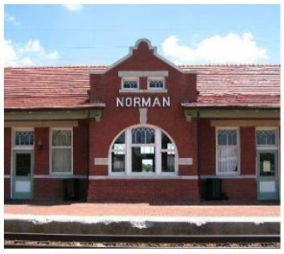
CENTRAL OKgo

CENTRAL OKLAHOMA COMMUTER CORRIDORS STUDY



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APPENDICES

DECEMBER 2015

COMMUTER CORRIDORS STUDY

APPENDICES

DECEMBER 2015

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Appendix A: Transit Ridership Projections

In order to determine the most suitable transit technology and route alignment for each of the three Central Oklahoma commuter corridors, a comparative transit ridership analysis was developed. The Oklahoma City Area Regional Transportation Study (OCARTS) travel demand model (TDM), the current regional model used by the Association of Central Oklahoma Governments (ACOG) Metropolitan Planning Organization (MPO), is a traditional four-step model with a mode choice component and a dynamic feedback loop.

ACOG developed the TDM's 2005 base and 2035 horizon year alternate transportation networks for use in Central Oklahoma. In both networks, the transportation facilities information, such as functional classification, number of lanes, posted speeds, intersection traffic control devices, and transit routes were provided by ACOG staff and updated by the study team to best represent the transportation system conditions in the corresponding years. The 2035 network, also called the 'Encompass 2035' network, contains the transportation improvement information associated with the approved long-range transportation plan for the Central Oklahoma area. ACOG also provided all necessary existing and projected demographic data sets as well as other Geographic Information System (GIS) layers needed for the study.

The TDM was used to assess the anticipated transit ridership results, which assisted in the selection of the locally preferred alternatives (LPAs).

A.1 Methodology

In order for the TDM forecast to be considered reasonable, the model must be able to produce realistic traffic and transit volumes. The methods and procedures used to adjust the model's accuracy are called calibration, whereas the comparison of the TDM's modeled volumes to observed traffic conditions for the base year is termed model validation. Both processes require quality input data in order to ensure the reasonableness of model outcomes and confidence in the forecast volumes.

Once the model was calibrated and validated, as described herein, it was used to perform the travel demand forecasting and analysis of the anticipated transit ridership for each one of the identified alternatives.

A.1.1 No-Build Alternative Regional Bus Network

Alternative transit scenarios are defined by route alignment, stop or station location, frequency of service and service hours, and are influenced by transit fares. All of these characteristics determine the accessibility and attractiveness of the transit service to prospective riders. The project team therefore maintained consistent input data and assumptions at the regional level to enable (1) the evaluation of both the independent benefit and direct comparison of the various alignments and transit technology options within each corridor, as well as (2) the assessment of combined benefits of the three corridors as a package scenario.

In coordination with regional stakeholders and ACOG, the project team developed a No-Build Alternative and coded the associated bus network into the TDM. These regional bus routes were largely based on:

- Cleveland Area Rapid Transit (CART) Long-Range Public Transportation Plan recommendations and feedback received from the Norman Comprehensive Transportation Plan development;
- EMBARK (formerly known as Metro Transit) route updates developed in 2013 by Nelson-Nygaard for Central Oklahoma Transportation and Parking Authority (COTPA);
- City of Edmond's Citylink transit routes; and
- Additional regional transit improvements, such as express bus routes to Yukon and Mustang. (Both of these routes are envisioned to be future routes that would provide express bus service from areas not served by this study to downtown Oklahoma City.)

The project team provided the basic fare structure to be used for the 2035 No-Build and Alternative scenarios, assuming base fare increases consistent with inflation and bus frequency improvements. The express bus fare is capped at 150% of the base fare.

Fares are defined by three categories. Local bus fares are set at $3.00 one-way, express bus fares are $4.50 one-way, and high capacity service (BRT, LRT, commuter rail, and streetcar) fares use a zone-based fare structure. Trips nine miles or less have a fare of $3.00 one-way and trips over nine miles are $5.00 one-way. Key fare policy elements such as reduced fares for seniors and youth and local and regional day/monthly passes will be considered as part of the financial planning task for this project. Year 2035 Fares are based on inflation, and the move to a regional system.

- Local Bus – One-way $3.00 Regular Fare
- Express Bus and Commuter Alternative – One-way $ 4.50 Regular Fare
- Transfer Fares:
  - ✓ Local Bus to Local Bus - $0.00
  - ✓ Local Bus to Express Bus or Commuter Alternative - $1.50
  - ✓ Express Bus or Commuter Alternative to Local Bus - $0.00
  - ✓ Express Bus or Commuter Alternative to Express Bus or Commuter Alternative - $0.00
  - ✓ Transfer between EMBARK, CART, and Citylink routes - $0.00

The subsequent model runs and transit ridership results were based on this regional bus network and utilized the same fare structure to allow a direct comparison of ridership forecasts and mobility benefits against the No-Build Alternative.

A.1.2 Development and Analysis of the Commuter Corridor Alternatives

In close coordination with corridor-specific workgroups and ACOG, the project team developed alignments, stops/stations, and park-and-ride locations, as well as other related transportation system attributes (including hours of operation, transit frequencies, and other network information) necessary to depict three viable build alternatives for each of the commuter corridors and a combined regional commuter rail scenario.

The ten initial alternatives – the Regional Rail Alternative, North Corridor Alternatives N1, N2, and N7, South Corridor Alternatives S1, S2, and S4, and East Corridor Alternatives E1, E5, and E6 – and the resulting transit ridership and mobility benefits are described in detail in Sections A.3 through A.5. Used as a starting point for the associated TDM runs, the project team made only minor feeder bus route modifications to the No-Build Alternative bus network, whereas the operational characteristics and the fare structure remained unchanged.

Using the individual alternatives' results and guidance received from ACOG staff and the Steering Committee, the project team also developed a final alternative consisting of the most widely supported alternative from each of the three corridors.1 To optimize the alternative, additional feeder bus route adjustments and a decrease in transfer fees were included in the analysis, all culminating in the LPAs. These adjustments, a description of the Locally Preferred Alternatives, and the detailed results are documented in Section A.7.

A.1.3 Overview of Ridership Results

This appendix provides a detailed description of the average weekday ridership results, boardings and alightings by station, mobility benefits, and trips by purpose between defined districts. The appendix also provides an overview of the regional transportation system characteristics and the modeling methodology.

Summarizing the results, the table on the following page provides an overview and side-by-side comparison of the following metrics for all alternatives:

- System-wide ridership;
- Route-specific bus ridership;
- Build alternative transit ridership;
- Increase in regional transit ridership; and
- Potential reduction of regional vehicle miles of travel (VMT).

[1] Please note that East Corridor Alternative E1 underwent additional modification, based on ACOG and Steering Committee guidance, to provide improved access to downtown Oklahoma City and Tinker Air Force Base (Alternative E1A).

Table A-1: Side-by-Side Comparison of the Central Oklahoma Commuter Corridors Alternatives

Route	No-Build Ridership	Regional Rail [2]	N1	N2	N7	S1	S2	S4	E1	E5	E6	Final - LPA
CART 12th Ave E	160	156	158	158	162	156	160	155	160	158	162	154
CART 24th Ave W	273	269	273	273	273	268	268	273	272	272	272	270
CART Berry Road	158	159	156	156	157	157	159	155	157	156	156	184
CART Downtown	164	164	165	164	164	164	165	151	164	164	164	257
CART E Norman	383	390	383	383	383	390	390	368	383	383	384	375
CART N10	430	579	430	431	430	580	588	707	431	430	430	691
CART N11	178	314	179	178	175	316	313	201	179	181	178	315
CART N12	235	307	233	233	234	307	309	232	234	233	233	256
CART N20	260	254	259	260	260	254	254	253	260	259	260	360
CART N21	530	503	530	534	529	500	501	528	530	530	530	384
CART N32	276	280	276	276	276	280	281	267	276	275	276	270
CART N40	72	69	72	72	72	69	69	70	72	71	72	67
CART N42	155	145	154	154	155	145	145	146	154	155	156	139
CART N52	302	287	302	302	301	287	288	286	302	302	302	246
CART Porter	349	470	349	349	349	471	475	375	350	349	349	924
CART Robinson	498	491	492	498	492	489	489	635	507	506	506	500
CART Route 24	271	252	267	267	266	254	261	214	266	267	266	(Removed)
CART SH 9	119	133	119	119	119	134	135	135	119	119	119	124
Citylink 1	183	179	179	272	265	185	183	185	184	183	185	166
Citylink 2	204	211	213	211	202	203	203	203	203	204	204	241
Citylink 3	387	385	387	332	356	387	386	386	387	386	386	248
Citylink 4	190	188	188	214	198	190	190	190	190	190	190	248
Citylink 5	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	259
Citylink 101	128	107	107	90	111	125	126	126	127	123	123	(Removed)
Citylink 102	199	191	187	181	137	199	199	199	199	199	199	(Removed)
Lincoln Shuttle (New)	(N/A)	63	59	60	136	170	171	171	160	136	136	396
EMBARK Route 2	372	354	348	373	385	395	393	376	389	384	391	552
EMBARK Route 3	335	303	299	323	338	353	353	333	355	350	351	244
EMBARK Route 5	2,558	2,709	2,708	2,752	2,567	2,570	2,570	2,566	2,570	2,564	2,562	1,798
EMBARK Route 7	1,650	1,645	1,649	1,664	1,650	1,649	1,653	1,651	1,651	1,646	1,651	2,404

[2] Please note that for the purposes of the regional travel demand model, Alternatives N1, S1, and E1 were coded as individual routes, and therefore require a transfer if patrons switch from one corridor to another.

Table A-1: Side-by-Side Comparison of the Central Oklahoma Commuter Corridors Alternatives

Route	No-Build Ridership	Regional Rail [2]	N1	N2	N7	S1	S2	S4	E1	E5	E6	Final - LPA
EMBARK Route 8	1,346	1,356	1,352	1,372	1,347	1,350	1,351	1,348	1,350	1,348	1,348	1,178
EMBARK Route 9	310	322	316	342	312	314	314	313	315	313	313	487
EMBARK Route 10	632	983	924	946	916	949	947	944	953	919	920	916
EMBARK Route 11	1,098	1,092	1,065	1,050	1,041	1,047	1,045	1,039	1,086	1,040	1,045	977
EMBARK Route 12	829	1,206	1,151	1,168	1,127	1,158	1,152	1,148	1,162	1,134	1,130	1,791
EMBARK Route 13	705	716	714	740	710	712	813	810	711	711	710	870
EMBARK Route 14	654	702	674	724	667	692	709	707	671	669	668	651
EMBARK Route 15	647	526	565	565	564	563	563	561	535	591	620	652
EMBARK Route 16	598	615	609	640	607	609	608	603	608	607	607	381
EMBARK Route 17	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	560
EMBARK Route 18	400	472	464	543	385	379	389	389	385	388	389	1,374
EMBARK Route 19	100	102	101	100	100	102	100	102	98	100	113	104
EMBARK Route 20	(N/A)	370	364	394	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	334
EMBARK Route 22	311	267	266	297	317	306	303	304	304	298	298	240
EMBARK Route 23	1,830	1,915	1,908	1,874	1,810	1,795	1,798	1,820	1,796	1,794	1,797	1,916
EMBARK Route 25	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	455
EMBARK Route 36	861	840	843	900	856	858	857	857	857	859	857	820
EMBARK Route 38	498	503	503	508	500	500	500	498	500	501	499	318
EMBARK Route 40	1,216	1,330	1,237	1,288	1,230	1,317	1,242	1,220	1,232	1,228	1,232	1,272
EMBARK Streetcar	656	534	541	475	542	540	539	536	549	543	544	2,103
EMBARK Mustang	61	61	60	62	59	59	60	60	59	59	59	74
EMBARK Yukon	48	48	48	50	48	48	48	48	48	48	48	189
Alternative Ridership	–	E1 – 1,376 N1 – 2,182 S1 – 3,317	1,967	3,304	373	3,054	3,807	4,269	1,154	263	271	E1A – 2,257 N1S1 – 5,656
Total Regional Ridership	23,821	32,392	26,795	28,620	24,652	27,999	28,821	29,111	25,606	24,587	24,657	37,651
Ridership Increase over No-Build	–	8,571	2,975	4,799	832	4,178	5,000	5,291	1,786	767	836	13,831
Potential Decrease in VMT	–	88,575	32,022	54,095	11,659	45,756	56,074	62,822	22,949	8,684	11,991	140,599

Note: (N/A) – Not applicable under a specific alternative.

A.1.4 Role of Ridership Results in the Selection of the Locally Preferred Alternative

Based on the corridor-specific goals, which were identified in coordination with local stakeholders, each alternative was assessed in terms of its ability to accomplish those goals. Performance metrics included, but were not limited to:

- Regional connectivity;
- Support of economic development;
- Support of a multi-modal transportation system; and
- Maximization of local and regional support.

Transit ridership results were therefore one of several factors taken into account to determine the LPAs.

A.2 Basic Model Setup

A.2.1 Introduction

ACOG undertook the Central Oklahoma Commuter Corridors Study for the Oklahoma City metropolitan area in order to determine the most suitable transit technology and route alignment for three separate commuter corridors.

The consultant team developed ridership forecasts for horizon year 2035 for the alternatives within each corridor.

In addition to summarizing the TDM results for each of the corridors' alternatives, this appendix also briefly describes the basic model setup and operational framework in which the transit ridership results were obtained.

A.2.2 Overview of Model Development

The travel demand modeling for the Central Oklahoma Commuter Corridors Study was carried out using the ACOG regional TDM.

Following the calibration and validation of the ACOG TDM to base year conditions, the consultant team used the Encompass 2035 Metropolitan Transportation Plan demographic forecasts by traffic analysis zone (TAZ) for the 2035 horizon year to populate zonal demographic and employment characteristics of the model. Table A-2 shows a breakdown of the model network by roadway functional classification.

Table A-2: Basic Model Network Information for Horizon Year 2035

Functional Class	Centerline Miles	Lane Miles
Freeway	479	1,269
Expressway	4	14
Principal Arterial	915	1,767
Major Arterial	2	6
Minor Arterial	4,878	6,015
Collector/Local	1,066	1,214
Ramp	183	188
Total	7,526	10,473

A.2.3 No-Build Alternative

In anticipation of the development of a comprehensive regional transit system, the project team worked closely with ACOG to develop a future, regional No-Build Alternative for the year 2035, against which each of the commuter corridor alternatives were measured. The No-Build routes also formed the basic transit network for all the candidate alternatives evaluated throughout this study. (Please note: Specific deviations to No-Build Alternative bus routes are documented in the following sections.)

Alignment

The transit routes included in the regional No-Build Alternative were largely based on:

- CART Long-Range Public Transportation Plan recommendations;
- Feedback received from the Norman Comprehensive Transportation Plan development;
- EMBARK route updates developed in 2013 by Nelson-Nygaard;
- City of Edmond's Citylink transit routes; and
- Additional envisioned regional transit improvements, such as express bus routes to Yukon and Mustang.

Basic Operational Plan

The No-Build Alternative operational plan was used as a starting point for all travel demand model runs. The route-specific headways and hours of operation were developed by the project team to generally provide service that is consistent with current operations.

Most 2035 bus routes would operate seven days a week with 15- to 30-minute peak frequencies on weekdays and 30- to 60-minute frequencies on Saturday and Sunday. Some limited service buses and express routes will only operate on weekdays. For the year 2035, service spans are assumed to increase to about 15 to 17 hours per day from about 5:30 a.m. to 10:30 p.m. on weekdays and from about 7:00 a.m. to 9:00 p.m. on Saturday and Sunday.

Alternative Operational Plan

The project team established the following operational plan specifications for typical weekday operations, which were considered in the coding of each of the alternatives:

- Service Hours – 5:30 am to 10:30 pm
- Headways
  - ✓ AM Peak – 15 minutes
  - ✓ Midday – 30 minutes
  - ✓ PM Peak – 15 minutes
  - ✓ Evening – 30 minutes

Transit System Fare Structure

The project team provided the basic fare structure to be used for the 2035 No-Build and Alternative scenarios, assuming base fare increases consistent with inflation and bus frequency improvements. The express bus fare is capped at 150% of the base fare.

Fares are defined by three categories. Local bus fares are set at $3.00 one-way, express bus fares are $4.50 one-way, and high capacity service (BRT, LRT, commuter rail, and streetcar) fares use a zone-based fare structure. Trips nine miles or less have a fare of $3.00 one-way and trips over nine miles are $5.00 one-way. Key fare policy elements such as reduced fares for seniors and youth and local and

regional day/monthly passes will be considered as part of the financial planning task for this project. Year 2035 Fares are based on inflation, and the move to a regional system.

- Local Bus – One-way $3.00 Regular Fare
- Express Bus and Commuter Alternative – One-way $ 4.50 Regular Fare
- Transfer Fares:
  - ✓ Local Bus to Local Bus - $0.00
  - ✓ Local to Express Bus or Commuter Alternative - $1.50
  - ✓ Express Bus or Commuter Alternative to Local Bus - $0.00
  - ✓ Express Bus or Commuter Alternative to Express Bus or Commuter Alternative - $0.00
  - ✓ Transfer between EMBARK, CART, and Citylink routes - $0.00

The fares above were adjusted to 2005 dollar value for modeling purposes to be consistent with the ACOG travel model inputs.

Transit Network Coding

Built on the No-Build, each of the alternatives was coded to reflect the operational characteristics of each scenario. Once the coding was completed, a series of debugging runs was performed to identify discontinuities or inconsistencies with the project definition. Items that were reviewed during this debugging exercise included:

- Review of station locations and access
- Discontinuity or anomalies in the coding of the transit route system

In addition, the debugging of the networks, quality assurance/quality control procedures were applied throughout the analysis. Network coding was performed using in-house tools, and applied consistent techniques and processes.

Geographic Market Segmentation

In order to analyze regional travel patterns, the metropolitan area and the study corridors were divided into 24 districts, as shown in Figure A-1. For easy identification of the corresponding corridor, the following numbering scheme was used:

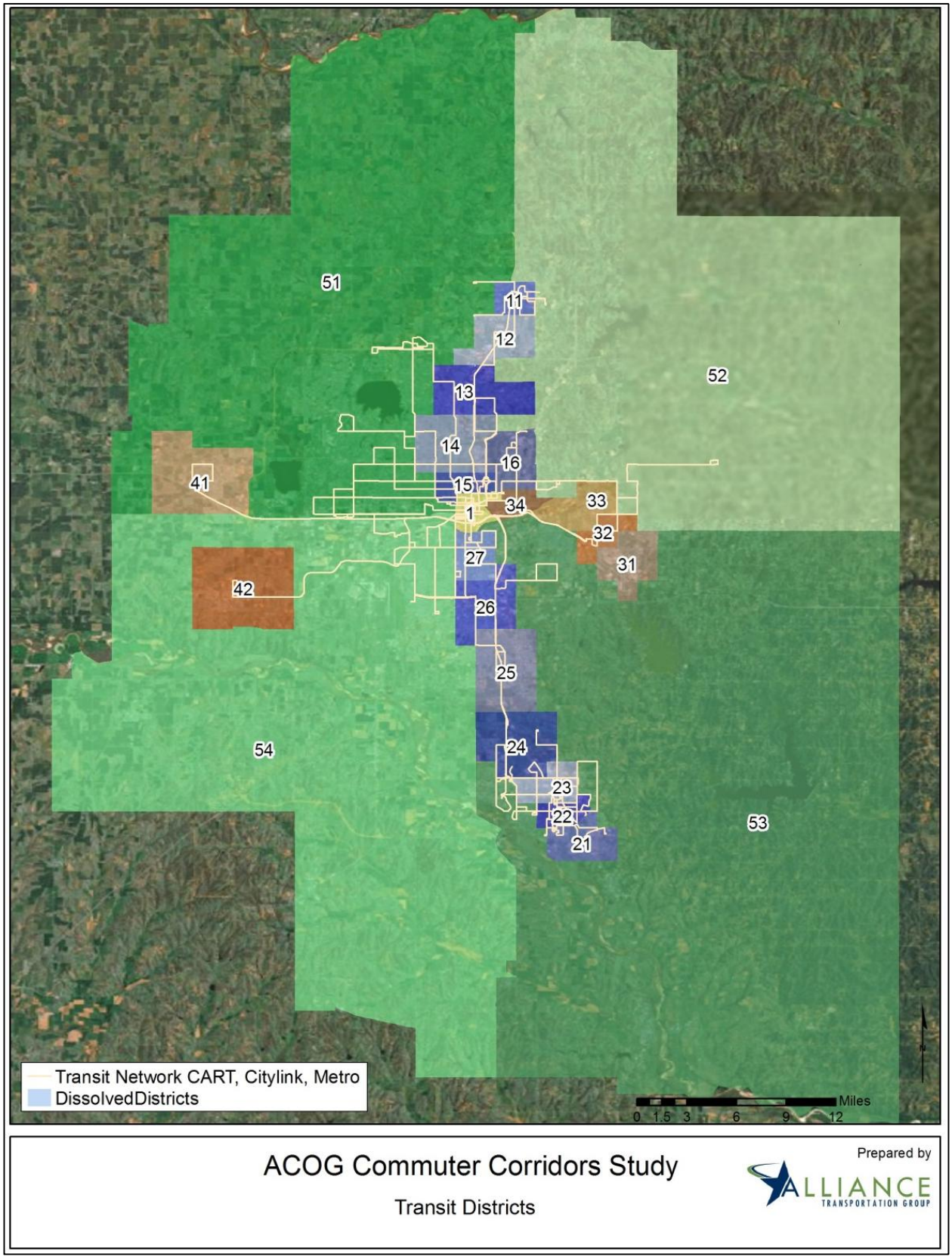
- District 1 – Downtown Oklahoma City
- Districts 11 through 16 – North Corridor, where District 11 represents the northern terminus.
- Districts 21 through 27 – South Corridor, where District 21 represents the southern terminus.
- Districts 31 through 34 – East Corridor, where District 31 represents the eastern terminus.
- District 41 and 42 – Western Corridor, where District 41 represents the Yukon area and District 42 encompasses the Mustang area.

These districts were used in the analysis of specific travel patterns by trip purpose—home-based work (HBW) vs. home-based other (HBO), home-based higher education (HBU), non-home-based work (NHBW), non-home-based other (NHBO), and home-based school k-12 (HBSch) combined—and the mode of travel used to complete the associated trip—single occupancy vehicle (SOV) and high occupancy vehicle (HOV) drive modes vs. local bus (LB), express bus (EB), streetcar (SC), and rail (RL)

transit modes. The resulting four matrices included for each of the corridors, show the breakdown by origin-destination (OD) district pairs.[3]

[3] It should be noted that the total number of HBW drive trips and other drive trips is less than the total number of SOC and HOV drive trips in the "Trip Purpose by Mode" table, since the district flow tables do not include external trips while the "Trip Purpose by Mode" table includes external trips.

Figure A-1: Transit Districts



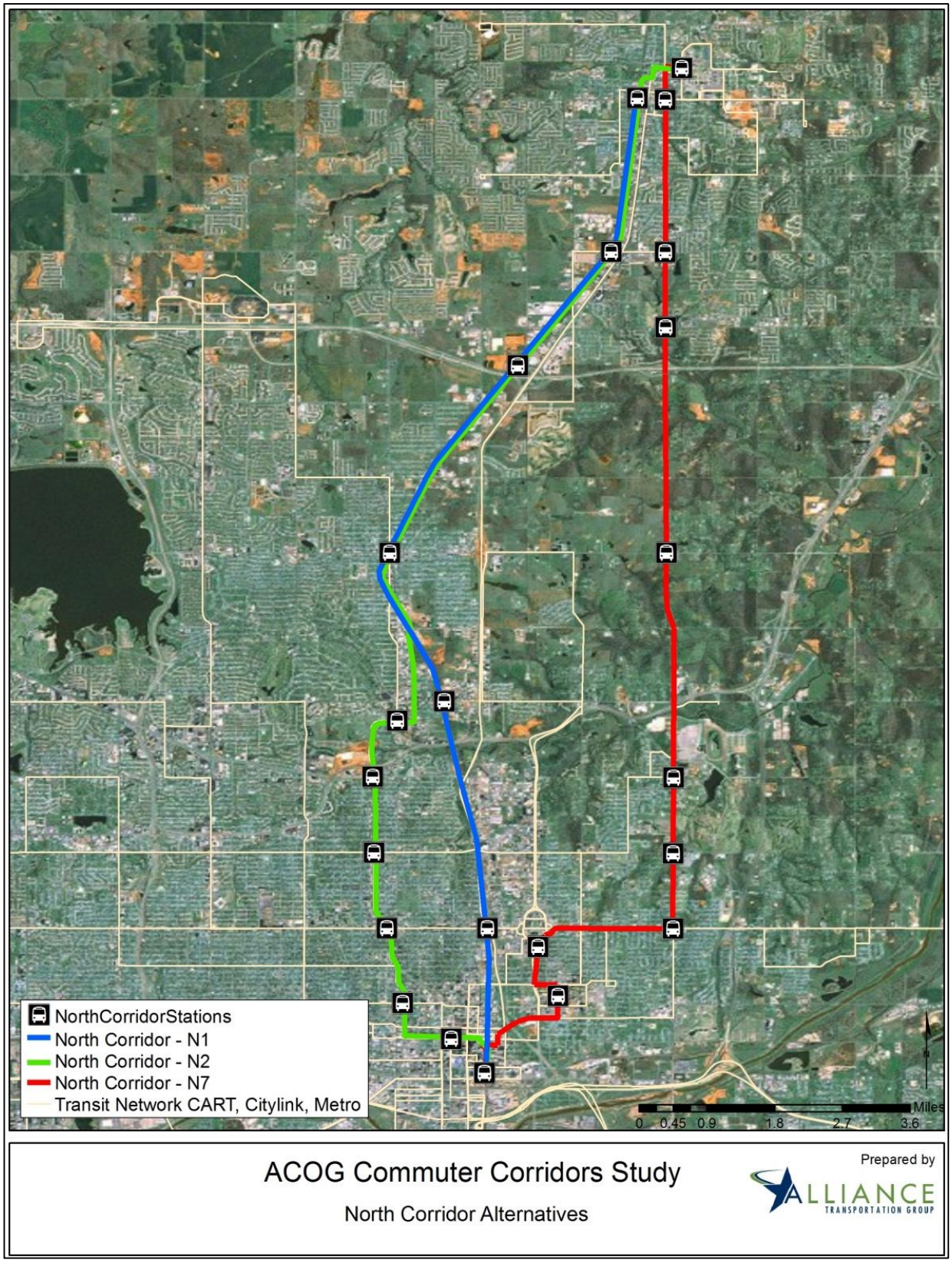
A.3 North Corridor Alternatives – Transit Ridership Results

A.3.1 Description of Alternatives

As developed by the project team, Steering Committee and stakeholders, the North Corridor Alternatives encompassed Alternatives N1, N2, and N7. Figure A-2 shows the alignments in detail.

- Alternative N1 was envisioned to operate in dedicated right-of-way (ROW) and was modeled as commuter rail.
- Alternative N2 (a stand-in for the N2/N3 Hybrid Alternative) was also envisioned to operate in dedicated ROW and was modeled transit technology-independent (accounting for light rail transit, bus rapid transit, or streetcar, but similar in character to rail-based transit).
- Alternative N7 was envisioned to operate in mixed traffic and was modeled transit technology-independent (accounting for either bus rapid transit or streetcar).

Figure A-2: North Corridor Alternatives



A.3.2 Changes to the No-Build Bus Network

The following changes were made to the previously coded No-Build bus network to accommodate the N1, N2, and N7 alternatives:

- EMBARK Route 10 was extended beyond the Oklahoma City Transit Center to provide service to Santa Fe Station.
- EMBARK Route 11 was rerouted along Reno Ave and Gaylord Boulevard to serve the Santa Fe Station.
- EMBARK Route 12 was also rerouted to serve the Santa Fe Station.
- A new Lincoln Shuttle was added to connect Santa Fe Station along Gaylord Boulevard, NE 4th Street, and Lincoln Boulevard to the Capitol.
- EMBARK Route 18 was extended to NW 63rd Street, past US-77, to provide bi-directional service with access to the commuter rail station.
- Alternatives N1 and N2 only – A new EMBARK Route 20 was added to operate from the Transit Center through the Capitol area, and then turn east on NE 36th Street, north on Kelly Avenue, west on Wilshire Boulevard, north on US-77, and west on Britton Road, terminating at the commuter rail station.

A.3.3 Results from Travel Demand Model

To provide a complete set of ridership forecasts and other TDM results for analysis of the candidate alternative, the following steps were taken:

- Performed an ACOG TDM run to produce horizon year 2035 ridership forecasts;
- Examined the mode choice model results;
- Examined the transit assignment results to obtain forecast transit ridership and boardings and alightings by route and mode of access (drive, walk, etc.) for the candidate alternative; and
- Prepared tables documenting the transit ridership for the candidate alternative.

It is important to note that the ridership forecasts are not capacity restrained. Therefore, they represent the potential market demand for the candidate alternative under the given demographic scenario and transit fare structure.

Transit Ridership

The following tables show the system-wide and route-specific transit ridership.

Table A-3: Average Weekday System-Wide Ridership for Horizon Year 2035

Alternative	Ridership	Difference from No-Build
No-Build	23,821	N/A
Alternative N1	26,795	2,975
Alternative N2	28,620	4,799
Alternative N7	24,652	832

Table A-4: Average Weekday Ridership Results by Route for Horizon Year 2035

Route	No-Build Ridership	N1 Ridership	N2 Ridership	N7 Ridership
CART 12th Ave E	160	158	158	162
CART 24th Ave W	273	273	273	273
CART Berry Rd	158	156	156	157
CART Downtown	164	165	164	164
CART E Norman	383	383	383	383
CART N10	430	430	431	430
CART N11	178	179	178	175
CART N12	235	233	233	234
CART N20	260	259	260	260
CART N21	530	530	534	529
CART N32	276	276	276	276
CART N40	72	72	72	72
CART N42	155	154	154	155
CART N52	302	302	302	301
CART Porter	349	349	349	349
CART Robinson	498	492	498	492
CART 24	271	267	267	266
CART SH 9	119	119	119	119
Citylink 1	183	179	272	265
Citylink 2	204	213	211	202
Citylink 3	387	387	332	356
Citylink 4	190	188	214	198
Citylink 101	128	107	90	111
Citylink 102	199	187	181	137
EMBARK Route 2	372	348	373	385
EMBARK Route 3	335	299	323	338
EMBARK Route 5	2,558	2,708	2,752	2,567
EMBARK Route 7	1,650	1,649	1,664	1,650
EMBARK Route 8	1,346	1,352	1,372	1,347
EMBARK Route 9	310	316	342	312
EMBARK Route 10	632	924	946	916
EMBARK Route 11	1,098	1,065	1,050	1,041
EMBARK Route 12	829	1,151	1,168	1,127
EMBARK Route 13	705	714	740	710
EMBARK Route 14	654	674	724	667
EMBARK Route 15	647	565	565	564
EMBARK Route 16	598	609	640	607
EMBARK Route 18	400	464	543	385
EMBARK Route 19	100	101	100	100
EMBARK Route 20	(N/A)	364	394	(N/A)
EMBARK Route 22	311	266	297	317
EMBARK Route 23	1,830	1,908	1,874	1,810
EMBARK Route 36	861	843	900	856
EMBARK Route 38	498	503	508	500

Table A-4: Average Weekday Ridership Results by Route for Horizon Year 2035

Route	No-Build Ridership	N1 Ridership	N2 Ridership	N7 Ridership
EMBARK Route 40	1,216	1,237	1,288	1,230
EMBARK Lincoln Shuttle	(N/A)	59	60	136
EMBARK Mustang	61	60	62	59
EMBARK Streetcar	656	541	475	542
EMBARK Yukon	48	48	50	48
Build Alternatives	N/A	1,967	3,304	373
Grand Total	23,821	26,795	28,620	24,652

System-wide Passenger-Miles

Passenger-miles are the cumulative sum of the distances ridden by each transit passenger and give an overall idea of transit system usage.

Table A-5: Average Weekday Passenger Miles by Mode for Horizon Year 2035

Transit Mode	Alternative N1 Passenger Miles	Alternative N2 Passenger Miles	Alternative N7 Passenger Miles
Local Bus	70,068	72,311	69,049
Express Bus	5,264	5,114	5,309
Streetcar	693	608	693
Build Alternative	15,164	27,051	2,439

System-wide Transfer between Transit Modes

In order to visualize the interaction between the different transit options, the number of transfers between transit modes was analyzed.

Table A-6: Alternative N1 – Average Weekday Transfers between Modes for Horizon Year 2035

From/To	Local Bus	Express Bus	Streetcar	Rail
Local Bus	3,771	92	214	83
Express Bus	87	12	2	7
Streetcar	43	0	0	0
Rail	467	37	0	0

Table A-7: Alternative N2 – Average Weekday Transfers between Modes for Horizon Year 2035

From/To	Local Bus	Express Bus	Streetcar	Rail
Local Bus	3,685	82	154	169
Express Bus	67	12	2	8
Streetcar	39	0	0	1
Rail	616	39	2	0

Table A-8: Alternative N7 – Average Weekday Transfers between Modes for Horizon Year 2035

From/To	Local Bus	Express Bus	Streetcar	BRT
Local Bus	3,663	91	213	13
Express Bus	80	12	3	1
Streetcar	46	1	0	0
BRT	13	1	0	0

Boarding and Alightings by Station

The following graphics and tables show the passenger boardings and alightings by station location.

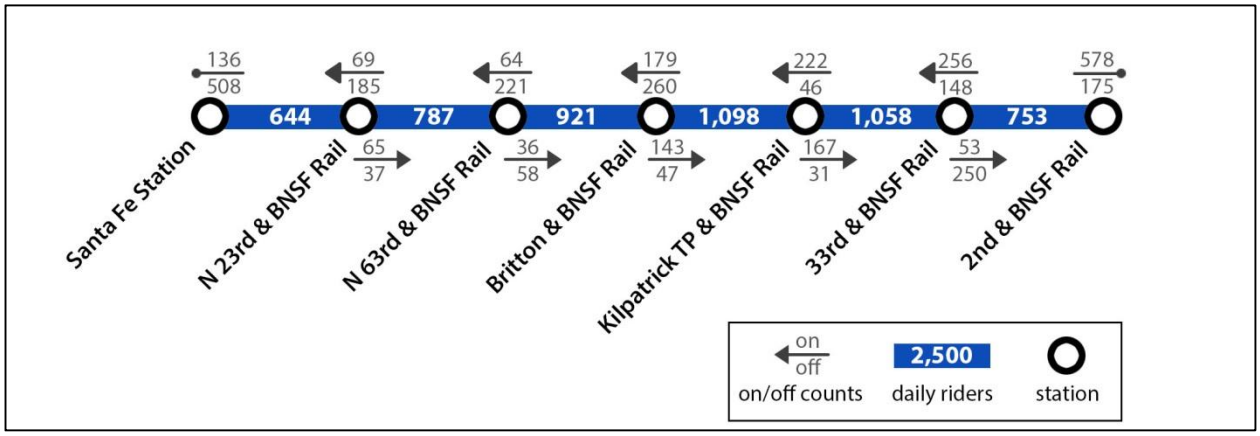
Additional Notes:

- Directional Imbalance – Before reviewing the information contained in the graphic display, it is important to note that the directional imbalance of the reported rail ridership is often confusing to individuals who do not work with travel demand model transit ridership. It is the industry standard to assign transit trips in production-attraction (PA) format. The imbalance is especially noticeable for trips of very directional nature, such as home-based work (HBW) trips. This is due to the fact that the typical commuting pattern of one trip into town in the morning and one trip out of town in the evening is assigned as two inbound trips in PA format. This convention allows transit planners and the models that forecast ridership to know the household characteristics (median income, household size, vehicle availability, area type) of transit riders based on the zone the transit rider starts their trip. This convention also ensures the outbound work trips return to the same zones as the inbound trips. In reality, on a daily basis, the inbound and outbound ridership will be equal to half of the total ridership of the two directions.
- Difference between Transit Trips from Mode Choice Model and the Ridership from Transit Assignment Routine – In addition, the trip totals typically shown in the mode choice model are slightly different than the ridership by route produced by the transit assignment routine. This difference is a function of the logic inherent in the two models. The mode choice model identifies production and attraction trip ends for each zone pair by mode and all of the segments of the trip are linked together and labeled as a single trip on the highest value mode used (e.g. if in the course of the trip a rider uses bus transit to access a light rail line, the mode choice model would identify this as a single light rail trip. The bus trip would not be reflected in mode choice.) In the assignment, however, the individual modes would not be linked and the bus trip would show up in the transit ridership forecast for both the bus route and the light rail. Similarly a trip that used several bus routes would show up as a trip on each route. Since most systems have a transfer proportion of about 15% or more, the transit assignment total by mode is typically higher than the mode choice total for zone to zone trip ends.

North Corridor Alternative N1

The following graphic shows forecasted boardings or alightings at each Alternative N1 commuter rail station.

Figure A-3: North Corridor – 2035 Boardings and Alightings for Alternative N1



To better understand the distribution of trips throughout the course of the day, the Alternative N1 boarding and alighting information was further broken out by mode of access (walk or drive), direction, and by peak and off-peak period, as shown in Table A-9 through Table A-12.

Table A-9: Northbound Peak Boardings and Alightings by Mode of Access for Alternative N1

Northbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	67	0	2	0	69	0
N 23rd Street & BNSF Rail	14	20	19	0	33	20
N 63rd Street & BNSF Rail	7	22	10	9	18	31
Britton & BNSF Rail	16	17	55	8	71	25
Kilpatrick Turnpike & BNSF Rail	2	5	91	11	93	16
33rd Street & BNSF Rail	5	28	47	107	53	135
2nd Street & BNSF Rail	0	20	0	90	0	111
Total	111	111	225	225	337	337

Table A-10: Northbound Off-Peak Boardings and Alightings by Mode of Access for Alternative N1

Northbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	On	Off	On
Santa Fe Station	66	0	1	0	67	0
N 23rd Street & BNSF Rail	12	17	20	0	32	17
N 63rd Street & BNSF Rail	9	19	9	8	18	27
Britton & BNSF Rail	16	15	55	7	71	22
Kilpatrick Turnpike & BNSF Rail	1	4	73	11	74	16
33rd Street & BNSF Rail	0	30	0	85	0	115
2nd Street & BNSF Rail	0	17	0	47	0	64
Total	104	104	159	159	262	262

Table A-11: Southbound Peak Boardings and Alightings by Mode of Access for Alternative N1

Southbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	On	Off	On
2nd Street & BNSF Rail	40	0	317	0	357	0
33rd Street & BNSF Rail	33	12	107	102	140	114
Kilpatrick Turnpike & BNSF Rail	3	3	119	26	122	29
Britton & BNSF Rail	27	17	75	112	101	129
N 63rd Street & BNSF Rail	17	17	17	109	33	126
N 23rd Street & BNSF Rail	25	14	18	98	43	111
Santa Fe Station	0	81	0	207	0	288
Total	144	144	653	653	797	797

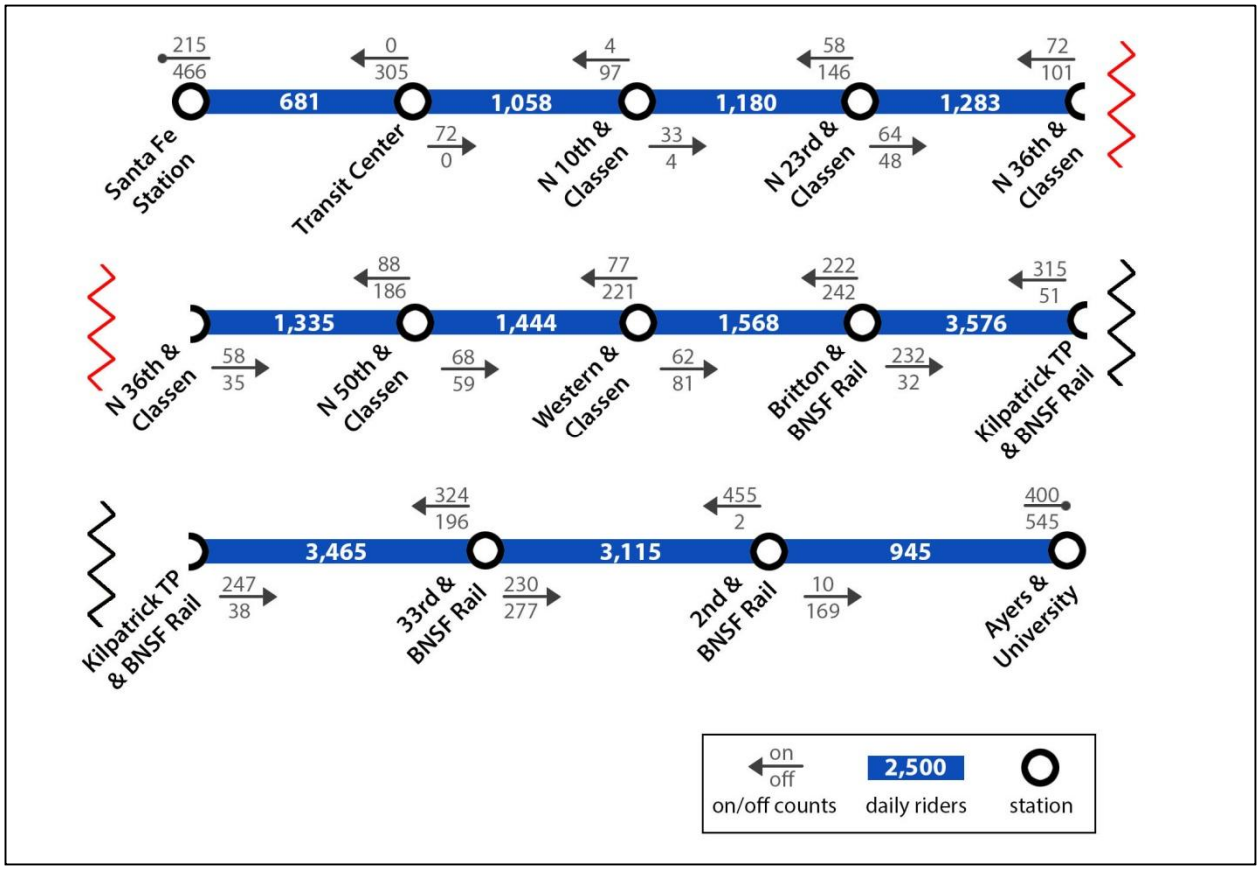
Table A-12: Southbound Off-Peak Boardings and Alightings by Mode of Access for Alternative N1

Southbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	On	Off	On
2nd Street & BNSF Rail	23	0	198	0	221	0
33rd Street & BNSF Rail	26	0	90	35	116	35
Kilpatrick Turnpike & BNSF Rail	3	2	97	16	100	17
Britton Road & BNSF Rail	23	15	55	116	78	131
N 63rd Street & BNSF Rail	15	15	15	79	30	95
N 23rd Street & BNSF Rail	10	8	15	66	26	74
Santa Fe Station	0	60	0	160	0	220
Total	100	100	472	472	572	572

North Corridor Alternative N2

The following graphic shows forecasted boardings or alightings at each Alternative N2 station.

Figure A-4: North Corridor – 2035 Boardings and Alightings for Alternative N2



To better understand the distribution of trips throughout the course of the day, the Alternative N2 boarding and alighting information is further broken out by mode of access (walk or drive), direction, and by peak and off-peak period, as shown in Table A-13 through Table A-16.

Table A-13: Northbound Peak Boardings and Alightings by Mode of Access for Alternative N2

Northbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	111	0	0	0	111	0
Transit Center	30	0	10	0	40	0
NW 10th Street & Classen Avenue	15	4	0	0	15	4
NW 23rd Street & Classen Avenue	29	28	3	2	33	30
NW 36th Street & Classen Avenue	19	17	10	0	29	17
NW 50th Street & Classen Avenue	14	28	21	1	35	29
Western Avenue & Classen Avenue	9	29	20	16	29	45
Britton Road & BNSF Rail	27	14	87	5	114	20
Kilpatrick Turnpike & BNSF Rail	2	7	130	12	132	18
33rd Street & BNSF Rail	20	42	137	102	156	144
2nd Street & BNSF Rail	1	25	6	77	7	103
Ayers Street & University Drive	0	82	0	208	0	290
Total	278	278	423	423	701	701

Table A-14: Northbound Off-Peak Boardings and Alightings by Mode of Access for Alternative N2

Northbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	104	0	0	0	104	0
Transit Center	22	0	10	0	32	0
NW 10th Street & Classen Avenue	17	0	0	0	17	0
NW 23rd Street & Classen Avenue	29	19	2	0	31	19
NW 36th Street & Classen Avenue	20	18	10	0	30	18
NW 50th Street & Classen Avenue	15	29	18	1	33	29
Western & Classen Avenue	11	24	21	12	32	36
Britton & BNSF Rail	31	9	87	3	118	13
Kilpatrick Turnpike & BNSF Rail	1	7	114	12	115	19
33rd Street & BNSF Rail	8	45	66	88	73	133
2nd Street & BNSF Rail	0	23	2	43	3	66
Ayers Street & University Drive	0	84	0	170	0	254
Total	258	258	330	330	588	588

Table A-15: Southbound Peak Boardings and Alightings by Mode of Access for Alternative N2

Southbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Ayers Street & University Drive	61	0	166	0	227	0
2nd Street & BNSF Rail	37	1	240	1	277	1
33rd Street & BNSF Rail	41	31	134	110	175	140
Kilpatrick Turnpike & BNSF Rail	4	4	166	27	170	31
Britton Road & BNSF Rail	23	20	107	100	130	119
Western & Classen Avenue	22	15	22	104	45	119
NW 50th Street & Classen Avenue	20	17	33	86	53	103
NW 36th Street & Classen Avenue	26	8	16	47	42	54
NW 23rd Street & Classen Avenue	44	14	2	72	47	86
NW 10th Street & Classen Avenue	4	13	0	49	4	61
Transit Center	0	36	0	160	0	196
Santa Fe Station	0	125	0	132	0	257
Total	283	283	886	886	1,169	1,169

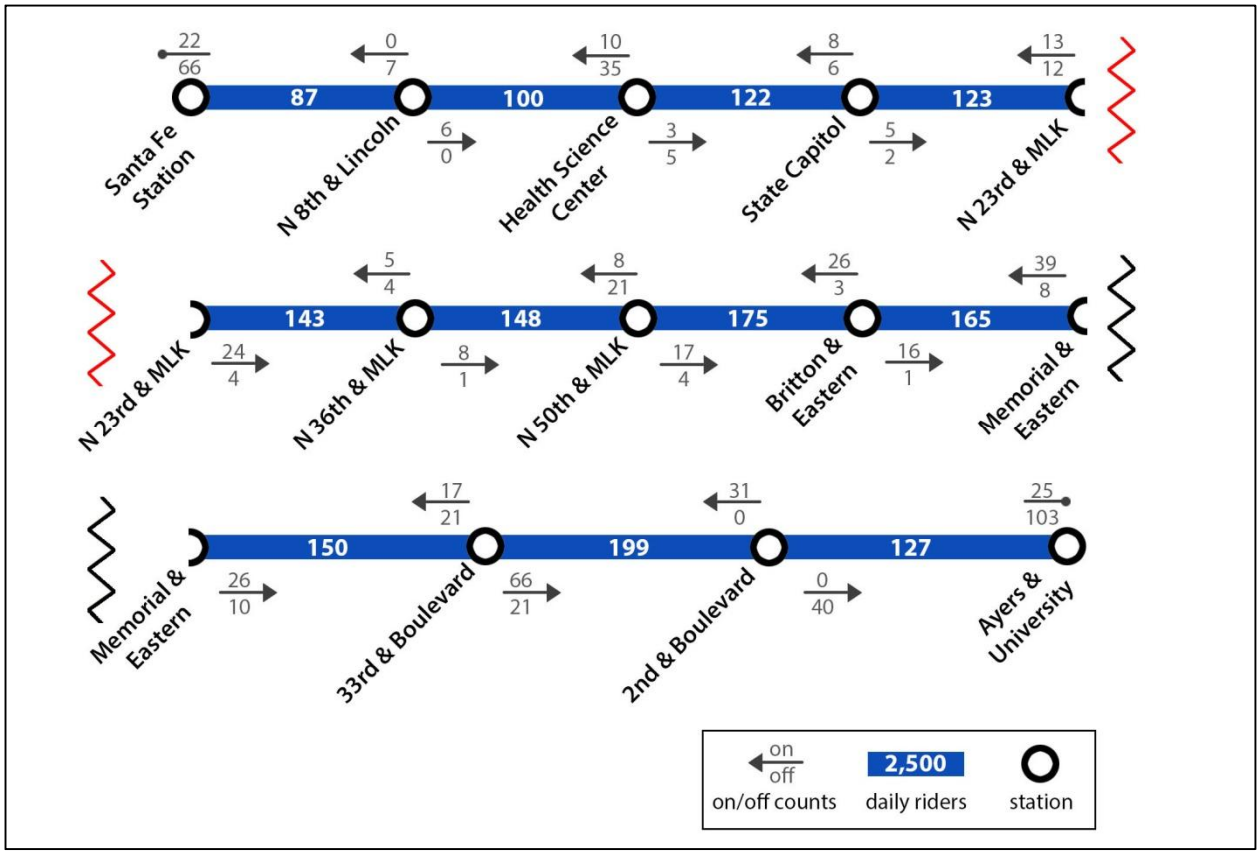
Table A-16: Southbound Off-Peak Boardings and Alightings by Mode of Access for Alternative N2

Southbound Off Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Ayers Street & University Drive	50	0	123	0	173	0
2nd Street & BNSF Rail	24	0	154	0	178	1
33rd Street & BNSF Rail	34	14	116	42	150	56
Kilpatrick Turnpike & BNSF Rail	4	3	141	17	145	20
Britton Road & BNSF Rail	12	18	80	105	92	123
Western Avenue & Classen Avenue	17	13	15	89	32	102
NW 50th Street & Classen Avenue	18	16	17	67	35	83
NW 36th Street & Classen Avenue	21	7	9	40	30	47
NW 23rd Street & Classen Avenue	11	9	0	51	11	60
NW 10th Street & Classen Avenue	0	7	0	30	0	36
Transit Center	0	14	0	95	0	109
Santa Fe Station	0	89	0	121	0	210
Total	190	190	656	656	846	846

North Corridor Alternative N7

The following graphic shows forecasted boardings or alightings at each Alternative N7 station.

Figure A-5: North Corridor – 2035 Boardings and Alightings for Alternative N7



To better understand the distribution of trips throughout the course of the day, the Alternative N7 boarding and alighting information is further broken out by mode of access (walk or drive), direction, and by peak and off-peak period, as shown in Table A-17 through Table A-20.

Table A-17: Northbound Peak Boardings and Alightings by Mode of Access for Alternative N7

Northbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	16	0	0	0	17	0
NE 8th Street & Lincoln Boulevard	3	0	1	0	4	0
Health Science Center	1	5	1	0	2	5
State Capitol	2	2	1	0	3	2
NE 23rd Street & MLK Avenue	12	3	1	1	13	3
NE 36th Street & MLK Avenue	2	1	2	0	4	1
NE 50th Street & MLK Avenue	5	2	4	1	8	3
Britton Road & Eastern Avenue	1	0	7	0	8	1
Memorial Road & Eastern Avenue	6	2	9	3	14	5
33rd Street & Boulevard	4	7	36	4	40	12
2nd Street & Boulevard	0	7	0	19	0	27
Ayers Street & University Drive	0	22	0	34	0	56
Total	51	51	62	62	114	114

Table A-18: Northbound Off-Peak Boardings and Alightings by Mode of Access for Alternative N7

Northbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	5	0	0	0	5	0
NE 8th Street & Lincoln Boulevard	2	0	1	0	2	0
Health Science Center	1	1	0	0	1	1
State Capitol	2	1	0	0	2	1
NE 23rd Street & MLK Avenue	10	1	1	0	11	1
NE 36th Street & MLK Avenue	2	0	2	0	4	0
NE 50th Street & MLK Avenue	5	0	4	0	8	1
Britton Road & Eastern Avenue	1	0	7	0	8	1
Memorial Road & Eastern Avenue	4	2	7	2	12	5
33rd Street & Boulevard	1	5	24	4	25	9
2nd Street & Boulevard	0	5	0	9	0	14
Ayers Street & University Drive	0	16	0	31	0	46
Total	32	32	46	46	78	78

Table A-19: Southbound Peak Boardings and Alightings by Mode of Access for Alternative N7

Southbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Ayers Street & University Drive	13	0	2	0	15	0
2nd Street & Boulevard	6	0	16	0	22	0
33rd Street & Boulevard	5	7	6	10	11	17
Memorial Road & Eastern Avenue	4	3	18	1	22	4
Britton Road & Eastern Avenue	2	0	13	1	14	1
NE 50th Street & MLK Avenue	4	3	2	8	6	11
NE 36th Street & MLK Avenue	2	1	2	1	3	2
NE 23rd Street & MLK Avenue	8	2	2	5	10	7
State Capitol	4	2	3	3	6	4
Health Science Center	10	7	1	15	10	23
NE 8th Street & Lincoln	0	2	0	3	0	5
Santa Fe Station	0	30	0	17	0	47
Total	57	57	63	63	121	121

Table A-20: Southbound Off-Peak Boardings and Alightings by Mode of Access for Alternative N7

Southbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Ayers Street & University Drive	8	0	1	0	10	0
2nd Street & Boulevard	3	0	7	0	9	0
33rd Street & Boulevard	2	3	4	1	6	4
Memorial Road & Eastern Avenue	2	2	15	1	17	3
Britton Road & Eastern Avenue	1	0	11	1	12	1
NE 50th Street & MLK Avenue	1	3	1	8	2	11
NE 36th Street & MLK Avenue	0	1	1	1	1	2
NE 23rd Street & MLK Avenue	2	2	1	4	3	6
State Capitol	1	0	1	1	1	2
Health Science Center	0	2	0	10	0	12
NE 8th Street & Lincoln	0	1	0	1	0	2
Santa Fe Station	0	7	0	12	0	19
Total	20	20	41	41	61	61

Additional Trip Characteristics – Market Segmentation

Further breaking down travel patterns by trip purpose, income, and mode of travel helps to better understand the needs of the transportation system users. The following tables offer information in regard to trip purpose by income level,[4] as well as trip purpose by mode of travel.[5] The trip purposes included in the analysis are:

- HBW – Home-based work trips

[4] Only HBW and HBO trips were stratified by income level.

[5] It should be noted that for trip tables by income level and mode of travel, the total number of trips was rounded to the nearest thousand and individual cells were proportionally adjusted to match the totals.

- HBO – Home-based trips for shopping, recreation or other purposes
- HBU – Home-based trips to higher education facilities
- NHBW – Non-home-based work trips
- NHBO – Non-home-based trips for shopping, recreation or other purposes
- HBSch – Home-based trips to schools (kindergarten through 12th grade)

Table A-21: Overall 2035 Trips by Purpose and Income Level for all Alternatives

	Low Income	Medium Income	High Income	Total
HBW	55,905	461,594	319,501	837,000
HBO	240,873	1,075,071	641,055	1,957,000
HBU		139,000		139,000
NHBW		506,000		506,000
NHBO		1,315,000		1,315,000
HBSch		848,000		848,000
Total				5,602,000

Of additional interest was a breakout of trips by purpose and mode of travel, for which the following mode of travel breakdown was considered:

- SOV – Single-occupancy vehicle, accounting for those automobile trips, where the driver is the only person in the vehicle
- HOV – High-occupancy vehicle, accounting for those automobile trips, where the driver is accompanied by at least one passenger
- LB – Local Bus, accounting for all local bus routes, thus excluding the express bus routes to Edmond, Norman, Yukon, and Mustang
- EB – Express Bus, accounting for the express bus routes to Edmond, Norman, Yukon, and Mustang (including the express bus-like Alternative N7, where applicable).
- SC – Streetcar, accounting for trips associated with the planned downtown Streetcar circulator.
- RL – Rail, accounting for the trips associated with rail (including rail Alternatives N1 and rail-like Alternative N2, where applicable).

Table A-22 through Table A-28 show the number of trips broken out by purpose and mode of travel for both the No-Build Alternative and the three North Corridor Alternatives, which helps illustrate the travel purpose that the proposed new build alternatives would be used.

Table A-22: 2035 No-Build Alternative Trips by Purpose and Mode of Travel

	SOV	HOV	LB	EB	SC	RL	Total
HBW	743,128	90,720	3,045	93	14	0	837,000
HBO	863,167	1,085,601	7,954	257	20	0	1,957,000
HBU	120,524	17,242	1,109	125	0	0	139,000
NHBW	410,095	94,605	1,193	30	77	0	506,000
NHBO	523,951	785,283	5,394	190	183	0	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,814,353	2,767,963	18,696	694	294	0	5,602,000

Table A-23: 2035 Trips by Purpose and Mode of Travel for Alternative N1

	SOV	HOV	LB	EB	SC	RL	Total
HBW	742,655	90,669	3,132	72	13	459	837,000
HBO	862,971	1,085,361	8,029	233	19	387	1,957,000
HBU	120,423	17,241	1,148	118	0	71	139,000
NHBW	409,951	94,578	1,225	24	75	146	506,000
NHBO	523,501	784,670	5,587	165	173	904	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,812,988	2,767,032	19,120	612	281	1,966	5,602,000

Table A-24: Difference in 2035 Trips by Purpose and Model of Travel between the No-Build Alternative and Alternative N1

	SOV	HOV	LB	EB	SC	RL
HBW	(474)	(50)	87	(21)	(1)	459
HBO	(197)	(240)	75	(24)	(1)	387
HBU	(101)	(1)	38	(7)	0	71
NHBW	(143)	(27)	31	(6)	(2)	146
NHBO	(450)	(612)	193	(25)	(10)	904
HBSch	0	0	0	0	0	0
Total	(1,364)	(931)	424	(82)	(13)	1,966

Table A-25: 2035 Trips by Purpose and Mode of Travel for Alternative N2

	SOV	HOV	LB	EB	SC	RL	Total
HBW	742,288	90,623	3,341	70	12	665	837,000
HBO	862,763	1,085,236	8,134	224	19	625	1,957,000
HBU	120,151	17,196	1,168	112	0	373	139,000
NHBW	409,832	94,564	1,294	23	73	215	506,000
NHBO	523,210	784,393	5,638	161	172	1,425	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,811,732	2,766,523	19,575	591	276	3,303	5,602,000

Table A-26: Difference in 2035 Trips by Purpose and Model of Travel between the No-Build Alternative and Alternative N2

	SOV	HOV	LB	EB	SC	RL
HBW	(840)	(97)	296	(22)	(1)	665
HBO	(404)	(366)	180	(33)	(1)	625
HBU	(372)	(47)	58	(12)	0	373
NHBW	(263)	(41)	100	(7)	(4)	215
NHBO	(741)	(890)	245	(28)	(11)	1,425
HBSch	0	0	0	0	0	0
Total	(2,621)	(1,440)	879	(103)	(17)	3,303

Table A-27: 2035 Trips by Purpose and Mode of Travel for Alternative N7

	SOV	HOV	LB	EB	SC	RL	Total
HBW	742,976	90,713	3,161	138	13	0	837,000
HBO	863,088	1,085,502	8,054	336	19	0	1,957,000
HBU	120,426	17,219	1,155	199	0	0	139,000
NHBW	410,057	94,595	1,228	44	75	0	506,000
NHBO	523,826	785,080	5,660	262	173	0	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,813,860	2,767,622	19,258	979	280	0	5,602,000

Table A-28: Difference in 2035 Trips by Purpose and Model of Travel between the No-Build Alternative and Alternative N7

	SOV	HOV	LB	EB	SC	RL
HBW	(153)	(7)	116	45	(1)	0
HBO	(79)	(99)	99	79	(1)	0
HBU	(97)	(23)	46	74	0	0
NHBW	(38)	(9)	35	15	(2)	0
NHBO	(126)	(202)	266	72	(10)	0
HBSch	0	0	0	0	0	0
Total	(492)	(341)	562	285	(14)	0

Table A-29 through Table A-31 shows the potential reduction in vehicle miles of travel (VMT) by trip purpose because of the addition of the respective North Corridor alternative.

Table A-29: Potential Reduced VMT by Trip Purpose for Alternative N1

	SOV (VMT)	HOV (VMT)	Total (VMT)
HBW	4,216	1,076	5,293
HBO	1,749	5,127	6,876
HBU	898	32	930
NHBW	1,275	566	1,842
NHBO	4,003	13,078	17,081
Total	12,142	19,880	32,022

Table A-30: Potential Reduced VMT by Trip Purpose for Alternative N2

	SOV (VMT)	HOV (VMT)	Total (VMT)
HBW	7,479	2,070	9,550
HBO	3,597	7,816	11,412
HBU	3,314	996	4,310
NHBW	2,342	880	3,222
NHBO	6,595	19,006	25,601
Total	23,327	30,768	54,095

Table A-31: Potential Reduced VMT by Trip Purpose for Alternative N7

	SOV (VMT)	HOV (VMT)	Total (VMT)
HBW	1,359	150	1,508
HBO	703	2,115	2,819
HBU	866	488	1,355
NHBW	336	201	537
NHBO	1,118	4,322	5,440
Total	4,382	7,277	11,659

Table A-32: Alternative N1 HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	875	25	49	41	275	160	42	5	13	21	28	54	82	55	112	48	39	33	42	16	617	76	159	464	3,332
11	779	998	644	185	595	157	85	5	12	27	23	37	54	34	299	56	74	49	59	16	2,061	693	142	360	7,445
12	1,063	648	1,057	340	1,040	291	162	9	22	39	38	66	103	64	324	103	106	70	103	27	2,954	815	262	586	10,293
13	1,866	273	574	642	1,836	405	189	9	23	53	47	81	134	85	539	106	133	97	108	29	4,399	531	290	979	13,427
14	2,902	142	285	344	2,877	779	269	14	35	68	66	121	216	147	566	141	156	125	146	45	5,063	412	426	1,725	17,070
15	2,309	59	108	103	853	508	118	8	20	44	44	79	133	89	399	84	99	90	73	27	1,748	174	261	1,003	8,433
16	1,554	84	143	125	874	359	209	8	20	43	42	75	108	64	451	104	126	104	50	18	1,321	266	273	604	7,025
21	210	8	12	10	68	34	14	828	1,102	1,541	536	197	91	25	462	48	44	14	12	12	164	48	1,729	456	7,668
22	225	8	12	10	69	33	14	495	1,348	1,922	624	210	92	24	466	43	43	15	12	12	169	43	1,547	472	7,910
23	305	11	16	14	95	47	19	355	1,192	2,661	958	300	132	36	485	51	48	21	14	14	228	50	1,753	618	9,425
24	562	17	29	28	203	113	41	292	841	1,490	1,548	714	319	90	497	89	67	34	32	32	474	89	2,092	1,269	10,961
25	2,798	81	133	125	909	499	187	317	868	1,665	1,746	3,369	1,618	408	2,675	391	315	176	128	134	2,075	394	3,573	5,184	29,768
26	1,822	42	72	70	539	293	91	54	141	286	297	641	1,027	276	1,348	168	147	94	78	69	1,299	176	1,054	2,929	13,011
27	1,995	49	88	75	538	279	85	20	52	118	122	231	421	280	1,028	145	136	96	84	51	1,310	162	635	1,999	10,000
31	359	15	23	20	123	66	30	13	24	43	29	49	69	33	916	190	150	28	15	7	262	167	283	264	3,176
32	927	38	55	45	288	146	70	19	41	88	57	93	134	70	1,758	535	488	75	34	16	615	299	545	586	7,020
33	1,830	75	114	99	649	350	170	30	67	127	88	148	224	125	1,862	683	817	151	65	26	1,269	567	888	992	11,417
34	407	22	39	29	173	97	44	3	8	13	17	32	43	24	81	39	35	36	21	8	332	74	109	200	1,890
41	1,744	111	224	140	917	352	106	18	41	68	69	116	200	127	469	113	112	79	2,783	398	6,904	244	379	3,762	19,473
42	1,353	56	112	74	529	266	73	36	84	136	143	250	342	170	547	110	90	62	829	1,178	3,619	147	558	4,908	15,672
51	18,641	4,655	6,700	3,874	16,768	4,739	1,768	127	316	583	578	1,014	1,741	1,134	4,390	1,194	1,244	890	5,026	1,220	89,093	7,242	3,485	21,954	198,375
52	10,966	4,183	4,234	2,065	8,153	2,852	1,629	222	448	766	593	997	1,436	744	9,554	2,718	2,858	834	736	223	19,657	14,718	5,093	6,373	102,052
53	10,162	370	590	521	3,513	1,902	812	3,863	7,386	11,936	6,415	4,617	3,725	1,273	17,372	3,205	2,409	742	467	341	7,603	3,228	25,828	13,007	131,288
54	13,221	356	675	603	4,655	2,344	644	785	1,942	3,185	2,990	4,499	4,546	1,696	6,865	1,039	899	602	2,741	1,939	19,938	1,243	8,505	36,136	122,049
Total	78,874	12,326	15,989	9,580	46,539	17,070	6,873	7,536	16,045	26,925	17,099	17,991	16,993	7,073	53,463	11,405	10,635	4,518	13,659	5,859	173,175	31,856	59,867	106,831	768,180

Table A-33: Alternative N1 HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	36	0	0	0	3	2	0	0	0	0	0	1	1	1	0	0	0	0	0	0	4	0	0	3	54
11	15	30	12	1	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	3	0	0	74
12	23	19	11	3	17	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	0	1	87
13	47	3	7	8	39	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	43	0	0	2	162
14	61	1	1	6	71	20	3	0	0	0	0	0	1	1	0	0	0	1	0	0	91	0	0	3	260
15	97	0	0	1	17	16	1	0	0	0	0	0	0	1	0	0	0	1	0	0	27	0	0	2	167
16	62	0	0	2	12	10	6	0	0	0	0	0	0	0	0	0	0	3	0	0	5	1	0	1	103
21	0	0	0	0	0	0	0	11	18	9	0	0	0	0	0	0	0	0	0	0	0	0	4	0	42
22	1	0	0	0	0	0	0	3	66	65	4	0	0	0	0	0	0	0	0	0	0	0	17	0	156
23	1	0	0	0	0	0	0	0	39	93	27	0	0	0	0	0	0	0	0	0	0	0	32	0	193
24	1	0	0	0	0	0	0	0	4	29	21	0	0	0	0	0	0	0	0	0	0	0	17	0	72
25	12	0	0	0	1	1	0	0	0	0	0	35	11	4	0	0	0	0	0	0	2	0	0	2	68
26	18	0	0	0	2	1	0	0	0	0	0	9	13	6	0	0	0	0	0	0	2	0	1	10	62
27	41	0	0	0	3	1	0	0	0	0	0	2	8	6	0	0	0	0	0	0	5	0	3	18	88
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4	0	0	0	0	1	0	0	18
33	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	1	0	0	14
34	11	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	17
41	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4
42	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	6
51	274	23	40	21	151	66	5	0	0	0	0	1	2	3	0	1	0	2	0	0	605	1	1	18	1,214
52	61	18	21	6	35	12	3	0	0	0	0	0	0	1	0	3	5	1	0	0	11	6	1	2	185
53	27	0	0	0	2	1	0	6	51	95	33	0	8	4	0	0	0	0	0	0	3	0	71	3	306
54	126	0	0	1	8	4	1	0	1	1	1	4	14	9	0	0	0	1	0	0	21	0	3	125	321
Total	930	95	93	49	368	155	23	21	178	292	87	52	60	36	0	13	13	12	3	2	833	15	152	192	3,674

Table A-34: Alternative N1 Non-HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	36,573	764	1,230	1,466	8,425	5,806	2,524	62	406	270	373	1,890	3,815	3,833	1,357	1,919	2,094	1,961	1,296	674	19,867	4,396	6,423	14,685	122,110
11	982	13,423	6,771	1,330	1,935	439	493	5	179	21	33	116	180	141	132	229	217	131	241	71	18,048	11,238	484	793	57,633
12	1,624	7,729	11,184	2,830	3,670	814	936	6	223	30	45	180	305	269	202	362	368	259	407	118	22,046	10,314	791	1,340	66,049
13	2,455	2,598	3,468	9,385	8,528	1,639	1,376	7	468	35	68	264	478	494	219	478	406	376	422	130	29,685	5,724	998	2,552	72,249
14	9,466	1,625	2,299	4,670	28,112	6,047	3,287	24	549	109	166	770	1,567	1,543	634	968	1,016	934	1,082	396	44,172	5,891	2,721	8,956	127,002
15	7,617	690	717	1,144	7,223	6,041	1,821	14	464	71	120	620	1,223	1,434	405	740	721	943	545	284	15,093	2,377	2,125	6,350	58,783
16	3,982	979	1,069	1,318	5,506	2,402	3,630	12	430	65	102	538	808	859	477	971	1,024	1,351	277	137	9,164	4,563	2,344	2,929	44,935
21	98	35	9	9	46	35	23	4,148	6,497	6,919	1,576	937	245	64	143	108	61	13	12	29	145	131	15,686	1,406	38,377
22	166	42	17	16	80	50	36	3,091	11,556	12,476	2,785	1,506	401	98	198	138	88	21	22	46	245	170	18,267	2,127	53,642
23	385	63	42	38	185	100	76	2,902	10,778	24,928	6,400	3,144	907	217	359	239	172	46	46	86	558	337	26,588	3,814	82,411
24	553	78	45	50	269	172	109	993	3,923	9,134	9,961	6,650	1,747	459	316	245	171	79	59	139	786	329	17,606	6,734	60,606
25	3,605	452	275	317	1,723	1,100	729	681	4,344	4,966	6,446	46,939	13,840	3,201	1,970	1,493	1,056	547	327	801	4,734	1,967	24,336	33,945	159,792
26	4,933	340	284	370	2,110	1,328	669	134	1,164	758	1,138	8,555	16,099	4,566	1,934	1,162	852	533	407	720	5,800	1,607	9,745	25,357	90,565
27	5,888	512	381	519	2,742	1,902	872	41	954	250	405	2,640	5,699	8,015	1,083	1,305	905	772	525	630	7,560	1,627	6,391	16,417	68,033
31	2,585	245	301	260	1,126	564	556	143	445	426	345	1,567	2,248	998	18,809	4,821	2,997	388	227	197	3,052	6,119	11,400	4,520	64,339
32	2,662	367	316	296	1,245	715	724	54	550	192	172	834	1,207	904	4,597	10,285	5,602	549	199	136	3,163	6,469	8,320	3,085	52,643
33	3,781	575	489	501	2,124	1,294	1,377	46	660	185	172	870	1,290	1,112	3,468	8,376	9,358	1,064	253	145	4,904	9,116	8,731	3,594	63,485
34	2,557	287	312	314	1,315	862	868	9	175	44	66	361	545	551	285	566	599	1,083	166	90	3,080	1,445	1,526	1,773	18,880
41	1,897	732	505	436	1,964	820	329	10	623	37	79	257	514	461	151	351	215	160	37,346	4,788	33,765	880	773	15,912	103,005
42	1,385	343	198	168	927	538	202	29	738	113	185	843	1,311	797	186	300	172	121	5,858	25,542	12,682	435	1,326	24,280	78,677
51	26,928	34,427	28,657	25,059	62,574	16,710	8,027	83	4,761	386	752	2,805	5,675	5,481	1,933	4,050	3,248	2,719	31,592	8,724	670,308	49,573	9,193	72,393	1,076,056
52	10,751	30,597	20,675	8,701	16,980	5,799	7,560	153	3,951	509	597	2,569	3,669	2,769	11,124	16,815	13,673	3,042	1,377	512	77,282	192,961	27,494	11,032	470,595
53	12,930	2,248	1,282	1,413	6,581	4,406	3,722	13,014	37,022	47,748	21,176	34,034	20,646	10,491	20,231	19,465	12,488	3,232	1,042	1,433	17,062	34,402	254,811	51,630	632,509
54	23,699	2,579	1,621	2,402	14,675	8,906	3,192	1,255	10,752	6,656	7,553	35,659	36,854	18,986	4,406	4,478	3,028	2,341	19,797	27,205	88,663	6,408	42,058	295,674	668,847
Total	167,500	101,731	82,146	63,011	180,063	68,491	43,136	26,917	101,610	116,331	60,713	154,544	121,272	67,742	74,620	79,863	60,536	22,665	103,525	73,031	1,091,861	358,478	500,138	611,299	4,331,223

Table A-35: Alternative N1 Non-HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	506	17	31	26	117	118	39	0	2	1	0	13	40	58	0	26	5	19	3	2	184	11	23	123	1,365
11	28	288	118	9	17	6	1	0	1	0	0	0	0	0	0	0	0	0	0	0	69	46	0	1	584
12	53	132	80	22	38	11	2	0	0	0	0	0	0	1	0	0	0	1	0	0	45	11	0	1	397
13	82	30	57	52	125	26	8	0	1	0	0	0	1	2	0	2	0	1	0	0	225	1	1	6	622
14	157	12	23	51	361	70	22	0	2	0	0	1	4	5	0	3	0	4	1	0	427	3	2	18	1,169
15	176	5	8	17	127	89	20	0	2	0	0	2	5	6	0	3	1	7	0	0	235	3	3	19	727
16	95	4	6	10	54	38	78	0	2	0	0	1	3	3	0	3	2	20	0	0	50	14	2	8	393
21	0	0	0	0	0	0	0	43	125	22	2	0	0	0	0	0	0	0	0	0	0	0	38	0	230
22	1	0	0	0	0	0	0	33	381	219	19	0	0	0	0	0	0	0	0	0	0	0	182	0	835
23	3	0	0	0	0	0	0	4	289	412	114	0	0	0	0	0	0	0	0	0	0	0	332	0	1,155
24	1	0	0	0	0	0	0	0	17	57	45	0	0	0	0	0	0	0	0	0	0	0	97	0	218
25	13	0	0	0	3	1	1	0	2	0	0	187	77	18	0	1	0	0	0	0	5	0	2	16	328
26	39	0	1	1	6	3	2	0	1	0	0	61	137	55	0	2	0	1	0	0	12	0	18	64	404
27	110	1	1	2	19	9	5	0	3	0	0	30	120	90	0	5	0	3	0	0	44	1	39	129	614
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
32	26	0	0	0	2	1	1	0	1	0	0	1	1	1	1	94	28	1	0	0	5	24	6	3	197
33	18	0	0	0	2	1	1	0	0	0	0	0	1	1	0	33	14	0	0	0	3	15	3	2	95
34	45	2	4	3	17	23	28	0	1	0	0	1	4	3	0	3	0	11	0	0	30	4	2	8	190
41	2	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	21	0	3	0	0	1	29
42	5	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	17	3	0	0	6	36
51	347	118	165	114	555	219	28	0	9	0	0	3	11	14	0	10	1	8	4	1	3,171	8	7	105	4,899
52	74	100	81	22	44	17	18	0	5	0	0	1	2	2	0	48	36	4	0	0	50	88	3	5	599
53	53	1	0	1	7	4	3	19	292	252	103	3	45	30	0	10	1	2	0	0	15	2	464	21	1,329
54	247	2	1	5	46	21	10	0	15	5	3	24	137	104	0	11	1	5	3	7	202	2	24	1,015	1,889
Total	2,081	713	578	336	1,541	656	269	98	1,154	968	289	328	590	394	2	257	89	89	33	28	4,777	233	1,249	1,551	18,304

Table A-36: Alternative N2 HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	867	27	50	41	274	159	42	5	13	21	28	54	82	55	111	47	39	33	43	16	615	76	159	465	3,322
11	768	987	639	184	598	156	85	5	12	27	23	37	55	34	298	55	74	50	59	16	2,067	689	139	369	7,426
12	1,052	639	1,051	339	1,041	291	162	9	22	39	38	65	103	65	322	103	106	70	103	27	2,957	811	261	596	10,272
13	1,841	271	575	640	1,830	404	189	9	24	53	47	81	134	85	539	106	134	97	107	29	4,403	531	289	985	13,405
14	2,862	145	287	345	2,862	777	268	14	35	68	66	120	216	147	572	142	155	126	146	45	5,049	413	428	1,722	17,011
15	2,286	61	108	104	853	506	118	8	20	43	44	79	133	89	401	84	99	90	73	27	1,743	174	262	1,003	8,408
16	1,545	85	143	124	874	359	209	8	21	43	42	75	108	63	452	104	126	104	50	18	1,321	267	273	605	7,020
21	209	8	12	10	68	34	14	830	1,101	1,539	537	197	91	25	465	49	45	14	12	12	162	49	1,731	455	7,667
22	225	8	12	10	69	33	14	495	1,348	1,921	625	210	91	24	469	44	44	15	12	12	166	43	1,548	470	7,909
23	306	11	16	14	95	47	19	355	1,192	2,655	961	301	131	35	486	51	49	21	14	14	225	51	1,753	618	9,420
24	565	17	29	28	203	114	41	292	839	1,484	1,550	717	319	89	497	89	67	34	31	32	471	90	2,093	1,266	10,960
25	2,792	81	134	125	911	500	189	319	872	1,666	1,748	3,369	1,613	406	2,668	390	316	176	128	134	2,063	397	3,578	5,186	29,760
26	1,808	41	72	70	538	292	91	54	141	285	296	638	1,028	276	1,346	168	148	93	79	69	1,304	177	1,054	2,936	13,003
27	1,983	52	89	75	537	278	85	20	52	118	122	231	422	280	1,033	145	137	95	84	52	1,300	162	636	2,000	9,988
31	360	15	23	20	123	66	30	13	24	43	29	49	69	33	913	189	150	28	15	7	264	167	282	264	3,177
32	925	38	55	45	288	146	70	19	41	89	57	93	134	70	1,754	534	488	74	35	16	618	298	546	587	7,019
33	1,826	75	114	99	648	350	169	30	67	128	88	147	223	125	1,863	683	816	150	66	26	1,276	567	888	992	11,416
34	403	23	40	29	173	97	44	3	8	13	17	32	43	24	81	39	35	36	21	8	333	74	109	201	1,886
41	1,741	112	226	141	917	350	105	18	41	68	68	116	199	127	460	113	112	78	2,783	398	6,926	246	378	3,747	19,470
42	1,356	56	113	74	522	266	73	37	86	137	141	249	342	170	554	110	90	62	828	1,177	3,620	147	560	4,903	15,672
51	18,550	4,644	6,699	3,874	16,759	4,746	1,770	128	319	583	578	1,015	1,745	1,134	4,396	1,200	1,244	892	5,021	1,219	89,030	7,239	3,497	21,949	198,231
52	10,952	4,166	4,225	2,060	8,153	2,848	1,627	222	447	764	594	997	1,436	745	9,544	2,715	2,851	832	737	223	19,669	14,698	5,085	6,418	102,009
53	10,148	370	591	521	3,513	1,903	810	3,860	7,382	11,938	6,428	4,622	3,721	1,272	17,399	3,204	2,409	739	470	342	7,585	3,238	25,825	12,996	131,288
54	13,233	360	678	604	4,631	2,342	647	785	1,939	3,190	2,970	4,496	4,552	1,698	6,847	1,038	904	604	2,741	1,939	19,980	1,248	8,499	36,096	122,020
Total	78,601	12,291	15,979	9,578	46,479	17,065	6,871	7,536	16,045	26,916	17,098	17,991	16,992	7,071	53,469	11,405	10,635	4,516	13,657	5,859	173,147	31,854	59,874	106,828	767,759

Table A-37: Alternative N2 HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	45	0	0	0	4	2	0	0	0	0	0	1	1	1	0	0	0	0	0	0	4	0	0	3	64
11	25	32	13	1	10	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	3	0	1	94
12	28	26	11	3	22	5	1	0	0	0	0	0	0	1	0	0	0	1	0	0	8	2	0	1	109
13	64	7	7	8	38	8	1	0	0	0	0	0	1	1	0	0	0	1	0	0	45	0	0	3	184
14	106	3	3	6	76	20	3	0	0	0	0	0	1	1	0	0	0	1	0	0	92	0	0	4	317
15	119	1	1	1	17	17	1	0	0	0	0	0	0	1	0	0	0	1	0	0	27	0	0	2	191
16	67	0	0	2	12	10	6	0	0	0	0	0	0	0	0	0	0	3	0	0	5	1	0	1	108
21	0	0	0	0	0	0	0	11	18	9	0	0	0	0	0	0	0	0	0	0	0	0	4	0	42
22	1	0	0	0	0	0	0	3	66	65	4	0	0	0	0	0	0	0	0	0	0	0	17	0	156
23	1	0	0	0	0	0	0	0	39	97	27	0	0	0	0	0	0	0	0	0	0	0	32	0	196
24	1	0	0	0	0	0	0	0	4	29	21	0	0	0	0	0	0	0	0	0	0	0	17	0	72
25	15	0	0	0	1	1	0	0	0	0	0	35	11	4	0	0	0	0	0	0	2	0	0	2	72
26	23	0	0	0	2	1	0	0	0	0	0	9	13	6	0	0	0	0	0	0	2	0	1	10	68
27	52	0	0	0	3	1	0	0	0	0	0	2	8	6	0	0	0	0	0	0	5	0	3	18	99
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4	0	0	0	0	1	0	0	18
33	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	1	0	0	14
34	14	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	21
41	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	5
42	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	6
51	359	37	43	22	173	69	6	0	0	0	0	1	2	4	0	1	0	3	0	0	613	2	1	21	1,357
52	76	23	24	7	51	13	3	0	0	0	0	0	0	1	0	3	5	2	0	0	16	6	0	3	233
53	32	0	0	0	2	1	0	6	51	96	33	0	8	4	0	0	0	0	0	0	3	0	71	3	311
54	155	0	0	1	7	4	1	0	1	1	1	4	14	9	0	0	0	1	0	0	21	0	3	124	349
Total	1,201	131	103	51	420	160	25	21	178	297	87	52	61	38	0	13	13	14	3	2	851	17	151	198	4,087

Table A-38: Alternative N2 Non-HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	36,481	784	1,224	1,460	8,365	5,780	2,509	62	405	270	372	1,887	3,796	3,817	1,351	1,909	2,083	1,950	1,308	683	19,894	4,409	6,404	14,690	121,892
11	965	13,320	6,731	1,328	1,970	442	492	5	181	21	33	117	181	148	132	229	218	136	240	71	18,065	11,197	480	822	57,522
12	1,607	7,624	11,119	2,822	3,702	817	937	6	223	30	45	180	308	278	201	361	367	263	405	117	22,062	10,281	790	1,379	65,924
13	2,436	2,550	3,475	9,349	8,498	1,632	1,371	7	468	35	67	262	480	500	218	478	408	376	421	132	29,705	5,735	995	2,568	72,166
14	9,418	1,647	2,325	4,687	27,939	6,028	3,286	24	547	109	165	766	1,570	1,547	644	976	1,013	946	1,082	404	44,073	5,926	2,740	8,945	126,809
15	7,585	692	709	1,154	7,212	6,021	1,817	14	462	71	120	619	1,219	1,431	409	742	720	943	544	290	15,062	2,395	2,133	6,340	58,704
16	3,964	980	1,061	1,308	5,509	2,403	3,635	12	430	66	101	537	807	855	477	968	1,023	1,350	278	139	9,166	4,585	2,343	2,929	44,925
21	98	35	9	9	46	35	23	4,153	6,490	6,905	1,576	931	242	62	145	109	61	13	12	29	143	134	15,707	1,403	38,372
22	167	41	17	16	79	50	36	3,088	11,557	12,481	2,784	1,504	398	96	200	140	89	21	22	46	242	172	18,267	2,122	53,637
23	387	63	42	39	184	100	76	2,900	10,775	24,922	6,411	3,150	902	213	360	240	173	46	46	87	554	339	26,578	3,815	82,403
24	557	78	45	51	268	172	111	995	3,917	9,104	9,972	6,675	1,747	455	315	246	173	80	59	138	784	332	17,601	6,726	60,600
25	3,612	449	277	319	1,722	1,099	737	684	4,354	4,971	6,446	46,920	13,789	3,177	1,957	1,488	1,059	551	326	801	4,705	1,983	24,350	33,999	159,778
26	4,909	334	285	373	2,108	1,330	668	134	1,165	755	1,132	8,518	16,091	4,555	1,926	1,166	861	530	411	721	5,821	1,619	9,738	25,401	90,549
27	5,869	529	386	520	2,722	1,897	866	42	952	250	404	2,650	5,708	8,009	1,087	1,302	907	766	530	634	7,507	1,636	6,390	16,444	68,007
31	2,579	244	301	259	1,123	566	557	144	446	430	346	1,568	2,246	997	18,804	4,813	2,991	388	232	197	3,071	6,124	11,398	4,513	64,337
32	2,651	365	317	295	1,243	719	724	55	552	195	173	836	1,203	904	4,590	10,277	5,597	546	203	136	3,189	6,454	8,333	3,089	52,644
33	3,765	572	491	500	2,116	1,295	1,377	47	662	187	172	863	1,279	1,105	3,472	8,378	9,354	1,057	259	146	4,948	9,120	8,739	3,576	63,480
34	2,545	298	317	312	1,311	863	865	9	175	44	65	359	546	548	284	562	595	1,077	170	91	3,092	1,445	1,521	1,775	18,867
41	1,893	733	510	441	1,965	815	328	10	625	37	79	256	510	459	149	351	215	158	37,311	4,785	33,874	887	770	15,840	103,000
42	1,394	342	199	168	912	537	202	30	743	113	184	842	1,312	799	190	302	175	122	5,854	25,510	12,705	438	1,329	24,276	78,677
51	26,895	34,259	28,663	25,084	62,630	16,746	8,039	83	4,770	386	752	2,822	5,693	5,495	1,948	4,077	3,260	2,738	31,544	8,716	669,822	49,572	9,253	72,451	1,075,698
52	10,736	30,471	20,664	8,688	16,994	5,797	7,551	154	3,953	509	598	2,570	3,673	2,783	11,112	16,807	13,648	3,039	1,382	516	77,433	192,795	27,511	11,122	470,507
53	12,919	2,237	1,279	1,411	6,573	4,411	3,719	13,008	37,002	47,775	21,201	34,050	20,623	10,489	20,256	19,465	12,487	3,213	1,058	1,441	17,036	34,467	254,808	51,587	632,516
54	23,777	2,593	1,631	2,409	14,571	8,882	3,198	1,255	10,749	6,648	7,514	35,669	36,947	19,008	4,395	4,480	3,057	2,352	19,808	27,195	88,722	6,433	42,021	295,510	668,825
Total	167,210	101,240	82,076	63,003	179,763	68,437	43,125	26,919	101,605	116,313	60,711	154,549	121,270	67,731	74,622	79,867	60,537	22,662	103,504	73,026	1,091,672	358,477	500,197	611,323	4,329,838

Table A-39: Alternative N2 Non-HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	539	33	32	26	216	135	39	0	2	1	1	14	44	62	0	26	5	19	3	2	213	12	24	131	1,579
11	42	309	143	12	44	11	2	0	1	0	0	0	0	1	0	0	0	1	0	0	86	48	0	1	700
12	53	210	81	22	72	16	4	0	0	0	0	0	0	2	0	0	0	1	0	0	51	15	0	2	531
13	80	98	56	51	129	26	10	0	1	0	0	0	2	3	0	2	0	2	0	0	233	4	1	8	707
14	245	62	39	49	377	72	24	0	2	0	0	1	5	6	0	3	0	5	1	0	428	4	2	19	1,345
15	206	36	17	17	130	90	20	0	2	0	0	2	5	6	0	3	1	7	0	0	233	3	3	19	799
16	97	9	5	9	54	38	78	0	2	0	0	1	3	3	0	3	2	20	0	0	49	14	2	8	396
21	0	0	0	0	0	0	0	43	125	22	2	0	0	0	0	0	0	0	0	0	0	0	38	0	230
22	1	0	0	0	0	0	0	33	380	218	19	0	0	0	0	0	0	0	0	0	0	0	181	0	832
23	3	0	0	0	0	0	0	4	289	414	114	0	0	0	0	0	0	0	0	0	0	0	332	0	1,158
24	1	0	0	0	0	0	0	0	17	57	45	0	0	0	0	0	0	0	0	0	0	0	97	0	218
25	15	0	0	0	3	1	1	0	2	0	0	187	77	18	0	1	0	0	0	0	5	0	2	16	330
26	44	4	1	1	7	3	2	0	1	0	0	61	137	55	0	2	0	1	0	0	12	0	17	64	414
27	123	8	2	3	19	9	5	0	3	0	0	30	119	90	0	5	0	3	0	0	44	1	39	129	634
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
32	26	0	0	0	2	1	1	0	1	0	0	1	1	1	1	94	28	1	0	0	5	24	6	3	197
33	19	1	0	0	2	1	1	0	0	0	0	0	1	1	0	33	14	0	0	0	3	15	3	2	97
34	52	5	5	3	18	24	28	0	1	0	0	1	4	3	0	3	0	11	0	0	30	4	2	8	201
41	2	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	21	0	3	0	0	1	29
42	5	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	17	3	0	0	6	36
51	408	301	180	118	619	233	32	0	9	0	0	3	12	17	0	10	1	10	4	1	3,187	14	7	108	5,273
52	78	134	89	23	78	23	19	0	5	0	0	1	2	3	0	48	35	5	0	0	57	90	3	6	699
53	57	1	0	1	7	4	3	19	291	253	104	3	45	30	0	10	1	2	0	0	15	2	464	21	1,333
54	275	6	2	5	45	20	10	0	15	5	3	24	137	104	0	11	1	5	3	7	201	2	24	1,014	1,918
Total	2,368	1,217	652	340	1,821	708	280	98	1,153	970	289	329	597	405	2	257	89	94	34	28	4,858	253	1,248	1,567	19,656

Table A-40: Alternative N7 HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	876	24	47	40	275	161	42	5	13	21	29	54	82	55	111	47	39	33	43	16	618	76	159	465	3,332
11	719	1,015	658	184	578	147	85	5	12	28	24	38	56	32	308	57	76	49	61	16	2,091	706	144	364	7,453
12	1,044	651	1,069	342	1,045	290	162	9	23	40	38	66	104	64	331	104	107	70	104	27	2,970	820	265	589	10,335
13	1,874	271	578	644	1,845	407	190	9	24	53	47	81	134	85	538	106	133	97	108	29	4,406	529	290	985	13,464
14	2,906	141	284	344	2,886	782	269	14	36	68	67	121	216	147	575	142	156	125	146	45	5,052	412	428	1,723	17,082
15	2,306	55	104	102	853	511	118	8	21	44	45	80	133	89	400	84	98	90	73	27	1,744	173	262	1,005	8,425
16	1,557	80	139	125	879	361	208	8	21	43	42	74	107	64	448	104	125	104	49	18	1,318	265	273	605	7,020
21	213	8	12	10	69	35	14	829	1,100	1,539	534	197	91	25	463	48	44	14	12	12	164	48	1,730	456	7,667
22	228	8	12	10	70	33	14	495	1,346	1,920	622	210	92	24	469	43	43	15	12	12	168	43	1,548	472	7,909
23	309	10	16	14	96	48	19	355	1,187	2,660	956	299	132	36	486	51	49	21	14	14	228	50	1,754	619	9,423
24	568	17	29	28	204	114	41	291	839	1,488	1,547	715	320	90	497	89	67	34	31	32	474	89	2,090	1,269	10,961
25	2,823	80	133	125	913	503	188	318	877	1,666	1,752	3,363	1,612	406	2,656	388	312	176	127	133	2,070	392	3,568	5,186	29,769
26	1,831	41	72	70	538	294	91	54	144	287	298	640	1,024	276	1,341	168	148	94	78	69	1,296	175	1,055	2,925	13,010
27	2,008	47	84	74	535	280	85	20	54	119	123	231	422	280	1,025	145	136	96	84	51	1,303	161	636	1,998	9,998
31	362	15	23	20	123	66	30	13	24	43	29	49	69	33	914	189	150	28	15	7	262	167	282	263	3,177
32	931	38	55	45	288	146	70	19	41	89	57	92	133	70	1,757	533	487	75	34	16	616	298	545	586	7,020
33	1,837	74	114	99	649	351	169	30	67	127	88	147	223	125	1,858	681	814	151	66	26	1,274	565	887	995	11,417
34	409	21	38	29	174	98	44	3	8	13	17	32	43	25	80	40	35	36	21	8	332	74	109	201	1,890
41	1,752	111	224	140	920	352	105	18	41	68	68	117	201	128	470	114	113	79	2,776	397	6,900	244	379	3,759	19,474
42	1,355	56	112	74	529	266	72	36	85	138	143	252	344	170	545	111	90	62	828	1,176	3,615	146	560	4,908	15,672
51	18,573	4,660	6,729	3,876	16,812	4,743	1,775	129	325	591	585	1,021	1,746	1,130	4,451	1,205	1,250	891	5,029	1,220	89,077	7,250	3,508	21,943	198,520
52	10,916	4,186	4,253	2,066	8,162	2,849	1,624	224	450	769	594	996	1,437	746	9,568	2,719	2,856	832	742	224	19,704	14,717	5,098	6,410	102,143
53	10,245	368	590	521	3,518	1,911	811	3,863	7,370	11,925	6,413	4,614	3,724	1,274	17,358	3,198	2,403	742	469	341	7,597	3,224	25,822	12,998	131,299
54	13,314	355	674	603	4,665	2,354	645	782	1,942	3,188	2,982	4,503	4,548	1,700	6,817	1,037	904	604	2,736	1,940	19,916	1,242	8,486	36,112	122,049
Total	78,956	12,332	16,049	9,585	46,628	17,102	6,871	7,536	16,048	26,928	17,100	17,992	16,993	7,074	53,465	11,405	10,635	4,519	13,659	5,859	173,197	31,864	59,877	106,834	768,508

Table A-41: Alternative N7 HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	37	0	0	0	3	2	0	0	0	0	0	1	1	1	0	0	0	0	0	0	4	0	0	3	54
11	8	33	10	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3	0	0	61
12	9	19	5	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	39
13	23	0	0	7	37	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0	0	1	119
14	56	0	0	5	64	19	3	0	0	0	0	0	1	1	0	0	0	1	0	0	90	0	0	3	244
15	105	0	0	1	17	16	1	0	0	0	0	0	0	1	0	0	0	1	0	0	28	0	0	2	174
16	67	1	1	1	8	10	6	0	0	0	0	0	0	0	0	0	0	3	0	0	5	1	0	1	105
21	0	0	0	0	0	0	0	11	18	9	0	0	0	0	0	0	0	0	0	0	0	0	4	0	42
22	1	0	0	0	0	0	0	3	66	65	4	0	0	0	0	0	0	0	0	0	0	0	17	0	156
23	1	0	0	0	0	0	0	0	39	93	27	0	0	0	0	0	0	0	0	0	0	0	32	0	193
24	1	0	0	0	0	0	0	0	4	29	21	0	0	0	0	0	0	0	0	0	0	0	17	0	72
25	12	0	0	0	1	1	0	0	0	0	0	35	11	4	0	0	0	0	0	0	2	0	0	2	68
26	19	0	0	0	1	1	0	0	0	0	0	9	13	6	0	0	0	0	0	0	2	0	1	10	62
27	43	0	0	0	2	1	0	0	0	0	0	2	8	6	0	0	0	0	0	0	5	0	3	18	89
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4	0	0	0	0	1	0	0	18
33	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	1	0	0	14
34	10	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	17
41	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4
42	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	6
51	223	19	9	15	109	52	5	0	0	0	0	1	2	2	0	1	0	2	0	0	595	1	1	16	1,054
52	33	20	6	1	3	3	4	0	0	0	0	0	0	0	0	3	5	1	0	0	3	6	0	1	89
53	28	0	0	0	2	1	0	7	51	95	33	0	8	4	0	0	0	0	0	0	3	0	71	3	307
54	130	0	0	1	7	3	1	0	1	1	1	4	14	9	0	0	0	1	0	0	21	0	3	125	323
Total	826	92	33	32	257	119	25	22	178	292	87	51	60	34	0	13	13	12	3	2	807	15	150	188	3,310

Table A-42: Alternative N7 Non-HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	36,657	721	1,174	1,451	8,493	5,846	2,531	63	413	276	380	1,905	3,804	3,832	1,347	1,909	2,081	1,953	1,303	681	19,862	4,380	6,409	14,710	122,180
11	862	13,542	6,866	1,287	1,830	393	477	5	180	22	33	118	183	131	134	233	223	125	247	72	18,064	11,331	487	801	57,645
12	1,543	7,759	11,343	2,813	3,616	782	929	7	224	30	46	182	307	261	205	366	373	257	414	119	22,088	10,380	800	1,348	66,191
13	2,464	2,580	3,495	9,437	8,592	1,636	1,379	7	470	35	67	264	480	491	218	478	407	376	423	132	29,739	5,704	997	2,559	72,433
14	9,462	1,587	2,273	4,694	28,221	6,082	3,291	24	553	110	168	770	1,560	1,532	650	980	1,018	940	1,081	403	44,139	5,896	2,741	8,938	127,111
15	7,629	646	673	1,138	7,247	6,070	1,827	14	469	73	122	625	1,222	1,434	409	744	720	946	544	288	15,087	2,374	2,135	6,357	58,792
16	4,002	930	1,032	1,318	5,531	2,408	3,630	12	429	66	101	535	800	858	474	966	1,021	1,352	275	138	9,168	4,567	2,342	2,930	44,884
21	100	35	9	9	47	36	23	4,151	6,497	6,909	1,564	931	245	64	144	109	61	13	12	29	146	132	15,699	1,407	38,372
22	169	42	17	16	79	51	35	3,092	11,557	12,478	2,767	1,496	400	98	200	139	89	21	22	46	245	170	18,280	2,129	53,638
23	394	63	42	39	185	101	75	2,899	10,762	24,921	6,393	3,134	907	217	360	240	173	46	45	87	561	335	26,593	3,829	82,399
24	565	78	45	51	270	174	110	991	3,912	9,130	9,960	6,645	1,754	461	316	246	171	80	58	138	792	328	17,585	6,744	60,604
25	3,661	448	275	319	1,724	1,109	730	683	4,354	4,996	6,466	46,892	13,795	3,187	1,958	1,481	1,047	550	324	801	4,739	1,956	24,285	34,019	159,797
26	4,975	338	285	371	2,111	1,334	668	134	1,175	767	1,143	8,540	16,062	4,562	1,921	1,168	866	535	409	719	5,789	1,604	9,749	25,338	90,566
27	5,922	495	361	510	2,721	1,897	869	42	967	256	410	2,653	5,710	8,020	1,079	1,302	904	771	526	632	7,528	1,626	6,393	16,441	68,035
31	2,612	245	302	262	1,128	567	559	145	445	428	342	1,550	2,231	1,000	18,825	4,813	2,994	391	231	197	3,061	6,116	11,402	4,495	64,341
32	2,681	367	317	296	1,247	718	725	55	550	195	173	835	1,195	903	4,596	10,273	5,595	550	202	136	3,179	6,456	8,325	3,074	52,645
33	3,800	575	489	501	2,125	1,299	1,376	47	658	186	172	861	1,280	1,112	3,466	8,364	9,339	1,063	258	147	4,943	9,102	8,730	3,594	63,487
34	2,563	274	303	315	1,320	866	869	9	175	44	65	357	542	550	282	568	598	1,080	168	91	3,090	1,443	1,524	1,778	18,875
41	1,911	733	505	439	1,971	824	329	10	617	37	79	260	516	465	152	354	217	160	37,290	4,790	33,787	880	776	15,899	103,002
42	1,396	343	197	169	931	542	200	30	737	114	185	857	1,320	799	186	303	175	121	5,849	25,489	12,689	435	1,332	24,288	78,685
51	26,704	34,460	28,774	25,165	62,712	16,676	8,026	84	4,813	395	758	2,840	5,689	5,448	1,974	4,088	3,275	2,717	31,621	8,727	670,213	49,619	9,270	72,291	1,076,340
52	10,684	30,642	20,777	8,665	16,897	5,762	7,539	154	3,941	512	597	2,560	3,664	2,775	11,123	16,823	13,661	3,033	1,393	518	77,397	192,970	27,542	11,082	470,713
53	13,066	2,248	1,278	1,416	6,573	4,433	3,723	13,011	36,960	47,692	21,196	33,988	20,647	10,514	20,216	19,440	12,466	3,234	1,055	1,433	17,102	34,392	254,836	51,627	632,546
54	23,888	2,574	1,613	2,411	14,681	8,943	3,176	1,249	10,747	6,655	7,517	35,737	36,949	19,022	4,375	4,476	3,057	2,345	19,772	27,209	88,554	6,406	41,924	295,594	668,878
Total	167,710	101,725	82,446	63,094	180,250	68,551	43,095	26,916	101,606	116,327	60,703	154,535	121,262	67,736	74,611	79,862	60,531	22,659	103,525	73,022	1,091,962	358,604	500,157	611,269	4,332,159

Table A-43: Alternative N7 Non-HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	543	8	10	10	82	98	43	0	2	1	0	12	39	57	0	26	5	23	3	2	170	12	23	121	1,290
11	10	314	104	1	2	2	5	0	1	0	0	0	0	0	0	0	0	1	0	0	65	47	0	1	553
12	13	131	32	2	2	3	7	0	0	0	0	0	0	0	0	0	0	1	0	0	12	12	0	1	216
13	21	5	4	42	106	15	5	0	1	0	0	0	1	1	0	2	0	1	0	0	214	1	1	5	425
14	94	2	2	43	329	67	21	0	2	0	0	1	4	5	0	3	0	4	1	0	425	3	2	17	1,023
15	168	4	4	15	121	88	21	0	2	0	0	2	5	5	0	3	1	7	0	0	239	3	2	18	708
16	104	19	13	6	46	41	78	0	2	0	0	1	4	4	0	4	2	21	0	0	55	13	2	9	425
21	0	0	0	0	0	0	0	42	125	22	2	0	0	0	0	0	0	0	0	0	0	0	38	0	230
22	1	0	0	0	0	0	0	33	380	218	19	0	0	0	0	0	0	0	0	0	0	0	181	0	832
23	3	0	0	0	0	0	0	4	290	411	114	0	0	0	0	0	0	0	0	0	0	0	331	0	1,155
24	1	0	0	0	0	0	0	0	17	56	45	0	0	0	0	0	0	0	0	0	0	0	97	0	218
25	13	0	0	0	2	1	1	0	2	0	0	186	77	18	0	1	0	0	0	0	5	0	2	16	327
26	38	0	0	1	6	3	2	0	1	0	0	61	137	55	0	2	0	1	0	0	12	0	17	64	401
27	109	1	1	2	17	8	5	0	3	0	0	30	120	90	0	5	0	3	0	0	44	1	39	129	610
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
32	26	0	0	0	2	1	1	0	1	0	0	1	1	1	1	94	28	1	0	0	5	24	6	3	197
33	18	0	0	0	2	1	1	0	0	0	0	0	1	1	0	33	14	0	0	0	3	15	3	2	94
34	44	7	5	3	14	24	30	0	1	0	0	1	3	3	0	2	0	12	0	0	29	5	2	7	192
41	2	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	21	0	3	0	0	1	29
42	4	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	17	3	0	0	6	35
51	271	119	34	93	503	203	31	0	9	0	0	3	11	13	0	10	1	8	4	1	3,141	8	6	103	4,572
52	47	121	35	3	10	8	24	0	5	0	0	1	2	1	0	48	35	5	0	0	22	88	3	5	464
53	53	1	0	1	6	3	3	19	292	251	103	3	46	31	0	10	1	2	0	0	15	2	465	21	1,329
54	244	3	1	5	43	19	10	0	15	5	3	24	135	104	0	11	1	5	3	7	202	2	23	1,015	1,879
Total	1,827	735	246	228	1,294	585	289	99	1,154	965	289	328	587	389	2	256	89	94	33	28	4,664	236	1,245	1,543	17,205

A.4 East Corridor Alternatives – Transit Ridership Results

A.4.1 Description of Alternatives

As developed by the project team, Steering Committee and stakeholders, the East Corridor encompassed Alternatives E1, E5, and E6. The figure below shows the alignments in detail. (Alternative E1A was developed after these initial alignments. Additional information is included on Page A-123 and A-124).

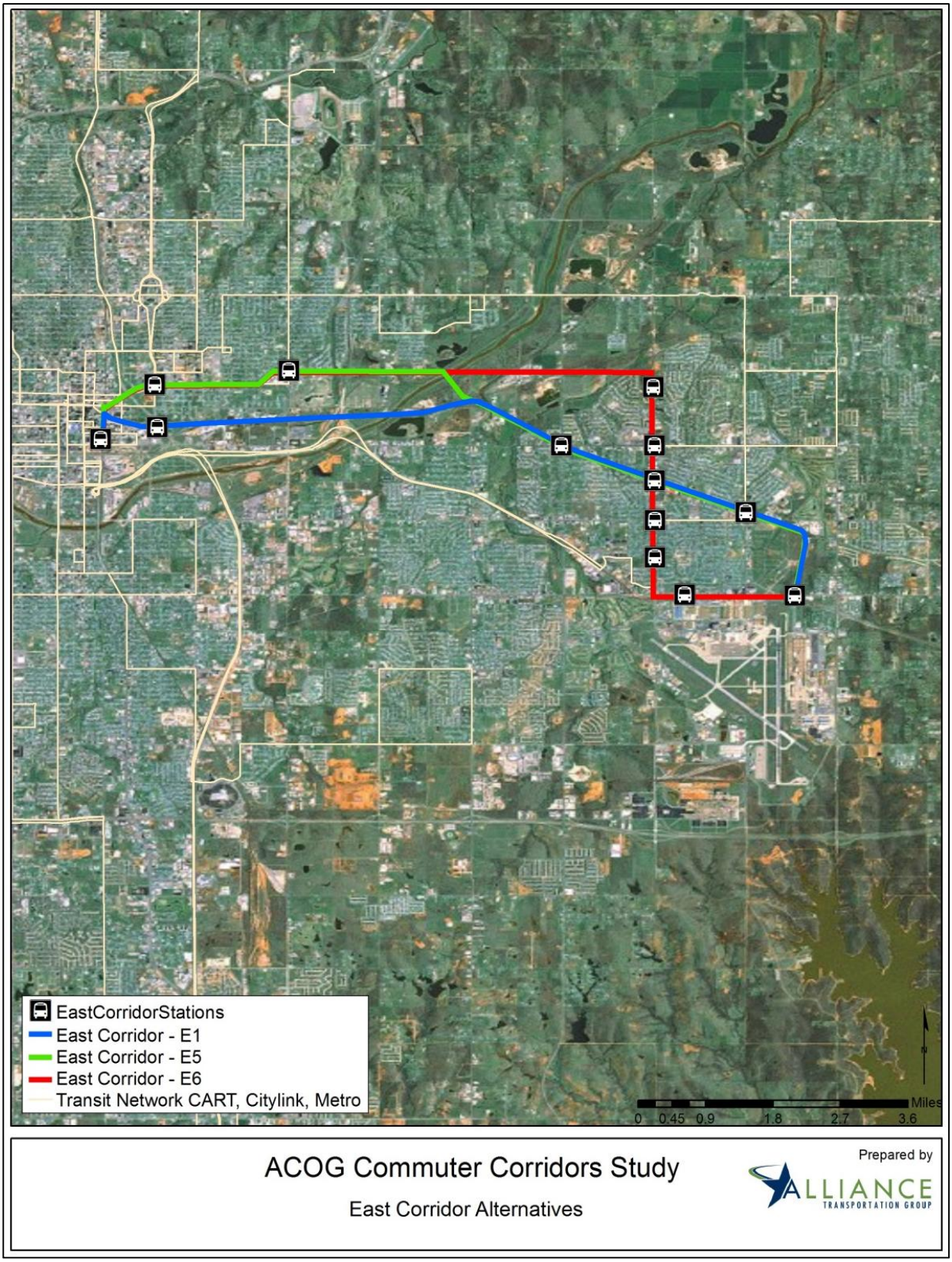
- Alternative E1 was envisioned to operate in dedicated (ROW) and was modeled as commuter rail to account for operational characteristics of the vehicle and guideway.
- Alternative E5 was envisioned to operate in mixed traffic (shared ROW) west of Sunnylane and then in dedicated ROW along the existing rail tracks. E5 was modeled transit technology-independent (accounting for either light rail transit, bus rapid transit, or streetcar).
- Alternative E6 was envisioned to operate in mixed traffic (shared ROW). E6 was modeled transit technology-independent (accounting for either bus rapid transit or streetcar).

A.4.2 Changes to the No-Build Bus Network

The following changes were made to the previously coded No-Build bus network to accommodate the E1, E5, and E6 alternatives:

- EMBARK Route 10 was extended beyond the Oklahoma City Transit Center to provide service to Santa Fe Station.
- EMBARK Route 11 was rerouted along Reno Ave and Gaylord Boulevard to serve the Santa Fe Station.
- EMBARK Route 12 was also rerouted to serve the Santa Fe Station.
- A new Lincoln Shuttle was added to connect Santa Fe Station along Gaylord Boulevard, NE 4th Street, and Lincoln Boulevard to the Capitol.

Figure A-6: East Corridor Alternatives



A.4.3 Results from Travel Demand Model

To provide a complete set of ridership forecasts and other TDM results for analysis of the candidate alternative, the following steps were taken:

- Performed an ACOG TDM run to produce horizon year 2035 ridership forecasts;
- Examined the mode choice model results;
- Examined the transit assignment results to obtain forecast transit ridership and boardings and alightings by route and mode of access (drive, walk, etc.) for the candidate alternative; and
- Prepared tables documenting the transit ridership for the candidate alternative.

It is important to note that the ridership forecasts are not capacity restrained. Therefore, they represent the potential market demand for the candidate alternative under the given demographic scenario and transit fare structure.

Transit Ridership

The following tables show the system-wide and route-specific transit ridership, projected for an average weekday in the year 2035.

Table A-44: Average Weekday System-Wide Ridership for Horizon Year 2035

Alternative	Ridership	Difference from No-Build
No-Build	23,821	N/A
Alternative E1	25,606	1,786
Alternative E5	24,587	767
Alternative E6	24,657	836

Table A-45: Average Weekday Ridership Results by Route for Horizon Year 2035

Route	No-Build Ridership	E1 Ridership	E5 Ridership	E6 Ridership
CART 12th Avenue E	160	160	158	162
CART 24th Avenue W	273	272	272	272
CART Berry Road	158	157	156	156
CART Downtown	164	164	164	164
CART E Norman	383	383	383	384
CART S10	430	431	430	430
CART S11	178	179	181	178
CART S12	235	234	233	233
CART S20	260	260	259	260
CART S21	530	530	530	530
CART N32	276	276	275	276
CART S40	72	72	71	72
CART S42	155	154	155	156
CART N52	302	302	302	302
CART Porter	349	350	349	349
CART Robinson	498	507	506	506
CART Rt 24	271	266	267	266
CART SH 9	119	119	119	119
Citylink 1	183	184	183	185
Citylink 2	204	203	204	204
Citylink 3	387	387	386	386
Citylink 4	190	190	190	190
Citylink 101	128	127	123	123
Citylink 102	199	199	199	199
EMBARK Route 2	372	389	384	391
EMBARK Route 3	335	355	350	351
EMBARK Route 5	2,558	2,570	2,564	2,562
EMBARK Route 7	1,650	1,651	1,646	1,651
EMBARK Route 8	1,346	1,350	1,348	1,348
EMBARK Route 9	310	315	313	313
EMBARK Route 10	632	953	919	920
EMBARK Route 11	1,098	1,086	1,040	1,045
EMBARK Route 12	829	1,162	1,134	1,130
EMBARK Route 13	705	711	711	710
EMBARK Route 14	654	671	669	668
EMBARK Route 15	647	535	591	620
EMBARK Route 16	598	608	607	607
EMBARK Route 18	400	385	388	389
EMBARK Route 19	100	98	100	113
EMBARK Route 22	311	304	298	298
EMBARK Route 23	1,830	1,796	1,794	1,797
EMBARK Route 36	861	857	859	857
EMBARK Route 38	498	500	501	499
EMBARK Route 40	1,216	1,232	1,228	1,232

Table A-45: Average Weekday Ridership Results by Route for Horizon Year 2035

Route	No-Build Ridership	E1 Ridership	E5 Ridership	E6 Ridership
EMBARK Lincoln Shuttle	(N/A)	160	136	136
EMBARK Mustang	61	59	59	59
EMBARK Streetcar	656	549	543	544
EMBARK Yukon	48	48	48	48
Build Alternatives	(N/A)	1,154	263	271
Grand Total	23,821	25,606	24,587	24,657

System-wide Passenger-Miles

Passenger-miles are the cumulative sum of the distances ridden by each transit passenger and give an overall idea of transit system usage.

Table A-46: Average Weekday Passenger Miles by Mode for Horizon Year 2035

Transit Mode	Alternative E1 Passenger Miles	Alternative E5 Passenger Miles	Alternative E6 Passenger Miles
Local Bus	68,906	68,850	69,146
Express Bus	5,917	5,878	5,864
Streetcar	699	694	694
Build Alternative	6,550	1,613	1,605

System-wide Transfer between Transit Modes

In order to visualize the interaction between the different transit options, the number of transfers between transit modes was analyzed.

Table A-47: Average Weekday Alternative E1 – Transfers between Modes for Horizon Year 2035

From/To	Local Bus	Express Bus	Streetcar	Rail
Local Bus	3,719	99	218	31
Express Bus	97	13	4	0
Streetcar	47	1	0	0
Rail	114	0	0	0

Table A-48: Average Weekday Alternative E5 – Transfers between Modes for Horizon Year 2035

From/To	Local Bus	Express Bus	Streetcar	BRT
Local Bus	3,680	96	213	14
Express Bus	94	13	4	1
Streetcar	46	1	0	0
BRT	24	0	0	0

Table A-49: Average Weekday Alternative E6 – Transfers between Modes for Horizon Year 2035

From/To	Local Bus	Express Bus	Streetcar	BRT
Local Bus	3,684	96	213	10
Express Bus	94	13	4	1
Streetcar	46	1	0	0
BRT	23	0	0	0

Boarding and Alightings by Station

The following graphics and tables show the passenger boardings and alightings by station location.

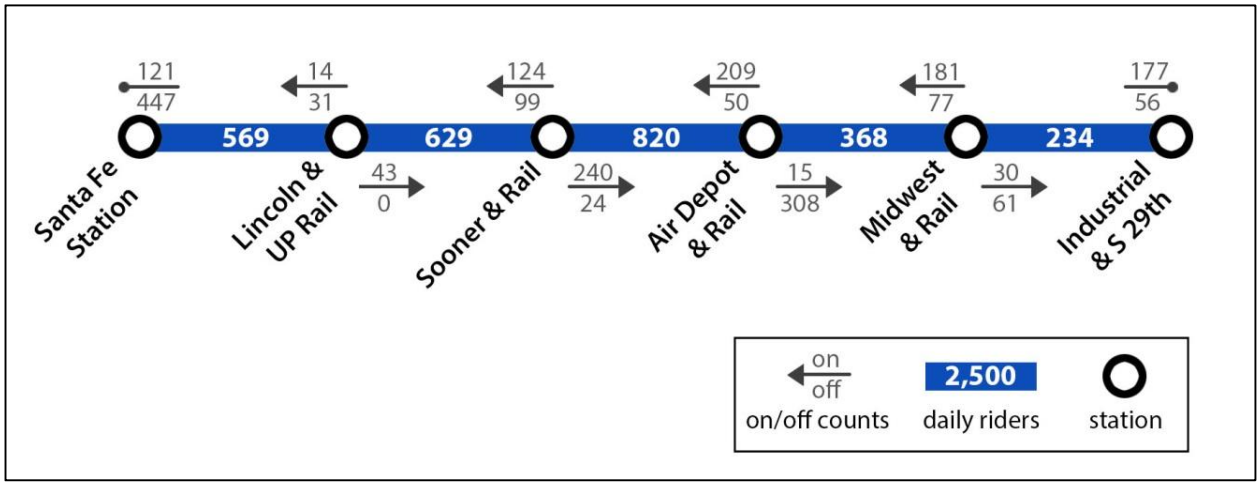
Additional Notes

- Directional Imbalance – Before reviewing the information contained in the graphic display, it is important to note that the directional imbalance of the reported rail ridership is often confusing to individuals who do not work with travel demand model transit ridership. It is the industry standard to assign transit trips in production-attraction (PA) format. The imbalance is especially noticeable for trips of very directional nature, such as home-based work (HBW) trips. This is due to the fact that the typical commuting pattern of one trip into town in the morning and one trip out of town in the evening is assigned as two inbound trips in PA format. This convention allows transit planners and the models that forecast ridership to know the household characteristics (median income, household size, vehicle availability, area type) of transit riders based on the zone the transit rider starts their trip. This convention also ensures the outbound work trips return to the same zones as the inbound trips. In reality, on a daily basis, the inbound and outbound ridership will be equal to half of the total ridership of the two directions.
- Difference between Transit Trips from Mode Choice Model and the Ridership from Transit Assignment Routine – In addition, the trip totals typically shown in the mode choice model are slightly different than the ridership by route produced by the transit assignment routine. This difference is a function of the logic inherent in the two models. The mode choice model identifies production and attraction trip ends for each zone pair by mode and all of the segments of the trip are linked together and labeled as a single trip on the highest value mode used (e.g. if in the course of the trip a rider uses bus transit to access a light rail line, the mode choice model would identify this as a single light rail trip. The bus trip would not be reflected in mode choice.) In the assignment, however, the individual modes would not be linked and the bus trip would show up in the transit ridership forecast for both the bus route and the light rail. Similarly a trip that used several bus routes would show up as a trip on each route. Since most systems have a transfer proportion of about 15% or more, the transit assignment total by mode is typically higher than the mode choice total for zone to zone trip ends.

East Corridor Alternative E1

The following graphic shows forecasted boardings or alightings at each Alternative E1 commuter rail station. (Boarding and alighting information for Alternative E1A is provided on Page A-123 and A-124.)

Figure A-7: East Corridor – 2035 Boardings and Alightings for Alternative E1



To better understand the distribution of trips throughout the course of the day, the Alternative E1 boarding and alighting information was further broken out by mode of access (walk or drive), direction, and by peak and off-peak period, as shown in Table A-50 through Table A-53.

Table A-50: Eastbound Peak Boardings and Alightings by Mode of Access for Alternative E1

Eastbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	51	0	6	0	57	0
Lincoln & UP Rail	3	0	18	0	20	0
Sooner Road & Rail	18	8	107	3	125	11
Air Depot Boulevard & Rail	4	47	4	109	8	157
Midwest Boulevard & Rail	3	13	12	16	16	29
Industrial Boulevard & SE 29th Street	0	10	0	19	0	28
Total	78	78	148	148	226	226

Table A-51: Eastbound Off-Peak Boardings and Alightings by Mode of Access for Alternative E1

Eastbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	On	Off	On
Santa Fe Station	60	0	4	0	64	0
Lincoln Boulevard & UP Rail	3	0	20	0	23	0
Sooner Road & Rail	18	9	97	3	115	12
Air Depot Boulevard & Rail	3	53	3	99	6	151
Midwest Boulevard & Rail	3	15	12	16	15	31
Industrial Boulevard & SE 29th Street	0	10	0	18	0	28
Total	87	87	136	136	223	223

Table A-52: Westbound Peak Boardings and Alightings by Mode of Access for Alternative E1

Westbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	On	Off	On
Industrial Boulevard & SE 29th Street	6	0	96	0	102	0
Midwest Boulevard & Rail	20	2	72	36	92	38
Air Depot Boulevard & Rail	60	3	49	30	110	33
Sooner Road & Rail	13	18	54	34	67	52
Lincoln Boulevard & UP Rail	0	4	9	14	9	18
Santa Fe Station	0	72	0	167	0	239
Total	99	99	280	280	380	380

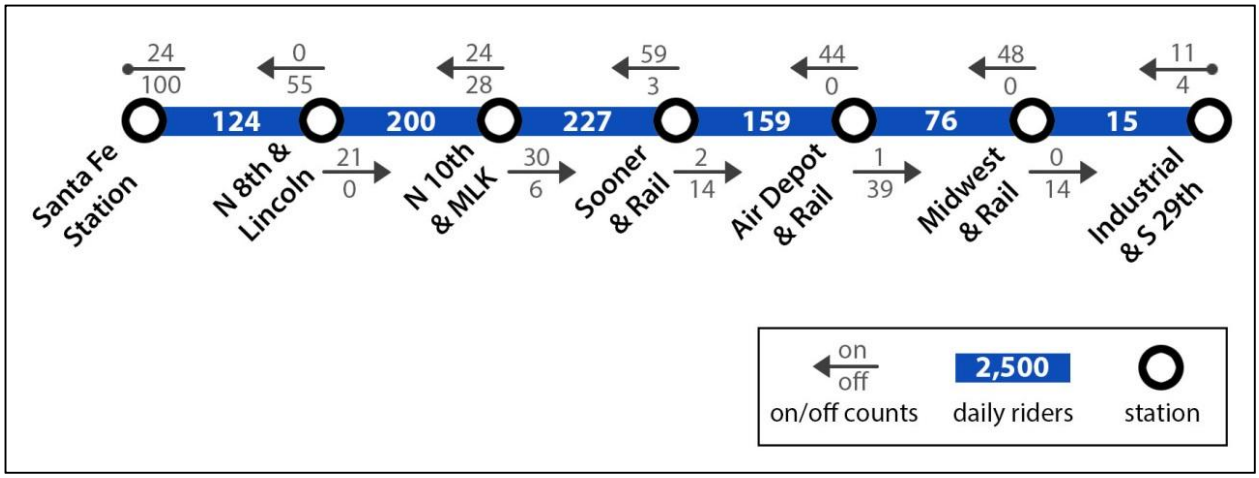
Table A-53: Westbound Off-Peak Boardings and Alightings by Mode of Access for Alternative E1

Westbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	On	Off	On
Industrial Boulevard & SE 29th Street	7	0	68	0	75	0
Midwest Boulevard & Rail	18	2	71	38	89	39
Air Depot Boulevard & Rail	61	3	38	14	99	17
Sooner Road & Rail	12	18	46	29	57	47
Lincoln Boulevard & UP Rail	0	3	5	11	5	14
Santa Fe Station	0	72	0	136	0	208
Total	97	97	228	228	325	325

East Corridor Alternative E5

The following graphic shows forecasted boardings or alightings at each Alternative E5 station.

Figure A-8: East Corridor – 2035 Boardings and Alightings for Alternative E5



To better understand the distribution of trips throughout the course of the day, the Alternative E5 boarding and alighting information is further broken out by mode of access (walk or drive), direction, and by peak and off-peak period, as shown in Table A-54 through Table A-57.

Table A-54: Eastbound Peak Boardings and Alightings by Mode of Access for Alternative E5

Eastbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	13	0	0	0	13	0
NE 8th Street & Lincoln Boulevard	6	0	5	0	10	0
NE 10th Street & MLK Avenue	10	4	5	0	15	4
Sooner Road & Rail	1	5	0	2	1	7
Air Depot Boulevard & Rail	0	14	0	5	0	20
Midwest Boulevard & Rail	0	4	0	2	0	7
Industrial Boulevard & SE 29th Street	0	1	0	1	0	2
Total	29	29	11	11	40	40

Table A-55: Eastbound Off-Peak Boardings and Alightings by Mode of Access for Alternative E5

Eastbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	10	0	0	0	10	0
NE 8th Street & Lincoln Boulevard	6	0	5	0	11	0
NE 10th Street & MLK Avenue	10	2	5	0	15	2
Sooner Road & Rail	1	5	0	3	1	7
Air Depot Boulevard & Rail	0	14	0	5	0	19
Midwest Boulevard & Rail	0	4	0	3	0	7
Industrial Boulevard & SE 29th Street	0	1	0	1	0	2
Total	26	26	11	11	37	37

Table A-56: Westbound Peak Boardings and Alightings by Mode of Access for Alternative E5

Westbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Industrial Boulevard & SE 29th Street	1	0	6	0	7	0
Midwest Boulevard & Rail	13	0	14	0	27	0
Air Depot Boulevard & Rail	17	0	7	0	24	0
Sooner Road & Rail	11	0	22	1	32	2
NE 10th Street & MLK Avenue	12	5	4	9	16	15
NE 8th Street & Lincoln Boulevard	0	15	0	16	0	31
Santa Fe Station	0	33	0	26	0	59
Total	54	54	52	52	106	106

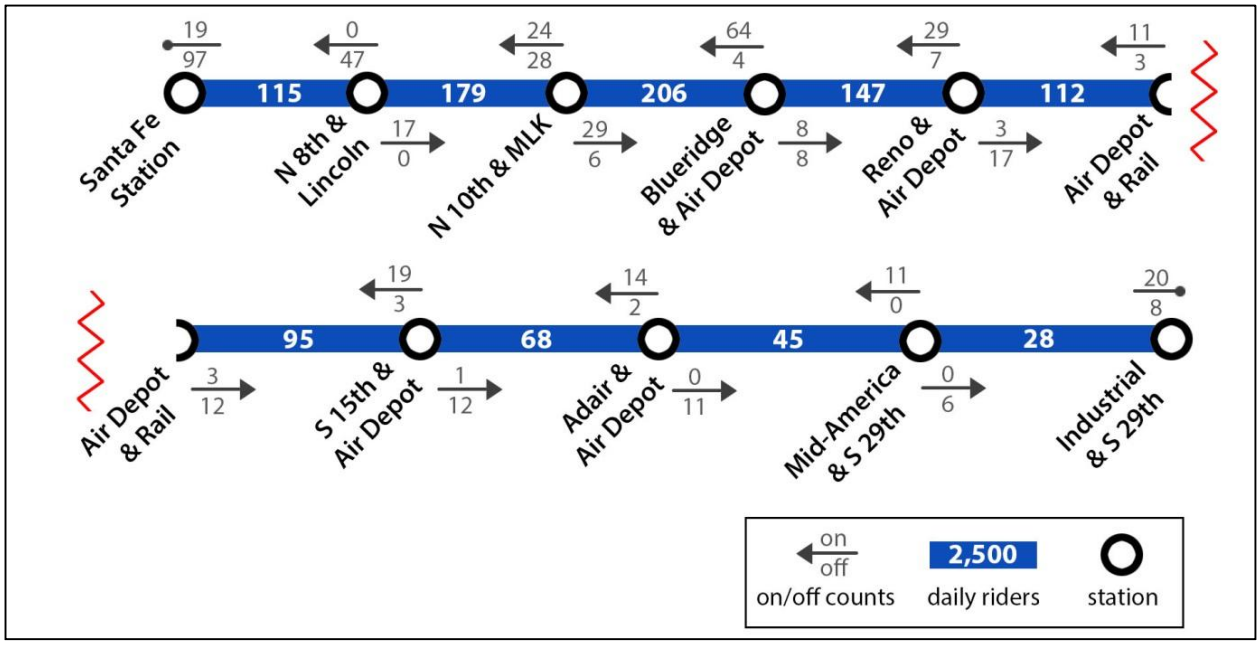
Table A-57: Westbound Off-Peak Boardings and Alightings by Mode of Access for Alternative E5

Westbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Industrial Boulevard & SE 29th Street	1	0	3	0	4	0
Midwest Boulevard & Rail	9	0	11	0	21	0
Air Depot Boulevard & Rail	12	0	9	0	20	0
Sooner Road & Rail	7	0	19	1	27	1
NE 10th Street & MLK Avenue	5	5	3	9	8	13
NE 8th Street & Lincoln Boulevard	0	11	0	13	0	24
Santa Fe Station	0	19	0	23	0	41
Total	35	35	45	45	80	80

East Corridor Alternative E6

The following graphic shows forecasted boardings or alightings at each Alternative E6 station.

Figure A-9: East Corridor – 2035 Boardings and Alightings for Alternative E6



To better understand the distribution of trips throughout the course of the day, the Alternative E6 boarding and alighting information is further broken out by mode of access (walk or drive), direction, and by peak and off-peak period, as shown in Table A-58 through Table A-61.

Table A-58: Eastbound Peak Boardings and Alightings by Mode of Access for Alternative E6

Eastbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	10	0	0	0	10	0
NE 8th Street & Lincoln Boulevard	5	0	4	0	8	0
NE 10th Street & MLK Avenue	10	4	4	0	14	4
Blueridge Drive & Air Depot Boulevard	4	2	2	1	6	4
Reno Avenue & Air Depot Boulevard	2	6	0	2	2	8
Air Depot Boulevard & Rail	1	4	1	2	2	6
SE 15th Street & Air Depot Boulevard	0	5	0	2	1	8
Adair Boulevard & Air Depot Boulevard	0	4	0	2	0	6
Mid-America Boulevard & SE 29th Street	0	3	0	1	0	4
Industrial Boulevard & SE 29th Street	0	3	0	1	0	4
Total	32	32	12	12	43	43

Table A-59: Eastbound Off-Peak Boardings and Alightings by Mode of Access for Alternative E6

Eastbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	8	0	0	0	8	0
NE 8th Street & Lincoln Boulevard	5	0	4	0	9	0
NE 10th Street & MLK Avenue	10	2	5	0	15	2
Blueridge Drive & Air Depot Boulevard	2	3	1	1	2	4
Reno Avenue & Air Depot Boulevard	1	6	0	3	2	9
Air Depot Boulevard & Rail	0	4	0	2	1	6
SE 15th Street & Air Depot Boulevard	0	3	0	2	1	4
Adair Boulevard & Air Depot Boulevard	0	3	0	2	0	5
Mid-America Boulevard & SE 29th Street	0	2	0	1	0	2
Industrial Boulevard & SE 29th Street	0	2	0	1	0	4
Total	26	26	11	11	37	37

Table A-60: Westbound Peak Boardings and Alightings by Mode of Access for Alternative E6

Westbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Industrial Boulevard & SE 29th Street	2	0	9	0	11	0
Mid-America Boulevard & SE 29th Street	6	0	1	0	6	0
Adair Boulevard & Air Depot Boulevard	5	0	3	1	7	2
SE 15th Street & Air Depot Boulevard	3	0	6	1	9	2
Air Depot Boulevard & Rail	6	0	0	1	6	2
Reno Avenue & Air Depot Boulevard	8	3	8	2	16	4
Blueridge Drive & Air Depot Boulevard	9	1	25	1	34	2
NE 10th Street & MLK Avenue	12	6	4	8	16	14
NE 8th Street & Lincoln Boulevard	0	12	0	14	0	26
Santa Fe Station	0	27	0	27	0	54
Total	50	50	56	56	106	106

Table A-61: Westbound Off-Peak Boardings and Alightings by Mode of Access for Alternative E6

Westbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Industrial Boulevard & SE 29th Street	2	0	7	0	9	0
Mid-America Boulevard & SE 29th Street	4	0	1	0	5	0
Adair Boulevard & Air Depot Boulevard	4	0	2	0	6	0
SE 15th Street & Air Depot Boulevard	2	0	8	1	10	1
Air Depot Boulevard & Rail	5	0	0	1	5	2
Reno Avenue & Air Depot Boulevard	6	2	7	1	13	3
Blueridge Drive & Air Depot Boulevard	6	1	23	1	30	2
NE 10th Street & MLK Avenue	5	5	3	8	8	14
NE 8th Street & Lincoln Boulevard	0	9	0	12	0	21
Santa Fe Station	0	16	0	26	0	42
Total	34	34	52	52	85	85

Additional Trip Characteristics – Market Segmentation

Further breaking down travel patterns by trip purpose, income, and mode of travel helps to better understand the needs of the transportation system users. The following tables offer information in regard to trip purpose by income level,[6] as well as trip purpose by mode of travel.[7] The trips purposes included in the analysis are:

- HBW – Home-based work trips
- HBO – Home-based trips for shopping, recreation or other purposes
- HBU – Home-based trips to higher education facilities
- NHBW – Non-home-based work trips
- NHBO – Non-home-based trips for shopping, recreation or other purposes
- HBSch – Home-based trips to schools (kindergarten through 12th grade)

Table A-62: Overall 2035 Trips by Purpose and Income Level for all Alternatives

	Low Income	Medium Income	High Income	Total
HBW	55,905	461,594	319,501	837,000
HBO	240,873	1,075,071	641,055	1,957,000
HBU		139,000		139,000
NHBW		506,000		506,000
NHBO		1,315,000		1,315,000
HBSch		848,000		848,000
Total				5,602,000

Of additional interest was a breakout of trips by purpose and mode of travel, for which the following mode of travel breakdown was considered:

- SOV – Single-occupancy vehicle, accounting for those automobile trips, where the driver is the only person in the vehicle
- HOV – High-occupancy vehicle, accounting for those automobile trips, where the driver is accompanied by at least one passenger
- LB – Local Bus, accounting for all local bus routes, thus excluding the express bus routes to Edmond, Norman, Yukon, and Mustang
- EB – Express Bus, accounting for the express bus routes to Edmond, Norman, Yukon, and Mustang (including the express bus-like Alternatives E5 and E6, where applicable).
- SC – Streetcar, accounting for trips associated with the planned downtown Streetcar circulator.
- RL – Rail, accounting for the trips associated with rail (including rail Alternative E1).

Table A-63 through Table A-69 show the number of trips broken out by purpose and mode of travel for both the No-Build Alternative and the three East Corridor Alternatives, which helps illustrate the travel purpose that the proposed new build alternatives would be used.

[6] Only HBW and HBO trips were stratified by income level.

[7] It should be noted that for trip tables by income level and mode of travel, the total number of trips was rounded to the nearest thousand and individual cells were proportionally adjusted to match the totals.

Table A-63: 2035 No-Build Alternative Trips by Purpose and Mode of Travel

	SOV	HOV	LB	EB	SC	RL	Total
HBW	743,128	90,720	3,045	93	14	0	837,000
HBO	863,167	1,085,601	7,954	257	20	0	1,957,000
HBU	120,524	17,242	1,109	125	0	0	139,000
NHBW	410,095	94,605	1,193	30	77	0	506,000
NHBO	523,951	785,283	5,394	190	183	0	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,814,353	2,767,963	18,696	694	294	0	5,602,000

Table A-64: 2035 Trips by Purpose and Mode of Travel for Alternative E1

	SOV	HOV	LB	EB	SC	RL	Total
HBW	742,876	90,710	3,153	91	13	158	837,000
HBO	863,010	1,085,425	8,023	254	20	267	1,957,000
HBU	120,464	17,224	1,123	125	0	64	139,000
NHBW	410,007	94,593	1,228	28	75	69	506,000
NHBO	523,643	784,785	5,621	186	172	593	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,813,489	2,767,249	19,147	684	280	1,151	5,602,000

Table A-65: Difference in 2035 Trips by Purpose and Model of Travel between the No-Build Alternative and Alternative E1

	SOV	HOV	LB	EB	SC	RL
HBW	(253)	(10)	107	(2)	(1)	158
HBO	(157)	(176)	69	(3)	0	267
HBU	(59)	(19)	14	0	0	64
NHBW	(88)	(12)	34	(2)	(2)	69
NHBO	(308)	(498)	227	(4)	(10)	593
HBSch	0	0	0	0	0	0
Total	(864)	(714)	451	(10)	(13)	1,151

Table A-66: 2035 Trips by Purpose and Mode of Travel for Alternative E5

	SOV	HOV	LB	EB	SC	RL	Total
HBW	742,975	90,721	3,153	137	13	0	837,000
HBO	863,049	1,085,576	8,020	335	20	0	1,957,000
HBU	120,492	17,230	1,126	153	0	0	139,000
NHBW	410,046	94,605	1,229	45	75	0	506,000
NHBO	523,766	785,137	5,653	272	173	0	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,813,816	2,767,780	19,181	942	281	0	5,602,000

Table A-67: Difference in 2035 Trips by Purpose and Model of Travel between the No-Build Alternative and Alternative E5

	SOV	HOV	LB	EB	SC	RL
HBW	(153)	1	108	45	0	0
HBO	(118)	(25)	66	78	0	0
HBU	(32)	(12)	16	28	0	0
NHBW	(49)	0	35	16	(2)	0
NHBO	(185)	(146)	259	82	(10)	0
HBSch	0	0	0	0	0	0
Total	(537)	(183)	485	248	(13)	0

Table A-68: 2035 Trips by Purpose and Mode of Travel for Alternative E6

	SOV	HOV	LB	EB	SC	RL	Total
HBW	743,001	90,687	3,166	133	13	0	837,000
HBO	863,093	1,085,492	8,055	341	20	0	1,957,000
HBU	120,494	17,225	1,127	154	0	0	139,000
NHBW	410,061	94,587	1,231	45	75	0	506,000
NHBO	523,820	785,063	5,669	276	173	0	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,813,957	2,767,567	19,248	948	281	0	5,602,000

Table A-69: Difference in 2035 Trips by Purpose and Model of Travel between the No-Build Alternative and Alternative E6

	SOV	HOV	LB	EB	SC	RL
HBW	(128)	(32)	121	40	0	0
HBO	(74)	(109)	100	84	0	0
HBU	(29)	(17)	18	29	0	0
NHBW	(34)	(17)	38	16	(2)	0
NHBO	(131)	(220)	275	86	(10)	0
HBSch	0	0	0	0	0	0
Total	(396)	(396)	551	254	(13)	0

Table A-70 through Table A-72 shows the potential reduction in vehicle miles of travel (VMT) by trip purpose because of the addition of the respective East Corridor alternative.

Table A-70: Potential Reduced VMT by Trip Purpose for Alternative E1

	SOV (VMT)	HOV (VMT)	Total (VMT)
HBW	2,249	214	2,463
HBO	1,394	3,764	5,158
HBU	528	395	923
NHBW	779	252	1,031
NHBO	2,741	10,633	13,374
Total	7,690	15,258	22,949

Table A-71: Potential Reduced VMT by Trip Purpose for Alternative E5

	SOV (VMT)	HOV (VMT)	Total (VMT)
HBW	1,362	(23)	1,338
HBO	1,051	541	1,593
HBU	283	263	546
NHBW	437	2	439
NHBO	1,647	3,121	4,769
Total	4,780	3,904	8,684

Table A-72: Potential Reduced VMT by Trip Purpose for Alternative E6

	SOV (VMT)	HOV (VMT)	Total (VMT)
HBW	1,135	692	1,828
HBO	661	2,338	2,999
HBU	258	374	632
NHBW	301	373	674
NHBO	1,170	4,689	5,859
Total	3,525	8,466	11,991

Table A-73: Alternative E1 HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	877	24	48	41	276	161	42	5	13	21	28	53	82	56	111	49	40	33	43	16	615	75	159	464	3,333
11	721	1,016	657	184	579	147	85	5	12	28	23	38	56	32	308	59	77	49	61	16	2,092	706	143	367	7,461
12	1,046	654	1,069	342	1,047	291	163	9	22	40	38	66	104	63	328	105	108	70	104	27	2,977	819	263	594	10,350
13	1,872	271	578	644	1,844	406	190	9	24	53	47	81	134	84	541	106	133	97	108	29	4,412	530	290	983	13,466
14	2,912	141	284	344	2,887	782	269	14	35	68	66	120	215	147	572	145	157	125	146	45	5,051	412	426	1,720	17,083
15	2,311	55	104	102	853	511	118	8	20	43	44	79	133	89	403	87	101	90	73	27	1,740	173	261	1,002	8,426
16	1,558	81	140	125	881	362	209	8	21	43	42	75	108	63	449	105	125	104	49	18	1,320	265	273	602	7,027
21	209	8	12	10	68	34	14	829	1,101	1,542	538	197	90	25	465	48	44	14	12	12	162	48	1,732	454	7,668
22	224	8	12	10	68	33	14	496	1,348	1,923	624	211	92	24	471	43	44	15	12	12	166	43	1,549	470	7,911
23	305	11	16	14	95	47	19	355	1,192	2,661	959	301	131	35	486	51	49	21	14	14	225	50	1,755	617	9,423
24	563	17	29	28	202	113	41	291	842	1,489	1,550	716	319	90	496	89	66	34	31	32	473	88	2,094	1,270	10,961
25	2,800	81	133	124	907	499	187	319	878	1,663	1,752	3,376	1,614	406	2,679	389	313	176	128	134	2,061	393	3,573	5,187	29,771
26	1,825	41	72	70	536	293	91	54	142	285	295	639	1,027	276	1,344	169	148	94	78	70	1,300	175	1,052	2,936	13,011
27	2,003	48	84	74	536	279	85	20	53	118	122	230	422	281	1,027	149	138	96	83	51	1,302	161	636	2,003	10,000
31	355	15	23	20	123	66	30	13	24	43	29	49	69	33	915	185	148	28	15	7	262	167	282	264	3,165
32	939	37	55	46	292	150	71	19	40	88	56	91	133	71	1,745	527	482	74	34	16	614	296	541	585	7,002
33	1,822	74	115	99	654	353	170	30	67	127	87	147	223	126	1,849	666	802	150	65	26	1,273	564	883	988	11,358
34	408	22	38	29	175	98	44	3	8	13	17	32	43	25	80	40	35	36	21	8	333	74	108	200	1,891
41	1,747	111	224	140	919	352	105	18	41	68	68	117	201	127	468	113	112	79	2,781	398	6,906	244	377	3,758	19,473
42	1,359	56	112	74	527	267	73	36	85	136	141	249	343	170	548	111	90	62	828	1,178	3,620	146	558	4,904	15,673
51	18,597	4,665	6,736	3,884	16,826	4,741	1,771	127	319	580	576	1,011	1,744	1,132	4,430	1,207	1,250	890	5,028	1,220	89,097	7,252	3,493	21,954	198,530
52	10,916	4,189	4,254	2,064	8,178	2,851	1,629	223	447	766	595	999	1,438	742	9,560	2,710	2,850	832	740	223	19,711	14,718	5,095	6,406	102,136
53	10,178	368	589	520	3,507	1,905	808	3,864	7,375	11,943	6,425	4,622	3,725	1,275	17,388	3,188	2,401	741	467	342	7,564	3,224	25,845	13,010	131,271
54	13,350	355	672	602	4,651	2,360	649	782	1,939	3,179	2,974	4,490	4,546	1,701	6,842	1,041	901	606	2,736	1,938	19,928	1,242	8,477	36,099	122,060
Total	78,897	12,347	16,056	9,587	46,629	17,101	6,875	7,535	16,047	26,919	17,098	17,990	16,992	7,073	53,504	11,381	10,613	4,517	13,659	5,859	173,204	31,865	59,865	106,832	768,449

Table A-74: Alternative E1 HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	37	0	0	0	3	2	0	0	0	0	0	1	1	1	0	0	0	0	0	0	4	0	0	3	54
11	5	30	9	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3	0	0	53
12	4	16	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	27
13	22	0	0	6	37	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0	0	1	117
14	56	0	0	5	64	19	3	0	0	0	0	0	1	1	0	0	0	1	0	0	90	0	0	3	245
15	105	0	0	1	17	16	1	0	0	0	0	0	0	1	0	0	0	1	0	0	27	0	0	2	173
16	63	0	0	1	7	9	6	0	0	0	0	0	0	0	0	0	0	3	0	0	5	1	0	1	97
21	0	0	0	0	0	0	0	11	18	9	0	0	0	0	0	0	0	0	0	0	0	0	4	0	42
22	1	0	0	0	0	0	0	3	66	65	4	0	0	0	0	0	0	0	0	0	0	0	17	0	156
23	1	0	0	0	0	0	0	0	39	95	27	0	0	0	0	0	0	0	0	0	0	0	32	0	195
24	1	0	0	0	0	0	0	0	4	30	21	0	0	0	0	0	0	0	0	0	0	0	17	0	73
25	12	0	0	0	1	1	0	0	0	0	0	35	11	4	0	0	0	0	0	0	2	0	0	2	68
26	18	0	0	0	1	1	0	0	0	0	0	9	13	6	0	0	0	0	0	0	2	0	1	10	62
27	42	0	0	0	2	1	0	0	0	0	0	2	8	6	0	0	0	0	0	0	5	0	3	18	89
31	8	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	1	0	0	0	0	0	0	0	15
32	22	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	6	0	0	0	1	1	1	0	39
33	40	0	0	0	1	2	0	0	0	0	0	0	0	1	1	14	12	1	0	0	1	1	1	1	77
34	10	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	17
41	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4
42	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	6
51	220	15	9	15	109	52	4	0	0	0	0	1	2	2	0	1	0	2	0	0	595	1	1	16	1,044
52	47	16	5	1	3	4	2	0	0	0	0	0	0	1	1	6	7	1	0	0	3	6	1	1	104
53	40	0	0	0	2	2	0	6	51	96	33	0	9	4	1	5	2	1	0	0	3	0	71	4	332
54	130	0	0	1	7	3	1	0	1	1	1	4	14	9	0	0	0	1	0	0	21	0	3	125	324
Total	891	77	28	31	259	121	19	21	178	295	87	52	61	35	6	37	30	12	3	2	808	15	153	191	3,413

Table A-75: Alternative E1 All Other Trip Purposes by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	36,635	739	1,194	1,465	8,492	5,852	2,536	61	406	268	370	1,873	3,807	3,833	1,351	1,958	2,109	1,955	1,311	676	19,816	4,380	6,380	14,662	122,130
11	861	13,554	6,867	1,287	1,834	394	483	5	181	21	33	118	183	130	135	241	229	125	246	72	18,073	11,333	490	805	57,702
12	1,545	7,774	11,328	2,824	3,632	786	932	6	224	30	46	182	306	258	205	372	377	256	412	119	22,118	10,366	798	1,357	66,255
13	2,460	2,581	3,500	9,446	8,587	1,637	1,377	7	471	35	67	263	477	488	220	479	408	376	423	131	29,747	5,709	999	2,549	72,439
14	9,490	1,591	2,281	4,686	28,207	6,076	3,288	23	551	109	166	768	1,560	1,539	651	1,014	1,042	939	1,080	396	44,098	5,901	2,730	8,925	127,111
15	7,642	650	675	1,133	7,246	6,069	1,820	14	467	71	120	622	1,220	1,434	417	787	748	946	541	284	15,055	2,375	2,130	6,338	58,802
16	3,981	951	1,046	1,315	5,547	2,411	3,639	12	430	65	101	538	803	855	477	978	1,026	1,355	276	137	9,173	4,565	2,344	2,908	44,932
21	97	36	9	9	45	35	23	4,152	6,498	6,916	1,577	934	242	62	145	108	61	13	12	29	143	132	15,700	1,398	38,376
22	166	42	17	16	78	50	36	3,094	11,559	12,480	2,775	1,509	398	97	201	139	89	21	21	46	242	171	18,280	2,120	53,645
23	385	63	42	38	182	99	76	2,898	10,779	24,922	6,405	3,155	904	214	361	239	172	46	46	86	554	337	26,591	3,814	82,408
24	554	78	44	50	267	171	109	990	3,919	9,117	9,965	6,659	1,744	457	315	244	168	79	60	139	787	327	17,606	6,750	60,598
25	3,608	449	275	315	1,709	1,094	729	685	4,359	4,972	6,466	47,034	13,790	3,175	1,970	1,483	1,034	548	327	803	4,705	1,960	24,317	33,986	159,794
26	4,947	339	284	368	2,097	1,328	667	133	1,167	755	1,132	8,521	16,094	4,566	1,929	1,183	867	533	409	724	5,800	1,605	9,725	25,394	90,565
27	5,910	499	363	508	2,728	1,899	867	41	959	250	404	2,626	5,712	8,037	1,083	1,348	933	771	524	627	7,501	1,616	6,386	16,441	68,034
31	2,579	245	301	260	1,126	569	556	145	448	435	347	1,574	2,260	1,000	18,837	4,735	2,965	388	229	196	3,048	6,114	11,412	4,528	64,298
32	2,700	365	319	299	1,273	747	735	54	549	194	171	825	1,196	921	4,555	10,153	5,520	551	200	135	3,196	6,426	8,301	3,094	52,479
33	3,769	576	497	507	2,157	1,325	1,386	47	658	185	171	859	1,283	1,125	3,446	8,180	9,162	1,059	256	143	4,965	9,094	8,691	3,589	63,129
34	2,557	284	308	316	1,328	868	863	8	175	44	65	356	545	551	282	572	599	1,074	171	90	3,096	1,435	1,515	1,767	18,871
41	1,900	735	508	440	1,964	821	328	10	619	37	79	260	517	461	151	350	215	160	37,319	4,787	33,787	880	771	15,894	102,992
42	1,397	344	198	169	924	541	203	29	738	112	182	844	1,317	798	188	302	174	122	5,850	25,525	12,708	435	1,325	24,261	78,685
51	26,749	34,502	28,793	25,176	62,676	16,631	8,006	83	4,782	386	749	2,808	5,687	5,453	1,972	4,125	3,298	2,713	31,595	8,729	670,206	49,642	9,241	72,390	1,076,391
52	10,642	30,671	20,781	8,668	16,943	5,765	7,546	154	3,941	513	599	2,570	3,675	2,757	11,120	16,730	13,606	3,031	1,388	515	77,427	193,048	27,537	11,081	470,708
53	12,966	2,249	1,281	1,410	6,549	4,420	3,714	13,013	36,996	47,755	21,197	34,027	20,638	10,512	20,226	19,341	12,420	3,229	1,045	1,437	17,001	34,385	254,953	51,646	632,410
54	23,959	2,577	1,610	2,391	14,668	8,967	3,219	1,249	10,732	6,644	7,516	35,608	36,907	19,012	4,388	4,510	3,048	2,368	19,775	27,192	88,731	6,394	41,884	295,545	668,892
Total	167,501	101,893	82,524	63,097	180,258	68,554	43,139	26,914	101,607	116,315	60,704	154,532	121,263	67,734	74,625	79,571	60,269	22,657	103,516	73,020	1,091,977	358,630	500,104	611,243	4,331,647

Table A-76: Alternative E1 All Other Trip Purposes by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	535	6	8	10	82	94	39	0	2	1	0	12	39	57	5	64	47	21	3	2	171	11	24	122	1,354
11	6	290	94	1	2	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	55	46	0	1	498
12	6	106	30	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	11	11	0	0	172
13	20	2	2	41	106	15	4	0	1	0	0	0	1	1	0	2	0	1	0	0	214	1	1	4	417
14	94	1	2	42	332	66	21	0	2	0	0	1	4	5	0	4	1	4	1	0	423	3	2	17	1,024
15	165	2	4	15	121	88	20	0	2	0	0	2	5	5	0	4	1	7	0	0	234	2	2	18	699
16	93	2	4	5	44	40	76	0	2	0	0	1	3	3	0	4	2	20	0	0	53	13	2	9	377
21	0	0	0	0	0	0	0	43	125	22	2	0	0	0	0	0	0	0	0	0	0	0	38	0	230
22	1	0	0	0	0	0	0	33	381	218	19	0	0	0	0	0	0	0	0	0	0	0	182	0	834
23	3	0	0	0	0	0	0	4	290	412	114	0	0	0	0	0	0	0	0	0	0	0	332	0	1,156
24	1	0	0	0	0	0	0	0	17	59	47	0	0	0	0	0	0	0	0	0	0	0	100	0	226
25	12	0	0	0	2	1	1	0	2	0	0	187	77	18	0	1	0	0	0	0	5	0	2	16	327
26	38	0	0	1	6	3	2	0	1	0	0	61	137	55	0	5	2	1	0	0	12	0	18	64	406
27	108	1	1	2	17	8	5	0	3	0	0	30	120	90	0	8	2	3	0	0	44	1	39	129	614
31	31	0	0	0	0	1	0	0	0	0	0	0	0	1	6	47	19	1	0	0	1	1	1	1	111
32	111	0	0	0	3	3	2	0	1	0	0	1	2	3	19	112	66	2	0	0	7	24	8	5	369
33	126	0	0	0	3	4	2	0	1	0	0	0	1	3	11	151	126	4	0	0	8	15	7	6	470
34	44	2	4	2	15	23	28	0	1	0	0	1	3	3	1	11	7	12	0	0	30	4	2	8	201
41	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	21	0	3	0	0	1	29
42	4	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	17	3	0	0	6	35
51	267	70	31	93	501	202	27	0	9	0	0	3	11	13	0	13	2	8	4	1	3,131	8	6	103	4,502
52	75	91	26	2	10	9	16	0	5	0	0	1	2	2	8	72	53	4	0	0	23	88	3	6	496
53	73	1	0	1	7	5	3	19	292	253	103	3	46	32	5	46	18	2	0	0	17	2	466	23	1,416
54	244	2	1	5	43	19	10	0	15	5	3	24	136	104	0	13	2	5	3	7	202	2	24	1,015	1,884
Total	2,059	576	206	224	1,297	585	257	98	1,155	972	291	328	590	397	56	557	349	96	33	28	4,649	233	1,260	1,554	17,848

Table A-77: Alternative E5 HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	877	24	47	41	275	161	42	5	13	21	29	54	82	55	112	49	40	33	42	17	616	76	160	465	3,333
11	720	1,019	660	184	575	147	85	5	12	28	24	39	56	32	310	57	75	48	61	16	2,091	708	144	364	7,460
12	1,046	654	1,072	342	1,043	290	163	9	23	40	38	67	104	64	332	104	107	70	104	28	2,974	821	265	590	10,349
13	1,870	272	578	644	1,843	406	190	9	24	54	48	82	134	85	543	109	136	98	108	29	4,403	529	291	981	13,467
14	2,905	141	284	344	2,885	782	269	14	35	69	67	121	215	147	573	145	160	126	145	45	5,050	411	428	1,721	17,084
15	2,309	55	104	102	852	511	118	8	20	43	44	80	133	89	402	87	102	90	73	27	1,741	173	262	1,002	8,427
16	1,552	81	140	125	879	361	209	8	21	43	42	75	108	63	453	108	129	104	49	18	1,315	266	274	604	7,027
21	213	8	12	10	69	35	14	827	1,099	1,539	536	197	91	25	463	48	44	14	12	12	164	49	1,728	457	7,668
22	229	8	13	10	70	33	14	495	1,346	1,918	623	210	92	24	467	43	43	15	12	12	169	43	1,546	473	7,910
23	309	11	16	14	96	48	19	354	1,191	2,658	957	300	132	35	484	50	48	21	14	15	227	51	1,752	620	9,422
24	567	17	29	28	204	114	41	292	839	1,487	1,546	715	319	90	493	88	66	34	32	32	474	89	2,091	1,273	10,961
25	2,814	81	133	125	914	502	188	318	870	1,661	1,741	3,363	1,616	408	2,668	390	316	177	128	134	2,065	396	3,572	5,189	29,769
26	1,828	42	72	70	538	294	91	54	142	285	296	637	1,025	276	1,346	169	149	94	78	69	1,295	177	1,055	2,930	13,010
27	2,003	48	84	74	535	279	85	21	53	118	122	231	421	280	1,032	147	139	96	83	51	1,301	162	636	1,998	10,000
31	363	15	23	19	124	67	30	13	24	43	29	49	69	33	913	188	148	28	15	7	264	167	282	264	3,177
32	943	37	54	47	296	149	71	19	41	88	56	93	134	70	1,739	523	478	74	34	16	632	294	539	588	7,013
33	1,839	74	113	100	657	353	170	30	67	127	87	148	223	126	1,848	673	804	149	65	26	1,291	562	880	993	11,404
34	408	21	38	29	174	97	44	3	8	13	17	32	43	24	81	41	35	36	21	8	332	74	109	201	1,890
41	1,749	111	224	140	922	353	106	18	40	68	69	116	200	127	469	113	112	79	2,777	397	6,910	244	378	3,755	19,475
42	1,348	56	112	74	528	266	72	36	85	136	142	248	343	170	554	110	89	61	828	1,177	3,621	146	559	4,908	15,671
51	18,607	4,666	6,730	3,878	16,793	4,742	1,766	129	322	589	584	1,021	1,750	1,134	4,454	1,217	1,263	892	5,029	1,220	89,067	7,241	3,509	21,934	198,536
52	10,957	4,185	4,255	2,062	8,171	2,849	1,631	223	449	769	595	1,002	1,441	746	9,534	2,707	2,838	833	741	224	19,710	14,708	5,098	6,427	102,154
53	10,216	368	590	521	3,525	1,912	814	3,861	7,378	11,934	6,416	4,619	3,721	1,274	17,386	3,193	2,395	741	468	341	7,591	3,231	25,817	12,994	131,305
54	13,276	356	674	605	4,662	2,354	644	786	1,944	3,188	2,989	4,492	4,540	1,698	6,857	1,045	911	603	2,738	1,939	19,897	1,248	8,501	36,102	122,049
Total	78,949	12,348	16,056	9,588	46,629	17,104	6,875	7,536	16,047	26,921	17,098	17,991	16,993	7,075	53,513	11,402	10,629	4,516	13,658	5,859	173,198	31,865	59,874	106,832	768,559

Table A-78: Alternative E5 HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	37	0	0	0	3	2	0	0	0	0	0	1	1	1	0	0	0	0	0	0	4	0	0	3	54
11	5	30	9	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3	0	0	53
12	4	16	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	27
13	22	0	0	6	37	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0	0	1	117
14	56	0	0	5	64	19	3	0	0	0	0	0	1	1	0	0	0	1	0	0	90	0	0	3	244
15	105	0	0	1	17	16	1	0	0	0	0	0	0	1	0	0	0	1	0	0	27	0	0	2	173
16	63	0	0	1	7	9	6	0	0	0	0	0	0	0	0	0	0	3	0	0	5	1	0	1	98
21	0	0	0	0	0	0	0	11	18	9	0	0	0	0	0	0	0	0	0	0	0	0	4	0	42
22	1	0	0	0	0	0	0	3	66	65	4	0	0	0	0	0	0	0	0	0	0	0	17	0	156
23	1	0	0	0	0	0	0	0	39	95	27	0	0	0	0	0	0	0	0	0	0	0	32	0	194
24	1	0	0	0	0	0	0	0	4	30	21	0	0	0	0	0	0	0	0	0	0	0	17	0	73
25	12	0	0	0	1	1	0	0	0	0	0	35	11	4	0	0	0	0	0	0	2	0	0	2	68
26	18	0	0	0	1	1	0	0	0	0	0	9	13	6	0	0	0	0	0	0	2	0	1	10	62
27	42	0	0	0	2	1	0	0	0	0	0	2	8	6	0	0	0	0	0	0	5	0	3	18	89
31	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
32	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5	1	0	0	1	1	1	0	29
33	20	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4	2	1	0	0	1	1	0	0	32
34	11	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	18
41	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4
42	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	6
51	220	15	9	15	109	52	4	0	0	0	0	1	2	2	0	1	0	2	0	0	594	1	1	16	1,044
52	34	16	5	1	3	3	2	0	0	0	0	0	0	0	0	3	6	1	0	0	3	6	0	1	83
53	30	0	0	0	2	1	0	6	51	96	33	0	8	4	0	1	0	1	0	0	3	0	71	3	310
54	130	0	0	1	7	3	1	0	1	1	1	4	14	9	0	0	0	1	0	0	21	0	3	125	323
Total	835	77	28	32	257	117	20	21	178	295	87	51	60	34	1	16	15	14	3	2	805	15	150	189	3,302

Table A-79: Alternative E5 All Other Trip Purposes by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	36,640	730	1,182	1,458	8,477	5,840	2,522	63	409	272	375	1,889	3,805	3,828	1,363	1,979	2,136	1,953	1,288	685	19,789	4,395	6,411	14,693	122,184
11	862	13,571	6,884	1,283	1,813	392	481	5	181	22	34	119	185	131	136	231	221	124	248	73	18,069	11,346	490	799	57,698
12	1,551	7,777	11,359	2,816	3,604	782	931	6	225	30	46	184	310	261	206	364	370	255	415	119	22,105	10,388	800	1,347	66,253
13	2,461	2,589	3,500	9,441	8,578	1,640	1,376	7	471	36	68	266	481	491	222	498	420	378	424	132	29,708	5,708	1,001	2,544	72,441
14	9,463	1,593	2,274	4,692	28,188	6,075	3,288	24	552	110	168	773	1,562	1,537	653	1,025	1,059	939	1,080	404	44,097	5,890	2,740	8,933	127,119
15	7,633	651	674	1,141	7,242	6,068	1,823	14	466	72	121	622	1,221	1,431	415	784	753	947	540	289	15,051	2,371	2,133	6,344	58,805
16	3,973	942	1,041	1,314	5,527	2,405	3,632	11	430	65	102	540	804	854	483	1,024	1,053	1,345	275	139	9,127	4,565	2,351	2,923	44,927
21	100	36	9	9	47	36	24	4,146	6,492	6,907	1,577	937	246	64	144	108	61	14	12	29	146	133	15,690	1,409	38,373
22	170	42	17	16	80	51	36	3,087	11,553	12,467	2,781	1,508	402	98	199	138	88	21	22	46	246	171	18,265	2,131	53,635
23	393	64	42	39	187	101	77	2,898	10,770	24,920	6,398	3,147	910	216	358	236	171	47	46	87	562	338	26,574	3,823	82,402
24	561	78	45	51	271	173	111	995	3,912	9,113	9,950	6,656	1,750	458	312	242	170	80	60	140	792	330	17,591	6,755	60,595
25	3,637	451	276	319	1,728	1,103	736	683	4,342	4,962	6,428	46,885	13,831	3,197	1,967	1,503	1,066	552	328	803	4,725	1,979	24,298	33,986	159,785
26	4,958	340	285	371	2,108	1,331	672	134	1,166	757	1,133	8,496	16,075	4,564	1,936	1,184	871	534	406	721	5,786	1,623	9,746	25,370	90,565
27	5,906	501	363	511	2,718	1,891	873	42	959	253	407	2,636	5,705	8,016	1,091	1,331	929	772	521	632	7,519	1,638	6,395	16,429	68,036
31	2,614	244	302	263	1,133	573	561	145	450	436	346	1,569	2,248	1,003	18,813	4,777	2,969	389	230	197	3,083	6,109	11,420	4,520	64,394
32	2,742	363	314	311	1,307	748	744	54	551	195	171	851	1,223	924	4,550	10,086	5,484	555	198	135	3,312	6,389	8,272	3,138	52,618
33	3,837	571	486	517	2,194	1,329	1,390	47	660	186	170	882	1,294	1,133	3,441	8,224	9,189	1,060	253	145	5,088	9,058	8,660	3,633	63,447
34	2,562	276	303	313	1,315	866	862	8	175	44	65	358	542	548	286	582	604	1,070	167	92	3,075	1,441	1,525	1,780	18,860
41	1,904	732	506	440	1,974	824	330	10	616	37	79	256	514	461	151	350	215	159	37,301	4,778	33,854	879	773	15,874	103,017
42	1,384	343	197	169	926	540	200	30	740	112	184	840	1,315	799	189	299	172	120	5,858	25,505	12,719	435	1,327	24,272	78,676
51	26,815	34,518	28,756	25,145	62,608	16,648	7,990	84	4,792	392	757	2,832	5,707	5,478	1,987	4,206	3,369	2,719	31,623	8,724	670,151	49,530	9,278	72,325	1,076,434
52	10,708	30,652	20,805	8,647	16,930	5,758	7,561	154	3,947	514	599	2,582	3,682	2,774	11,104	16,721	13,596	3,045	1,392	519	77,413	192,991	27,539	11,118	470,751
53	12,996	2,249	1,283	1,419	6,592	4,427	3,732	13,009	36,996	47,740	21,185	34,058	20,628	10,496	20,267	19,379	12,418	3,225	1,047	1,435	17,057	34,476	254,854	51,557	632,527
54	23,815	2,585	1,618	2,418	14,712	8,959	3,183	1,256	10,750	6,660	7,551	35,636	36,832	18,980	4,411	4,564	3,104	2,347	19,779	27,196	88,510	6,436	41,986	295,560	668,846
Total	167,687	101,897	82,522	63,104	180,259	68,559	43,134	26,914	101,605	116,303	60,693	154,520	121,272	67,742	74,683	79,835	60,489	22,649	103,511	73,023	1,091,983	358,622	500,119	611,263	4,332,389

Table A-80: Alternative E5 All Other Trip Purposes by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	535	6	7	10	82	94	39	0	2	1	0	12	39	57	2	32	18	25	3	2	170	13	23	121	1,293
11	6	289	94	1	2	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	55	46	0	1	498
12	6	106	31	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	11	11	0	0	172
13	20	2	2	41	106	15	4	0	1	0	0	0	1	1	0	2	0	1	0	0	214	1	1	4	417
14	94	1	2	42	329	66	21	0	2	0	0	1	4	5	0	3	1	4	1	0	424	3	2	17	1,021
15	165	2	4	15	121	88	20	0	2	0	0	1	5	5	0	4	1	7	0	0	234	3	2	18	699
16	94	2	3	5	44	40	76	0	2	0	0	1	3	3	0	7	6	20	0	0	53	13	2	9	385
21	0	0	0	0	0	0	0	42	125	22	2	0	0	0	0	0	0	0	0	0	0	0	38	0	230
22	1	0	0	0	0	0	0	33	380	219	19	0	0	0	0	0	0	0	0	0	0	0	182	0	835
23	3	0	0	0	0	0	0	4	289	412	114	0	0	0	0	0	0	0	0	0	0	0	332	0	1,156
24	1	0	0	0	0	0	0	0	17	60	47	0	0	0	0	0	0	0	0	0	0	0	100	0	225
25	12	0	0	0	2	1	1	0	2	0	0	186	77	18	0	1	0	0	0	0	5	0	2	16	327
26	38	0	0	1	6	3	2	0	1	0	0	60	137	55	0	2	0	1	0	0	12	1	18	64	401
27	108	1	1	2	17	8	5	0	3	0	0	30	119	90	0	6	1	3	0	0	44	1	39	129	609
31	6	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	0	0	13
32	47	0	0	1	3	1	3	0	1	0	0	1	2	2	4	98	33	5	0	0	6	25	7	4	241
33	49	0	0	0	3	2	4	0	1	0	0	0	1	1	1	42	19	6	0	0	5	16	4	4	159
34	53	2	4	2	14	23	28	0	1	0	0	1	3	3	1	11	8	12	0	0	29	4	2	7	208
41	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	21	0	3	0	0	1	29
42	4	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	17	3	0	0	6	35
51	268	70	31	93	501	202	27	0	9	0	0	3	11	13	0	11	1	8	4	1	3,129	8	6	103	4,499
52	52	91	26	2	10	8	18	0	5	0	0	1	2	2	0	52	42	6	0	0	22	88	3	5	435
53	57	1	0	1	6	3	3	19	291	253	103	3	45	31	0	11	2	3	0	0	15	2	464	22	1,337
54	242	2	1	5	43	19	10	0	15	5	3	24	136	104	0	11	2	5	3	7	201	2	24	1,015	1,879
Total	1,863	576	206	224	1,293	578	263	99	1,152	972	291	327	588	390	10	296	135	107	33	28	4,636	237	1,251	1,546	17,100

Table A-81: Alternative E6 HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	878	24	47	40	276	161	42	5	13	21	28	54	82	55	110	49	40	33	42	16	615	76	159	464	3,332
11	721	1,019	660	184	577	148	85	5	12	28	23	38	56	32	307	57	75	49	61	16	2,090	707	143	365	7,458
12	1,049	654	1,072	343	1,046	291	163	9	22	40	38	66	104	63	328	104	107	70	104	27	2,971	820	264	591	10,348
13	1,868	271	579	644	1,844	407	190	9	24	53	47	81	134	84	539	109	138	98	108	29	4,410	529	290	981	13,463
14	2,913	140	282	343	2,886	783	270	14	35	68	66	120	215	146	569	145	160	126	146	45	5,050	412	426	1,720	17,079
15	2,309	55	103	102	854	512	118	8	20	44	44	80	133	89	399	87	102	91	73	27	1,739	173	262	1,001	8,423
16	1,557	81	140	125	879	362	209	8	20	43	42	74	108	63	447	107	129	104	50	18	1,314	265	273	604	7,023
21	210	8	11	10	67	34	14	830	1,102	1,540	536	197	91	25	462	48	44	14	12	12	162	48	1,732	457	7,665
22	225	8	12	10	68	33	14	496	1,348	1,922	623	210	92	24	466	43	43	15	12	12	167	43	1,549	472	7,907
23	306	11	16	14	94	47	19	355	1,191	2,661	958	300	132	36	484	51	48	20	14	14	226	51	1,753	621	9,420
24	565	17	29	27	202	113	40	291	841	1,489	1,548	716	318	90	496	88	66	34	31	32	473	88	2,092	1,271	10,959
25	2,801	80	132	124	905	497	186	318	874	1,665	1,750	3,374	1,611	407	2,675	392	317	175	128	134	2,056	395	3,576	5,186	29,759
26	1,827	41	71	70	539	294	90	54	141	285	295	639	1,025	276	1,340	168	148	93	79	69	1,299	176	1,051	2,932	13,004
27	2,006	48	84	74	536	280	85	20	53	118	122	231	421	281	1,022	147	139	96	84	51	1,301	162	637	1,996	9,992
31	363	15	23	20	124	67	30	12	24	43	29	49	69	33	913	189	149	28	15	7	263	167	283	263	3,177
32	943	37	54	47	296	149	71	19	40	87	56	93	135	70	1,726	522	478	74	34	16	633	294	539	587	7,001
33	1,840	73	112	100	657	352	170	30	66	125	87	149	225	126	1,828	670	799	149	64	26	1,292	559	881	993	11,375
34	409	21	38	29	174	98	44	3	8	13	17	32	43	24	80	40	35	36	21	8	331	74	109	201	1,889
41	1,743	111	224	140	921	353	106	18	41	68	69	116	200	127	462	112	111	78	2,782	397	6,916	243	376	3,759	19,472
42	1,353	56	112	73	525	266	72	36	85	137	142	249	342	170	544	111	89	62	830	1,179	3,623	146	561	4,905	15,669
51	18,597	4,663	6,737	3,880	16,812	4,746	1,771	128	321	588	581	1,022	1,752	1,133	4,414	1,215	1,268	894	5,019	1,218	89,052	7,245	3,501	21,962	198,520
52	10,964	4,194	4,257	2,067	8,177	2,854	1,633	222	446	763	594	995	1,437	742	9,538	2,714	2,841	834	738	223	19,679	14,720	5,100	6,399	102,133
53	10,209	368	587	519	3,512	1,906	809	3,862	7,382	11,935	6,419	4,613	3,723	1,275	17,352	3,192	2,393	739	468	342	7,563	3,229	25,837	13,012	131,247
54	13,290	354	672	601	4,657	2,353	643	783	1,938	3,185	2,983	4,492	4,545	1,701	6,817	1,041	906	604	2,743	1,940	19,967	1,241	8,481	36,088	122,025
Total	78,945	12,347	16,055	9,587	46,629	17,103	6,875	7,536	16,047	26,922	17,100	17,992	16,993	7,075	53,316	11,399	10,625	4,516	13,657	5,859	173,194	31,862	59,873	106,830	768,339

Table A-82: Alternative E6 HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	37	0	0	0	3	2	0	0	0	0	0	1	1	1	0	0	0	0	0	0	4	0	0	3	54
11	5	30	9	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3	0	0	53
12	4	16	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	27
13	22	0	0	6	37	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0	0	1	117
14	56	0	0	5	64	19	3	0	0	0	0	0	1	1	0	0	0	1	0	0	90	0	0	3	245
15	105	0	0	1	17	16	1	0	0	0	0	0	0	1	0	0	0	1	0	0	27	0	0	2	173
16	63	0	0	1	7	9	6	0	0	0	0	0	0	0	0	0	0	3	0	0	5	1	0	1	98
21	0	0	0	0	0	0	0	11	18	9	0	0	0	0	0	0	0	0	0	0	0	0	4	0	42
22	1	0	0	0	0	0	0	3	66	65	4	0	0	0	0	0	0	0	0	0	0	0	17	0	156
23	1	0	0	0	0	0	0	0	39	95	27	0	0	0	0	0	0	0	0	0	0	0	32	0	195
24	1	0	0	0	0	0	0	0	4	30	21	0	0	0	0	0	0	0	0	0	0	0	17	0	73
25	12	0	0	0	1	1	0	0	0	0	0	35	11	4	0	0	0	0	0	0	2	0	0	2	68
26	19	0	0	0	1	1	0	0	0	0	0	9	13	6	0	0	0	0	0	0	2	0	1	10	62
27	43	0	0	0	2	1	0	0	0	0	0	2	8	6	0	0	0	0	0	0	5	0	3	18	89
31	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
32	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	5	1	0	0	1	1	1	0	30
33	18	0	0	0	1	0	0	0	0	0	0	0	0	0	1	6	3	1	0	0	1	1	0	0	33
34	11	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	17
41	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4
42	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	6
51	220	15	9	15	109	52	4	0	0	0	0	1	2	2	0	1	0	2	0	0	594	1	1	16	1,044
52	34	16	5	1	3	3	2	0	0	0	0	0	0	0	0	4	6	1	0	0	3	6	0	1	83
53	30	0	0	0	2	1	0	6	51	96	33	0	8	4	0	1	1	1	0	0	3	0	71	3	312
54	131	0	0	1	7	3	1	0	1	1	1	4	14	9	0	0	0	1	0	0	21	0	3	125	324
Total	835	77	28	31	258	117	20	21	178	295	87	52	60	34	1	19	17	14	3	2	805	15	151	189	3,309

Table A-83: Alternative E6 All Other Trip Purposes by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	36,691	723	1,178	1,452	8,496	5,851	2,534	62	408	272	374	1,897	3,804	3,823	1,352	1,966	2,133	1,956	1,299	683	19,775	4,395	6,412	14,634	122,172
11	860	13,574	6,879	1,289	1,827	394	483	5	180	21	33	118	184	130	134	231	220	125	245	72	18,066	11,338	489	803	57,700
12	1,548	7,782	11,362	2,827	3,624	786	935	6	223	30	46	181	307	258	205	364	371	256	410	118	22,090	10,373	798	1,352	66,253
13	2,446	2,583	3,501	9,453	8,579	1,636	1,377	7	469	35	67	263	476	482	220	498	423	378	422	131	29,745	5,706	995	2,548	72,440
14	9,474	1,575	2,253	4,678	28,223	6,085	3,296	23	551	109	167	768	1,561	1,529	646	1,021	1,059	944	1,083	403	44,114	5,897	2,727	8,926	127,113
15	7,641	647	673	1,130	7,248	6,074	1,827	14	467	72	121	623	1,224	1,432	411	778	750	948	543	287	15,036	2,382	2,132	6,338	58,799
16	3,986	945	1,044	1,320	5,532	2,411	3,635	11	428	65	101	534	802	853	477	1,011	1,054	1,347	276	139	9,119	4,567	2,339	2,921	44,920
21	98	35	9	9	46	35	23	4,154	6,496	6,908	1,573	928	244	63	144	107	60	13	12	29	144	132	15,707	1,406	38,374
22	169	42	17	16	79	50	35	3,092	11,555	12,474	2,779	1,502	402	98	198	137	87	21	22	46	243	171	18,271	2,133	53,638
23	393	63	42	38	183	100	75	2,903	10,775	24,932	6,397	3,139	911	219	359	236	170	46	46	86	558	337	26,569	3,834	82,410
24	563	77	44	50	268	172	107	991	3,917	9,123	9,960	6,650	1,747	460	316	242	169	77	59	139	789	327	17,599	6,753	60,598
25	3,639	448	272	313	1,710	1,095	723	682	4,355	4,978	6,456	46,968	13,788	3,192	1,975	1,502	1,066	541	325	798	4,697	1,968	24,330	33,977	159,800
26	4,956	338	283	370	2,112	1,330	666	134	1,166	757	1,133	8,534	16,079	4,564	1,931	1,178	869	529	410	720	5,795	1,606	9,728	25,372	90,556
27	5,921	498	362	510	2,725	1,896	874	41	958	251	404	2,641	5,700	8,021	1,082	1,333	932	774	527	632	7,514	1,632	6,407	16,391	68,027
31	2,598	244	301	263	1,128	569	557	144	446	429	348	1,563	2,249	998	18,735	4,772	2,970	387	230	197	3,058	6,109	11,410	4,514	64,217
32	2,737	363	312	313	1,307	746	743	54	548	192	170	850	1,228	924	4,526	10,089	5,488	557	198	134	3,313	6,394	8,258	3,141	52,584
33	3,845	569	483	521	2,194	1,325	1,388	46	655	184	170	887	1,313	1,136	3,414	8,207	9,149	1,061	252	145	5,095	9,002	8,681	3,649	63,371
34	2,570	279	305	315	1,317	866	866	8	175	44	65	356	542	548	284	576	605	1,075	169	91	3,069	1,444	1,524	1,768	18,861
41	1,887	732	506	439	1,971	823	329	10	621	37	79	259	515	456	148	346	211	157	37,326	4,779	33,838	875	765	15,890	103,000
42	1,385	343	198	168	914	537	200	30	740	113	185	844	1,309	800	186	302	172	120	5,864	25,527	12,717	433	1,330	24,262	78,679
51	26,747	34,489	28,786	25,141	62,644	16,662	8,001	84	4,787	390	754	2,847	5,721	5,470	1,966	4,197	3,365	2,723	31,532	8,704	670,117	49,573	9,252	72,489	1,076,442
52	10,691	30,713	20,811	8,681	16,914	5,753	7,559	154	3,938	509	598	2,560	3,667	2,752	11,109	16,776	13,586	3,047	1,382	516	77,298	193,084	27,553	11,057	470,708
53	13,001	2,251	1,278	1,411	6,575	4,417	3,714	13,010	37,006	47,744	21,199	33,975	20,626	10,510	20,232	19,365	12,422	3,214	1,050	1,436	16,991	34,434	254,915	51,647	632,425
54	23,817	2,571	1,610	2,391	14,641	8,943	3,182	1,252	10,747	6,653	7,530	35,663	36,871	19,018	4,395	4,553	3,091	2,350	19,819	27,207	88,762	6,387	41,945	295,440	668,836
Total	167,666	101,883	82,509	63,095	180,255	68,556	43,129	26,917	101,610	116,325	60,710	154,550	121,269	67,737	74,444	79,787	60,422	22,646	103,501	73,021	1,091,944	358,566	500,137	611,244	4,331,924

Table A-84: Alternative E6 All Other Trip Purposes by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	536	6	7	10	82	94	39	0	2	1	0	12	39	57	2	32	16	25	3	2	170	12	23	121	1,290
11	6	289	94	1	2	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	55	46	0	1	498
12	6	106	31	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	11	11	0	0	172
13	20	2	2	41	106	15	4	0	1	0	0	0	1	1	0	2	0	1	0	0	214	1	1	4	416
14	94	1	2	42	331	66	21	0	2	0	0	1	4	5	0	3	1	4	1	0	424	3	2	17	1,023
15	165	2	4	15	121	88	20	0	2	0	0	2	5	5	0	4	1	7	0	0	235	2	2	18	699
16	94	2	4	5	44	40	78	0	2	0	0	1	3	3	0	8	5	20	0	0	53	13	2	9	387
21	0	0	0	0	0	0	0	43	125	22	2	0	0	0	0	0	0	0	0	0	0	0	38	0	230
22	1	0	0	0	0	0	0	34	382	218	19	0	0	0	0	0	0	0	0	0	0	0	181	0	835
23	3	0	0	0	0	0	0	4	290	412	114	0	0	0	0	0	0	0	0	0	0	0	331	0	1,156
24	1	0	0	0	0	0	0	0	17	60	47	0	0	0	0	0	0	0	0	0	0	0	100	0	226
25	13	0	0	0	2	1	1	0	2	0	0	187	77	18	0	1	0	0	0	0	5	0	2	16	328
26	38	0	0	1	6	3	2	0	1	0	0	61	137	55	0	2	0	1	0	0	12	0	18	64	401
27	109	1	1	2	17	8	5	0	3	0	0	30	120	90	0	6	1	3	0	0	45	1	39	128	610
31	15	0	0	0	0	0	1	0	0	0	0	0	0	0	0	3	2	2	0	0	1	1	0	1	27
32	45	0	0	1	3	1	3	0	0	0	0	1	2	2	5	107	35	5	0	0	6	26	7	4	253
33	43	0	0	0	3	2	4	0	1	0	0	0	1	1	4	53	23	5	0	0	5	22	3	3	173
34	53	2	4	2	14	23	28	0	1	0	0	1	3	3	1	11	7	12	0	0	29	4	2	7	206
41	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	21	0	3	0	0	1	29
42	4	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	17	3	0	0	6	35
51	268	70	31	93	501	203	27	0	9	0	0	3	11	13	0	11	1	8	4	1	3,130	8	6	103	4,501
52	51	91	26	3	10	8	18	0	5	0	0	1	2	2	1	57	46	6	0	0	22	88	3	5	446
53	58	1	0	1	6	3	4	19	292	253	103	3	46	31	0	15	4	3	0	0	15	2	465	22	1,346
54	244	2	1	5	43	19	10	0	15	5	3	24	135	103	0	11	2	5	3	7	202	2	23	1,013	1,877
Total	1,868	575	206	224	1,294	579	266	100	1,155	971	291	328	587	390	14	325	146	108	33	28	4,639	243	1,249	1,545	17,163

A.5 South Corridor Alternatives – Transit Ridership Results

A.5.1 South Corridor Alternatives

As developed by the project team, Steering Committee and stakeholders, the South Corridor Alternatives encompassed Alternatives S1, S2, and S4. The figure below shows the alignments in detail.

- Alternative S1 was envisioned to operate in dedicated ROW and was modeled as commuter rail.
- Alternatives S2 and S4 were envisioned to operate in dedicated ROW and were modeled transit technology-independent (accounting for either bus rapid transit or streetcar, but similar in character to rail-based transit).

A.5.2 Changes to the No-Build Bus Network

The following changes were made to the previously coded No-Build bus network to accommodate the S1, S2, and S4 alternatives:

- EMBARK Route 10 was extended beyond the Oklahoma City Transit Center to provide service to Santa Fe Station.
- EMBARK Route 11 was rerouted along Reno Ave and Gaylord Boulevard to serve the Santa Fe Station.
- EMBARK Route 12 was also rerouted to serve the Santa Fe Station.
- A new Lincoln Shuttle was added to connect Santa Fe Station along Gaylord Boulevard, NE 4th Street, and Lincoln Boulevard to the Capitol.

Alternative S1

- EMBARK Route 40 was extended southwest along Santa Fe, NE 12th Street, and N Broadway Street to provide loop service in Moore. The loop was routed along Broadway Street, SE 19th Street, Telephone Road, and N 5th Street with tie-ins to commuter rail stations at SE 19th Street and NE 2nd Street.

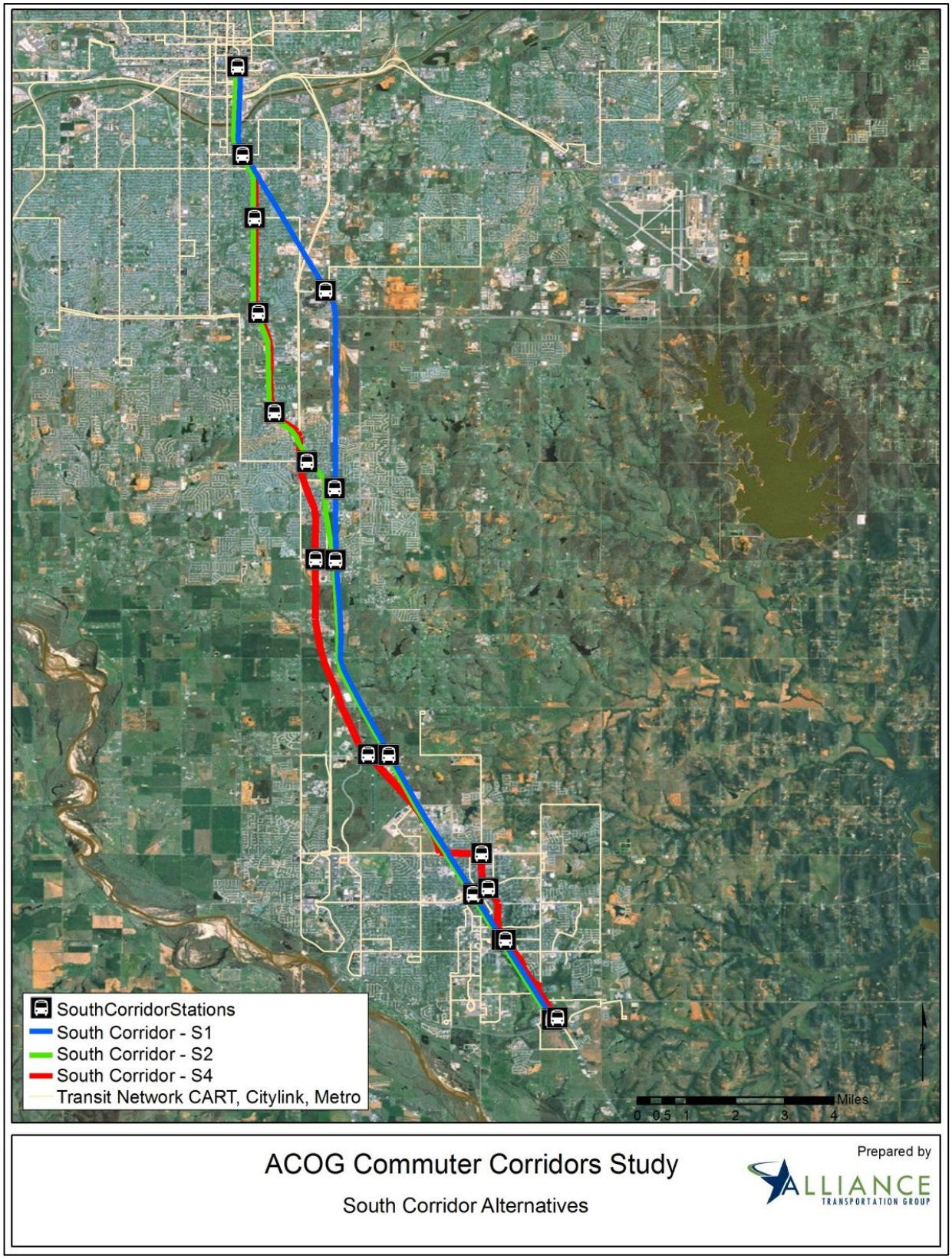
Alternative S2

- EMBARK Route 13 was extended east on I-240 to provide access to the build alternative station.
- EMBARK Route 40 was extended southwest along Santa Fe, NE 12th Street, and N Broadway Street to provide loop service in Moore. The loop was routed along Broadway Street, SE 19th Street, Telephone Road, and N 5th Street with a tie-in to the station at SE 19th Street.

Alternative S4

- EMBARK Route 13 was extended east on I-240 to provide access to the build alternative station.
- EMBARK Route 40 was extended southwest along Santa Fe, NE 12th Street, and N Broadway Street to provide loop service in Moore, routed along Broadway Street, SE 19th Street, Telephone Road, and N 5th Street with a tie-in to the station at SE 19th Street.

Figure A-10: South Corridor Alternatives



A.5.3 Results from Travel Demand Model

To provide a complete set of ridership forecasts and other TDM results for analysis of the candidate alternative, the following steps were taken:

- Performed an ACOG TDM run to produce horizon year 2035 ridership forecasts;
- Examined the mode choice model results;
- Examined the transit assignment results to obtain forecast transit ridership and boardings and alightings by route and mode of access (drive, walk, etc.) for the candidate alternative; and
- Prepared tables documenting the transit ridership for the candidate alternative.

It is important to note that the ridership forecasts are not capacity restrained. Therefore, they represent the potential market demand for the candidate alternative under the given demographic scenario and transit fare structure.

Transit Ridership

The following tables show the system-wide and route-specific transit ridership.

Table A-85: Average Weekday System-Wide Ridership for Horizon Year 2035

Alternative	Ridership	Difference from No-Build
No-Build	23,821	N/A
Alternative S1	27,999	4,178
Alternative S2	28,821	5,000
Alternative S4	29,111	5,291

Table A-86: Average Weekday Ridership Results by Route for Horizon Year 2035

Route	No-Build Ridership	S1 Ridership	S2 Ridership	S4 Ridership
CART 12th Avenue E	160	156	160	155
CART 24th Avenue W	273	268	268	273
CART Berry Road	158	157	159	155
CART Downtown	164	164	165	151
CART E Norman	383	390	390	368
CART S10	430	580	588	707
CART S11	178	316	313	201
CART S12	235	307	309	232
CART S20	260	254	254	253
CART S21	530	500	501	528
CART N32	276	280	281	267
CART S40	72	69	69	70
CART S42	155	145	145	146
CART N52	302	287	288	286
CART Porter	349	471	475	375
CART Robinson	498	489	489	635
CART Rt 24	271	254	261	214
CART SH 9	119	134	135	135
Citylink 1	183	185	183	185
Citylink 2	204	203	203	203
Citylink 3	387	387	386	386
Citylink 4	190	190	190	190
Citylink 101	128	125	126	126
Citylink 102	199	199	199	199
EMBARK Route 2	372	395	393	376
EMBARK Route 3	335	353	353	333
EMBARK Route 5	2,558	2,570	2,570	2,566
EMBARK Route 7	1,650	1,649	1,653	1,651
EMBARK Route 8	1,346	1,350	1,351	1,348
EMBARK Route 9	310	314	314	313
EMBARK Route 10	632	949	947	944
EMBARK Route 11	1,098	1,047	1,045	1,039
EMBARK Route 12	829	1,158	1,152	1,148
EMBARK Route 13	705	712	813	810
EMBARK Route 14	654	692	709	707
EMBARK Route 15	647	563	563	561
EMBARK Route 16	598	609	608	603
EMBARK Route 18	400	379	389	389
EMBARK Route 19	100	102	100	102
EMBARK Route 22	311	306	303	304
EMBARK Route 23	1,830	1,795	1,798	1,820
EMBARK Route 36	861	858	857	857
EMBARK Route 38	498	500	500	498
EMBARK Route 40	1,216	1,317	1,242	1,220

Table A-86: Average Weekday Ridership Results by Route for Horizon Year 2035

Route	No-Build Ridership	S1 Ridership	S2 Ridership	S4 Ridership
EMBARK Lincoln Shuttle	(N/A)	170	171	171
EMBARK Mustang	61	59	60	60
EMBARK Streetcar	656	540	539	536
EMBARK Yukon	48	48	48	48
Build Alternatives	(N/A)	3,054	3,807	4,269
Grand Total	23,821	27,999	28,821	29,111

System-wide Passenger-Miles

Passenger-miles are the cumulative sum of the distances ridden by each transit passenger and give an overall idea of transit system usage.

Table A-87: Average Weekday Passenger Miles by Mode for Horizon Year 2035

Transit Mode	Alternative S1 Passenger Miles	Alternative S2 Passenger Miles	Alternative S4 Passenger Miles
Local Bus	70,129	70,192	69,849
Express Bus	5,543	5,615	5,463
Streetcar	690	690	688
Build Alternative	26,523	28,984	31,040

System-wide Transfer between Transit Modes

In order to visualize the interaction between the different transit options, the number of transfers between transit modes was analyzed.

Table A-88: Average Weekday Alternative S1 – Transfers between Modes for Horizon Year 2035

From/To	Local Bus	Express Bus	Streetcar	Rail
Local Bus	3,629	87	212	150
Express Bus	93	13	3	0
Streetcar	46	1	0	0
Rail	544	45	0	N/A

Table A-89: Average Weekday Alternative S2 – Transfers between Modes for Horizon Year 2035

From/To	Local Bus	Express Bus	Streetcar	Rail
Local Bus	3,612	89	208	126
Express Bus	94	13	3	0
Streetcar	47	1	0	0
Rail	631	49	0	N/A

Table A-90: Average Weekday Alternative S4 – Transfers between Modes for Horizon Year 2035

From/To	Local Bus	Express Bus	Streetcar	BRT
Local Bus	3,575	91	208	115
Express Bus	94	13	3	0
Streetcar	46	1	0	0
BRT	629	0	0	0

Boarding and Alightings by Station

The following graphics and tables show the passenger boardings and alightings by station location.

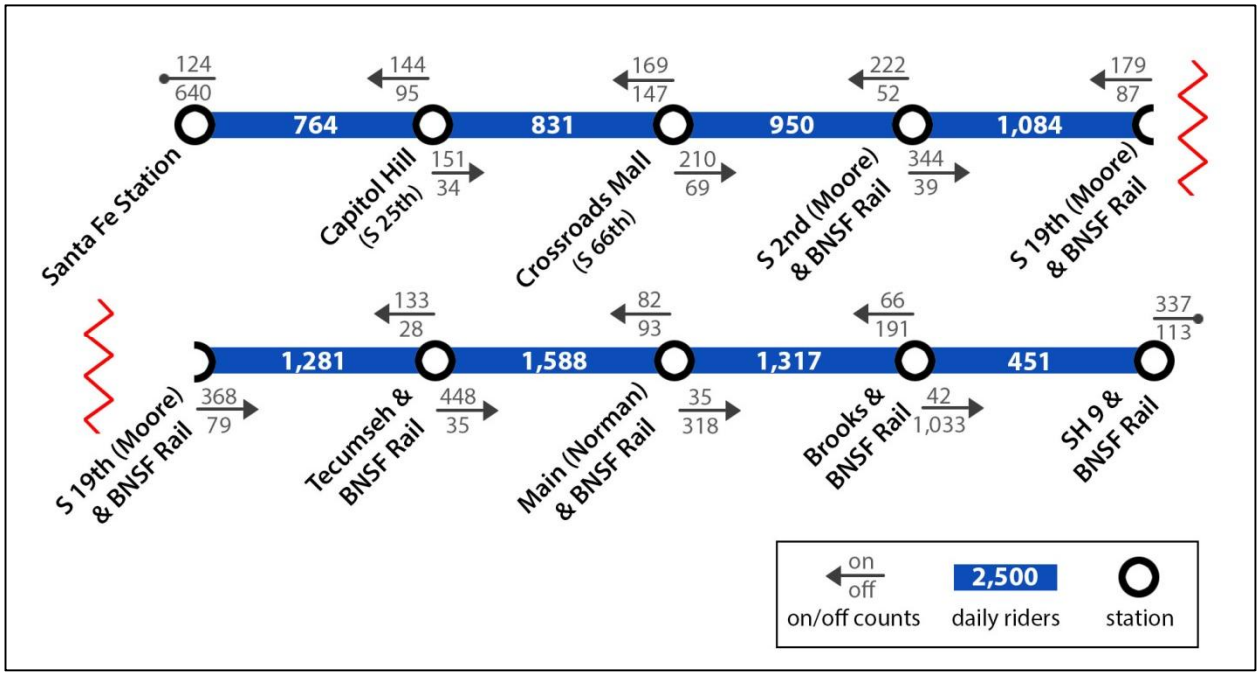
Additional Notes

- Directional Imbalance – Before reviewing the information contained in the graphic display, it is important to note that the directional imbalance of the reported rail ridership is often confusing to individuals who do not work with travel demand model transit ridership. It is the industry standard to assign transit trips in production-attraction (PA) format. The imbalance is especially noticeable for trips of very directional nature, such as home-based work (HBW) trips. This is due to the fact that the typical commuting pattern of one trip into town in the morning and one trip out of town in the evening is assigned as two inbound trips in PA format. This convention allows transit planners and the models that forecast ridership to know the household characteristics (median income, household size, vehicle availability, area type) of transit riders based on the zone the transit rider starts their trip. This convention also ensures the outbound work trips return to the same zones as the inbound trips. In reality, on a daily basis, the inbound and outbound ridership will be equal to half of the total ridership of the two directions.
- Difference between Transit Trips from Mode Choice Model and the Ridership from Transit Assignment Routine – In addition, the trip totals typically shown in the mode choice model are slightly different than the ridership by route produced by the transit assignment routine. This difference is a function of the logic inherent in the two models. The mode choice model identifies production and attraction trip ends for each zone pair by mode and all of the segments of the trip are linked together and labeled as a single trip on the highest value mode used (e.g. if in the course of the trip a rider uses bus transit to access a light rail line, the mode choice model would identify this as a single light rail trip. The bus trip would not be reflected in mode choice.) In the assignment, however, the individual modes would not be linked and the bus trip would show up in the transit ridership forecast for both the bus route and the light rail. Similarly a trip that used several bus routes would show up as a trip on each route. Since most systems have a transfer proportion of about 15% or more, the transit assignment total by mode is typically higher than the mode choice total for zone to zone trip ends.

South Corridor Alternative S1

The following graphic shows forecasted boardings or alightings at each Alternative S1 commuter rail station.

Figure A-11: South Corridor – 2035 Boardings and Alightings for Alternative S1



To better understand the distribution of trips throughout the course of the day, the Alternative S1 boarding and alighting information was further broken out by mode of access (walk or drive), direction, and by peak and off-peak period, as shown in Table A-91 through Table A-94.

Table A-91: Southbound Peak Boardings and Alightings by Mode of Access for Alternative S1

Southbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	66	0	5	0	71	0
Capitol Hill (S 25th Street)	41	27	42	0	83	27
Crossroads Mall (S 66th Street)	19	25	92	15	110	41
S 2nd Street & BNSF Rail	20	7	174	12	195	19
S 19th Street & BNSF Rail	16	10	187	44	202	54
Tecumseh Road & BNSF Rail	5	3	251	16	256	19
Main Street & BNSF Rail	6	16	13	152	19	168
Brooks Street & BNSF Rail	5	79	18	493	23	572
SH-9 & BNSF Rail	0	11	0	49	0	60
Total	178	178	781	781	959	959

Table A-92: Southbound Off-Peak Boardings and Alightings by Mode of Access for Alternative S1

Southbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	On	Off	On
Santa Fe Station	53	0	0	0	53	0
Capitol Hill (S 25th Street)	36	7	31	0	67	7
Crossroads Mall (S 66th Street)	17	24	82	4	100	29
S 2nd Street & BNSF Rail	19	8	131	12	149	20
S 19th Street & BNSF Rail	14	9	152	16	165	25
Tecumseh Road & BNSF Rail	4	3	188	13	192	16
Main Street & BNSF Rail	5	17	12	133	17	150
Brooks Street & BNSF Rail	4	72	15	390	19	462
SH-9 & BNSF Rail	0	10	0	44	0	54
Total	151	151	611	611	763	763

Table A-93: Northbound Peak Boardings and Alightings by Mode of Access for Alternative S1

Northbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	On	Off	On
SH-9 & BNSF Rail	22	0	178	0	200	0
Brooks Street & BNSF Rail	26	10	14	109	39	119
Main Street & BNSF Rail	13	12	26	42	39	54
Tecumseh Road & BNSF Rail	2	5	68	10	71	16
S 19th Street & BNSF Rail	16	9	88	35	104	44
S 2nd Street & BNSF Rail	18	7	104	26	122	34
Crossroads Mall (S 66th Street)	21	14	76	63	98	77
Capitol Hill (S 25th Street)	55	8	42	47	97	56
Santa Fe Station	0	107	0	264	0	371
Total	173	173	597	597	770	770

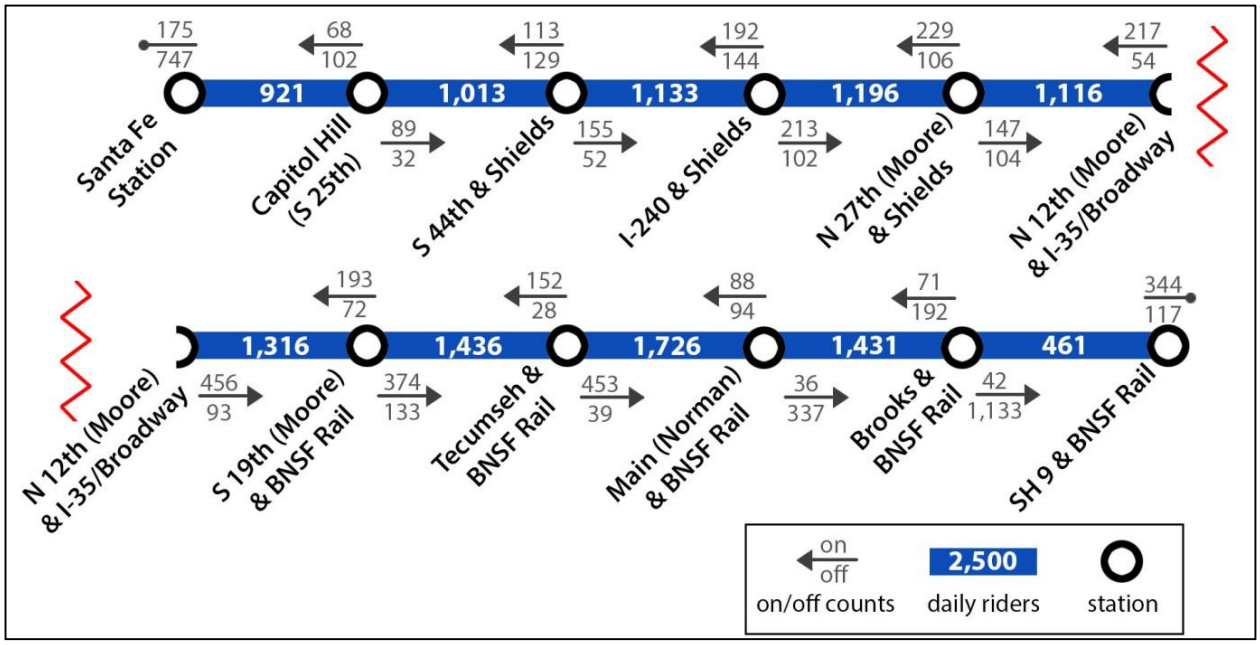
Table A-94: Northbound Off-Peak Boardings and Alightings by Mode of Access for Alternative S1

Northbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	On	Off	On
SH-9 & BNSF Rail	17	0	120	0	137	0
Brooks Street & BNSF Rail	21	7	6	66	27	72
Main Street & BNSF Rail	14	8	29	31	43	39
Tecumseh Road & BNSF Rail	2	4	60	8	62	12
S 19th Street & BNSF Rail	14	9	61	33	75	43
S 2nd Street & BNSF Rail	16	6	84	13	100	18
Crossroads Mall (S 66th Street)	18	14	53	56	71	70
Capitol Hill (S 25th Street)	13	6	34	33	47	39
Santa Fe Station	0	61	0	208	0	269
Total	116	116	447	447	562	562

South Corridor Alternative S2

The following graphic shows forecasted boardings or alightings at each Alternative S2 station.

Figure A-12: South Corridor – 2035 Boardings and Alightings for Alternative S2



To better understand the distribution of trips throughout the course of the day, the Alternative S2 boarding and alighting information is further broken out by mode of access (walk or drive), direction, and by peak and off-peak period, as shown in Table A-95 through Table A-98.

Table A-95: Southbound Peak Boardings and Alightings by Mode of Access for Alternative S2

Southbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	95	0	3	0	98	0
Capitol Hill (S 25th Street)	37	25	11	0	48	25
S 44th Street & Shields Boulevard	32	26	47	6	79	32
I-240 & Shields Boulevard	22	28	88	24	110	52
N 27th Street & Shields Boulevard	28	16	52	35	80	51
N 12th Street & I-35/Broadway	9	10	251	37	259	48
S 19th Street & BNSF Rail	17	14	190	70	206	85
Tecumseh Road & BNSF Rail	5	4	255	18	260	21
Main Street & BNSF Rail	6	18	13	160	19	178
Brooks Street & BNSF Rail	5	103	18	526	23	629
SH-9 & BNSF Rail	0	11	0	51	0	62
Total	256	256	927	927	1,183	1,183

Table A-96: Southbound Off-Peak Boardings and Alightings by Mode of Access for Alternative S2

Southbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	76	0	0	0	77	0
Capitol Hill (S 25th Street)	33	6	8	0	41	6
S 44th Street & Shields Boulevard	29	16	47	3	77	20
I-240 & Shields Boulevard	18	27	85	22	103	50
N 27th Street & Shields Boulevard	21	18	46	35	67	53
N 12th Street & I-35/Broadway	9	9	188	36	197	45
S 19th Street & BNSF Rail	15	12	153	37	168	49
Tecumseh Road & BNSF Rail	4	3	189	14	193	18
Main Street & BNSF Rail	5	19	12	140	17	159
Brooks Street & BNSF Rail	4	94	15	410	19	504
SH-9 & BNSF Rail	0	10	0	45	0	55
Total	215	215	743	743	958	958

Table A-97: Northbound Peak Boardings and Alightings by Mode of Access for Alternative S2

Northbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
SH-9 & BNSF Rail	22	0	182	0	204	0
Brooks Street & BNSF Rail	26	10	14	109	40	120
Main Street & BNSF Rail	14	12	28	42	42	54
Tecumseh Road & BNSF Rail	3	5	76	10	79	16
S 19th Street & BNSF Rail	13	9	108	29	120	38
N 12th Street & I-35/Broadway	13	5	147	24	160	29
N 27th Street & Shields Boulevard	23	7	96	68	119	76
I-240 & Shields Boulevard	27	8	87	87	114	95
S 44th Street & Shields Boulevard	46	10	24	68	70	79
Capitol Hill (S 25th)	50	9	3	54	53	63
Santa Fe Station	0	159	0	274	0	432
Total	236	236	767	767	1,002	1,002

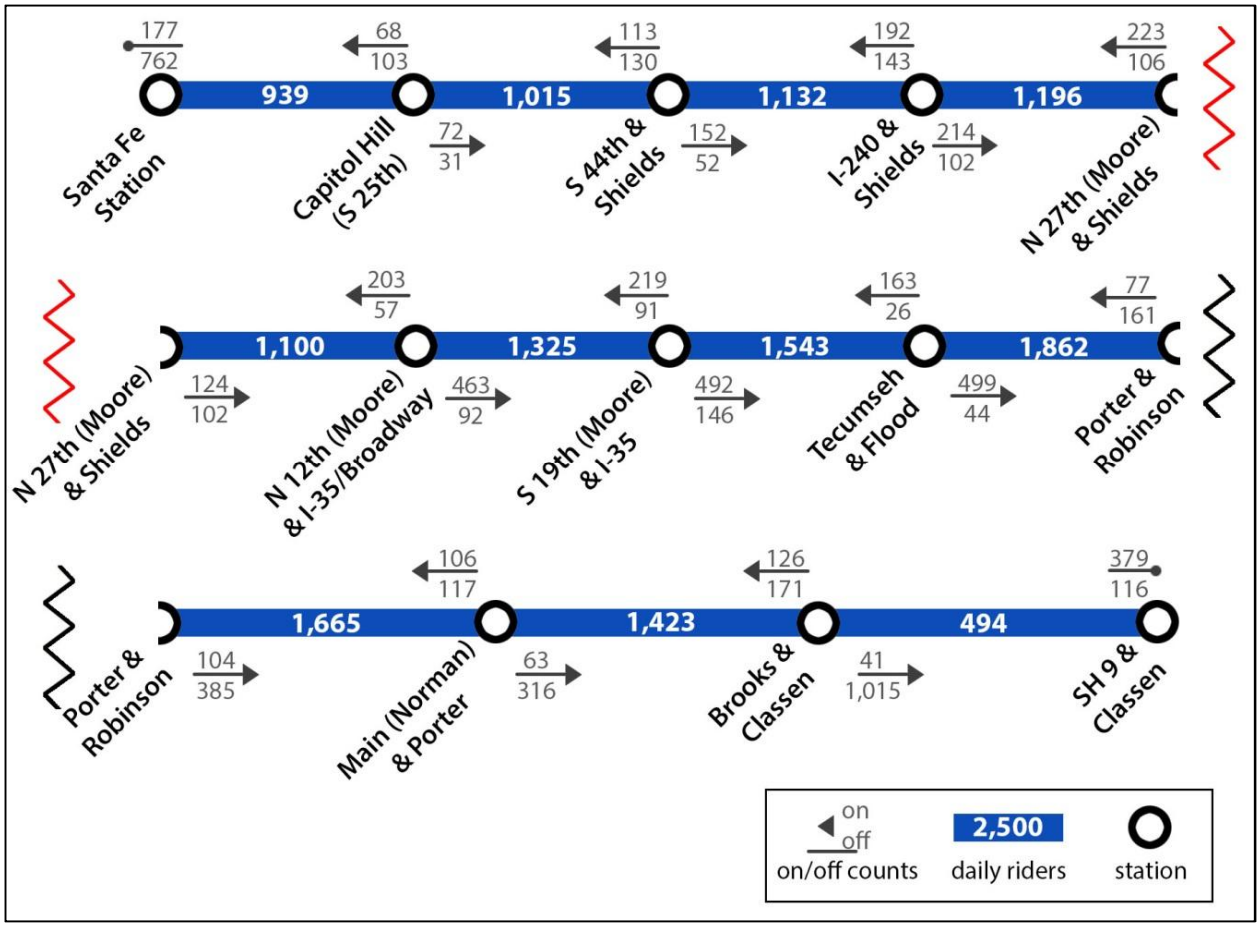
Table A-98: Northbound Off-Peak Boardings and Alightings by Mode of Access for Alternative S2

Northbound Off Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
SH-9 & BNSF Rail	17	0	123	0	140	0
Brooks Street & BNSF Rail	22	7	9	66	31	72
Main Street & BNSF Rail	15	9	30	31	45	40
Tecumseh Road & BNSF Rail	3	4	70	8	73	12
S 19th Street & BNSF Rail	8	8	64	26	72	34
N 12th Street & I-35/Broadway	6	4	51	20	57	24
N 27th Street & Shields Boulevard	20	5	90	25	110	30
I-240 & Shields Boulevard	25	7	53	42	78	49
S 44th Street & Shields Boulevard	25	9	18	40	43	50
Capitol Hill (S 25th Street)	12	7	2	32	14	39
Santa Fe Station	0	94	0	220	0	314
Total	154	154	510	510	664	664

South Corridor Alternative S4

The following graphic shows forecasted boardings or alightings at each Alternative S4 station.

Figure A-13: South Corridor – 2035 Boardings and Alightings for Alternative S4



To better understand the distribution of trips throughout the course of the day, the Alternative S4 boarding and alighting information is further broken out by mode of access (walk or drive), direction, and by peak and off-peak period, as shown in Table A-99 through Table A-102.

Table A-99: Southbound Peak Boardings and Alightings by Mode of Access for Alternative S4

Southbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	97	0	1	0	98	0
Capitol Hill (S 25th Street)	28	25	11	0	39	25
S 44th Street & Shields Boulevard	28	26	49	6	77	32
I-240 & Shields Boulevard	14	28	96	24	109	52
N 27th Street & Shields Boulevard	12	16	55	35	67	51
N 12th Street & I-35/Broadway	10	10	271	37	280	48
S 19th Street & I-35	18	13	248	98	266	111
Tecumseh Road & Flood Avenue	3	2	269	23	272	25
Porter Avenue & Robinson Street	51	23	28	185	79	207
Main Street & Porter Avenue	28	43	14	143	42	186
Brooks Street & Classen Boulevard	5	92	17	462	22	555
SH-9 & Classen Boulevard	0	14	0	46	0	60
Total	293	293	1,059	1,059	1,352	1,352

Table A-100: Southbound Off-Peak Boardings and Alightings by Mode of Access for Alternative S4

Southbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	78	0	0	0	79	0
Capitol Hill (S 25th Street)	24	6	8	0	33	6
S 44th Street & Shields Boulevard	25	16	50	3	75	20
I-240 & Shields Boulevard	11	27	94	22	105	50
N 27th Street & Shields Boulevard	8	18	49	35	57	52
N 12th Street & I-35/Broadway	9	9	173	36	182	44
S 19th Street & I-35	16	12	209	23	226	35
Tecumseh Road & Flood Avenue	1	2	226	17	228	19
Porter Avenue & Robinson Street	14	21	12	157	26	178
Main Street & Porter Avenue	9	17	12	112	21	129
Brooks Street & Classen Boulevard	4	61	14	399	19	460
SH-9 & Classen Boulevard	0	13	0	42	0	55
Total	202	202	847	847	1,049	1,049

Table A-101: Northbound Peak Boardings and Alightings by Mode of Access for Alternative S4

Northbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
SH-9 & Classen Boulevard	27	0	191	0	218	0
Brooks Street & Classen Boulevard	60	9	27	89	87	98
Main Street & Porter Avenue	34	27	40	54	74	80
Porter Avenue & Robinson Street	22	51	16	66	38	118
Tecumseh Road & Flood Avenue	1	5	85	11	86	16
S 19th Street & I-35	17	13	120	34	138	47
N 12th Street & I-35/Broadway	12	6	133	25	145	31
N 27th Street & Shields Boulevard	24	8	96	67	119	75
I-240 & Shields Boulevard	27	9	87	85	114	94
S 44th & Shields Boulevard	46	12	24	68	70	79
Capitol Hill (S 25th Street)	51	10	3	54	54	64
Santa Fe Station	0	171	0	270	0	441
Total	321	321	823	823	1,143	1,143

Table A-102: Northbound Off-Peak Boardings and Alightings by Mode of Access for Alternative S4

Northbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
SH-9 & Classen Boulevard	22	0	139	0	161	0
Brooks Street & Classen Boulevard	30	8	9	65	39	73
Main Street & Porter Avenue	17	13	15	24	32	37
Porter Avenue & Robinson Street	25	14	14	30	39	43
Tecumseh Road & Flood Avenue	1	3	75	8	77	10
S 19th Street & I-35	14	14	67	31	81	45
N 12th Street & I-35/Broadway	6	6	52	20	58	25
N 27th Street & Shields Boulevard	20	7	84	24	104	31
I-240 & Shields Boulevard	25	8	53	41	78	49
S 44th & Shields Boulevard	25	11	18	40	43	51
Capitol Hill (S 25th Street)	12	8	2	31	14	39
Santa Fe Station	0	106	0	215	0	321
Total	196	196	529	529	725	725

Additional Trip Characteristics – Market Segmentation

Further breaking down travel patterns by trip purpose, income, and mode of travel helps to better understand the needs of the transportation system users. The following tables offer information in regard to trip purpose by income level,[8] as well as trip purpose by mode of travel.[9] The trips purposes included in the analysis are:

- HBW – Home-based work trips

[8] Only HBW and HBO trips were stratified by income level.

[9] It should be noted that for trip tables by income level and mode of travel, the total number of trips was rounded to the nearest thousand and individual cells were proportionally adjusted to match the totals.

- HBO – Home-based trips for shopping, recreation or other purposes
- HBU – Home-based trips to higher education facilities
- NHBW – Non-home-based work trips
- NHBO – Non-home-based trips for shopping, recreation or other purposes
- HBSch – Home-based trips to schools (kindergarten through 12th grade)

Table A-103: Overall 2035 Trips by Purpose and Income Level for all Alternatives

	Low Income	Medium Income	High Income	Total
HBW	55,905	461,594	319,501	837,000
HBO	240,873	1,075,071	641,055	1,957,000
HBU		139,000		139,000
NHBW		506,000		506,000
NHBO		1,315,000		1,315,000
HBSch		848,000		848,000
Total				5,602,000

Of additional interest was a breakout of trips by purpose and mode of travel, for which the following mode of travel breakdown was considered:

- SOV – Single-occupancy vehicle, accounting for those automobile trips, where the driver is the only person in the vehicle
- HOV – High-occupancy vehicle, accounting for those automobile trips, where the driver is accompanied by at least one passenger
- LB – Local Bus, accounting for all local bus routes, thus excluding the express bus routes to Edmond, Norman, Yukon, and Mustang
- EB – Express Bus, accounting for the express bus routes to Edmond, Norman, Yukon, and Mustang (including the express bus-like Alternative S4, where applicable).
- SC – Streetcar, accounting for trips associated with the planned downtown Streetcar circulator.
- RL – Rail, accounting for the trips associated with rail (including rail Alternatives S1 and rail-like alternative S2 and S4, where applicable).

Table A-104 through Table A-110 show the number of trips broken out by purpose and mode of travel for both the No-Build Alternative and the three South Corridor Alternatives, which helps illustrate the travel purpose that the proposed new build alternatives would be used.

Table A-104: 2035 No-Build Alternative Trips by Purpose and Mode of Travel

	SOV	HOV	LB	EB	SC	RL	Total
HBW	743,128	90,720	3,045	93	14	0	837,000
HBO	863,167	1,085,601	7,954	257	20	0	1,957,000
HBU	120,524	17,242	1,109	125	0	0	139,000
NHBW	410,095	94,605	1,193	30	77	0	506,000
NHBO	523,951	785,283	5,394	190	183	0	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,814,353	2,767,963	18,696	694	294	0	5,602,000

Table A-105: 2035 Trips by Purpose and Mode of Travel for Alternative S1

	SOV	HOV	LB	EB	SC	RL	Total
HBW	742,494	90,678	3,158	86	13	572	837,000
HBO	862,864	1,085,329	8,023	241	19	524	1,957,000
HBU	119,860	17,152	1,182	101	0	705	139,000
NHBW	409,926	94,577	1,229	26	75	167	506,000
NHBO	523,406	784,537	5,630	171	172	1,084	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,812,037	2,766,786	19,222	625	278	3,052	5,602,000

Table A-106: Difference in 2035 Trips by Purpose and Model of Travel between the No-Build Alternative and Alternative S1

	SOV	HOV	LB	EB	SC	RL
HBW	(634)	(41)	112	(7)	(1)	572
HBO	(304)	(272)	68	(16)	(1)	524
HBU	(664)	(90)	73	(24)	0	705
NHBW	(169)	(28)	36	(4)	(3)	167
NHBO	(545)	(745)	236	(18)	(11)	1,084
HBSch	0	0	0	0	0	0
Total	(2,316)	(1,177)	526	(69)	(15)	3,052

Table A-107: 2035 Trips by Purpose and Mode of Travel for Alternative S2

	SOV	HOV	LB	EB	SC	RL	Total
HBW	742,410	90,669	3,164	86	13	658	837,000
HBO	862,753	1,085,239	8,041	241	20	707	1,957,000
HBU	119,784	17,152	1,183	103	0	778	139,000
NHBW	409,885	94,577	1,230	26	75	206	506,000
NHBO	523,223	784,359	5,619	172	172	1,456	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,811,543	2,766,509	19,237	628	280	3,804	5,602,000

Table A-108: Difference in 2035 Trips by Purpose and Model of Travel between the No-Build Alternative and Alternative S2

	SOV	HOV	LB	EB	SC	RL
HBW	(718)	(51)	118	(7)	(1)	658
HBO	(414)	(363)	87	(16)	0	707
HBU	(740)	(90)	74	(22)	0	778
NHBW	(209)	(27)	37	(4)	(2)	206
NHBO	(729)	(923)	225	(18)	(11)	1,456
HBSch	0	0	0	0	0	0
Total	(2,810)	(1,454)	540	(67)	(13)	3,804

Table A-109: 2035 Trips by Purpose and Mode of Travel for Alternative S4

	SOV	HOV	LB	EB	SC	RL	Total
HBW	742,277	90,645	3,166	86	13	814	837,000
HBO	862,706	1,085,143	8,052	240	19	840	1,957,000
HBU	119,961	17,157	1,099	105	0	678	139,000
NHBW	409,843	94,568	1,224	27	75	264	506,000
NHBO	523,144	784,220	5,621	172	172	1,671	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,811,420	2,766,244	19,161	630	279	4,266	5,602,000

Table A-110: Difference in 2035 Trips by Purpose and Model of Travel between the No-Build Alternative and Alternative S4

	SOV	HOV	LB	EB	SC	RL
HBW	(851)	(75)	121	(7)	(1)	814
HBO	(461)	(459)	97	(17)	(1)	840
HBU	(562)	(85)	(10)	(20)	0	678
NHBW	(251)	(37)	30	(3)	(2)	264
NHBO	(807)	(1,063	227	(18)	(11)	1,671
HBSch	0	0	0	0	0	0
Total	(2,933)	(1,719)	465	(64)	(15)	4,266

Table A-111 through Table A-113 shows the potential reduction in vehicle miles of travel (VMT) by trip purpose because of the addition of the respective South Corridor alternative.

Table A-111: Potential Reduced VMT by Trip Purpose for Alternative S1

	SOV (VMT)	HOV (VMT)	Total (VMT)
HBW	5,644	886	6,529
HBO	2,702	5,815	8,517
HBU	5,909	1,922	7,831
NHBW	1,505	598	2,103
NHBO	4,853	15,923	20,776
Total	20,613	25,143	45,756

Table A-112: Potential Reduced VMT by Trip Purpose for Alternative S2

	SOV (VMT)	HOV (VMT)	Total (VMT)
HBW	6,394	1,082	7,476
HBO	3,685	7,746	11,431
HBU	6,586	1,928	8,514
NHBW	1,862	586	2,448
NHBO	6,484	19,721	26,205
Total	25,011	31,064	56,074

Table A-113: Potential Reduced VMT by Trip Purpose for Alternative S4

	SOV (VMT)	HOV (VMT)	Total (VMT)
HBW	7,576	1,604	9,180
HBO	4,102	9,794	13,896
HBU	5,004	1,821	6,825
NHBW	2,237	793	3,030
NHBO	7,182	22,710	29,891
Total	26,100	36,721	62,822

Table A-114: Alternative S1 HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	871	24	47	40	275	160	42	6	17	24	30	56	82	55	111	47	39	33	42	16	616	75	160	464	3,333
11	718	1,018	660	184	576	147	85	5	12	29	24	38	57	32	310	57	76	49	61	16	2,090	708	144	364	7,460
12	1,041	655	1,072	343	1,044	290	163	9	23	40	38	66	105	63	331	104	108	70	104	28	2,975	821	265	590	10,348
13	1,859	271	579	646	1,845	406	190	9	24	53	47	81	134	84	542	106	135	97	108	29	4,412	531	291	984	13,465
14	2,897	140	283	344	2,888	782	269	14	38	70	68	125	217	147	571	142	156	125	146	45	5,054	412	428	1,722	17,082
15	2,299	55	104	102	854	510	118	9	25	46	45	83	133	89	401	84	99	90	73	27	1,744	173	260	1,003	8,426
16	1,550	82	141	125	881	361	210	8	22	44	43	75	108	63	450	104	126	104	50	18	1,317	266	274	606	7,026
21	258	8	11	10	69	39	14	819	1,083	1,517	530	206	94	27	453	48	44	15	12	12	161	48	1,715	450	7,642
22	277	8	12	10	72	39	14	492	1,322	1,896	617	220	97	27	459	43	43	17	12	12	166	42	1,536	464	7,897
23	364	10	16	13	100	54	19	353	1,171	2,624	945	307	137	38	478	50	48	22	14	14	225	50	1,741	614	9,409
24	562	17	29	27	203	113	41	289	816	1,474	1,542	707	317	88	495	88	66	34	31	32	472	88	2,087	1,270	10,887
25	2,798	80	132	124	915	502	187	316	856	1,658	1,739	3,332	1,601	399	2,648	386	309	175	128	133	2,059	390	3,558	5,184	29,613
26	1,823	41	71	70	538	293	91	55	145	290	298	638	1,020	274	1,342	167	145	93	78	69	1,294	174	1,052	2,925	12,986
27	1,999	47	83	75	535	279	86	22	58	126	123	237	419	278	1,025	144	136	96	83	51	1,296	160	638	1,990	9,985
31	361	15	23	20	124	66	30	13	24	43	29	49	69	33	915	189	149	28	15	7	261	167	283	263	3,177
32	926	38	55	46	288	146	70	19	41	90	57	91	133	70	1,756	535	489	75	34	16	614	298	546	587	7,019
33	1,828	74	114	99	649	351	169	30	68	129	88	146	223	125	1,861	683	817	151	65	26	1,271	566	889	994	11,416
34	407	21	38	29	174	97	44	4	10	14	18	32	43	24	80	40	35	36	21	8	332	74	109	200	1,891
41	1,739	111	224	140	919	351	105	18	41	69	69	117	200	127	469	114	112	79	2,777	397	6,909	244	380	3,763	19,474
42	1,349	56	112	74	528	266	72	37	86	138	142	250	341	170	549	111	90	62	828	1,178	3,621	146	561	4,906	15,673
51	18,493	4,666	6,735	3,879	16,803	4,733	1,771	129	326	594	586	1,021	1,746	1,128	4,440	1,204	1,250	888	5,035	1,222	89,151	7,251	3,508	21,967	198,527
52	10,886	4,191	4,255	2,064	8,158	2,839	1,629	224	448	771	598	995	1,437	745	9,588	2,723	2,862	833	742	224	19,683	14,721	5,109	6,434	102,157
53	10,309	367	588	520	3,532	1,924	811	3,843	7,313	11,877	6,393	4,601	3,714	1,270	17,344	3,199	2,405	743	466	341	7,557	3,220	25,789	12,962	131,086
54	13,236	353	673	603	4,659	2,350	642	787	1,945	3,206	2,995	4,481	4,536	1,697	6,845	1,036	897	602	2,737	1,939	19,921	1,239	8,517	36,118	122,014
Total	78,850	12,347	16,056	9,587	46,628	17,099	6,875	7,509	15,913	26,823	17,066	17,955	16,963	7,055	53,462	11,405	10,635	4,518	13,663	5,859	173,201	31,862	59,840	106,822	767,993

Table A-115: Alternative S1 HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	37	0	0	0	3	2	0	0	0	0	0	1	1	1	0	0	0	0	0	0	4	0	0	3	53
11	5	30	9	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3	0	0	53
12	4	16	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	27
13	22	0	0	7	37	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0	0	1	117
14	56	0	0	5	64	19	3	0	0	0	0	0	1	1	0	0	0	1	0	0	90	0	0	3	244
15	105	0	0	1	17	16	1	0	0	0	0	0	0	1	0	0	0	1	0	0	27	0	0	2	173
16	63	0	0	1	7	9	6	0	0	0	0	0	0	0	0	0	0	3	0	0	5	1	0	1	97
21	7	0	0	0	0	0	0	12	24	17	2	3	1	1	0	0	0	0	0	0	0	0	5	0	71
22	5	0	0	0	0	0	0	4	72	65	5	1	1	0	0	0	0	0	0	0	0	0	17	0	170
23	5	0	0	0	0	0	0	1	42	96	29	1	1	0	0	0	0	0	0	0	0	0	33	0	209
24	12	0	0	0	0	1	0	3	28	45	25	5	3	2	0	0	0	0	0	0	0	0	22	0	146
25	60	0	0	0	2	3	0	5	31	26	8	42	21	11	0	0	0	1	0	0	3	0	9	4	227
26	30	0	0	0	2	1	0	0	2	2	1	11	13	6	0	0	0	0	0	0	2	0	1	10	83
27	51	0	0	0	3	1	0	0	2	1	0	3	8	6	0	0	0	0	0	0	5	0	3	18	103
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4	0	0	0	0	1	0	0	18
33	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	1	0	0	14
34	10	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	16
41	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4
42	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	6
51	218	15	9	15	109	51	4	0	0	0	0	1	2	2	0	1	0	2	0	0	595	1	1	16	1,043
52	26	16	5	0	3	3	1	0	0	0	0	0	0	0	0	3	5	1	0	0	3	6	0	1	73
53	73	0	0	0	3	3	0	20	106	135	42	20	17	11	0	0	0	1	0	0	4	0	82	5	524
54	140	0	0	1	8	4	1	1	6	6	2	5	16	11	0	0	0	1	0	0	21	0	5	125	353
Total	945	77	28	32	260	123	20	48	314	392	115	94	87	54	0	13	13	12	3	2	809	15	179	193	3,825

Table A-116: Alternative S1 Non-HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	36,510	719	1,177	1,451	8,452	5,824	2,529	70	457	312	384	1,970	3,804	3,811	1,343	1,905	2,082	1,955	1,308	674	19,813	4,389	6,459	14,713	122,113
11	860	13,574	6,884	1,285	1,820	391	484	5	180	22	34	119	187	130	135	233	224	125	247	72	18,056	11,341	491	797	57,697
12	1,540	7,791	11,354	2,822	3,611	782	936	7	223	31	46	182	310	259	205	366	375	256	414	119	22,094	10,383	799	1,349	66,253
13	2,444	2,582	3,500	9,455	8,589	1,637	1,376	7	465	36	68	264	479	489	219	479	412	374	425	131	29,737	5,719	998	2,553	72,438
14	9,438	1,576	2,264	4,692	28,260	6,080	3,295	25	574	115	170	796	1,575	1,539	642	976	1,019	936	1,083	397	44,107	5,896	2,733	8,927	127,114
15	7,607	643	676	1,138	7,263	6,066	1,826	15	507	79	122	640	1,226	1,431	408	743	724	945	544	284	15,088	2,380	2,105	6,340	58,800
16	3,968	952	1,047	1,310	5,549	2,406	3,646	12	437	68	103	542	808	856	475	968	1,028	1,354	277	137	9,141	4,575	2,342	2,933	44,932
21	134	35	9	9	49	44	23	4,117	6,435	6,864	1,565	1,022	269	77	142	108	61	15	12	29	145	131	15,621	1,397	38,312
22	224	42	17	16	84	63	36	3,087	11,436	12,372	2,765	1,616	439	116	197	139	89	24	21	46	247	169	18,193	2,117	53,556
23	505	63	42	37	194	121	79	2,896	10,670	24,712	6,348	3,273	976	246	354	238	171	51	45	86	563	333	26,458	3,812	82,275
24	577	77	44	49	271	177	109	991	3,813	9,073	9,933	6,583	1,750	461	313	243	167	79	59	138	789	324	17,562	6,745	60,328
25	3,642	446	273	316	1,739	1,121	735	686	4,167	5,016	6,442	46,500	13,735	3,184	1,950	1,477	1,029	549	327	801	4,725	1,947	24,321	34,048	159,177
26	4,966	334	281	373	2,111	1,335	675	138	1,144	782	1,145	8,533	15,966	4,529	1,916	1,151	842	535	407	720	5,798	1,588	9,717	25,342	90,330
27	5,882	490	358	512	2,713	1,891	884	44	942	275	409	2,735	5,676	7,968	1,078	1,292	903	780	523	627	7,508	1,612	6,398	16,373	67,871
31	2,567	243	299	259	1,110	564	552	146	448	438	348	1,543	2,220	998	18,879	4,829	2,999	387	225	196	3,008	6,128	11,445	4,499	64,331
32	2,668	367	318	297	1,244	722	726	55	549	197	172	820	1,200	904	4,589	10,280	5,605	550	200	137	3,168	6,458	8,329	3,090	52,644
33	3,781	575	490	501	2,127	1,301	1,376	47	657	188	172	857	1,279	1,109	3,460	8,369	9,356	1,063	256	146	4,930	9,106	8,744	3,593	63,484
34	2,554	279	304	313	1,326	868	868	9	182	47	66	362	546	549	282	567	600	1,080	168	89	3,093	1,444	1,521	1,770	18,887
41	1,895	734	507	441	1,968	820	328	11	617	37	79	258	516	463	151	353	216	159	37,288	4,783	33,822	879	776	15,909	103,010
42	1,389	344	198	169	931	543	201	30	736	114	185	842	1,301	797	186	304	175	121	5,851	25,527	12,708	435	1,332	24,269	78,687
51	26,613	34,495	28,780	25,171	62,653	16,631	7,999	85	4,786	397	761	2,849	5,695	5,439	1,959	4,081	3,270	2,703	31,645	8,738	670,400	49,580	9,262	72,417	1,076,410
52	10,651	30,708	20,808	8,659	16,901	5,738	7,546	155	3,909	514	602	2,557	3,666	2,766	11,109	16,832	13,681	3,034	1,394	517	77,334	193,009	27,555	11,122	470,768
53	13,198	2,243	1,278	1,414	6,620	4,483	3,729	12,946	36,649	47,593	21,131	34,051	20,652	10,521	20,234	19,448	12,485	3,240	1,043	1,435	17,023	34,365	254,589	51,504	631,874
54	23,777	2,569	1,610	2,408	14,688	8,949	3,180	1,258	10,690	6,687	7,571	35,476	36,798	19,014	4,387	4,477	3,021	2,348	19,783	27,204	88,709	6,384	42,115	295,653	668,756
Total	167,389	101,882	82,517	63,098	180,272	68,558	43,141	26,838	100,673	115,966	60,623	154,389	121,072	67,658	74,613	79,861	60,533	22,664	103,546	73,031	1,092,006	358,577	499,867	611,271	4,330,045

Table A-117: Alternative S1 Non-HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	532	6	7	10	81	93	39	1	11	8	2	26	67	83	0	26	5	21	3	2	169	11	27	121	1,352
11	6	290	94	1	2	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	55	46	0	1	499
12	6	106	31	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	11	11	0	0	172
13	20	2	2	42	106	15	4	0	3	0	0	0	1	1	0	2	0	1	0	0	214	1	1	4	418
14	93	1	2	42	330	66	21	0	3	0	0	1	4	5	0	3	0	4	1	0	424	3	2	17	1,023
15	164	2	4	15	121	88	20	0	5	0	0	2	5	5	0	3	1	7	0	0	234	2	2	18	701
16	93	2	4	5	44	40	76	0	2	0	0	1	3	3	0	3	2	20	0	0	53	13	2	9	376
21	5	0	0	0	0	0	0	44	146	47	4	6	2	1	0	0	0	0	0	0	0	0	42	0	298
22	9	0	0	0	0	0	0	38	418	232	23	8	4	1	0	0	0	0	0	0	0	0	187	0	921
23	14	0	0	0	0	0	0	16	309	435	123	14	6	2	0	0	0	0	0	0	0	0	368	0	1,289
24	18	0	0	0	0	1	0	9	132	117	55	18	10	5	0	0	0	0	0	0	1	0	124	1	492
25	122	0	0	0	3	4	1	9	251	68	19	218	130	43	0	1	0	1	0	0	8	0	45	22	949
26	129	0	0	1	6	4	2	1	56	10	3	86	151	63	0	2	0	1	0	0	14	1	22	67	619
27	185	1	1	2	18	8	5	0	63	5	1	41	132	89	0	5	0	3	0	0	45	1	41	128	778
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
32	26	0	0	0	2	1	1	0	1	0	0	1	1	1	1	94	28	1	0	0	5	24	6	3	196
33	18	0	0	0	2	1	1	0	1	0	0	0	1	1	0	33	14	0	0	0	3	15	3	2	95
34	43	2	4	2	14	23	28	0	1	0	0	1	3	3	0	2	0	12	0	0	29	4	2	7	181
41	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	21	0	3	0	0	1	29
42	4	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	17	3	0	0	6	35
51	266	70	31	93	502	202	27	0	12	0	0	3	11	13	0	11	1	8	4	1	3,133	8	6	103	4,504
52	36	91	26	2	10	8	16	0	5	0	0	1	2	2	0	48	35	4	0	0	22	88	3	5	403
53	113	1	0	1	7	5	3	53	608	375	121	60	72	46	0	10	1	2	0	0	17	2	515	24	2,036
54	260	2	1	5	43	20	10	1	62	14	5	27	145	109	0	11	1	5	3	7	202	2	31	1,017	1,982
Total	2,163	577	206	224	1,294	583	257	175	2,092	1,313	357	516	752	477	2	256	89	91	33	28	4,646	231	1,432	1,556	19,348

Table A-118: Alternative S2 HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	872	24	47	40	275	160	42	6	17	23	29	56	82	55	111	48	39	33	42	16	614	76	160	464	3,332
11	718	1,017	659	184	579	147	85	5	12	28	24	38	57	32	309	57	76	49	61	16	2,090	706	144	367	7,461
12	1,044	654	1,070	342	1,047	290	163	9	23	40	38	66	105	64	330	104	108	70	104	27	2,975	818	265	592	10,349
13	1,860	271	579	645	1,844	405	190	9	24	53	48	82	134	84	542	106	134	97	108	29	4,415	530	291	984	13,465
14	2,899	139	282	344	2,888	781	269	14	37	70	67	125	217	147	574	142	156	125	146	45	5,055	411	428	1,721	17,082
15	2,296	55	103	102	854	509	118	9	24	46	45	84	134	89	405	85	99	90	73	27	1,743	173	262	1,002	8,426
16	1,547	82	141	125	882	361	210	8	21	44	43	76	109	64	451	104	126	105	49	18	1,320	266	274	603	7,027
21	250	8	11	10	67	37	14	821	1,082	1,517	530	207	98	28	454	48	43	14	12	12	161	48	1,715	455	7,642
22	274	8	12	10	69	37	14	493	1,322	1,895	618	222	100	28	460	43	43	17	12	12	165	42	1,534	470	7,899
23	360	10	16	13	96	53	19	354	1,173	2,625	946	308	139	39	478	50	48	22	14	14	225	50	1,739	618	9,409
24	563	17	29	27	202	114	41	290	818	1,476	1,543	706	313	87	494	88	66	34	31	32	471	89	2,087	1,267	10,886
25	2,813	80	132	124	914	505	188	316	854	1,656	1,739	3,315	1,587	396	2,648	386	310	175	127	133	2,057	393	3,561	5,165	29,576
26	1,833	41	71	70	543	297	91	54	142	289	293	632	1,012	271	1,331	165	144	93	78	69	1,291	174	1,047	2,908	12,940
27	1,989	47	83	75	538	279	86	22	59	130	122	236	419	277	1,020	144	135	96	83	51	1,296	161	638	1,986	9,973
31	360	15	23	20	123	66	30	13	24	43	29	49	69	33	916	190	150	28	15	7	263	167	283	263	3,177
32	925	37	55	45	288	146	70	19	41	89	57	91	133	69	1,761	535	488	75	34	16	615	297	546	586	7,020
33	1,827	74	114	99	650	350	169	30	67	128	88	146	223	125	1,864	683	817	151	66	26	1,272	565	889	994	11,416
34	407	21	38	29	173	97	44	3	9	14	18	33	43	24	80	40	35	36	21	8	332	74	109	200	1,891
41	1,742	112	225	141	917	352	106	18	41	68	69	115	199	127	469	114	113	79	2,780	398	6,910	244	379	3,757	19,473
42	1,348	56	113	74	527	266	73	36	85	138	143	250	342	169	551	111	90	62	828	1,179	3,616	147	561	4,907	15,672
51	18,491	4,669	6,739	3,882	16,806	4,732	1,773	129	321	591	583	1,021	1,749	1,130	4,454	1,206	1,253	890	5,028	1,221	89,124	7,252	3,515	21,966	198,526
52	10,883	4,188	4,256	2,067	8,171	2,840	1,626	223	449	772	598	996	1,439	743	9,583	2,725	2,863	832	740	224	19,697	14,714	5,109	6,420	102,160
53	10,284	368	587	518	3,514	1,918	808	3,844	7,319	11,881	6,395	4,598	3,720	1,273	17,335	3,197	2,405	742	469	341	7,577	3,225	25,803	12,985	131,106
54	13,250	353	671	601	4,660	2,355	646	784	1,939	3,195	2,997	4,477	4,528	1,691	6,840	1,034	893	602	2,740	1,938	19,910	1,241	8,499	36,132	121,977
Total	78,834	12,347	16,056	9,587	46,628	17,099	6,876	7,508	15,902	26,813	17,064	17,930	16,951	7,045	53,460	11,405	10,635	4,518	13,663	5,859	173,195	31,863	59,836	106,813	767,885

Table A-119: Alternative S2 HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	37	0	0	0	3	2	0	0	0	0	0	1	1	1	0	0	0	0	0	0	4	0	0	3	54
11	5	30	9	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3	0	0	53
12	4	16	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	27
13	22	0	0	6	37	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0	0	1	117
14	56	0	0	5	64	19	3	0	0	0	0	0	1	1	0	0	0	1	0	0	91	0	0	3	244
15	105	0	0	1	17	16	1	0	0	0	0	0	0	1	0	0	0	1	0	0	28	0	0	2	173
16	63	0	0	1	7	9	6	0	0	0	0	0	0	0	0	0	0	3	0	0	5	1	0	1	97
21	6	0	0	0	0	0	0	12	24	17	2	3	1	1	0	0	0	0	0	0	0	0	4	0	71
22	4	0	0	0	0	0	0	4	72	65	5	1	0	0	0	0	0	0	0	0	0	0	17	0	170
23	4	0	0	0	0	0	0	1	43	96	29	1	0	0	0	0	0	0	0	0	0	0	33	0	209
24	11	0	0	0	0	1	0	4	28	45	25	6	3	3	0	0	0	0	0	0	0	0	21	1	148
25	67	0	0	0	2	3	0	6	35	29	9	54	23	15	0	0	0	1	0	0	3	0	10	6	263
26	42	0	0	0	2	2	0	1	6	5	2	17	17	10	0	0	0	0	0	0	3	0	3	13	122
27	57	0	0	0	3	1	0	0	2	2	1	4	9	6	0	0	0	0	0	0	5	0	3	19	113
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4	0	0	0	0	1	0	0	18
33	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	1	0	0	14
34	10	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	16
41	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4
42	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	6
51	219	15	9	15	109	52	4	0	0	0	0	1	2	2	0	1	0	2	0	0	595	1	1	16	1,044
52	27	16	5	0	3	3	2	0	0	0	0	0	0	0	0	3	5	1	0	0	3	6	0	1	74
53	57	0	0	0	2	2	0	19	102	131	42	19	18	11	0	0	0	1	0	0	3	0	80	6	492
54	148	0	0	1	8	4	1	2	11	10	3	12	20	14	0	0	0	1	0	0	22	0	6	126	389
Total	961	77	28	31	260	123	20	50	323	400	117	119	98	65	0	13	13	12	3	2	809	15	180	200	3,919

Table A-120: Alternative S2 Non-HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	36,533	718	1,176	1,450	8,461	5,825	2,529	68	452	308	381	1,969	3,820	3,779	1,354	1,914	2,091	1,957	1,297	685	19,751	4,393	6,439	14,703	122,054
11	863	13,567	6,877	1,291	1,833	393	483	5	180	22	34	118	188	133	135	233	223	125	246	72	18,067	11,321	490	803	57,703
12	1,546	7,780	11,343	2,827	3,625	783	936	7	223	30	46	182	312	262	206	366	373	257	413	119	22,111	10,359	800	1,352	66,256
13	2,446	2,585	3,497	9,453	8,581	1,632	1,375	7	468	36	68	264	480	488	220	479	410	374	423	132	29,756	5,713	1,000	2,553	72,440
14	9,438	1,573	2,257	4,685	28,245	6,065	3,291	24	568	113	168	801	1,581	1,537	648	979	1,019	938	1,083	404	44,142	5,884	2,739	8,928	127,114
15	7,598	642	674	1,134	7,258	6,052	1,823	15	500	78	122	652	1,236	1,434	416	750	724	945	541	289	15,070	2,376	2,132	6,335	58,798
16	3,957	950	1,047	1,319	5,546	2,408	3,640	12	430	67	103	544	813	859	476	967	1,026	1,352	274	139	9,170	4,571	2,345	2,917	44,932
21	131	36	9	9	46	40	23	4,119	6,428	6,862	1,565	1,033	286	83	142	107	60	14	12	29	143	130	15,606	1,398	38,312
22	220	42	17	16	81	60	36	3,089	11,427	12,370	2,765	1,631	465	125	197	138	88	24	21	45	244	170	18,175	2,119	53,564
23	495	63	42	37	189	119	77	2,900	10,677	24,712	6,345	3,288	1,003	257	355	237	171	51	45	85	558	334	26,423	3,817	82,280
24	576	78	44	50	270	177	109	996	3,821	9,085	9,936	6,581	1,733	455	312	243	168	80	59	138	786	327	17,574	6,723	60,318
25	3,695	448	274	317	1,749	1,136	742	687	4,146	5,021	6,457	46,335	13,625	3,177	1,951	1,475	1,028	553	327	800	4,743	1,963	24,359	33,970	158,978
26	4,994	332	282	377	2,150	1,370	682	136	1,119	781	1,132	8,491	15,840	4,526	1,909	1,145	834	537	408	716	5,813	1,601	9,697	25,203	90,073
27	5,824	492	360	516	2,743	1,905	882	44	928	284	407	2,712	5,679	7,938	1,072	1,293	898	777	523	629	7,506	1,634	6,385	16,321	67,752
31	2,582	245	301	261	1,120	567	557	144	446	433	349	1,555	2,242	993	18,795	4,811	3,000	389	232	197	3,065	6,109	11,426	4,522	64,341
32	2,656	365	316	296	1,244	721	725	55	549	195	173	821	1,190	897	4,606	10,288	5,609	548	203	137	3,181	6,451	8,336	3,082	52,644
33	3,769	574	491	501	2,127	1,299	1,376	47	657	187	172	854	1,275	1,103	3,481	8,379	9,364	1,061	257	147	4,932	9,100	8,743	3,590	63,486
34	2,550	278	305	313	1,320	864	867	9	181	46	66	363	549	551	283	568	601	1,080	168	91	3,086	1,447	1,525	1,773	18,885
41	1,898	738	510	442	1,960	824	328	10	618	37	79	255	509	460	152	352	216	159	37,316	4,785	33,819	882	773	15,883	103,006
42	1,384	346	199	169	924	539	201	30	737	114	186	843	1,308	795	189	303	174	121	5,854	25,533	12,685	437	1,333	24,276	78,680
51	26,599	34,549	28,813	25,153	62,609	16,616	8,008	84	4,752	391	759	2,840	5,699	5,446	1,975	4,093	3,279	2,712	31,597	8,723	670,361	49,615	9,282	72,438	1,076,393
52	10,624	30,670	20,793	8,676	16,915	5,740	7,533	154	3,928	515	603	2,556	3,676	2,764	11,136	16,843	13,690	3,031	1,390	520	77,395	192,980	27,557	11,108	470,797
53	13,136	2,256	1,278	1,408	6,587	4,464	3,720	12,939	36,691	47,587	21,119	34,019	20,708	10,518	20,208	19,430	12,486	3,228	1,056	1,436	17,072	34,412	254,626	51,538	631,920
54	23,800	2,569	1,613	2,400	14,688	8,956	3,200	1,254	10,661	6,671	7,588	35,470	36,707	18,951	4,387	4,472	3,001	2,351	19,796	27,180	88,572	6,412	42,066	295,840	668,606
Total	167,314	101,895	82,518	63,100	180,271	68,557	43,143	26,834	100,585	115,947	60,623	154,178	120,924	67,530	74,607	79,866	60,533	22,665	103,543	73,030	1,092,027	358,621	499,831	611,191	4,329,331

Table A-121: Alternative S2 Non-HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	535	6	7	10	82	93	39	1	10	8	2	39	78	114	0	26	5	21	3	2	171	11	27	122	1,411
11	6	289	94	1	2	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	55	46	0	1	498
12	6	106	30	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	11	11	0	0	172
13	20	2	2	41	106	15	4	0	2	0	0	0	1	1	0	2	0	1	0	0	214	1	1	4	417
14	93	1	2	42	330	67	21	0	3	0	0	2	4	5	0	3	0	4	1	0	424	3	2	17	1,024
15	164	2	4	15	121	88	20	0	5	0	0	2	5	5	0	3	1	7	0	0	235	2	2	18	701
16	92	2	4	5	44	40	76	0	2	0	0	1	3	3	0	3	2	20	0	0	53	13	2	9	376
21	5	0	0	0	0	0	0	44	146	47	4	7	3	2	0	0	0	0	0	0	0	0	42	0	301
22	8	0	0	0	0	0	0	38	418	232	23	10	4	2	0	0	0	0	0	0	0	0	186	0	920
23	13	0	0	0	0	0	0	17	311	435	123	16	7	4	0	0	0	0	0	0	0	0	367	1	1,294
24	17	0	0	0	0	1	0	10	133	118	55	24	14	9	0	0	0	0	0	0	0	0	123	2	506
25	134	0	0	0	3	4	2	11	292	74	21	304	153	69	0	1	0	1	0	0	9	0	50	24	1,154
26	172	0	0	1	6	5	2	3	93	17	5	140	203	91	0	2	0	2	0	0	14	1	31	74	861
27	225	1	1	2	18	8	5	1	83	7	2	55	150	98	0	5	0	3	0	0	46	1	42	132	887
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
32	26	0	0	0	2	1	1	0	1	0	0	1	1	1	1	94	28	1	0	0	5	24	6	3	197
33	18	0	0	0	2	1	1	0	0	0	0	0	1	1	0	33	14	0	0	0	3	15	3	2	95
34	44	2	4	2	14	23	28	0	1	0	0	1	3	3	0	2	0	12	0	0	29	4	2	7	182
41	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	21	0	3	0	0	1	29
42	4	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	17	3	0	0	6	35
51	266	70	31	93	501	203	27	0	10	0	0	4	11	14	0	11	1	8	4	1	3,134	8	6	103	4,504
52	36	91	26	2	9	8	16	0	5	0	0	1	2	1	0	48	36	4	0	0	21	87	3	4	401
53	87	1	0	1	6	4	3	52	554	367	119	61	79	48	0	10	1	2	0	0	15	2	509	24	1,947
54	273	2	1	5	43	20	10	2	102	19	7	56	167	120	0	11	1	5	3	7	203	2	35	1,019	2,112
Total	2,245	576	206	224	1,295	585	257	177	2,175	1,325	361	724	891	591	2	257	89	91	33	28	4,650	231	1,440	1,573	20,026

Table A-122: Alternative S4 HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	873	24	47	41	274	160	42	6	16	25	30	56	82	55	111	47	39	33	42	16	614	75	160	463	3,334
11	722	1,017	659	184	576	148	86	5	12	28	24	38	57	32	311	57	76	49	61	16	2,086	706	145	365	7,460
12	1,050	653	1,070	342	1,045	292	164	9	23	40	38	66	105	64	332	104	107	71	104	27	2,969	818	265	592	10,349
13	1,859	272	580	645	1,843	406	189	9	24	53	48	81	134	84	544	106	134	97	108	29	4,414	529	291	985	13,465
14	2,894	141	283	344	2,889	781	269	14	37	72	68	125	217	147	574	142	156	125	145	45	5,056	411	427	1,722	17,082
15	2,296	55	104	102	853	509	118	8	23	51	46	84	133	89	405	85	99	90	73	27	1,741	173	262	1,001	8,427
16	1,549	81	140	125	881	361	209	8	21	44	43	76	108	63	453	104	126	105	49	18	1,319	266	274	605	7,026
21	234	8	11	10	67	35	14	822	1,089	1,506	533	207	98	28	457	48	44	14	12	12	162	48	1,720	454	7,631
22	264	8	12	10	68	35	13	493	1,333	1,894	617	221	101	28	460	43	43	15	12	12	166	42	1,535	471	7,898
23	356	10	16	13	96	52	19	353	1,177	2,609	944	307	140	39	479	50	48	22	14	14	225	50	1,737	618	9,389
24	564	17	29	28	203	114	41	290	821	1,456	1,534	708	316	88	493	88	66	34	31	32	473	88	2,087	1,268	10,869
25	2,805	80	132	124	915	504	188	315	852	1,627	1,728	3,314	1,591	396	2,652	388	312	175	128	133	2,058	393	3,565	5,170	29,544
26	1,830	41	71	71	545	297	91	54	143	289	295	631	1,010	271	1,331	165	144	93	78	69	1,291	174	1,048	2,903	12,936
27	1,986	48	84	75	538	279	85	21	57	128	125	236	418	277	1,019	144	135	96	83	51	1,297	161	639	1,990	9,972
31	362	15	23	20	123	66	30	13	24	43	29	49	69	33	915	190	150	28	15	7	259	167	283	265	3,177
32	926	38	55	45	288	146	70	19	41	89	57	92	133	70	1,762	535	488	75	34	16	609	298	546	587	7,019
33	1,827	75	114	99	650	350	169	30	67	128	88	147	224	125	1,865	682	817	151	65	26	1,266	566	889	995	11,416
34	407	21	38	29	174	98	44	3	9	14	18	33	43	24	81	40	35	36	21	8	332	74	109	200	1,891
41	1,741	111	224	140	922	352	106	18	41	67	68	115	200	127	470	114	113	79	2,778	397	6,910	244	379	3,761	19,476
42	1,352	56	112	74	531	267	73	36	85	136	142	247	342	170	546	111	90	62	828	1,178	3,619	146	561	4,908	15,671
51	18,491	4,665	6,735	3,880	16,794	4,737	1,772	130	326	592	587	1,024	1,746	1,133	4,468	1,205	1,248	892	5,029	1,222	89,155	7,246	3,519	21,933	198,530
52	10,908	4,191	4,257	2,063	8,168	2,846	1,629	223	449	770	597	996	1,435	739	9,563	2,716	2,858	834	740	224	19,698	14,714	5,102	6,442	102,162
53	10,288	368	589	521	3,512	1,912	808	3,846	7,326	11,809	6,387	4,608	3,729	1,275	17,341	3,202	2,408	742	468	341	7,543	3,228	25,794	13,005	131,048
54	13,253	354	672	604	4,673	2,352	646	786	1,935	3,174	2,988	4,466	4,522	1,687	6,838	1,037	898	601	2,743	1,938	19,936	1,244	8,500	36,109	121,957
Total	78,839	12,347	16,055	9,587	46,629	17,099	6,875	7,510	15,932	26,645	17,036	17,925	16,951	7,044	53,469	11,405	10,634	4,518	13,663	5,859	173,197	31,863	59,835	106,812	767,730

Table A-123: Alternative S4 HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	36	0	0	0	3	2	0	0	0	0	0	1	1	1	0	0	0	0	0	0	4	0	0	3	53
11	5	30	9	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	3	0	0	53
12	4	16	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	27
13	22	0	0	6	37	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0	0	1	117
14	56	0	0	5	64	19	3	0	0	0	0	0	1	1	0	0	0	1	0	0	91	0	0	3	244
15	103	0	0	1	17	16	1	0	0	0	0	0	0	1	0	0	0	1	0	0	28	0	0	2	171
16	63	0	0	1	7	9	6	0	0	0	0	0	0	0	0	0	0	3	0	0	5	1	0	1	97
21	5	0	0	0	0	0	0	12	21	31	3	3	1	1	0	0	0	0	0	0	0	0	5	0	80
22	5	0	0	0	0	0	0	4	65	70	5	1	0	0	0	0	0	0	0	0	0	0	17	0	169
23	7	0	0	0	0	0	0	2	42	106	31	2	1	1	0	0	0	0	0	0	0	0	35	0	228
24	11	0	0	0	0	1	0	3	23	60	30	7	3	3	0	0	0	0	0	0	0	0	21	1	162
25	66	0	0	0	2	3	0	5	31	59	16	56	23	15	0	0	0	1	0	0	3	0	9	6	295
26	41	0	0	0	2	2	0	1	5	11	2	17	17	10	0	0	0	0	0	0	3	0	2	13	126
27	55	0	0	0	3	1	0	0	2	5	1	4	9	6	0	0	0	0	0	0	5	0	3	19	113
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4	0	0	0	0	1	0	0	18
33	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	1	0	0	13
34	10	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	16
41	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4
42	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	6
51	217	15	9	15	109	52	4	0	0	0	0	1	2	2	0	1	0	2	0	0	596	1	1	16	1,043
52	27	16	5	0	3	3	2	0	0	0	0	0	0	0	0	3	5	1	0	0	3	6	0	1	74
53	54	0	0	0	2	2	0	18	91	206	47	20	17	10	0	0	0	0	0	0	3	0	81	5	558
54	145	0	0	1	8	4	1	2	13	22	6	12	21	14	0	0	0	1	0	0	22	0	7	126	406
Total	949	77	28	31	260	123	19	47	293	570	141	123	98	65	0	13	13	12	3	2	810	15	182	199	4,076

Table A-124: Alternative S4 Non-HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	36,491	727	1,184	1,458	8,479	5,835	2,524	66	449	320	397	1,966	3,815	3,775	1,360	1,916	2,090	1,954	1,301	679	19,742	4,389	6,455	14,683	122,055
11	865	13,568	6,887	1,286	1,821	393	489	5	181	21	34	118	186	132	136	234	223	127	246	72	18,048	11,332	493	801	57,700
12	1,553	7,772	11,345	2,823	3,614	787	942	7	224	30	46	182	310	262	207	367	374	259	413	119	22,088	10,368	805	1,356	66,253
13	2,446	2,597	3,509	9,453	8,575	1,640	1,370	7	469	35	68	264	480	490	222	479	408	374	423	132	29,744	5,703	1,001	2,552	72,439
14	9,431	1,586	2,266	4,686	28,258	6,073	3,284	24	567	116	170	801	1,582	1,543	647	977	1,017	934	1,076	402	44,138	5,882	2,733	8,925	127,117
15	7,597	649	677	1,137	7,254	6,060	1,821	14	495	85	124	654	1,236	1,435	417	748	723	943	542	287	15,049	2,378	2,136	6,336	58,796
16	3,968	946	1,043	1,321	5,546	2,412	3,640	12	427	66	102	541	805	855	479	971	1,026	1,355	276	139	9,165	4,566	2,348	2,925	44,931
21	121	36	9	9	45	37	23	4,117	6,443	6,846	1,573	1,011	284	83	142	108	61	13	12	29	144	130	15,625	1,402	38,302
22	213	42	17	16	79	57	35	3,088	11,484	12,351	2,766	1,615	465	124	196	138	88	22	21	45	243	169	18,187	2,124	53,587
23	485	63	42	38	189	117	76	2,892	10,673	24,619	6,340	3,263	1,006	256	355	237	171	50	45	85	558	334	26,408	3,817	82,121
24	584	77	44	50	270	178	109	995	3,828	9,046	9,907	6,607	1,752	464	311	243	170	79	59	138	789	326	17,552	6,726	60,304
25	3,679	446	273	317	1,742	1,133	739	682	4,146	4,982	6,414	46,337	13,640	3,171	1,953	1,483	1,047	549	329	799	4,749	1,962	24,372	33,994	158,939
26	4,982	335	284	380	2,150	1,366	678	135	1,129	796	1,139	8,491	15,815	4,519	1,912	1,150	840	538	406	716	5,812	1,598	9,717	25,191	90,078
27	5,809	497	362	518	2,730	1,897	872	42	942	288	420	2,711	5,675	7,931	1,073	1,292	895	775	523	628	7,504	1,626	6,395	16,375	67,778
31	2,598	245	301	263	1,103	563	558	145	447	434	349	1,557	2,237	995	18,813	4,816	2,997	390	231	198	3,021	6,120	11,432	4,525	64,336
32	2,666	368	317	298	1,233	717	726	55	549	194	172	826	1,194	900	4,609	10,283	5,606	549	202	136	3,149	6,462	8,342	3,090	52,643
33	3,774	577	490	503	2,122	1,292	1,379	47	657	187	173	862	1,283	1,110	3,477	8,367	9,358	1,060	258	146	4,911	9,108	8,732	3,609	63,483
34	2,554	278	304	314	1,319	867	868	9	177	47	66	362	544	550	285	571	601	1,080	168	91	3,082	1,445	1,526	1,777	18,885
41	1,895	731	504	438	1,977	821	330	10	617	37	79	253	512	461	152	354	217	160	37,310	4,785	33,831	877	774	15,895	103,023
42	1,393	343	197	169	939	542	203	30	735	113	184	832	1,312	795	186	303	175	122	5,850	25,516	12,680	436	1,334	24,290	78,679
51	26,623	34,497	28,760	25,130	62,613	16,642	7,993	85	4,798	399	764	2,860	5,700	5,489	1,981	4,089	3,263	2,712	31,583	8,734	670,581	49,539	9,307	72,289	1,076,431
52	10,647	30,682	20,813	8,661	16,920	5,755	7,552	154	3,922	514	601	2,563	3,664	2,744	11,118	16,810	13,669	3,037	1,390	517	77,337	193,034	27,541	11,141	470,786
53	13,153	2,251	1,280	1,419	6,547	4,432	3,722	12,953	36,713	47,504	21,101	34,095	20,733	10,533	20,197	19,450	12,496	3,233	1,054	1,435	16,982	34,412	254,554	51,641	631,891
54	23,789	2,577	1,611	2,415	14,758	8,943	3,206	1,259	10,642	6,656	7,558	35,377	36,695	18,914	4,388	4,479	3,019	2,347	19,823	27,198	88,668	6,423	42,066	295,740	668,551
Total	167,315	101,891	82,517	63,101	180,284	68,559	43,138	26,832	100,713	115,686	60,548	154,153	120,925	67,531	74,613	79,863	60,534	22,663	103,543	73,027	1,092,015	358,618	499,835	611,203	4,329,106

Table A-125: Alternative S4 Non-HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	527	6	7	10	82	93	39	1	10	12	3	40	78	113	0	26	5	21	3	2	171	11	27	122	1,408
11	6	289	94	1	2	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	55	46	0	1	498
12	6	106	31	1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	11	11	0	0	172
13	20	2	2	41	106	15	4	0	1	0	0	0	1	1	0	2	0	1	0	0	214	1	1	4	416
14	93	1	2	42	329	67	21	0	2	0	0	2	4	5	0	3	0	4	1	0	424	3	2	17	1,023
15	162	2	4	15	121	88	20	0	4	0	0	2	5	5	0	3	1	7	0	0	238	2	2	18	701
16	93	2	3	5	44	40	76	0	1	0	0	1	3	3	0	3	2	20	0	0	53	13	2	9	376
21	4	0	0	0	0	0	0	44	142	61	6	7	3	2	0	0	0	0	0	0	0	0	43	0	310
22	8	0	0	0	0	0	0	39	377	250	21	8	3	2	0	0	0	0	0	0	0	0	182	0	890
23	22	0	0	0	0	0	0	22	344	492	134	31	12	7	0	0	0	0	0	0	0	0	379	1	1,444
24	15	0	0	0	0	1	0	7	116	136	68	23	12	8	0	0	0	0	0	0	0	0	122	2	511
25	141	0	0	0	3	4	2	10	259	116	41	301	152	69	0	1	0	1	0	0	9	0	49	24	1,183
26	171	0	0	1	6	5	2	2	75	25	8	142	203	91	0	2	0	2	0	0	14	1	31	73	856
27	222	1	1	2	18	8	5	0	56	10	3	55	150	98	0	5	0	3	0	0	46	1	43	132	860
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
32	25	0	0	0	2	1	1	0	1	0	0	1	1	1	1	94	28	1	0	0	5	24	7	3	196
33	18	0	0	0	2	1	1	0	0	0	0	0	1	1	0	33	14	0	0	0	3	15	3	2	95
34	44	2	4	2	14	23	28	0	1	0	0	1	3	3	0	2	0	12	0	0	29	4	2	7	182
41	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	21	0	3	0	0	1	29
42	4	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	17	3	0	0	6	35
51	264	70	31	93	501	203	27	0	9	0	0	4	11	14	0	11	1	8	4	1	3,144	8	6	103	4,510
52	36	91	26	2	10	8	16	0	5	0	0	1	2	2	0	48	35	4	0	0	22	88	3	5	404
53	84	1	0	1	6	4	3	50	528	452	130	68	78	47	0	10	1	2	0	0	15	2	516	24	2,022
54	265	2	1	5	44	20	10	2	108	31	12	57	169	121	0	11	1	5	3	7	203	2	38	1,018	2,135
Total	2,232	576	206	224	1,293	586	257	177	2,043	1,585	427	743	892	593	2	256	89	91	33	28	4,664	231	1,456	1,572	20,256

A.6 Regional Rail Alternative – Transit Ridership Results

A.6.1 Description of Alternative

As developed by the project team, Steering Committee and stakeholders, the Regional Rail Alternative combined the North Corridor N1 (Commuter Rail) Alternative, the East Corridor E1A (Streetcar) Alternative, and the South Corridor S1 (Commuter Rail) Alternative, for a comprehensive evaluation of projected commuter rail ridership. While each corridor must be able to stand on its own in terms of operations and value to the region, it was important for the project team to evaluate a fully integrated system to ensure that the whole would be greater than the sum of its parts. The figure below shows the alignment in detail.

It is important to note that the alternatives described in the Regional Rail Alternative were developed and modeled before Alternative E1A was developed. It was determined that Alternative E1A would perform better in terms of ridership, but it was not modeled at this stage (information about Alternative E1A is included on Page A-123 and A-124.

At Tinker AFB (Traffic Analysis Zone [TAZ] 1819), the following special adjustments were made to account for the on-base, intra-zonal-bus service:

- A special walk-only connector was created, which has a 0.3-mile walking distance to connect the zone's centroid and the station, in order to simulate accessibility of nearby employment, as well as internal distribution via an on-base bus system.
- The ACOG model defines a half-mile radius from the transit station as the walk-accessible transit service area. Based on this rule, 20% of the trips in the TAZ are within the walk-accessible service coverage. To better account for on-base (intra-zonal) bus distribution, the percentage was manually increased to 70% at this station.

A.6.2 Changes to the No-Build Bus Network

The following changes were made to the previously coded No-Build bus network to accommodate the Regional Rail Alternative:

- EMBARK Route 10 was extended beyond the Oklahoma City Transit Center to provide service to Santa Fe Station.
- EMBARK Route 11 was rerouted along Reno Ave and Gaylord Boulevard to serve the Santa Fe Station.
- EMBARK Route 12 was also rerouted to serve the Santa Fe Station.
- A new Lincoln Shuttle was added to connect Santa Fe Station along Gaylord Boulevard, NE 4th Street, and Lincoln Boulevard to the Capitol.
- EMBARK Route 18 was extended on N 63rd Street past US-77 to provide bi-directional service with access to the commuter rail station.
- A new EMBARK Route 20 was added to operate from the Transit Center through the Capitol area, and then turning east on NE 36th Street, north on Kelly Avenue, west on Wilshire Boulevard, north on US-77, and west on Britton Road, terminating at the commuter rail station.
- EMBARK Route 40 was extended southwest along Santa Fe, NE 12th Street, and N Broadway Street to provide loop service in Moore. The loop was routed along Broadway Street, SE 19th Street, Telephone Road, and N 5th Street with tie-ins to commuter rail station at SE 19th Street and NE 2nd Street.

Figure A-14: Regional Rail Alternative Alignment

A.6.3 Results from Travel Demand Model

To provide a complete set of ridership forecasts and other TDM results for analysis of the regional rail alternative, the following steps were taken:

- Performed an ACOG TDM run to produce horizon year 2035 ridership forecasts;
- Examined the mode choice model results;
- Examined the transit assignment results to obtain forecast transit ridership and boardings and alightings by route and mode of access (drive, walk, etc.) for the regional rail alternative; and
- Prepared tables documenting the transit ridership for the regional rail alternative.

It is important to note that the ridership forecasts are not capacity restrained. Therefore, they represent the potential market demand for the regional rail alternative under the given demographic scenario and transit fare structure.

Transit Ridership

The following tables show the system-wide and route-specific transit ridership.

Table A-126: Average Weekday System-Wide Ridership for Horizon Year 2035

No-Build Alternative	Regional Rail Alternative	Difference
23,821	32,392	8,571

Table A-127: Average Weekday Ridership Results by Route for Horizon Year 2035

Route	No-Build Ridership	Regional Rail Ridership[10]
CART 12th Ave E	160	156
CART 24th Ave W	273	269
CART Berry Rd	158	159
CART Downtown	164	164
CART E Norman	383	390
CART N10	430	579
CART N11	178	314
CART N12	235	307
CART N20	260	254
CART N21	530	503
CART N32	276	280
CART N40	72	69
CART N42	155	145
CART N52	302	287
CART Porter	349	470
CART Robinson	498	491
CART 24	271	252
CART SH-9	119	133
Citylink 1	183	179
Citylink 2	204	211
Citylink 3	387	385
Citylink 4	190	188
Citylink 101	128	107
Citylink 102	199	191
EMBARK Route 2	372	354
EMBARK Route 3	335	303
EMBARK Route 5	2,558	2,709
EMBARK Route 7	1,650	1,645
EMBARK Route 8	1,346	1,356
EMBARK Route 9	310	322
EMBARK Route 10	632	983
EMBARK Route 11	1,098	1,092
EMBARK Route 12	829	1,206
EMBARK Route 13	705	716
EMBARK Route 14	654	702
EMBARK Route 15	647	526
EMBARK Route 16	598	615
EMBARK Route 18	400	472
EMBARK Route 19	100	102
EMBARK Route 20	(New – Not in No-Build)	370
EMBARK Route 22	311	267

[10] Please note that Alternatives N1, S1, and E1 were coded as individual routes, and therefore require a transfer if patrons switch from one corridor to another.

Table A-127: Average Weekday Ridership Results by Route for Horizon Year 2035

Route	No-Build Ridership	Regional Rail Ridership[10]
EMBARK Route 23	1,830	1,915
EMBARK Route 36	861	840
EMBARK Route 38	498	503
EMBARK Route 40	1,216	1,330
EMBARK Streetcar	656	534
EMBARK Lincoln Shuttle	(New – not included as part of the No-Build Alternative)	63
EMBARK Mustang	61	61
EMBARK Yukon	48	48
Alternative E1	(N/A)	1,376
Alternative N1	(N/A)	2,182
Alternative S1	(N/A)	3,317
Total	23,821	32,392

System-wide Passenger-Miles

Passenger-miles are the cumulative sum of the distances ridden by each transit passenger and give an overall idea of transit system usage.

Table A-128: Average Weekday Passenger Miles by Mode for Horizon Year 2035

Transit Mode	Regional Rail Passenger Miles
Local Bus	71,000
Express Bus	4,800
Streetcar (including Downtown Oklahoma City and North Corridor Routes)	700
Rail	56,400

System-wide Transfer between Transit Modes

In order to visualize the interaction between the different transit options, the number of transfers between transit modes was analyzed.

Table A-129: Average Weekday Transfers between Modes for Horizon Year 2035

From / To	Local Bus	Express Bus	Streetcar	Rail
Local Bus	3,721	79	211	242
Express Bus	82	12	2	7
Streetcar	43	0	0	0
Rail	1,069	83	0	426

Boarding and Alightings by Station

The following graphics and tables show the passenger boardings and alightings by station location.

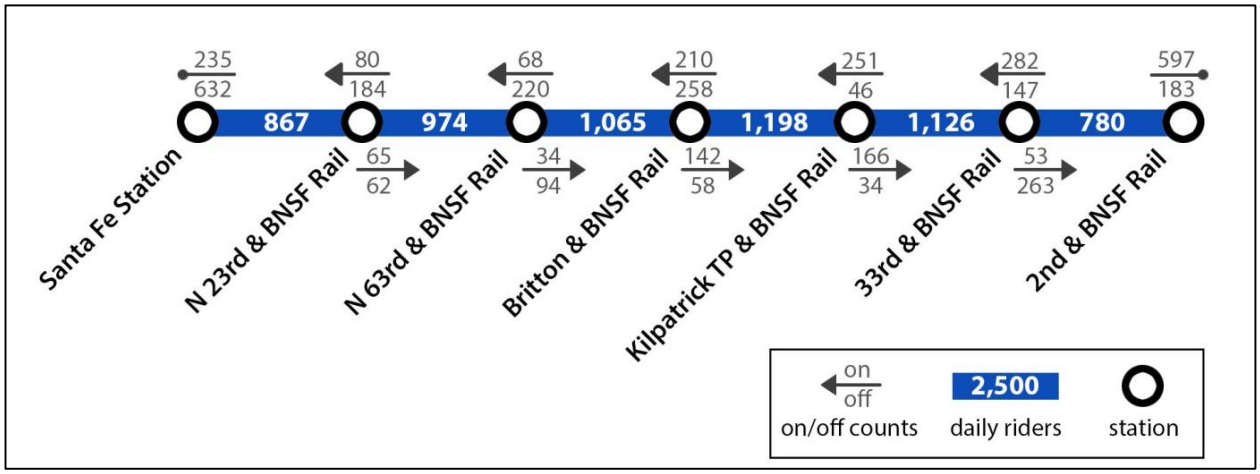
Additional Notes

- Directional Imbalance – Before reviewing the information contained in the graphic display, it is important to note that the directional imbalance of the reported rail ridership is often confusing to individuals who do not work with travel demand model transit ridership. It is the industry standard to assign transit trips in production-attraction (PA) format. The imbalance is especially noticeable for trips of very directional nature, such as home-based work (HBW) trips. This is due to the fact that the typical commuting pattern of one trip into town in the morning and one trip out of town in the evening is assigned as two inbound trips in PA format. This convention allows transit planners and the models that forecast ridership to know the household characteristics (median income, household size, vehicle availability, area type) of transit riders based on the zone the transit rider starts their trip. This convention also ensures the outbound work trips return to the same zones as the inbound trips. In reality, on a daily basis, the inbound and outbound ridership will be equal to half of the total ridership of the two directions.
- Difference between Transit Trips from Mode Choice Model and the Ridership from Transit Assignment Routine – In addition, the trip totals typically shown in the mode choice model are slightly different than the ridership by route produced by the transit assignment routine. This difference is a function of the logic inherent in the two models. The mode choice model identifies production and attraction trip ends for each zone pair by mode and all of the segments of the trip are linked together and labeled as a single trip on the highest value mode used (e.g. if in the course of the trip a rider uses bus transit to access a light rail line, the mode choice model would identify this as a single light rail trip. The bus trip would not be reflected in mode choice.) In the assignment, however, the individual modes would not be linked and the bus trip would show up in the transit ridership forecast for both the bus route and the light rail. Similarly a trip that used several bus routes would show up as a trip on each route. Since most systems have a transfer proportion of about 15% or more, the transit assignment total by mode is typically higher than the mode choice total for zone to zone trip ends.

North Corridor Alternative N1

The following graphic shows forecasted boardings or alightings at each Alternative N1 commuter rail station.

Figure A-15: North Corridor – 2035 Boardings and Alightings for Alternative N1



To better understand the distribution of trips throughout the course of the day, the Alternative N1 boarding and alighting information was further broken out by mode of access (walk or drive), direction, and by peak and off-peak period, as shown in Table A-130 through Table A-133.

Table A-130: Northbound Peak Boardings and Alightings by Mode of Access for Alternative N1

Northbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	74	0	56	0	131	0
N 23rd Street & BNSF Rail	14	22	19	17	33	39
N 63rd Street & BNSF Rail	7	24	9	28	17	52
Britton Road & BNSF Rail	16	17	55	14	71	31
Kilpatrick Turnpike & BNSF Rail	2	5	91	12	92	17
33rd Street & BNSF Rail	5	30	47	112	53	142
2nd Street & BNSF Rail	0	21	0	94	0	115
Total	119	119	277	277	396	396

Table A-131: Northbound Off-Peak Boardings and Alightings by Mode of Access for Alternative N1

Northbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	70	0	34	0	105	0
N 23rd Street & BNSF Rail	12	18	20	5	32	23
N 63rd Street & BNSF Rail	9	22	9	20	17	42
Britton Road & BNSF Rail	16	15	55	11	71	26
Kilpatrick Turnpike & BNSF Rail	1	5	73	13	74	17
33rd Street & BNSF Rail	0	31	0	91	0	122
2nd Street & BNSF Rail	0	18	0	51	0	69
Total	108	108	190	190	298	298

Table A-132: Southbound Peak Boardings and Alightings by Mode of Access for Alternative N1

Southbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
2nd Street & BNSF Rail	40	0	327	0	367	0
33rd Street & BNSF Rail	34	11	119	101	153	113
Kilpatrick Turnpike & BNSF Rail	3	3	133	25	136	28
Britton Road & BNSF Rail	28	17	88	111	117	128
N 63rd Street & BNSF Rail	18	17	18	108	36	125
N 23rd Street & BNSF Rail	28	14	22	97	50	110
Santa Fe Station	0	90	0	265	0	354
Total	152	152	708	708	859	859

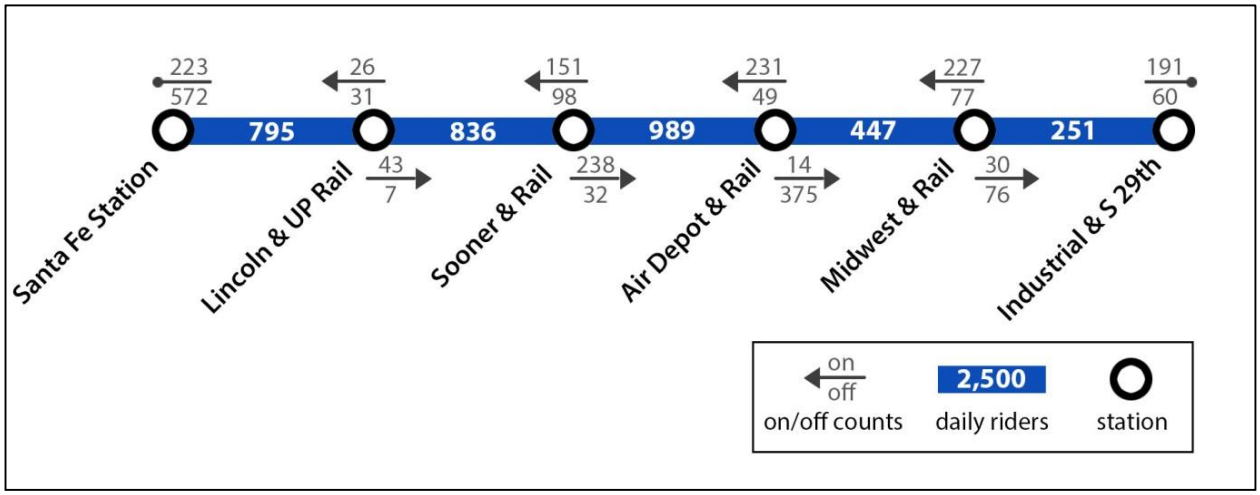
Table A-133: Southbound Off-Peak Boardings and Alightings by Mode of Access for Alternative N1

Southbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
2nd Street & BNSF Rail	23	0	206	0	229	0
33rd Street & BNSF Rail	28	0	102	34	129	34
Kilpatrick Turnpike & BNSF Rail	3	2	112	16	115	18
Britton Road & BNSF Rail	25	15	68	115	94	130
N 63rd Street & BNSF Rail	16	15	16	79	32	95
N 23rd Street & BNSF Rail	11	8	19	66	30	74
Santa Fe Station	0	65	0	213	0	278
Total	106	106	523	523	629	629

East Corridor Alternative E1

The following graphic shows forecasted boardings or alightings at each Alternative E1 commuter rail station.

Figure A-16: East Corridor – 2035 Boardings and Alightings for Alternative E1



To better understand the distribution of trips throughout the course of the day, the Alternative E1 boarding and alighting information is further broken out by mode of access (walk or drive), direction, and by peak and off-peak period, as shown in Table A-134 through Table A-137.

Table A-134: Eastbound Peak Boardings and Alightings by Mode of Access for Alternative E1

Eastbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	55	0	57	0	112	0
Lincoln Boulevard & UP Rail	2	1	18	5	20	6
Sooner Road & Rail	17	8	106	7	124	15
Air Depot Boulevard & Rail	4	49	4	142	8	191
Midwest Boulevard & Rail	3	14	12	23	15	37
Industrial Boulevard & SE 29th Street	0	10	0	20	0	30
Total	82	82	198	198	280	280

Table A-135: Eastbound Off-Peak Boardings and Alightings by Mode of Access for Alternative E1

Eastbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	61	0	49	0	111	0
Lincoln Boulevard & UP Rail	3	0	20	1	22	1
Sooner Road & Rail	18	9	97	7	114	16
Air Depot Boulevard & Rail	3	54	3	130	6	184
Midwest Boulevard & Rail	3	15	12	23	15	39
Industrial Boulevard & SE 29th Street	0	10	0	19	0	30
Total	88	88	181	181	269	269

Table A-136: Westbound Peak Boardings and Alightings by Mode of Access for Alternative E1

Westbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Industrial Boulevard & SE 29th Street	7	0	105	0	112	0
Midwest Boulevard & Rail	22	2	94	36	117	38
Air Depot Boulevard & Rail	65	3	59	29	123	33
Sooner Road & Rail	15	18	67	33	82	52
Lincoln Boulevard & UP Rail	0	4	15	14	16	17
Santa Fe Station	0	82	0	228	0	310
Total	109	109	341	341	449	449

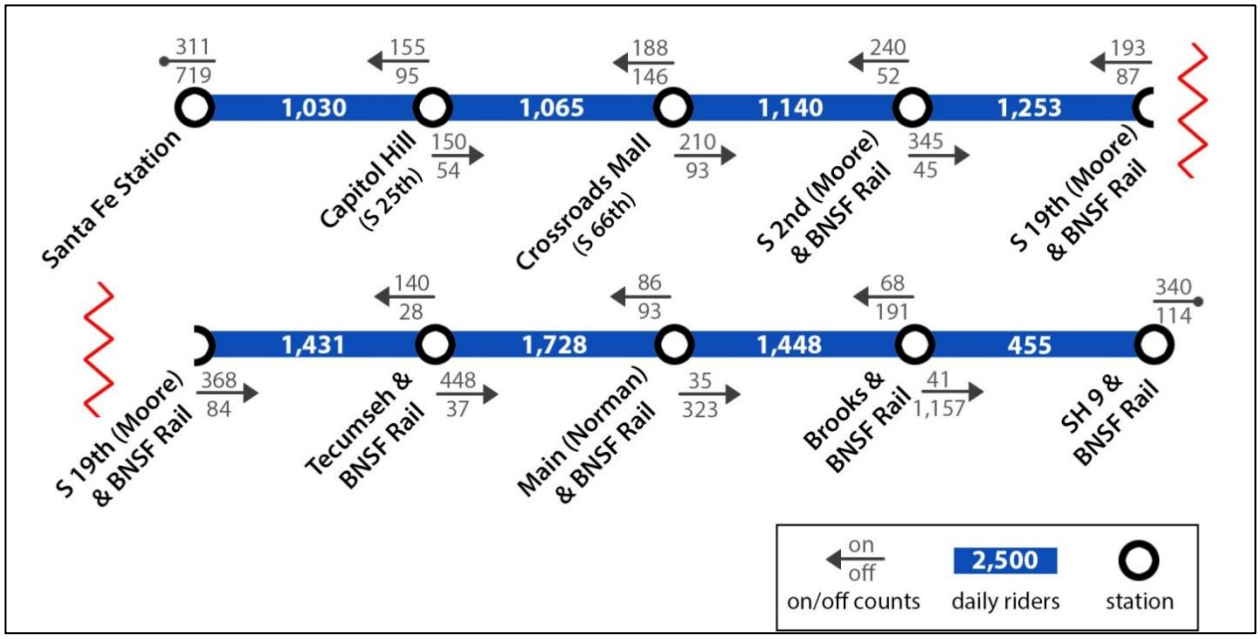
Table A-137: Westbound Off-Peak Boardings and Alightings by Mode of Access for Alternative E1

Westbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Industrial Boulevard & SE 29th Street	7	0	73	0	80	0
Midwest Boulevard & Rail	19	2	91	37	111	39
Air Depot Boulevard & Rail	63	3	46	14	108	17
Sooner Road & Rail	13	18	57	29	69	47
Lincoln Boulevard & UP Rail	0	3	11	11	11	14
Santa Fe Station	0	76	0	186	0	262
Total	102	102	277	277	378	378

South Corridor Alternative S1

The following graphic shows forecasted boardings or alightings at each Alternative S1 commuter rail station.

Figure A-17: South Corridor – 2035 Boardings and Alightings for Alternative S1



To better understand the distribution of trips throughout the course of the day, the Alternative S1 boarding and alighting information is further broken out by mode of access (walk or drive), direction, and by peak and off-peak period, as shown in Table A-138 through Table A-141.

Table A-138: Southbound Peak Boardings and Alightings by Mode of Access for Alternative S1

Southbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	77	0	98	0	174	0
Capitol Hill (S 25th Street)	41	28	42	13	83	40
Crossroads Mall (S 66th Street)	19	27	92	27	110	54
S 2nd Street & BNSF Rail	21	8	175	15	196	22
S 19th Street & BNSF Rail	16	10	187	47	203	57
Tecumseh Road & BNSF Rail	5	3	252	17	256	21
Main Street & BNSF Rail	6	16	13	155	19	171
Brooks Street & BNSF Rail	5	87	18	551	22	638
SH-9 & BNSF Rail	0	10	0	50	0	60
Total	189	189	875	875	1,064	1,064

Table A-139: Southbound Off-Peak Boardings and Alightings by Mode of Access for Alternative S1

Southbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	60	0	76	0	137	0
Capitol Hill (S 25th Street)	36	8	31	6	67	14
Crossroads Mall (S 66th Street)	17	25	82	13	99	39
S 2nd Street & BNSF Rail	19	8	131	14	149	22
S 19th Street & BNSF Rail	13	9	152	17	165	27
Tecumseh Road & BNSF Rail	4	3	187	14	191	17
Main Street & BNSF Rail	5	17	12	135	17	152
Brooks Street & BNSF Rail	4	77	15	442	19	519
SH-9 & BNSF Rail	0	10	0	44	0	54
Total	158	158	686	686	844	844

Table A-140: Northbound Peak Boardings and Alightings by Mode of Access for Alternative S1

Northbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
SH-9 & BNSF Rail	22	0	180	0	202	0
Brooks Street & BNSF Rail	26	10	15	108	40	119
Main Street & BNSF Rail	13	12	27	42	41	53
Tecumseh Road & BNSF Rail	2	5	73	10	75	16
S 19th Street & BNSF Rail	17	9	95	35	112	44
S 2nd Street & BNSF Rail	19	7	113	26	132	34
Crossroads Mall (S 66th Street)	23	14	85	63	108	77
Capitol Hill (S 25th Street)	58	8	47	47	104	56
Santa Fe Station	0	114	0	302	0	416
Total	179	179	634	634	814	814

Table A-141: Northbound Off-Peak Boardings and Alightings by Mode of Access for Alternative S1

Northbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
SH-9 & BNSF Rail	17	0	121	0	138	0
Brooks Street & BNSF Rail	22	7	6	65	28	72
Main Street & BNSF Rail	14	8	31	31	45	39
Tecumseh Road & BNSF Rail	2	4	63	8	65	12
S 19th Street & BNSF Rail	14	10	67	33	81	43
S 2nd Street & BNSF Rail	16	6	91	13	107	18
Crossroads Mall (S 66th Street)	19	14	61	55	81	69
Capitol Hill (S 25th Street)	13	6	38	33	51	39
Santa Fe Station	0	63	0	240	0	303
Total	118	118	478	478	596	596

Additional Trip Characteristics – Market Segmentation

Further breaking down travel patterns by trip purpose, income, and mode of travel helps to better understand the needs of the transportation system users. The following tables offer information in regard to trip purpose by income level,[11] as well as trip purpose by mode of travel.[12] The trip purposes included in the analysis are:

- HBW – Home-based work trips
- HBO – Home-based trips for shopping, recreation or other purposes
- HBU – Home-based trips to higher education facilities
- NHBW – Non-home-based work trips
- NHBO – Non-home-based trips for shopping, recreation or other purposes
- HBSch – Home-based trips to schools (kindergarten through 12th grade)

Table A-142: Overall 2035 Trips by Purpose and Income Level

	Low Income	Medium Income	High Income	Total
HBW	55,905	461,594	319,501	837,000
HBO	240,873	1,075,071	641,055	1,957,000
HBU		139,000		139,000
NHBW		506,000		506,000
NHBO		1,315,000		1,315,000
HBSch		848,000		848,000
Total				5,602,000

Of additional interest was a breakout of trips by purpose and mode of travel, for which the following mode of travel breakdown was considered:

- SOV – Single-occupancy vehicle, accounting for those automobile trips, where the driver is the only person in the vehicle
- HOV – High-occupancy vehicle, accounting for those automobile trips, where the driver is accompanied by at least one passenger
- LB – Local Bus, accounting for all local bus routes, thus excluding the express bus routes to Edmond, Norman, Yukon, and Mustang
- EB – Express Bus, accounting for the express bus routes to Edmond, Norman, Yukon, and Mustang
- SC – Streetcar, accounting for trips associated with the planned downtown Streetcar circulator.
- RL – Rail, accounting for the trips associated with the commuter rail alternatives (N1, S1, and E1)

Table A-143 through Table A-145 show the number of trips broken out by purpose and mode of travel for both the No-Build Alternative and the Regional Rail Alternative, which helps illustrate the travel purpose that the proposed new Regional Rail Alternative would be used.

[11] Only HBW and HBO trips were stratified by income level.

[12] It should be noted that for trip tables by income level and mode of travel, the total number of trips was rounded to the nearest thousand and individual cells were proportionally adjusted to match the totals.

Table A-143: 2035 No-Build Alternative Trips by Purpose and Mode of Travel

	SOV	HOV	LB	EB	SC	RL	Total
HBW	743,128	90,720	3,045	93	14	0	837,000
HBO	863,167	1,085,601	7,954	257	20	0	1,957,000
HBU	120,524	17,242	1,109	125	-	0	139,000
NHBW	410,095	94,605	1,193	30	77	0	506,000
NHBO	523,951	785,283	5,394	190	183	0	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,814,353	2,767,963	18,696	694	294	0	5,602,000

Table A-144: 2035 Regional Rail Alternative Trips by Purpose and Mode of Travel

	SOV	HOV	LB	EB	SC	RL	Total
HBW	741,889	90,646	3,139	67	13	1,247	837,000
HBO	862,489	1,085,014	8,045	222	19	1,211	1,957,000
HBU	119,607	17,136	1,199	91	0	967	139,000
NHBW	409,724	94,563	1,225	22	75	391	506,000
NHBO	522,719	783,793	5,528	152	171	2,636	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,809,917	2,765,665	19,136	553	277	6,452	5,602,000

Table A-145: Difference in 2035 Trips by Purpose and Model of Travel between the No-Build Alternative and the Regional Rail Alternative

	SOV	HOV	LB	EB	SC	RL
HBW	(1,239)	(74)	93	(26)	(1)	1,247
HBO	(678)	(587)	91	(35)	(1)	1,211
HBU	(917)	(106)	90	(34)	0	967
NHBW	(371)	(41)	31	(8)	(3)	391
NHBO	(1,232)	(1,490)	134	(38)	(12)	2,636
HBSch	0	0	0	0	0	0
Total	(4,436)	(2,298)	440	(141)	(16)	6,452

Noteworthy is the considerable reduction in single-occupancy vehicle trips across most trip purposes. Table A-146 shows the potential reduction in vehicle miles of travel (VMT) by trip purpose because of the addition of the Regional Rail Alternative.

Table A-146: Potential Reduced Vehicle VMT by Trip Purpose

	SOV (VMT)	HOV (VMT)	Total (VMT)
HBW	11,028	1,583	12,611
HBO	6,031	12,546	18,577
HBU	8,157	2,263	10,420
NHBW	3,301	886	4,187
NHBO	10,963	31,817	42,780
Total	39,480	49,095	88,575

Table A-147: Regional Rail Alternative HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	864	26	50	41	274	158	42	6	17	24	29	56	82	55	112	49	40	33	43	16	617	75	160	464	3,332
11	773	994	640	184	593	156	86	5	12	27	24	41	57	34	302	60	78	50	59	16	2,059	692	142	361	7,445
12	1,055	645	1,054	339	1,038	291	162	9	24	40	38	67	104	64	327	105	108	70	103	27	2,953	816	263	587	10,290
13	1,854	273	575	642	1,832	402	190	9	24	54	47	83	133	84	543	107	134	97	108	29	4,406	533	289	977	13,425
14	2,888	144	288	345	2,877	778	269	14	37	70	66	124	217	146	576	145	158	125	144	45	5,056	413	426	1,718	17,069
15	2,295	59	108	103	853	506	118	9	25	47	45	82	133	89	402	86	101	90	74	27	1,747	173	260	1,003	8,434
16	1,544	84	143	125	875	358	209	8	22	44	42	75	108	63	454	105	126	104	50	18	1,324	266	273	606	7,025
21	256	8	13	11	74	40	14	818	1,078	1,511	530	207	94	27	453	52	45	15	12	12	161	48	1,714	449	7,642
22	275	8	15	12	77	40	14	491	1,318	1,888	615	221	97	27	458	47	46	17	12	12	167	42	1,534	466	7,898
23	360	11	19	15	103	54	20	354	1,170	2,619	945	307	136	38	476	54	51	22	14	14	226	50	1,738	612	9,408
24	557	17	29	28	201	112	41	290	816	1,473	1,543	710	317	88	496	88	66	34	31	32	471	88	2,089	1,267	10,885
25	2,771	81	134	124	904	497	188	315	848	1,662	1,738	3,333	1,601	400	2,668	385	309	175	128	134	2,060	393	3,568	5,187	29,604
26	1,819	42	72	71	541	294	91	54	143	289	296	636	1,020	274	1,342	169	146	94	79	69	1,294	175	1,051	2,924	12,984
27	1,985	49	86	76	538	278	86	21	57	126	122	235	419	277	1,025	148	138	96	83	51	1,304	161	637	1,987	9,986
31	351	16	24	19	122	65	30	13	25	44	30	49	68	33	915	185	148	28	15	7	262	167	282	264	3,163
32	928	39	57	45	290	148	71	20	43	90	57	93	133	69	1,755	523	480	74	34	16	614	296	542	584	7,001
33	1,806	75	115	99	652	351	170	30	70	130	89	147	222	124	1,860	664	800	150	65	26	1,273	564	883	988	11,353
34	402	22	39	29	174	96	44	4	10	15	17	32	43	24	80	40	35	36	22	8	334	73	109	201	1,890
41	1,730	112	224	140	917	349	105	18	41	70	70	116	199	127	470	113	112	78	2,780	397	6,926	245	380	3,754	19,473
42	1,351	56	111	74	529	267	73	37	86	139	143	248	341	169	548	111	91	62	826	1,175	3,618	147	563	4,907	15,672
51	18,511	4,654	6,687	3,869	16,736	4,724	1,767	128	321	591	582	1,023	1,748	1,133	4,441	1,206	1,249	889	5,034	1,220	89,153	7,245	3,493	21,962	198,366
52	10,905	4,180	4,230	2,060	8,150	2,846	1,628	225	459	775	598	995	1,435	740	9,567	2,704	2,848	832	738	223	19,649	14,716	5,097	6,408	102,008
53	10,203	372	596	521	3,511	1,907	811	3,842	7,317	11,878	6,394	4,605	3,718	1,271	17,360	3,189	2,400	742	469	342	7,567	3,232	25,808	12,998	131,052
54	13,173	358	676	605	4,656	2,341	644	789	1,945	3,209	3,001	4,466	4,532	1,691	6,870	1,039	900	602	2,740	1,942	19,917	1,246	8,531	36,138	122,013
Total	78,654	12,324	15,986	9,579	46,518	17,059	6,871	7,509	15,907	26,815	17,063	17,952	16,959	7,049	53,499	11,370	10,607	4,515	13,662	5,859	173,159	31,857	59,833	106,812	767,419

Table A-148: Regional Rail Alternative HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	36	0	0	0	3	2	0	0	0	0	0	1	1	1	0	0	0	0	0	0	4	0	0	3	54
11	15	30	12	1	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	3	0	0	74
12	23	19	11	3	17	5	0	0	0	0	0	0	0	1	0	1	0	0	0	0	6	1	0	1	90
13	46	3	7	8	39	10	1	0	0	0	0	0	1	1	0	1	0	1	0	0	43	0	0	2	163
14	61	1	1	6	71	20	3	0	0	0	0	0	1	1	0	0	0	1	0	0	90	0	0	3	261
15	96	0	0	1	17	16	1	0	0	0	0	0	1	1	0	0	0	1	0	0	27	0	0	2	166
16	62	0	0	2	12	10	6	0	0	0	0	0	0	0	0	0	0	3	0	0	5	1	0	1	103
21	7	0	0	0	0	0	0	12	24	17	2	3	1	1	0	0	0	0	0	0	0	0	5	0	71
22	5	0	0	0	0	0	0	4	72	65	5	1	1	0	0	0	0	0	0	0	0	0	17	0	170
23	5	0	0	0	0	0	0	1	42	98	29	1	1	0	0	0	0	0	0	0	0	0	33	0	212
24	11	0	0	0	1	1	0	3	28	45	25	5	3	2	0	1	0	0	0	0	0	0	21	0	148
25	59	0	1	1	5	3	0	5	31	26	8	42	21	11	0	2	1	1	0	0	3	0	9	4	234
26	29	0	0	0	2	1	0	0	2	2	1	11	13	6	0	1	0	0	0	0	2	0	1	10	85
27	50	0	0	0	3	2	0	0	2	1	0	3	9	6	0	0	0	0	0	0	5	0	3	18	103
31	8	0	0	0	1	0	0	0	0	0	0	0	0	0	1	3	1	0	0	0	0	0	0	0	16
32	22	0	0	0	1	1	0	0	0	0	0	0	0	0	1	5	5	0	0	0	1	1	1	0	40
33	39	0	1	0	3	2	0	0	1	1	0	1	1	1	1	14	12	1	0	0	2	1	2	1	83
34	11	0	0	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	18
41	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	4
42	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	6
51	272	23	40	21	150	65	5	0	1	0	0	1	3	4	0	3	2	2	0	0	605	1	2	18	1,219
52	83	19	22	6	37	13	3	0	1	1	0	1	2	2	2	7	8	1	0	0	12	6	1	2	229
53	84	1	1	1	7	5	1	20	107	136	43	21	18	12	1	8	3	1	0	0	4	0	82	6	559
54	136	0	0	1	8	5	1	1	6	6	2	5	16	11	0	1	0	1	0	0	21	0	5	125	352
Total	1,161	97	98	51	386	166	24	49	318	398	116	98	92	60	7	49	36	15	3	2	839	15	184	199	4,463

Table A-149: Regional Rail Alternative Non-HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	36,139	771	1,243	1,468	8,442	5,782	2,519	70	452	309	377	1,939	3,795	3,786	1,354	1,936	2,095	1,950	1,330	687	19,999	4,379	6,404	14,724	121,950
11	975	13,397	6,744	1,330	1,931	440	495	5	179	21	34	126	189	142	136	257	240	132	243	71	18,023	11,240	490	792	57,632
12	1,612	7,689	11,153	2,828	3,665	814	939	6	233	32	45	187	311	271	206	383	387	261	410	118	22,012	10,329	798	1,342	66,032
13	2,439	2,605	3,470	9,400	8,513	1,629	1,374	7	461	36	66	267	476	490	221	485	412	376	421	131	29,686	5,733	992	2,537	72,228
14	9,433	1,645	2,330	4,674	28,148	6,045	3,282	25	564	115	165	793	1,574	1,536	653	1,024	1,052	936	1,060	400	44,032	5,905	2,718	8,883	126,992
15	7,571	688	719	1,147	7,238	6,023	1,813	15	503	80	121	637	1,226	1,432	410	774	748	941	546	287	15,083	2,363	2,095	6,319	58,778
16	3,957	975	1,065	1,319	5,527	2,394	3,633	11	432	67	99	533	805	853	481	978	1,027	1,351	277	139	9,178	4,567	2,335	2,926	44,929
21	133	36	10	12	52	44	24	4,115	6,421	6,850	1,565	1,033	267	76	143	125	70	16	12	29	145	131	15,615	1,390	38,314
22	223	42	23	21	90	63	37	3,082	11,417	12,342	2,759	1,633	438	116	197	158	101	25	21	46	247	169	18,187	2,121	53,560
23	501	65	53	46	203	121	79	2,899	10,674	24,711	6,344	3,288	967	244	355	265	192	51	46	86	563	334	26,399	3,798	82,285
24	570	79	46	51	268	175	110	994	3,807	9,069	9,943	6,625	1,742	459	314	245	171	80	59	138	784	327	17,565	6,707	60,327
25	3,602	454	282	316	1,713	1,106	738	683	4,141	5,010	6,440	46,533	13,705	3,186	1,967	1,473	1,035	551	330	806	4,715	1,970	24,377	34,014	159,146
26	4,951	341	288	380	2,126	1,340	679	136	1,132	773	1,137	8,483	15,958	4,538	1,922	1,184	859	539	412	720	5,801	1,603	9,692	25,319	90,312
27	5,835	506	377	533	2,713	1,889	880	43	928	271	405	2,702	5,671	7,949	1,081	1,346	929	777	523	626	7,541	1,625	6,384	16,324	67,858
31	2,554	253	315	259	1,115	562	560	147	453	436	352	1,572	2,251	997	18,783	4,727	2,959	389	227	198	3,047	6,128	11,450	4,543	64,277
32	2,672	378	336	301	1,264	740	735	56	557	203	175	838	1,204	908	4,586	10,095	5,487	549	201	136	3,207	6,430	8,310	3,096	52,464
33	3,744	585	508	507	2,152	1,320	1,387	47	662	199	174	869	1,284	1,108	3,466	8,148	9,136	1,059	257	145	4,966	9,090	8,699	3,587	63,100
34	2,529	290	320	319	1,320	865	859	9	183	49	64	359	544	548	284	566	595	1,071	172	92	3,107	1,430	1,510	1,776	18,860
41	1,880	736	505	438	1,964	813	328	11	618	39	81	258	508	458	151	347	212	158	37,304	4,780	33,906	881	772	15,854	103,001
42	1,400	343	195	167	936	546	202	30	737	115	188	841	1,311	796	188	305	176	123	5,834	25,479	12,689	438	1,344	24,295	78,681
51	26,764	34,411	28,557	25,003	62,502	16,659	8,009	84	4,721	395	759	2,844	5,723	5,503	1,978	4,142	3,311	2,719	31,626	8,712	670,454	49,541	9,223	72,387	1,076,027
52	10,681	30,584	20,691	8,677	16,990	5,791	7,551	159	3,973	532	602	2,567	3,673	2,751	11,126	16,688	13,593	3,033	1,383	515	77,206	193,034	27,552	11,073	470,425
53	13,023	2,270	1,304	1,416	6,533	4,405	3,724	12,939	36,642	47,583	21,104	34,147	20,654	10,537	20,212	19,361	12,424	3,231	1,054	1,442	16,999	34,448	254,679	51,594	631,727
54	23,684	2,602	1,624	2,404	14,644	8,913	3,177	1,261	10,659	6,698	7,612	35,310	36,793	18,968	4,420	4,520	3,045	2,343	19,790	27,243	88,461	6,430	42,227	295,853	668,683
Total	166,874	101,744	82,158	63,017	180,047	68,481	43,135	26,834	100,550	115,931	60,613	154,385	121,069	67,653	74,633	79,533	60,260	22,660	103,539	73,027	1,091,853	358,523	499,817	611,253	4,327,588

Table A-150: Regional Rail Alternative - Non-HBW Trips by Transit Mode – District to District Flows

From/ To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	500	18	31	25	118	117	39	1	10	8	2	26	68	83	5	63	46	19	3	2	184	11	29	123	1,531
11	28	287	117	9	17	6	1	0	1	0	0	0	0	0	0	2	1	0	0	0	69	46	0	1	585
12	52	131	81	21	38	11	2	0	10	0	0	0	1	1	0	4	1	1	0	0	45	11	0	1	413
13	82	30	57	52	124	26	8	0	16	0	0	1	2	2	0	6	1	1	0	0	225	1	1	6	641
14	155	12	22	51	360	71	22	0	6	0	0	2	5	5	0	5	2	4	1	0	425	3	3	18	1,173
15	175	5	8	17	127	88	20	0	5	0	0	2	6	6	0	4	1	7	0	0	233	3	3	19	730
16	95	4	6	10	54	38	78	0	3	0	0	1	3	3	0	4	3	20	0	0	50	14	2	8	395
21	5	0	0	0	0	0	0	44	146	47	4	6	2	1	0	1	0	0	0	0	0	0	42	0	299
22	8	0	0	0	0	0	0	38	417	232	23	8	4	1	0	0	0	0	0	0	0	0	188	0	921
23	14	0	0	0	0	0	0	16	309	437	124	14	6	2	0	1	0	0	0	0	0	0	367	0	1,292
24	17	0	0	0	1	1	0	9	132	118	55	18	10	5	0	2	1	0	0	0	1	0	123	1	494
25	117	1	2	1	6	4	2	9	250	68	19	218	129	43	1	12	4	1	0	0	8	0	45	22	964
26	129	1	1	1	8	4	2	1	57	10	3	86	150	63	0	7	3	1	0	0	14	1	22	67	632
27	185	1	2	3	20	9	5	0	63	5	1	41	132	89	0	9	3	3	0	0	45	1	41	128	787
31	30	1	1	0	1	1	0	0	7	0	0	1	1	1	6	47	19	1	0	0	1	1	1	1	122
32	108	1	2	1	5	3	2	0	11	1	0	1	4	3	19	111	66	2	0	0	7	24	9	5	384
33	122	2	3	2	7	4	2	0	19	1	0	2	4	4	11	150	125	4	0	0	8	15	7	6	499
34	45	2	5	3	18	24	28	0	2	0	0	2	4	4	1	11	7	11	0	0	31	4	2	9	212
41	2	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	21	0	3	0	0	1	29
42	5	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	17	3	0	0	6	35
51	345	118	165	114	553	218	28	0	26	0	0	4	13	15	0	20	4	8	4	1	3,170	8	7	104	4,927
52	111	101	83	22	46	19	19	0	29	1	0	2	4	4	8	77	55	5	0	0	52	88	4	6	736
53	128	2	2	2	11	7	4	53	620	376	121	61	73	47	5	55	22	3	0	0	18	2	517	26	2,155
54	265	2	2	5	46	21	10	1	62	14	5	27	144	108	0	14	3	5	3	7	202	2	31	1,017	1,997
Total	2,722	719	589	340	1,562	672	273	175	2,204	1,319	359	522	767	492	59	605	366	97	33	28	4,794	235	1,445	1,574	21,952

A.7 Locally Preferred Alternatives – Transit Ridership Results

A.7.1 Description of Alternatives

On July 17, 2014, the Steering Committee recommended selection of the following LPAs in the North, South, and East Corridors.

North Corridor

Alternative N1 (Commuter Rail) utilizing the existing BNSF ROW where feasible and a Streetcar extension to connect from the north end of the planned downtown Oklahoma City Streetcar to near NW 63rd Street and Western Avenue.

South Corridor

Alternative S1 (Commuter Rail) utilizing the existing BNSF ROW where feasible.

East Corridor

Alternative E1A (Streetcar) utilizing a portion of East Reno Avenue, the abandoned rail ROW through Midwest City and a connection to Tinker Air Force Base, as well as a system to distribute riders within the base.

The LPAs for all three corridors also called for advancement of a connection, via Streetcar, from the Santa Fe Hub to the University of Oklahoma Health Sciences Center northeast of NE 8th Street and Lincoln Boulevard.

As developed by the project team, and supported by the Steering Committee, modeling for the North and South corridors was merged to provide for a one-seat ride between the two corridors (Alternative N1S1).

A.7.2 Changes to the No-Build Bus Network

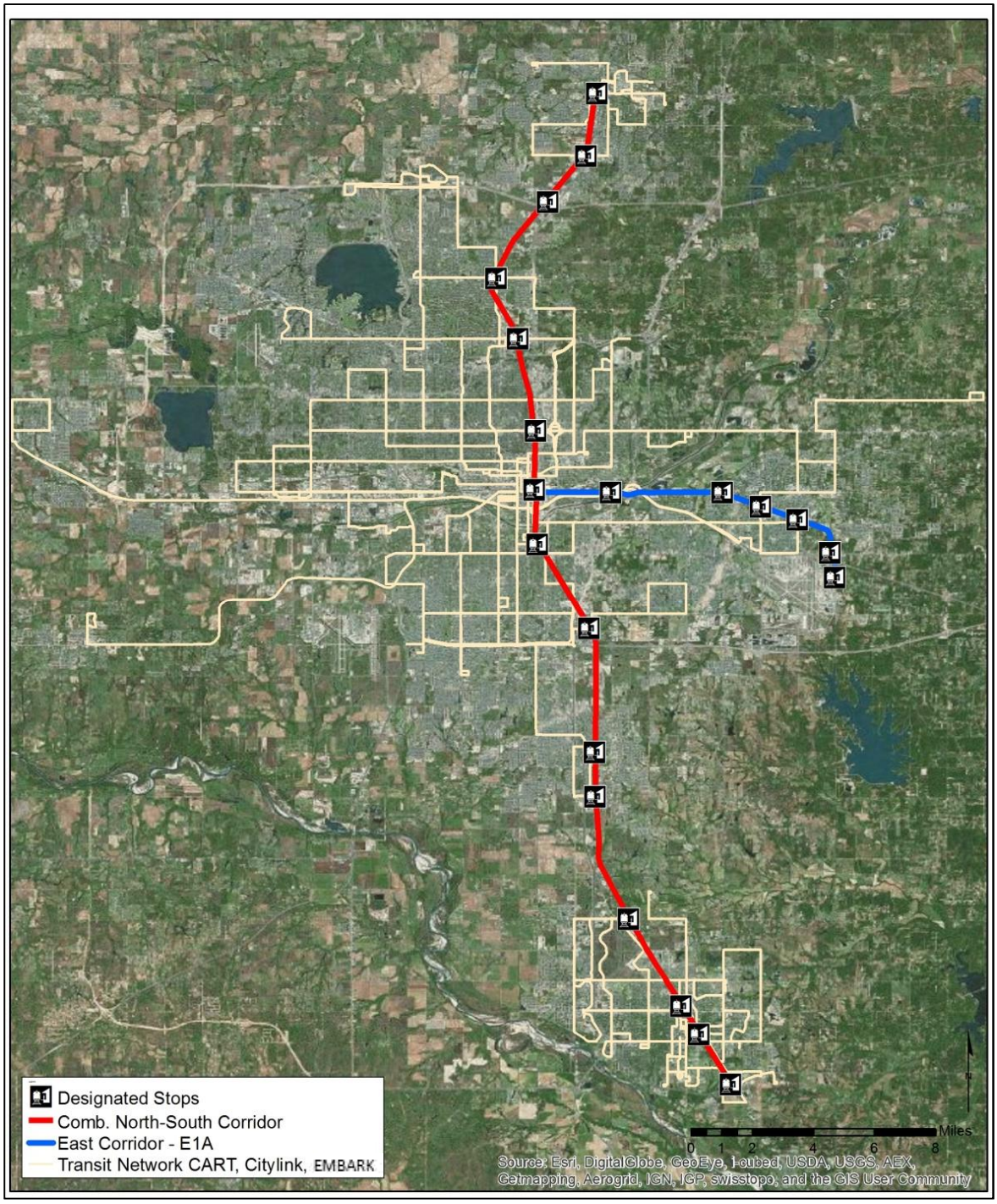
The following changes were made to the previously coded No-Build bus network to accommodate the Locally Preferred Alternatives:

- Express bus service between downtown Oklahoma City and Edmond (Citylink 101 and 102) and downtown Oklahoma City and Norman (CART Route 24) was removed.
- Minor route adjustments and additions were made on various routes.
  - ✓ CART Berry Road Corridor – Changed alignment/Extension (to Tecumseh Station)
  - ✓ CART N20 West Norman – Extension (to Tecumseh Station)
  - ✓ CART 24th Ave W Corridor – Extension (to Tecumseh Station)
  - ✓ CART SH-9 Circulator – Changed alignment/Extension (to SH-9 Station)
  - ✓ Citylink 2 – Extension (to W 33rd & BNSF Station)
  - ✓ Citylink 5 – New route (service from downtown Edmond to W 33rd St Station via Boulevard Street)
  - ✓ EMBARK Route 8 – Changed alignment, per recommendations in Nelson Nygaard Report
  - ✓ EMBARK Route 13 – Extension (to Crossroads Mall Station)
  - ✓ EMBARK Route 17 – New route (downtown Oklahoma City via SE 15th to Midwest Boulevard)
  - ✓ EMBARK Route 18 – Changed alignment/Extension (to NW 63rd and N Independence)

- ✓ EMBARK Route 20 – New route (downtown Oklahoma City via Capitol and Kelley to Britton and N May)
- ✓ EMBARK Route 25 – New route (Airport to Crossroads Mall Station)
- ✓ New Mustang Express Bus – Additional stop at Meridian
- ✓ New Yukon Express – Additional stops at Mustang, Morgan, and MacArthur
- ✓ Connection from Streetcar Zeta to N 63rd Street Station
- ✓ Direct connection between Streetcar Zeta and the Santa Fe Station in downtown Oklahoma City

- Alternatives N1 and S1 were combined for a "one-seat ride", which would not require a transfer.
- For Tinker AFB (Traffic Analysis Zone 1819), the following special adjustments were made to account for the on-base, intra-zonal bus service:
  - ✓ A special walk-only connector was created, which had a 0.3-mile walking distance to connect the zone's centroid and the station – in order to simulate accessibility of nearby employment, as well as internal distribution via an on-base bus system.
  - ✓ The ACOG model defines a half-mile radius from the transit station as the walk-accessible transit service area. Based on this rule, 20% of the trips in the TAZ would be within the walk-accessible service coverage. To better account for on-base (intra-zonal) bus distribution, the percentage was manually increased to 70%.

Figure A-18: Locally Preferred Alternatives



A.7.3 Results from Travel Demand Model

To provide a complete set of ridership forecasts and other TDM results for analysis of the alternative, the following steps were taken:

- Performed an ACOG TDM run to produce horizon year 2035 ridership forecasts;
- Examined the mode choice model results;
- Examined the transit assignment results to obtain forecast transit ridership and boardings and alightings by route and mode of access (drive, walk, etc.) for the alternative; and
- Prepared tables documenting the transit ridership for the alternative.

It is important to note that the ridership forecasts are not capacity restrained. Therefore, they represent the potential market demand for the candidate alternative under the given demographic scenario and transit fare structure.

Transit Ridership

The following tables show the system-wide and route-specific transit ridership.

Table A-151: Average Weekday System-Wide Ridership for Horizon Year 2035

No- Build Alternative	Locally Preferred Alternative	Difference
23,821	37,651	13,831

Table A-152: Average Weekday Ridership Results by Route for Horizon Year 2035

Route	No-Build Ridership	LPA System-wide Ridership
CART 12th Ave E	160	154
CART 24th Ave W	273	270
CART Berry Rd	158	184
CART Downtown	164	257
CART E Norman	383	375
CART S10	430	691
CART S11	178	315
CART S12	235	256
CART S20	260	360
CART S21	530	384
CART N32	276	270
CART S40	72	67
CART S42	155	139
CART N52	302	246
CART Porter	349	924
CART Robinson	498	500
CART 24	271	(Removed)
CART SH 9	119	124
Citylink 1	183	166
Citylink 2	204	241
Citylink 3	387	248
Citylink 4	190	248
Citylink 5	(New – not included in the No-Build Alternative)	259

Table A-152: Average Weekday Ridership Results by Route for Horizon Year 2035

Route	No-Build Ridership	LPA System-wide Ridership
Citylink 101	128	(Removed)
Citylink 102	199	(Removed)
EMBARK Rout 2	372	552
EMBARK Rout 3	335	244
EMBARK Rout 5	2,558	1,798
EMBARK Rout 7	1,650	2,404
EMBARK Rout 8	1,346	1,178
EMBARK Rout 9	310	487
EMBARK Rout 10	632	916
EMBARK Rout 11	1,098	977
EMBARK Rout 12	829	1,791
EMBARK Rout 13	705	870
EMBARK Rout 14	654	651
EMBARK Rout 15	647	652
EMBARK Rout 16	598	381
EMBARK Rout 17	(New – not included in the No-Build Alternative)	560
EMBARK Rout 18	400	1,374
EMBARK Rout 19	100	104
EMBARK Rout 20	(New – not included in the No-Build Alternative)	334
EMBARK Rout 22	311	240
EMBARK Rout 23	1,830	1,916
EMBARK Rout 25	(New – not included in the No-Build Alternative)	455
EMBARK Rout 36	861	820
EMBARK Rout 38	498	318
EMBARK Rout 40	1,216	1,272
Downtown Streetcar	656	2,103
EMBARK Lincoln Shuttle	(New – not included in the No-Build Alternative)	396
EMBARK Mustang	61	74
EMBARK Yukon (new)	48	189
Build Alternatives E1A and N1S1	(N/A)	2,257 5,656
Grand Total	23,821	37,651

System-wide Passenger-Miles

Passenger-miles are the cumulative sum of the distances ridden by each transit passenger and give an overall idea of transit system usage.

Table A-153: Average Weekday Passenger Miles by Mode for Horizon Year 2035

Transit Mode	LPA System Wide Passenger Miles
Local Bus	76,428
Express Bus	2,108
Streetcar	6,484
Rail	70,111

System-wide Transfer between Transit Modes

In order to visualize the interaction between the different transit options, the number of transfers between transit modes was analyzed.

Table A-154: Average Weekday LPA – Transfers between Modes for Horizon Year 2035

From/To	Local Bus	Express Bus	Streetcar	Rail
Local Bus	4,092	23	410	509
Express Bus	44	4	2	0
Streetcar	248	1	5	38
Rail	1,528	0	177	382

Boardings and Alightings by Station

The following graphics and tables show the passenger boardings and alightings by station location.

Additional Notes

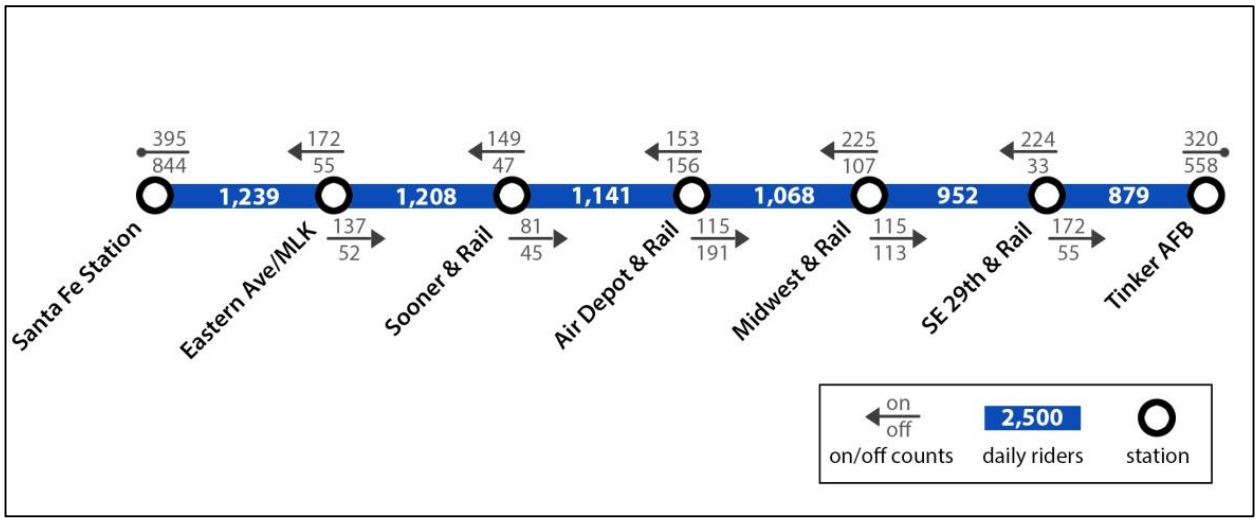
- Directional Imbalance – Before reviewing the information contained in the graphic display, it is important to note that the directional imbalance of the reported rail ridership is often confusing to individuals who do not work with travel demand model transit ridership. It is the industry standard to assign transit trips in production-attraction (PA) format. The imbalance is especially noticeable for trips of very directional nature, such as home-based work (HBW) trips. This is due to the fact that the typical commuting pattern of one trip into town in the morning and one trip out of town in the evening is assigned as two inbound trips in PA format. This convention allows transit planners and the models that forecast ridership to know the household characteristics (median income, household size, vehicle availability, area type) of transit riders based on the zone the transit rider starts their trip. This convention also ensures the outbound work trips return to the same zones as the inbound trips. In reality, on a daily basis, the inbound and outbound ridership will be equal to half of the total ridership of the two directions.
- Difference between Transit Trips from Mode Choice Model and the Ridership from Transit Assignment Routine – In addition, the trip totals typically shown in the mode choice model are slightly different than the ridership by route produced by the transit assignment routine. This difference is a function of the logic inherent in the two models. The mode choice model identifies production and attraction trip ends for each zone pair by mode and all of the segments of the trip are linked together and labeled as a single trip on the highest value mode used (e.g. if in the course of the trip a rider uses bus transit to access a light rail line, the mode choice model would identify this as a single light rail trip. The bus trip would not be reflected in mode choice.) In the assignment, however, the individual modes would not be linked and the bus trip would show up in the transit ridership forecast for both the bus route and the light rail. Similarly a trip that used several bus routes would show up as a trip on each route. Since most

systems have a transfer proportion of about 15% or more, the transit assignment total by mode is typically higher than the mode choice total for zone to zone trip ends.

East Corridor Alternative E1A

The following graphic shows forecasted boardings or alightings at each Alternative E1A station.

Figure A-19: East Corridor – 2035 Boardings and Alightings for the Alternative E1A



To better understand the distribution of trips throughout the course of the day, the Alternative E1A boarding and alighting information was further broken out by mode of access (walk or drive), direction, and by peak and off-peak period, as shown in Table A-155 through Table A-158.

Table A-155: Eastbound Peak Boardings and Alightings by Mode of Access for Alternative E1A

Eastbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
Santa Fe Station	103	0	102	0	205	0
Eastern Avenue/MLK Avenue	7	17	61	10	68	27
Sooner Road & Rail	12	9	33	12	45	21
Air Depot Boulevard & Rail	36	37	29	55	64	92
Midwest Boulevard & Rail	28	19	40	38	68	57
SE 29th Street & Rail	14	6	87	19	101	25
Tinker AFB	0	112	0	218	0	330
Total	200	200	351	351	552	552

Table A-156: Eastbound Off-Peak Boardings and Alightings by Mode of Access for Alternative E1A

Eastbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	On	Off	On
Santa Fe Station	112	0	78	0	191	0
Eastern Avenue/MLK Avenue	7	17	62	8	69	25
Sooner Road & Rail	9	11	27	14	36	25
Air Depot Boulevard & Rail	32	46	19	54	51	100
Midwest Boulevard & Rail	20	22	26	34	47	56
SE 29th Street & Rail	9	7	61	23	71	30
Tinker AFB	0	87	0	141	0	228
Total	190	190	274	274	463	463

Table A-157: Westbound Peak Boardings and Alightings by Mode of Access for Alternative E1A

Westbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	On	Off	On
Tinker AFB	117	0	39	0	156	0
SE 29th Street & Rail	9	9	95	7	104	16
Midwest Boulevard & Rail	29	21	87	20	116	41
Air Depot Boulevard & Rail	40	43	33	35	73	78
Sooner Road & Rail	16	9	62	14	78	23
Eastern Avenue/MLK Avenue	21	8	63	21	84	29
Santa Fe Station	0	142	0	283	0	425
Total	233	233	379	379	612	612

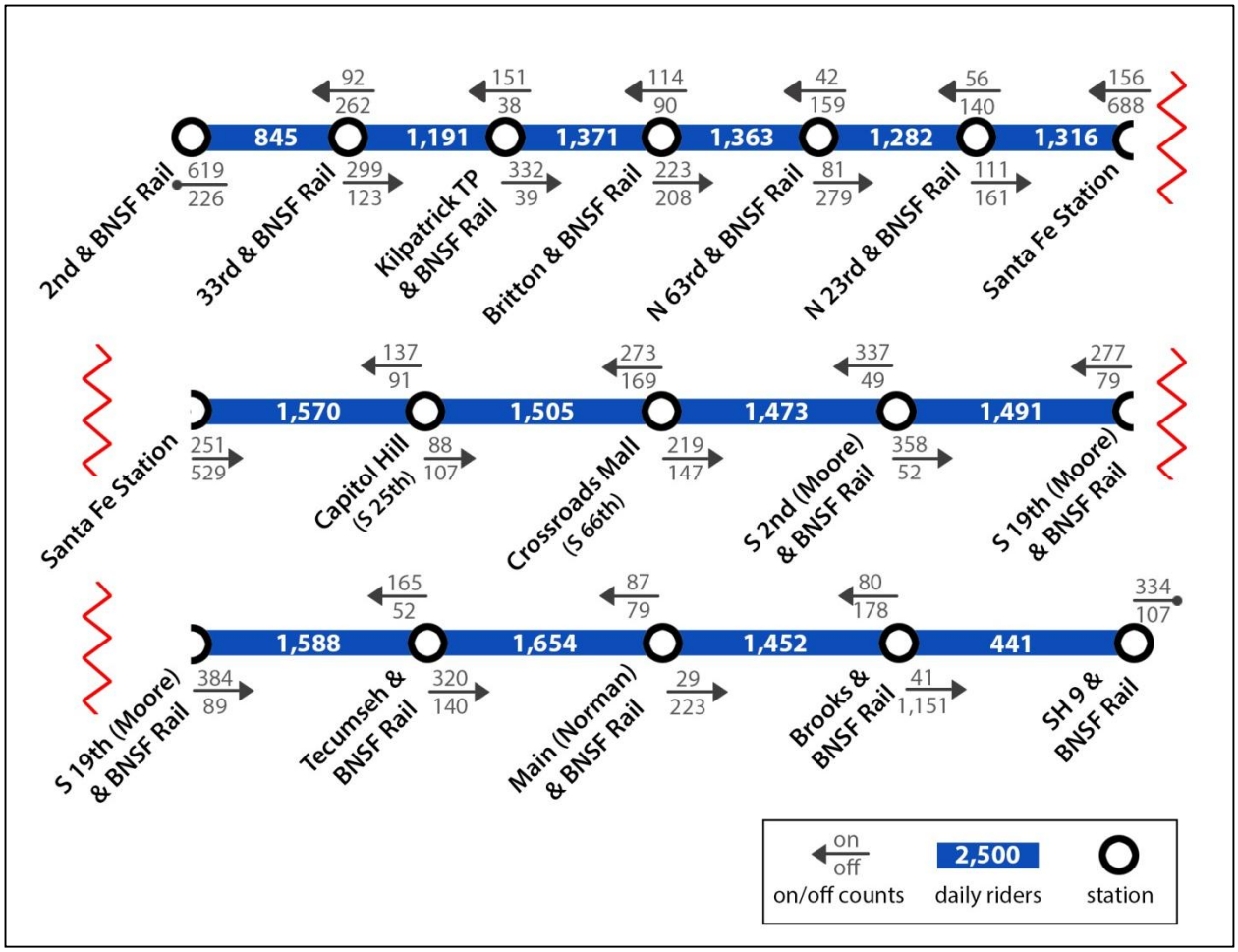
Table A-158: Westbound Off-Peak Boardings and Alightings by Mode of Access for Alternative E1A

Westbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	On	Off	On
Tinker AFB	126	0	38	0	164	0
SE 29th Street & Rail	9	11	111	7	120	17
Midwest Boulevard & Rail	29	19	80	46	109	65
Air Depot Boulevard & Rail	52	40	28	38	80	79
Sooner Road & Rail	16	9	55	15	71	24
Eastern Avenue/MLK Avenue	27	8	60	18	87	26
Santa Fe Station	0	172	0	247	0	419
Total	259	259	372	372	631	631

North and South Corridor Alternative N1S1

Figure A-20 shows forecasted boardings or alightings at each Alternative N1S1 commuter rail station.

Figure A-20: North and South Corridor – 2035 Boardings and Alightings for the Alternative N1S1



To better understand the distribution of trips throughout the course of the day, the Alternative N1S1 boarding and alighting information was further broken out by mode of access (walk or drive), direction, and by peak and off-peak period, as shown in Table A-159 through Table A-162.

Table A-159: Northbound Peak Boardings and Alightings by Mode of Access for Alternative N1S1

Northbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
SH-9 & BNSF Rail	24	0	176	0	200	0
Brooks Street & BNSF Rail	32	10	20	99	51	109
Main Street & BNSF Rail	14	17	28	35	42	52
Tecumseh Road & BNSF Rail	7	10	84	22	91	32
S 19th Street & BNSF Rail	22	10	138	31	160	41
S 2nd Street & BNSF Rail	25	7	161	25	186	32
Crossroads Mall (SE 66th Street)	59	15	97	76	157	92
Capitol Hill (SE 25th Street)	82	11	13	41	95	52
Santa Fe Station	68	132	26	271	94	403
NE 23rd Street & BNSF Rail	13	37	17	50	30	87
NW 63rd Street & BNSF Rail	13	37	11	63	24	99
Britton Road & BNSF Rail	16	27	41	23	57	50
Kilpatrick Turnpike & BNSF Rail	2	6	81	12	82	18
W 33rd Street & BNSF Rail	5	38	54	99	59	137
W 2nd Street & BNSF Rail	0	24	0	98	0	122
Total	380	380	946	946	1,327	1,327

Table A-160: Northbound Off-Peak Boardings and Alightings by Mode of Access for Alternative N1S1

Northbound Off-Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
SH-9 & BNSF Rail	19	0	115	0	135	0
Brooks Street & BNSF Rail	21	7	8	62	29	69
Main Street & BNSF Rail	13	9	32	19	45	27
Tecumseh Road & BNSF Rail	7	5	68	14	75	20
S 19th Street & BNSF Rail	18	10	99	29	117	39
S 2nd Street & BNSF Rail	22	6	129	11	151	17
Crossroads Mall (SE 66th Street)	40	16	76	62	117	78
Capitol Hill (SE 25th Street)	33	7	9	31	42	38
Santa Fe Station	50	73	12	213	62	285
NE 23rd Street & BNSF Rail	12	19	13	34	25	53
NW 63rd Street & BNSF Rail	12	17	7	43	18	59
Britton Road & BNSF Rail	15	24	43	16	57	40
Kilpatrick Turnpike & BNSF Rail	1	6	67	13	69	20
W 33rd Street & BNSF Rail	2	41	31	83	32	125
W 2nd Street & BNSF Rail	0	25	0	80	0	104
Total	265	265	709	709	974	974

Table A-161: Southbound Peak Boardings and Alightings by Mode of Access for Alternative N1S1

Southbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
W 2nd Street & BNSF Rail	41	0	322	0	363	0
W 33rd Street & BNSF Rail	34	12	116	67	151	79
Kilpatrick Turnpike & BNSF Rail	3	3	189	20	192	23
Britton Road & BNSF Rail	49	13	86	95	135	108
NW 63rd Street & BNSF Rail	28	21	24	155	52	176
NE 23rd Street & BNSF Rail	39	15	28	82	67	97
Santa Fe Station	86	85	56	227	143	312
Capitol Hill (SE 25th Street)	40	38	8	30	47	67
Crossroads Mall (SE 66th Street)	41	44	80	35	121	78
S 2nd Street & BNSF Rail	19	12	182	14	201	27
S 19th Street & BNSF Rail	16	14	192	46	208	60
Tecumseh Road & BNSF Rail	12	9	177	64	189	73
Main Street & BNSF Rail	9	18	11	112	20	130
Brooks Street & BNSF Rail	5	128	17	495	22	624
SH-9 & BNSF Rail	0	12	0	45	0	57
Total	423	423	1,488	1,488	1,911	1,911

Table A-162: Southbound Off-Peak Boardings and Alightings by Mode of Access for Alternative N1S1

Southbound Peak	Walk Access		Drive Access		Total	
Station Name	On	Off	On	Off	On	Off
W 2nd Street & BNSF Rail	31	0	224	0	256	0
W 33rd Street & BNSF Rail	32	5	116	40	149	45
Kilpatrick Turnpike & BNSF Rail	3	2	136	14	140	16
Britton Road & BNSF Rail	34	13	55	86	89	100
NW 63rd Street & BNSF Rail	16	13	13	90	29	103
NE 23rd Street & BNSF Rail	21	10	23	54	44	64
Santa Fe Station	66	50	42	167	108	217
Capitol Hill (SE 25th Street)	35	14	7	25	41	40
Crossroads Mall (SE 66th Street)	27	40	71	28	97	69
S 2nd Street & BNSF Rail	18	12	138	14	157	26
S 19th Street & BNSF Rail	15	13	161	16	175	29
Tecumseh Road & BNSF Rail	5	9	126	58	131	67
Main Street & BNSF Rail	4	15	4	78	9	93
Brooks Street & BNSF Rail	5	105	14	422	19	527
SH-9 & BNSF Rail	0	11	0	38	0	50
Total	314	314	1,131	1,131	1,444	1,444

Additional Trip Characteristics – Market Segmentation

Further breaking down travel patterns by trip purpose, income, and mode of travel, helps to better understand the needs of the transportation system users. The following tables therefore offer

information in regard to trip purpose by income level,13 as well as trip purpose by mode of travel.14 The trips purposes included in the analysis are:

- HBW – Home-based work trips
- HBO – Home-based trips for shopping, recreation or other purposes
- HBU – Home-based trips to higher education facilities
- NHBW – Non-home-based work trips
- NHBO – Non-home-based trips for shopping, recreation or other purposes
- HBSch – Home-based trips to schools (kindergarten through 12th grade)

Table A-163: Overall 2035 Trips by Purpose and Income Level for the LPA

	Low Income	Medium Income	High Income	Total
HBW	55,905	461,594	319,501	837,000
HBO	240,873	1,075,071	641,055	1,957,000
HBU		139,000		139,000
NHBW		506,000		506,000
NHBO		1,315,000		1,315,000
HBSch		848,000		848,000
Total				5,602,000

Of additional interest was a breakout of trips by purpose and mode of travel, for which the following mode of travel breakdown was considered:

- SOV – Single-occupancy vehicle, accounting for those automobile trips, where the driver is the only person in the vehicle
- HOV – High-occupancy vehicle, accounting for those automobile trips, where the driver is accompanied by at least one passenger
- LB – Local Bus, accounting for all local bus routes, thus excluding the express bus routes to Edmond, Norman, Yukon, and Mustang
- EB – Express Bus, accounting for the express bus routes to Edmond, Norman, Yukon, and Mustang (including the express bus, where applicable).
- SC – Streetcar, accounting for trips associated with the planned downtown Streetcar circulator.
- RL – Rail, accounting for the trips associated with rail (including rail-like Alternative E1A).

Table A-164 through Table A-166 show the number of trips broken out by purpose and mode of travel for both the No-Build Alternative and the Locally Preferred Alternative, which helps illustrate the travel purpose that the proposed new build alternative would be used.

[13] Only HBW and HBO trips were stratified by income level.

[14] It should be noted that for trip tables by income level and mode of travel, the total number of trips was rounded to the nearest thousand and individual cells were proportionally adjusted to match the totals.

Table A-164: 2035 No-Build Alternative Trips by Purpose and Mode of Travel

	SOV	HOV	LB	EB	SC	RL	Total
HBW	743,128	90,720	3,045	93	14	0	837,000
HBO	863,167	1,085,601	7,954	257	20	0	1,957,000
HBU	120,524	17,242	1,109	125	0	0	139,000
NHBW	410,095	94,605	1,193	30	77	0	506,000
NHBO	523,951	785,283	5,394	190	183	0	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,814,353	2,767,963	18,696	694	294	0	5,602,000

Table A-165: 2035 Locally Preferred Alternative Trips by Purpose and Mode of Travel

	SOV	HOV	LB	EB	SC	RL	Total
HBW	740,872	90,479	3,738	33	226	1,652	837,000
HBO	862,212	1,084,587	8,539	114	237	1,311	1,957,000
HBU	119,470	17,105	1,293	12	41	1,080	139,000
NHBW	409,266	94,446	1,534	11	236	507	506,000
NHBO	522,309	783,058	6,043	86	519	2,986	1,315,000
HBSch	153,488	694,512	0	0	0	0	848,000
Total	2,807,617	2,764,187	21,147	255	1,259	7,535	5,602,000

Table A-166: Difference in 2035 Trips by Purpose and Model of Travel between the No-Build Alternative and the Locally Preferred Alternative

	SOV	HOV	LB	EB	SC	RL
HBW	(2,257	(241)	693	(60)	213	1,652
HBO	(955)	(1,014)	585	(144)	217	1,311
HBU	(1,054)	(137)	183	(113)	41	1,080
NHBW	(829)	(159)	340	(18)	159	507
NHBO	(1,642)	(2,225)	649	(104)	336	2,986
HBSch	0	0	0	0	0	0
Total	(6,736)	(3,776)	2,451	(439)	965	7,535

Table A-167 shows the potential reduction in vehicle miles of travel (VMT) by trip purpose because of the addition of the LPAs.

Table A-167: Potentially Reduced VMT by Trip Purpose

	SOV (VMT)	HOV (VMT)	Total (VMT)
HBW	20,084	5,146	25,230
HBO	8,496	21,664	30,160
HBU	9,379	2,924	12,303
NHBW	7,374	3,399	10,773
NHBO	14,615	47,519	62,134
Total	59,948	80,651	140,599

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Table A-168: Locally Preferred Alternative HBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	871	24	47	41	276	159	42	5	13	21	28	57	83	55	110	48	39	33	42	16	615	75	159	463	3,324
11	714	1,022	656	182	566	145	86	5	12	29	24	38	56	32	312	57	76	49	61	16	2,080	708	145	363	7,434
12	1,033	650	1,052	340	1,028	287	164	9	22	40	38	66	103	62	332	104	107	70	104	27	2,959	820	265	591	10,273
13	1,869	268	572	636	1,820	406	189	9	23	53	47	86	136	85	539	108	134	97	108	29	4,364	529	292	987	13,385
14	2,857	139	281	344	2,831	773	266	14	35	68	66	126	219	147	569	143	156	125	145	45	5,003	410	427	1,716	16,905
15	2,271	55	103	104	853	501	117	8	20	44	44	85	136	90	401	86	100	90	73	27	1,740	172	262	999	8,378
16	1,531	81	140	126	870	357	208	8	20	43	42	78	109	64	454	106	126	104	50	18	1,317	265	274	605	6,997
21	204	8	12	10	67	33	14	824	1,092	1,520	541	194	90	24	464	48	44	14	12	13	162	48	1,728	458	7,624
22	222	8	12	10	68	33	14	496	1,341	1,907	625	208	91	24	467	44	44	15	12	12	166	43	1,549	473	7,884
23	304	10	16	13	94	47	19	355	1,176	2,630	951	298	131	35	486	51	49	20	14	15	225	50	1,753	623	9,365
24	552	17	29	27	200	112	41	287	811	1,465	1,532	709	318	88	493	88	66	34	32	32	471	88	2,085	1,271	10,847
25	2,777	78	129	124	906	496	186	312	843	1,643	1,722	3,343	1,607	400	2,653	388	312	174	127	133	2,059	391	3,556	5,182	29,540
26	1,827	41	71	71	548	296	91	53	141	283	294	637	1,015	274	1,335	168	147	94	78	69	1,307	175	1,048	2,917	12,981
27	1,997	47	82	78	551	281	85	20	52	116	120	236	418	276	1,014	147	137	96	82	51	1,320	160	630	1,986	9,982
31	354	15	23	19	123	66	30	13	23	43	29	49	68	33	886	187	147	27	15	7	263	167	282	265	3,135
32	929	37	55	46	296	149	71	19	40	88	56	94	133	70	1,706	515	472	73	34	16	618	294	537	583	6,933
33	1,802	74	114	100	654	349	169	30	66	127	87	149	222	124	1,806	664	803	146	65	26	1,272	563	879	986	11,277
34	404	21	38	29	172	98	44	3	8	13	17	33	44	25	79	40	35	36	21	8	333	74	109	200	1,885
41	1,740	111	224	140	919	350	105	18	41	68	68	115	200	127	462	113	112	80	2,784	398	6,924	243	379	3,746	19,466
42	1,346	56	112	73	524	265	72	36	85	138	143	248	341	169	545	110	89	62	831	1,180	3,622	145	560	4,914	15,666
51	18,587	4,649	6,690	3,858	16,690	4,727	1,771	128	320	584	580	1,035	1,762	1,134	4,423	1,213	1,248	897	5,021	1,218	88,894	7,243	3,522	21,926	198,122
52	10,857	4,186	4,250	2,063	8,135	2,840	1,629	223	450	775	592	983	1,416	736	9,486	2,704	2,844	822	739	224	19,701	14,727	5,074	6,438	101,897
53	10,114	368	588	522	3,512	1,898	807	3,838	7,312	11,891	6,403	4,598	3,707	1,265	17,297	3,179	2,394	734	467	341	7,574	3,230	25,815	13,008	130,862
54	13,211	354	671	606	4,668	2,354	645	783	1,933	3,183	2,987	4,483	4,527	1,694	6,828	1,035	901	607	2,739	1,939	19,949	1,240	8,505	36,080	121,921
Total	78,371	12,318	15,966	9,564	46,373	17,021	6,864	7,496	15,881	26,771	17,040	17,947	16,932	7,034	53,146	11,346	10,580	4,498	13,657	5,860	172,938	31,862	59,835	106,781	766,082

Table A-169: Locally Preferred Alternative HBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	40	0	0	0	5	2	1	0	0	0	0	1	1	2	0	0	0	0	0	0	5	0	0	4	62
11	12	26	13	1	5	2	0	0	0	0	0	0	1	1	2	0	0	0	0	0	6	4	0	0	73
12	20	20	24	2	13	4	0	0	1	0	0	1	1	2	2	1	0	0	0	0	9	1	1	1	103
13	53	2	5	11	45	7	1	0	1	1	0	1	1	2	4	1	0	1	0	0	63	0	1	1	203
14	124	1	2	4	121	27	5	0	1	0	0	1	1	2	2	1	1	1	0	0	124	0	1	5	422
15	134	0	0	1	24	21	2	0	0	0	0	0	1	1	1	0	0	1	0	0	30	0	0	3	221
16	77	0	0	1	16	11	6	0	0	0	0	0	0	1	1	0	0	3	0	0	9	1	0	2	130
21	7	0	0	0	1	1	0	10	23	13	4	3	1	1	0	0	0	0	0	0	0	0	5	0	69
22	4	0	0	0	1	0	0	4	71	72	6	1	0	0	1	0	0	0	0	0	0	0	17	0	179
23	3	0	0	0	1	0	0	2	50	120	33	1	1	0	1	0	0	0	0	0	0	0	33	0	246
24	13	0	1	0	3	2	0	3	32	52	35	6	3	2	3	1	0	0	0	0	1	0	22	2	182
25	70	2	3	2	15	9	1	5	31	23	15	42	21	11	14	3	1	2	0	0	8	0	12	7	296
26	25	0	1	0	3	2	0	0	2	1	1	10	18	6	2	0	0	0	0	0	3	0	2	12	91
27	48	0	1	0	4	2	0	0	1	1	0	3	9	6	1	1	0	1	0	0	6	0	3	18	105
31	9	0	0	0	1	1	0	0	0	0	0	0	0	0	27	2	2	1	0	0	0	0	1	0	46
32	24	0	0	0	1	1	0	0	0	0	0	0	0	0	35	16	14	1	0	0	1	2	4	1	101
33	42	0	1	0	3	3	0	0	1	0	0	0	1	1	49	15	7	3	0	0	2	1	5	2	136
34	13	0	0	0	2	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	21
41	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	3	0	0	3	14
42	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	8
51	291	21	39	24	185	70	6	0	2	1	1	4	7	9	8	3	2	3	1	0	708	2	3	22	1,411
52	95	25	15	5	39	14	4	0	2	1	1	3	4	5	51	11	13	4	0	0	20	7	3	4	325
53	112	1	3	1	17	12	1	19	114	140	51	21	23	13	59	17	10	4	0	0	8	1	87	13	727
54	195	0	1	1	14	7	2	1	7	5	3	5	27	12	4	2	1	2	2	1	29	0	7	148	475
Total	1,419	100	110	55	518	199	30	45	338	431	151	104	123	76	268	74	54	29	8	2	1,036	20	206	249	5,646

Table A-170: Locally Preferred Alternative NHBW Trips by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	9,196	60	144	238	1,845	1,622	488	6	13	27	48	221	463	493	562	306	358	435	110	57	2,941	528	1,014	2,582	23,757
11	247	1,974	1,041	226	374	84	82	0	1	2	3	13	20	16	51	28	36	25	26	7	2,187	1,520	69	106	8,137
12	514	990	1,929	530	818	178	155	1	2	4	5	22	39	32	86	46	59	46	56	14	3,326	1,323	120	221	10,515
13	522	115	328	595	1,001	186	121	1	1	3	4	20	37	33	58	32	41	35	27	7	2,016	366	89	234	5,873
14	3,405	168	434	867	6,003	1,317	630	3	7	14	24	113	224	210	281	155	195	184	134	42	7,527	860	478	1,658	24,933
15	1,997	25	62	109	917	729	198	1	3	6	11	52	107	105	128	71	89	99	33	15	1,266	194	228	673	7,118
16	917	39	83	117	697	316	299	1	2	5	8	35	60	51	133	75	102	94	15	6	679	309	197	259	4,500
21	12	0	0	1	4	2	1	719	587	590	198	66	16	4	42	7	6	1	1	1	7	8	1,034	103	3,410
22	32	1	1	1	10	7	4	747	2,032	1,856	582	182	43	9	76	15	11	3	1	4	18	14	1,890	267	7,806
23	77	2	3	4	23	15	8	797	2,277	4,439	1,462	443	104	22	153	30	23	7	2	7	43	28	3,222	530	13,722
24	114	2	4	5	33	23	11	236	596	1,301	1,762	708	162	34	126	24	19	10	4	11	67	27	1,888	704	7,872
25	681	10	20	28	190	133	62	96	221	487	931	3,570	1,062	207	629	122	95	55	20	52	362	137	1,960	2,838	13,967
26	1,610	17	37	60	433	309	113	26	58	125	232	1,158	2,196	554	973	199	159	106	44	79	874	210	1,703	4,098	15,370
27	1,152	9	22	37	275	206	66	4	9	20	37	172	418	377	321	99	81	64	26	31	551	94	543	1,475	6,089
31	706	17	30	36	206	140	92	23	36	74	64	237	352	155	11,098	838	588	83	17	17	348	715	2,215	780	18,868
32	738	18	32	39	219	150	102	8	13	26	23	91	142	98	1,552	1,222	925	89	16	11	350	741	1,103	425	8,132
33	845	22	39	47	269	183	132	6	10	20	18	72	114	81	1,009	800	1,120	107	17	9	404	788	837	376	7,325
34	679	9	19	26	167	132	80	1	2	4	6	27	49	43	100	58	71	92	9	5	239	101	161	202	2,280
41	407	23	59	42	220	93	29	1	2	3	6	22	46	40	49	23	25	21	3,500	430	3,779	70	82	2,121	11,095
42	201	6	15	11	70	43	12	3	5	8	15	58	81	44	52	15	13	10	392	1,377	995	23	96	2,142	5,688
51	7,130	2,012	3,447	2,770	9,047	2,351	936	7	17	35	65	279	586	541	667	355	426	377	2,698	688	68,241	3,751	1,112	11,098	118,639
52	1,520	1,649	1,325	569	1,403	470	456	11	16	31	31	118	176	112	1,719	818	1,021	184	65	20	4,065	11,159	1,436	621	28,996
53	1,940	36	68	87	536	376	219	2,092	3,344	5,146	3,426	2,011	1,161	446	3,969	1,027	791	209	46	65	926	1,291	17,161	3,692	50,064
54	5,457	56	137	219	1,732	1,123	308	149	297	503	775	2,411	2,822	1,295	1,506	390	342	275	1,326	1,444	9,590	476	3,335	28,761	64,733
Total	40,100	7,260	9,278	6,663	26,493	10,190	4,604	4,938	9,550	14,731	9,739	12,101	10,481	5,002	25,341	6,754	6,598	2,612	8,585	4,398	110,799	24,734	41,973	65,964	468,889

Table A-171: Locally Preferred Alternative NHBW Trips by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	157	0	1	1	24	31	6	0	0	0	0	1	3	5	6	3	2	5	0	0	16	1	3	11	276
11	3	20	11	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	0	0	46
12	9	13	17	2	9	2	0	0	0	0	0	0	0	1	1	0	0	0	0	0	6	0	0	0	63
13	11	1	2	4	12	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	44
14	82	1	2	6	95	21	3	0	0	0	0	1	1	2	1	1	0	1	0	0	56	0	1	2	275
15	41	0	0	0	11	11	1	0	0	0	0	0	0	1	0	0	0	0	0	0	9	0	0	1	78
16	14	0	0	0	3	3	3	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	28
21	0	0	0	0	0	0	0	3	7	3	1	1	0	0	0	0	0	0	0	0	0	0	1	0	16
22	1	0	0	0	0	0	0	5	29	30	3	1	0	0	0	0	0	0	0	0	0	0	9	0	78
23	1	0	0	0	0	0	0	2	42	59	15	1	0	0	0	0	0	0	0	0	0	0	19	0	139
24	1	0	0	0	0	0	0	1	5	12	11	2	1	0	0	0	0	0	0	0	0	0	9	0	43
25	13	0	0	0	2	2	0	1	5	5	5	21	7	3	3	1	0	0	0	0	1	0	3	2	73
26	18	0	0	0	2	2	0	0	1	1	1	7	16	6	2	0	0	0	0	0	1	0	4	8	70
27	13	0	0	0	1	1	0	0	0	0	0	1	4	3	0	0	0	0	0	0	1	0	1	5	32
31	10	0	0	0	1	1	0	0	0	0	0	0	0	0	18	12	5	2	0	0	0	0	1	0	50
32	11	0	0	0	1	1	0	0	0	0	0	0	0	0	27	11	7	1	0	0	0	2	3	0	64
33	13	0	0	0	1	1	0	0	0	0	0	0	0	0	18	6	3	1	0	0	0	1	2	0	47
34	12	0	0	0	1	1	1	0	0	0	0	0	0	0	2	1	1	0	0	0	0	0	0	0	20
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	1	0	0	1	5
42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
51	53	6	11	13	65	17	2	0	0	0	0	0	1	2	1	0	0	1	1	0	301	1	1	14	489
52	9	7	3	1	4	1	1	0	0	0	0	0	0	0	10	2	2	1	0	0	2	3	1	0	49
53	12	0	0	0	1	1	0	5	24	41	22	6	3	2	13	4	2	1	0	0	1	0	33	2	174
54	33	0	0	0	2	1	0	0	1	1	1	1	10	5	1	0	0	0	1	0	12	0	2	57	128
Total	517	50	49	29	237	99	20	17	114	151	58	44	47	32	103	42	25	15	5	1	424	14	91	106	2,289

Table A-172: Locally Preferred Alternative All Other Trip Purposes by Drive Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	27,095	656	1,018	1,245	6,632	4,141	2,019	55	390	243	326	1,771	3,373	3,314	781	1,626	1,720	1,493	1,181	622	16,911	3,853	5,402	12,040	97,907
11	602	11,656	5,830	1,041	1,409	299	408	5	181	20	31	106	163	114	86	205	186	101	221	66	15,820	9,834	425	694	49,505
12	999	6,773	9,341	2,266	2,735	589	787	6	202	27	40	161	268	226	121	318	312	213	359	106	18,693	9,063	684	1,137	55,426
13	1,945	2,441	3,129	8,750	7,483	1,454	1,254	6	432	33	63	265	457	473	163	459	374	343	397	125	27,557	5,335	931	2,356	66,226
14	6,046	1,397	1,802	3,803	21,949	4,723	2,625	20	529	95	142	715	1,383	1,355	364	861	842	753	948	359	36,383	4,993	2,279	7,273	101,642
15	5,546	618	604	1,056	6,359	5,256	1,603	12	452	65	109	621	1,147	1,343	283	704	647	840	511	269	13,803	2,159	1,914	5,647	51,568
16	3,013	910	962	1,214	4,792	2,063	3,318	10	422	60	93	529	761	813	350	919	934	1,257	262	132	8,493	4,241	2,156	2,671	40,377
21	82	35	8	8	42	32	22	3,405	5,855	6,277	1,407	861	226	59	103	101	56	12	12	28	137	125	14,643	1,311	34,844
22	129	41	16	14	68	43	32	2,348	9,483	10,598	2,209	1,307	353	87	124	125	78	18	20	43	223	157	16,383	1,865	45,764
23	303	61	38	35	159	84	66	2,101	8,443	20,434	4,908	2,684	799	191	208	211	149	38	44	80	511	308	23,331	3,320	68,506
24	426	75	40	45	231	147	98	751	3,227	7,807	8,169	5,908	1,582	420	190	219	151	69	56	128	716	301	15,677	6,050	52,483
25	2,905	432	247	296	1,552	980	674	577	3,887	4,450	5,451	43,067	12,729	2,969	1,334	1,372	955	491	306	742	4,381	1,826	22,325	31,155	145,102
26	3,364	317	242	335	1,761	1,054	565	105	1,070	624	891	7,347	13,704	3,962	943	988	714	434	362	637	5,045	1,394	7,961	21,154	74,972
27	4,689	481	329	519	2,535	1,701	809	36	909	227	362	2,531	5,236	7,528	748	1,239	840	710	493	595	7,141	1,521	5,785	14,834	61,800
31	1,785	229	272	226	922	427	465	121	405	360	285	1,311	1,876	842	7,597	3,829	2,324	293	214	180	2,733	5,398	9,184	3,747	45,025
32	1,942	348	286	266	1,079	596	634	46	531	168	148	760	1,060	810	2,940	8,836	4,557	455	185	125	2,881	5,668	7,168	2,672	44,161
33	2,882	551	452	461	1,896	1,128	1,251	41	633	167	153	808	1,169	1,036	2,394	7,407	8,092	932	238	137	4,579	8,278	7,846	3,225	55,756
34	1,819	271	289	290	1,135	744	783	8	172	40	59	341	498	507	181	508	525	982	160	87	2,857	1,336	1,361	1,569	16,521
41	1,476	710	445	394	1,730	721	297	9	620	33	73	231	465	419	100	326	188	140	33,846	4,360	30,053	804	689	13,744	91,875
42	1,168	338	182	155	839	491	187	27	737	105	169	776	1,222	748	133	282	157	110	5,476	24,178	11,690	406	1,227	22,173	72,975
51	19,832	32,363	25,130	22,226	53,317	14,319	7,101	75	4,727	352	687	2,648	5,241	5,025	1,301	3,819	2,902	2,378	28,828	8,020	601,066	45,773	8,249	61,466	956,845
52	9,022	29,039	19,482	8,076	15,447	5,259	7,084	143	3,908	487	568	2,429	3,454	2,629	9,333	15,869	12,565	2,820	1,327	499	73,297	181,977	26,062	10,512	441,290
53	10,878	2,211	1,209	1,348	6,060	4,050	3,495	10,835	33,300	42,519	17,721	31,991	19,400	10,029	16,180	18,238	11,551	2,999	1,006	1,371	16,180	33,120	237,623	48,009	581,323
54	18,327	2,511	1,463	2,238	13,033	7,849	2,905	1,099	10,388	6,125	6,761	33,121	33,938	17,688	2,880	4,124	2,730	2,100	18,431	25,706	79,195	5,917	38,692	266,646	603,867
Total	126,276	94,466	72,815	56,309	153,165	58,149	38,481	21,843	90,903	101,316	50,826	142,289	110,504	62,586	48,840	72,583	53,547	19,982	94,882	68,593	980,344	333,790	457,999	545,270	3,855,758

Table A-173: Locally Preferred Alternative All Other Trip Purposes by Transit Mode – District to District Flows

From/To	1	11	12	13	14	15	16	21	22	23	24	25	26	27	31	32	33	34	41	42	51	52	53	54	Total
1	444	13	24	24	128	113	39	1	10	5	2	26	70	81	25	64	51	38	4	2	183	13	40	137	1,536
11	18	219	103	7	12	4	1	0	0	0	0	1	2	2	0	1	0	0	0	0	57	46	1	0	473
12	37	110	110	15	25	7	1	0	22	0	0	1	3	4	1	3	1	1	0	0	47	7	1	2	399
13	75	22	41	74	122	28	6	0	38	0	1	2	4	5	1	4	1	1	0	0	283	1	2	4	716
14	184	10	18	34	435	88	23	0	19	1	0	4	10	11	1	7	3	4	1	0	416	3	4	21	1,302
15	178	3	6	8	129	96	20	0	15	0	0	3	8	9	1	6	3	5	1	0	229	3	4	21	748
16	94	2	3	8	61	36	76	0	6	0	0	2	5	5	0	5	4	16	0	0	55	15	3	12	408
21	3	0	0	0	1	1	0	36	146	37	7	4	2	1	0	1	0	0	0	0	0	0	42	0	282
22	5	0	0	0	1	1	0	31	392	177	22	6	3	1	0	0	0	0	0	0	0	0	177	0	816
23	8	0	0	0	1	1	0	14	286	393	109	11	5	2	0	1	0	0	0	0	0	0	329	0	1,161
24	13	0	1	0	2	2	0	5	115	77	60	12	9	4	1	2	1	0	0	0	1	0	109	2	416
25	114	4	7	5	19	13	2	8	245	49	32	199	121	41	6	11	4	2	0	0	16	1	56	27	984
26	82	2	4	2	11	7	2	1	38	5	3	68	162	56	2	5	2	1	0	0	16	1	30	78	579
27	146	3	5	3	21	14	6	0	44	2	1	36	126	89	1	10	3	3	1	0	48	2	44	132	743
31	103	1	1	1	5	3	1	0	8	1	0	2	5	3	58	109	63	8	0	0	2	3	6	3	384
32	92	1	1	1	6	3	2	0	7	0	0	1	3	4	56	163	61	5	0	0	7	32	28	6	480
33	114	1	2	1	10	6	2	0	17	0	0	1	4	4	46	94	30	10	0	0	8	18	19	7	396
34	93	1	1	2	21	9	26	0	2	0	0	2	4	4	4	10	6	11	0	0	23	4	3	9	237
41	4	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	51	0	13	0	0	7	78
42	5	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	16	3	0	0	7	36
51	289	107	139	118	558	214	29	0	48	0	0	7	19	23	2	17	4	7	12	1	3,086	9	9	103	4,800
52	108	110	47	15	45	18	20	0	33	0	0	3	7	8	47	91	60	8	0	0	54	91	8	8	781
53	191	3	6	3	22	16	4	44	614	290	112	55	84	51	68	135	66	7	0	0	22	4	486	49	2,334
54	287	1	3	4	47	23	12	1	67	10	7	29	208	116	2	17	5	6	17	11	204	3	47	1,038	2,165
Total	2,687	612	523	325	1,683	705	273	142	2,171	1,050	359	477	865	522	324	757	369	136	88	32	4,774	256	1,449	1,677	22,255

Appendix B: Capital and Operating Costs

B.1 Capital Costs

Capital, operation and maintenance costs were developed for the preliminary alternatives for consideration by the Steering Committee, workgroups and the public as input for recommending a Locally Preferred Alternative (LPA) for each corridor. Other significant inputs were the technical analyses (environmental and social benefits and impacts) and public sentiment.

This section provides the methodology for development of capital costs, which include initial construction and vehicle costs. Ongoing operation and maintenance cost estimates are presented in Section B.2. As a corridor level planning study, CentralOK!go utilized order-of-magnitude capital cost estimates since detailed engineering occurs later in the planning process. Throughout the stages of project development, more detailed information is gained and estimates are continually refined.

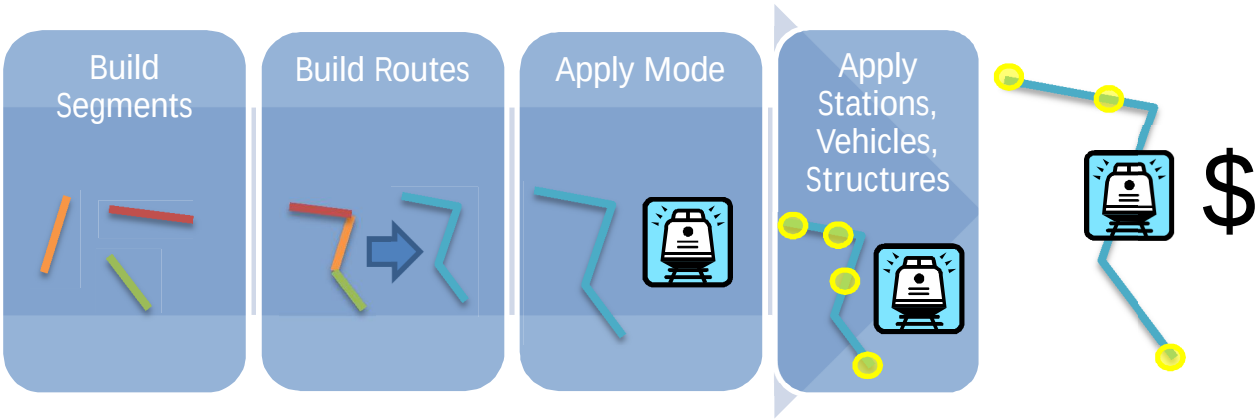
B.1.1 Methodology

Rough order-of-magnitude (ROM) costs were calculated using a modified "top-down" approach by gathering total capital cost data from similar systems in the United State and extrapolating or adjusting them according to the conditions of this study. This was done by applying per-mile costs from other systems with certain characteristics similar to portions of the CentralOK!go study routes. The goal of this effort was to make relative comparisons between the systems. The actual cost of a system could reasonably be expected to fall within the ranges provided, but is subject to external factors and currently unknown conditions that require detailed engineering.

A further level of detail was added to the "top down" method by breaking the analysis into logical segments with distinct conditions and separately applying cost for vehicles, stations, and structures (bridges).

The process for determining ROM capital costs for the CentralOK!go study is graphically represented in Figure B-1 and described further below.

Figure B-1: Process for Determining ROM Capital Costs



B.1.2 Rough-Order-of-Magnitude Capital Costs Determination

Several steps were undertaken to produce the ROM capital costs for each alternative in each corridor as discussed below.

Build Segments

First, the preliminary alignments in each corridor were broken into logical segments based on existing conditions. The existing conditions included:

- Functional Density (Urban, Suburban) – It was assumed that costs increase relative to the density of the existing built environment. Therefore, an urban environment has a higher functional density than a suburban environment.
- Type of Existing ROW (existing railroad (RR) ROW, existing RR ROW abandoned, undeveloped, arterial street, freeway) – These classifications were used to determine the probable extent of capital improvements that would be necessary per mode based on the existing conditions.
- Need for additional ROW (None, Minor, or Substantial)

Build Routes

After the build segments for each alignment were evaluated, the segments along each alignment were reassembled to create full routes. This resulted in the evaluation of the segments being applied to the full routes.

Apply Mode

A transit mode was then applied to each alignment based on the mode(s) considered most appropriate for each alternative. These mode and alignment combinations were determined by the project team in consultation with the Steering Committee and workgroups. Table B-1 lists the modes for each alternative that moved forward into the Detailed Evaluation, described in Chapter 4.

Table B-1: Modes for Each Alternative by Corridor

Alignment	Commuter Rail	Light Rail (LRT)	Streetcar	Bus Rapid Transit (BRT)
North Corridor				
N1	✓			
N2		✓	✓	✓
N3		✓	✓	✓
N7			✓	✓
East Corridor				
E1	✓			
E1A			✓	✓
E5		✓	✓	✓
E6			✓	✓
South Corridor				
S1	✓			
S2			✓	✓
S4			✓	✓

Apply Stations, Vehicles, and Structures

Specific high-cost items were separated from the guideway costs and counted separately to increase the accuracy and confidence in the ROM capital cost estimates.

Stations

A specific number of stations for each alignment were identified by the planning team as a result of Steering Committee, workgroup and public input. The followings unit costs were assumed per station.

Table B-2: Station Cost Assumption per Mode

Mode	Stations
Commuter Rail	$1,500,000
Light Rail	$1,500,000
Streetcar	$150,000
Bus Rapid Transit	$250,000

Vehicles

A specific number of vehicles were assumed for each alternative based on the operations analysis performed, as described in Appendix A. The following unit costs were assumed per vehicle.

Table B-3: Vehicle Cost Assumption per Mode

Mode	Vehicles
Commuter Rail	$7,000,000
Light Rail	$4,000,000
Streetcar	$4,500,000
Bus Rapid Transit	$800,000

Structures (Bridges)

Bridges that crossed the alignment were also included in the capital cost estimate. Bridges that were crossed that were assumed to be either new or in need of rehabilitation were estimated at a cost of $70 per square foot (SF) for new structures or $30 per SF for rehabilitated structures. Table B-4 through Table B-6 includes the structures analysis by corridor.

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Table B-4: North Corridor Structures Analysis

Road	Crossing	Rail/ Vehicle	Length (feet)	Width (feet)	Square Feet	Lanes/ Tracks	Alignments						
							N1	N2 Rail	N2 BRT	N3 Rail	N3 BRT	N7 Rail	N7 BRT
Existing Rail	NW 36th Street	Rail	207	62	12,834	4	o						
Existing Rail	I-235	Rail	289	20	5,780	1	o						
Existing Rail	I-44/Creek	Rail	493	20	9,860	1	o						
Existing Rail	N Western Avenue	Rail	275	30	8,250	1	o	o	N				
Existing Rail	W 2nd Street (Edmond)	Rail	180	36	6,480	2		o	N				
W Britton Road	Broadway Highway	Vehicle	338	140	47,320	8				x	o		
Broadway Extension	On ramp	x	450	30	13,500	NEW				N			
Broadway Extension	W Hefner Road	Vehicle	320	130	41,600	6				x	o		
Broadway Extension	NE 122nd Street	Vehicle	155	160	24,800	9				x	o		
Broadway Extension	E Memorial Road	Vehicle	183	136	24,888	7				x	o		
Broadway Extension	N Kelley Avenue	Vehicle	430	143	61,490	7				x	o		
Harrison Avenue	I-235/Centennial	Vehicle	222	77	17,094	5						x	o
N Eastern Avenue	John Kilpatrick Turnpike	Vehicle	190	85	16,150	5						x	o
Children's Avenue	Pedestrian Bridge	x	x	x		x							x
"o" = existing bridge with no expected modifications				Total Existing Structure Square feet			0	0	0	200,098	0	33,244	0
"x" = existing bridge requiring modifications				Total New Structure Square feet			0	0	14,730	13,500	0	0	0
"N" = new structure				Existing Structure Cost		$30/SF	$ -	$ -	$ -	$6,002,940	$ -	$997,320	$ -
				New Structure Cost		$70/SF	$ -	$ -	$1,031,100	$945,000	$ -	$ -	$ -
				Total			$ -	$ -	$1,031,100	$6,947,940	$ -	$997,320	$ -

Table B-5: East Corridor Structures Analysis

Road	Crossing	Rail/ Vehicle	Length (feet)	Width (feet)	Square Feet	Lanes/ Tracks	Alignments							
							E1	E5 – Rail	E5 – BRT	E6 – Rail	E6 – BRT	EAlt1 – Rail	EAlt1 – BRT	NAlt1 – SC
Existing Rail	OK River	Rail	836	17	14,212	1	o							
Existing Rail	Creek	Rail	93	15	1,395	1	o							
Existing Rail	Creek	Rail	141	30	4,230	1	o	o	N			o	N	
Existing Rail	Creek	Rail	60	30	1,800	1	o	o	N			o	N	
Existing Rail	Key Boulevard	Rail	40	30	1,200	1	o	o	N			o	N	
Harrison Avenue	I-235/Centennial	Vehicle	222	77	17,094	5		x	o	x	o			
New Structure	OK River/Trails	x	2,900	30	87,000	NEW		N						
New Structure	Creek	x	135	30	4,050	NEW		N						
NE 10th Street	OK River	Vehicle	1,250	60	75,000	4				x	o			
NE 10th Street	Creek	Vehicle	300	60	18,000	4				x	o			
NE 10th Street	Creek	Vehicle	165	60	9,900	4				x	o			
E. Corridor flyover to Union Station		Rail			600,000	1	N							
E. Corridor Union Pacific Flyover					200,000	1	N							
New Structure	Station to Reno Avenue	x	500	30	15,000	NEW						N		
E Reno Avenue	Waterway	Vehicle	120	70	8,400	5						x	o	
E Reno Avenue	Creek	Vehicle	55	50	2,750	4						x	o	
E Reno Avenue	OK River	Vehicle	1,615	60	96,900	4						x	o	
E Reno Avenue	Creek	Vehicle	145	50	7,250	4						x	o	
E Reno Avenue	Creek	Vehicle	50	50	2,500	4						x	o	
E Reno Avenue	Creek	Vehicle	200	50	10,000	4						x	o	
E Reno Avenue	Creek	Vehicle	100	56	5,600	4						x	o	
S Douglas Boulevard	I-40	Vehicle	308	82	25,256	6						x	o	
"o" = existing bridge with no expected modifications				Total Existing Structure Square feet			0	17,094	0	119,994	0	158,656	0	0
"x" = existing bridge requiring modifications				Total New Structure Square feet			800,000	91,050	7,230	0	0	15,000	7,230	0
"N" = new structure				Existing Structure Cost		$30/SF	$ -	$512,820	$ -	$3,599,820	$ -	$4,759,680	$ -	$ -
				New Structure Cost		$70/SF	$56,000,000	$6,373,500	$506,100	$ -	$ -	$1,050,000	$506,100	$ -
				Total			$56,000,000	$6,886,320	$506,100	$3,599,820	$ -	$5,809,680	$506,100	$ -

Table B-6: South Corridor Structures Analysis

Road	Crossing	Rail/ Vehicle	Length (feet)	Width (feet)	Square Feet	Lanes/ Tracks	Alignments				
							S1	S2 – Rail	S2 – BRT	S4 – Rail	S4 – BRT
Existing Rail	SW 7th Street	Rail	100	81	8,100	3	o				
Existing Rail	I-40	Rail	730	40	29,200	2	o				
Existing Rail	SE 15th Street	Rail	85	32	2,720	2	o				
Existing Rail	OK River/SE 17th Street	Rail	876	32	28,032	2	o				
Existing Rail	SE 59th Street	Rail	175	25	4,375	1	o				
Existing Rail	I-235	Rail	252	22	5,544	1	o				
Existing Rail	NW 27th Street	Rail	141	56	7,896	3	o				
Existing Rail	SW 19th Street	Rail	78	30	2,340	1	o	o	N		
Existing Rail	Creek	Rail	115	30	3,450	1	o	o	N		
Existing Rail	W Robinson Avenue	Rail	125	40	5,000	2	o	o	N		
Existing Rail	Creek	Rail	33	33	1,089	2	o	o	N		
S Shields Boulevard	I-40	Vehicle	875	115	100,625	7		x	o	x	o
S Shields Boulevard	OK River, various	Vehicle	2,390	100	239,000	6		x	o	x	o
S Shields Boulevard	I-240	Vehicle	161	118	18,998	8		x	o	x	o
S Shields Boulevard	I-35	x	1,900	30	57,000	NEW		N	N		
S Shields Boulevard	I-35	x	1,750	30	52,500	NEW				N	
I-35	NW 5th Street	Vehicle	200	120	24,000	6				x	o
I-35	W Main Street	Vehicle	200	120	24,000	6				x	o
I-35	New Structure	x	550	30	16,500	NEW				N	
"o" = existing bridge with no expected modifications				Total Existing Structure Square feet			0	358,623	0	406,623	0
"x" = existing bridge requiring modifications				Total New Structure Square feet			0	57,000	68,879	69,000	0
"N" = new structure				Existing Structure Cost	$30/SF		$ -	$10,758,690	$ -	$12,198,690	$ -
				New Structure Cost	$70/SF		$ -	$3,990,000	$4,821,530	$4,830,000	$ -
				Total			$ -	$14,748,690	$4,821,530	$17,028,690	$ -

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Bridge costs were adjusted to address specific conditions in a few locations, including:

- East Corridor – Union Pacific Railroad (UP) yard flyover at NE 4th Street/Sunnylane Road – comparable costs for similar commuter rail flyovers (Capital Metropolitan Transportation Authority MetroRail Red Line flyover of UP[15] in Austin, Texas) were assumed
- East Corridor – Reno Avenue Oklahoma River Bridge – structure varied in different iterations of the alternatives (new structure vs. widening vs. rehabilitated only, etc.)
- East Corridor – Flyover from UP spur into Santa Fe Station – information prepared for the Bricktown Minimum Clearance Envelope Study[16] was used to inform a conceptual engineering cost estimate for the north-to-east connection from the UP spur to proposed platforms at the Santa Fe Station

Determine Assumed Unit Costs

Guideway costs are a function of the route mode and the functional density, the type of existing ROW, and the need for additional ROW for each segment included in a route. Table B-7 includes the guideway unit cost analysis guidelines. Factored unit costs were developed and then informed by approximate per-mile costs of different types of guideways from completed projects throughout the U.S., as shown in Table B-8 through Table B-9.

[15] Capital Metropolitan Transportation Red Line UP Flyover, URS, 2007

[16] Bricktown Minimum Clearance Envelope Study, URS, 2014

Table B-7: Assumed Guideway Unit Costs Guidelines (Gray fields were not used)

Commuter Rail							
	Factor	1	0.8	0	1.1	0	2
	Commuter Rail	No ROW needs		Minor ROW needs		Substantial ROW needs	
		Urban	Suburban	Urban	Suburban	Urban	Suburban
Factor	Type of Existing Conditions	$/Route-Mile					
1	Existing RR ROW	$ 17,500,000	$ 14,000,000	$ -	$ 19,250,000	$ -	$ -
0	Existing RR ROW double track	$ -	$ -	$ -	$ -	$ -	$ -
0.9	Existing RR ROW abandoned	$ 15,750,000	$ 12,600,000	$ -	$ -	$ -	$ -
1	Undeveloped	$ 17,500,000	$ -	$ -	$ -	$ -	$ 35,000,000

Light Rail							
	Factor	1	0.9	1.25	1.1	2	1.75
	Light Rail Transit	No ROW needs		Minor ROW needs		Substantial ROW needs	
		Urban	Suburban	Urban	Suburban	Urban	Suburban
Factor	Type of Existing Conditions	$/Route-Mile					
1	Existing RR ROW	$ 35,000,000	$ 31,500,000	$ -	$ -	$ -	$ -
1	Existing RR ROW abandoned	$ 35,000,000	$ 31,500,000	$ -	$ -	$ -	$ -
0.9	Undeveloped	$ 31,500,000	$ -	$ -	$ -	$ -	$ 55,125,000
1.4	Arterial Street	$ 49,000,000	$ 44,100,000	$ 61,250,000	$ 53,900,000	$ 98,000,000	$ 85,750,000
2	Highway	$ 70,000,000	$ 63,000,000	$ -	$ -	$ -	$ -

Streetcar							
	Factor	1	0.9	1.25	1.1	2	1.75
	Streetcar	No ROW needs		Minor ROW needs		Substantial ROW needs	
		Urban	Suburban	Urban	Suburban	Urban	Suburban
Factor	Type of Existing Conditions	$/Route-Mile					
1	Existing RR ROW	$ 30,000,000	$ 27,000,000	$ -	$ -	$ -	$ -
1	Existing RR ROW abandoned	$ 30,000,000	$ 27,000,000	$ -	$ -	$ -	$ -
0.9	Undeveloped	$ 27,000,000	$ -	$ -	$ -	$ -	$ 47,250,000
1.4	Arterial Street	$ 42,000,000	$ 37,800,000	$ 52,500,000	$ 46,200,000	$ 84,000,000	$ 73,500,000
2	Highway	$ 60,000,000	$ 54,000,000	$ -	$ -	$ -	$ -

Bus Rapid Transit							
	Factor	1	0.8	1.25	1.1	2	1.75
	Bus Rapid Transit	No ROW needs		Minor ROW needs		Substantial ROW needs	
		Urban	Suburban	Urban	Suburban	Urban	Suburban
Factor	Type of Existing Conditions	$/Route-Mile					
1	Existing RR ROW	$ 30,000,000	$ 24,000,000	$ -	$ -	$ -	$ -
0.9	Existing RR ROW abandoned	$ 27,000,000	$ 21,600,000	$ -	$ -	$ -	$ -
0.9	Undeveloped	$ 27,000,000	$ -	$ -	$ -	$ -	$ 47,250,000
0.125	Arterial - mixed flow	$ 3,750,000	$ 3,000,000	$ -	$ -	$ -	$ -
1.2	Arterial Street	$ 36,000,000	$ 28,800,000	$ 45,000,000	$ 39,600,000	$ 72,000,000	$ 63,000,000
1.4	Highway	$ 42,000,000	$ 33,600,000	$ -	$ -	$ -	$ -

Note: Factors were used to differentiate roadway costs based on location, whereas urban roadways are typically more expensive to construct than suburban roadways.

Table B-8: Unit Cost Data for Existing U.S. Transit Systems

System	Total Length	Capital Cost (2014 $)	Cost per Route-Mile (2014 $)	Notes	Assumed Per-Mile Costs
Commuter Rail					
Denton County (TX) DCTA A-Train	21 miles	$137,317,647	$6,538,936	Guideway cost. existing suburban/ Rural RR ROW	Assume base guideway cost of $17.5 M/mile on existing RR ROW.
Austin (TX) Capital MetroRail	32 miles	$43,233,049	$1,351,033	Guideway cost. Used existing ROW already owned	
San Diego (CA) Sprinter	22 miles	$477,000,000	$21,681,818	total project cost	
Fort Worth (TX) TEX Rail	37.6 miles	$959,000,000	$25,505,319	Total project cost (estimated). Double track along existing freight and passenger corridors	
Light Rail					
Norfolk (VA) Tide Light Rail	7.4 miles	$228,492,204	$30,877,325	Guideway cost. Some arterial, some existing RR ROW	Assume base guideway cost of $35M/mile on existing RR ROW based on Tide & Lynx. Multiply by 1.4 for base guideway cost of $49M/mile on existing arterial streets based on Phoenix and Houston METRO
Phoenix (AZ) Valley METRO Light Rail	20 miles	$1,233,284,000	$61,664,200	Guideway cost. dedicated median in arterials, paved track	
Charlotte (NC) LYNX	9.6 miles	$447,834,608	$46,649,438	Guideway cost. mostly existing RR ROW	
Houston (TX) METRO Blue Line	12.3 miles	$715,300,000	$58,154,472		
Austin (TX) METRORail	12.8 miles	$324,000,000	$43,200,000	Cost of initial 7.5 mile segment. Primarily in arterials	
Dallas (TX) DART	85 miles	$1,800,000,000	$64,285,714	Green Line only - lots of aerial guideway	

Table B-8: Unit Cost Data for Existing U.S. Transit Systems

System	Total Length	Capital Cost (2014 $)	Cost per Route-Mile (2014 $)	Notes	Assumed Per-Mile Costs
Streetcar					
Seattle (WA)	1.3 miles starter	$63,732,000	$49,024,615	Total project cost	Assume base guideway cost of $30M/mile on existing RR ROW. Calibrated to factor of 1.4 for base guideway cost of $42M/mile based on example system average
Portland (OR)	4.8 mile starter (loop)	$58,754,940	$ 24,481,225	Total project cost	
Tucson (AZ)	3.9 miles	$ 196,000,000	$ 50,256,410	Total project cost	
Cincinnati (OH)	4.5 mile loop	$ 102,000,000	$ 45,333,333	Total project cost	
Atlanta (GA)	2.7 mile loop	$ 69,200,000	$ 51,259,259	Total project cost	
BRT					
Los Angeles (CA) Metro Orange Line	18 miles	$ 389,448,000	$27,800,000	RR ROW – required new paving, dedicated ROW	Assume base guideway cost of $30M/mile for "gold standard" dedicated BRT on existing RR ROW based on LA Orange Line Calibrated to factor of 1.2 for base guideway cost of $36M/mile based on Healthline
Cleveland (OH) RTA Healthline	7.1 miles	$234,000,000	$33,000,000	Arterial – required significant other upgrades	

Source: URS, 2014.

Table B-9: FTA National Transit Database Evaluation of Contextual Unit Costs Systems

Norfolk (VA) Hampton Roads Tide Light Rail		
Total through 2011 shown in 2014 dollars	=	$285,521,729
Miles of track constructed	=	7.4
Cost per mile	=	$38,584,017
Guideway cost through 2011 in 2014 dollars	=	$228,492,204
Miles of track constructed	=	7.4
Cost per mile	=	$30,877,325
Guideway cost as a percentage of total	=	80%
Station cost through 2011 in 2014 dollars	=	$47,000,748
Stations	=	11
Cost per station	=	$4,272,795
Charlotte (NC) CATS LYNX Light Rail		
Total through 2008 shown in 2014 dollars	=	$509,285,054
Miles of track constructed	=	9.6
Cost per mile	=	$53,050,526
Guideway cost through 2008 in 2014 dollars	=	$447,834,608
Miles of track constructed	=	9.6
Cost per mile	=	$46,649,438
Guideway cost as a percentage of total	=	88%
Station cost through 2008 in 2014 dollars	=	$3,118,111
Stations	=	15
Cost per station	=	$207,874
Phoenix (AZ) Valley Metro Light Rail		
Total through 2009 shown in 2014 dollars	=	$1,936,546,800
Miles of track constructed	=	20
Cost per mile	=	$96,827,340
Guideway cost through 2009 in 2014 dollars	=	$1,233,284,000
Miles of track constructed	=	20
Cost per mile	=	$61,664,200
Guideway cost as a percentage of total	=	64%
Station cost through 2009 in 2014 dollars	=	$100,798,066
Stations	=	32
Cost per station	=	$3,149,940
Denton County (TX) DCTA Commuter Rail		
Total through 2011 shown in 2014 dollars	=	$ 264,805,082
Miles of track constructed	=	21
Cost per mile	=	$ 12,609,766
Guideway cost through 2011 in 2014 dollars	=	$ 137,317,647
Miles of track constructed	=	21
Cost per mile	=	$ 6,538,936
Guideway cost as a percentage of total	=	52%
Station cost through 2011 in 2014 dollars	=	$ 23,678,385
Stations	=	6
Cost per station	=	$ 3,946,397

Table B-9: FTA National Transit Database Evaluation of Contextual Unit Costs Systems

Norfolk (VA) Hampton Roads Tide Light Rail		
Austin (TX) CMTA Commuter Rail		
Total through 2010 shown in 2014 dollars	=	$135,630,469
Miles of track constructed	=	32
Cost per mile	=	$4,238,452
Guideway cost through 2011 in 2014 dollars	=	$43,233,049
Miles of track constructed	=	32
Cost per mile	=	$1,351,033
Guideway cost as a percentage of total	=	32%
Station cost through 2010 in 2014 dollars	=	$48,802,000
Stations	=	9
Cost per station	=	$5,422,444

Rough-Order-of-Magnitude Cost per Alternative

Total estimated capital costs were determined by compiling the above factors and criteria for each corridor alternative. Attachment 1 includes the detailed tables of the capital cost estimate analysis.

Validate Capital Costs

The total alternative capital costs were validated against total project costs for similar systems and situations across the US. The factored unit costs were then adjusted, if necessary, to correct any major inconsistencies in the results.

Determine Annualized Capital Costs

Annualized capital costs were determined using a simplified methodology as a function of vehicle and infrastructure minor and major replacement intervals and costs (based on the useful lives of the various cost items). It was also assumed that future inflation negates the future time-value of money. Those assumptions are shown in Table B-10.

Table B-10: Annualized Capital Costs Assumptions

	Replacement Cost %	Replacement Lifespan (years)	Major Cost %	Major Cost Interval (years)
Lifespan for Infrastructure				
Commuter Rail	100%	60	4%	2.4
Light Rail	100%	60	4%	2.4
Streetcar	100%	60	4%	2.4
Bus Rapid Transit	100%	60	4%	2.4
Lifespan for Vehicles				
Commuter Rail	100%	25	50%	12.5
Light Rail	100%	25	50%	12.5
Streetcar	100%	25	50%	12.5
Bus Rapid Transit	100%	12	50%	6

Note: Major Cost Interval is the annualized Replacement Cost.

B.1.3 Revisions, Refinements and Iteration

The following sections describe the iterations performed to the capital cost estimates based on input from the Steering Committee, workgroups, and the public.

Additional Alternative – North Corridor

The "NAlt1" Streetcar route was developed as a shortened version of the N3 Streetcar route for inclusion with the N1 commuter rail route as a full system alternative for the North Corridor. The "NAlt1" route extends from NW 10th Street and Classen Boulevard (the northern terminus of the currently proposed MAPS 3 downtown Oklahoma City Streetcar project) to a connection with the N1 commuter rail route at NW 63rd Street and I-235.

Additional Alternatives – East Corridor

Cost estimates for several alternatives were added in the East Corridor to determine if an alignment using Reno Avenue might be more cost effective. The Reno Avenue corridor has sufficient roadway capacity and ROW width, as well as an existing bridge over the Oklahoma River that provides a direct connection to downtown Oklahoma City. "EAlt1" commuter rail, "EAlt2" BRT, "EAlt3" streetcar, and "EAlt4" contraflow/mixed BRT were added to the East Corridor alternatives. The "EAlt2" BRT option would include fully-exclusive bus-only lanes (typically requiring reconstruction of the entire street section), while the "EAlt4" contraflow/mixed BRT would be the most cost effective option using existing roadway lanes converted to temporary transit-only use during peak commute times. Similar to "EAlt2" BRT, "EAlt3" streetcar was assumed to include reconstruction of the entire street section which is typically required for the installation of the "embedded" tracks, whether or not the service is mixed-flow. It was assumed that each of the additional alternatives would use the existing Reno Avenue Oklahoma River Bridge with minimal modifications, except for the "EAlt1" commuter rail option which was assumed to include a new bridge. (Streetcar tracks (EAlt3) can typically be retrofitted into existing highway bridge structures.)

B.1.4 Results

The ROM capital costs are included in Table B-11 through Table B-13. There is also a capital cost range, total cost per mile and annualized capital cost (based on the useful lives of the various cost items to develop each alternative) for each alternative in each corridor. The top-down approach as described above lends itself to providing a capital cost range because it is impossible to predict the particular conditions that a project will face as it moves through development – the national cost data vary widely even for systems that appear similar. The actual cost of a system could reasonably be expected to fall within the ranges provided, but is subject to external factors and currently unknown conditions that require detailed engineering.

Table B-11: North Corridor ROM Capital Costs by Alternative

Route Name/ Description	Route Miles	Order of Magnitude Capital Cost	Order of Magnitude Capital Cost Range	Total Cost per Mile	Annualized Capital Cost (based on midpoint)
N1 – Commuter Rail	13.9	$310 M	$260 M – $360 M	$22 M	$18.1 M
N2 – LRT	16.0	$850 M	$720 M – $980 M	$53 M	$48.7 M
N2 – Streetcar	16.0	$720 M	$610 M – $830 M	$45 M	$41.6 M
N2 – BRT	16.0	$600 M	$510 M – $690 M	$37 M	$34.7 M
N3 – LRT	16.1	$1,080 M	$920 M – $1,240 M	$67 M	$62.2 M
N3 – Streetcar	16.1	$930 M	$790 M – $1,070 M	$58 M	$53.3 M
N3 – BRT	16.1	$710 M	$600 M – $820 M	$44 M	$41.0 M
N7 – Streetcar	15.9	$650 M	$550 M – $750 M	$41 M	$37.8 M
N7 – BRT	15.9	$60 M	$50 M – $70 M	$4 M	$4.1 M
NAlt1 – Streetcar	5.3	$320 M	$270 M – $370 M	$61 M	$18.3 M

Table B-12: East Corridor ROM Capital Costs by Alternative

Route Name/ Description	Route Miles	Order of Magnitude Capital Cost	Order of Magnitude Capital Cost Range	Total Cost per Mile	Annualized Capital Cost (based on midpoint)
E1 – Commuter Rail	9.1	$240 M	$200 M – $280 M	$26 M	$14.1 M
E5 – LRT	9.7	$440 M	$370 M – $510 M	$45 M	$25.5 M
E5 – Streetcar	9.7	$380 M	$320 M – $440 M	$39 M	$21.9 M
E5 – BRT	9.7	$170 M	$140 M – $200 M	$17 M	$10.2 M
E6 – Streetcar	11.1	$460 M	$390 M – $530 M	$41 M	$27.0 M
E6 – BRT	20.9	$50 M	$40 M – $60 M	$2 M	$3.2 M
EAlt1 – Commuter Rail	9.8	$330 M	$280 M – $380 M	$34 M	$19.4 M
EAlt2 – BRT	9.8	$300 M	$260 M – $350 M	$31 M	$17.4 M
EAlt3 – Streetcar	9.8	$380 M	$320 M – $440 M	$39 M	$22.3 M
EAlt4 – BRT (Contraflow Transit Only Lane)	9.8	$140 M	$120 M – $160 M	$14 M	$8.4 M

Table B-13: South Corridor ROM Capital Costs by Alternative

Route Name/ Description	Route Miles	Order of Magnitude Capital Cost	Order of Magnitude Capital Cost Range	Total Cost per Mile	Annualized Capital Cost (based on midpoint)
S1 – Commuter Rail	20.7	$360 M	$310 M – $410 M	$17 M	$21.5 M
S2 – Streetcar	20.7	$750 M	$640 M – $860 M	$36 M	$43.5 M
S2 – BRT	20.7	$600 M	$510 M – $690 M	$29 M	$34.8 M
S4 – Streetcar	21.4	$1,000 M	$850 M – $1,150 M	$47 M	$57.3 M
S4 – BRT	21.4	$710 M	$600 M – $820 M	$33 M	$41.2 M

B.2 Operation and Maintenance Costs

B.2.1 Introduction

This Section summarizes the methodology used to estimate operation and maintenance (O&M) costs for the ten preliminary alternatives identified for detailed evaluation with input from the Steering Committee, workgroups, and the public. Also discussed below, are three additional modified alternatives that arose during CentralOK!go. The following sections describe the alignments evaluated, the operating characteristics and service assumptions used to develop total revenue hour requirements for each alternative, the cost assumptions used, and the resulting O&M costs for each alternative.

B.2.2 Alignments Evaluated

The CentralOK!go Steering Committee and workgroups recommended alternatives within each corridor for further study. O&M costs were developed for each of these alternatives, as well as, a few additional permutations described below.

North Corridor

As shown in Figure B-2, the North Corridor alignments selected for further study included:

- N1 – along the existing BNSF freight rail tracks
- N2 – along NW 4th Street and Classen Boulevard to Wilshire Boulevard, then along the existing BNSF rail tracks
- N3 – along NW 4th Street, Classen Boulevard, I-235/Broadway Extension, and Ayers Street
- N7 – along Reno Avenue, Lincoln Boulevard, NE 36th Street, MLK Boulevard and Ayers Street
- N1AIt – extending the downtown Streetcar network north along NW 10th Street and Classen Boulevard to the NW 63rd Street N1 commuter rail station

Alternative N1 was evaluated as a commuter rail mode only. Alternatives N2 and N3 were evaluated for potential as light rail transit (LRT), streetcar or bus rapid transit (BRT), while N7 was evaluated for potential as either BRT or streetcar. In addition, a fifth alternative, extending the downtown streetcar network to the NW 63rd Street N1 commuter rail station was evaluated as streetcar.

East Corridor

Figure B-4 illustrates the East Corridor alignments selected for further study by the Steering Committee as well as a modified alignment, E1A:

- E1 – This alternative would travel north from the Santa Fe Station in downtown Oklahoma City along E.K. Gaylord/Broadway and then utilize the existing UP freight rail tracks, as well as a new track extension within an abandoned rail ROW south to SE 29th Street.
- E1A – Utilizes new track along Reno Avenue, the existing UP freight rail tracks, a new track extension within an abandoned rail ROW south to SE 29th Street, and extends further south along Douglas Boulevard to the east side of Tinker Air Force Base.
- E5 – This alternative would travel north from the Santa Fe Station in downtown Oklahoma City along E.K. Gaylord/Broadway and then travel along NE 8th Street, NE 10th Street, the UP, and along a new extension within an abandoned rail ROW south to SE 29th Street.
- E6 this alternative would travel north from the Santa Fe Station in downtown Oklahoma City along E.K. Gaylord/Broadway and then travel along NE 8th Street, NE 10th Street, Air Depot Boulevard, and SE 29th Street.

In addition to these four alignments, O&M costs were developed for a modified alternative E1+ (not pictured) which mimics alternative E1 along the UP tracks but extends to Tinker Air Force Base to the south along Douglas Boulevard in a similar fashion to E1A.

Alternatives E1 and E1+ were evaluated as a commuter rail. Alternative E5 was evaluated for potential as LRT, streetcar or BRT. Alternatives E6 and E1A were evaluated for potential as either BRT or streetcar.

South Corridor

Figure B-3 illustrates the three alternatives selected for further study in the South Corridor:

- S1 along the existing BNSF rail tracks south to SH-9
- S2 along Shields Boulevard to Moore then along the existing BNSF rail tracks
- S4 along Shields Boulevard, I-35, Flood Avenue, Robinson Street, and Porter Avenue/Classen Boulevard to SH-9

Alternative S1 was evaluated for potential as commuter rail, while S2 and S4 were evaluated as either streetcar or BRT.

Figure B-2: North Corridor Alignments

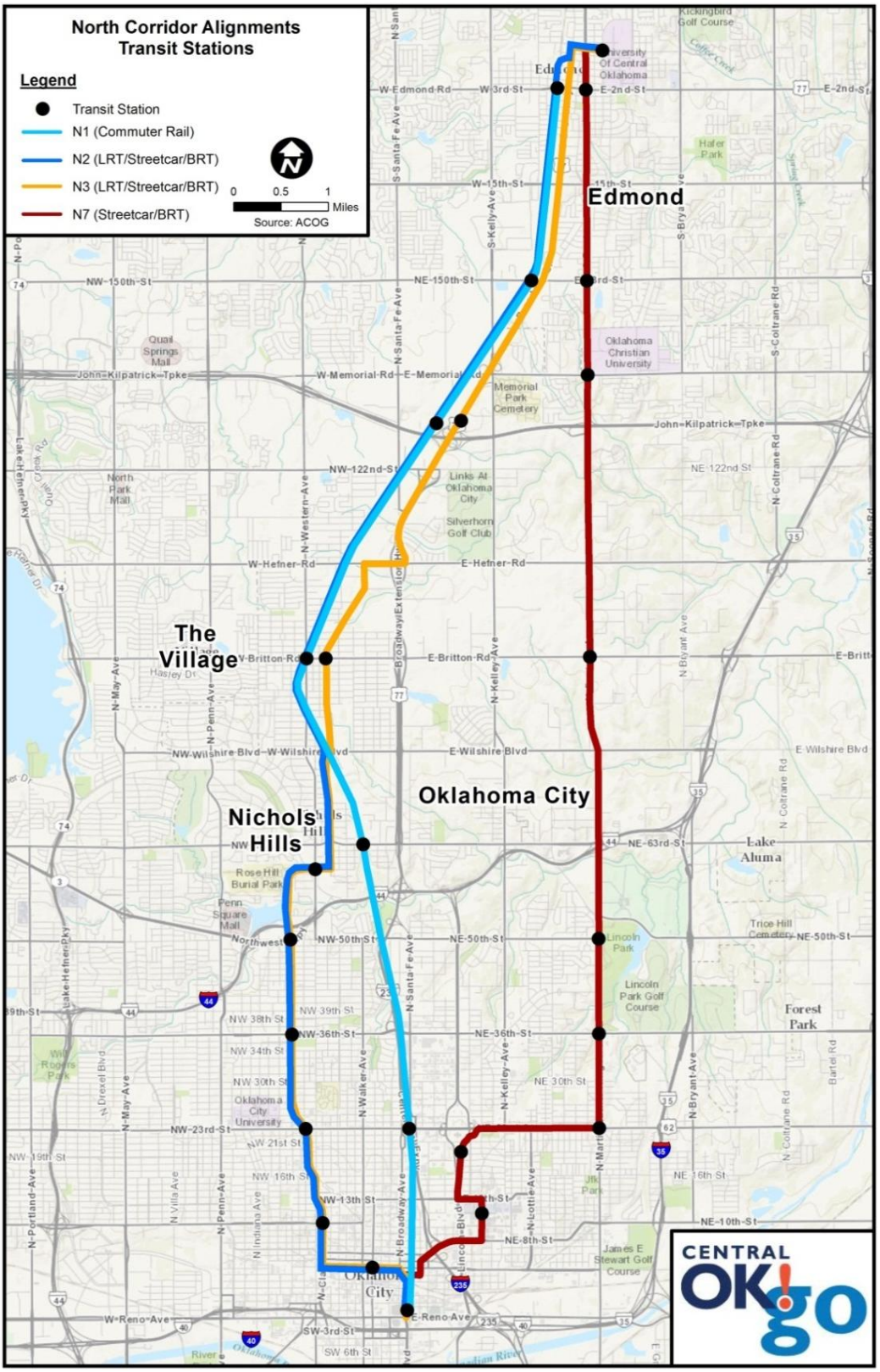


Figure B-3: East Corridor Alignments

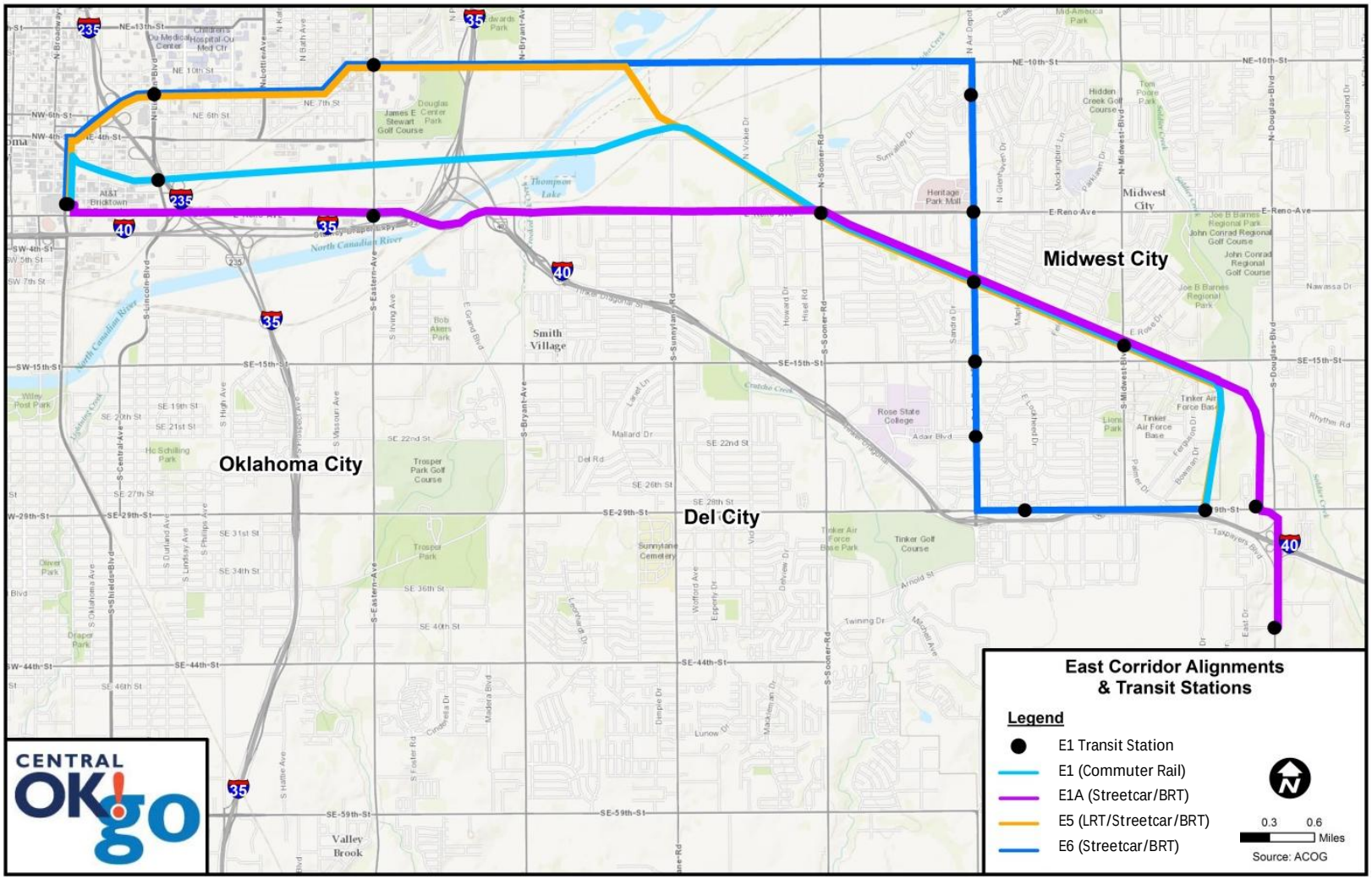
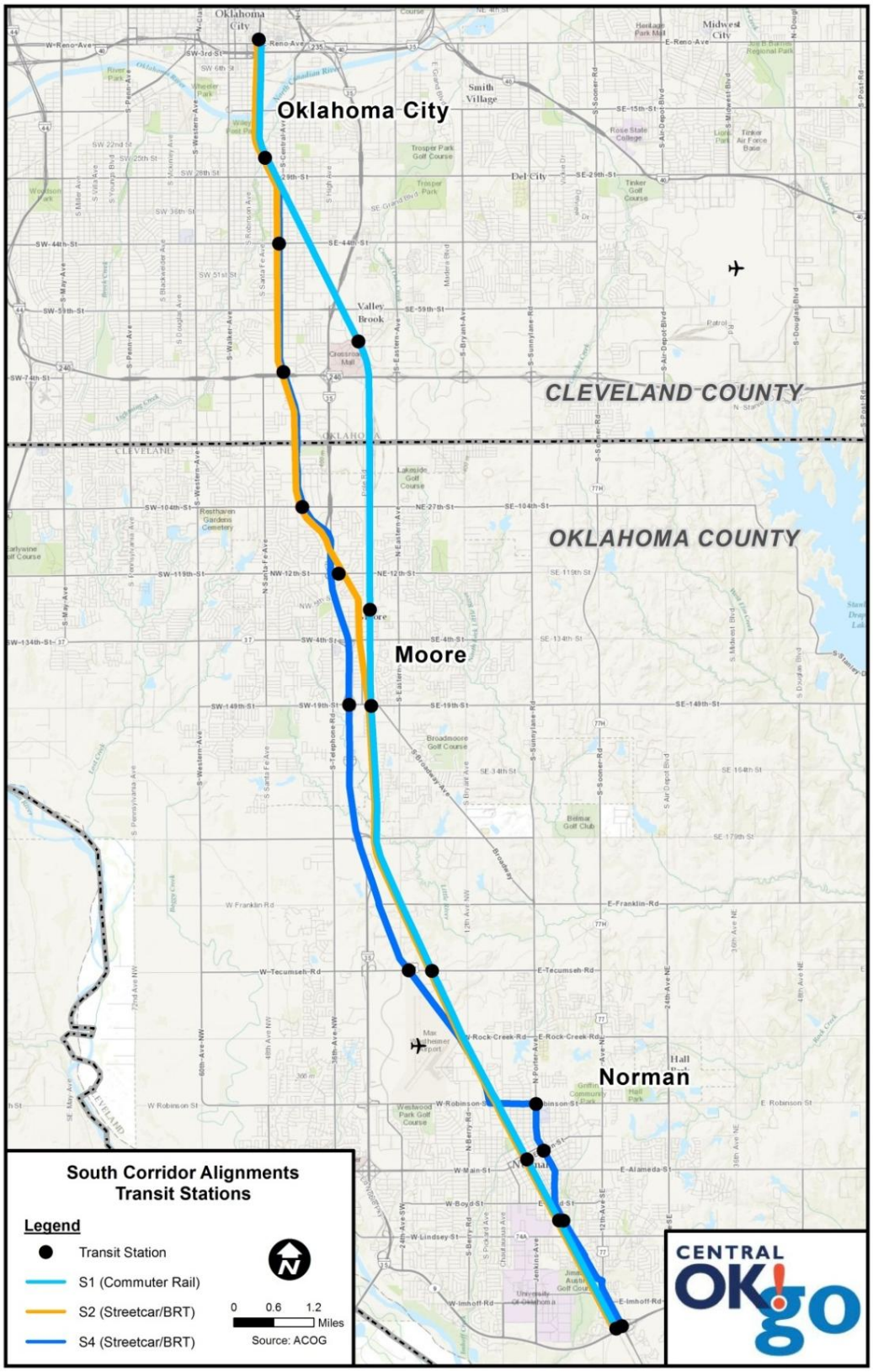


Figure B-4: South Corridor Alignments



B.2.3 Operating Speeds and Travel Times

The distances between stops for each alternative were measured. For all alignments that would operate (in full or in part) on existing rail ROW or vacant areas outside of designated roadway corridors, an average speed of 50 mph was assumed for that portion of the alignment.

For portions of alignments located along street ROW, speed limits were used when available to determine average speeds. Speeds were averaged by approximate length at each speed. For alternatives N2, N3, the North Corridor Streetcar Extension, S2, S4, and the portion of E1A along Reno Avenue, it was assumed that dedicated ROW for transit would be available. In these areas, average posted speeds were reduced by five miles per hour (5 mph) to account for slower vehicle speeds during acceleration and deceleration. Alternatives N7, E1+, E5, E6, and the southern part of E1A include segments that operate in mixed traffic. For those segments, the average operating speeds were derived by subtracting ten miles per hour (10 mph) to account for slower vehicle speeds during acceleration, deceleration, and while operating in heavy traffic or at signalized intersections.

The period of time in which a vehicle picks up and drops off passengers at a stop was also factored, including opening and closing doors and time spent standing (dwell time). For all commuter rail alternatives, a dwell time of 40 seconds at each station was assumed. For light rail, streetcar and BRT alternatives, a dwell time of 25 seconds was used. Table B-14 summarizes the distances, average operating speeds, and calculated travel times for each alignment analyzed. A complete stop-by-stop description of distances, speeds and travel times is available in Section B.3.

Table B-14: Operating Parameters by Alignment

Corridor/ Alternative	Distance (mi.)	Travel Speeds (mph)	Target Travel Time (min.)	Dwell Time per Stop (sec)	# of Stops	Avg. Speed (w/dwell) (mph)	Loaded one-way Travel Time (min.)
North Corridor							
Alternative N1	13.9	50.0	16.6	0:40	7	40.4	20 min 38 sec
Alternative N2	15.9	38.6	24.7	0:25	12	32.6	29 min 16 sec
Alternative N3	16.0	33.5	28.7	0:25	10	29.6	32 min 27 sec
Alternative N7	15.9	26.5	35.8	0:25	11	23.9	40 min 0 sec
North Corridor Streetcar Extension	5.3	31.0	10.2	0:25	7	25.1	12 min 41 sec
East Corridor							
Alternative E1	9.3	50.0	11.1	0:40	6	38.6	14 min 27 sec
Alternative E1+ (to Tinker AFB)	10.2	47.3	13.0	0:40	7	36.1	16 min 58 sec
Alternative E1A	9.8	38.4	15.3	0:25	7	33.1	17 min 47 sec
Alternative E5	9.7	35.1	16.6	0:25	7	30.5	19 min 5 sec
Alternative E6	11.1	27.0	24.7	0:25	10	23.4	28 min 29 sec
South Corridor							
Alternative S1	20.6	50.0	24.7	0:40	9	41.1	30 min 4 sec
Alternative S2	20.6	41.6	29.7	0:25	11	36.5	33 min 54 sec
Alternative S4	21.2	39.8	32.0	0:25	11	35.2	36 min 9 sec

Service Assumptions

Table B-15 provides the assumptions made regarding operating hours and frequencies. Approximately 1,900 peak and 4,000 off-peak hours are anticipated per year, resulting from over 14,500 round trips. Peak period is defined as the periods of day during which traffic levels rise from their normal levels to maximum levels (typically from 6:00 to 8:30 AM and 3:30 to 6:30 PM). These periods are typically in the morning and evening rush hours when most people travel to and from work.

Table B-15: Service Assumptions

	Days/year	Service Characteristics	Peak	Off Peak
Weekday	252	Service Hours	5.5	11.5
		Frequency (min.)	15	30
		Round Trips	22	23
Weekend/Holiday	113	Service Hours	4.5	9.5
		Frequency (min.)	30	30
		Round Trips	9	19
Annual Total	365	Service Hours	1,894.5	3,971.5
		Round Trips	6,561	7,943

Layovers are the time allowed at a transit stop between arrival and departure for the purpose of turning vehicles, recovery of delays, and preparing for the return trip. The minimum layover varies by mode and vehicle. For BRT and streetcar alternatives, a total of 10 minutes of layover per round trip was assumed. For LRT alternatives, 15 minutes of round-trip layover was assumed, while commuter rail was calculated using an assumption of 20 minutes per round trip (approximately 10 minutes per terminus).

B.2.4 O&M Cost Assumptions

O&M costs for each alternative were calculated by multiplying the anticipated revenue hours required to maintain service headways of 15-30 minutes by the mode-specific, 2017 cost per revenue mile assumed for the Oklahoma City area, as shown in Table B-16. Headway is the time between the passing of the front ends of successive transit vehicles heading in the same direction, or simply put, how often the vehicle arrives at the station. To produce a reasonable estimate, 2012 NTD average national cost per revenue mile statistics were reduced by a factor of 0.24 to regionalize the data. This factor was derived by comparing known local bus revenue hour costs for Oklahoma City to the national average for bus. Once 2012 costs were determined, they were escalated to 2017 values using an inflation factor of 3% per year.

Table B-16: Cost per Revenue Hour

Mode	2012 National Average	2012 Oklahoma City	2017 Oklahoma City
Commuter Rail	$501.00	$403.04	$467.23
Light Rail	$257.00	$206.75	$239.68
Bus Rapid Transit	$151.00	$121.47	$140.82
Streetcar	$189.00	$152.04	$176.26

Because of the preliminary nature of this study, the number and location of maintenance facilities associated with each alternative is undetermined. In order to maintain a fair comparison among alternatives, the estimated costs developed for this analysis do not include maintenance facilities or operational costs for deadhead mileage. A deadhead is the movement of the vehicle without

passengers, typically for the purpose of getting to or from a maintenance facility to passenger operations.

B.2.5 O&M Cost Projections

Table B-17 below summarizes the annual O&M cost projections for each of the preliminary alternatives. A table with detailed layover, cycle time and vehicle information is available in Section B.4. As shown below, for any given alignment, BRT is the least expensive technology to operate while commuter rail and LRT are the most expensive.

Table B-17: Annual Operation & Maintenance Cost Projection Summary (in Millions $)

	Commuter Rail	LRT	Streetcar	BRT
North Corridor				
Alternative N1	$4.8	–	–	–
Alternative N2	–	$4.8	$3.5	$2.8
Alternative N3	–	$5.2	$3.5	$2.8
Alternative N7	–	–	$3.8	$3.1
North Corridor Streetcar Ext.	–	–	$2.3	–
East Corridor				
Alternative E1	$3.5	–	–	–
Alternative E1+ (to Tinker AFB)	$3.5	–	–	–
Alternative E1A	–	–	$2.6	$2.0
Alternative E5	–	$3.5	$2.6	$2.0
Alternative E6	–	–	$3.5	$2.8
South Corridor				
Alternative S1	$5.2	–	–	–
Alternative S2	–	–	$3.8	$3.1
Alternative S4	–	–	$3.8	$3.1

B.3 Travel Time Calculations

B.3.1 North Corridor Alternatives

Table B-18: Alternative N1 Travel Time

Average Segment Speed (mph)	Segment (from)	Segment (to)	Distance (miles)	Target Travel Time (min)	Target Dwell Time (sec)	Loaded Travel Time (minutes)
50	Bricktown	NW 23rd Street	1.9	2.3	40	2.30
50	NW 23rd Street	NW 63rd Street	3.0	3.7	40	3.66
50	NW 63rd Street	Briton Road	2.1	2.6	40	2.57
50	Briton Road	Kilpatrick Turnpike	2.9	3.4	40	3.43
50	Kilpatrick Turnpike	W 33rd Street	1.8	2.2	40	2.19
50	W 33rd Street	W 3rd Street/E 2nd Street	2.1	2.5	40	2.48
Avg. Moving Speed			Total (mi)	Total (min)	Avg. Run Speed (mph)	Run Time (min)
50.0			13.9	16.7	40.4	20.64

Table B-19: Alternative N2 Travel Time

Average Segment Speed (mph)	Segment (from)	Segment (to)	Distance (miles)	Target Travel Time (min)	Target Dwell Time (sec)	Loaded TT (minutes)
25	Bricktown	Hudson Avenue	0.8	1.8	25	1.84
27	Hudson Avenue	NW 10th Street	1.0	2.2	25	2.18
30	NW 10th Street	NW 23rd Street	1.0	2.1	25	2.08
30	NW 23rd Street	NW 36th Street	1.0	2.1	25	2.08
35	NW 36th Street	NW 50th Street	1.0	1.7	25	1.72
30	NW 50th Street	Western Avenue	1.0	1.9	25	1.94
40	Western Avenue	Briton Road	2.5	3.7	25	3.73
50	Briton Road	Kilpatrick Turnpike	2.9	3.4	25	3.43
50	Kilpatrick Turnpike	W 33rd Street	1.8	2.2	25	2.18
50	W 33rd Street	W 3rd Street	2.1	2.5	25	2.49
50	W Edmond Road	University Drive	0.8	1.0	25	1.01
Avg. Moving Speed			Total (mi)	Total (sec)	Avg. Run Speed (mph)	Run Time (min)
38.6			15.9	24.7	32.6	29.26

Table B-20: Alternative N3 Travel Time

Average Segment Speed (mph)	Segment (from)	Segment (to)	Distance (miles)	Target Travel Time (min)	Target Dwell Time (sec)	Loaded TT (minutes)
25	Bricktown	Hudson Avenue	0.8	1.8	25	1.84
27	Hudson Avenue	NW 10th Street	1.0	2.2	25	2.18
30	NW 10th Street	NW 23rd Street	1.0	2.1	25	2.08
30	NW 23rd Street	NW 36th Street	1.0	2.1	25	2.08
35	NW 36th Street	NW 50th Street	1.0	1.7	25	1.72
30	NW 50th Street	Western Avenue	1.0	1.9	25	1.94
35	Western Avenue	Briton Road	2.4	4.2	25	4.18
40	Briton Road	Kilpatrick Turnpike	3.3	4.9	25	4.89
35	Kilpatrick Turnpike	University Drive	4.5	7.8	25	7.79
Avg. Moving Speed			Total (mi)	Total (sec)	Avg. Run Speed (mph)	Run Time (min)
33.5			16.0	28.7	29.6	32.45

Table B-21: Alternative N7 Travel Time

Average Segment Speed (mph)	Segment (from)	Segment (to)	Distance (miles)	Target Travel Time (min)	Target Dwell Time (sec)	Loaded TT (minutes)
20	Bricktown	Young Boulevard	1.7	5.2	25	5.14
22	Young Boulevard	Lincoln Avenue	0.9	2.5	25	2.47
22	Lincoln Avenue	MLK Avenue	1.6	4.4	25	4.36
27	MLK Avenue	NE 36th Street	1.0	2.2	25	2.22
30	NE 36th Street	NE 50th Street	1.0	2.0	25	2.01
33	NE 50th Street	Briton Road	3.0	5.5	25	5.46
37	Briton Road	E Memorial Road	3.0	4.9	25	4.85
30	E Memorial Road	W 33rd Street	1.0	2.0	25	2.00
23	W 33rd Street	E 2nd Street	2.0	5.3	25	5.28
18	E 2nd Street	University Drive	0.6	2.1	25	2.06
Avg. Moving Speed			Total (mi)	Total (sec)	Avg. Run Speed (mph)	Run Time (min)
26.5			15.9	35.8	23.9	40.00

Table B-22: North Corridor SC Extension

Average Segment Speed (mph)	Segment (from)	Segment (to)	Distance (miles)	Target Travel Time (min)	Target Dwell Time (sec)	Loaded TT (minutes)
25	10th Street & Walker	10th Street & Classen Boulevard	0.4	1.0	25	1.02
30	10th Street & Classen Boulevard	NW 23rd Street	1.0	2.1	25	2.06
30	NW 23rd Street	NW 36th Street	1.0	2.1	25	2.08
35	NW 36th Street	NW 50th Street	1.0	1.7	25	1.72
30	NW 50th Street	Western Avenue	1.0	1.9	25	1.94
35	Western Avenue	63rd Street Station	0.8	1.4	25	1.36
Avg. Moving Speed			Total (mi)	Total (sec)	Avg. Run Speed (mph)	Run Time (min)
31.0			5.3	10.2	25.1	12.68

B.3.2 East Corridor Alternatives

Table B-23: Alternative E1 Travel Time

Average Segment Speed (mph)	Segment (from)	Segment (to)	Distance (miles)	Target Travel Time (min)	Target Dwell Time (sec)	Loaded TT (minutes)
50	Bricktown	S Lincoln Boulevard	0.9	1.1	40	1.12
50	S Lincoln Boulevard	Sooner Road	4.6	5.5	40	5.52
50	Sooner Road	Air Depot Boulevard	1.1	1.3	40	1.34
50	Air Depot Boulevard	Midwest Boulevard	1.1	1.3	40	1.30
50	Midwest Boulevard	SE 29th Street	1.5	1.8	40	1.83
Avg. Moving Speed			Total (mi)	Total (sec)	Avg. Run Speed (mph)	Run Time (min)
50.0			9.3	11.1	38.6	14.45

Table B-24: Alternative E1+ (to Tinker AFB) Travel Time

Average Segment Speed (mph)	Segment (from)	Segment (to)	Distance (miles)	Target Travel Time (min)	Target Dwell Time (sec)	Loaded TT (minutes)
50	Bricktown	S Lincoln Boulevard	0.9	1.1	40	1.12
50	S Lincoln Boulevard	Sooner Road	4.6	5.5	40	5.52
50	Sooner Road	Air Depot Boulevard	1.1	1.3	40	1.34
50	Air Depot Boulevard	Midwest Boulevard	1.1	1.3	40	1.30
50	Midwest Boulevard	SE 29th Street	1.6	2.0	40	1.94
30	SE 29th Street	Tinker AFB	0.9	1.7	40	1.73
Avg. Moving Speed			Total (mi)	Total (sec)	Avg. Run Speed (mph)	Run Time (min)
47.3			10.2	13.0	36.1	16.96

Table B-25: Alternative E1A Travel Time

Average Segment Speed (mph)	Segment (from)	Segment (to)	Distance (miles)	Target Travel Time (min)	Target Dwell Time (sec)	Loaded TT (minutes)
33	Bricktown	Eastern Avenue	2.1	3.8	25	3.81
35	Eastern Avenue	Sooner Road	3.0	5.2	25	5.17
50	Sooner Road	Air Depot Boulevard	1.1	1.3	25	1.34
50	Air Depot Boulevard	Midwest Boulevard	1.1	1.3	25	1.30
50	Midwest Boulevard	SE 29th Street	1.6	2.0	25	1.94
30	SE 29th Street	Tinker AFB	0.9	1.7	25	1.73
Avg. Moving Speed			Total (mi)	Total (sec)	Avg. Run Speed (mph)	Run Time (min)
38.4			9.8	15.3	33.1	17.79

Table B-26: Alternative E5 Travel Time

Average Segment Speed (mph)	Segment (from)	Segment (to)	Distance (miles)	Target Travel Time (min)	Target Dwell Time (sec)	Loaded TT (minutes)
20	Bricktown	N Lincoln Boulevard	1.1	3.3	25	3.29
25	N Lincoln Boulevard	MLK Avenue	1.5	3.7	25	3.69
39	MLK Avenue	Sooner Road	3.3	5.1	25	5.14
50	Sooner Road	Air Depot Boulevard	1.1	1.3	25	1.34
50	Air Depot Boulevard	Midwest Boulevard	1.1	1.3	25	1.30
50	Midwest Boulevard	SE 29th Street	1.5	1.8	25	1.83
Avg. Moving Speed			Total (mi)	Total (sec)	Avg. Run Speed (mph)	Run Time (min)
35.1			9.7	16.6	30.5	19.09

Table B-27: Alternative E6 Travel Time

Average Segment Speed (mph)	Segment (from)	Segment (to)	Distance (miles)	Target Travel Time (min)	Target Dwell Time (sec)	Loaded TT (minutes)
20	Bricktown	Lincoln Boulevard	1.1	3.3	25	3.29
25	Lincoln Boulevard	MLK Avenue	1.5	3.7	25	3.69
30	MLK Avenue	Blueridge Drive	4.2	8.4	25	8.37
30	Blueridge Drive	E Reno Avenue	0.8	1.6	25	1.55
25	E Reno Avenue	UP RR ROW	0.5	1.1	25	1.12
25	UP RR ROW	SE 15th Street	0.5	1.3	25	1.27
25	SE 15th Street	Adair Boulevard	0.5	1.2	25	1.20
27	Adair Boulevard	Mid America Boulevard	0.8	1.9	25	1.84
30	Mid America Boulevard	Industrial Boulevard	1.2	2.4	25	2.40
Avg. Moving Speed			Total (mi)	Total (sec)	Avg. Run Speed (mph)	Run Time (min)
27.0			11.1	24.7	23.4	28.49

B.3.3 South Corridor Alternatives

Table B-28: Alternative S1 Travel Time

Average Segment Speed (mph)	Segment (from)	Segment (to)	Distance (miles)	Target Travel Time (min)	Target Dwell Time (sec)	Loaded TT (minutes)
50	Bricktown	SE 25th Street	1.8	2.2	40	2.16
50	SE 25th Street	SE 66th Street	3.1	3.7	40	3.71
50	SE 66th Street	NE 2nd Street	4.1	4.9	40	4.87
50	NE 2nd Street	SE 19th Street	1.5	1.8	40	1.75
50	SE 19th Street	Tecumseh Road	4.2	5.0	40	4.99
50	Tecumseh Road	Main Street	3.2	3.8	40	3.81
50	Main Street	E Brooks Street	1.0	1.3	40	1.24
50	E Brooks Street	Hwy 9	1.8	2.2	40	2.20
Avg. Moving Speed			Total (mi)	Total (sec)	Avg. Run Speed (mph)	Run Time (min)
50.0			20.6	24.7	41.1	30.06

Table B-29: Alternative S2 Travel Time

Average Segment Speed (mph)	Segment (from)	Segment (to)	Distance (miles)	Target Travel Time (min)	Target Dwell Time (sec)	Loaded TT (minutes)
35	Bricktown	SE 25th Street	1.8	3.1	25	3.09
35	SE 25th Street	SW 44th Street	1.3	2.3	25	2.29
37	SW 44th Street	SW 74th Street	1.9	3.2	25	3.14
45	SW 74th Street	SW 104th Street	2.1	2.8	25	2.76
35	SW 104th Street	NW 12th Street	1.2	2.1	25	2.07
30	NW 12th Street	SE 19th Street	2.1	4.2	25	4.16
50	SE 19th Street	Tecumseh Road	4.2	5.0	25	4.99
50	Tecumseh Road	Main Street	3.2	3.8	25	3.81
50	Main Street	E Brooks Street	1.0	1.3	25	1.24
50	E Brooks Street	Hwy 9	1.8	2.2	25	2.20
Avg. Moving Speed			Total (mi)	Total (sec)	Avg. Run Speed (mph)	Run Time (min)
41.6			20.6	29.7	36.5	33.90

Table B-30: Alternative S4 Travel Time

Average Segment Speed (mph)	Segment (from)	Segment (to)	Distance (miles)	Target Travel Time (min)	Target Dwell Time (sec)	Loaded TT (minutes)
35	Bricktown	SE 25th Street	1.8	3.1	25	3.09
35	SE 25th Street	SW 44th Street	1.3	2.3	25	2.29
37	SW 44th Street	SW 74th Street	1.9	3.2	25	3.14
45	SW 74th Street	SW 104th Street	2.1	2.8	25	2.76
55	SW 104th Street	SW 19th Street	3.2	3.5	25	3.48
55	SW 19th Street	Tecumseh Road	4.2	4.5	25	4.53
40	Tecumseh Road	Robinson Street	3.1	4.6	25	4.58
25	Robinson Street	Main Street	0.7	1.8	25	1.74
25	Main Street	E Brooks Street	1.1	2.7	25	2.70
30	E Brooks Street	Hwy 9	1.8	3.7	25	3.68
Avg. Moving Speed			Total (mi)	Total (sec)	Avg. Run Speed (mph)	Run Time (min)
39.8			21.2	32.0	35.2	36.15

B.4 O&M Cost Calculations

Table B-31: North Corridor Alignment Costs

Potential Service Frequency	Commuter Rail		LRT		Streetcar		BRT	
	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak
	15	30	15	30	15	30	15	30
Alternative N1								
Round Trip Length (miles)		27.7						
Round Trip Travel Time (min)		41.3						
Minimum Layover (min)		20						
Actual Layover (min)	33.7	48.7						
Round Trip Run Time (Cycle Time)	75	90						
Vehicles in Operation	5	3						
Annual Vehicle Revenue Miles		402,189						
Annual Vehicle Revenue Hours		20,116						
Annual Cost ($Mil)**		$4.8						
Alternative N2								
Round Trip Length (miles)				31.8		31.8		31.8
Round Trip Travel Time (min)				58.5		58.5		58.5
Minimum Layover (min)				15		10		10
Actual Layover (min)			16.5	31.5	16.5	31.5	16.5	31.5
Round Trip Run Time (Cycle Time)			75	90	75	90	75	90
Vehicles in Operation			5	3	5	3	5	3
Annual Vehicle Revenue Miles				460,650		460,650		460,650
Annual Vehicle Revenue Hours				20,116		20,116		20,116
Annual Cost ($Mil)**				$4.8		$3.5		$2.8
Alternative N3								
Round Trip Length (miles)				32.1		32.1		32.1
Round Trip Travel Time (min)				64.9		64.9		64.9
Minimum Layover (min)				15		10		10
Actual Layover (min)			25.1	25.1	10.1	25.1	10.1	25.1
Round Trip Run Time (Cycle Time)			90	90	75	90	75	90
Vehicles in Operation			6	3	5	3	5	3
Annual Vehicle Revenue Miles				465,309		465,309		465,309
Annual Vehicle Revenue Hours				21,756		20,116		20,116
Annual Cost ($Mil)**				$5.2		$3.5		$2.8
Alternative N7								
Round Trip Length (miles)						31.7		31.7
Round Trip Travel Time (min)						80.0		80.0
Minimum Layover (min)						10		10
Actual Layover (min)					10.0	10.0	10.0	10.0
Round Trip Run Time (Cycle Time)					90	90	90	90
Vehicles in Operation					6	3	6	3
Annual Vehicle Revenue Miles						459,821		459,821
Annual Vehicle Revenue Hours						21,756		21,756
Annual Cost ($Mil)**						$3.8		$3.1

Table B-31: North Corridor Alignment Costs

Potential Service Frequency	Commuter Rail		LRT		Streetcar		BRT	
	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak
	15	30	15	30	15	30	15	30
North Corridor Streetcar Extension								
Round Trip Length (miles)						21.0		
Round Trip Travel Time (min)						25.4		
Minimum Layover (min)						10		
Actual Layover (min)					19.6	34.6		
Round Trip Run Time (Cycle Time)					45	60		
Vehicles in Operation					3	2		
Annual Vehicle Revenue Miles						305,144		
Annual Vehicle Revenue Hours						12,864		
Annual Cost ($Mil)**						$2.3		

** Does not include potential maintenance yard or deadhead costs

Table B-32: East Corridor Alignment Costs

Potential Service Frequency	Commuter Rail		LRT		Streetcar		BRT	
	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak
	15	30	15	30	15	30	15	30
Alternative E1								
Round Trip Length (miles)		18.5						
Round Trip Travel Time (min)		28.9						
Minimum Layover (min)		20						
Actual Layover (min)	31.10	31.10						
Round Trip Run Time (Cycle Time)	60	60						
Vehicles in Operation	4	2						
Annual Vehicle Revenue Miles		268,780						
Annual Vehicle Revenue Hours		14,504						
Annual Cost ($Mil)**		$3.5						
Alternative E1+								
Round Trip Length (miles)		20.5						
Round Trip Travel Time (min)		33.9						
Minimum Layover (min)		20						
Actual Layover (min)	26.07	26.07						
Round Trip Run Time (Cycle Time)	60	60						
Vehicles in Operation	4	2						
Annual Vehicle Revenue Miles		296,607						
Annual Vehicle Revenue Hours		14,504						
Annual Cost ($Mil)**		$3.5						
Alternative E1A								
Round Trip Length (miles)						19.6		19.6
Round Trip Travel Time (min)						35.6		35.6
Minimum Layover (min)						10		10
Actual Layover (min)					24.4	24.4	24.4	24.4
Round Trip Run Time (Cycle Time)					60	60	60	60
Vehicles in Operation					4	2	4	2
Annual Vehicle Revenue Miles						284,163		284,163
Annual Vehicle Revenue Hours						14,504		14,504
Annual Cost ($Mil)**						$2.6		$2.0
Alternative E5								
Round Trip Length (miles)				19.4		19.4		19.4
Round Trip Travel Time (min)				38.2		38.2		38.2
Minimum Layover (min)				15		10		10
Actual Layover (min)			21.8	21.8	21.8	21.8	21.8	21.8
Round Trip Run Time (Cycle Time)			60	60	60	60	60	60
Vehicles in Operation			4	2	4	2	4	2
Annual Vehicle Revenue Miles				281,378		281,378		281,378
Annual Vehicle Revenue Hours				14,504		14,504		14,504
Annual Cost ($Mil)**				$3.5		$2.6		$2.0

Table B-32: East Corridor Alignment Costs

Potential Service Frequency	Commuter Rail		LRT		Streetcar		BRT	
	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak
	15	30	15	30	15	30	15	30
Alternative E6								
Round Trip Length (miles)						22.2		22.2
Round Trip Travel Time (min)						57.0		57.0
Minimum Layover (min)						10		10
Actual Layover (min)					18.0	33.0	18.0	33.0
Round Trip Run Time (Cycle Time)					75	90	75	90
Vehicles in Operation					5	3	5	3
Annual Vehicle Revenue Miles						322,632		322,632
Annual Vehicle Revenue Hours						20,116		20,116
Annual Cost ($Mil)**						$3.5		$2.8

** Does not include potential maintenance yard or deadhead costs

Table B-33: South Corridor Alignment Costs

Potential Service Frequency	Commuter Rail		LRT		Streetcar		BRT	
	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak	Peak	Off Peak
	15	30	15	30	15	30	15	30
Alternative S1								
Round Trip Length (miles)		41.2						
Round Trip Travel Time (min)		60.1						
Minimum Layover (min)		20						
Actual Layover (min)	29.9	29.9						
Round Trip Run Time (Cycle Time)	90	90						
Vehicles in Operation	6	3						
Annual Vehicle Revenue Miles		597,774						
Annual Vehicle Revenue Hours		21,756						
Annual Cost ($Mil)**		$5.2						
Alternative S2								
Round Trip Length (miles)						41.2		41.2
Round Trip Travel Time (min)						67.8		67.8
Minimum Layover (min)						10		10
Actual Layover (min)					22.2	22.2	22.2	22.2
Round Trip Run Time (Cycle Time)					90	90	90	90
Vehicles in Operation					6	3	6	3
Annual Vehicle Revenue Miles						598,263		598,263
Annual Vehicle Revenue Hours						21,756		21,756
Annual Cost ($Mil)**						$3.8		$3.1
Alternative S4								
Round Trip Length (miles)						42.5		42.5
Round Trip Travel Time (min)						72.3		72.3
Minimum Layover (min)						10		10
Actual Layover (min)					17.7	17.7	17.7	17.7
Round Trip Run Time (Cycle Time)					90	90	90	90
Vehicles in Operation					6	3	6	3
Annual Vehicle Revenue Miles						615,695		615,695
Annual Vehicle Revenue Hours						21,756		21,756
Annual Cost ($Mil)**						$3.8		$3.1

** Does not include potential maintenance yard or deadhead costs

Appendix C: Economic Development Potential

C.1 Introduction

This Appendix provides initial guidance and recommendations for planning future development around the LPA stations identified in CentralOK!go. It includes an assessment of economic and real estate trends, local economic development objectives, and station area land use and development conditions. In preparing this information, several data collection activities and analyses were undertaken including:

- Site visits along each LPA
- City staff interviews on economic and community development objectives for key station areas
- Analysis of employment, demographic, and real estate trends

Specific objectives of this work included:

- Defining transit oriented development (TOD) and the market and physical factors required for implementation;
- Providing economic and market context to identify the strengths, weaknesses, and opportunities along each corridor and key station area;
- Identifying key station areas with TOD potential; and
- Recommending initial station area development concepts and typologies, initial implementation steps, and other planning considerations for key station areas.

C.1.1 Transit Oriented Development Definition

This section presents an introduction and overview of TOD, including a definition of TOD, factors for success, and economic benefits. TOD can be defined as mixed use residential or commercial development within walking distance of a transit station designed to maximize access to transit and incorporates features designed to encourage transit ridership. A TOD often resembles other activity centers with a greater mix of uses and higher densities than the surrounding market area. TODs typically have the following features:

- Mix of Uses – Land uses can be mixed either vertically or horizontally. TOD is primarily residential at suburban locations, but can have employment and other commercial and retail uses at activity center and downtown locations.
- Compact Development – TODs are built at higher densities than the surrounding market area, creating a focal point around a transit station. The density and amount of development are market driven; higher land values support higher development densities and more urban locations support greater amounts of development.
- Pedestrian Oriented – TODs are designed to facilitate

Spring Valley Station, Dallas, TX

pedestrian access to and from the station with ample sidewalks, interconnected blocks and streets, buildings oriented toward the street, and parking located in secondary locations.

- TOD Typology – Stations can be classified according to their transit function and their approximate place in the continuum of urban and suburban development. This continuum ranges from downtown and regional activity or employment centers on the larger and most intense end of the development spectrum to neighborhood centers on the smaller end. There are also more specialized single use centers such as hospitals or major sports complexes. The mix of uses varies by type and location; however, the larger urban centers tend to be higher density and contain more employment uses. Smaller centers tend to contain lower densities and a greater proportion of housing.

Transit has a positive effect on development potential around stations because it improves regional accessibility, which increases property values. Higher land values can support (and require) higher development densities and in some cases a different mix of land uses in much the same way as property adjacent to a highway interchange is different from development farther away. However, the presence of transit alone does not translate to greater development potentials. There are other key economic requirements impacting transit oriented development:

- A Positive Real Estate Market – TOD cannot overcome negative local or national real estate market conditions, including negative population or employment growth, declining building and land values, or the lack of conventional development financing.
- Supportive Public Policy – A local jurisdiction needs to provide a planning framework and zoning that allows for the type, mix, and density of development supportable by the market and desired by the community.
- Realistic Expectations – In small- to mid-sized urban markets, TOD may not materialize until several years after transit service begins.

TOD Plan

Transit oriented development also requires a commitment to a long-term development plan. Historically, TOD has generally not occurred until the transit investment is in place and providing a high level of accessibility that is generating high levels of ridership. In all but the most robust real estate markets, a TOD plan may take 10, 20, or more years to be fully implemented as a significant activity center.

A station area plan is key as it provides direction for the preferred land uses to be developed within a station influence area over a long-term horizon of 10 to 20 or more years. The typical area of influence is approximately a half-mile radius modified by logical roadway and geographic features. In addition to the land use element, the plan should be grounded by a market study that identifies the potentials for TOD land uses. It should also contain an infrastructure needs analysis, redevelopment strategies, and recommendations for changes and incentives to encourage TOD. The TOD plan allows a community to address the individual characteristics and market opportunities and constraints of individual station locations and settings.

Transit Ready

Planning for transit and TOD is compatible with multiple revitalization and redevelopment goals such as attracting mixed use development, increasing development density and diversity, creating walkable neighborhoods and business districts, redeveloping or re-purposing obsolete industrial property adjacent to rail corridors, and reducing dependence on automobiles. Cities in the Kansas City, Denver, and Dallas-Fort Worth regions are planning or have planned for transit service and TOD well in advance of an operating transit system. Since land use change can take several years, it is important to begin

planning and implementing higher density development and revitalization plans now to position the region for future transit service.

C.1.2 Transit Oriented Development Benefits

TOD is pursued by communities for several reasons including local economic development benefits, increased access to jobs (by residents) and labor force (by employers), and for the environmental and social benefits of compact development. The private sector, land owners, investors, and developers are interested in TOD because of its potential to support higher property values. TOD also increases ridership on transit systems, and, to the transit operator it is a lower cost way of adding riders compared to expanding the transit system.

Demand for Transit Accessible Real Estate

Demographers, economists, and the national homebuilding industry expect housing and commercial real estate demand to shift dramatically in the coming years; some areas of the U.S. are already experiencing these predicted shifts. Over the past decade, there have been at least four national studies of housing preferences and national demographic trends that indicate increasing demand for more compact and transit accessible housing, workplace, and retail locations. Conversely, the demand for large homes and large lot suburban and exurban development is expected to decrease. Some highlights of this research are summarized below:

- Approximately 38% of Americans would like the option to live in attached housing (apartments, condos, townhomes), and 35% to 40% would prefer single family homes on small lots (less than 7,000 square feet).[17]
- Attached housing comprises only 30% of the national housing supply and small lot housing comprises only another 30% of the housing supply, creating a gap between housing preferences and what the market is providing.[18,19]
- One-quarter of Americans would like to be able to walk or cycle to work, yet only 4% actually do. When work, shopping, and services are located less than one mile from home, roughly 40% of the population will walk or cycle to these locations.[20]
- From 1990 to 2010 approximately 80% of housing demand was from growing families (children of baby boomers having their own children). Over the next 20 years, this market segment is projected to be one-quarter of the housing market. The housing market will be dominated by empty nesters (baby boomers), smaller households as households size continues to fall, and the young labor force.
- Generation Y and Millennials show stronger preferences for more urban style housing in both central city and suburban locations, and have lower rates of car ownership. They also prefer workplaces in more mixed use urban style environments rather than the single use suburban business parks popular from the 1970s through the 2000s[21]. As the U.S. labor force shrinks with

[17] Nelson, A. C., 2006. Leadership in a New Era. Journal of the American Planning Association, vol. 72, No. 4, Autumn 2006.

[18] Nelson, A. C., "The Mass Market for Suburban Low Density Development is Over". The Urban Lawyer, Vol. 44, No. 4., Fall 2012 (Nelson's Analysis of National Association of Realtors' Data)

[19] National Association of Realtors, 2011. The 2011 Community Preference Survey.

[20] Nelson, A. C.; Deyette, J.; and Ekwurzel, B. Reshaping Metropolitan America: Trends and Opportunities. Island Press, 2013.

[21] The Nielson Company, 2014. Millennials – Breaking the Myths.

the retirement of the baby boomers, attracting this young labor force will be important to businesses and cities.

Real Estate Impacts

The access and convenience that good transit service provides makes these locations attractive to residents and businesses, resulting in higher property values generally within one-quarter to one-half mile of high frequency transit, as summarized below and in Table C-1.

- Average rents in the Bay Area for a one-bedroom apartment were priced 10% above comparable projects and 16% higher for two-bedroom units.[22] On average, rents in East Bay TODs (e.g., Oakland and Berkeley) were 10-15% higher than non-TOD units.
- A similar study conducted in Dallas found that a sample of properties located around DART rail stations saw increases in property values and rents of about 25% greater than overall county levels and comparable non-TOD properties.[23] Specifically, an analysis at Dallas' Mockingbird Station found a rent premium of 23% above comparable non-TOD units. Between 1997 and 2001 median values of residential properties increased 32.1% near DART light rail stations compared to 19.5% in control group areas.
- A study completed in the Denver, Colorado region found that apartment rents in TOD locations were 15% higher than comparable properties in non-TOD locations.

[22] *Transit-Oriented Development in the United States: Experience, Challenges, and Prospects.* TCRP Report 102. Transportation Research Board. 2004.

[23] *The Initial Economic Impacts of the DART LRT System.* Center for Economic Development and Research. 1999.

Table C-1: Transit Oriented Development Residential Property Premiums

City/Region	System	Technology	Study Date	Passenger Miles[1]	Metro Area Congestion Rating[2]	Value of Proximity to Station
Residential						
Alameda County (Bay Area)	BART	Heavy Rail	1994	1,449 million	8	39%
Boston, MA	MBTA	Commuter Rail	1994	793 million	12	6.7%
California Bay Area	BART	Heavy Rail	1996	1,448 million	8	10-15%
Dallas, TX	DART	Light Rail	1999	472 million	15	25%
Denver, CO	RTD	Light Rail	–	134 million	16	7-18%
North San Diego County (Coaster Line)	NCTD	Commuter Rail	–	40 million	13	+20%
Philadelphia, PA	SEPTA	Commuter Rail	1993	486 million	11	7-15%
Portland, OR	TriMet	Light Rail	1993	194 million	25	11%
Santa Clara County (Silicon Valley)	VIA	Light Rail	2001	54 million	8	15%
Commercial						
Santa Clara County (Silicon Valley)	VIA	Light Rail	2001	54 million	8	23%
Washington D.C.	WMTA	Heavy Rail	–	1,640 million	7	10-20%
San Diego, CA	Various	Various	–	–	13	20-40%

Notes: [1]- FTA National Transit Database, http://www.ntdprogram.gov/ntdprogram
[2]- Texas Transportation Institute Urban Mobility Report, http://mobility.tamu.edu/ums
Source: Research summarized by EPS, 2014.

TOD projects served by intensive transit service produce the healthiest real estate results. While high quality transit is important, it is not the only factor in determining success. Higher densities, pedestrian amenities, and retail services all contribute to the level of premium. It is the synergy of proximity, density, mix of uses, and pedestrian friendliness that truly translates into property values and enhanced real estate performance.[24]

Equity

Transportation and fuel costs are rising nationally and worldwide. For those who cannot afford to own a car or choose not to, quality public transit can provide a viable means to access better job opportunities that may not be close to home. Good transit can connect people of all income ranges to opportunities for job training, education, and career advancement.

C.2 Station Area Development Conditions

This section describes existing land use and development conditions in the general areas of the proposed stations, focusing on the one-quarter to one-half mile radius of TOD influence. It also summarizes consultant interviews with city planning and economic development staffs on their jurisdiction's objectives, concepts, and ideas on development options for key station sites in their communities. Staffs representing the Cities of Edmond, Oklahoma City, Midwest City, Moore, and

[24] Transit-Oriented Development in the United States: Experience, Challenges, and Prospects. TCRP Report 102. Transportation Research Board. 2004.

Norman were interviewed. The planning and development objectives and station area conditions described in this chapter influence the recommended development concepts and implementation steps presented in Appendix C3.

C.2.1 North Corridor

The major stations proposed for the North Corridor LPA and evaluated in this report include the W 2nd Street Station in downtown Edmond, the Kilpatrick Turnpike Station, the NW 63rd Street Station, and the NE 23rd Street Station, and, as shown in Section C.3.2.

W 2nd Street Station

The W 2nd Street Station in downtown Edmond is proposed for the vicinity of 2nd Street and Main Street. Conceptual station layout plans were prepared by a consultant retained by the City of Edmond prior to this study. Just north of 2nd Street along the south side of 1st Street is the city's Marketplace, an outdoor market, which is another potential station location. The City of Edmond owns several properties in downtown on the west (rear) halves of the North and South Broadway blocks. These properties could potentially be part of a station, commuter parking, or support new TOD.

Land use in the area consists of a traditional (pre-World War II) main street of one and two story retail, commercial, and office mixed use buildings fronting Broadway. Buildings on Broadway are well occupied which is an indication of strong market demand associated with Edmond's affluent demographics. The rail ROW is located one and a half to two blocks to the west, and there are approximately 30 to 40 freight trains per day on this line. Many older buildings remain along the rail ROW running north to south such as grain silos, small early 1900s and older warehouse buildings, corrugated metal buildings, and a lumber yard, giving the area an authentic railroad depot character. A few of these buildings have been converted to house businesses such as a yoga studio, contractor/construction offices, and artist space. There is also ample land for infill and redevelopment.

Downtown Edmond along Broadway

Business in a renovated depot building, Downtown Edmond

BNSF rail bordering Downtown Edmond

The City of Edmond is interested in the opportunities created by locating a station in its downtown. The City is completing a Downtown Plan to examine ways to increase development density along the southern portion of Broadway that is currently developed with lower density highway commercial development. Among the options being considered is promoting more multifamily development and redevelopment in this area to serve students at the University of Central Oklahoma (UCO) and senior demand, and reduce demand for those looking for smaller lower-maintenance homes. A challenge will be in determining appropriate densities, as much of downtown is two stories or less and taller buildings may affect the character.

Kilpatrick Turnpike Station

This station is proposed in Oklahoma City in the vicinity of either Memorial Road or North Santa Fe Avenue. Along Memorial Road, land use is primarily distribution warehouses, car dealerships, and highway commercial development. Many buildings are relatively modern and house viable businesses. Due to the location near the intersections of major north-south and east-west arterials and the proximity of the Kilpatrick Turnpike and Broadway Extension, this station could draw riders from a large area. A large parking area would likely be needed.

BNSF at Memorial Drive

The land use pattern in the Memorial Road location is not supportive of transit oriented development. However, south of Memorial Road along Santa Fe the land use transitions to residential and there are several large undeveloped properties. This area may be more compatible with TOD than the Memorial Road location due to the residential context. A new office park was recently built at the southeast corner of NE 122nd and Broadway Extension, indicating that this area may support additional office development.

Distribution warehouse at Memorial Drive and BNSF

NW 63rd Station

The NW 63rd Station is proposed in the vicinity of NW 63rd Street in Oklahoma City. Land to the west of the BNSF has been recently developed by Chesapeake Energy for its corporate headquarters. The 120-acre campus is still under development and currently includes 2.2 million square feet of office space, as well as amenities such as a 70,000 square foot fitness facility, a 60,000 square foot child development center, and five on site restaurants.

An upscale retail district at Classen Curve is located just under three-quarters of a mile to the west, as are affluent neighborhoods in Nichols Hills. Penn Square Mall is approximately 1.5 miles to the west. East of the BNSF, development consists of arterial commercial and light industrial on the south side of NW 63rd, and Class B and C (mid-grade) office buildings on the north side of NW 63rd. There are several infill development parcels remaining on and around the Chesapeake campus, as well as on the east side of the BNSF.

Real estate market conditions are comparatively strong to the west of the BNSF. The Classen Curve retail center was recently developed and is occupied by upscale clothing and food and beverage tenants. There is a Whole Foods Market located at the northwest corner of N Western Avenue and N Classen Boulevard, and several smaller well maintained retail centers and professional office buildings. The City of Nichols Hills is located just to the west of North Western Avenue. Oklahoma City is interested in continuing to leverage economic spin offs from the investment in the Chesapeake Campus, and the large number of employees at this location.

View south along BNSF from 63rd Street. Chesapeake Energy Campus on right.

NW 23rd Street Station

A station is proposed for the vicinity of NW 23rd Street and Broadway, approximately two miles from downtown Oklahoma City. This area is adjacent to the Heritage Hills East neighborhood, and within a half mile of the Paseo and Mesta Park Neighborhoods. These are relatively high income up-and-coming neighborhoods that are experiencing reinvestment in the housing stock with renovations of older homes, and razing of older homes to be replaced with newer homes. The area has a traditional block grid pattern that facilitates multimodal (bicycle and pedestrian) access. The State Capitol complex, a major employment center, is just over a half mile to the east along NE 23rd Street.

Commercial development along NW 23rd Street

North 23rd Street is a commercial arterial with an eclectic mixture of retailers, ethnic businesses and restaurants, and personal services. Despite the reinvestment in the housing stock in surrounding neighborhoods, infrastructure and public space conditions along N 23rd Street are only fair. The City of Oklahoma City has adopted the Northeast 23rd Street Corridor Plan to address needs for housing, transportation and infrastructure, and businesses to catalyze revitalization in this area. A mass transit station would add additional energy and focus to the area and complement the Plan.

Market conditions for transit oriented development are stronger west of the BNSF, where there is more private investment in housing and retail occurring. The development context to the east is also less supportive of TOD, given the largely industrial and large block development pattern, infrastructure barriers such as the Broadway Ave and BNSF overpasses, the depression of NW 23rd Street below

Commercial development near NW 23rd Street and Broadway

Broadway Extension, and the larger median-separated cross section of NE 23rd Street east of Broadway Extension and BNSF.

C.2.2 East Corridor

Five general station locations were evaluated for the East Corridor: Reno and Martin Luther King (MLK) Avenue, Sooner Road, Air Depot Boulevard, Midwest Boulevard, and two potential stations near Tinker AFB (SE 29th Street and Tinker AFB). The East Corridor LPA is proposed as a variation of modern streetcar technology, following Reno Avenue and then an inactive rail corridor running northwest to southeast through Midwest City, as illustrated in Section C.3.2.

Reno and MLK Station

Land use near the intersection of Reno Street and Martin Luther King Avenue consists of the Greyhound Bus Terminal, several large vacant industrial sites, low density and low value industrial sites, a large truck stop, a hotel/motel and conference center, and other low value motels along Reno Avenue. Some of the industrial sites are reported to be brownfield sites with some remediation completed. The active industrial properties have outdoor trail, equipment, and material storage which is an indication of low land values. I-40 is one block to the south and forms a hard edge between the station area and the Oklahoma River and regional greenways along the river. The BNSF main line lies approximately one-half mile to the north. Martin Luther King Avenue crosses the tracks using a bridge.

New affordable housing at 7th and Martin Luther King

The Kennedy neighborhood is located north of the BNSF tracks, as is the James E. Stewart municipal golf course, Douglass High School, and the Oklahoma City Housing Authority offices are on NE 4th Street. The Central Urban Development Authority (CUDA), a non-profit community development corporation, is developing new affordable homes in the Kennedy neighborhood at 7th Street and MLK across from Douglass High School.

The industrial context in this station area is challenging for transit oriented development. Also, the connectivity to adjacent neighborhoods and services is poor due to the barriers created by the BNSF rail and I-40. A large public-private partnership would likely be needed to assemble land for development and address these access and connectivity barriers. One consideration would be to plan for a jobs-based development, rather than a mixed-use TOD. This concept could integrate housing (likely affordable housing) with industrial and other middle skill living wage jobs serving the region as well as the workforce in the neighborhoods to the north.

Sooner Road Station

This station area includes an arterial road intersection with a large electronics and appliance store on the northeast corner, and a neighborhood shopping center and gas station on the southwest corner. There is additional arterial commercial development along the west side of Sooner Road between Sooner Road and the rail alignment. The area also contains single family homes on deep lots (200 to 500 feet deep). The appliance store site, the residential parcels, and other low density commercial and residential parcels in the area could be consolidated to create larger infill and redevelopment sites around the proposed station.

Reno Avenue at Sooner Road

Air Depot Boulevard, Midwest Boulevard Stations

The proposed station areas at Air Depot Boulevard and Midwest Boulevard are similar and therefore discussed together. In both locations, the rail alignment crosses these north-south arterials at an angle. Development along both streets consists largely of arterial retail and commercial buildings with surface parking. The age, quality, and economic viability of the retail and commercial space vary in both locations. Single family neighborhoods are set back from the arterials and not generally accessed by driveways onto the arterials, but by collector streets from the arterials. In both locations, consolidation of property would be required to create larger more cohesive development sites for TOD.

Air Depot Boulevard station area

Midwest City is interested in revitalizing its arterials, recognizing that much of the commercial space is outdated and reaching the end of its economic life. The City's comprehensive plan specifically supports the conversion of vacant and obsolete retail to mixed use and higher density residential development. There are sites in both station areas that meet these criteria.

SE 29th Street and Tinker AFB Stations

The East Corridor LPA contains two stations that could serve Tinker AFB and the surrounding travel shed. The first is the SE 29th Street Station located at SE 29th Street and South Douglas Boulevard approximately a quarter mile west of the intersection in Midwest City. This location may not support any significant amount of TOD due to floodplain and topography constraints, Air Force property, and flight path restrictions.

The second and terminal station (Tinker AFB Station) is in the area of Douglas Boulevard and Staff Drive, a main employee entrance to the Base. This station is within Oklahoma City. The Base is located on the west side of Douglas Boulevard. The east side is private property developed with several low intensity

and low value commercial and light industrial uses. There is also a substantial amount of undeveloped land along the east side of Douglas Boulevard.

The land along Douglas Boulevard is in Oklahoma City's Airport Environs (AE1 and AE2) zoning overlays that heavily restrict development due to noise and safety concerns near the Base. In addition, this area is expected to be designated as Urban Reserve in the City's updated Comprehensive Plan, PlanOKC, as there are major water and sewer constraints and a lack of other public services in southeast Oklahoma City.

C.2.3 South Corridor

Stations evaluated in this report on the South Corridor LPA are the Crossroads Mall Station, S 2nd Street Station, S 19th Street Station, Tecumseh Road Station, and Main Street Station (which could potentially use the existing Amtrak Station). Other potential stations include the Brooks Street Station adjacent to the University of Oklahoma (OU) campus, and an end-of-line station at SH-9, as shown in Section C.3.2.

Crossroads Mall Station

This station is proposed near Plaza Mayor, formerly Crossroads Mall, between SE 59th and SE 66th Streets. Plaza Mayor is being renovated and re-tenanted by the Legaspi Company as a Hispanic and Latino oriented mall, following the closure and bankruptcy of Crossroads Mall. The mall is approximately 760,000 square feet. The four anchor spaces remain vacant, but several national tenants have been signed to fill inline mall spaces including Bath and Body Works and Victoria's Secret. Outparcel sites are developed with three limited service hotels, an AMC multiplex theatre, a Best Buy store, and smaller store and restaurant space.

Plaza Mayor (formerly Crossroads Mall)

Surrounding land use consists of partially developed industrial land and oil and gas wells. There are several large undeveloped sites throughout this area and along the BNSF that could potentially accommodate more development. There may be an opportunity to utilize a transit station in combination with the mall repositioning to attract additional development, such as mixed income and market housing, and additional retail and entertainment. The adjacent community of Valley Brook contains many of the region's sexually oriented businesses, largely along SE 59th, which creates perception issues to potential investors and developers. The large parcel sizes and distance allows for sufficient buffering for any new development surrounding Plaza Mayor, and a large enough redevelopment could establish a place and create a different market in this location.

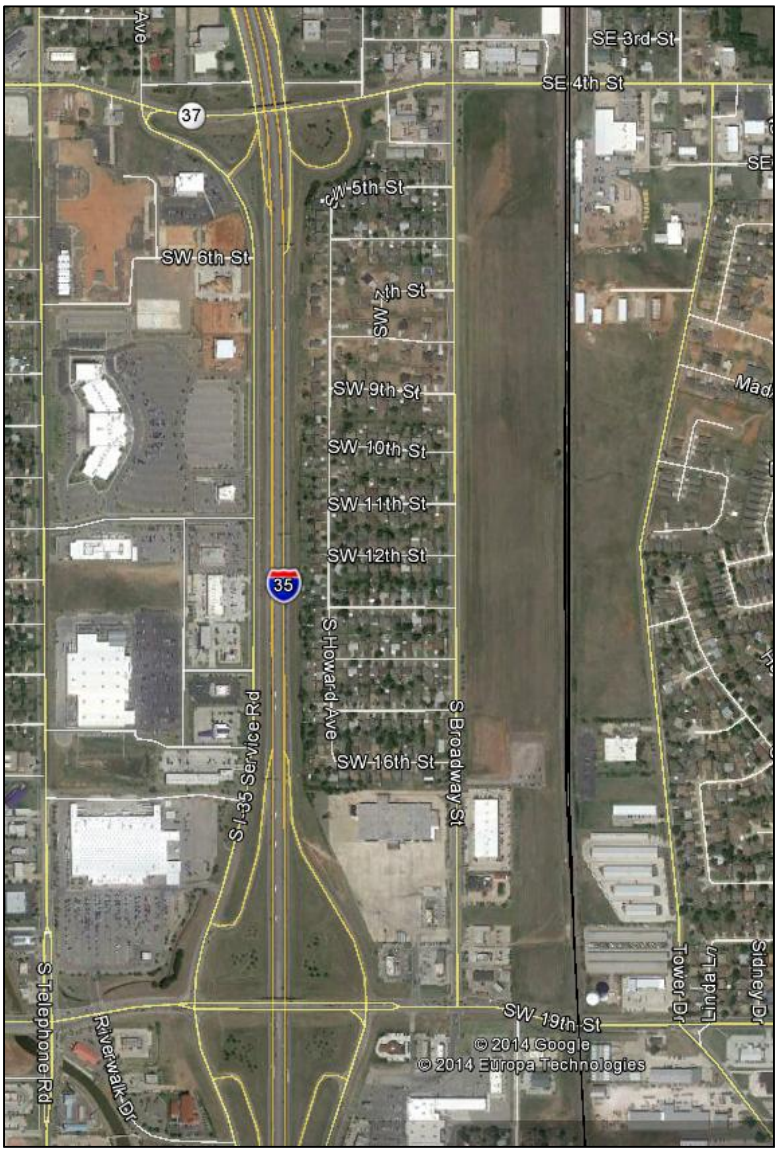
S 2nd Street and S 19th Street Stations

Two station locations are proposed in the City of Moore. The S 2nd Street Station would be located near Moore Central Park, just south of Moore's small downtown commercial center on Broadway. The City owns an approximately 60-acre undeveloped property at the southeast corner of SE 4th and South Broadway Streets, extending nearly to SW 19th Street along the BNSF ROW. The City has broken ground on a signature park on this site, Central Park. The S 19th Street Station would connect to the Moore Riverwalk on the west side of I-35. The Riverwalk is a retail and entertainment district with approximately 250,000 square feet of development organized around a canal to which the City has made improvements including pedestrian bridges and walking trails. On the other side of I-35 are the

Shops at Moore, a 260,000 square foot retail center anchored by JC Penney. Other retail in the area includes a 200,000 square foot Walmart Supercenter and a 135,000 square foot Home Depot to the north and west of the site, respectively.

A station at or near the northern edge of Central Park could create an additional organizing feature to add activity to Moore's downtown, in addition to the activity attracted by the park. It may also be possible to locate a station in a way to serve downtown Moore, Central Park, and the Riverwalk area with one station. There are several aging light industrial properties and undeveloped parcels on the east side of the BNSF ROW that could support additional housing and small scale commercial development.

Moore has one of the top ranked school districts in the State, making it attractive for residential development, and there are several recently constructed subdivisions in the vicinity. Many employees at Tinker AFB live in Moore because of its small town feel and easy commute to the Base via Sooner Road or I-240.



Tecumseh Road Station

Three potential station locations in Norman were examined: Tecumseh Road, Main Street (serving downtown in the vicinity of the Amtrak Station), and Brooks Street on the OU campus. An additional station is proposed further south at SH-9.

Vacant land along north side of Tecumseh Road

The Tecumseh Road station could be located on the north side of Tecumseh Road. There are several hundred acres of undeveloped land that could support residential development, and the City's Comprehensive Plan identifies this area as an area for residential growth. New residential development is also occurring further east along Tecumseh Road, which is an indication that there is a market. Tecumseh Road is also a major east-west thoroughfare that could draw transit commuters from a large area.

Main Street Station

The BSNF passes through downtown Norman and there are a number of potential station locations. The existing Amtrak station at East Comanche Street would be a logical location and could utilize the existing station building and platform. The surrounding area consists of Cleveland County government buildings, including a County detention center, one to two story professional office buildings surrounding the County offices, and several undeveloped surface parking lots. The east side of the rail line consists of light industrial buildings and surface parking on the north side of Comanche, and a single family residential neighborhood dating to the early 1900s south of Comanche. While it may take more than one development and market cycle, there are many opportunities for infill and redevelopment in this general area.

Norman Amtrak Station

Other South Corridor Stations

A station is also being considered for the University of Oklahoma (OU) campus at Brooks Street and one at SH-9, 1.6 miles to the south. The OU campus station, as currently envisioned, would likely serve major athletic and other campus events. It would therefore be a "special generator" station with service only for major events. There are low density light industrial properties and vacant sites along Classen Boulevard and East Lindsey Street that are possible redevelopment and infill sites. Any development of Campus property would be under the purview of OU.

There are recently constructed apartments, The Edge at Norman, just to the south along Lindsey Street, indicating market support for student housing in the area. A for-sale condominium building, Loft 401,

was also recently constructed just to the north on Boyd Street. It was suggested that the student housing options on campus are perceived to be unattractive, which creates demand for off-campus housing.

The area around SH-9 is a growing area, with distribution warehouses, manufacturing facilities, new housing (single family and student apartments), and the 60-acre National Center for Employee Development training center. Locating a station in an area with a large amount of vacant land, potentially more than 20 acres, could facilitate planning for a large housing or employment development around a rail station.

C.3 Development Concepts and Recommendations

This section proposes development concepts and implementation steps to attract transit oriented development (TOD) at key stations on the LPA corridors. The first section presents the concept of station development typologies. Station typologies provide a conceptual framework for initial station area development planning that reflects the station's location, market conditions, anticipated transit service characteristics, existing land use and infrastructure, and community aspirations. Next, the station typologies are applied to each key station and initial development concepts are proposed, along with the major planning and implementation actions needed to achieve TOD. In some cases, city representatives interviewed had not yet formed ideas for specific stations that weren't already addressed in other formal plans or policy documents. In these cases, a future vision for the area is proposed.

C.3.1 Station Typologies

Station typologies were created for each station area after evaluating the existing land use conditions surrounding them, the potential type of station (e.g., neighborhood walk up vs. park-and-ride), their economic function along each corridor, roadway connections and other access, available land, and each jurisdiction's planning objectives for the station areas. The typologies contain a range of development intensities and densities based on these site characteristics. A benefit of creating station typologies is that it helps establish unique market positions for each station so that they are not all competing for the same types of development. Eight station typologies were proposed for the LPAs and are described below and summarized in Table C-2.

- Downtown/Central Business District – This station type has the largest amount of development and supports the highest development densities. A downtown station is located in a region's economic center– downtown Oklahoma City in this case–that has some of the highest land and real estate values, thus the highest development densities. Downtown Oklahoma City contains a full mix of housing, employment, restaurants and bars, and some retail.

Downtown Portland, OR

- Employment Activity Center – This station type is a major regional activity center in which employment is the major economic or market driver. The presence of a large number of employees, and relatively high employment densities, supports retail and services, and in some cases housing (apartments, condominiums, and townhomes). The NW 63rd Station in the North Corridor adjacent to the Chesapeake Energy Campus is an example.

Office buildings served by DART light rail at Galatyn Park Station

- Commercial Activity Center – This is also a major regional destination, but the market driver or anchor is weighted more towards retail development (and its employees and destination shoppers) than office employment. The Crossroads Mall Station in the South Corridor is an example.
- Commuter Center and Park-n-Ride – This station type is primarily a transportation hub and emphasizes bus connections and commuter parking over TOD. This emphasis is due to a combination of factors, particularly the surrounding development context which is less supportive of TOD than other station typologies, and its location near major road arteries and highways. Depending on its ultimate location, the Capitol Hill (SE 25th Street) falls into this typology, as well as two stations on the East Corridor (SE 29th Street and Tinker AFB).

Lakeline Metrorail Station, Austin, TX

- Main Street – A Main Street station is adjacent to or embedded in a traditional downtown Main Street setting. It may have limited parking due to land constraints around existing development, with many riders either walking or cycling to the station, or riding a feeder or circulator bus. Stations in

Downtown Carrollton, TX on DART light rail line

downtown Edmond (W 2nd Street) and Norman (Main Street) are envisioned as Main Street Stations.

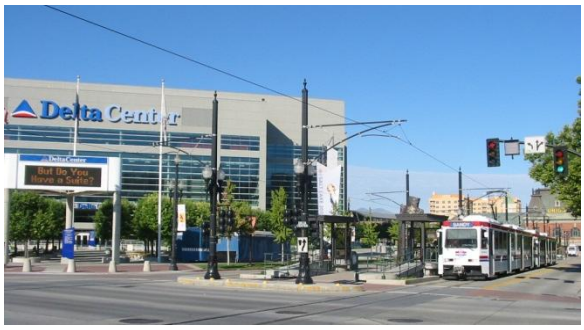
- Residential Commuter Center – The vision implied in this station typology is a residential village or community organized around a transit station. In suburban communities with undeveloped land, it presents an opportunity to create a new development type that may not already exist and can differentiate the community as a result. Located on a major arterial, the station may have a large park-and-ride. However, if carefully planned, residential development and neighborhood retail (or larger) can be integrated into a development around the station and station parking. Residential development would follow the principles of New Urbanism and Traditional Neighborhood Design (TND), which emphasizes smaller lot sizes, a variety of housing types, walkability, and amenities such as parks, trails, gathering places, and a modest amount of mixed use development (according to local market demand). In order to be successful, TOD in this context requires a vision and leadership, advanced planning, and collaboration among property owners and the local jurisdiction. S 2nd Street in Moore and Tecumseh Road in Norman are proposed as residential commuter centers.

Downtown Plano, TX on DART light rail line

- Urban Neighborhood – Similar to a Main Street Station, an Urban Neighborhood station is integrated into an existing development context. As a result, there may be land constraints for parking and new development and TOD is in the form of infill and redevelopment. The difference between an Urban Neighborhood station and a Main Street station is that the Urban Neighborhood may have more housing than retail or commercial development, although it is a continuum with no clear dividing line. The NE 23rd Street Station in Oklahoma City, and Sooner Road and Reno and MLK Stations in Del City and Midwest City, and Midwest Boulevard in Midwest City fall under this typology.

Development at Baylor University Medical Center Station on DART light rail

- Campus or Special Events Station – This station type serves a large institutional campus or facility such as a concert venue, stadium, or entertainment district. The OU campus in Norman is such an example, as OU sporting events draw large numbers of attendees from throughout the region. The station may only have transit service for special events and therefore little utilization from daily commuters. The amount of TOD supported depends on the frequency of events and other economic drivers surrounding the station, and land or site availability and may be small.



Light Rail station adjacent to Delta Center in Salt Lake City, UT

Table C-2: Commuter Rail Station Typologies

	Station Type	Development Potential		Scale	Transit System Function	Corridor Example
		Residential	Commercial/Employment			
More Commercial/ Employment ↑	Downtown/ Central Business District	Urban multifamily and loft	• Major regional employment center • Office, retail, services, and entertainment	High rise: 5 stories and above	• Regional destination for employment, shopping, and entertainment. • Numerous and frequent multimodal connections (bus, light rail, streetcar)	• Santa Fe Station
	Employment Activity Center	Multifamily and townhome	• Employment emphasis • More office than retail	5 stories and above	• Sub-regional destination. • Park-n-ride • District circulator transit and express feeder bus	• NW 63rd Station
	Commercial Activity Center	Multifamily and townhome	• Predominately commercial. More than 100,000 sq. ft. of retail. More retail than office.	Less than 4-5 stories	• Sub-regional destination • Park-n-ride • District circulator transit and express feeder bus	• Crossroads Mall • Sooner Road • Midwest Boulevard
	Commuter Center and Park-n-Ride	Limited	• Office, flex, Research &Development may be possible	Less than 4 stories	• Large park-n-ride catchment area • Express and local bus • Development limited by adjacent land use and connectivity conditions	• Capitol Hill (SE 25th Street) • Tinker AFB
More Residential ↓	Main Street	Multifamily	• Main street retail/ mixed use infill	Less than 4 stories	• Limited transit parking due to land constraints • District circulator bus connections • Bus or streetcar corridors. Walk-up stops. Limited transit parking.	• W 2nd Street • Main Street
	Commuter Center – Residential Emphasis	Small lot single family, multifamily, townhome; May be more than quarter-mile from station.	• Significant retail possible depending on trade area size	Less than 4 stories	• Large park-n-ride • May have feeder bus and express bus connections	• Tecumseh Road • S 2nd Street • Reno and MLK
	Urban Neighborhood	Multifamily, townhome, small lot single-family	• Neighborhood serving commercial (less than 50,000 sq. ft.)	Less than 4 stories	• Neighborhood walk-up station. Small or no park-n-ride. Local bus connections	• 23rd Street

Table C-2: Commuter Rail Station Typologies

	Station Type	Development Potential		Scale	Transit System Function	Corridor Example
		Residential	Commercial/Employment			
Special Uses	Campus/ Special Events Station/ Regional Activity Center	Limited multifamily	• Institutional and entertainment • Limited office and retail	Varies	• Large commuter destination • Large parking reservoirs to serve activities, not necessarily for transit.	• Brooks Street (OU in Norman)

C.3.2 North Corridor Development Recommendations

W 2nd Street Station

The development concept for the W 2nd Street station in downtown Edmond is to reinforce the existing downtown and to utilize the commuter rail station to support additional revitalization and redevelopment. The W 2nd Street station area context already supports TOD as there is a surrounding small block grid roadway structure that is walkable. As described in detail in Appendix C, there are numerous opportunities for infill and redevelopment in the downtown area. Locations fronting Broadway could support additional retail, small professional offices, and services in a mixed use format with apartments above them. The properties west of Broadway and west of BNSF could be planned for a variety of retail, restaurant, residential, office, or light manufacturing or artisan spaces in a manner that reflects the railroad depot heritage.

The following actions by the City would enhance successful TOD around this station:

- Depending on the parking demand with commuter rail service, the City should consider if it can contribute to the cost of structured parking to free up land for development. Careful attention to parking is critical to successful TOD.
- Ensure that development policies support TOD and downtown style development as described in the Edmond Downtown Plan (2014).
- Once a station location is identified with more specificity, more detailed site and access planning should occur to ensure safe and convenient access to the station for pedestrians and cyclists that minimizes the need for parking and integrates the station with downtown.

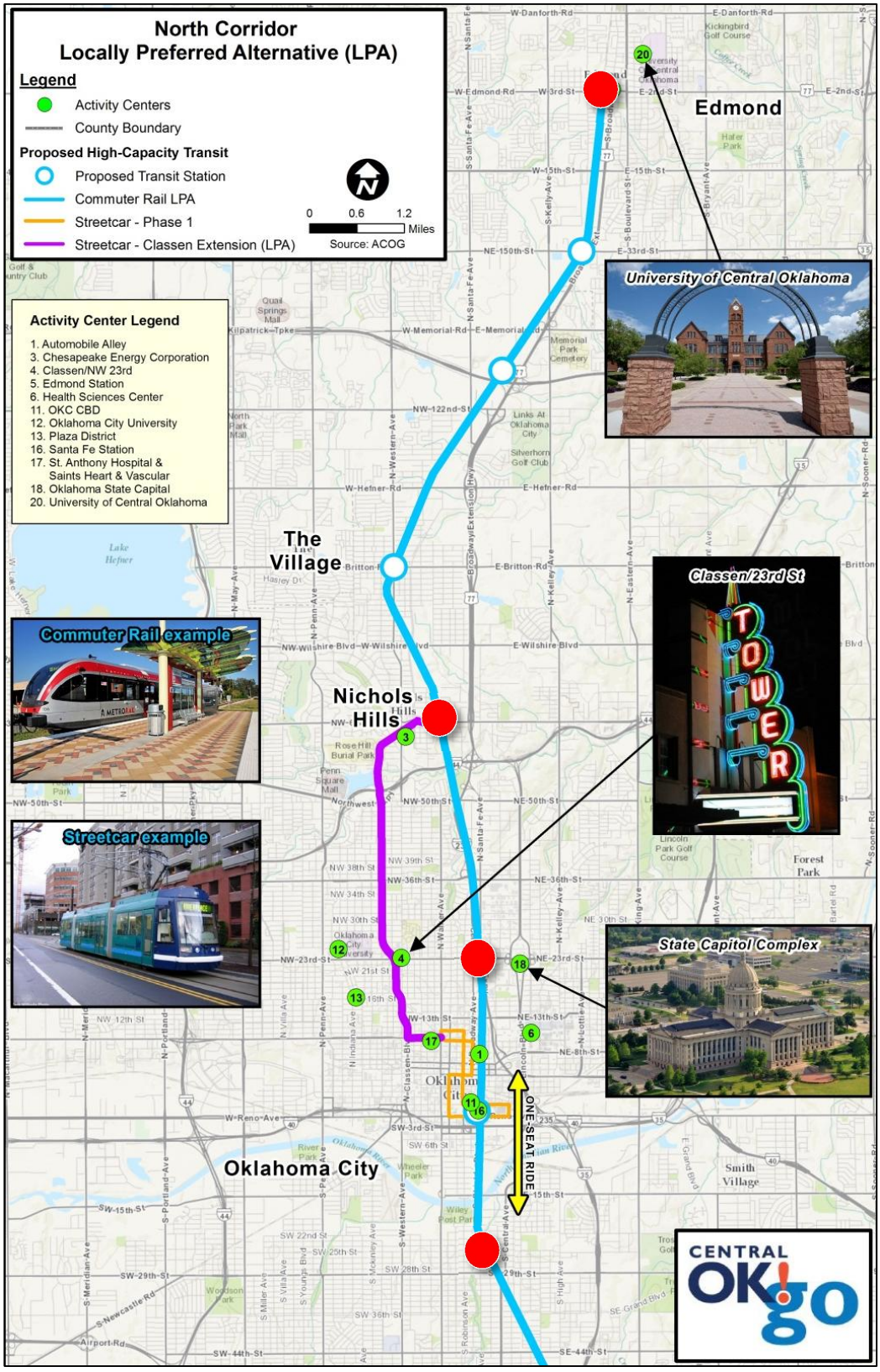
NW 63rd Street Station

This station area has the strongest market conditions in the North Corridor, with demand driven by the Chesapeake Energy Campus and the community of Nichols Hills to the west. This location can support additional housing, retail, and employment development over a long term planning timeframe. Implementation in this area should focus on improving pedestrian and bicycle connectivity among the major employment and retail centers, as the large block pattern is an impediment to non-automobile access. It is recommended that the City create and adopt a subarea or TOD plan for this area to address these connectivity issues, as well as urban design standards and future land use to support TOD.

N 23rd Street Station

The neighborhoods in this area are in transition and undergoing reinvestment. There are several under-developed sites and aging commercial buildings near the BNSF ROW that could be candidates for redevelopment as residential and mixed use projects with a nearby commuter rail station as an amenity. The commuter rail station would not be the primary market driver here though. Rather, the revival of the N 23rd Street commercial district, proximity to downtown Oklahoma City and the State Capitol (major employment centers), as well as the appeal of this traditional, centrally located neighborhood will be the main drivers of redevelopment. The City of Oklahoma City could consider updating the N 23rd Street Corridor Plan to anticipate a commuter rail station, further refine a location, and address access, circulation, and infrastructure needs to support additional revitalization and TOD.

Figure C-1: North Corridor Stations Described above
(Stations described above shown in Red)



C.3.3 East Corridor Development Recommendations

Reno and MLK Station

Given the challenging industrial context and disinvestment surrounding this station area, the recommended approach for this station area is for a long term and large scale redevelopment effort. It could involve a public-private partnership with the City, the Urban Renewal and Housing Authorities, and a private developer. Rather than trying to change the industrial context of this area to a mixed use TOD, a more jobs based project could be envisioned. This would involve creating sites for industrial and middle skill/living wage businesses. The plan could leverage the existing assets – highway and rail access – and target manufacturing, building trades/services, and other firms that look for centrally located sites. Housing could also be integrated into the plan to increase access to jobs within the plan area and in the region by transit, and to provide additional mixed income housing opportunities in the region.

Del City/Midwest City Stations (Sooner Road, Air Depot Boulevard, and Midwest Boulevard)

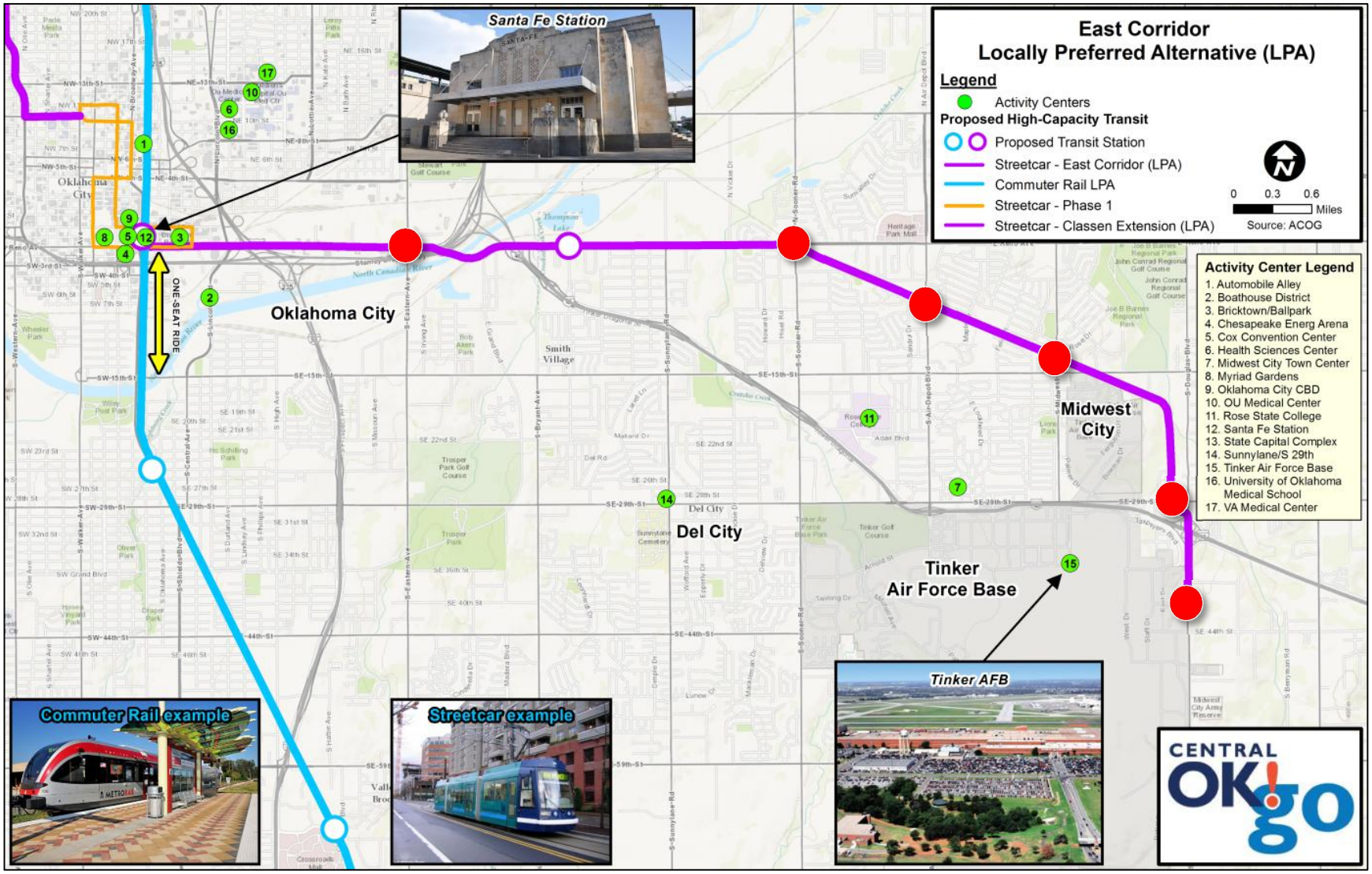
The proposed locations for the Sooner Road, Air Depot Boulevard, and Midwest Boulevard stations are in similar development contexts and are addressed together in this section because they share a similar set of implementation strategies. Each one-quarter to one-half of a mile radius around potential station locations encompasses arterial roads with commercial buildings of varying quality and economic viability, vacant infill parcels, and in some areas the edges of single family neighborhoods. In order for TOD to occur in these locations, property needs to be assembled to create large enough sites to allow for a development size that can achieve economies of scale. The Cities should continue to encourage the redevelopment or renovation of outmoded commercial space, and could consider expanding its Special Planning Areas to proposed station areas, or creating new subarea plans or policies to encourage TOD. Development incentives including gap financing may also be needed for project feasibility. The Cities of Del City and Midwest City will need to coordinate on a joint TOD plan for the Sooner Road station in order to create a shared development vision around the final station location.

The types of development estimated to be possible on these sites includes multifamily housing, senior housing, and updated mixed use commercial space including retail and restaurant space, and medical and professional office space. A large development may be able to recruit anchor retailers, such as a grocer, to locate or relocate in such a development.

SE 29th Street and Tinker AFB Stations

The stations proposed just outside Tinker AFB have constraints that limit the opportunity for TOD. The primary function of these stations will be to serve commuters to the Base and inbound park and ride users. Land around the SE 29th Street station area is constrained by floodplain and property that is located within the Accident Potential Zone (APZ) of the runway flight path. The land along Douglas Boulevard is in Oklahoma City's Airport Environs (AE1 and AE2) zoning overlays which heavily restricts development near the Base. This area also lacks basic public services to serve urban development; it is not a priority development area for Oklahoma City.

Figure C-2: East Corridor Stations Described above
(Stations described above shown in Red)



C.3.4 South Corridor Development Recommendations

Capitol Hill (SE 25th Street) Station

This station area will not likely support TOD in the foreseeable future. The existing development pattern contains many viable industrial businesses that are not economically viable to redevelop, and the cost to create a walkable environment in this area is likely prohibitive due to the large suburban arterial block pattern. These factors suggest that this station will likely function as a park-and-ride until a time in the future when residential or employment demand in this location makes an economic case for redevelopment. Even without TOD, station planning and design should still accommodate access by all modes of transportation.

Crossroads Mall Station

This is a challenging station area due to the mix of large retail and industrial land uses, and large roadway and parcel configurations. Nevertheless there are significant areas of undeveloped land surrounding the former Crossroads Mall (now Plaza Mayor) that have the potential to become a major regional destination pending its successful renovation and re-tenanting. The City of Oklahoma City should begin dialogues with the major property owners to begin establishing a vision for future development and to determine if additional planning for the surrounding area is warranted in the near future. One potential concept that could be explored would be a mixed income village with housing, employment, and retail. Excess surface parking at the mall could be considered for conversion to development sites or for inclusion with the proposed commuter rail station.

S 19th Street Station

The City of Moore has broken ground on its 60-acre signature park, Central Park. This likely precludes TOD on the majority of the vacant land between SE 4th Street and SE 19th Street along Broadway and the BNSF. There are additional industrial, storage, commercial, and vacant land properties on the east side of the BNSF, and along SE 4th and SE 19th that could eventually accommodate a redevelopment tied to a transit station. However, it will likely take more than one market cycle for any redevelopment to be feasible. Residential development is the most likely development type that can be supported in this location, although sites with frontage along the arterials could also support retail and commercial development.

The City of Moore can begin planning by identifying vacant properties, and properties with buildings that may be reaching the end of their economic life to identify future development areas, and to determine how or if they could be integrated with a transit station once a more precise location is selected. The City can also begin examining how to improve connections (non-automobile) from existing neighborhoods to a station location (and to Central Park), and to improve connections across infrastructure barrier such as the BNSF, I-35, and the wide cross sections of SE 4th and SE 19th.

Tecumseh Road Station

This station's proposed typology is a commuter town center. There are at least three quarter sections (approximately 160 acres each) of largely undeveloped land around the proposed station location at Tecumseh Road. Norman is an attractive community for commuters and has a generally strong residential market. There is also new housing being built near the proposed station location. The recommended development concept here is to create a new residential community that combines single family housing and medium density attached housing with a commuter rail station, and

potentially neighborhood commercial development, thus integrating transit oriented development (TOD) with traditional neighborhood design (TND).

This is a major opportunity to create a more sustainable form of residential development that is also marketable because of the amenities and quality of life it offers. Creating this type of development will require a developer with a long term vision and patience, and advanced planning, leadership, vision, and flexibility from the City. Once a station location is identified, the City of Norman should establish a TOD plan and the appropriate zoning to allow the desired type of development in order to get ahead of the market.

Main Street Station

Like other stations in places that are embedded in established business districts or neighborhoods, TOD and redevelopment here will depend on site availability and individual land owner decisions. Site assemblage will be needed to accommodate developments of any scale. As the commuter rail line moves from vision to implementation, the City should more closely examine potential station locations, including the area around the existing Amtrak station. If there are other locations deemed to have better redevelopment potential, they should be considered. There are numerous low density properties and surface parking lots surrounding the Amtrak station. A commuter rail station could help energize this area, and further contribute to revitalization in downtown Norman. The City of Norman can still be proactive by identifying potential redevelopment sites and beginning conversations with property owners and developers at an appropriate time.

Brooks Street Station

There may or may not be the potential for TOD at an OU campus station; it will depend on the exact location of the station and the level of transit service provided. If service is only for special events, the station will not be a major enhancement to the location. If a higher level of service is provided, the City and University can examine opportunities for additional campus development, or surrounding infill and redevelopment that complements the station.

Figure C-3: South Corridor Stations Described above
(Stations described above shown in Red)

Table C-3: Development Concepts – North Corridor

Station	Typology	Location Context: Existing	Location Context: Aspirational	½ Mile Connectivity	Market Drivers/Anchors	Future Development Potential
W 2nd Street	• Main Street	• Traditional downtown	• Enhanced vibrant downtown • Small scale infill/ redevelopment	• 400' x 300' blocks • Good	• Downtown Edmond • Univ. of Central OK	• 2-4 story multifamily and townhome • Retail and mixed use
NW 63rd Street	• Employment Commercial Center	• 2nd Ring Suburb • Suburban office • Arterial commercial	• Enhanced employment and commercial	• 400 x 300 blocks, varies • Moderate • Topographic constraints	• Chesapeake Energy campus • Classen Curve commercial • Penn Square Mall	• Corporate and professional office • Residential, multifamily • Commercial/mixed use
N 23rd Street	• Urban Neighborhood	• 1st Ring suburb • Pre-war commercial • Small lot single family	• 23rd Commercial Revitalization District • Improve access to State Capitol • Link to neighborhoods	• 350' x 400' blocks west • Highway and rail barrier east-west • Moderate	• Mesta Park & Paseo neighborhoods (west) • 23rd Street Commercial Corridor • State Capitol (east)	• Infill residential/loft • Commercial mixed use
Santa Fe Station	• Downtown/ Central Business District	• Downtown OKC • Bricktown Neighborhood	• Continued revitalization of Bricktown	• 400' x 500' blocks • Good	• Downtown employment • Chesapeake Arena • Convention Center • Bricktown	• Continuation of downtown and Bricktown revitalization

Table C-4: Development Concepts – East Corridor

Station	Typology	Location Context: Existing	Location Context: Aspirational	½ Mile Connectivity	Market Drivers/Anchors	Future Development Potential
Reno and MLK	• Commuter Center – Residential Emphasis	• Industrial/ brownfields • Single family • Regional park • High school	• Mixed income village • Improve food access • Improve jobs/ training access	• ¼ to ½ mile and larger blocks • Moderate	• Regional park • High school • Katy Trail • Proximity to Downtown	• Residential village • Single family • Multifamily
Sooner Road Air Depot Boulevard	• Commercial Activity Center	• Arterial commercial	• Revitalized commercial • Residential infill	• 700'-1,000' blocks • Poor	• Established neighborhoods	• Revitalized commercial • Residential infill
Midwest Boulevard	• Commercial Activity Center	• Arterial commercial • Underdeveloped sites • Low value industrial	• Revitalized commercial • Residential infill	• 1,000' blocks • Cul de Sacs • Poor to Moderate	• Established neighborhoods	• AFB flight path limits SE quadrant of ½ mile
SE 29th Street Tinker AFB	• Employment Activity Center • Park-n-Ride	• Highway and arterial location • Low density industrial and commercial	• Tinker AFB commuter hub	• 1 mile section line arterials • Interstate 40 • Poor	• SE 29th Street • Tinker AFB	• Commuter and services hub for Tinker AFB • Off base contractor offices • Single and multifamily residential • Park-n-Ride

Table C-5: Development Concepts – South Corridor

Station	Typology	Location Context: Existing	Location Context: Aspirational	½ Mile Connectivity	Market Drivers/Anchors	Future Development Potential
Capitol Hill (SE 25th Street)	• Commuter Center • Park-N-Ride	• Highway and arterial • Large parcel commercial and industrial	• Higher value commercial • More employment	• ½ to 1 mile blocks • Poor	• Low density employment	• TBD • Requires redevelopment of existing industrial and car dealership uses
Crossroads Mall	• Commercial Activity Center	• Regional mall • Industrial • Arterial and highway access	• Renovated/ repositioned mall • Mixed use mixed income village	• ½ to 1 mile blocks • Poor	• Plaza Mayor (former Crossroads Mall)	• Mixed income housing • Multifamily and single family • Supporting mixed use services • Requires redevelopment of industrial uses
S 19th Street (Moore)	• Commuter Center – Residential Emphasis	• Vacant land • Adjacent to post-war downtown • Suburban residential	• Signature Central Park • Community Recreation Center • Increase housing and commercial diversity	• ¼ to ½ mile and larger blocks • Moderate	• Downtown Moore • Residential market and strong school district • Planned Central Park	• Central Park and Commuter Hub • Infill housing redevelopment on adjacent industrial properties • Modest amount of mixed use
Tecumseh Road	• Commuter Center – Residential Emphasis	• Undeveloped agricultural and industrial • Adjacent recent single family residential	• Transit supportive residential	• ½ to 1 mile or more • Poor	• Residential market	• Small lot single family • Multifamily • Supporting retail/commercial center • Oriented around commuter rail station
Main Street (Norman)	• Main Street	• Traditional downtown depot	• Enhanced vibrant downtown • Small scale infill/ redevelopment	• 400’ x 300’ blocks • Good	• Downtown Edmond • University of Central OK	• 2-4 story multifamily and townhome • Retail and mixed use
Brooks Street	• Campus/ Special Events	• OU Campus	• OU Campus	• 500 to 1,500’ • Moderate	• OU Stadium and campus	• Campus station for commuting faculty and staff • Serve athletic and other large events

C.4 Economic and Demographic Framework

The material in this Appendix reviews relevant growth trends in the four-county ACOG region comprised of Canadian, Cleveland, Logan, and Oklahoma Counties, as shown in Figure C-4. These trends place the proposed transit corridors in context compared to the region and market areas in which they are located. Note that the Oklahoma City Metropolitan Statistical Area (MSA) encompasses seven Counties: Canadian, Cleveland, Grady, Lincoln, Logan, McClain, and Oklahoma which extends to more rural and exurban areas that are not strongly oriented to the potential transit corridors. The City of Oklahoma City encompasses 621 square miles, or approximately 15% of the metropolitan land area and overlaps with Oklahoma, Canadian, and Cleveland Counties. Oklahoma County, containing Oklahoma City, Edmond, Midwest City, and Del City along the LPAs, accounts for over 60% of the population in the four-county ACOG region. Cleveland County, containing Moore and Norman along the South Corridor LPA, accounts for 14% of the population in the ACOG region.

Figure C-4: Central Oklahoma Metropolitan Region

C.4.1 Employment Trends

As of the third quarter of 2012, the Bureau of Labor Statistics estimated that the four-county ACOG region had 539,000 jobs, as shown in Table C-6. From 2001 through 3Q2012, 33,362 jobs were added at an average rate of 0.5% per year. Each county had positive job growth during this period. In absolute

terms, Oklahoma County (+13,471) and Cleveland County (+12,738) added the most jobs, with annual employment growth rates of 0.3% and 1.6% respectively. Oklahoma and Cleveland Counties each captured approximately 40% of the employment growth in the region. Canadian County captured about 20% of the region's growth over the last decade, adding 6,646 jobs. Logan County had 7,027 jobs at the end of 2012, up 507 from 2001, accounting for 1.5% of the job growth in the ACOG region.

Table C-6: Wage and Salary Employment by County, 2001-3Q2012

County	2001	3Q 2012	Change		
			Total	Annual %	Share
Canadian County	22,255	28,901	6,646	2.2%	19.9%
Cleveland County	61,359	74,097	12,738	1.6%	38.2%
Logan County	6,520	7,027	507	0.6%	1.5%
Oklahoma County	415,507	428,978	13,471	0.3%	40.4%
Total	505,641	539,003	33,362	0.5%	100%

Source: Bureau of Labor Statistics; EPS, 2014.

In 2012, the largest industries in the four-county ACOG region were health care with 67,426 jobs and 12.5% of the total; retail with 58,853 jobs (10.9 percent), accommodation and food services with 51,965 jobs (9.6 percent), and government with 46,914 jobs (8.7 percent) as shown in Table C-7. Professional services jobs, comprised of finance, insurance, and real estate (FIRE), professional and technical services, management of companies, and administrative services total 104,749 jobs and 19.4% of all jobs.

While mining and extractive industries (including oil and gas) account for only 18,232 jobs and 3.4% of the total, this sector had the largest absolute growth and is a major economic driver in the region's economy. Mining and extractive industries added over 12,000 jobs or nearly one third of the new jobs over this time period. Major employers such as Chesapeake Energy and Devon Energy have been expanding. Chesapeake is developing a major corporate campus at NW 63rd and North Western Avenue. Devon Energy recently built an iconic tower in downtown Oklahoma City to house their world headquarters.

Health care and social assistance added 11,507 jobs, followed by accommodation and food services (+9,995), professional and technical services (+7,191), and private educational services (+6,657) were other sectors that contributed significantly to positive employment growth. The manufacturing sector lost 12,452 jobs, a decrease of 27.7 percent.

Table C-7: Wage and Salary Employment by Industry, ACOG Region, 2001-3Q2012

Industry Sector	2001	3Q 2012	2001-2012		2012 %
			Change	Annual %	Total
Agriculture	805	476	-329	-4.4%	0.1%
Mining	6,137	18,232	12,095	9.7%	3.4%
Utilities	2,445	3,045	600	1.9%	0.6%
Construction	22,207	24,711	2,504	0.9%	4.6%
Manufacturing	44,892	32,440	-12,452	-2.7%	6.0%
Wholesale Trade	20,357	24,044	3,687	1.4%	4.5%
Retail Trade	59,104	58,853	-251	0.0%	10.9%
Transportation & Warehousing	17,032	13,571	-3,461	-1.9%	2.5%
Information	14,400	8,721	-5,679	-4.2%	1.6%
Finance & Insurance	20,174	20,938	764	0.3%	3.9%
Real Estate & Rental/Leasing	10,581	9,922	-659	-0.5%	1.8%
Professional & Technical Services	21,899	29,090	7,191	2.4%	5.4%
Management of Companies & Enterprises	5,084	6,552	1,468	2.2%	1.2%
Administrative & Waste Services	39,386	38,247	-1,139	-0.2%	7.1%
Educational Services	21,019	27,676	6,657	2.4%	5.1%
Healthcare & Social Assistance	55,919	67,426	11,507	1.6%	12.5%
Arts, Entertainment, & Recreation	7,192	8,771	1,579	1.7%	1.6%
Accommodation & Food Services	41,970	51,965	9,995	1.8%	9.6%
Other Services (non-Government)	16,051	13,236	-2,815	-1.6%	2.5%
Government	46,199	46,914	715	0.1%	8.7%
Other	32,788	34,173	1,385	0.4%	6.3%
Total	505,641	539,003	33,362	0.5%	100.0%

Source: Bureau of Labor Statistics; EPS, 2014.

Within the major cities along the LPAs, Oklahoma City has the largest number of jobs, with 361,000. Norman has nearly 44,000 jobs, followed by Edmond with nearly 30,000 jobs. Midwest City has 18,385 jobs and Moore has 13,700 jobs. Del City has the smallest employment base with 4,300 jobs, as shown in Table C-8. The distribution of jobs in the region indicates that the majority of work trips are to Oklahoma City. Within Oklahoma City, major office, retail, and service employment centers include Downtown Oklahoma City including Devon Energy's 1.8 million square foot tower, Northwest Expressway, the Chesapeake Energy Campus, Penn Square Mall vicinity, the State Capitol complex at NE 23rd Street and North Lincoln Boulevard, and the Health Sciences Center district north of Bricktown. Office and retail/service districts can be more efficiently served with transit than industrial districts due to the higher density of employees (employees per square foot of building or per acre of land).

Tinker AFB in the East Corridor has 25,000 military and civilian employees including 8,000 active duty military personnel that are not included in these data. Although the base is officially located within the incorporated limits of Oklahoma City, which is where the jobs are recorded, it has strong economic ties to Midwest City due to its location.

In the major cities along the corridors, the composition of employment was examined to differentiate the employment markets along the corridors and in these cities. In Oklahoma City, health care and social assistance is the largest sector with 14.5% of jobs, shown in Table C-8. In Norman, health care makes up 17.6% of the jobs. Educational services are the largest sector in Edmond (18.1 percent) and Moore (19.9 percent). Retail trade accounts for 22.9% of jobs in Midwest City.

Table C-8: Employment by Industry, LPA Cities, 2011

Industry Sector	Oklahoma City	Del City	Edmond	Midwest City	Moore	Norman
Total Jobs	360,753	4,006	29,784	18,385	13,731	43,479
Agriculture	0.1%	0.0%	0.2%	0.2%	0.0%	0.0%
Mining	4.1%	0.4%	1.2%	0.1%	0.3%	0.5%
Utilities	1.0%	0.8%	0.6%	0.9%	0.0%	0.8%
Construction	4.5%	6.0%	5.0%	2.6%	9.9%	3.5%
Manufacturing	6.2%	14.8%	1.9%	4.2%	4.9%	5.8%
Wholesale Trade	5.5%	6.5%	4.6%	1.1%	2.7%	2.6%
Retail Trade	9.6%	16.6%	14.1%	22.9%	14.5%	15.9%
Transportation & Warehousing	2.9%	0.9%	0.4%	0.6%	0.7%	0.4%
Information	2.5%	0.4%	1.6%	0.3%	2.2%	1.9%
Finance & Insurance	4.3%	5.1%	3.6%	4.2%	2.3%	3.3%
Real Estate & Rental/Leasing	1.8%	1.5%	1.7%	1.7%	1.3%	1.8%
Professional & Technical Services	6.2%	5.6%	8.0%	5.4%	4.1%	6.8%
Management of Companies & Enterprises	1.5%	0.8%	0.8%	0.2%	0.2%	0.3%
Administrative & Waste Services	8.7%	6.2%	6.1%	2.8%	9.8%	7.2%
Educational Services	6.1%	3.1%	18.1%	17.5%	19.9%	7.0%
Healthcare & Social Assistance	14.5%	7.0%	11.4%	16.4%	6.8%	17.6%
Arts, Entertainment, & Recreation	1.5%	0.8%	2.2%	0.9%	1.3%	3.2%
Accommodation & Food Services	7.9%	15.7%	13.6%	13.1%	14.2%	14.2%
Other Services (non-Government)	2.6%	4.8%	3.2%	2.7%	2.5%	2.7%
Government	8.4%	3.1%	1.8%	2.1%	2.3%	4.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: U.S. Census LEHD-On the Map, EPS, 2014.

Major Employers

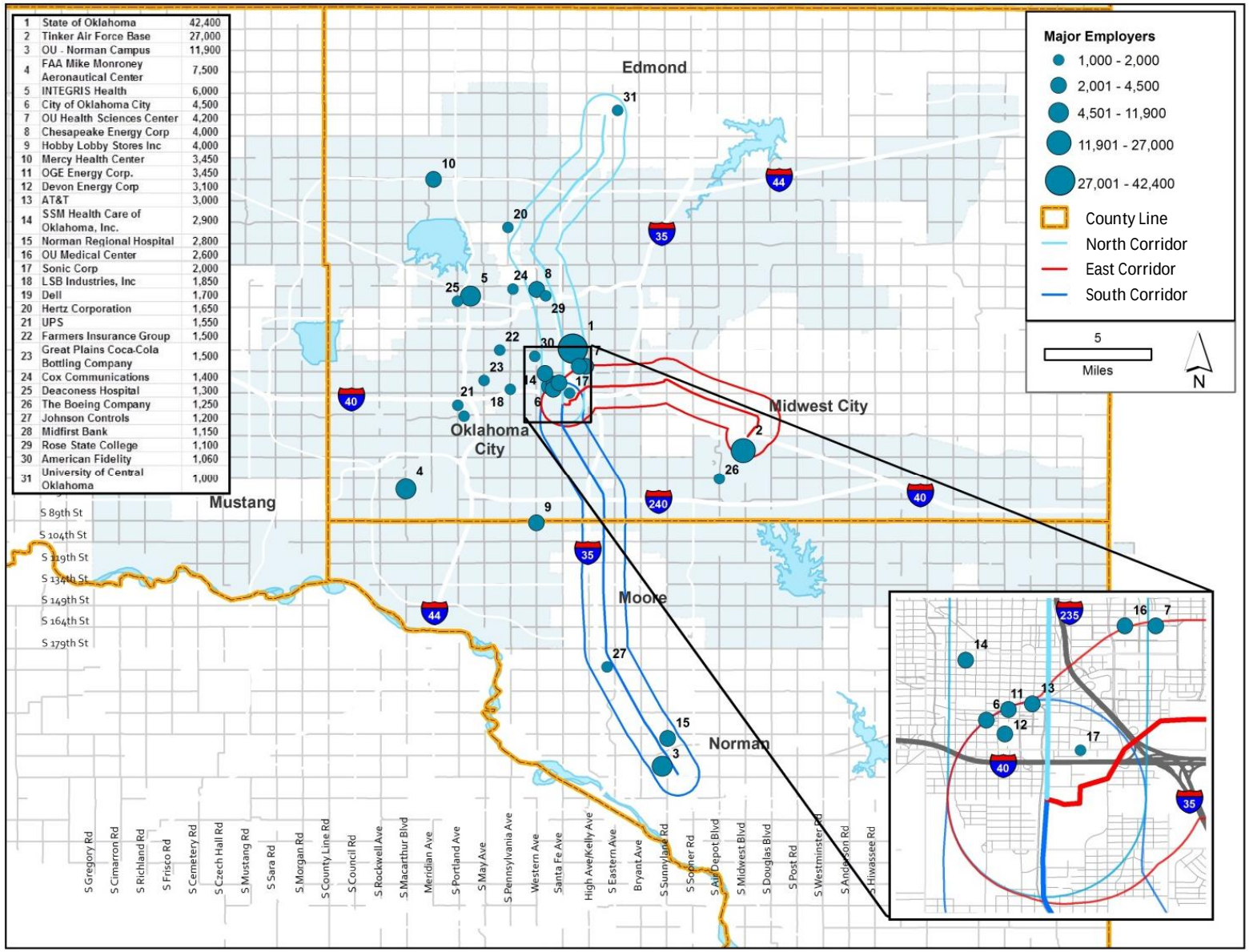
There are thirty-one major employers (1,000 employees or more) in the ACOG region, as shown in Figure C-5. Many large employers are in central Oklahoma City, which could be served by any of the LPAs within the three commuter corridors. The North Corridor has 10 major employers within a mile of the LPA, listed below. The East Corridor has four in addition to a few that lie within a mile of the East and North Corridors. The South Corridor has three major employers outside of central Oklahoma City.

- Central Oklahoma City
  - ✓ Sonic Corp (2,000)
  - ✓ OU Medical Center (2,600)
  - ✓ AT&T (3,000)
  - ✓ Devon Energy (3,100)
  - ✓ OGE Energy (3,450)
  - ✓ OU Health Sciences Center (4,200)
  - ✓ City of Oklahoma City (4,500)
- North Corridor
  - ✓ University of Central Oklahoma (1,000)

- ✓ Hertz Corporation (1,650)
- ✓ SSM Health Care (2,900)
- ✓ Chesapeake Energy (4,000)
- ✓ State of Oklahoma (42,400)

- East Corridor
  - ✓ Rose State College (1,100)
  - ✓ Tinker AFB (25,000)
- South Corridor
  - ✓ Johnson Controls (1,200)
  - ✓ Norman Regional Hospital (2,800)
  - ✓ OU Norman Campus (11,900)

Figure C-5: Major Employers in the ACOG Region, 2012



C.4.2 Population and Household Trends

As of the 2010 Census, the ACOG region had a population of just over 1.1 million, as shown in Table C-9. The four-county region added 141,692 people from 2000 through 2010 at an annual rate of 1.3 percent. Oklahoma County captured the highest proportion of that growth, adding 58,185 people or 41% of the total population growth in the region, although it grew at the slowest annual rate of the four counties (0.8 percent). Cleveland County captured nearly 34% of the population growth, adding 47,739 people at an annual rate of 2.1 percent. Canadian County grew at the fastest annual rate (2.8 percent) over the last 10 years, capturing 20% of the growth with 27,844 new residents. Finally, Logan County had the smallest amount of absolute growth, adding just under 8,000 people.

Household growth generally follows population trends, but provides a more direct linkage to understanding housing demand, as each household is a group of people, related or unrelated, living in one housing unit. Canadian County's high rate of population growth is reflected in an even slightly higher rate of household growth (3.0 percent) over the last decade. It added almost 11,000 households, capturing 20% of the ACOG region's household growth. Similarly, Oklahoma County added the largest number of households (20,764), capturing 38.6% of the growth at an annual rate of 0.8 percent. Cleveland County added 19,120 households, capturing 35.6% of the growth and Logan County added 2,901 households, reflecting an annual growth rate of 2.1 percent.

Table C-9: ACOG Region Population and Households by County, 2000-2010

County	2000	2010	2000 – 2010		
			Change	Capture	Annual %
Population					
Canadian County	87,697	115,541	27,844	19.7%	2.8%
Cleveland County	208,016	255,755	47,739	33.7%	2.1%
Logan County	33,924	41,848	7,924	5.6%	2.1%
Oklahoma County	660,448	718,633	58,185	41.1%	0.8%
ACOG Region	990,085	1,131,777	141,692	100.0%	1.3%
Households					
Canadian County	31,484	42,434	10,950	20.4%	3.0%
Cleveland County	79,186	98,306	19,120	35.6%	2.2%
Logan County	12,389	15,290	2,901	5.4%	2.1%
Oklahoma County	266,834	287,598	20,764	38.6%	0.8%
ACOG Region	389,893	443,628	53,735	100.0%	1.3%

Source: U.S. Census; EPS, 2014.

The cities with the largest amount of population growth in the ACOG region were Oklahoma City, Edmond, Moore, and Norman. Oklahoma City, with the largest land area by far, added nearly 74,000 people from 2000 through 2010, capturing just over half of the region's population growth. The City of Norman grew by 15,200 people, making it the fastest growing city in the region besides Oklahoma City. The City of Edmond, on the North Corridor, added 13,000 people from 2000 through 2010, accounting for 9.2% of regional population growth. Moore, on the South Corridor, added 13,943 people or 9.8% of the region's growth. Midwest City had the least amount of population growth, adding 283 people. To the west, Mustang added 4,239 people at a rapid growth rate of 2.8% per year, as a new wave of urban and suburban development in the region moves to the west and northwest.

Table C-10: Population Trends by City, ACOG Region, 2000-2010

City	2000		2010		2000 – 2010		ACOG Region Capture
	Total Number	Percent	Total Number	Percent	Change	Annual Percent	
Oklahoma City	506,132	58.3%	579,999	58.8%	73,867	1.4%	52.1%
Enclave Cities	59,552	6.9%	61,132	6.2%	1,580	0.3%	1.1%
Bethany	20,307	34.1%	19,051	31.2%	-1,256	-0.6%	-0.9%
Forest Park	1,066	1.8%	998	1.6%	-68	-0.7%	0.0%
Lake Aluma	97	0.2%	88	0.1%	-9	-1.0%	0.0%
Mustang	13,156	22.1%	17,395	28.5%	4,239	2.8%	3.0%
Nichols Hills	4,056	6.8%	3,710	6.1%	-345	-0.9%	-0.2%
Valley Brook	817	1.4%	765	1.3%	-52	-0.7%	0.0%
The Village	10,157	17.1%	8,929	14.6%	-1,228	-1.3%	-0.9%
War Acres	9,735	16.3%	10,043	16.4%	308	0.3%	0.2%
Woodlawn Park	161	0.3%	153	0.3%	-8	-0.5%	0.0%
Oklahoma City w/Enclave Cities	565,684	65.2%	641,131	65.0%	75,447	1.3%	53.2%
Surrounding Cities	302,406	34.8%	345,823	35.0%	43,417	1.4%	30.6%
Del City	22,128	7.3%	21,332	6.2%	-796	-0.4%	-0.6%
Edmond	68,315	22.6%	81,405	23.5%	13,090	1.8%	9.2%
Midwest City	54,088	17.9%	54,371	15.7%	283	0.1%	0.2%
Moore	41,138	13.6%	55,081	15.9%	13,943	3.0%	9.8%
Norman	95,694	31.6%	110,925	32.1%	15,231	1.5%	10.7%
Yukon	21,043	7.0%	22,709	6.6%	1,666	0.8%	1.2%
Total Major Cities	868,090	100.0%	986,954	100.0%	118,864	1.3%	83.9%

Source: U.S. Census; EPS, 2014.

Population Forecast

ACOG's 2035 population forecast for the area encompassed by its transportation and land use model and socioeconomic dataset is summarized below by county and major city. The forecasts do not cover the entire four-county ACOG region, so the forecasts are not directly comparable to the above trends. Also, the forecasts are somewhat dated as the base year is 2005. Nevertheless they are useful for planning purposes and illustrating expectations on future growth patterns and amounts. The majority of the region's growth is still expected to occur in Oklahoma City, with the addition of 178,000 people forecasted, as shown in Table C-11. Moore and Norman on the South LPA are forecasted to add 69,000 people, and Edmond on the North LPA is expected to add nearly 40,000 people. On the East LPA, Midwest City and Del City are forecasted to add nearly 9,000 people and approximately 1,400 people, respectively. Compared to past trends, growth rates are expected to slow in Oklahoma City and accelerate in Moore and Midwest City.

Table C-11: ACOG Region Population Forecast by City, 2005-2035

County	2005	2035	2005 – 2035		
			Change	Annual %	Share of Forecast Area
Canadian County (Portion)					
Mustang	15,786	24,598	8,812	1.5%	1.9%
Piedmont	4,164	11,461	7,297	3.4%	1.6%
Yukon	22,223	27,669	5,446	0.7%	1.2%
Subtotal	*42,173*	*63,728*	*21,555*	*1.4%*	*4.6%*
Cleveland County (Portion)					
Moore	48,266	68,050	19,784	1.2%	4.2%
Norman	106,655	156,173	49,518	1.3%	10.6%
Subtotal	*154,921*	*224,223*	*69,302*	*1.2%*	*14.8%*
Logan County (Portion)					
Guthrie	10,390	13,001	2,611	0.8%	0.6%
Oklahoma County (Except Oklahoma City)					
Bethany	20,295	21,297	1,001	0.2%	0.2%
Del City	22,460	23,905	1,445	0.2%	0.3%
Edmond	74,562	114,274	39,712	1.4%	8.5%
Forest Park	1,082	1,259	177	0.5%	0.0%
Midwest City	56,346	65,318	8,972	0.5%	1.9%
Nichols Hills	4,093	4,164	71	0.1%	0.0%
The Village	10,157	11,290	1,133	0.4%	0.2%
Subtotal	*188,995*	*241,507*	*52,512*	*0.8%*	*11.2%*
Oklahoma City[1]	*548, 242*	*726,556*	*178,314*	*0.9%*	*38.1%*
Total	1,330,810	1,798,473	467,663	1.0%	100.0%

Notes: [1]- Oklahoma City's population is divided between three counties in the following approximate proportions; Canadian (8%), Cleveland (12%), and Oklahoma (80%).
Source: ACOG; EPS, 2014.

C.4.3 Real Estate Trends

This section reviews real estate trends in the study area region to inform the evaluation of station area development options.

Office Market

According to Price Edwards & Company, Oklahoma City's office market is divided into five submarkets: the Central Business District (CBD), Midtown, North, Northwest, and West, as illustrated in Figure C-6. The real estate brokerage community has not tracked the office market in the eastern and southern portions of the region as the market is much smaller in those locations.

The region's multitenant office market has not grown substantially over the past 10 years. The office inventory had net growth of 123,741 square feet from 2001 to 2012, shown in Table C-12. The brokerage statistics include multi-tenant buildings larger than 15,000 square feet. They do not include owner occupied buildings such as the Devon Energy and Chesapeake Energy headquarters facilities. The CBD lost 205,032 square feet during that time while the suburban submarkets added 328,733 square feet. Among the other submarkets, the Midtown submarket had the most growth (588,111 square feet)

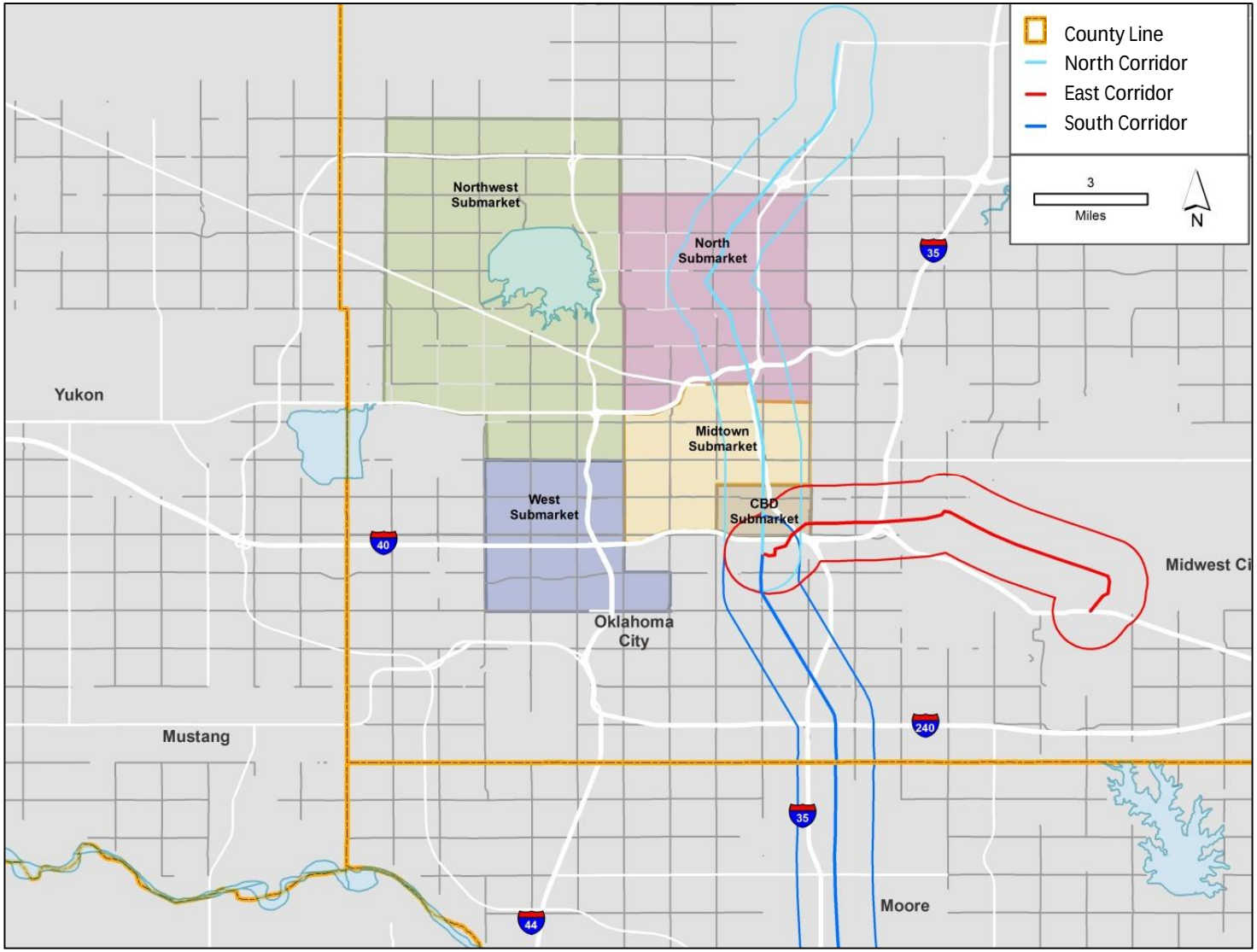
and the highest annual growth rate (5.6 percent). The Northwest submarket also showed positive growth, adding 159,066 square feet, but at an annual rate of only 0.3 percent. The North submarket lost an average of almost 30,000 square feet of office space annually over the last decade for a total decrease of 318,939. The smaller West submarket lost office space at a 1.5% annual rate, with almost 100,000 fewer square feet in 2012 than in 2001.

Industrial Market

Statistics on the industrial market are provided for reference, as industrial development has lower employment densities compared to office and retail development, making it more difficult to serve with transit. Industrial development is typically not compatible with TOD as well, at least in North America, and does not often contribute as strongly to ridership as more concentrated forms of employment development.

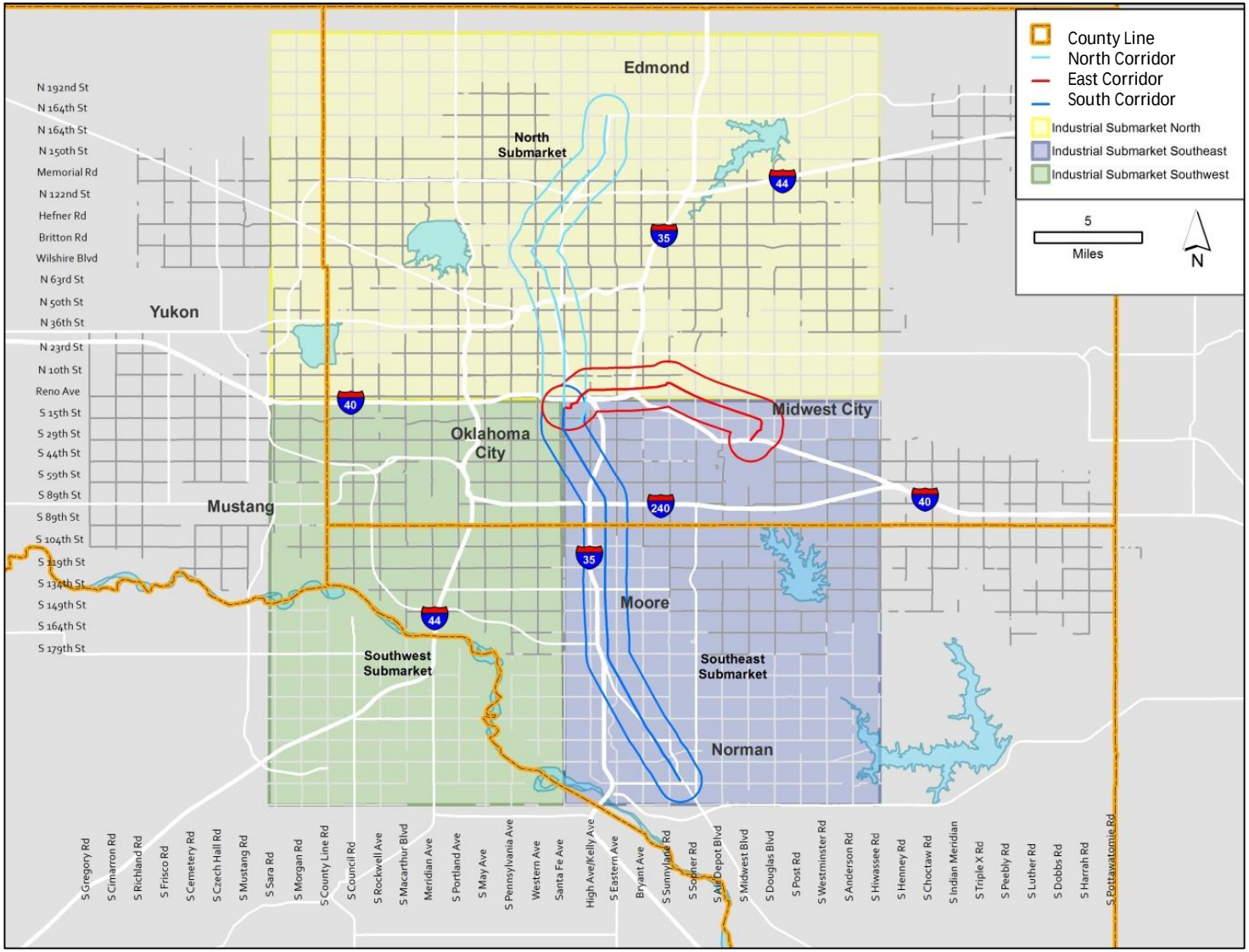
According to Price Edwards & Company, the industrial market is divided into three large submarkets: the North, Southeast, and Southwest, as illustrated in Figure C-7. The Southwest submarket, south of I-40 and west of I-35, is the largest with 6.9 million square feet of inventory. This submarket added 772,353 square feet from 2002 through 2012, as shown in Table C-13. The North submarket is less than one-third the size of the Southwest submarket with 2.0 million square feet. Note again that these figures do not include owner-occupied buildings and there are several large owner-occupied industrial buildings in the North Corridor, along Broadway Extension near Kilpatrick Turnpike. The Southeast submarket has 1.2 million square feet of space, not including buildings within Tinker AFB.

Figure C-6: Oklahoma City Metropolitan Area Office Submarkets



Source: Price Edwards & Company, EPS; 2014.

Figure C-7: Oklahoma City Metropolitan Area Industrial Submarkets



Source: Price Edwards & Company, EPS; 2014.

Table C-12: Oklahoma City Metropolitan Area Office Inventory and Absorption by Submarket, 2001-2012

Submarket Inventory	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Change 2001-2012		
													Sq. Ft.	Ann. Sq. Ft.	Ann. %
CBD	5,369,723	5,569,931	5,610,585	5,489,928	5,207,199	5,226,112	5,168,649	5,178,649	5,203,683	5,159,691	5,164,691	5,164,691	-205,032	-18,639	-0.4%
Suburban	9,575,845	9,611,802	9,582,087	9,368,344	9,190,493	9,210,388	9,886,925	9,995,598	10,137,433	9,885,736	9,925,141	9,904,618	328,773	29,888	0.3%
North	3,163,216	3,179,268	3,182,194	3,212,107	3,215,676	3,121,207	3,068,284	3,080,753	3,154,239	2,859,720	2,847,165	2,844,277	-318,939	-28,994	-1.0%
Northwest	5,057,792	5,077,697	5,047,697	4,920,378	4,738,958	4,853,322	4,996,906	5,092,803	5,162,004	5,236,813	5,234,493	5,216,858	159,066	14,461	0.3%
Midtown	714,941	714,941	710,105	593,768	593,768	593,768	1,234,052	1,234,052	1,234,052	1,234,052	1,303,052	1,303,052	588,111	53,465	5.6%
West	639,896	639,896	642,091	642,091	642,091	642,091	587,683	587,990	587,138	555,151	540,431	540,431	-99,465	-9,042	-1.5%
Total	14,945,568	15,181,733	15,192,672	14,858,272	14,397,692	14,436,500	15,055,574	15,174,247	15,341,116	15,045,427	15,088,832	15,069,309	123,741	11,249	0.1%

Note: The Devon Energy Center was completed in October, 2012 and is not included in the 2012 figure.
Source: Price Edwards & Company, EPS; 2014.

Table C-13: Oklahoma City Metropolitan Area Industrial Inventory by Submarket, 2002-2012

Submarket	2002	2003	2004	2005	2006	2007	2008	2009	2010	2012	Change 2002-Q2 2012		
											Sq. Ft.	Ann. Sq. Ft.	Ann. %
North	1,423,602	2,154,978	1,962,647	2,183,156	2,062,302	2,139,401	2,113,121	2,185,061	2,185,061	2,046,241	622,639	-1,692	3.9%
Southeast	1,633,041	1,832,841	1,832,841	1,828,041	1,872,041	1,872,041	1,710,475	1,855,963	1,731,163	1,208,670	-424,371	-2,213	-3.1%
Southwest	6,106,991	6,106,991	6,419,276	6,278,133	6,103,825	5,834,334	5,804,767	5,852,577	7,479,583	6,879,344	772,353	-1,618	1.3%
Total	9,163,634	10,094,810	10,214,764	10,289,330	10,038,168	9,845,776	9,628,363	9,893,601	11,395,807	10,134,255	970,621	-1,519	1.1%

Notes: Includes buildings 15,000 SF RBA and greater. Does not include buildings under construction or buildings owned by the government. Year 2011 Data unavailable. Year 2010 and 2012 reports are mid-year data.
Source: Price Edwards & Company, EPS; 2014.

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