MOE (Measures of Effectiveness)

Background

Measures of effectiveness (MOE) from the Triangle Regional Model (TRM) provide general, system-wide indicators for travel volume, mobility, travel time, congestion, and mode choice. The measures are not specific to a particular roadway or travel corridor but instead cover the entire transportation system, and therefore are useful for comparing the effectiveness of the Adopted 2050 MTP with the 2016 Base Year and the 2050 Existing Plus Committed (E+C) no build scenarios. Most of the data used for calculating these Performance Measures comes from the TRM, which is a travel demand model that is capable of forecasting future transportation metrics based on a set of assumptions concerning the highway and transit network, and land use (i.e., location of population and employment).

This document presents and compares the MOEs for three transportation scenarios:

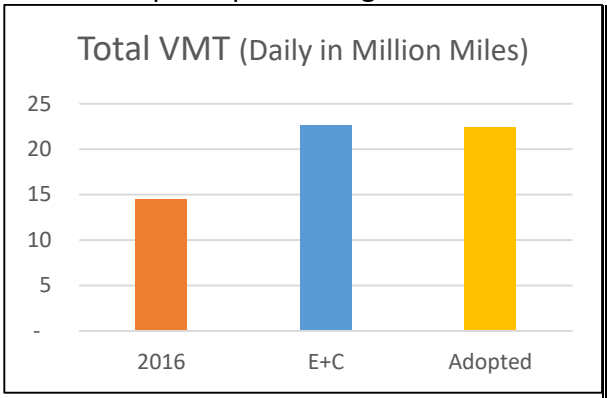
- 2016 Base Year – This is a model of the existing transportation network.
- 2050 E+C – This is the population and employment for the year 2050 on the existing transportation network, plus any projects that are currently committed for completion, e.g., the East End Connector. This could be called the "no-build" scenario.
- Adopted – This is the population and employment for the year 2050 using the land use scenario assumed in the adopted 2050 MTP, combined with the transportation network (e.g., highway and transit improvements) in that adopted plan.

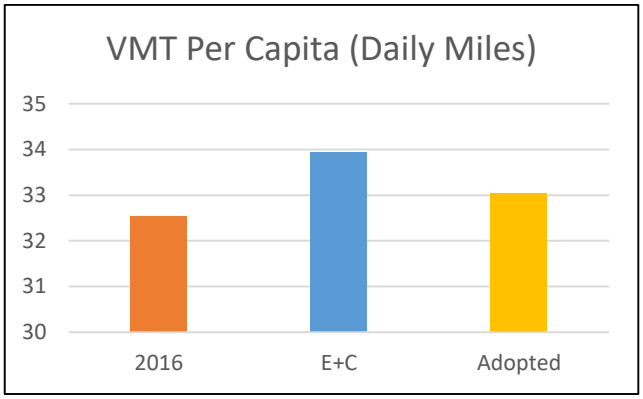
Measures

The next section summarizes the key trends of the TRM measures. A table of all the measures follows that section.

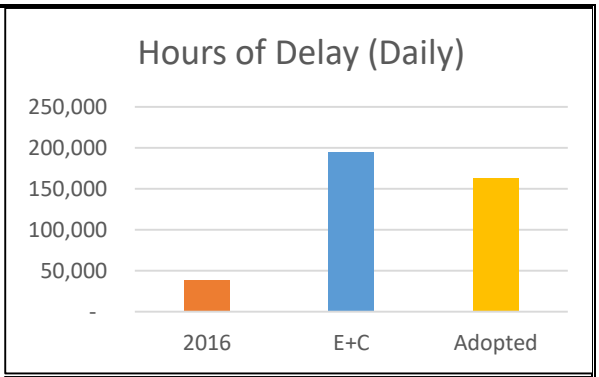
Summary

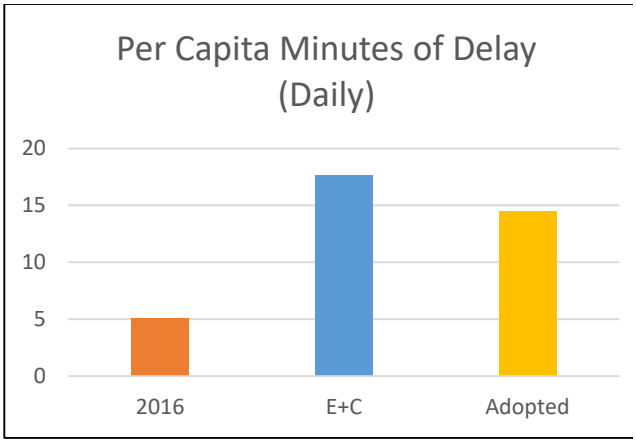
Volume – The population and employment in 2050 drive large travel increases in the E+C (i.e., No Build scenario) and Adopted. The transportation improvements in the Adopted do little to reduce the per capita mileage.

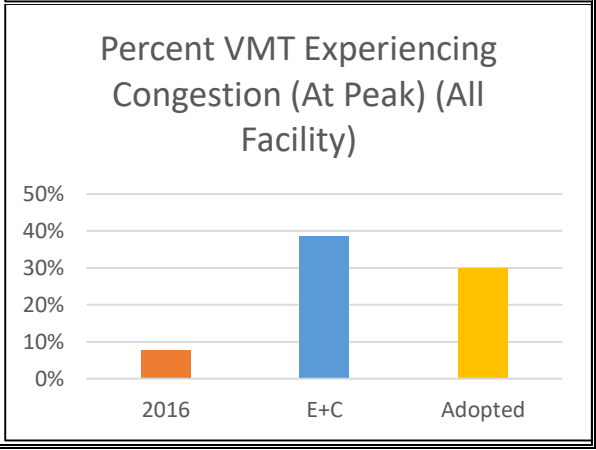




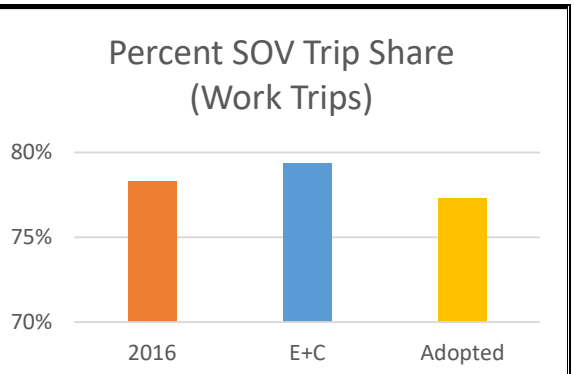
Congestion and Delay – The E+C scenario produces high levels of delay and congestion. The Adopted does well to reduce the overall congestion and per capita delay, but those values do not return to the current levels.

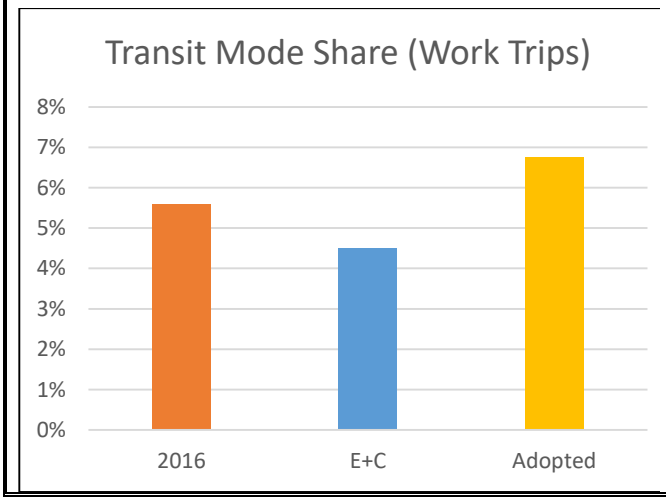


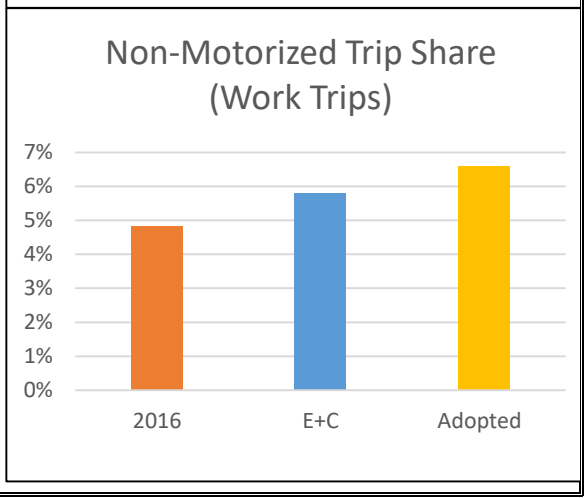




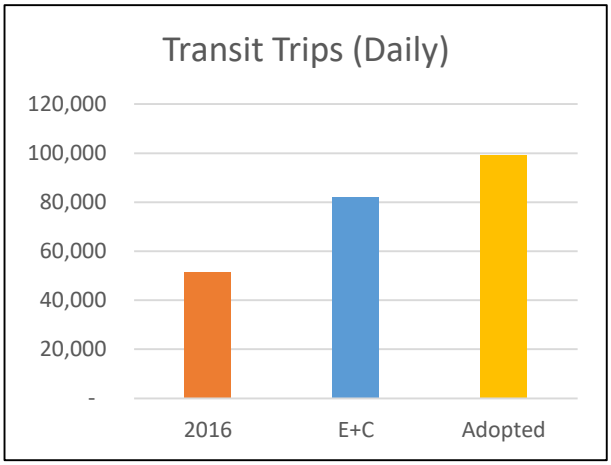
Mode Share – The single-occupied vehicle (SOV) and biking and walking (non-motorized) trip shares vary little among the different scenarios. There is a positive improvement in the transit mode share in the Adopted because of the investment in transit.







Transit Trips – The higher population and employment in the E+C scenario produces a modest increase in transit use. The transit investments in the Adopted help the number of transit trips to double.



Adopted 2050 MTP

Measures of Effectiveness for the DCHC MPO

DCHC MPO	Year = / Scneario =	2016 Baseline	2050 E+C	2050 Adopted
1	**Performance Measures**			
1.1	Total VMT (daily)			
1.1.1	All Facility+C Connectors	14,516,717	22,620,357	22,361,069
1.1.1a	All Facility+C Connectors (per capita)	33	34	33
1.1.2	All Facility (no C Connectors)	13,612,286	21,264,845	21,043,401
1.1.2a	All Facility (no C Connectors) (per capita)	31	32	31
1.2	Total VHT (daily)			
1.2.1	All Facility+C Connectors	365,641	725,075	692,892
1.2.1a	All Facility+C Connectors (per capita)	0.82	1.09	1.02
1.2.2	All Facility (no C Connectors)	335,601	677,058	645,837
1.2.2a	All Facility (no C Connectors) (per capita)	0.75	1.02	0.95
1.3	Average Speed by Facility (miles/hour)			
1.3.1	- Freeway	59	48	51
1.3.2	- Arterial	35	30	30
1.3.3	- All Facility	46	39	40
1.4	Peak Average Speed by Facility (miles/hour)			
1.4.1	- Freeway	57	45	48
1.4.2	- Arterial	34	28	29
1.4.3	- All Facility	45	36	38
1.5	Daily Average Travel Length - All Person Trips			
1.5.1	- Travel Time	13	16	16
1.5.2	- Travel Distance	6	6	6
1.6	Daily Average Travel Length - Work Trips			
1.6.1	- Travel Time	20	25	23
1.6.2	- Travel Distance - Work Trips	10	10	10
1.7	Peak Average Travel Length - All Person Trips			
1.7.1	- Peak Travel Time	14	18	18
1.7.2	- Peak Travel Distance	6	6	7
1.8	Daily Average Travel Length - All CV Trips			
1.8.1	- Travel Time	10	11	11
1.8.2	- Travel Distance	7	7	6
1.9	Daily Average Travel Length - Truck Trips			
1.9.1	- Travel Time	11	13	13
1.9.2	- Travel Distance	8	8	8
1.10.	Hours of Delay (daily)	37,909	195,359	163,181
1.10a	Minutes of Delay (daily) (per capita)	5	18	14
1.10.1	Truck Hours of Delay (daily)	1,939	10,911	8,954
1.11	Percent of VMT experiencing congestion - All Day			
1.11.1	- Freeway	6%	52%	34%
1.11.2	- Arterial	5%	18%	16%
1.11.3	- All Facility	5%	33%	23%
1.12	Percent of VMT experiencing congestion - Peak			
1.12.1	- Freeway	10%	61%	43%

Adopted 2050 MTP

Measures of Effectiveness for the DCHC MPO

DCHC MPO	Year = / Scneario =	2016 Baseline	2050 E+C	2050 Adopted
1.12.2	- Arterial	7%	26%	24%
1.12.3	- All Facility	8%	39%	30%
1.12.4	- Designated truck routes	6%	26%	26%
1.12.5	- Facilities w/bus routes	8%	49%	31%
2	**Mode Share Measures**			
2.1	All Trips - Daily			
2.1.1	- Drive alone (single occupant vehicle -SOV)	939,928	1,474,117	1,462,635
2.1.2	- Carpool (Share ride)	765,458	1,209,578	1,202,780
2.1.3	- Bus	51,620	82,246	99,021
2.1.4	- Rail	-	-	2,232
2.1.5	- Non-Motorized (Bike and Walk)	311,628	554,258	576,942
2.2	Work Trips - Daily			
2.2.1	- Drive alone (single occupant vehicle -SOV)	202,133	329,284	324,209
2.2.2	- Carpool (Share ride)	29,143	43,077	38,322
2.2.3	- Bus	14,413	18,669	28,344
2.2.4	- Rail	-	-	930
2.2.5	- Non-Motorized (Bike and Walk)	12,433	24,046	27,636
2.3	All Trips - Peak Hours			
2.3.1	- Drive alone (single occupant vehicle -SOV)	500,574	787,905	784,246
2.3.2	- Carpool (Share ride)	439,581	705,322	699,608
2.3.3	- Bus	27,172	43,724	53,788
2.3.4	- Rail	-	-	1,689
2.3.5	- Non-Motorized (Bike and Walk)	140,260	251,413	263,628
3	**Demographics and Trip Measures**			
3.1	Population	446,275	666,483	676,776
3.2	Employment	289,221	518,726	519,508
3.3	Total Daily Person Trips	2,068,634	3,320,199	3,343,610
3.3.1	Work Person Trips	258,122	415,076	419,441
3.4	Total Daily CV Trips	133,002	202,059	204,124
3.4.1	Daily Truck Trips	54,882	82,260	82,910
4	**Other Measures**			
4.1	Lane Miles	2,597	2,675	2,792
5	**Transit Measures**			
5.1	Transit Ridership by Prod. Ends			
5.1.1	- GoTriangle (Including Rail)	17,035	30,363	82,325
5.1.2	- GoRaleigh	23,853	62,385	120,756
5.1.3	- CHT	29,797	59,794	57,835
5.1.4	- GoDurham	23,286	26,842	31,983
5.1.5	- NCSU	11,873	18,999	13,276
5.1.6	- DUKE	8,018	12,727	10,293
5.1.7	- OCPT	576	109	811
5.1.8	- GoCary	2,597	3,688	6,191
5.1.9	Total	117,036	214,908	323,471

Adopted 2050 MTP

Measures of Effectiveness for the DCHC MPO

DCHC MPO	Year =	2016	2050	2050
	Scneario =	Baseline	E+C	Adopted
5.4	Transit Supply - Service Miles			
5.4.1	- GoTriangle (Including Rail)	13,392	13,128	15,171
5.4.2	- GoRaleigh	10,970	17,686	4,979
5.4.3	- CHT	10,418	9,876	563
5.4.4	- GoDurham	9,852	9,389	2,979
5.4.5	- NCSU	4,563	4,563	905
5.4.6	- DUKE	2,652	2,776	933
5.4.7	- OCPT	974	662	1,336
5.4.8	- GoCary	1,623	1,931	6,171
5.4.9	Total	54,448	60,015	4,513
	All Trips - Mode Share			
	- Drive alone (single occupant vehicle -SOV)	45%	44%	44%
	- Carpool (Share ride)	37%	36%	36%
	- Bus	2%	2%	3%
	- Rail	0%	0%	0%
	- Non-Motorized (Bike and Walk)	15%	17%	17%
	Total	**100%**	**100%**	**100%**
	Work Trips - Mode Share			
	- Drive alone (single occupant vehicle -SOV)	78%	79%	77%
	- Carpool (Share ride)	11%	10%	9%
	- Bus	6%	4%	7%
	- Rail	0%	0%	0%
	- Non-Motorized (Bike and Walk)	5%	6%	7%
	Total	**100%**	**100%**	**100%**

Note: Values are rounded. Thus, some math operations will appear incorrect, e.g., 90 - 89 = 0

" - " = measure is not applicable, e.g., there is no rail transit in the Plans and Trends scenario.