

Appendix D

Metro South MetroLink Extension AA/DEIS: Ridership Forecasting and Methodology Report (December 2004)

Metro South MetroLink Extension
Alternatives Analysis and DEIS

2025 Ridership Forecasting and Methodology Report

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Introduction

This report describes the methods of travel demand forecasting for a proposed expansion of MetroLink into south St. Louis County. The study, *Metro South*, is lead by the Transportation Corridor Improvement Group (TCIG), whose members include planners from the East-West Gateway Council of Governments (EWGCOG), Metro (formerly the Bi-State Development Agency) and the Missouri Department of Transportation (MoDOT). Metro South will rely heavily on federal funding for construction and as such, seek approval from the Federal Transit Administration (FTA) via the New Starts program.

Background

Essentially, two travel demand forecasting models are maintained by the EWGCOG. One model is used for major transportation investment analysis (MTIA) involving public transportation and is often referred to as the “transit model” by council staff. Forecasts for the Long-Range Transportation Plan incorporate the outcome of area MTIAs by extracting modal shares from an approved project and then factoring out the transit trips prior to making the horizon year highway forecasts.

Methods employed in the transit model reflect the work of various consultants over the course of some ten years. Moreover, the turnover of EWGCOG modeling staff has been considerable during past years. As such, the Council has relied heavily on the work of consultants in maintaining the model.

This arrangement has led to numerous methodological changes designed to improve the model’s performance. The last such change was made in a study for Metro and the St. Clair County Transit District (SCCTD). The approach is documented under the title, *Methods Report, 2020 Ridership Forecasting for the MetroLink Extension to Scott AFB/Shiloh Station, May 2002*.

In their review of that methods report, EWGCOG concluded that the rail bias and market segment assumptions made for the above-mentioned study would be difficult to substantiate and decided to use a prior version of the transit model. Moreover, EWGCOG had recently completed comprehensive surveys (both household and on-board) and recognized this as an opportunity to validate the mode choice model on the basis of income categories. All prior forecasts made simple boarding comparisons and lacking survey data, largely assumed modal shares for the various income categories were in the ballpark.

Sections 1 and 2 describe EWGCOG’s assumptions for trip generation and distribution. Sections 3 and 4 describe the methods for constructing transit paths and modal choice. Sections 5 and 6 present results from modal choice and transit assignment for the base year 2005. Section 7 summarizes results for transit modeling for the 2025 No Build. The last section (Section 8) summarizes results for the build alternatives. All of the forecasting utilized person trips Tables provided by the EWGCOG and stem from models developed for the Long-Range Transportation Plan.

1. Trip Generation

The trip generation model uses a cross-classification form to estimate total trip productions, based on households, stratified by income and household size and linear regression equations are used to calculate trip attractions. The model classifies trips into four main purposes: Home-Based Work (HB Work), Home-Based Other (HB Other), Non-Home-Based (NHB), and Commercial. The HB Other purpose is further subdivided into Shopping, Drop Passenger, and Other. The trip production rates were developed from the results of a sample household interview survey undertaken in 1990 and appear below in Table 1-1. Although the rates are based on the survey, non-motorized and school trips were excluded in the derivation. The rates reflect only those trips made by vehicle or transit. Taxi, shuttle and limo trips and other commercial productions rates are set to attractions.

Table 1-1: Home-Based and Non-Home Based Trip Production Rates

HB Work	Household Size				
Income	1	2	3	4	5
Low	.920	1.510	1.510	1.510	1.510
Medium	1.290	2.150	2.920	2.920	2.920
High	1.290	2.710	2.920	2.920	2.920

HB Other	Household Size				
Income	1	2	3	4	5
Low	1.616	3.377	4.816	6.387	8.754
Medium	1.460	3.232	4.372	6.175	8.540
High	1.471	2.521	3.979	6.138	8.540

HB Shopping	Household Size				
Income	1	2	3	4	5
Low	0.546	0.884	1.176	1.023	1.374
Medium	0.494	0.854	0.852	0.989	1.340
High	0.497	0.847	0.850	0.983	1.340

HB Drop Pass.	Household Size				
Income	1	2	3	4	5
Low	0.000	0.458	1.806	2.087	2.850
Medium	0.000	0.443	1.309	2.018	2.780
High	0.000	0.439	1.306	2.006	2.780

HB Other	Household Size				
Income	1	2	3	4	5
Low	1.070	1.811	2.380	3.277	4.531
Medium	0.967	1.935	2.212	3.168	4.420
High	0.974	1.235	1.822	3.149	4.420

Table 1-1: Home-Based and Non-Home Based Trip Production Rates (cont.)

NHB Income	Household Size				
	1	2	3	4	5
Low	0.964	1.153	2.374	2.503	2.386
Medium	1.450	2.218	3.208	3.705	3.580
High	1.439	2.369	3.601	3.742	3.580

Work and non-work trip attractions rates appear below in Table 1-2, along with the commercial trip model. Work attractions are computed from five broad employment categories. Drop passenger attractions rates are set to productions.

Table 1-2: Trip Attraction Rates

Employment Category	Commercial	Industrial	Public	Extractive	Household Attractions
HB Work	1.473	1.360	1.060	1.472	0.561
HB Other	3.707	0.146	3.100	0.027	
HB Shopping	5.000	0.000	0.000	0.000	
HB Drop Pass.	Attractions set equal to Productions				
HB Other	2.855	0.146	3.100	0.027	0.561
NHB	1.100	0.108	0.526	0.043	0.177
Commercial	0.593	0.440	0.204	0.440	0.390

Results for Year 2005 trip generation appear in Table 1-3, along with results of the commercial trip model.

Table 1-3: Year 2005 Trip Generation Estimates

WORK (person trips)

Household Income	Productions	Attractions
Low	438,952	438,952
Medium/High	1,839,514	1,839,514
Totals	2,278,466	2,278,466

NON-WORK (person trips)

Non-Work Trip Purpose	Productions	Attractions
HB Shopping	676,925	676,925
HB Drop Pass.	723,060	723,060
HB Other	1,627,226	1,627,226
NHB	1,870,438	1,870,438
Totals	4,897,649	4,897,649

COMMERCIAL (vehicle trips)

Commercial vehicle trips	Productions	Attractions
Commercial, Truck, Taxi	873,550	873,550

2. Trip Distribution

The trip distribution uses a gravity model formulation, including K-factors, to estimate person-trip matrices from the production and attractions of the trip generation model. The distributions are calculated by purpose with a seven-iteration feedback loop mechanism utilizing loaded travel times from subsequent feedback loop iteration. Convergence occurs when the congested time inputs to the gravity roughly equal those of the next successive highway assignment. Tables 2-1 and 2-2 provide county-level comparisons between the model's HB Work trip distribution, the 2002 Household Survey and the 2000 Census Journey-to-Work information.

**Table 2-1: HB Work Trip Distribution
(Model 2005 versus 2002 Household Survey)**

Model

Origin	Destination								
	Franklin	Jefferson	St Charles	St Louis City	St Louis County	St Clair	Madison	Monroe	Total
Franklin	46,487	371	1,184	3,249	12,805	290	350	32	64,768
Jefferson	3,182	50,060	2,381	20,433	63,263	1,934	1,023	387	142,663
St Charles	255	102	143,904	9,208	96,877	200	488	16	251,050
St Louis City	41	714	1,115	183,272	85,658	4,236	2,713	146	277,895
St Louis County	2,627	12,310	22,603	189,679	756,395	7,742	10,994	1,301	1,003,651
St Clair	49	527	614	35,233	22,818	128,063	12,725	2,199	202,228
Madison	37	166	1,101	35,199	29,096	14,555	125,512	294	205,960
Monroe	43	235	359	3,403	5,581	3,523	610	6,707	20,461
Total	52,721	64,485	173,261	479,676	1,072,493	160,543	154,415	11,082	2,168,676

HH Survey

**Exp fact
1.67**

Origin	Destination								
	Franklin	Jefferson	St Charles	St Louis City	St Louis County	St Clair	Madison	Monroe	Total
Franklin	68,532	1,909	2,203	2,337	17,235	205	-	-	92,420
Jefferson	1,292	86,651	2,951	27,420	62,818	481	653	225	182,491
St Charles	150	253	137,603	26,378	110,424	986	-	-	275,794
St Louis City	0	1,252	2,053	192,570	93,459	1,181	-	560	291,075
St Louis County	1,579	10,928	26,812	208,060	597,048	2,363	5,646	221	852,657
St Clair	-	1,319	1,670	27,539	26,136	152,107	8,993	1,392	219,156
Madison	-	-	3,992	37,324	28,848	11,984	149,239	-	231,387
Monroe	125	649	-	3,068	6,290	1,192	97	12,274	23,695
Total	71,678	102,962	177,286	524,695	942,258	170,499	164,627	14,672	2,168,676

**Model
Errors
in Person
Trips**

Origin	Destination								
	Franklin	Jefferson	St Charles	St Louis City	St Louis County	St Clair	Madison	Monroe	Total
Franklin	-22,045	-1,538	-1,019	912	-4,430	85	350	32	-27,652
Jefferson	1,890	-36,591	-570	-6,987	445	1,453	370	162	-39,828
St Charles	105	-151	6,301	-17,170	-13,547	-786	488	16	-24,744
St Louis City	41	-538	-938	-9,298	-7,801	3,055	2,713	-414	-13,180
St Louis County	1,048	1,382	-4,209	-18,381	159,347	5,379	5,348	1,080	150,994
St Clair	49	-792	-1,056	7,694	-3,318	-24,044	3,732	807	-16,928
Madison	37	166	-2,891	-2,125	248	2,571	-23,727	294	-25,427
Monroe	-82	-414	359	335	-709	2,331	513	-5,567	-3,234
Total	-18,957	-38,477	-4,025	-45,019	130,235	-9,956	-10,212	-3,590	0

**Model
Errors
as a
Percentage**

Origin	Destination								
	Franklin	Jefferson	St Charles	St Louis City	St Louis County	St Clair	Madison	Monroe	Total
Franklin	-32%	-81%	-46%	39%	-26%	42%			-30%
Jefferson	146%	-42%	-19%	-25%	1%	302%	57%	72%	-22%
St Charles	70%	-60%	5%	-65%	-12%	-80%			-9%
St Louis City		-43%	-46%	-5%	-8%	259%		-74%	-5%
St Louis County	66%	13%	-16%	-9%	27%	228%	95%	487%	18%
St Clair		-60%	-63%	28%	-13%	-16%	41%	58%	-8%
Madison			-72%	-6%	1%	21%	-16%		-11%
Monroe	-66%	-64%		11%	-11%	195%	532%	-45%	-14%
Total	-26%	-37%	-2%	-9%	14%	-6%	-6%	-24%	0

* Shaded cells reflect areas with access to transit services.

**Table 2-2: HB Work Trip Distribution
(Model 2005 versus 2000 Census Journey-to-Work)**

Model

Origin	Destination								Total
	Franklin	Jefferson	St Charles	St Louis City	St Louis County	St Clair	Madison	Monroe	
Franklin	46,487	371	1,184	3,249	12,805	290	350	32	64,768
Jefferson	3,182	50,060	2,381	20,433	63,263	1,934	1,023	387	142,663
St Charles	255	102	143,904	9,208	96,877	200	488	16	251,050
St Louis City	41	714	1,115	183,272	85,658	4,236	2,713	146	277,895
St Louis County	2,627	12,310	22,603	189,679	756,395	7,742	10,994	1,301	1,003,651
St Clair	49	527	614	35,233	22,818	128,063	12,725	2,199	202,228
Madison	37	166	1,101	35,199	29,096	14,555	125,512	294	205,960
Monroe	43	235	359	3,403	5,581	3,523	610	6,707	20,461
Total	52,721	64,485	173,261	479,676	1,072,493	160,543	154,415	11,082	2,168,676

2000 Census

*Exp fact
1.87*

Origin	Destination								Total
	Franklin	Jefferson	St Charles	St Louis City	St Louis County	St Clair	Madison	Monroe	
Franklin	50,851	1,460	1,434	4,218	22,171	447	271	22	80,876
Jefferson	1,897	64,275	2,417	29,856	78,972	1,604	916	251	180,188
St Charles	1,039	711	131,164	20,463	116,738	1,655	1,376	39	273,186
St Louis City	545	2,211	2,694	154,420	95,477	2,713	2,346	94	260,500
St Louis County	3,280	10,228	24,075	196,970	671,643	8,129	7,116	494	921,935
St Clair	243	569	1,198	34,170	23,556	131,765	13,188	1,715	206,404
Madison	255	539	1,968	27,145	31,416	17,443	141,341	131	220,238
Monroe	43	384	157	4,448	6,240	3,239	788	10,048	25,348
Total	58,153	80,378	165,107	471,692	1,046,213	166,996	167,342	12,795	2,168,676

*Model Errors
in Person
Trips*

Origin	Destination								Total
	Franklin	Jefferson	St Charles	St Louis City	St Louis County	St Clair	Madison	Monroe	
Franklin	-4,364	-1,089	-250	-969	-9,366	-157	79	10	-16,108
Jefferson	1,285	-14,215	-36	-9,423	-15,709	330	107	136	-37,525
St Charles	-784	-609	12,740	-11,255	-19,861	-1,455	-888	-23	-22,136
St Louis City	-504	-1,497	-1,579	28,852	-9,819	1,523	367	52	17,395
St Louis County	-653	2,082	-1,472	-7,291	84,752	-387	3,878	807	81,716
St Clair	-194	-42	-584	1,063	-738	-3,702	-463	484	-4,176
Madison	-218	-373	-867	8,054	-2,320	-2,888	-15,829	163	-14,278
Monroe	0	-149	202	-1,045	-659	284	-178	-3,341	-4,887
Total	-5,432	-15,893	8,154	7,984	26,280	-6,453	-12,927	-1,713	0

*Model Errors
as a
Percentage*

Origin	Destination								Total
	Franklin	Jefferson	St Charles	St Louis City	St Louis County	St Clair	Madison	Monroe	
Franklin	-9%	-75%	-17%	-23%	-42%	-35%	29%	42%	-20%
Jefferson	68%	-22%	-1%	-32%	-20%	21%	12%	54%	-21%
St Charles	-75%	-86%	10%	-55%	-17%	-88%	-65%	-59%	-8%
St Louis City	-92%	-68%	-59%	19%	-10%	56%	16%	56%	7%
St Louis County	-20%	20%	-6%	-4%	13%	-5%	54%	163%	9%
St Clair	-80%	-7%	-49%	3%	-3%	-3%	-4%	28%	-2%
Madison	-85%	-69%	-44%	30%	-7%	-17%	-11%	124%	-6%
Monroe	0%	-39%	128%	-24%	-11%	9%	-23%	-33%	-19%
Total	-9%	-20%	5%	2%	3%	-4%	-8%	-13%	0

* Shaded cells reflect areas with access to transit services.

3. Transit Pathbuilding

The model develops walk access to transit in a 3-step process involving GIS, MINUTP and a FORTRAN program. The process determines the percent of each TAZ's land area that is within a reasonable walking distance to transit in terms of work productions, work attractions, non-work productions and non-work attractions. Drive access is not automated and follows the coding conventions of MINUTP. Catchment areas for park-ride nodes are left to the analyst to define (i.e., determining what zones should have connections to a designated park-ride node).

Pathbuilding parameters appear below in Table 3-1. Average travel speeds for buses are reported in Table 3-2.

Table 3-1: Pathbuilding Parameters

Path Parameters	Weights/Thresholds	
	Work	Non-Work
Out-of Vehicle Time	2.5	2.5
Minimum Initial Wait	1 min	1 min
Maximum Initial Wait	15 min	20 min
Minimum Transfer Time	3 min	3 min
Transfer Penalty	5 min	3 min
Drive Access Penalty	1.2	1.2

Table 3-2: Average Travel Speeds for Buses

Area	Model Peak	Model Midday	Observed Daily
Missouri – Locals	17.1 mph	17.5 mph	14.6 mph
Missouri – Express	19.1 mph	n/a	20.4 mph
Illinois Routes	22.5 mph	22.2 mph	18.0 mph

4. Mode Choice Model

The mode choice model has two nests illustrated by Figure 4-1. Modal shares are computed for the four income quartiles (i.e., \$0-25k, \$25-\$45k, \$45-\$75k and over \$75k) using the skim variables, skim coefficients and income constants. NHB trips are evaluated as a single purpose because incomes are largely irrelevant to the trip purpose beyond trip generation. All income constants are shown on Table 4-1 and were calibrated using modal share targets derived from both the HH survey and the On-Board survey. Past modeling efforts assumed modal shares were reasonable based on the assignment results (i.e., boardings). Top-level skim coefficients appear in Table 4-2 by trip purpose and the model's parameters appear in Table 4-3.

Figure 4-1: Example Choice Structure

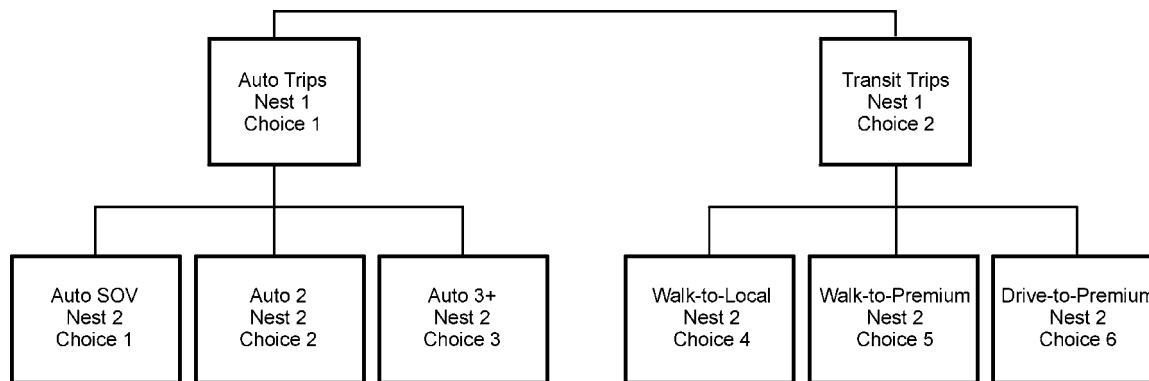


Table 4-1: Mode Constants by Income and Trip Purpose

HB WORK	Mode Constants by Income Group					
Income	Drive Alone	HOV 2	HOV 3+	Transit Walk-to-Local	Transit Walk-to-Premium	Transit Drive-to-Premium
\$0 - \$25k	-2.40	-4.25	-4.85	-1.25	0.65	0.50
\$25k - \$45k	-1.50	-4.30	-4.90	-1.30	0.60	-0.05
\$45k - \$75k	-0.40	-3.05	-3.85	-2.25	0.50	-0.15
over \$75k	0.00	-3.15	-3.90	-3.00	0.40	-0.35

HB Non-Work	Mode Constants by Income Group					
Income	Drive Alone	HOV 2	HOV 3+	Transit Walk-to-Local	Transit Walk-to-Premium	Transit Drive-to-Premium
\$0 - \$25k	-3.25	-3.75	-3.95	-1.30	0.00	0.55
\$25k - \$45k	-1.65	-2.35	-2.60	-2.50	-0.35	0.00
\$45k - \$75k	-0.95	-1.65	-1.75	-2.65	-0.25	0.00
over \$75k	-0.40	-0.90	-1.20	-2.55	0.00	0.00

Non-Home Based	Mode Constants					
Income	Drive Alone	HOV 2	HOV 3+	Transit Walk-to-Local	Transit Walk-to-Premium	Transit Drive-to-Premium
N/A	-1.30	-2.35	-2.95	-2.05	-1.30	0.20

Table 4-2: Top-Level Skim Coefficients by Trip Purpose

Modes	Time & Cost Variables	Utility Coefficients by Trip Purpose			
		HB Work	HB Shop	HB Other	NHB
Auto	In-Vehicle	-0.0228	-0.0238	-0.0238	-0.0230
	Out-of-Vehicle	-0.0570	-0.0595	-0.0595	-0.0575
	Operating Costs	-0.0117	-0.0245	-0.0245	-0.0237
Transit	Walk Access	-0.0570	-0.0595	-0.0595	-0.0575
	Wait	-0.0570	-0.0595	-0.0595	-0.0575
	Transfer	-0.0650	-0.0595	-0.0595	-0.0575
	In-Vehicle	-0.0228	-0.0238	-0.0238	-0.0230
	Drive Access	-0.0274	-0.0240	-0.0240	-0.0230
	Fares	-0.0117	-0.0245	-0.0245	-0.0237

Table 4-3: Model Parameters

Parameters	Value	Units
HOV 2 definition	2	persons per vehicle
HOV 3 definition	3.77	persons per vehicle
Auto Operating Costs	11.16	cents per mile
Base Year Price Index	31.7	n/a
Future Year Price Index	127.4	n/a
HOV 2 Pickup Time	1.1	minutes
HOV 3 Pickup Time	2.8	minutes
Intrazonal Highway Times LOV	5	minutes
Intrazonal Highway Times HOV	5	minutes
Short Walk Bias	60	minutes
Fixed Guideway Bias	0	minutes

5. Linked Trip Estimates for the Base Year 2005

Tables 5-1 through 5-4 show the validation targets and linked trip estimates from the mode choice model. Targets for transit linked trips were derived from the 2002 on-board survey. Targets for person trips made by automobile were derived from the household survey.

Person trip estimates for HB Work appear in Table 5-1. In the first chart (*HB Work Person Trip Targets*), a total of 2,192,104 daily work trips were forecasted by the EWGCOG for the year 2005. The on-board surveys suggest roughly 2.3% (49,911) of the daily work trips would be made by public transportation. Subtracting the linked transit trips from the total person trips yields the total number of person trips made by automobile. For example, work person trips for the lowest income group (\$0 to \$25,000) is estimated to be 205,088 per day. The on-board survey revealed 26,075 low-income patrons used transit each day to get to work. This leaves 179,012 low-income persons who travel by automobile in the modeled trip universe.

The household survey suggests that 78% of the low-income workers, who drive, do so alone (i.e., single-occupancy vehicles or SOV), while another 22% carpool (i.e., high-occupancy vehicles or HOV). Applying these percentages to the estimate for low-income person trips made by automobile (179,012), yields the expected number of low-income persons who will travel to work in the SOV and HOV modal groups. In this example, 140,093 are expected in the SOV category and another 38,919 are expected in the HOV category. The next chart shows trip estimates as they are output from the mode choice model. Results are cross-tabulated by income and modal group. The modal groups include:

- Auto 1 or SOV, drive alone,
- SR2 or HOV, 2 persons per vehicle,
- SR3+ or HOV, 3 or more persons per vehicle,
- WK-TRN or Walk-to-Transit, and
- DR-TRN or Drive-to-Transit.

The bottom two charts tabulate model differences from the targeted person trips.

Similar strategies and computations were used to derive person trip targets for the other trip purposes. After adjusting the income constants until results were similar to the targeted values, the transit assignments were run and boarding estimates were reviewed.

**Table 5-1: Home-Based Work
Validation Targets and Model Results**

HB Work Person Trip Targets

Modal Estimates	Person Trip Estimates by Income Group				Total
	\$0 - \$25k	\$25k - \$45k	\$45k - \$75k	over \$75k	
Total Person Trip Forecast ¹	205,087	453,968	710,593	821,454	2,191,102
Transit Walk-to-Locals Targets ²	21,986	8,416	3,391	1,102	34,894
Transit Walk-to-Premium Targets ²	1,960	1,751	1,931	930	6,571
Transit Drive-to-Premium Targets ²	2,130	2,553	2,552	1,213	8,447
Total Transit Linked Trips	26,075	12,720	7,873	3,244	49,911
Total Person Trips by Auto ³	179,012	441,248	702,720	818,210	2,141,191
% SOV ⁴	78%	87%	89%	93%	
% HOV ⁴	22%	13%	11%	7%	
Target SOV Trips	140,093	384,992	628,935	759,323	1,913,343
Target HOV Trips	38,919	56,256	73,786	58,887	227,848

Notes:

1. Long Range Transportation Plan base year 2005 forecast.
2. Derived from 2002 on-board survey.
3. Subtraction: total person trips minus transit linked trips.
4. Derived from 2002 household survey.

Trip Estimates from the Mode Choice Model

	INC 1	INC 2	INC 3	INC 4	TOTAL
AUTO 1	139,688	395,461	625,545	759,357	1,920,051
SR2	25,487	27,557	52,370	38,543	143,957
SR3+	14,753	16,080	25,134	19,410	75,377
WK-LOC	21,542	9,836	3,437	997	35,812
WK-PRM	2,053	2,195	1,491	1,161	6,900
DR-TRN	1,565	2,839	2,616	1,987	9,007
TOTAL	205,088	453,968	710,593	821,455	2,191,104
TRIPS BY NEST					
OVERALL	205,088	453,968	710,593	821,455	2,191,104
AUTO NEST	179,928	439,098	703,049	817,310	2,139,385
TRANSIT NEST	25,160	14,870	7,544	4,145	51,719
TOTAL	205,088	453,968	710,593	821,455	2,191,104

Model Difference from Person Trip Targets

Transit Walk-to-Locals	444	-1,420	-46	105	-918
Transit Walk-to-Premium	-94	-444	440	-232	-330
Transit Drive-to-Premium	565	-286	-65	-775	-561
SOV Trips (Auto 1)	-405	10,469	-3,390	34	6,708
HOV Trips (SR2+SR3)	1,321	-12,619	3,718	-934	-8,514

Model Difference from Person Trip Targets as %

Transit Walk-to-Locals	2.0%	-16.9%	-1.4%	9.5%	-2.6%
Transit Walk-to-Premium	-4.8%	-25.4%	22.8%	-24.9%	-5.0%
Transit Drive-to-Premium	26.5%	-11.2%	-2.5%	-63.9%	-6.6%
SOV Trips (Auto 1)	-0.3%	2.7%	-0.5%	0.0%	0.4%
HOV Trips (SR2+SR3)	3.4%	-22.4%	5.0%	-1.6%	-3.7%

**Table 5-2: Home-Based Non-Work
Validation Targets and Model Results**

HB Non-Work Person Trip Targets

Modal Estimates	Person Trip Estimates by Income Group				Total
	\$0 - \$25k	\$25k - \$45k	\$45k - \$75k	over \$75k	
Total Person Trip Forecast ¹	348,518	513,693	809,579	1,115,850	2,787,640
Transit Walk-to-Locals Targets ²	31,414	4,583	1,538	821	38,356
Transit Walk-to-Premium Targets ²	2,570	831	632	590	4,622
Transit Drive-to-Premium Targets ²	1,170	705	752	505	3,132
Total Transit Linked Trips	35,153	6,119	2,921	1,916	46,109
Total Person Trips by Auto ³	313,365	507,574	806,658	1,113,934	2,741,531
% SOV ⁴	78%	87%	89%	93%	
% HOV ⁴	22%	13%	11%	7%	
Target SOV Trips	245,236	442,861	721,959	1,033,764	2,443,820
Target HOV Trips	68,129	64,712	84,699	80,170	297,711

Notes:

1. Long Range Transportation Plan base year 2005 forecast.
2. Derived from 2002 on-board survey.
3. Subtraction: total person trips minus transit linked trips.
4. Derived from 2002 household survey.

Trip Estimates from the Mode Choice Model

	INC 1	INC 2	INC 3	INC 4	TOTAL
AUTO 1	126,150	228,606	347,784	453,426	1,155,966
SR2	98,106	147,092	224,539	356,636	826,373
SR3+	91,720	131,786	234,367	303,770	761,643
WK-LOC	29,182	4,450	1,535	935	36,102
WK-PRM	2,447	999	661	578	4,685
DR-TRN	913	760	693	504	2,870
TOTAL	348,518	513,693	809,579	1,115,849	2,787,639
TRIPS BY NEST					
OVERALL	348,518	513,693	809,579	1,115,849	2,787,639
AUTO NEST	315,976	507,484	806,690	1,113,832	2,743,982
TRANSIT NEST	32,542	6,209	2,889	2,017	43,657
TOTAL	348,518	513,693	809,579	1,115,849	2,787,639

Model Difference from Person Trip Targets

Transit Walk-to-Locals	2,232	133	3	-114	2,254
Transit Walk-to-Premium	123	-169	-30	12	-64
Transit Drive-to-Premium	257	-55	59	1	262
SOV Trips (Auto 1)	-119,086	-214,255	-374,175	-580,338	-1,287,854
HOV Trips (SR2+SR3)	121,697	214,166	374,207	580,236	1,290,305

Model Difference from Person Trip Targets as %

Transit Walk-to-Locals	7.1%	2.9%	0.2%	-13.9%	5.9%
Transit Walk-to-Premium	4.8%	-20.3%	-4.7%	2.0%	-1.4%
Transit Drive-to-Premium	22.0%	-7.7%	7.8%	0.2%	8.4%
SOV Trips (Auto 1)	-48.6%	-48.4%	-51.8%	-56.1%	-52.7%
HOV Trips (SR2+SR3)	178.6%	331.0%	441.8%	723.8%	433.4%

**Table 5-3: Non-Home Based
Validation Targets and Model Results**

NHB

Modal Estimates	Person Trip Estimates
Total Person Trip Forecast ¹	1,775,233
Transit Walk-to-Locals Targets ²	18,919
Transit Walk-to-Premium Targets ²	3,146
Transit Drive-to-Premium Targets ²	1,694
Total Transit Linked Trips	23,759
Total Person Trips by Auto ³	1,751,474
% SOV ⁴	56%
% HOV ⁴	44%
Target SOV Trips	975,537
Target HOV Trips	775,937

Notes:

1. Long Range Transportation Plan base year 2005 forecast.
2. Derived from 2002 on-board survey.
3. Subtraction: total person trips minus transit linked trips.
4. Derived from 2002 household survey.

Trip Estimates from the Mode Choice Model

	Person Trips
AUTO 1	947,381
SR2	473,872
SR3+	290,445
WK-LOC	18,625
WK-PRM	3,254
DR-TRN	1,733
TOTAL	1,733,077
TRIPS BY NEST	
OVERALL	1,733,077
AUTO NEST	764,317
TRANSIT NEST	23,612
TOTAL	1,733,077

Model Difference from Person Trip Targets

Transit Walk-to-Locals	-294
Transit Walk-to-Premium	108
Transit Drive-to-Premium	39
SOV Trips (Auto 1)	-28,156
HOV Trips (SR2+SR3)	-11,620

Model Difference from Person Trip Targets as %

Transit Walk-to-Locals	-1.6%
Transit Walk-to-Premium	3.4%
Transit Drive-to-Premium	2.3%
SOV Trips (Auto 1)	-2.9%
HOV Trips (SR2+SR3)	-1.5%

6. Boarding Estimates for the Base Year 2005

Boarding summaries appear in Tables 6-1 along with comparisons to a variety of sources. Nearly all of the model error stems from boardings for Missouri local buses, which are overstated by 29,070 per day.

Table 6-2 summarizes the model's estimate of daily boarding at MetroLink Stations. It should be noted that results are presented in an origin-destination form as opposed to the production-attraction form in which the trips are assigned. Station-level accuracy is always problematic and a summary of aggregate segments is also provided. Boardings estimates at Missouri Stations and in the downtown appear within a reasonable range. Illinois Stations are deficient by 27% when compared to September 2001 data.

Table 6-3 summarizes MetroLink boardings by work and non-work trip purposes and by two modes-of-access, walk/bus transfer and drive access. Comparative statistics are summarized in a secondary Table at the bottom of the page. Work and non-work splits appear reasonable when compared to the On-Board survey.

Results appear far off the mark in the comparison by access mode. The survey suggests that roughly 26% of all MetroLink boardings stem from drive access or approximately 9,000 person trips per day. The model estimate is 5,774 (15%) and is about 10% shy of an exact validation. It also merits some mention that Kiss-Ride (i.e., drop-off or pick-up) person trips are not modeled explicitly. Results for this mode-of-access/egress are implied in the targeting of system-wide modal shares. Thus, the Kiss-Ride estimate is in the results of Drive Access to Park-Ride locations and in the walk access estimates for both bus and rail.

Table 6-1: 2005 Model Boarding Estimates and Reported Boardings

MODEL ESTIMATES

General Service Area	Work		Non-Work		Daily Summation	
	Daily Boardings	Passenger Miles	Daily Boardings	Passenger Miles	Total Boardings	Passenger Miles
Madison County	3,535	37,845	3,447	11,803	6,982	49,648
St. Clair County	2,642	9,644	4,454	13,213	7,096	22,857
Missouri-Locals	56,619	199,580	63,030	192,558	119,649	392,138
Missouri-Express	4,204	47,340	-	-	4,204	47,340
MetroLink	20,128	136,075	18,364	95,494	38,492	231,569
Totals	87,128	430,484	89,295	313,068	176,423	743,552

COMPARISON Model vs. Reported Boardings

General Service Area	Model Daily Boardings	Reported Daily Boardings ¹	Model Error	
			Boardings	%
Madison County	6,982	6,407	575	9.0%
St. Clair County	7,096	8,709	(1,613)	-18.5%
Missouri-Locals	119,649	90,579	29,070	32.1%
Missouri-Express	4,204	2,343	1,861	79.4%
MetroLink	38,492	40,833	(2,341)	-5.7%
Totals	176,423	148,871	27,552	18.5%

1) Sources:

Reported daily boardings for Madison County were obtained from the 2002 On-Board Survey. All other reported boardings are year 2004 and were provided by Metro.

**Table 6-2: Daily MetroLink Boardings
(Model 2005 Estimate vs. Reported)**

MetroLink Station	Model Estimate ²	Reported ¹			Segment Comparison Missouri-Downtown-Illinois	
		Sept 2001	Spring 2004			
Lambert Main Terminal	1,263	2,596	2,089	Missouri Stations	Model	19,654
Lambert East Terminal	140	493	409		Sept. 2001	17,851
North Hanley Station	1,626	1,877	2,658		Model Difference	1,803
UMSL North Station	804	556	943		%	10.1%
UMSL South Station	880	1,317	1,265			
Rock Road Station	1,697	1,515	1,543		Spring 2004	19,384
Wellston Station	1,582	1,024	1,185		Model Difference	270
Delmar Station	2,284	2,101	2,226		%	1.4%
Forest Park Station	1,812	1,846	1,443			
Central West End Station	4,609	2,234	3,128			
Grand Station	2,959	2,292	2,496			
Union Station	2,088	2,240	2,030	Downtown Stations	Model	11,021
Civic Center Station	1,197	957	1,230		Sept. 2001	10,294
Stadium MetroLink Station	2,257	1,411	1,905		Model Difference	727
8th & Pine Station	1,841	1,542	2,443		%	7.1%
Convention Center Station	2,415	2,565	2,157		Spring 2004	10,729
Arch Laclède's Landing	1,224	1,579	963		Model Difference	292
				%	2.7%	
East Riverfront Station	657	1,745	1,138	Illinois Stations	Model	7,655
5th & Missouri Station	2,031	2,867	1,922		Sept. 2001	10,553
Emerson Park Station	647	491	958		Model Difference	-2,898
J J K Center Station	556	899	1,084		%	-27.5%
Washington Park Station	607	571	647			
Fairview Heights Station	1,070	965	1,397		Spring 2004	9,831
Memorial Hospital Station	284	326	544		Model Difference	-2,176
Swansea Station	794	510	677		%	-22.1%
Belleville Station	497	791	679			
College Station	515	1,388	784			
Scott/Shiloh Station	162		889			
Totals	38,492	38,698	40,833			

Notes:

- 1) Reported boardings provided by Metro.
- 2) Assignment results have been converted to origins and destinations.

Table 6-3: Daily Modes of Access or Egress for MetroLink Stations

MetroLink Station	Work Boardings		Non-Work Boardings		Daily Boardings	
	Walk or Bus Transfer	Drive	Walk or Bus Transfer	Drive	Walk or Bus Transfer	Drive
Lambert Main Terminal	489		774		1,263	
Lambert East Terminal	54		86		140	
North Hanley Station	249	673	297	407	546	1,080
UMSL North Station	398	-	406	-	804	-
UMSL South Station	171	311	280	120	450	430
Rock Road Station	841	38	809	9	1,650	47
Wellston Station	671	182	670	59	1,341	241
Delmar Station	1,164	70	1,013	38	2,176	108
Forest Park Station	987	151	499	177	1,485	327
Central West End Station	2,626		1,983		4,609	
Grand Station	1,693		1,267		2,959	
Union Station	872		1,216		2,088	
Civic Center Station	616		581		1,197	
Stadium MetroLink Station	1,113		1,144		2,257	
8th & Pine Station	1,002		839		1,841	
Convention Center Station	1,343		1,073		2,415	
Arch Laclède's Landing	438		786		1,224	
East Riverfront Station	88	95	217	258	304	353
5th & Missouri Station	636	263	811	322	1,446	585
Emerson Park Station	135	139	240	133	375	272
J J K Center Station	215		341		556	
Washington Park Station	142	153	203	110	345	263
Fairview Heights Station	172	539	98	261	270	800
Memorial Hospital Station	33	165	16	71	49	235
Swansea Station	165	341	144	145	309	486
Belleville Station	270	24	189	15	459	39
College Station	43	290	39	143	82	433
Scott/Shiloh Station	35	43	48	37	82	80
Totals	16,656	3,473	16,063	2,301	32,718	5,774
	20,128		18,364		38,492	

Comparative Statistics

Statistic	Model	On-Board Survey
% Work	52.3%	50.0%
% Non-Work	47.7%	50.0%
Walk or Transfer	85.0%	57.3%
Drive & Carpool	15.0%	25.7%
KnR (drop-off/pickup)	<i>implied</i>	17.0%

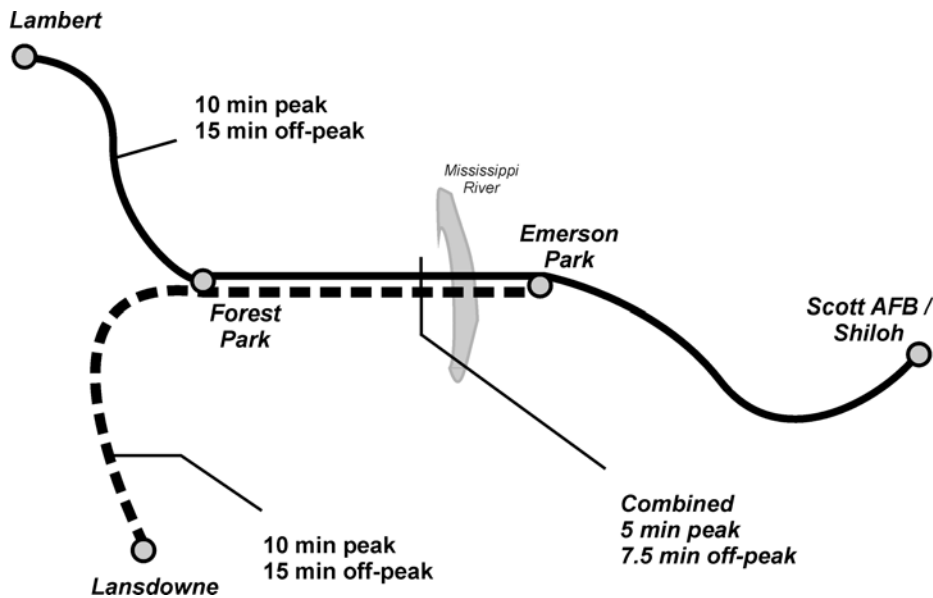
Note: Assignment results have been converted to origins and destinations.

7. 2025 No Build Forecast

In addition to EWGCOG's highway improvement program (i.e., TIP projects), the 2025 No Build forecast assumes Segment 1 of the Cross-County MetroLink extension (already under construction) and a supporting feeder bus plan. The operating plan assumes two lines running at 10 and 15-minute headways during peak and off-peak periods respectively (Figure 7-1).

It merits some mention that the Base Year 2005 assumed a 7.5-minute peak and a 10-minute off peak service, from Lambert Station to Belleville Station. Therefore, two rail segments of MetroLink have a service decrease in the 2025 forecast. The segments are between Lambert and Forest Park, as well as between Emerson Park and Bellville. Although not shown below, the Belleville Station precedes the Scott AFB/Shiloh Station.

Figure 7-1: 2025 No Build Operating Plan Schematic



Year 2025 results from the mode choice model are compared with the base year 2005 results in Tables 7-1 and 7-3. Transit trips are lost in the home-based purposes and manifest in walk access. Drive access trips to transit show increases. The NHB trip purpose shows increases in both walk and drive access.

**Table 7-1: Comparative Results from the Mode Choice Model
(HB Work Person Trips, Year 2005 vs. Year 2025)**

Year 2005

Mode Choices	INCOME GROUPS				TOTAL
	\$0 - \$25k	\$25k - \$45k	\$45k - \$75k	over \$75k	
AUTO 1	139,688	395,461	625,545	759,357	1,920,051
SR2	25,487	27,557	52,370	38,543	143,957
SR3+	14,753	16,080	25,134	19,410	75,377
WK-LOC	21,542	9,836	3,437	997	35,812
WK-PRM	2,053	2,195	1,491	1,161	6,900
DR-TRN	1,565	2,839	2,616	1,987	9,007
TOTAL	205,088	453,968	710,593	821,455	2,191,104

Year 2025

Mode Choices	INCOME GROUPS				TOTAL
	\$0 - \$25k	\$25k - \$45k	\$45k - \$75k	over \$75k	
AUTO 1	149,234	411,521	654,067	832,102	2,046,924
SR2	27,327	28,917	55,144	42,336	153,724
SR3+	15,869	16,972	26,627	21,383	80,851
WK-LOC	21,983	9,510	3,259	960	35,712
WK-PRM	2,776	2,927	2,084	2,132	9,919
DR-TRN	2,721	4,630	4,319	4,189	15,859
TOTAL	219,910	474,477	745,500	903,102	2,342,989

Net Change in Person Trips

Mode Choices	INCOME GROUPS				TOTAL
	\$0 - \$25k	\$25k - \$45k	\$45k - \$75k	over \$75k	
AUTO 1	9,546	16,060	28,522	72,745	126,873
SR2	1,840	1,360	2,774	3,793	9,767
SR3+	1,116	892	1,493	1,973	5,474
WK-LOC	441	-326	-178	-37	-100
WK-PRM	723	732	593	971	3,019
DR-TRN	1,156	1,791	1,703	2,202	6,852
TOTAL	14,822	20,509	34,907	81,647	151,885

**Table 7-2: Comparative Results from the Mode Choice Model
(HB Non-Work Person Trips Year 2005 vs. Year 2025)**

Year 2005

Mode Choices	INCOME GROUPS				TOTAL
	\$0 - \$25k	\$25k - \$45k	\$45k - \$75k	over \$75k	
AUTO 1	126,150	228,606	347,784	453,426	1,155,966
SR2	98,106	147,092	224,539	356,636	826,373
SR3+	91,720	131,786	234,367	303,770	761,643
WK-LOC	29,182	4,450	1,535	935	36,102
WK-PRM	2,447	999	661	578	4,685
DR-TRN	913	760	693	504	2,870
TOTAL	348,518	513,693	809,579	1,115,849	2,787,639

Year 2025

Mode Choices	INCOME GROUPS				TOTAL
	\$0 - \$25k	\$25k - \$45k	\$45k - \$75k	over \$75k	
AUTO 1	169,409	296,480	453,558	598,050	1,517,497
SR2	133,816	195,330	301,613	482,074	1,112,833
SR3+	126,877	178,570	322,285	418,342	1,046,074
WK-LOC	31,505	4,366	1,433	872	38,176
WK-PRM	3,925	1,585	1,077	1,173	7,760
DR-TRN	3,458	2,640	2,387	2,002	10,487
TOTAL	468,990	678,971	1,082,353	1,502,513	3,732,827

Net Change in Person Trips

Mode Choices	INCOME GROUPS				TOTAL
	\$0 - \$25k	\$25k - \$45k	\$45k - \$75k	over \$75k	
AUTO 1	43,259	67,874	105,774	144,624	361,531
SR2	35,710	48,238	77,074	125,438	286,460
SR3+	35,157	46,784	87,918	114,572	284,431
WK-LOC	2,323	-84	-102	-63	2,074
WK-PRM	1,478	586	416	595	3,075
DR-TRN	2,545	1,880	1,694	1,498	7,617
TOTAL	120,472	165,278	272,774	386,664	945,188

HB Non-Work combines both HB Shop and HB Other.

**Table 7-3: Comparative Results from the Mode Choice Model
(Non-Home Based Person Trips Year 2005 vs. Year 2025)**

NHB

Mode Choices	Base Year 2005	No Build Year 2025	Change in Person Trips
AUTO 1	947,381	1,335,805	388,424
SR2	473,872	631,180	157,308
SR3+	290,445	422,519	132,074
WK-LOC	18,625	20,967	2,342
WK-PRM	3,254	6,050	2,796
DR-TRN	1,733	7,236	5,503
TOTAL	1,735,310	2,423,757	688,447

Boarding estimates for the Year 2025 No Build are compared to the base year in Table 7-4. Bus boardings decline for Missouri, St. Clair and Madison County, while increases are shown for MetroLink. Boarding estimates at MetroLink Stations appear comparatively in Tables 7-5 through 7-7. As noted, results have been organized into an origin-destination form, as opposed to the production-attraction form used in the assignment process.

**Table 7-4: Comparative Boarding Results from Transit Assignment
(Year 2005 vs. Year 2025)**

Year 2005 Base

General Service Area	Work		Non-Work		Daily Summation	
	Daily Boardings	Passenger Miles	Daily Boardings	Passenger Miles	Total Boardings	Passenger Miles
Madison County	3,535	37,845	3,447	11,803	6,982	49,648
St. Clair County	2,642	9,644	4,454	13,213	7,096	22,857
Missouri-Locals	56,619	199,580	63,030	192,558	119,649	392,138
Missouri-Express	4,204	47,340	-	-	4,204	47,340
MetroLink	20,128	136,075	18,364	95,494	38,492	231,569
Totals	87,128	430,484	89,295	313,068	176,423	743,552

Year 2025 No Build

General Service Area	Work		Non-Work		Daily Summation	
	Daily Boardings	Passenger Miles	Daily Boardings	Passenger Miles	Total Boardings	Passenger Miles
Madison County	2,144	16,549	3,194	11,919	5,338	28,468
St. Clair County	2,505	8,034	4,639	13,842	7,144	21,876
Missouri-Locals	57,992	178,405	66,994	184,278	124,986	362,683
Missouri-Express	5,031	70,274			5,031	70,274
MetroLink	37,024	236,762	46,054	253,580	83,078	490,342
Totals	104,696	510,024	120,881	463,619	225,577	973,643

Net Change in Volume

General Service Area	Work		Non-Work		Daily Summation	
	Daily Boardings	Passenger Miles	Daily Boardings	Passenger Miles	Total Boardings	Passenger Miles
Madison County	-1,391	-21,296	-253	116	-1,644	-21,180
St. Clair County	-137	-1,610	185	629	48	-981
Missouri-Locals	1,373	-21,175	3,964	-8,280	5,337	-29,455
Missouri-Express	827	22,934			827	22,934
MetroLink	16,896	100,687	27,690	158,086	44,586	258,773
Totals	17,568	79,540	31,586	150,551	49,154	230,091

% Change from Base

General Service Area	Work		Non-Work		Daily Summation	
	Daily Boardings	Passenger Miles	Daily Boardings	Passenger Miles	Total Boardings	Passenger Miles
Madison County	-39%	-56%	-7%	1%	-24%	-43%
St. Clair County	-5%	-17%	4%	5%	1%	-4%
Missouri-Locals	2%	-11%	6%	-4%	4%	-8%
Missouri-Express	20%	48%			20%	48%
MetroLink	84%	74%	151%	166%	116%	112%
Totals	20%	18%	35%	48%	28%	31%

**Table 7-5: Comparative Boarding Results for MetroLink Stations
(Year 2005 vs. Year 2025)**

MetroLink Station	Base Year 2005	No Build Year 2025	Change from Base	
			Boardings	%
Lambert Main Terminal	1,263	1,558	295	23%
Lambert East Terminal	140	173	32	23%
North Hanley	1,626	2,309	684	42%
UMSL North	804	871	67	8%
UMSL South	880	1,405	525	60%
Rock Road	1,697	1,896	199	12%
Wellston	1,582	2,274	692	44%
Delmar	2,284	1,949	-335	-15%
Forest Park	1,812	8,404	6,592	364%
Central West End	4,609	8,665	4,057	88%
Grand	2,959	4,567	1,608	54%
Union	2,088	3,657	1,569	75%
Civic Center	1,197	2,169	972	81%
Stadium MetroLink	2,257	3,157	900	40%
8th & Pine	1,841	3,710	1,869	101%
Convention Center	2,415	3,919	1,504	62%
Arch Laclede's Landing	1,224	1,800	576	47%
East Riverfront	657	888	232	35%
5th & Missouri	2,031	2,626	595	29%
Emerson Park	647	2,074	1,427	221%
J J K Center	556	515	-41	-7%
Washington Park	607	902	295	49%
Fairview Heights	1,070	1,527	457	43%
Memorial Hospital	284	446	163	57%
Swansea	794	1,045	251	32%
Belleville	497	579	82	16%
College	515	906	392	76%
Scott AFB/Shiloh	162	211	49	100%
Totals	38,492	64,193	25,702	67%

Cross-County Segment I Station	No Build Year 2025
Skinker	1,880
University City	1,001
Forsyth	902
Clayton	5,424
Richmond Heights	1,041
Brentwood / I-64	3,319
Maplewood	788
Sunnen	1,091
Shrewsbury	3,454
Total	18,897

Note: Assignment results have been converted to origins and destinations.

**Table 7-6: Comparative Mode-of-Access/Egress Results for MetroLink Stations
(Year 2005vs. Year 2025)**

MetroLink Station	Work Boardings		Non-Work Boardings		Daily Boardings		Base Year 2005 Daily Boardings		Change from Base Year 2005	
	Walk or Bus Transfer	Drive	Walk or Bus Transfer	Drive	Walk or Bus Transfer	Drive	Walk or Bus Transfer	Drive	Walk or Bus Transfer	Drive
Lambert Main Terminal	535		1,023		1,558		1,263		295	
Lambert East Terminal	59		114		173		140		32	
North Hanley Station	265	906	313	825	578	1,731	546	1,080	32	652
UMSL North Station	400	-	471	-	871	-	804		67	
UMSL South Station	172	510	307	416	479	926	450	430	29	496
Rock Road Station	909	57	884	46	1,793	103	1,650	47	143	56
Wellston Station	733	346	811	384	1,544	730	1,341	241	203	489
Delmar Station	810	177	779	183	1,589	360	2,176	108	-587	253
Forest Park Station	3,106	1,002	2,818	1,478	5,924	2,480	1,485	327	4,439	2,153
Central West End Station	4,039		4,626		8,665		4,609		4,057	
Grand Station	2,306		2,261		4,567		2,959		1,608	
Union Station	1,135		2,522		3,657		2,088		1,569	
Civic Center Station	894		1,275		2,169		1,197		972	
Stadium MetroLink Station	1,184		1,973		3,157		2,257		900	
8th & Pine Station	1,787		1,923		3,710		1,841		1,869	
Convention Center Station	1,748		2,171		3,919		2,415		1,504	
Arch Laclède's Landing	506		1,294		1,800		1,224		576	
East Riverfront Station	5	157	148	578	153	735	304	353	-151	383
5th & Missouri Station	405	358	1,031	832	1,436	1,190	1,446	585	-11	606
Emerson Park Station	430	483	562	599	992	1,082	375	272	617	811
J J K Center Station	140		375		515		556		-41	
Washington Park Station	84	248	279	291	363	539	345	263	18	277
Fairview Heights Station	140	628	147	612	287	1,240	270	800	17	440
Memorial Hospital Station	69	148	60	169	129	317	49	235	81	82
Swansea Station	162	323	188	373	350	696	309	486	41	210
Belleville Station	250	40	243	47	493	87	459	39	34	48
College Station	51	396	58	402	109	798	82	433	27	365
Scott AFB/Shiloh Station	39	53	44	75	83	128	82	80	1	48
Totals	22,363	5,831	28,691	7,309	51,054	13,139	32,718	5,774	18,336	7,366
	28,194		36,000		64,193		38,492		25,702	

Note: Assignment results have been converted to origins and destinations.

Table 7-7: Modes-of-Access/Egress for Segment I, Cross-County MetroLink Expansion (Year 2025)

Cross-County Segment I Station	Work		Non-Work		Daily Totals	
	Walk or Transfer	Drive	Walk or Transfer	Drive	Walk or Transfer	Drive
Skinker	816		1,064		1,890	
University City	425		576		997	
Forsyth	393		509		906	
Clayton	2,574		2,850		5,407	
Richmond Heights	420		621		1,036	
Brentwood / I-64	661	907	449	1,302	1,109	2,211
Maplewood	376		412		784	
Sunnen	599		492		1,076	
Shrewsbury	817	857	703	1,077	1,498	1,888
Totals	7,080	1,764	7,673	2,379	14,753	4,143
	8,844		10,052		18,896	

Note: Assignment results have been converted to origins and destinations.

8. 2025 Forecasting Results for the Build Alternatives

Travel demand forecasts were prepared for six build alternatives including:

- TSM
- Purple
- Blue (Kenrick Station end-of-line)
- Blue (Butler Hill Station end-of-line)
- Orange (Butler Hill Station end-of-line)
- Orange (Reavis Barracks Station end-of-line)

Systemwide linked trips are summarized for each of the build alternatives in Table 8-1. The Blue Alternative (Butler Hill end-of-line) yields the highest ridership result with 170,351 daily person trips, a net increase of 7,823 person trips (+4.8%) over the TSM. The Orange Alternative (Butler Hill end-of-line) yields roughly the same amount.

Table 8-1: Systemwide Linked Person Trips

Systemwide Linked Trips				
Build Alternatives	HB Work	HB Non-Work	Non-HB	Total
No Build	61,490	56,425	34,255	152,170
TSM	61,852	56,634	34,477	152,963
<i>Change from No Build</i>	362	209	222	793
Purple	61,845	56,535	34,416	152,796
<i>Change from TSM</i>	-7	-99	-61	-167
Blue ¹ (Kenrick)	61,845	56,535	34,416	152,796
<i>Change from TSM</i>	-7	-99	-61	-167
Blue (Butler Hill)	65,522	59,373	35,323	160,218
<i>Change from TSM</i>	3,670	2,739	846	7,255
Orange	65,150	59,613	35,499	160,262
<i>Change from TSM</i>	3,298	2,979	1,022	7,299
Orange (Reavis Barracks)	64,571	58,757	35,140	158,468
<i>Change from TSM</i>	2,719	2,123	663	5,505

1)LRT running times for the Blue Alignment to Kenrick Station is within 30 seconds of the Purple Alignment. Hence, it was not modeled and the reported results are taken from the Purple Alternative.

A summary of the systemwide daily boardings appears below in Table 8-2. All of the alternatives show a slight decline in bus boardings as compared to the TSM due to various changes in the service plan. MetroLink boardings increase across all of the alternatives, with the Blue and Orange Alternatives (Butler Hill end-of-line) having roughly the same result.

Table 8-2: Systemwide Daily Boardings

Daily Boardings

	Bus Service		MetroLink Lines					
			MetroLink Totals	Existing	Cross-County Seg. I	Metro South Build Alternatives		
	Illinois	Missouri		Lambert to Scott/Shiloh	Shrewsbury to Emerson Park	Kenrick to Emerson Park	Butler Hill to Emerson Park	Reavis-Barracks to Emerson Park
Year 2005 Base	14,078	123,853	38,492	38,492				
No Build	12,482	130,017	83,078	42,485	40,593			
TSM	12,441	132,266	82,965	42,471	40,494			
<i>Change from No Build</i>	-41	2,249	-113	-14	-99			
Purple	12,493	132,017	83,210	42,394		40,816		
<i>Change from TSM</i>	52	-249	245	-77		322		
Blue ¹ (Kenrick)	12,493	132,017	83,210	42,394		40,816		
<i>Change from TSM</i>	52	-249	245	-77		322		
Blue (Butler Hill)	12,505	131,101	92,666	43,121			49,545	
<i>Change from TSM</i>	64	-1,165	9,701	650			8,952	
Orange	12,499	131,877	92,038	42,984			49,054	
<i>Change from TSM</i>	58	-389	9,073	513			8,461	
Orange (Reavis Barracks)	12,447	131,562	90,146	43,020				47,126
<i>Change from TSM</i>	6	-704	7,181	549				6,533

1) LRT running times for the Blue Alignment to Kenrick Station is within 30 seconds of the Purple Alignment. Hence, it was not modeled and the reported results are taken from the Purple Alternative.

User benefits were estimated using FTA’s SUMMIT evaluation software. Results appear below in Table 8-3. Results reflect the number of user benefits hours gained (i.e., benefit) or lost (i.e., disbenefit) when compared to the TSM Alternative. The Blue Alternative had a net gain of 8,536 hours over the TSM overall, with 4,897 netted from work travel, 2,794 stemming from HB non-work travel and 846 hours from non-home based travel. Results for the Orange Alternative with a Butler Hill end-of-line netted an overall gain of 7,984 hours.

**Table 8-3: Systemwide User Benefit Estimates
(Hours Gained or Lost versus the TSM)**

Build Alternatives	Net Total	HB Work			HB Non-Work			Non-Home Based		
		Gained	Lost	Net	Gained	Lost	Net	Gained	Lost	Net
Purple	-131	6	-12	-6	4	-83	-80	2	-47	-45
Blue ¹ (Kenrick)	-131	6	-12	-6	4	-83	-80	2	-47	-45
Blue (Butler Hill)	8,536	4,922	-26	4,897	2,911	-118	2,794	913	-68	846
Orange	7,984	4,169	-10	4,160	2,935	-56	2,879	981	-35	946
Orange (Reavis Barracks)	6,017	2,121	-82	2,039	3,377	-16	3,361	664	-47	616

1)LRT running times for the Blue Alignment to Kenrick Station is within 30 seconds of the Purple Alignment. Hence, it was not modeled and the reported results are taken from the Purple Alternative.

Daily passenger miles largely typify the results shown previously. Just as boardings for buses showed a decline, so do the passenger miles. MetroLink boardings increase for all alternatives when compared to the TSM. Interestingly, the Orange Alternative having Butler Hill as the end-of-line yields the highest MetroLink passenger miles despite having a lower number of rail boardings.

Table 8-4: Daily Passenger Miles

Daily Passenger Miles

	Bus Service		MetroLink Lines					
			MetroLink Totals	Existing	Cross-County Seg. I	Metro South Build Alternatives		
	Illinois	Missouri		Lambert to Scott/Shiloh	Shrewsbury to Emerson Park	Kenrick to Emerson Park	Butler Hill to Emerson Park	Reavis-Barracks to Emerson Park
Year 2005 Base	72,505	439,478		231,569				
No Build	50,344	432,957	490,342	282,100	208,242			
TSM	50,506	434,369	489,876	282,147	207,729			
<i>Change from No Build</i>	162	1,412	-466	47	-513			
Purple	50,623	430,973	492,781	282,150		210,631		
<i>Change from TSM</i>	117	-3,396	2,905	3		2,902		
Blue ¹ (Kenrick)	50,623	430,973	492,781	282,150		210,631		
<i>Change from TSM</i>	117	-3,396	2,905	3		2,902		
Blue (Butler Hill)	50,689	422,752	645,551	286,283			359,268	
<i>Change from TSM</i>	183	-11,617	155,675	4,136			151,539	
Orange	50,660	428,500	651,554	285,996			365,558	
<i>Change from TSM</i>	154	-5,869	161,678	3,849			157,829	
Orange (Reavis Barracks)	50,567	425,181	605,660	286,571				319,089
<i>Change from TSM</i>	61	-9,188	115,784	4,424				111,360

1) LRT running times for the Blue Alignment to Kenrick Station is within 30 seconds of the Purple Alignment. Hence, it was not modeled and the reported results are taken from the Purple Alternative.

An estimate of daily parking demand at park-ride stations is shown below on Table 8-5. The assumptions noted below the Table stem from data extracted from the on-board surveys and information provided by Metro.

Table 8-5: Estimated Daily Parking Demand

Build Alternatives		Park-Ride Stations			
		Kenrick	Gravois	Reavis Barracks	Butler Hill
Purple	Work	23			
	Non-Work	14			
	Parking Spaces	20			
Blue	Work	189	189		1,758
	Non-Work	59	59		1,507
	Parking Spaces	150	150		1,690
Orange	Work			178	1,529
	Non-Work			184	1,340
	Parking Spaces			180	1,480
Orange (Reavis Barracks)	Work			1,588	
	Non-Work			1,219	
	Parking Spaces			1,480	

Assumptions:

Auto Occupancy	Work	1.05
	Non-Work	2.25
	% Kiss-Ride	10%
	Turnover	20%

Table 8-6: Highway Assignment Results

Scenarios	Congested		
	Vehicle Miles	Vehicle Hours	Average Speed
Year 2005 Base	72,885,584	1,884,601	38.67
No Build	86,566,929	2,284,623	37.89
TSM	86,572,213	2,284,845	37.89
<i>Change from No Build</i>	5,284	223	0.00
Purple	86,587,167	2,285,939	37.88
<i>Change from TSM</i>	14,954	1,094	-0.01
Blue ¹ (Kenrick)	86,587,167	2,285,939	37.88
<i>Change from TSM</i>	14,954	1,094	-0.01
Blue (Butler Hill)	86,507,248	2,283,279	37.89
<i>Change from TSM</i>	-64,965	-1,566	0.00
Orange	86,464,813	2,281,099	37.90
<i>Change from TSM</i>	-107,400	-3,747	-0.02
Orange (Reavis Barracks)	86,532,009	2,283,769	37.89
<i>Change from TSM</i>	-40,204	-1,076	0.00