

2035 LRTP and CTP Alternatives – Performance Measures

Purpose of Performance Measures

Performance Measures provide a general indicator of the a transportation system from a variety of perspectives such as mobility, travel time, congestion, mode choice, air quality, financial, and environmental justice (i.e., perspective of minority and low-income populations). The measures are not specific to a particular travel corridor but instead cover the entire transportation system, and therefore are useful for comparing the efficiency and effectiveness of the different transportation Alternatives. Most of the data used for calculating the Performance Measures comes from the Triangle Regional Model, which is a travel demand model that forecasts future travel statistics based on a set of assumptions concerning the highway network, transit service and other transportation facilities.

The tables in this section provide the Performance Measures for the fifteen different transportation Alternatives that are being analyzed. Each Alternative is a combination of one of the five transportation systems, including:

- Comprehensive Transportation Plan;
- Intensive Highway;
- Intensive Fixed Guideway;
- Intensive Bus Transit; and,
- Moderate Multimodal,

And, one of the five Land Use Scenarios, including:

- Baseline;
- Constrained;
- Buildout;
- Travel Corridors; and,
- Transit Node.

(Note: For additional information on the development of the Alternatives, see Section 4, “Alternatives – Detailed Description” in this report.)

Performance Measures Tables

For comparison purposes, the Performance Measure tables are organized by transportation system type, plus the first table compares all the Alternatives that use the Baseline Land Use Scenario. The order of the tables on the following pages is:

1. Alternatives using Baseline SE Data
2. Comprehensive Transportation Plan (CTP) Alternatives
3. Intensive Highway Alternatives
4. Intensive Fixed Guideway Alternatives
5. Intensive Bus Transit
6. Moderate Multimodal Alternatives

Use of E+C

The column in the table designated as E+C indicates Existing plus Committed. The E+C is composed of a transportation network of the existing and committed highway and transit facilities, and the 2035 socioeconomic data (i.e., population and employment in the year 2035). Thus, the E+C serves as a benchmark for comparing how much the performance measures improve with the transportation investments in the different Alternatives.

Targets

The DCHC MPO set Targets – Good, Better and Best – for each Performance Measure. The Target values are shown in the right side columns and serve as another benchmark for comparing the different Alternatives.

2035 Long Range Transportation Plan

LRTP Alternatives Using Baseline Land Use Scenario

		7a	2a	3a	4a	5a	6a	Targets		
		2035 E+C	CTP	Highway	Fixed Guideway	Bus Transit	Mod. Multimodal	Good	Better	Best
1	Mobility Targets									
1.1	VMT Per Capita (daily miles)	31.6	31.2	32.1	31.4	31.5	31.3	29.1	27.5	24.5
1.2	Total VMT change from 2035 E+C	N/A	-1.1%	1.8%	-0.4%	-0.2%	-0.8%	-5%	-10%	-20%
1.3	VHT per capita (daily minutes)	50.0	42.3	43.7	45.9	46.0	45.4	50.5	47.9	42.5
1.4	Total VHT change from 2035 E+C	N/A	-15.4%	-12.5%	-8.0%	-7.8%	-9.1%	-5%	-10%	-20%
1.5	Percent of Peak Period VMT at Congestion (V/C > 1)	10.4%	2.8%	2.8%	5.3%	5.7%	5.3%	12%	8%	4%
1.6	Average Travel Time (work trips) (daily minutes)	25.8	22.6	22.6	23.5	23.5	23.5	24	22	20
1.7	Average Travel Time (all trips) (daily minutes)	17.2	16.2	16.2	16.4	16.5	16.5	15	14	13
1.8	Average Travel Time (all peak trips) (daily minutes)	20.5	18.6	18.5	19.1	19.1	19.2	19	17	15
2	Transit Targets									
2.1	Transit Mode Share (all trips)	2.3%	3.6%	2.8%	3.5%	3.3%	2.9%	3.0%	5.0%	8.0%
2.2	Percent Ridership change from 2035 E+C	N/A	77.6%	23.4%	78.3%	61.8%	26.5%	100%	200%	400%
2.3	Transit Mode Share (peak trips)	2.5%	4.0%	3.1%	3.8%	3.6%	3.2%	5.0%	8.0%	12.0%
2.4	Daily Transit Trips per Capita	0.13	0.20	0.15	0.19	0.18	0.16	0.29	0.43	0.72
3	TDM Targets									
3.1	Percent SOV Trip Share (all trips)	54.8%	53.5%	54.3%	53.8%	53.9%	54.1%	52.5%	50.0%	44.5%
3.2	Percent SOV Trip Change from 2035 E+C	N/A	-1.0%	0.6%	-1.5%	-1.4%	-0.3%	-5%	-10%	-20%
3.3	Percent SOV Trip Share (peak trips)	58.8%	57.3%	58.1%	57.7%	57.7%	57.9%	78.4%	74.3%	66.0%
3.4	Percent Non-motorized Trip Share (all trips)	6.8%	6.7%	6.7%	6.8%	6.8%	6.7%	9%	11%	15%
3.5	Percent Non-motorized trip change from 2035 E+C	N/A	0.2%	0.2%	0.0%	0.0%	0.0%	30%	59%	117%
4	Air Quality and Environmental Targets (Guide data is the federal Air Quality Conformity budget)									
4.1	Carbon Monoxide - CO (kg/day)	96,717	97,475	99,257	96,796	97,021	86,533	5% under budget	10% under budget	20% under budget
4.2	Nitrogen Oxides - NOx (kg/day)	3,294	3,260	3,363	3,285	3,291	2,888			
4.3	Greenhouse Gas Change (community target)	N/A	N/A	N/A	N/A	N/A	N/A	-10%	-20%	-30%
5	Financial/Economics Targets									
5.1	Revenue/Cost Gap (Ratio of traditional revenue/cost)	N/A	0.32	0.74	0.62	0.59	1.11	0.90	0.95	1.00
5.2	Cost per Trip	N/A	N/A	N/A	N/A	N/A	N/A	\$0.20	\$0.18	\$0.16
5.3	Annual Cost of Congestion (in million \$)	730	355	385	537	538	521	1,030	848	666
6	Environment Justice/Land Use Targets									
6.1	Percent of EJ Population within 1/4 mile of transit	72%	80%	77%	78%	77%	77%	65%	75%	85%
6.2	Percent of Employment within 1/4 mile of transit	75%	86%	80%	84%	83%	81%	75%	80%	90%
6.3	EJ Travel Time (ratio of avg.travel time) (EJ/All)	0.94	0.95	0.95	0.95	0.94	0.94	1.00	0.95	0.90

2035 Long Range Transportation Plan Comprehensive Transportation Plan (CTP) Alternatives

		7a	2a	2b	Targets		
		2035 ENC	Baseline	Buildout	Good	Better	Best
1	Mobility Targets						
1.1	VMT Per Capita (daily miles)	31.6	31.2	32.2	29.1	27.5	24.5
1.2	Total VMT change from 2035 E+C	N/A	-1.1%	49.4%	-5%	-10%	-20%
1.3	VHT per capita (daily minutes)	50.0	42.3	55.1	50.5	47.9	42.5
1.4	Total VHT change from 2035 E+C	N/A	-15.4%	61.3%	-5%	-10%	-20%
1.5	Percent of Peak Period VMT at Congestion (V/C > 1)	10.4%	2.8%	15.9%	12%	8%	4%
1.6	Average Travel Time (work trips) (daily minutes)	25.8	22.6	25.7	24	22	20
1.7	Average Travel Time (all trips) (daily minutes)	17.2	16.2	18.3	15	14	13
1.8	Average Travel Time (all peak trips) (daily minutes)	20.5	18.6	21.8	19	17	15
2	Transit Targets						
2.1	Transit Mode Share (all trips)	2.3%	3.6%	2.4%	3.0%	5.0%	8.0%
2.2	Percent Ridership change from 2035 E+C	N/A	77.6%	108.4%	100%	200%	400%
2.3	Transit Mode Share (peak trips)	2.5%	4.0%	2.6%	5.0%	8.0%	12.0%
2.4	Daily Transit Trips per Capita	0.13	0.20	0.13	0.29	0.43	0.72
3	TDM Targets						
3.1	Percent SOV Trip Share (all trips)	54.8%	53.5%	53.8%	52.5%	50.0%	44.5%
3.2	Percent SOV Trip Change from 2035 E+C	N/A	-1.0%	-1.8%	-5%	-10%	-20%
3.3	Percent SOV Trip Share (peak trips)	58.8%	57.3%	58.9%	78.4%	74.3%	66.0%
3.4	Percent Non-motorized Trip Share (all trips)	6.8%	6.7%	8.0%	9%	11%	15%
3.5	Percent Non-motorized trip change from 2035 E+C	N/A	0.2%	69.3%	30%	59%	117%
4	Air Quality and Environmental Targets (Guide data is the federal Air Quality Conformity budget)						
4.1	Carbon Monoxide - CO (kg/day)	96,717	97,475	98,416	5% under budget	10% under budget	20% under budget
4.2	Nitrogen Oxides - NOx (kg/day)	3,294	3,260	3,343			
4.3	Greenhouse Gas Change (community target)	N/A	N/A	N/A	-10%	-20%	-30%
5	Financial/Economics Targets						
5.1	Revenue/Cost Gap (Ratio of traditional revenue/cost)	N/A	0.74	0.62	0.90	0.95	1.00
5.2	Cost per Trip	N/A	N/A	N/A	\$0.20	\$0.18	\$0.16
5.3	Annual Cost of Congestion (in million \$)	730	355	1283	1,030	848	666
6	Environment Justice/Land Use Targets						
6.1	Percent of EJ Population within 1/4 mile of transit	72%	80%	81%	65%	75%	85%
6.2	Percent of Employment within 1/4 mile of transit	75%	86%	82%	75%	80%	90%
6.3	EJ Travel Time (ratio of avg.travel time) (EJ/All)	0.94	0.95	0.94	1.00	0.95	0.90

2035 Long Range Transportation Plan Highway Intensive Alternatives

		7a	3a	3b	3c	Targets		
		2035 ENC	Baseline	Constrained	Corridor	Good	Better	Best
1	Mobility Targets							
1.1	VMT Per Capita (daily miles)	31.6	32.1	32.4	31.9	29.1	27.5	24.5
1.2	Total VMT change from 2035 E+C	N/A	1.8%	-7.0%	0.8%	-5%	-10%	-20%
1.3	VHT per capita (daily minutes)	50.0	43.7	42.7	43.3	50.5	47.9	42.5
1.4	Total VHT change from 2035 E+C	N/A	-12.5%	-22.6%	-13.5%	-5%	-10%	-20%
1.5	Percent of Peak Period VMT at Congestion (V/C > 1)	10.4%	2.8%	2.4%	2.9%	12%	8%	4%
1.6	Average Travel Time (work trips) (daily minutes)	25.8	22.6	21.4	21.9	24	22	20
1.7	Average Travel Time (all trips) (daily minutes)	17.2	16.2	15.7	15.9	15	14	13
1.8	Average Travel Time (all peak trips) (daily minutes)	20.5	18.5	17.9	18.2	19	17	15
2	Transit Targets							
2.1	Transit Mode Share (all trips)	2.3%	2.8%	3.0%	2.8%	3.0%	5.0%	8.0%
2.2	Percent Ridership change from 2035 E+C	N/A	23.4%	18.5%	25.4%	100%	200%	400%
2.3	Transit Mode Share (peak trips)	2.5%	3.1%	3.4%	3.2%	5.0%	8.0%	12.0%
2.4	Daily Transit Trips per Capita	0.13	0.15	0.16	0.16	0.29	0.43	0.72
3	TDM Targets							
3.1	Percent SOV Trip Share (all trips)	54.8%	54.3%	54.4%	54.3%	52.5%	50.0%	44.5%
3.2	Percent SOV Trip Change from 2035 E+C	N/A	0.6%	-9.5%	-0.9%	-5%	-10%	-20%
3.3	Percent SOV Trip Share (peak trips)	58.8%	58.1%	58.0%	58.2%	78.4%	74.3%	66.0%
3.4	Percent Non-motorized Trip Share (all trips)	6.8%	6.7%	6.7%	6.9%	9%	11%	15%
3.5	Percent Non-motorized trip change from 2035 E+C	N/A	0.2%	-10.8%	1.1%	30%	59%	117%
4	Air Quality and Environmental Targets (Guide data is the federal Air Quality Conformity budget)							
4.1	Carbon Monoxide - CO (kg/day)	96,717	99,257	90,464	97,612	5% under budget	10% under budget	20% under budget
4.2	Nitrogen Oxides - NOx (kg/day)	3,294	3,363	3,084	3,330			
4.3	Greenhouse Gas Change (community target)	N/A	N/A	N/A	N/A	-10%	-20%	-30%
5	Financial/Economics Targets							
5.1	Revenue/Cost Gap (Ratio of traditional revenue/cost)	N/A	0.74	0.74	0.74	0.90	0.95	1.00
5.2	Cost per Trip	N/A	N/A	N/A	N/A	\$0.20	\$0.18	\$0.16
5.3	Annual Cost of Congestion (in million \$)	730	385	287	383	1,030	848	666
6	Environment Justice/Land Use Targets							
6.1	Percent of EJ Population within 1/4 mile of transit	72%	77%	79%	79%	65%	75%	85%
6.2	Percent of Employment within 1/4 mile of transit	75%	80%	80%	82%	75%	80%	90%
6.3	EJ Travel Time (ratio of avg.travel time) (EJ/All)	0.94	0.95	0.95	0.95	1.00	0.95	0.90

2035 Long Range Transportation Plan Fixed Guideway Alternatives

		7a	4a	4b	4c	Targets		
		2035 ENC	Baseline	Corridor	Transit Nodes	Good	Better	Best
1	Mobility Targets							
1.1	VMT Per Capita (daily miles)	31.6	31.4	31.2	31.7	29.1	27.5	24.5
1.2	Total VMT change from 2035 E+C	N/A	-0.4%	-1.2%	-0.5%	-5%	-10%	-20%
1.3	VHT per capita (daily minutes)	50.0	45.9	45.6	46.6	50.5	47.9	42.5
1.4	Total VHT change from 2035 E+C	N/A	-8.0%	-9.0%	-7.7%	-5%	-10%	-20%
1.5	Percent of Peak Period VMT at Congestion (V/C > 1)	10.4%	5.3%	5.5%	5.7%	12%	8%	4%
1.6	Average Travel Time (work trips) (daily minutes)	25.8	23.5	22.7	23.4	24	22	20
1.7	Average Travel Time (all trips) (daily minutes)	17.2	16.4	16.2	16.4	15	14	13
1.8	Average Travel Time (all peak trips) (daily minutes)	20.5	19.1	18.7	19.0	19	17	15
2	Transit Targets							
2.1	Transit Mode Share (all trips)	2.3%	3.5%	3.6%	3.6%	3.0%	5.0%	8.0%
2.2	Percent Ridership change from 2035 E+C	N/A	78.3%	80.7%	83.2%	100%	200%	400%
2.3	Transit Mode Share (peak trips)	2.5%	3.8%	3.9%	3.9%	5.0%	8.0%	12.0%
2.4	Daily Transit Trips per Capita	0.13	0.19	0.20	0.20	0.29	0.43	0.72
3	TDM Targets							
3.1	Percent SOV Trip Share (all trips)	54.8%	53.8%	53.8%	53.6%	52.5%	50.0%	44.5%
3.2	Percent SOV Trip Change from 2035 E+C	N/A	-1.5%	-2.8%	-2.0%	-5%	-10%	-20%
3.3	Percent SOV Trip Share (peak trips)	58.8%	57.7%	57.8%	57.5%	78.4%	74.3%	66.0%
3.4	Percent Non-motorized Trip Share (all trips)	6.8%	6.8%	6.9%	6.9%	9%	11%	15%
3.5	Percent Non-motorized trip change from 2035 E+C	N/A	0.0%	0.9%	1.7%	30%	59%	117%
4	Air Quality and Environmental Targets (Guide data is the federal Air Quality Conformity budget)							
4.1	Carbon Monoxide - CO (kg/day)	96,717	96,796	95,333	96,068	5% under budget	10% under budget	20% under budget
4.2	Nitrogen Oxides - NOx (kg/day)	3,294	3,285	3,257	3,275			
4.3	Greenhouse Gas Change (community target)	N/A	N/A	N/A	N/A	-10%	-20%	-30%
5	Financial/Economics Targets							
5.1	Revenue/Cost Gap (Ratio of traditional revenue/cost)	N/A	0.62	0.62	0.62	0.90	0.95	1.00
5.2	Cost per Trip	N/A	N/A	N/A	N/A	\$0.20	\$0.18	\$0.16
5.3	Annual Cost of Congestion (in million \$)	730	537	533	553	1,030	848	666
6	Environment Justice/Land Use Targets							
6.1	Percent of EJ Population within 1/4 mile of transit	72%	78%	80%	81%	65%	75%	85%
6.2	Percent of Employment within 1/4 mile of transit	75%	84%	85%	85%	75%	80%	90%
6.3	EJ Travel Time (ratio of avg.travel time) (EJ/All)	0.94	0.95	0.95	0.95	1.00	0.95	0.90

2035 Long Range Transportation Plan Bus Transit Alternatives

		7a	5a	5b	5c	Targets		
		2035 ENC	Baseline	Corridor	Transit Nodes	Good	Better	Best
1	Mobility Targets							
1.1	VMT Per Capita (daily miles)	31.6	31.5	31.4	31.4	29.1	27.5	24.5
1.2	Total VMT change from 2035 E+C	N/A	-0.2%	-0.8%	-0.8%	-5%	-10%	-20%
1.3	VHT per capita (daily minutes)	50.0	46.0	45.8	45.8	50.5	47.9	42.5
1.4	Total VHT change from 2035 E+C	N/A	-7.8%	-8.5%	-8.5%	-5%	-10%	-20%
1.5	Percent of Peak Period VMT at Congestion (V/C > 1)	10.4%	5.7%	5.5%	5.5%	12%	8%	4%
1.6	Average Travel Time (work trips) (daily minutes)	25.8	23.5	22.7	22.7	24	22	20
1.7	Average Travel Time (all trips) (daily minutes)	17.2	16.5	16.3	16.3	15	14	13
1.8	Average Travel Time (all peak trips) (daily minutes)	20.5	19.1	18.8	18.8	19	17	15
2	Transit Targets							
2.1	Transit Mode Share (all trips)	2.3%	3.3%	3.4%	3.4%	3.0%	5.0%	8.0%
2.2	Percent Ridership change from 2035 E+C	N/A	83.7%	87.2%	87.2%	100%	200%	400%
2.3	Transit Mode Share (peak trips)	2.5%	3.6%	3.7%	3.7%	5.0%	8.0%	12.0%
2.4	Daily Transit Trips per Capita	0.13	0.18	0.19	0.19	0.29	0.43	0.72
3	TDM Targets							
3.1	Percent SOV Trip Share (all trips)	54.8%	53.9%	53.8%	53.8%	52.5%	50.0%	44.5%
3.2	Percent SOV Trip Change from 2035 E+C	N/A	-1.4%	-1.5%	-1.5%	-5%	-10%	-20%
3.3	Percent SOV Trip Share (peak trips)	58.8%	57.7%	57.8%	57.6%	78.4%	74.3%	66.0%
3.4	Percent Non-motorized Trip Share (all trips)	6.8%	6.8%	6.9%	6.9%	9%	11%	15%
3.5	Percent Non-motorized trip change from 2035 E+C	N/A	-1.1%	1.0%	0.5%	30%	59%	117%
4	Air Quality and Environmental Targets (Guide data is the federal Air Quality Conformity budget)							
4.1	Carbon Monoxide - CO (kg/day)	96,717	97,021	95,693	95,693	5% under budget	10% under budget	20% under budget
4.2	Nitrogen Oxides - NOx (kg/day)	3,294	3,291	3,268	3,268			
4.3	Greenhouse Gas Change (community target)	N/A	N/A	N/A	N/A			
5	Financial/Economics Targets							
5.1	Revenue/Cost Gap (Ratio of traditional revenue/cost)	N/A	0.59	0.59	0.59	0.90	0.95	1.00
5.2	Cost per Trip	N/A	N/A	N/A	N/A	\$0.20	\$0.18	\$0.16
5.3	Annual Cost of Congestion (in million \$)	730	538	539	539	1,030	848	666
6	Environment Justice/Land Use Targets							
6.1	Percent of EJ Population within 1/4 mile of transit	72%	77%	79%	79%	65%	75%	85%
6.2	Percent of Employment within 1/4 mile of transit	75%	83%	84%	84%	75%	80%	90%
6.3	EJ Travel Time (ratio of avg.travel time) (EJ/All)	0.94	0.94	0.95	0.95	1.00	0.95	0.90

2035 Long Range Transportation Plan Moderate Multimodal Alternatives

		7a	6a	6b	6c	Targets		
		2035 ENC	Baseline	Corridor	Transit Nodes	Good	Better	Best
1	Mobility Targets							
1.1	VMT Per Capita (daily miles)	31.6	31.3	31.5	31.4	29.1	27.5	24.5
1.2	Total VMT change from 2035 E+C	N/A	-0.8%	-0.4%	-1.7%	-5%	-10%	-20%
1.3	VHT per capita (daily minutes)	50.0	45.4	45.3	45.4	50.5	47.9	42.5
1.4	Total VHT change from 2035 E+C	N/A	-9.1%	-9.6%	-10.1%	-5%	-10%	-20%
1.5	Percent of Peak Period VMT at Congestion (V/C > 1)	10.4%	5.3%	5.6%	5.7%	12%	8%	4%
1.6	Average Travel Time (work trips) (daily minutes)	25.8	23.5	22.6	23.2	24	22	20
1.7	Average Travel Time (all trips) (daily minutes)	17.2	16.5	16.2	16.4	15	14	13
1.8	Average Travel Time (all peak trips) (daily minutes)	20.5	19.2	18.7	19.0	19	17	15
2	Transit Targets							
2.1	Transit Mode Share (all trips)	2.3%	2.9%	2.6%	2.6%	3.0%	5.0%	8.0%
2.2	Percent Ridership change from 2035 E+C	N/A	26.5%	10.3%	12.0%	100%	200%	400%
2.3	Transit Mode Share (peak trips)	2.5%	3.2%	2.8%	2.9%	5.0%	8.0%	12.0%
2.4	Daily Transit Trips per Capita	0.13	0.16	0.14	0.14	0.29	0.43	0.72
3	TDM Targets							
3.1	Percent SOV Trip Share (all trips)	54.8%	54.1%	54.0%	53.8%	52.5%	50.0%	44.5%
3.2	Percent SOV Trip Change from 2035 E+C	N/A	-0.3%	-2.6%	-1.8%	-5%	-10%	-20%
3.3	Percent SOV Trip Share (peak trips)	58.8%	57.9%	58.2%	57.9%	78.4%	74.3%	66.0%
3.4	Percent Non-motorized Trip Share (all trips)	6.8%	6.7%	7.0%	6.9%	9%	11%	15%
3.5	Percent Non-motorized trip change from 2035 E+C	N/A	0.0%	0.9%	1.6%	30%	59%	117%
4	Air Quality and Environmental Targets (Guide data is the federal Air Quality Conformity budget)							
4.1	Carbon Monoxide - CO (kg/day)	96,717	86,533	96,955	96,723	5% under budget	10% under budget	20% under budget
4.2	Nitrogen Oxides - NOx (kg/day)	3,294	2,888	3,286	3,233			
4.3	Greenhouse Gas Change (community target)	N/A	N/A	N/A	N/A	-10%	-20%	-30%
5	Financial/Economics Targets							
5.1	Revenue/Cost Gap (Ratio of traditional revenue/cost)	N/A	1.11	1.11	1.11	0.90	0.95	1.00
5.2	Cost per Trip	N/A	N/A	N/A	N/A	\$0.20	\$0.18	\$0.16
5.3	Annual Cost of Congestion (in million \$)	730	521	514	513	1,030	848	666
6	Environment Justice/Land Use Targets							
6.1	Percent of EJ Population within 1/4 mile of transit	72%	77%	79%	80%	65%	75%	85%
6.2	Percent of Employment within 1/4 mile of transit	75%	81%	83%	83%	75%	80%	90%
6.3	EJ Travel Time (ratio of avg.travel time) (EJ/All)	0.94	0.94	0.95	0.95	1.00	0.95	0.90