

TRM Performance Measures

Background

Performance Measures 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 2015 Base Year and the 2045 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.

This document presents and compares the Performance Measures for three transportation scenarios:

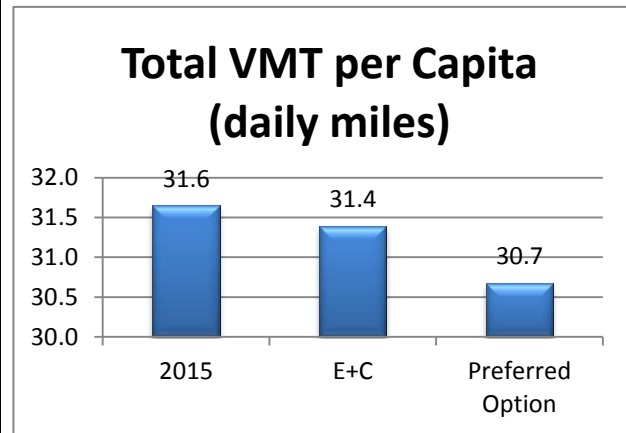
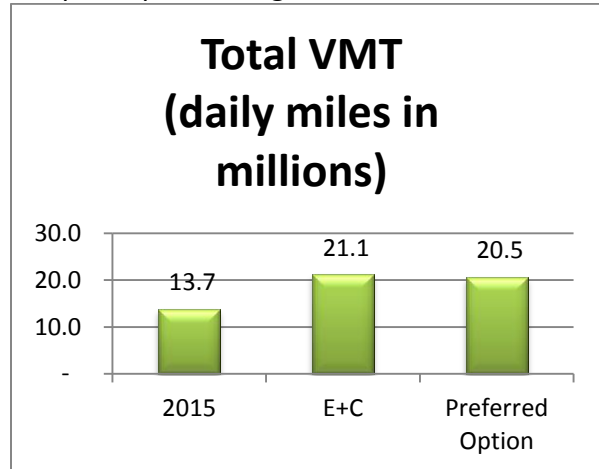
- 2015 Base Year – This is a model of the existing transportation network.
- 2045 E+C – This is the population and employment for the year 2045 on the existing transportation network, plus any projects that are currently committed for completion, e.g., the East End Connector. This is similar to a “no-build” scenario.
- 2045 – This is the population and employment for the year 2045, using the AIM-High land use scenario, and a transportation network that includes the highway and transit improvements in the Preferred Option.

Performance Measures

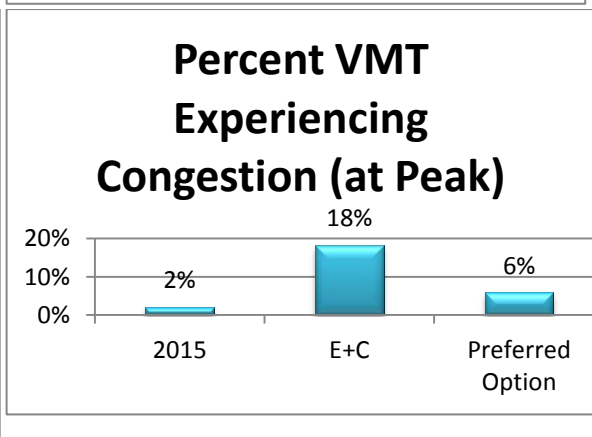
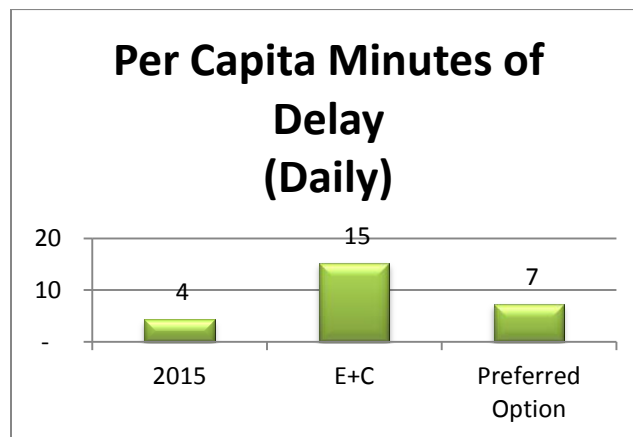
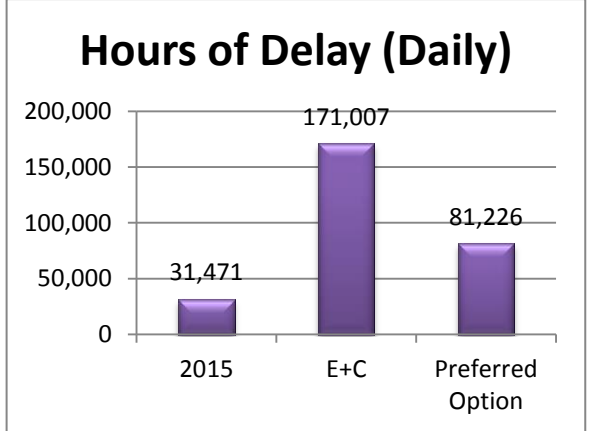
The next section summarizes the key trends of the TRM Performance Measures. A table of all the Measures follows that section. The table displays the actual values of the three Performance Measure scenarios and the percent of variation among those scenarios.

Summary

Volume – The population and employment in 2045 drive large travel increases in the E+C and Preferred Option. The transportation improvements in the Preferred Option do little to reduce the per capita mileage.

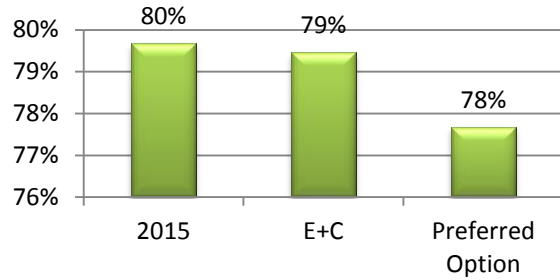


Congestion and Delay – The E+C scenario produces high levels of delay and congestion. The Preferred Option does well to reduce the overall congestion and per capita delay, but those values do not return to the current levels.

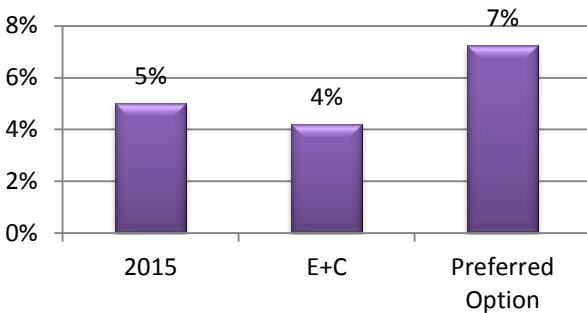


Mode Share – The single-occupied vehicle (SOV) and biking and walking (non-motorized) trip shares vary little among the different scenarios. There is a positive improvement in the transit mode share in the Preferred Option because of the investment in fixed-guideway and bus transit.

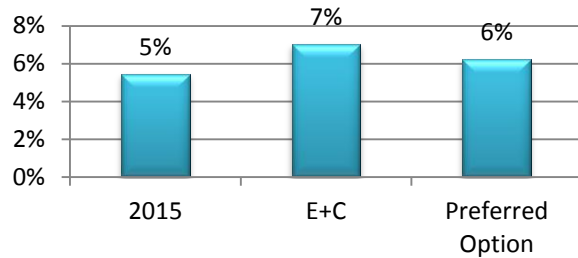
Percent SOV Trip Share (work trips)



Transit Mode Share (work trips)

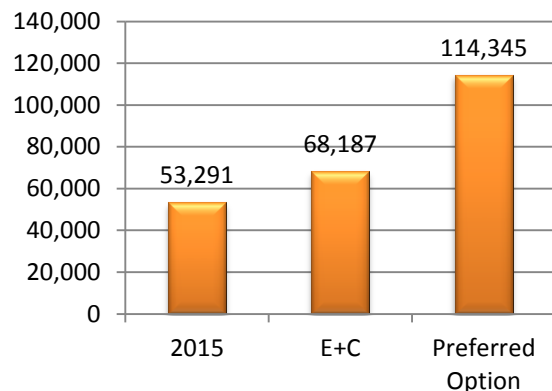


Non-Motorized Trip Share (work trips)



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)



2045 MTP -- Preferred Option
TRM Performance Measures for the DCHC MPO

MPO	Name =	Baseline	E+C	Pref. Opt.	Comparisons		
					Baseline to E+C	E+C to Pref. Opt.	Baseline to Pref. Opt.
	SE Data ==>	2015	2045	2045 AIM High			
	Transportation Network ==>	2015	E+C	Preferred Option	to E+C	Pref. Opt.	Pref. Opt.
1	Performance Measures						
1.1.1	Total Vehicle Miles Traveled (VMT-daily)	13,736,334	21,108,837	20,545,690	54%	-3%	50%
1.1.1a	Total Vehicle Miles Traveled (VMT-per capita)	32	31	31	-1%	-2%	-3%
1.2.1	Total Vehicle Hours Traveled (VHT-daily)	342,054	665,310	548,553	95%	-18%	60%
1.2.1a	Total Vehicle Minutes Traveled (VHT-per capita)	47	59	49	26%	-17%	4%
<u>1.3</u>	<u>Average Speed by Facility (miles/hour)</u>						
1.3.1	- Freeway	57	48	53	-16%	11%	-6%
1.3.2	- Arterial	35	30	33	-14%	9%	-6%
1.3.3	- All Facility	47	40	45	-15%	12%	-4%
<u>1.4</u>	<u>Peak Average Speed by Facility (miles/hour)</u>						
1.4.1	- Freeway	56	45	52	-19%	14%	-7%
1.4.2	- Arterial	34	28	32	-17%	12%	-6%
1.4.3	- All Facility	46	37	43	-18%	15%	-6%
<u>1.5</u>	<u>Daily Average Travel Length - All Person Trips</u>						
1.5.1	- Travel Time (minutes)	13	16	14	22%	-13%	7%
1.5.2	- Travel Distance (miles)	6.1	6.1	6.1	0%	0%	0%
<u>1.6</u>	<u>Daily Average Travel Length - Work Trips</u>						
1.6.1	- Travel Time	20	24	21	20%	-14%	4%
1.6.2	- Travel Distance - Work Trips	10.8	10.1	10.6	-6%	5%	-2%
<u>1.7</u>	<u>Peak Average Travel Length - All Person Trips</u>						
1.7.1	- Peak Travel Time	15	18	16	22%	-14%	5%
1.7.2	- Peak Travel Distance	7.0	6.7	6.9	-4%	2%	-2%
<u>1.8</u>	<u>Daily Avg. Travel Length - Commercial Vehicle Trips</u>						
1.8.1	- Travel Time	10	11	10	11%	-5%	5%
1.8.2	- Travel Distance	6.7	6.5	6.8	-2%	4%	2%
<u>1.9</u>	<u>Daily Average Travel Length - Truck Trips</u>						
1.9.1	- Travel Time	11	13	12	11%	-5%	5%
1.9.2	- Travel Distance	7.8	7.7	8.1	-2%	5%	3%

2045 MTP -- Preferred Option
TRM Performance Measures for the DCHC MPO

MPO	Name =	Baseline	E+C	Pref. Opt.	Comparisons		
					Baseline	E+C to	Baseline to
	SE Data ==>	2015	2045	2045 AIM High	Baseline	E+C to	Baseline to
	Transportation Network ==>	2015	E+C	Preferred Option	to E+C	Pref. Opt.	Pref. Opt.
<u>1.10</u>	Hours of Delay (daily)	31,471	171,007	81,226	443%	-53%	158%
1.10a	Minutes of Delay (daily) (per capita)	4	15	7	251%	-52%	67%
1.10.1	Truck Hours of Delay (daily)	1,588	10,643	5,344	570%	-50%	237%
<u>1.11</u>	Percent of Congested VMT (volume > capacity) - All Day						
1.11.1	- Freeway	1%	12%	4%	933%	-70%	208%
1.11.2	- Arterial	3%	15%	5%	500%	-65%	108%
1.11.3	- All Facility	1%	12%	4%	764%	-69%	164%
<u>1.12</u>	Percent of Congested VMT (volume > capacity) - Peak						
1.12.1	- Freeway	2%	20%	6%	1047%	-69%	253%
1.12.2	- Arterial	4%	22%	8%	441%	-65%	90%
1.12.3	- All Facility	2%	18%	6%	767%	-68%	176%
1.12.4	- Designated truck routes	3%	17%	8%	425%	-51%	156%
1.12.5	- Facilities w/bus routes	2%	18%	5%	738%	-70%	152%
2	Mode Share Measures						
<u>2.1</u>	All Trips - Daily						
2.1.1	- Drive alone (single occupant vehicle -SOV)	906,699	1,389,181	1,326,015	53%	-5%	46%
2.1.2	- Carpool (Share ride)	720,549	1,096,707	1,096,202	52%	0%	52%
2.1.3	- Bus	53,291	68,187	81,640	28%	20%	53%
2.1.4	- Rail	-	-	32,705			
2.1.5	- Non-Motorized (Bike and Walk)	302,239	503,083	533,560	66%	6%	77%
<u>2.2</u>	Work Trips - Daily						
2.2.1	- Drive alone (single occupant vehicle -SOV)	198,430	305,947	301,831	54%	-1%	52%
2.2.2	- Carpool (Share ride)	24,542	35,811	34,321	46%	-4%	40%
2.2.3	- Bus	12,511	16,207	20,577	30%	27%	64%
2.2.4	- Rail	-	-	7,630	N/A	N/A	N/A
2.2.5	- Non-Motorized (Bike and Walk)	13,587	27,085	24,209	99%	-11%	78%
<u>2.2a</u>	Work Trips - Mode Share						
2.2.1a	- Drive alone (single occupant vehicle -SOV)	80%	79%	78%	0%	-2%	-2%

2045 MTP -- Preferred Option
TRM Performance Measures for the DCHC MPO

MPO	Name =	Baseline	E+C	Pref. Opt.	Comparisons		
					SE Data ==>	2015	2045
	Transportation Network ==>	2015	E+C	Preferred Option			
2.2.2a	- Carpool (Share ride)	10%	9%	9%	-6%	-5%	-10%
2.2.3a	- Bus	5%	4%	5%	-16%	26%	5%
2.2.4a	- Rail	N/A	N/A	2%	N/A	N/A	N/A
2.2.5a	- Non-Motorized (Bike and Walk)	5%	7%	6%	29%	-11%	14%
3	Transit Measures						
3.1	Transit Ridership (regionwide)						
3.1.1	- GoTriangle (rail included in rail scenarios)	12,064	20,374	59,018	69%	190%	389%
3.1.2	- GoRaleigh	24,308	36,407	87,509	50%	140%	260%
3.1.3	- CHT	33,206	41,831	55,494	26%	33%	67%
3.1.4	- GoDurham	21,963	27,466	45,172	25%	64%	106%
3.1.5	- NCSU	13,614	20,438	24,161	50%	18%	77%
3.1.6	- DUKE	8,263	9,579	12,071	16%	26%	46%
3.1.7	- OPT	306	N/A	N/A	N/A	N/A	N/A
3.1.8	- GoCary	2,765	3,110	5,006	12%	61%	81%
3.1.9	Total	116,484	159,200	288,431	37%	81%	148%
3.2	Total Rail Ridership	N/A	N/A	43,589	N/A	N/A	N/A
4	Demographic Measures						
4.1	Population	434,036	672,377	669,866	55%	0%	54%
4.2	Employment	269,779	449,898	449,071	67%	0%	66%
4.3	Total Daily Person Trips	1,982,778	3,057,158	3,070,122	54%	0%	55%
4.3.1	Work Person Trips	249,070	385,050	388,568	55%	1%	56%
4.4	Total Daily CV (commercial vehicle) Trips	126,680	202,550	202,014	60%	0%	59%
4.4.1	Daily Truck Trips	52,282	84,686	84,293	62%	0%	61%
4.5.1	Total Highway Lane Miles	2,555	2,605	2,902	2%	11%	14%
4.5.2	Transit Service Miles	61551	61,581	84,368	0%	37%	37%

N/A = measures is not applicable, e.g., there is no rail transit in the 2013 scenario.

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