

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 Preferred Option 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:

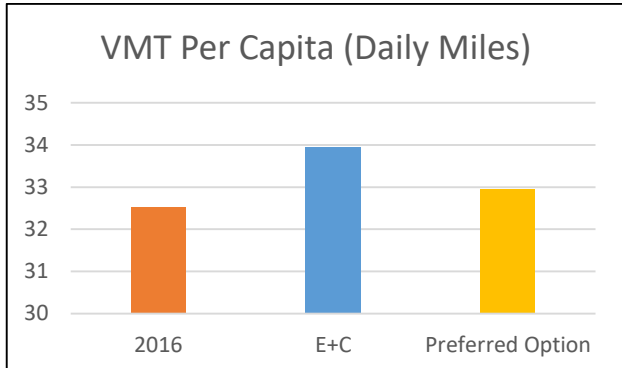
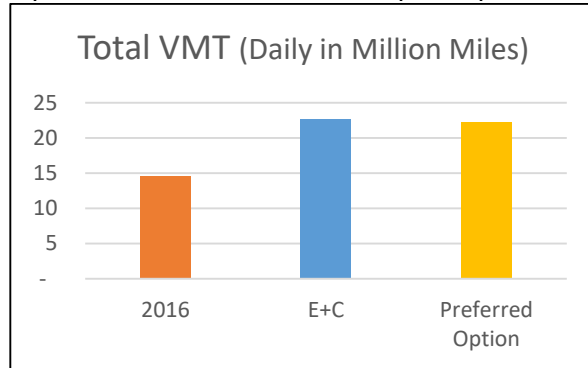
- 2016 Base Year – This is a model of the existing transportation network.
- 2050 E+C – This is the population and employment for the year 2050 on the existing transportation network, plus any projects that are currently committed for completion, e.g., the East End Connector. This could be called the “no-build” scenario.
- 2050 – This is the population and employment for the year 2050, using the Opportunity Places land use scenario, and a transportation network that includes the highway and transit improvements in the Preferred Option.

Measures

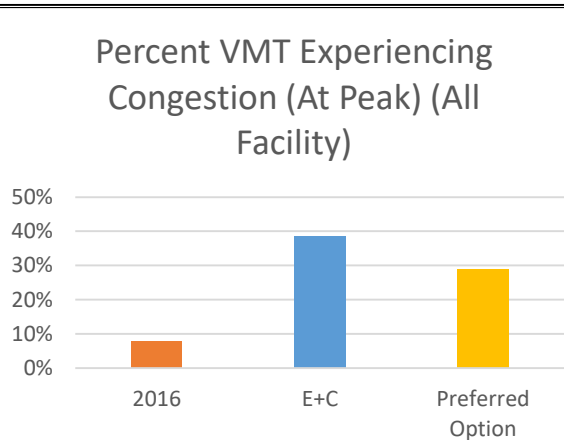
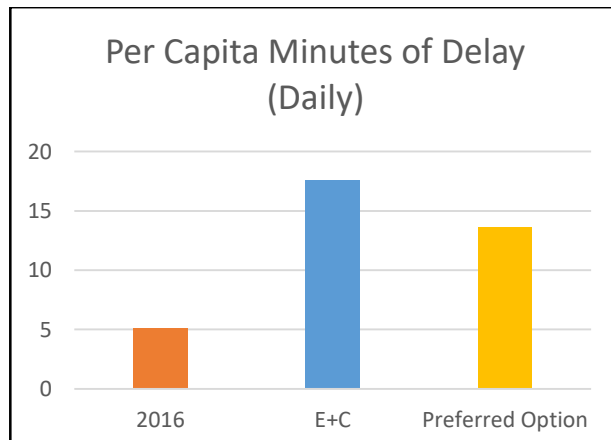
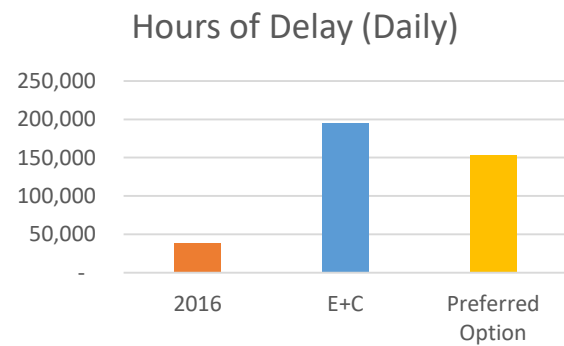
The next section summarizes the key trends of the TRM measures. A table of all the measures follows that section. The DCHC MPO will post additional performance measures, such as the mode choice for Travel Choice Neighborhoods (TCN, i.e., areas with high capacity transit), on the Preferred Option web page.

Summary

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

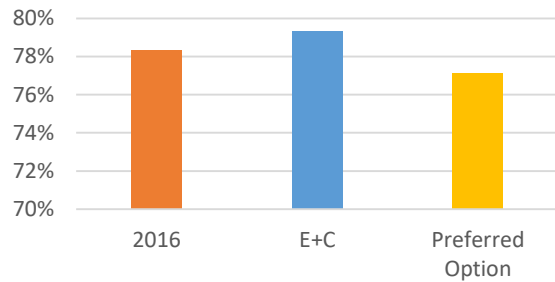


Congestion and Delay – The E+C scenario produces high levels of delay and congestion. The Preferred Option does well to reduce the overall congestion and per capita delay, but those values do not return to the current levels.

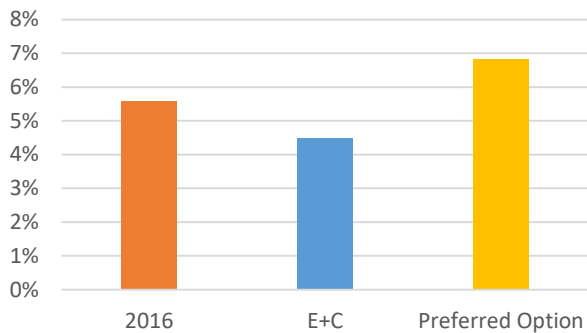


Mode Share – The single-occupied vehicle (SOV) and biking and walking (non-motorized) trip shares vary little among the different scenarios. There is a positive improvement in the transit mode share in the Preferred Option because of the investment in transit.

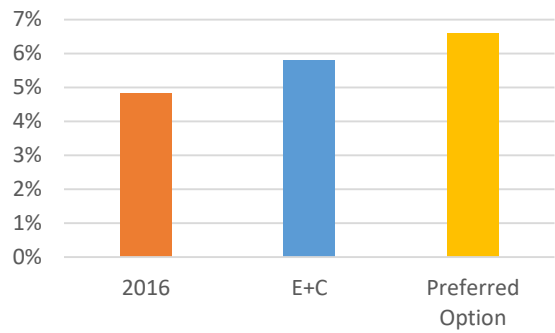
Percent SOV Trip Share (Work Trips)



Transit Mode Share (Work Trips)

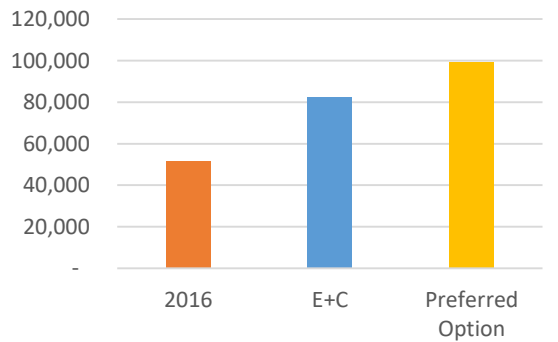


Non-Motorized Trip Share (Work Trips)



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

Transit Trips (Daily)



2050 MTP -- Preferred Option
Measures of Effectiveness for the DCHC MPO

DCHC MPO	Year =	2016	2050	2050 Preferred Option
	Alternative (Scenario) =	Baseline	E+C	
1 Performance Measures				
1.1 Total VMT (daily)				
1.1.1	All Facility+C Connectors	14,516,717	22,620,357	22,279,438
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	20,976,915
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	670,399
1.2.1a	All Facility+C Connectors (per capita)	0.82	1.09	0.99
1.2.2	All Facility (no C Connectors)	335,601	677,058	623,814
1.2.2a	All Facility (no C Connectors) (per capita)	0.75	1.02	0.92
1.3 Average Speed by Facility (miles/hour)				
1.3.1	- Freeway	59	48	51
1.3.2	- Arterial	35	30	31
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	22
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	17
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	7
1.9 Daily Average Travel Length - Truck Trips				
1.9.1	- Travel Time	11	13	12
1.9.2	- Travel Distance	8	8	8
1.10.	Hours of Delay (daily)	37,909	195,359	153,637
1.10a	Minutes of Delay (daily) (per capita)	5	18	14
1.10.1	Truck Hours of Delay (daily)	1,939	10,911	8,309
1.11 Percent of VMT experiencing congestion - All Day				
1.11.1	- Freeway	6%	52%	34%
1.11.2	- Arterial	5%	18%	14%
1.11.3	- All Facility	5%	33%	23%
1.12 Percent of VMT experiencing congestion - Peak				

2050 MTP -- Preferred Option
Measures of Effectiveness for the DCHC MPO

DCHC MPO	Year =	2016	2050	2050 Preferred Option
	Alternative (Scenario) =	Baseline	E+C	Option
1.12.1	- Freeway	10%	61%	43%
1.12.2	- Arterial	7%	26%	21%
1.12.3	- All Facility	8%	39%	29%
1.12.4	- Designated truck routes	6%	26%	24%
1.12.5	- Facilities w/bus routes	8%	49%	27%
2 Mode Share Measures				
2.1 All Trips - Daily				
2.1.1	- Drive alone (single occupant vehicle -SOV)	939,928	1,474,117	1,444,960
2.1.2	- Carpool (Share ride)	765,458	1,209,578	1,196,098
2.1.3	- Bus	51,620	82,246	99,169
2.1.4	- Rail	-	-	1,489
2.1.5	- Non-Motorized (Bike and Walk)	311,628	554,258	603,202
2.2 Work Trips - Daily				
2.2.1	- Drive alone (single occupant vehicle -SOV)	202,133	329,284	323,701
2.2.2	- Carpool (Share ride)	29,143	43,077	39,227
2.2.3	- Bus	14,413	18,669	28,579
2.2.4	- Rail	-	-	547
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	776,017
2.3.2	- Carpool (Share ride)	439,581	705,322	696,811
2.3.3	- Bus	27,172	43,724	54,183
2.3.4	- Rail	-	-	1,131
2.3.5	- Non-Motorized (Bike and Walk)	140,260	251,413	275,912
3 Demographics and Trip Measures				
3.1	Population	446,275	666,483	675,991
3.2	Employment	289,221	518,726	519,644
3.3	Total Daily Person Trips	2,068,634	3,320,199	3,344,918
3.3.1	Work Person Trips	258,122	415,076	419,690
3.4	Total Daily CV Trips	133,002	202,059	203,886
3.4.1	Daily Truck Trips	54,882	82,260	82,821
4 Other Measures				
4.1	Lane Miles	2,597	2,675	2,851
5 Transit Measures				
5.1	Transit Ridership by Prod. Ends			
5.1.1	- GoTriangle (Including Rail)	17,035	30,363	70,858
5.1.2	- GoRaleigh	23,853	62,385	114,711
5.1.3	- CHT	29,797	59,794	56,414
5.1.4	- GoDurham	23,286	26,842	33,484
5.1.5	- NCSU	11,873	18,999	16,245
5.1.6	- DUKE	8,018	12,727	9,905
5.1.7	- OCPT	576	109	459

2050 MTP -- Preferred Option
Measures of Effectiveness for the DCHC MPO

DCHC MPO	Year =	2016	2050	2050
		Baseline	E+C	Preferred Option
Alternative (Scenario) =				
5.1.8	- GoCary	2,597	3,688	4,071
5.1.9	Total	117,036	214,908	306,149
5.4 Transit Supply - Service Miles				
5.4.1	- GoTriangle (Including Rail)	13,392	13,128	37,084
5.4.2	- GoRaleigh	10,970	17,686	51,018
5.4.3	- CHT	10,418	9,876	16,584
5.4.4	- GoDurham	9,852	9,389	25,302
5.4.5	- NCSU	4,563	4,563	3,566
5.4.6	- DUKE	2,652	2,776	3,017
5.4.7	- OCPT	974	662	423
5.4.8	- GoCary	1,623	1,931	3,730
5.4.9	Total	54,448	60,015	140,728
All Trips - Mode Share				
	- Drive alone (single occupant vehicle -SOV)	45%	44%	43%
	- Carpool (Share ride)	37%	36%	36%
	- Bus	2%	2%	3%
	- Rail	0%	0%	0%
	- Non-Motorized (Bike and Walk)	15%	17%	18%
	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