30.3%	31.4%	38.4%	8.2%	32.1%	37.2%	15.6%
10	Carrollton	29.7%	28.2%	24.4%	28.2%	35.0%	8.2%	23.9%	44.9%	9.8%
11	Grand Prairie	26.8%	23.1%	18.1%	27.8%	38.5%	11.0%	27.0%	25.6%	19.2%
12	Lewisville	23.6%	28.9%	20.3%	33.1%	31.9%	10.7%	17.7%	31.1%	17.3%
13	McKinney	22.3%	18.2%	14.3%	19.7%	32.1%	11.8%	21.4%	24.3%	15.9%
14	Allen	17.4%	11.5%	18.3%	17.1%	39.9%	5.7%	4.5%	37.2%	5.1%
15	Frisco	15.7%	12.3%	22.7%	11.9%	35.1%	20.0%	8.2%	29.0%	8.3%

Access to Opportunity Score/ Overall Transit



Access to Opportunity Score/ Overall Driving



Highway Major Road DFW Region



Percentage of population living in high access to opportunity areas

Driving

Rank	City Names	Overall Opportunity	Jobs	Health Care	Food Outlets	Education	Entertainment	Service	Child Care	Elderly Care
1	Carrollton	100%	100%	100%	100%	99.9%	99.9%	100%	100%	99.9%
2	Garland	99.5%	78.5%	99.5%	99.8%	95.9%	98.5%	96.1%	98.6%	99.8%
3	Irving	99.5%	88%	99.1%	99.5%	99.5%	99.4%	100%	99.3%	98.8%
4	Dallas	98.4%	82.8%	96.9%	98.6%	98.7%	98.5%	98.7%	98.3%	98.9%
5	Richardson	97.3%	92.5%	98.2%	98.2%	95.6%	97.2%	95.4%	96.7%	97.5%
6	Plano	97.1%	92.5%	98.2%	96.9%	92.7%	97.2%	83.5%	97%	97%
7	Lewisville	97.1%	91.0%	99.4%	95.6%	89.2%	92%	80.9%	94.2%	86.7%
8	Grand Prairie	93.9%	79.8%	90.6%	95.3%	95.7%	91.6%	96.2%	95.3%	94.1%
9	Arlington	85.9%	59.5%	74.1%	89%	91.2%	76.3%	95.1%	93.1%	86.8%
10	Mesquite	76.1%	28.4%	73.8%	79.6%	76.3%	74.8%	79.6%	76.9%	79.1%
11	Frisco	70%	42%	86.9%	68.2%	52.5%	83.7%	42.8%	74.1%	71%
12	Allen	57.5%	58.2%	68.8%	56.3%	38.5%	65.9%	20%	64.4%	59.6%
13	Fort Worth	39.5%	40.3%	28.9%	41.9%	45.3%	33.4%	53.3%	48.9%	37.2%
14	McKinney	18.1%	23%	32.2%	15%	3%	30.9%	2.6%	22.8%	23%
15	Denton	0%	0%	0%	0%	12.7%	0.1%	0%	0%	0%

Average Opportunity Scores by Driving for the Top 15 Cities in DFW

Mode	Destinations	Dallas	Fort Worth	Arlington	Plano	Garland	Irving	Grand Prairie	Mesquite	McKinney	Carrollton	Frisco	Denton	Richardson	Lewisville	Allen
Driving	Service Opportunity	131.1	108.2	118.3	112.3	113.0	136.8	122.2	117.5	92.1	124.1	101.8	83.1	118.6	109.2	97.9
	Health Opportunity	129.4	98.4	108.4	128.1	117.0	132.3	113.7	113.4	99.1	136.6	114.1	87.8	131.9	123.2	108.2
	Education Opportunity	132.1	104.5	116.6	116.9	113.2	133.0	119.7	115.2	92.0	126.2	104.5	91.7	123.8	113.1	100.3
	Job Opportunity	124.5	102.8	113.2	124.6	111.7	116.6	117.3	97.5	93.0	124.1	101.8	85.8	129.2	119.8	104.3
	Child & youth Opportunity	128.4	106.1	115.8	124.2	114.4	130.3	118.9	115.0	96.5	131.4	110.8	83.4	125.5	117.7	106.7
	Elderly & disability Opportunity	131.0	101.1	112.1	125.0	119.1	129.1	117.4	116.4	97.4	129.8	109.4	85.4	130.9	113.0	105.5
	Entertainment Opportunity	132.9	100.2	109.6	123.0	114.5	131.0	116.8	115.1	99.7	129.0	112.6	88.4	126.1	116.0	107.4
	Food Opportunity	130.3	103.1	113.5	122.3	116.9	133.2	119.2	116.7	95.9	131.1	108.7	84.2	127.1	115.9	104.9
	Overall Opportunity	130.7	102.1	112.7	123.4	115.8	132.4	117.6	114.4	96.3	131.6	109.6	86.4	128.1	117.8	105.1
walking	Service Opportunity	111.5	108.1	101.5	97.6	103.2	101.5	99.5	103.5	102.2	98.0	95.4	106.1	101.6	95.3	95.5
	Health Opportunity	107.6	104.8	103.3	107.7	98.7	102.0	98.2	101.6	101.1	101.5	101.8	105.7	107.3	101.3	105.5
	Education Opportunity	106.3	103.8	104.5	101.6	103.7	101.8	97.9	100.3	100.8	99.2	97.8	116.3	105.5	98.4	100.5
	Job Opportunity	107.3	106.6	104.0	108.6	101.5	104.6	100.1	100.0	105.6	103.9	99.3	106.5	109.1	103.0	102.1
	Child & youth Opportunity	108.3	107.9	105.2	108.1	101.3	103.0	97.8	103.8	101.5	105.0	101.7	106.3	104.2	103.4	108.2
	Elderly & disability Opportunity	104.7	100.0	99.9	103.4	103.6	100.5	102.0	99.4	106.3	97.9	100.5	105.1	106.6	100.8	95.2
	Entertainment Opportunity	105.4	101.7	98.9	100.7	97.8	98.4	98.7	99.0	111.4	97.1	104.4	107.4	102.3	98.1	101.3
	Food Opportunity	112.3	105.3	104.5	105.8	101.4	102.1	99.6	101.7	101.8	100.9	98.6	106.5	104.9	100.7	102.2
	Overall Opportunity	112.3	106.9	104.3	106.9	101.2	102.6	98.6	101.9	104.0	101.3	100.1	109.1	107.7	100.4	103.6
Transit	Service Opportunity	133.9	109.3	90.1	96.8	110.9	108.5	89.6	90.5	89.4	100.2	89.5	89.8	110.3	89.4	89.4
	Health Opportunity	131.3	106.0	90.2	106.6	107.8	106.6	89.8	90.5	89.7	102.0	89.9	90.4	122.7	89.7	89.7
	Education Opportunity	133.7	106.0	91.3	99.7	114.0	108.0	89.4	90.2	89.1	101.3	89.2	90.5	118.5	89.1	89.1
	Job Opportunity	130.3	104.4	90.9	103.8	107.8	106.6	90.5	91.0	90.4	103.7	90.6	90.6	117.5	90.4	90.4
	Child & youth Opportunity	133.9	111.3	89.0	105.3	112.4	110.0	88.3	89.3	88.1	105.0	88.3	88.5	122.0	88.1	88.1
	Elderly & disability Opportunity	133.8	103.2	89.6	104.9	119.3	104.4	89.5	90.2	89.3	98.0	89.4	90.2	131.3	89.3	89.3
	Entertainment Opportunity	128.3	104.5	92.5	99.4	103.9	100.9	91.9	92.4	91.9	99.7	91.9	92.2	112.6	91.9	91.9
	Food Opportunity	133.7	105.1	89.8	103.3	112.8	108.2	89.5	90.2	89.3	103.5	89.5	89.7	118.7	89.3	89.3
	Overall Opportunity	133.7	106.5	89.9	103.3	111.0	107.3	89.4	90.1	89.2	101.9	89.3	89.8	120.3	89.2	89.2

- **Location** Matters
- Importance of **Informed, Evidence-Based** Decision Making
- **Opportunity Index**
 - Housing Agencies
 - Transit Agencies
 - Cities
 - Real Estate and Private Firms
 - Public