

Comparison of Travel Time Distributions from ACS 2015 and NPMRDS

Applying Census Data for Transportation:
50 Years of Transportation Planning Data Progress

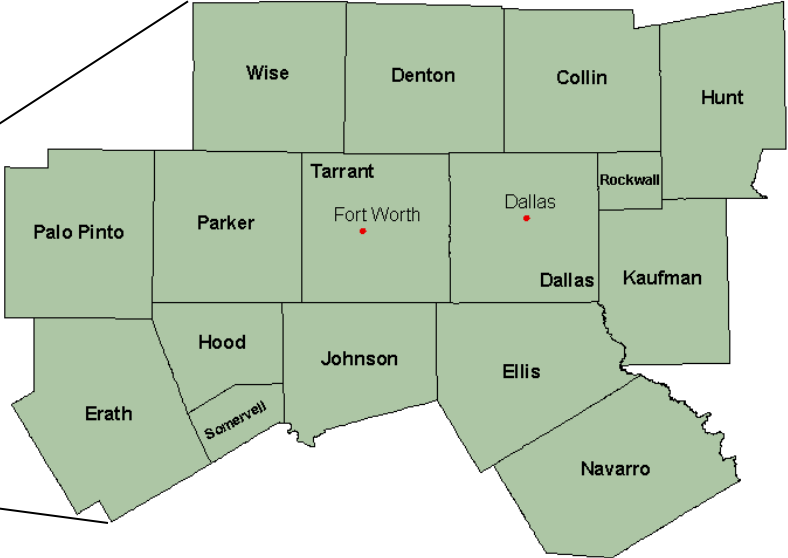
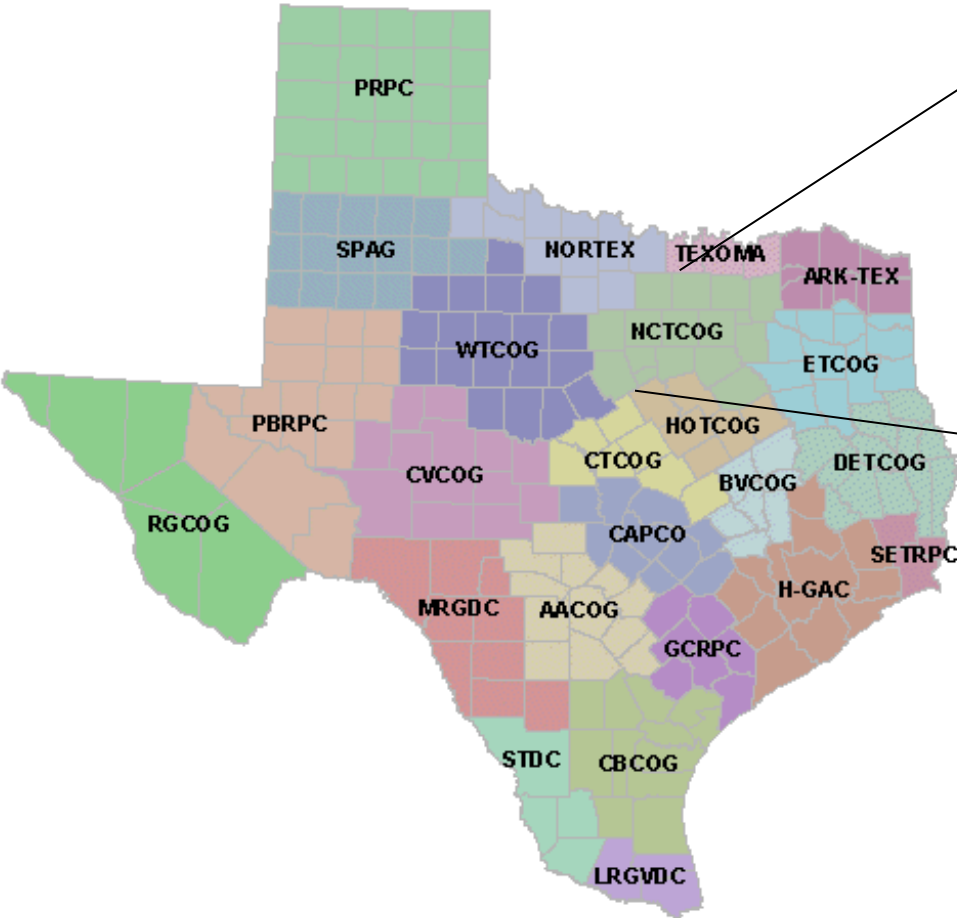
Kansas City, MO
November 16th, 2017



Purpose

Compare the Travel Time estimations from the American Community Survey (ACS) with those derived from real speed data from the National Performance Management Research Data Set (NPMRDS)

NCTCOG Region



Commuter information in the ACS

13195011

U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU

THE American Community Survey

This booklet shows the content of the American Community Survey questionnaire.

Start Here

Respond online today at:
<https://respond.census.gov/acs>

OR

Complete this form and mail it back as soon as possible.

This form asks for information about the people who are living or staying at the address on the mailing label and about the house, apartment, or mobile home located at the address on the mailing label.

If you need help or have questions about completing this form, please call 1-800-354-7271. The telephone call is free. Call 1-800-552-8220. The telephone call is free.

Telephone Device for the Deaf (TDD):
If you need help or have questions about completing this form, please call 1-877-433-5626. Usual también puede completar su entrevista por teléfono con un entrevistador que habla español. O puede responder por Internet en: <https://respond.census.gov/acs>

For more information about the American Community Survey, visit our web site at: <http://www.census.gov/acs/www/>

OMB No. 0607-0810
OMB No. 0607-0596

ACS-1 (INFO) (2016)

13195102

Person 1 (continued)

29 a. LAST WEEK, did this person work for pay at a job (or business)?

Yes → SKIP to question 30
 No - Did not work (or retired)

b. LAST WEEK, did this person do ANY work for pay, even for as little as one hour?

Yes
 No → SKIP to question 35a

30 At what location did this person work LAST WEEK?

31 How did this person usually get to work LAST WEEK? If this person usually use more than one method of transportation during the trip, mark (X) the box of the one used for most of the distance.

Car, truck, or van
 Bus or trolley bus
 Streetcar or trolley car
 Subway or elevated
 Railroad
 Ferryboat
 Taxicab

Motorcycle
 Bicycle
 Walked
 Worked at home → SKIP to question 39a
 Other method

32 How many people, including this person, usually rode to work in the car, truck, or van LAST WEEK?

Person(s)

33 What time did this person usually leave home to go to work LAST WEEK?

34 How many minutes did it usually take this person to get from home to work LAST WEEK?

Minutes

35 What time did this person usually leave home to go to work LAST WEEK?

36 During the LAST 4 WEEKS, has this person been ACTIVELY looking for work?

Yes
 No → SKIP to question 38

37 LAST WEEK, could this person have started a job if offered one, or returned to work if recalled?

Yes, could have gone to work
 No, because of own temporary illness
 No, because of all other reasons (in school, etc.)

38 During the LAST 4 WEEKS, has this person been ACTIVELY looking for work?

40 to 47 weeks
 27 to 39 weeks
 14 to 26 weeks
 13 weeks or less

39 During the PAST 12 MONTHS, in the WEEKS WORKED, how many hours did this person usually work each WEEK?

Usual hours worked each WEEK

40 During the PAST 12 MONTHS, in the WEEKS WORKED, how many hours did this person usually work each WEEK?

Usual hours worked each WEEK

41 Has this person been informed that he or she will be recalled to work within the next 6 months OR been given a date to return to work?

Yes → SKIP to question 37
 No

42 Has this person been informed that he or she will be recalled to work within the next 6 months OR been given a date to return to work?

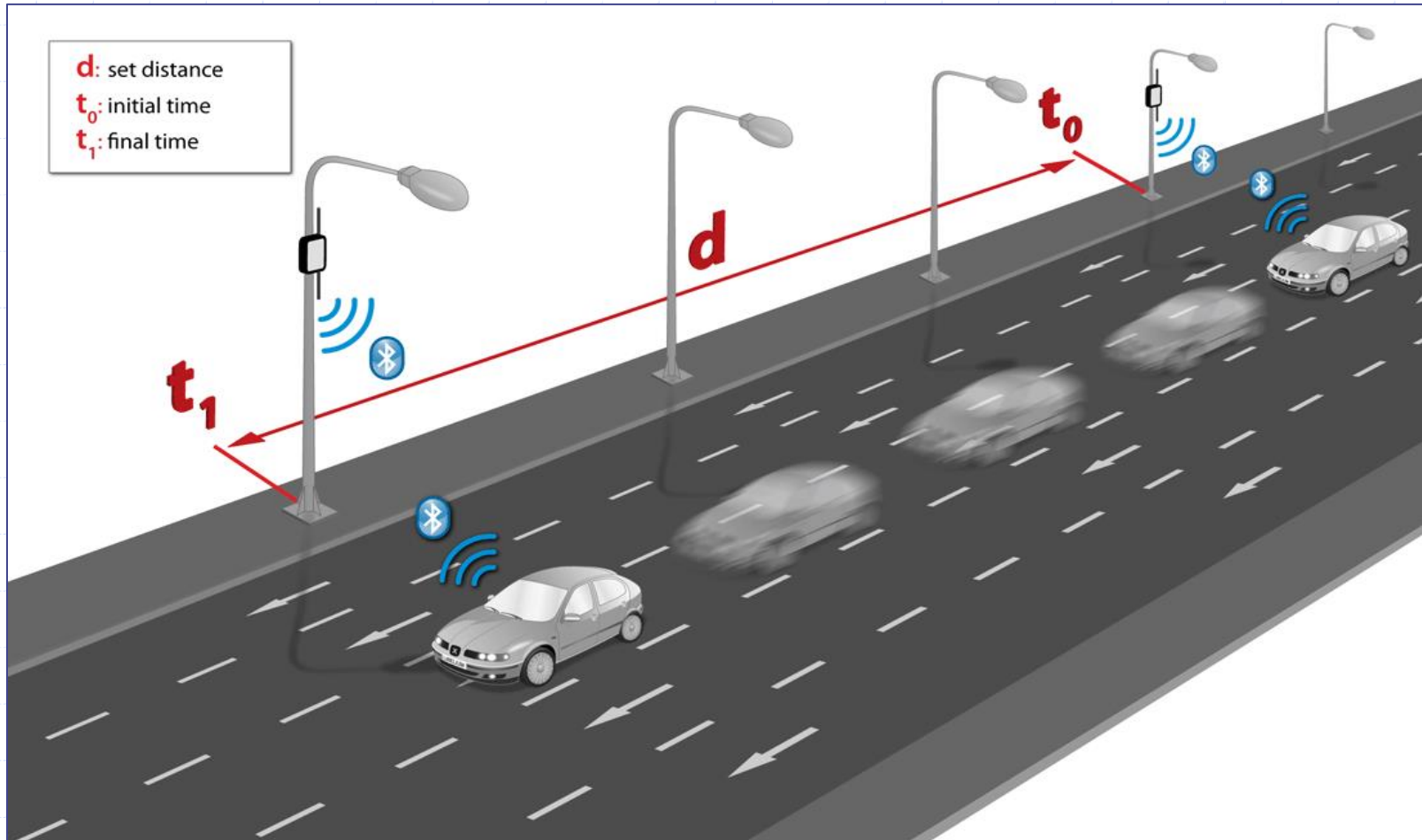
Yes → SKIP to question 37
 No



NPMRDS

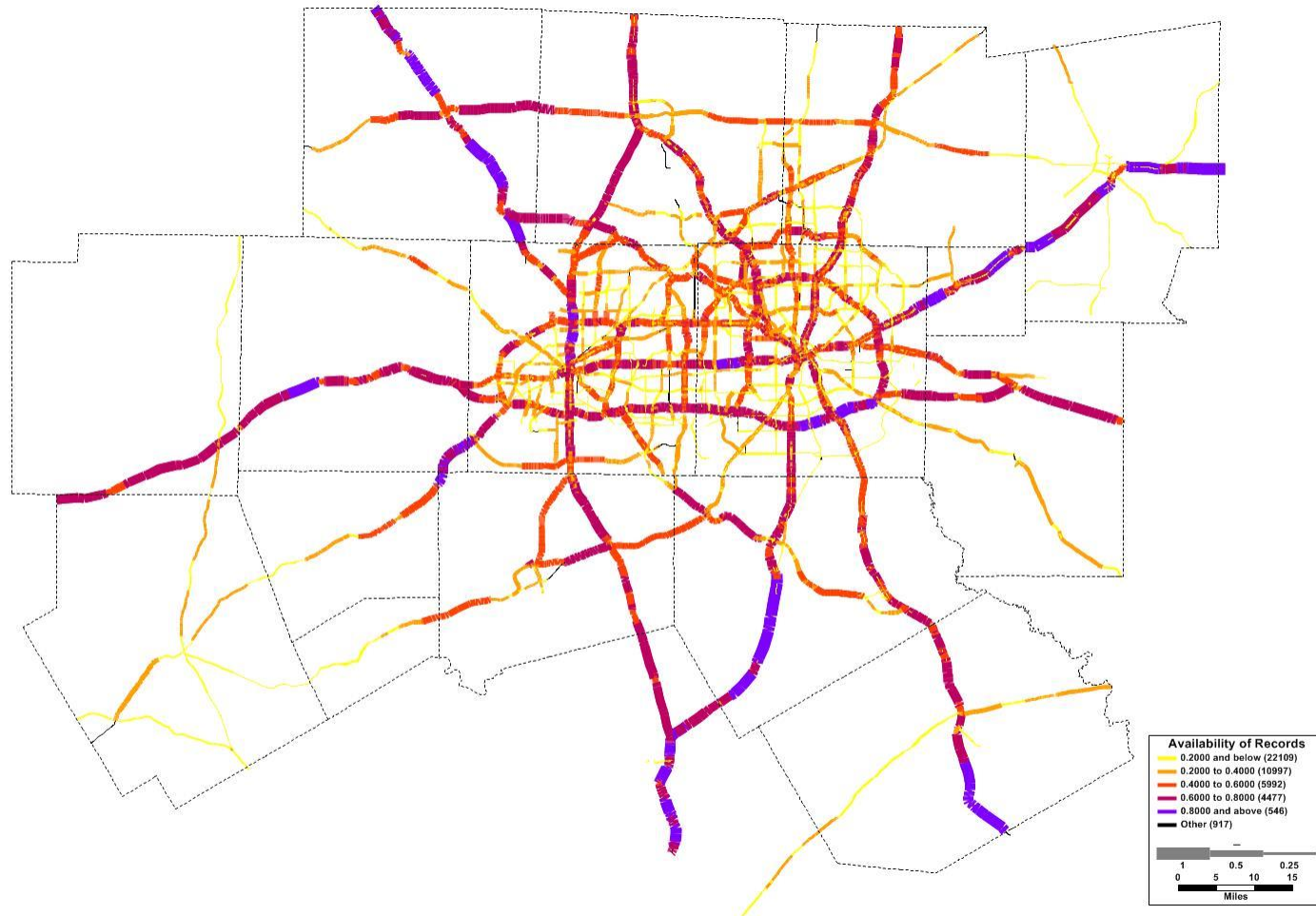
- ◆ NPMRDS stands for National Performance Management Research Data Set
- ◆ It refers to a Vehicle probe-based **travel time data** set acquired by the Federal Highway Administration (FHWA)
- ◆ Data is collected by HERE, before February 2017

Collection of Speed Data

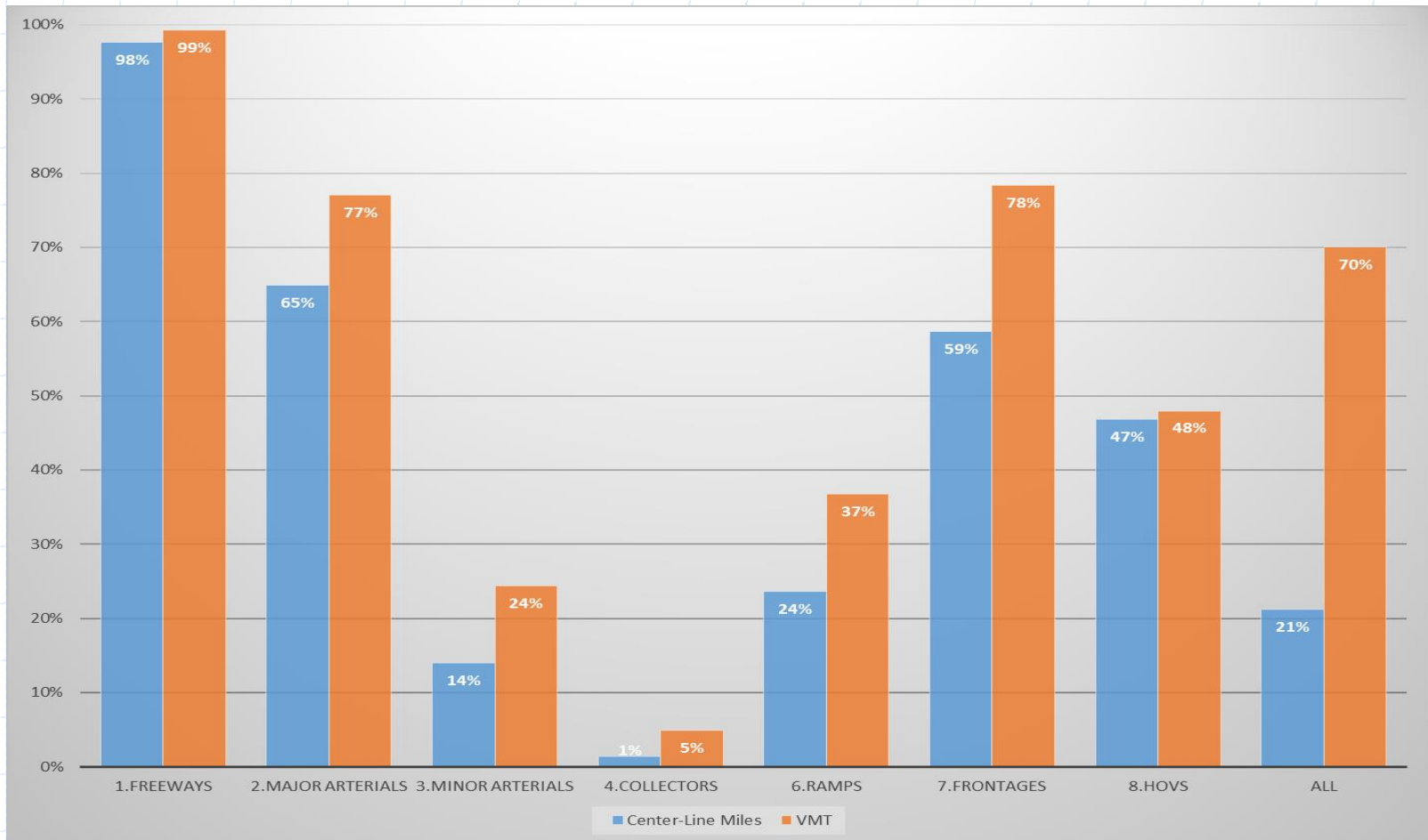


Coverage.

Travel Times for All Vehicles



Coverage by Road Type at Dallas-Fort Worth MPA

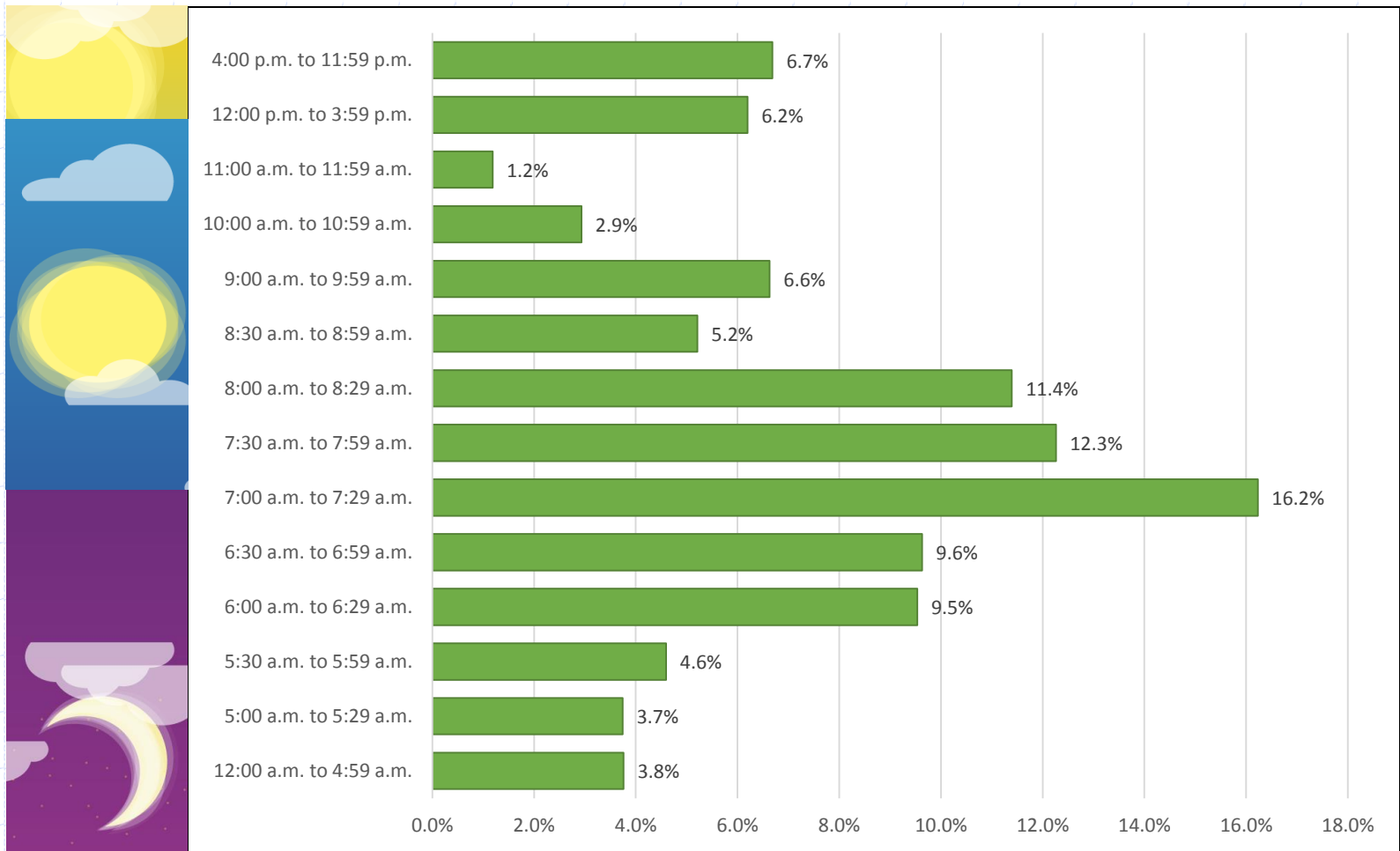


Source of Data for ACS

- ◆ B08303 TRAVEL TIME TO WORK
- ◆ B08132 MEANS OF TRANSPORTATION TO WORK BY TIME LEAVING HOME TO GO TO WORK

- **Universe: Workers 16 years and over who did not work at home**
- **2011-2015 American Community Survey 5-Year Estimates**
- **By County**

Distribution of Departures Times of Commute Trips from ACS



Other Input Data

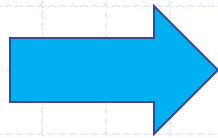
- ◆ HBW matrix from Travel Demand Model for 2014
- ◆ Travel Times from NPMRDS for weekdays of 2015 for roads that are part of the NHS
- ◆ Travel Times for from Travel Model Network 2014 for non-NHS segments

Matrix Home Based Work Trips

Destination

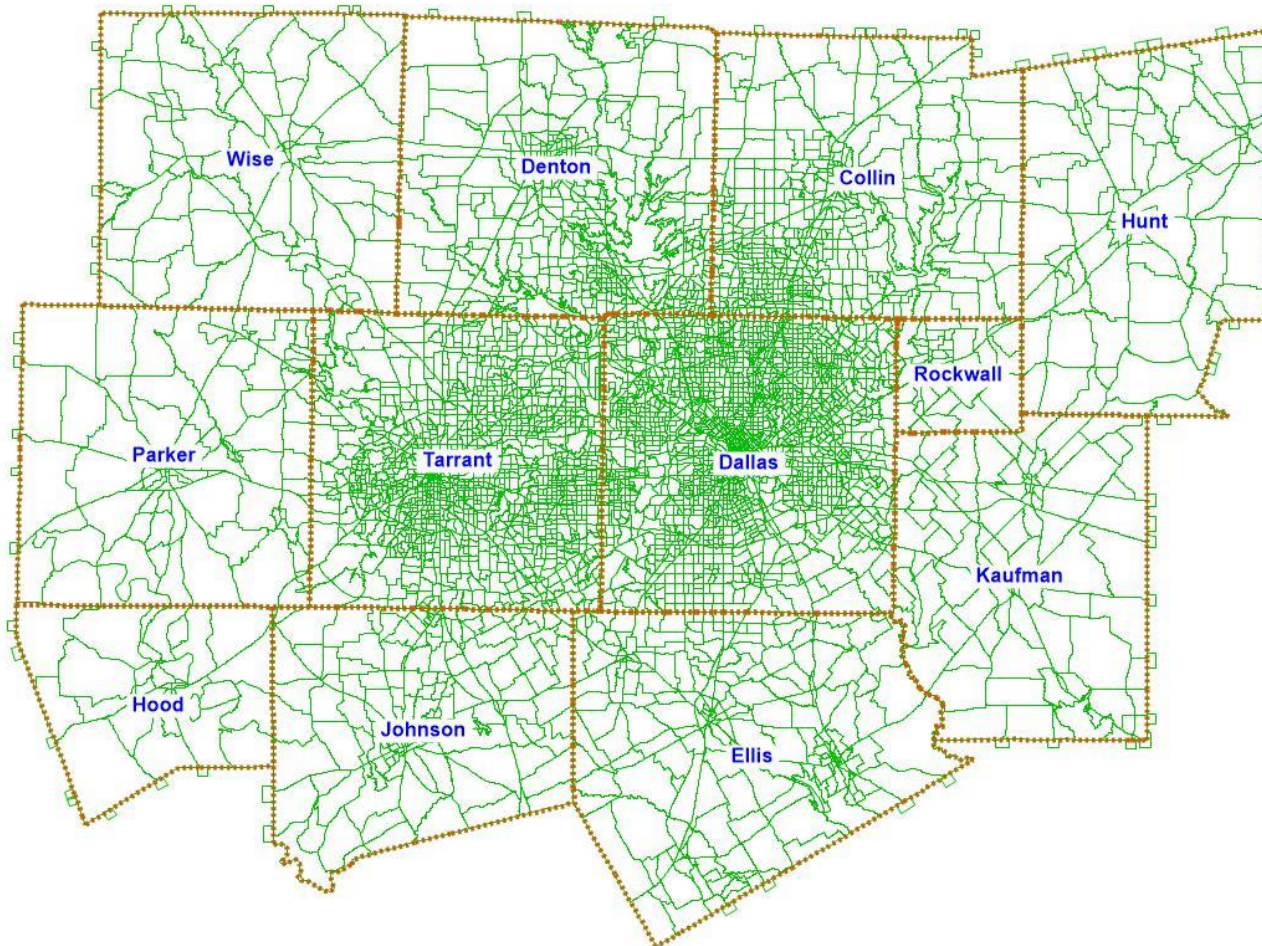


Origin



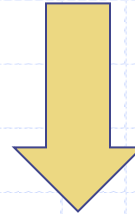
	1006	1007	1009	1011	1012	1013	1014	1016	1017	Sum
1029	0.89	0.72	0.72	0.42	2.47	2.12	2.68	1.90	2.23	219.14
1030	0.42	0.20	1.72	0.24	0.58	0.51	0.58	0.56	0.41	179.71
1031	0.09	0.06	0.36	0.06	0.18	0.15	0.17	0.15	0.15	36.59
1032	1.03	0.87	1.61	0.57	3.00	2.56	3.26	3.27	2.75	216.68
1033	0.73	0.60	0.58	0.40	2.10	1.79	1.95	1.62	1.93	158.40
1034	0.19	0.09	0.88	0.10	0.25	0.22	0.25	0.23	0.17	60.33
1035	0.07	0.06	0.19	0.03	0.19	0.16	0.18	0.16	0.16	25.83
1036	0.12	0.10	0.11	0.06	0.29	0.25	0.32	0.25	0.24	66.76
1037	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1039	0.58	0.48	1.85	0.30	1.38	1.21	1.37	1.15	1.10	244.64
1040	0.09	0.08	0.15	0.04	0.22	0.20	0.22	0.19	0.18	43.10
1041	0.17	0.15	0.13	0.08	0.44	0.39	0.43	0.33	0.37	75.33
1043	0.33	0.28	0.25	0.16	0.75	0.65	0.84	0.65	0.63	145.06
1044	0.36	0.30	0.63	0.17	0.73	0.73	0.84	0.68	0.57	177.30
1045	0.24	0.19	0.19	0.11	0.56	0.49	0.56	0.42	0.46	160.31
1046	0.19	0.15	0.15	0.09	0.43	0.38	0.43	0.31	0.29	168.35
1047	0.09	0.07	0.08	0.05	0.20	0.18	0.23	0.16	0.16	129.82
1086	0.73	0.35	1.73	0.60	1.02	0.63	0.53	0.47	0.46	105.93
2001	0.15	0.11	0.14	0.06	0.31	0.28	0.60	0.25	0.22	68.58
2002	0.15	0.10	0.15	0.06	0.27	0.25	0.49	0.20	0.19	339.73
2009	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	20.47
Sum	85.98	42.63	111.76	28.99	100.42	93.33	117.05	81.99	77.63	925844.00

5335 Traffic Survey Zones

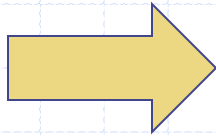


Travel Time Matrix, NPMRDS and Travel Model

Destination

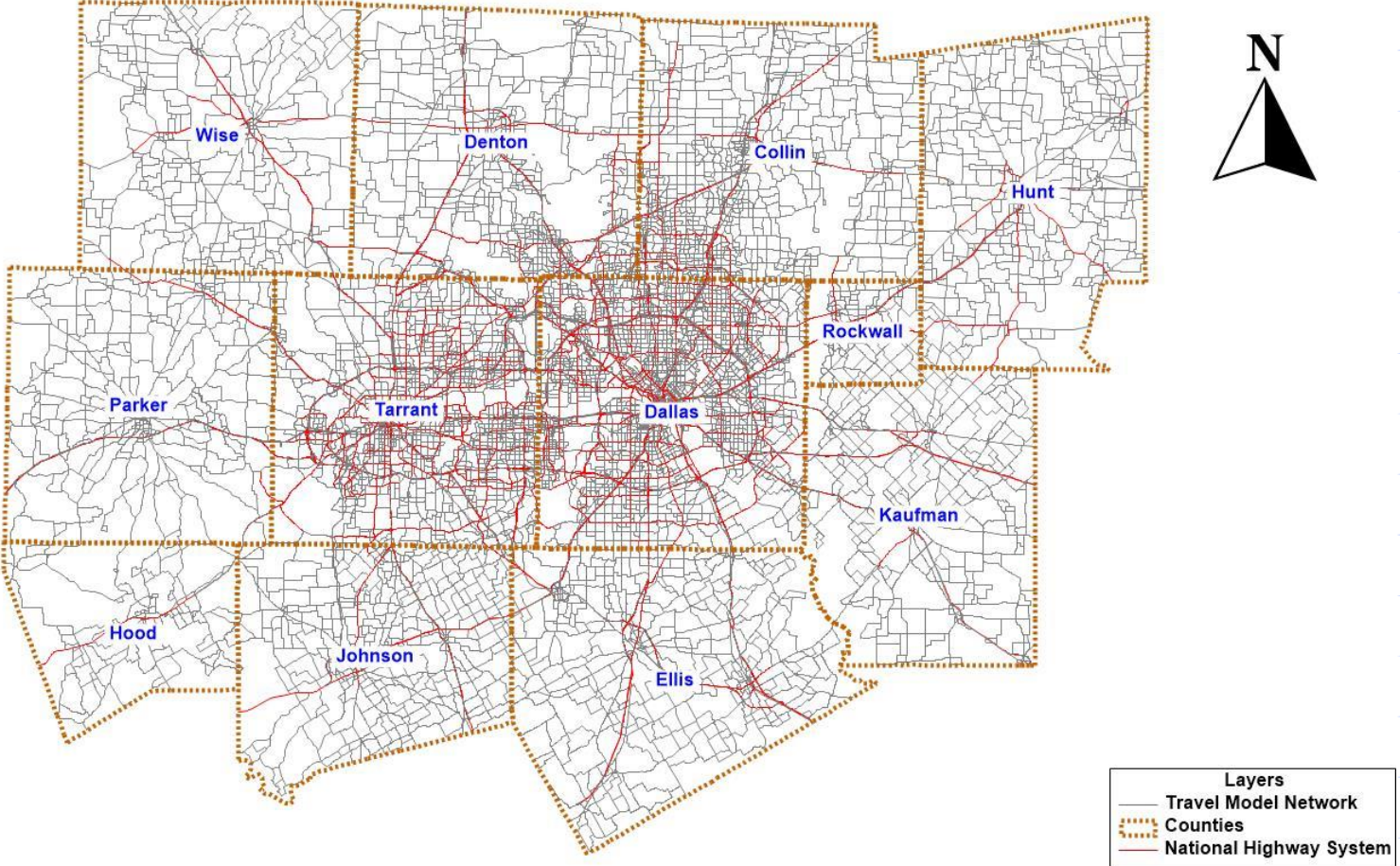


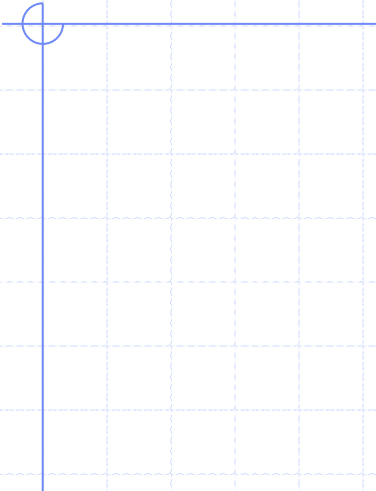
Origin



	1001	1004	1006	1007	1009	1011	1012	1013	1014	Mean
6162	82.42	78.95	79.44	75.28	82.89	74.75	69.40	70.32	67.59	38.62
6163	82.27	78.81	79.30	75.13	82.74	74.60	69.25	70.17	67.44	39.32
6164	81.96	78.50	78.99	74.82	82.44	74.29	68.94	69.86	67.14	39.38
6165	83.71	80.25	80.74	76.57	84.18	76.04	70.69	71.61	68.89	38.65
6166	82.83	79.37	79.86	75.69	83.31	75.16	69.81	70.73	68.01	39.77
6168	85.33	81.87	82.36	78.19	85.80	77.66	72.31	73.23	70.50	39.71
6170	86.39	82.93	83.42	79.25	86.86	78.72	73.37	74.29	71.68	39.48
6172	86.54	83.07	83.56	79.39	87.01	78.87	73.51	74.43	71.71	39.77
6174	87.78	84.32	84.81	80.64	88.25	80.11	74.76	75.68	74.23	38.83
6175	85.50	82.04	82.53	78.36	85.97	77.83	72.48	73.40	73.40	37.18
6176	87.13	83.66	84.15	79.99	87.60	79.46	74.11	75.03	72.58	38.08
6177	84.71	81.25	81.74	77.57	85.19	77.04	71.69	72.61	72.61	36.41
6178	85.73	82.26	82.75	78.58	86.20	78.05	72.70	73.62	73.62	37.12
6180	86.08	82.61	83.10	78.94	86.55	78.41	73.06	73.98	73.98	37.30
6181	85.70	82.24	82.73	78.56	86.17	78.03	72.68	73.60	73.60	36.89
6182	87.87	84.41	84.90	80.73	88.35	80.20	74.85	75.77	75.50	38.81
6183	87.15	83.69	84.18	80.01	87.63	79.48	74.13	75.05	75.05	38.32
6184	89.97	86.51	87.00	82.83	90.44	82.30	76.95	77.87	77.87	40.51
6185	91.41	87.94	88.43	84.27	91.88	83.74	78.39	79.31	78.65	41.42
6186	89.42	85.96	86.45	82.28	89.90	81.75	76.40	77.32	77.32	39.96
6187	94.14	90.68	91.17	87.00	94.61	86.47	81.12	82.04	81.32	43.39
Mean	88.39	84.95	85.44	81.34	88.52	80.77	75.49	76.41	75.86	52.07

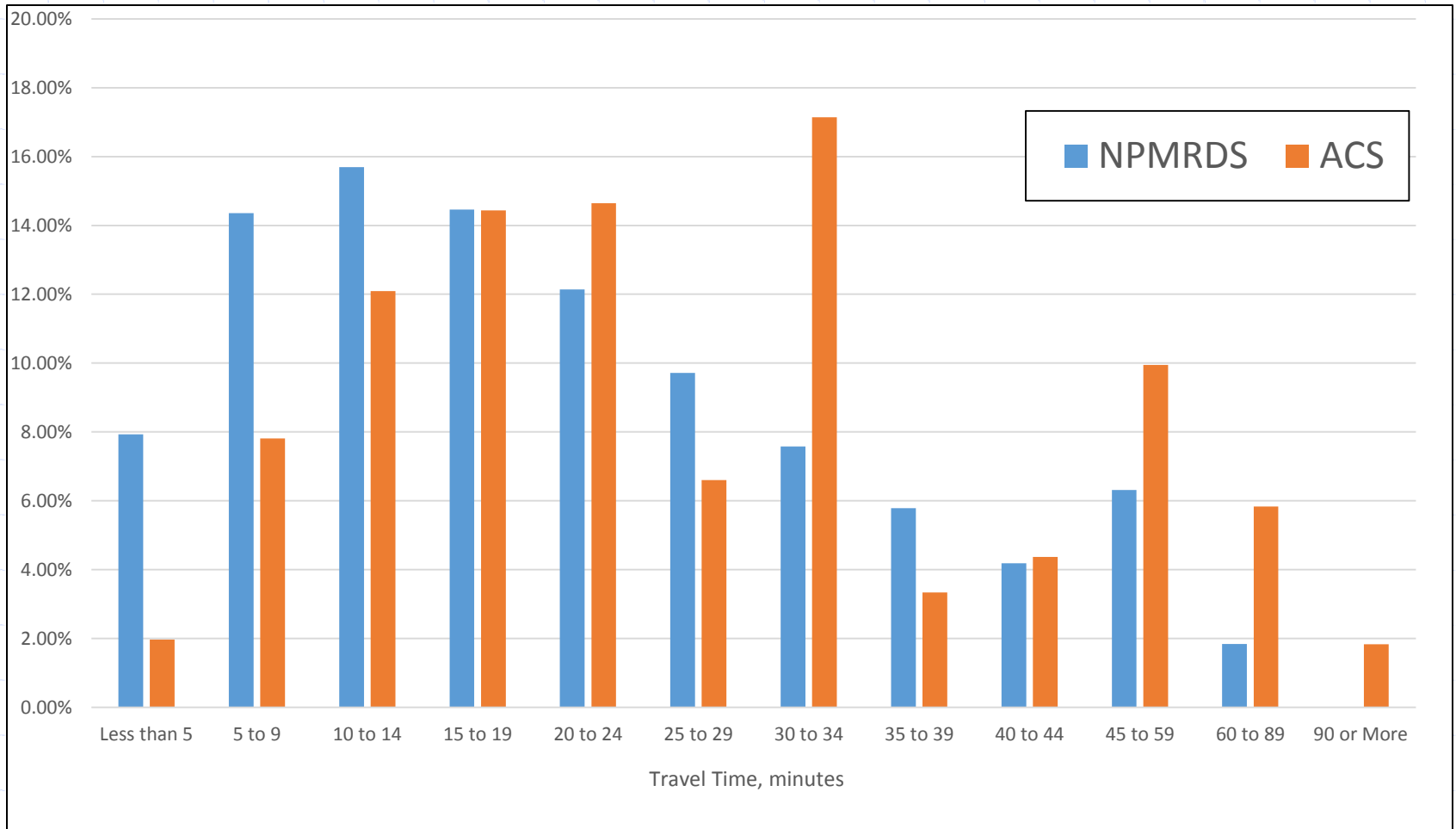
NPMRDS Speeds on Travel Model Network



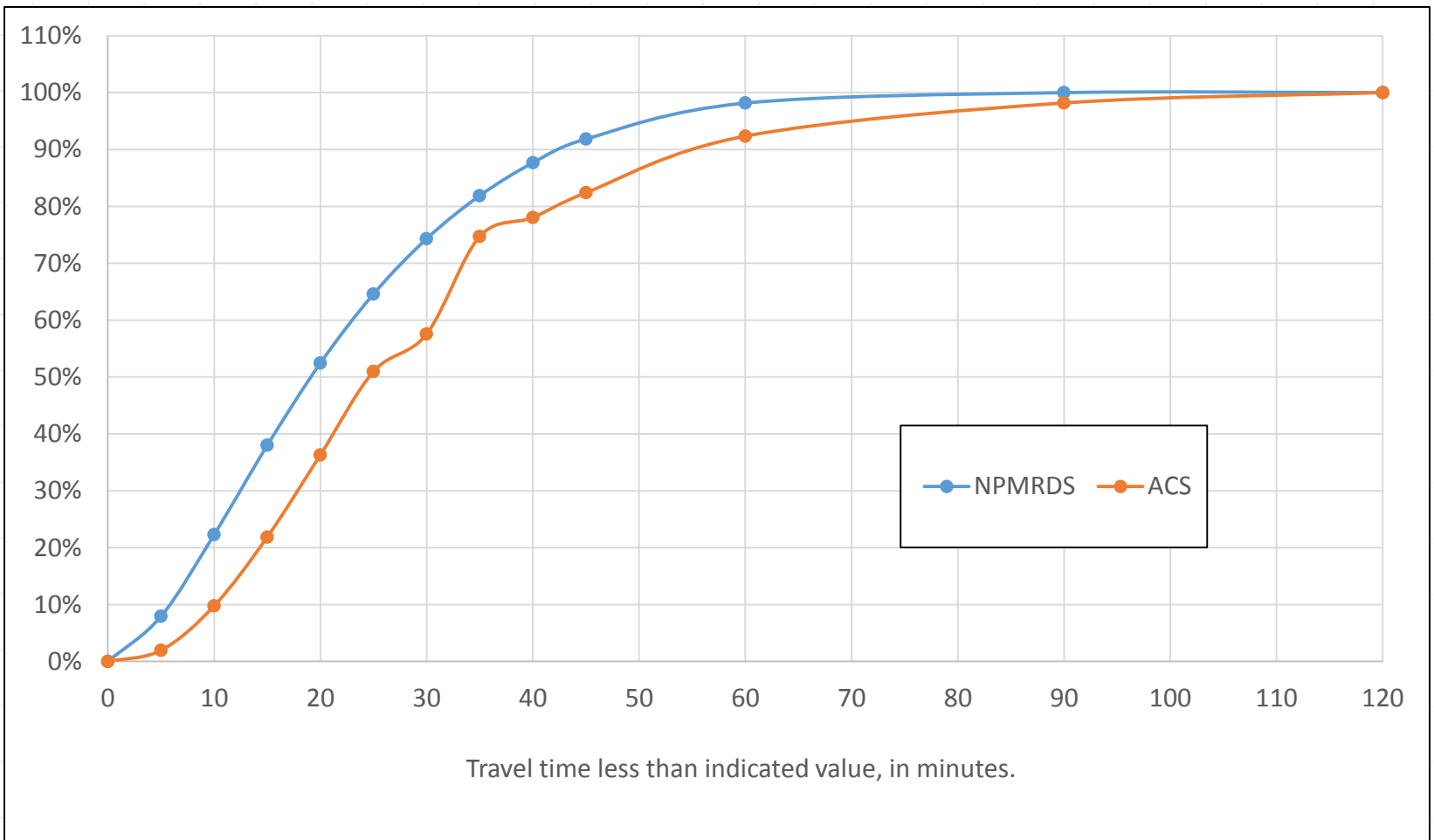


RESULTS

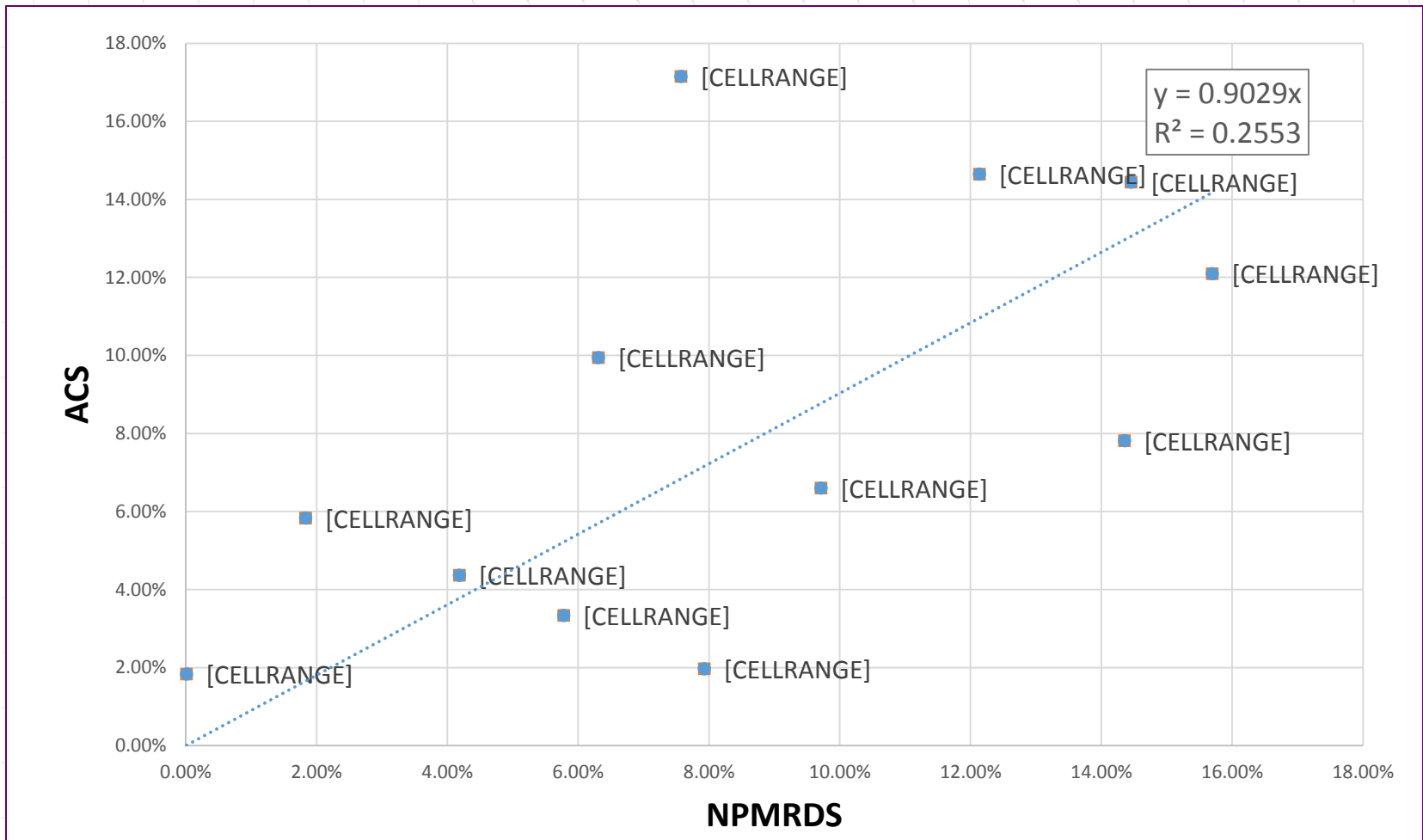
Travel Time Distribution MPA



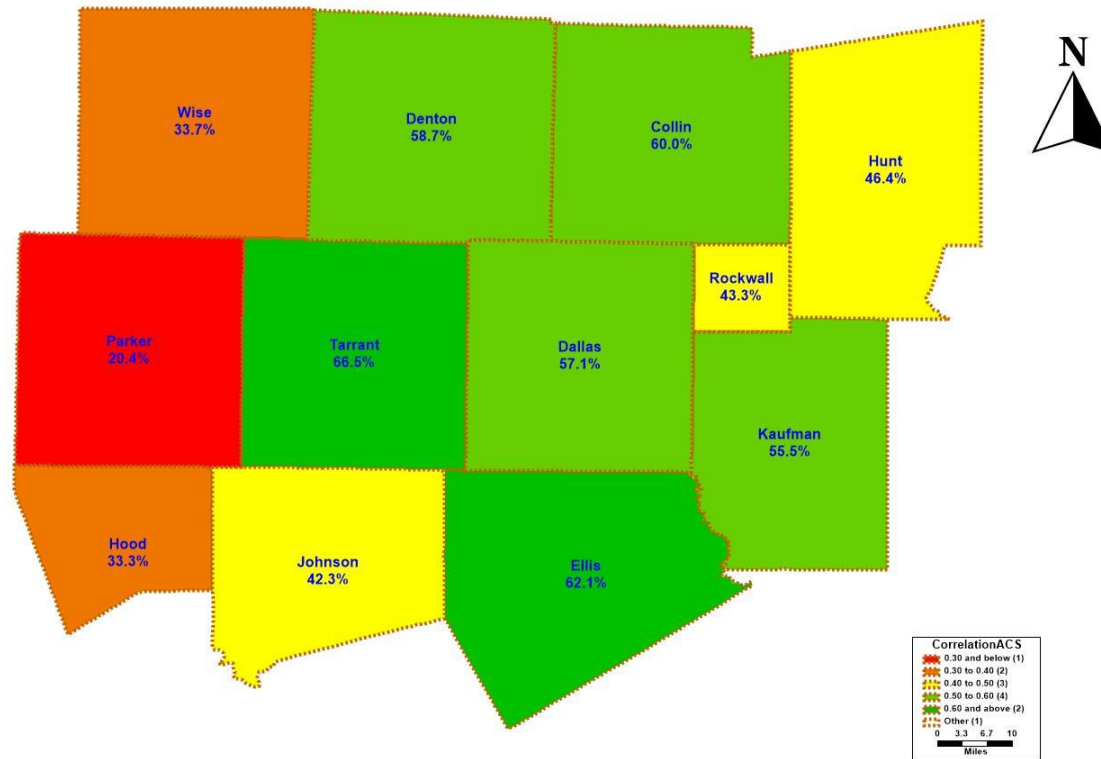
Cumulative Distribution



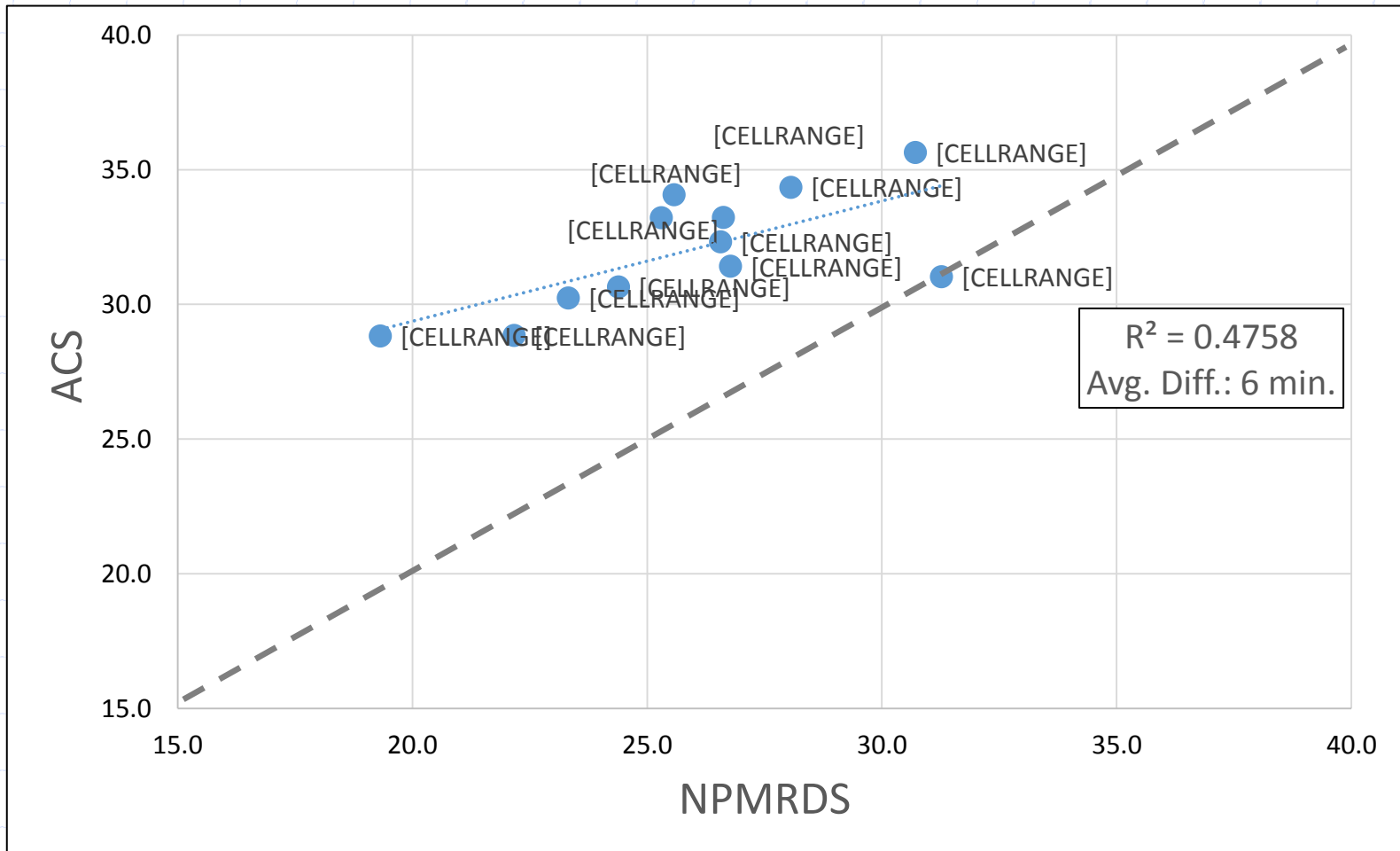
Comparison of Distributions



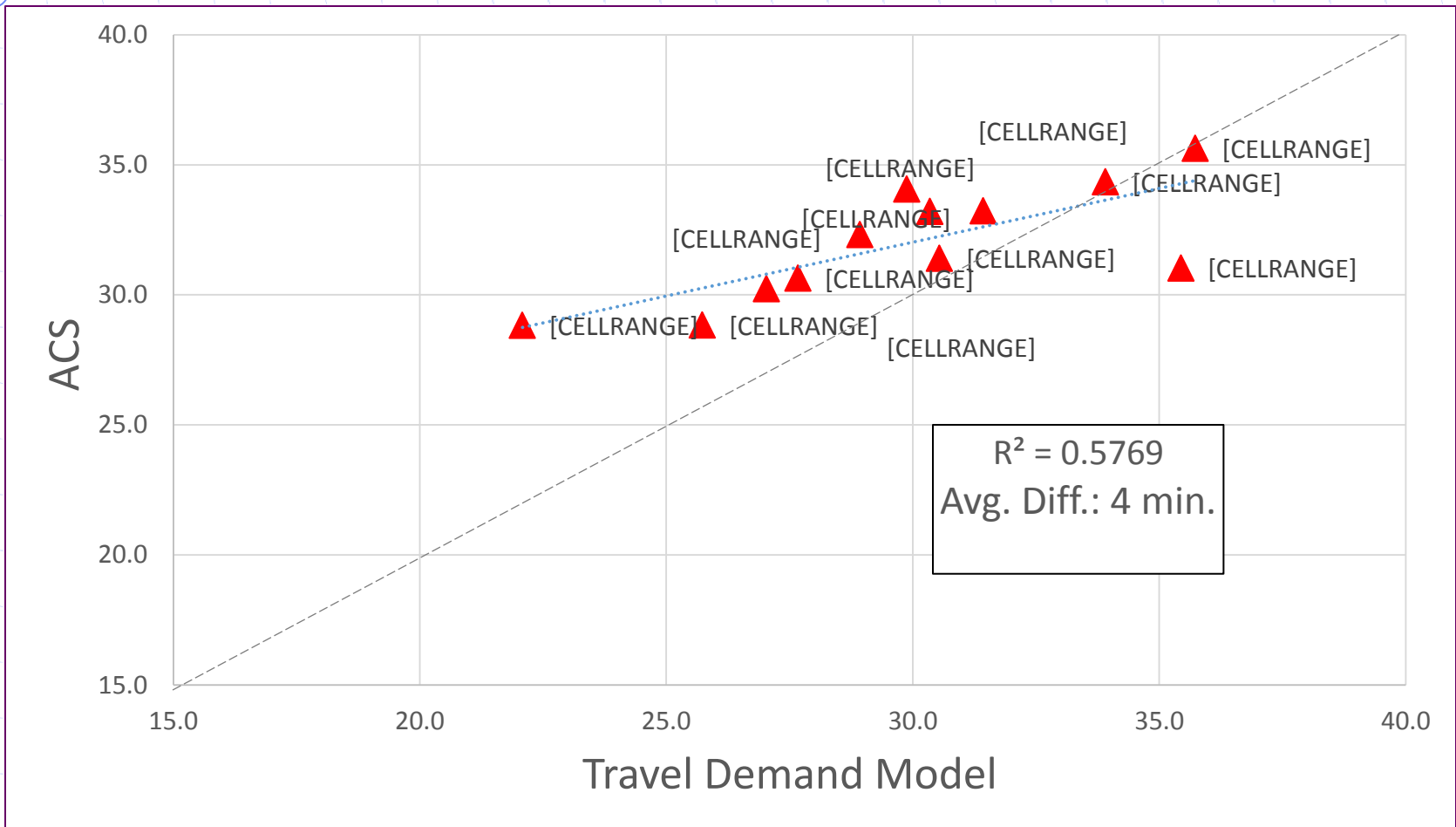
Correlation between ACS and NPMRDS for each county



Average Travel Time

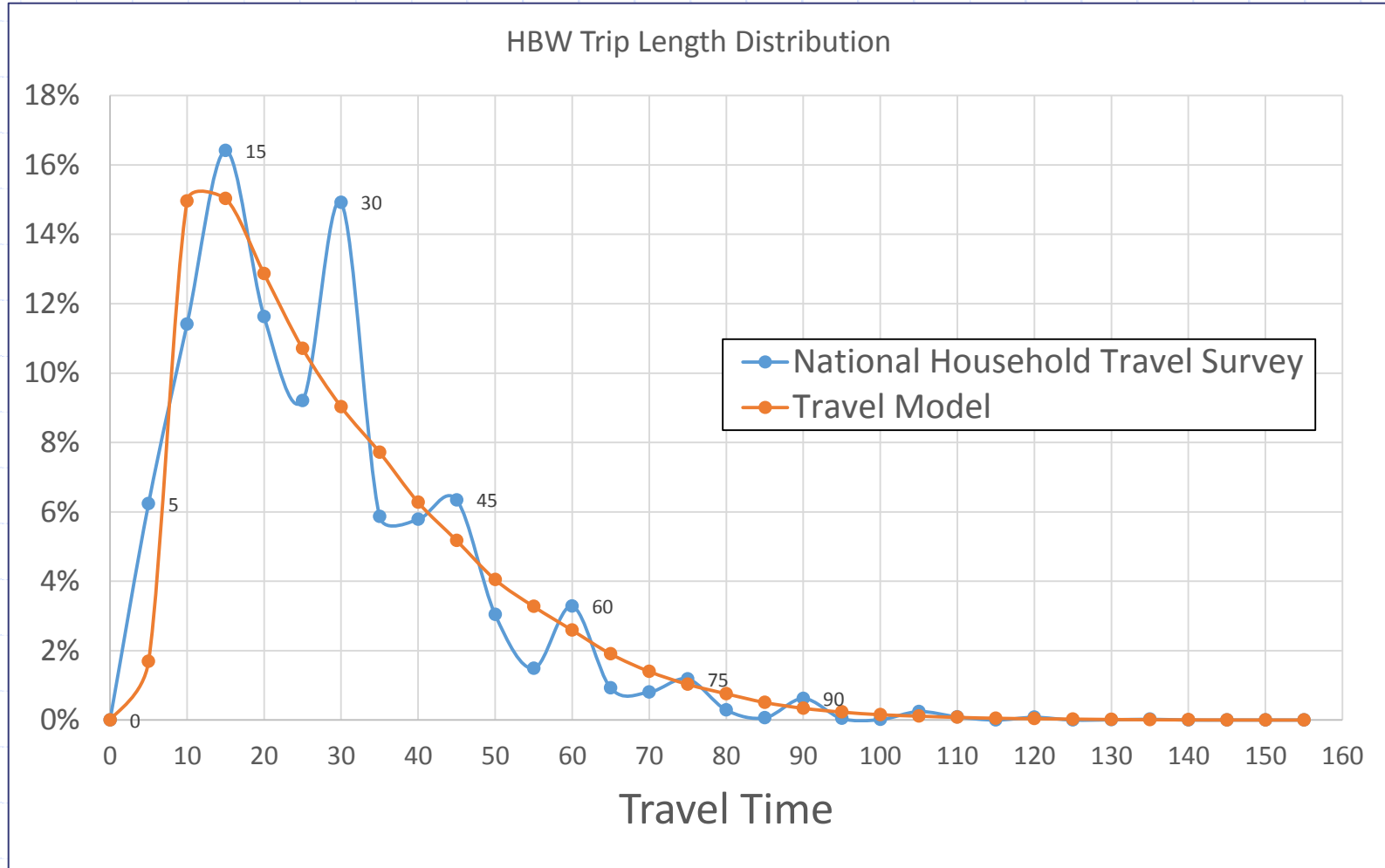


Comparing ACS and Travel Demand Model



HBW Trip Length Distribution

National Household Travel Survey, 2009



Reasons behind Differences

- ◆ Bias of perception towards familiar terms or intervals (e.g. half an hour)
- ◆ Commuter trips in ACS consider out-of-region
- ◆ Terminal times were not considered in the NPMRDS travel times

Questions?

Contact:

Francisco J. Torres, P.E.
Data Applications Manager
Model Development and Data Management
Ext. 7356
ftorres@nctcog.org