APPENDIX A: Benefit-Cost Analysis

Central Omaha Bus Rapid Transit:

Connecting the Dots

2014 TIGER Application

SRF Consulting Group, Inc. | Engineers Planners Designers

Memorandum

SRF No. 8480

To: Curt Simon, Executive Director
Metro Transit

From: Bill Troe / Stephen Osberg

Date: April 25, 2014

Subject: TIGER Grant BCA Narrative

Introduction

The proposed BRT system is a crucial investment in the economic success and cultural vibrancy of the Omaha-Council Bluffs metropolitan area. Beyond its obvious transportation benefits, the system will support long-term efficiency and productivity throughout the entire region by improving the mix of jobs and housing, promoting more efficient use of underdeveloped parcels in congested transportation corridors. Enhanced transportation options in defined signature corridors, such as the proposed project, support community-based development and redevelopment planning, and provide improved access to employment opportunities.

A formal benefit-cost analysis (BCA) was conducted for this project using best practices for BCA in transportation planning, and reflecting current TIGER grant application guidelines. As noted in the application narrative and in this BCA technical memorandum, it is important to understand that a formal BCA is not a comprehensive measure of a project's total economic impact, as many of the key local benefits are not incorporated into the calculated benefit-cost ratio. This broader set of economic benefits and impacts on local and regional economic well-being and competitiveness are described in various sections of the application. The BCA only incorporates benefits and costs that can reliably be quantified, though the project meets the demands of each of the TIGER selection criteria:

- **State of Good Repair:** The project funds will be spent on improving a congested corridor and replacing aging transit rolling stock along the nearly eight-mile corridor of West Dodge Road/Dodge Street that connects residential areas, regional retail commercial development, high-intensity employment centers, the University of Nebraska-Omaha, the University of Nebraska Medical Center, and downtown Omaha. The project budget includes adequate funding for maintenance and replacement of vehicles and infrastructure over the life of the project.
- **Economic Competitiveness:** This project will have an impact on local, regional, and national economic competitiveness by reducing travel costs and costs associated with increased fuel use. This will improve the competitive position of business enterprises along the corridor and enable travel for work, school, and other productive purposes.

- **Quality of Life:** The BRT system furthers the six "Livability Principles" developed through the DOT/HUD/EPA partnership in the following ways:
    - Provide more transportation choices. By providing premium transit service with faster travel time and greater ease of use in the heart of Omaha, the proposed project makes public transportation a more feasible and attractive option for meeting people's transportation needs. The shift to transit will also help reduce our nation's dependence on foreign fuel sources.
    - Promote equitable, affordable housing. By improving transit service, the project enables people to more easily shift modes away from personal automobile, reducing their transportation costs. Savings can be applied to housing costs. Additionally, the infill development spurred by BRT service will provide a greater range of housing options within the core of the city.
    - Enhance economic competitiveness. As noted above, the project will increase people's access to jobs and other destinations, improving the productivity of the economy.
    - Support existing communities. The BRT will promote extensive infill development, reducing the demand for "greenfield" development at the edge of the metropolitan area and more efficiently using existing infrastructure. The transit-oriented mixed-use development will provide a walkable alternative to the automobile-dependent development found elsewhere in the region.
    - Coordinate and leverage federal policies and investment. This transit project paves the way for more efficient use of all government funds through a more coordinated transportation system.
    - Value communities and neighborhoods. The increases in transit reliability and service made possible through the construction of the proposed system make non-motorized transportation more feasible option for Omaha residents. By acting as a "walk extender," BRT allows people to travel further without get into cars, increasing the walkability of the entire community.
- **Environmental Sustainability:** The project will result in a mode shift from automobiles, which in Omaha typically reflect an occupancy rate of 1.07 persons per trip, to a highly efficient, high occupancy transit concept.
- **Safety:** Reducing regional VMT by shifting travelers from personally operated automobiles to professionally operated transit vehicles will reduce the number of crashes and the associated costs.

To the maximum extent possible given available data, the formal BCA prepared in connection with this TIGER grant application reflects quantifiable economic benefits. When presented with a choice of values to include in calculations, the BCA consistently incorporates the more conservative

options to ensure that benefits are not inflated and costs are not unduly minimized. The benefit-cost analysis covers each of the primary selection criteria that lend themselves to quantifiable evaluation.

Monetized Benefits Included in the Evaluation

- Transit user time savings.
- Reductions in transportation costs for travelers.
- Increased mobility for the transit dependent population.
- Savings from reductions in crashes.
- Reduced social cost related to greenhouse gas emissions and reductions in air quality.
- Reduced social costs of water quality damage.

Economic Benefits Not included in the Evaluation

- Property value increases associated with transit-oriented development. (Construction costs of development were estimated to be over $450 million along the corridor.)[1]
- Worker productivity gains and jobs creation.
- Benefits of BRT service on weekends.
- Fuel and emissions savings from potential use of hybrid buses in the BRT system.

Benefit Calculation Assumptions

The following sections highlight the critical assumptions and methods along with potential economic and social benefits resulting from development of the BRT system.

Discount Rates

Federal TIGER guidance recommends that applicants discount future benefits and costs to 2014 present values using a real discount rate of seven percent to represent the opportunity cost of money in the private sector. TIGER guidance also allows for present value analysis using a three-percent discount rate when the funds currently dedicated to the project would be other public expenditures. This is the case for this project, where the project would essentially be funded through public sources.

The project benefits are presented in this narrative using the more conservative seven-percent discount rate, which clearly demonstrates the project's long term benefits outweigh the project's costs. The BCA spreadsheets display both three-percent and seven-percent figures.

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[1] SB Friedman, Central Omaha Alternatives Analysis – Forecast of Development Impacts of BRT and Streetcar Alternatives, Memorandum, July 19, 2013.

Length of Analysis

The BRT project, if funded, will be constructed in 2016, and will be operable by 2018. The BCA compares the capital construction costs to the quantifiable benefits of the project for 20 years following construction (through the end of 2037). The traffic model used is based on weekday travel, so one year is equal to 260 working days within these calculations. This value conservatively excludes benefit and costs accrued during weekend service.

Year 2014 Dollars

This analysis was computed in 2014 dollars.

Build/No-Build Assumptions

The BCA was developed by comparing a Build case to a No-Build case. The No-Build case assumes continuation of local and express bus service in the corridor. All calculations are based on the increment of cost between the two cases, so the No-Build case can be assumed to have both benefits and costs of zero dollars for comparison purposes.

Project Benefits

Economic Competitiveness

Preferential treatment for transit vehicles at intersections and reduced automobile traffic, relative to the baseline, through a mode shift from personal vehicles to BRT will provide travelers throughout the region significant travel time savings. By 2040, the system will reduce daily regional travel time by nearly 2,000 hours, or over 500,000 hours annually. The economic benefit associated with the improved efficiency is estimated to be over $37 million (2014$) over the first twenty years of service.

Further, people switching modes from personal vehicles to BRT will see a substantial reduction in their transportation costs as the can reduce their costs associated with vehicle acquisition, maintenance, fuel, registration, or insurance.

New development along the project corridor will result in the many long-term positive economic impacts – specifically in terms of jobs, wages and domestic product – that accrue from the productivity gains resulting from transit investments and density increases.

Quality of Life

As an affordable and convenient mode of transportation, BRT has the potential to improve the quality of life for the diverse market of travelers within midtown and downtown Omaha, including students, faculty, and staff at the University of Nebraska at Omaha. All users will benefit from the comfort provided by the new transit facilities.

After housing costs, owning and driving vehicles is the second highest average household expense. "Location efficiency" describes the economic benefit to households located in walkable neighborhoods with good access to high-quality transit, such as the proposed BRT. With its improvements to service quality and overall ridership compared to existing transit service, the BRT concept will bring location efficiency benefits to those already living in the corridor and using transit.

Additionally, a primary goal of the project is to improve the mobility of the transit dependent population along the corridor. Approximately 16 percent of those living within a half mile of a proposed station lack access to an automobile. Thus, they are considered transit dependent. Implementation of BRT in the corridor will provide an improvement in both travel time and overall accessibility for the transit dependent population. By improving transit service travel time in the corridor, the BRT concept is expected to entice a mode shift to attract choice riders presently traveling by private automobile.

Environmental Sustainability: Greenhouse Gases and Air Quality

Omaha's BRT will reduce the number of vehicle miles traveled throughout the region, thereby lessening the damage done to the environment by the area's transportation system. In its first 20 years of service, it will reduce greenhouse gas emissions by over 52,000 metric tons, while also decreasing emissions of pollutants such as nitrogen oxides (NO_x), particulate matter ($PM_{2.5}$), and volatile organic compounds (VOC). Similarly, the reduction in VMT will lessen the harmful effects of runoff and oil spills on water quality. The economic benefit associated with reducing greenhouse gas emissions as well as other emissions affecting air quality through implementing BRT in the corridor is estimated to be nearly $2.5 million (2014$) over the first twenty years of operation.

Safety: Reduced Crashes

Reductions in regional VMT brought about through improved transit service will decrease the potential for crashes, improving public safety. In addition, providing a multimodal corridor establishes a mix of modes on the roadway for users to choose, including buses, passenger cars, trucks, bicyclists, and pedestrians. Pedestrian amenities supporting the BRT will have a traffic calming effect, reducing speeds and improving safety for all road users. Using the societal costs of crashes included in the 2014 TIGER NOFA, the reduction in crashes associated with implementing BRT in the corridor is approximately $11.7 million (2014$).

Project Costs

Investment is required to bring about the benefits summarized above. Capital costs are expected to be approximately $30.5 million and annual operating and system maintenance expenses will increase by just over $1.3 million. Operations and maintenance costs are based on both direct and indirect costs including fixed costs that will not increase due to new service. Including these indirect costs helps provide a more conservative estimate of costs. In addition, increases in transit vehicle VMT

will cause increases in emissions and crash potential involving transit vehicles. Transit vehicle emissions were based on standard diesel-powered vehicles to provide a conservative estimate of emissions, though there is a possibility that more fuel-efficient hybrid vehicles will be used for service expansion. Regardless, benefits observed from decreases in emissions and safety risks associated with reduced automobile VMT will far outweigh the increase in transit revenue miles.

Economic Impacts of BRT on Development

By far, the greatest potential economic benefit of the BRT system is the added development potential in areas adjacent to the corridor, especially economically distressed and underutilized areas. Investment into the transit system supports the local desire to increase the level of infill development in Omaha, and the infrastructure investment provides developers with the sense of permanency required to consider relocating in the corridor. An independent firm estimates that investment into BRT will bring about a net increase of more than $450 million of private sector development along the corridor.

Overall, this infill development will benefit the region by reducing the burden of constructing and maintaining new transportation routes to support development of farmland along the fringe of the city; promoting public health by making parts of the city more accessible through active modes of transportation; allowing for a wider variety of housing opportunities to meet the diverse needs of Omaha's residents; and adding to the region's tax base.

Benefit-Cost Analysis Results

A monetized comparison of a selection of the benefits against the full project costs yields a benefit of $1.85 for every $1.00 invested in the BRT system. This ratio does not include benefits associated with jobs or property development. It is based on a conservative projection of benefits and costs. The BCA spreadsheets offer a detailed look at both the project costs and resultant benefits.

Monetized benefits are summarized in the following table.

Criteria	Benefit	Description	Value (7% Discount)
Economic Competitiveness	Vehicle Operating Cost Savings	Reductions in monetary costs to drivers switching to public transit.	$ 8,604,000
	Travel Time Savings	Door-to-door trip time savings to BRT users.	$ 37,328,000
Livability	Transit Dependent Mobility	Portion of trip cost and time savings accruing to transit dependent persons.	$ 6,214,000
Sustainability	Greenhouse Gas Emissions Air Quality Damage Reductions	Reductions in pollutants and greenhouse gases relative to the no-build condition.	$ 2,428,273
	Water Quality Damage Reductions	Reductions in runoff and fuel spill pollution relative to the no-build scenario.	$ 915,000
Safety	Accident Reduction	Reductions in property losses, injuries and deaths due to reductions in automobile use.	$ 11,701,000
		Total	$ 67,190,273

TIGER 2014 BCA SUMMARY - Metro Transit Bus Rapid Transit, Omaha, NE

BENEFITS

	Economic Competitiveness		Livability	Environmental Sustainability			Safety					
Analysis Year	Travel Time Savings	Operations Savings	Transit Dependent Mobility	Air quality (no CO_2)	CO_2 (Discounted at 3%)	Water Quality	Crash Savings	Subtotal Without Carbon	3% Discount Without Carbon	7% Discount Without Carbon	3% Discount Total	7% Discount Total
2016	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2017	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2018	$2,958,018	$871,328	$691,133	$29,408	$76,486	$81,957	$998,769	$5,630,613	$5,002,727	$4,295,568	$5,079,213	$4,372,054
2019	$3,143,683	$887,495	$694,880	$30,723	$81,390	$85,213	$1,047,195	$5,889,189	$5,080,066	$4,198,910	$5,161,456	$4,280,301
2020	$3,329,349	$903,800	$698,627	$32,037	$84,628	$88,469	$1,095,621	$6,147,904	$5,148,773	$4,096,608	$5,233,402	$4,181,237
2021	$3,515,015	$920,245	$702,374	$33,352	$86,105	$91,725	$1,144,048	$6,406,759	$5,209,281	$3,989,808	$5,295,386	$4,075,912
2022	$3,700,681	$936,829	$706,121	$34,667	$90,785	$94,981	$1,192,474	$6,665,753	$5,262,007	$3,879,529	$5,352,792	$3,970,314
2023	$3,886,347	$953,552	$709,868	$35,981	$93,703	$98,238	$1,240,900	$6,924,886	$5,307,349	$3,766,679	$5,401,051	$3,860,382
2024	$4,072,013	$970,415	$713,615	$37,296	$96,512	$101,494	$1,289,326	$7,184,158	$5,345,689	$3,652,062	$5,442,200	$3,748,573
2025	$4,257,679	$987,417	$717,362	$38,610	$99,212	$104,750	$1,337,752	$7,443,570	$5,377,393	$3,536,387	$5,476,605	$3,635,599
2026	$4,443,345	$1,004,558	$721,109	$39,925	$101,804	$108,006	$1,386,178	$7,703,121	$5,402,814	$3,420,278	$5,504,618	$3,522,082
2027	$4,629,011	$1,021,838	$724,856	$41,240	$106,056	$111,263	$1,434,604	$7,962,811	$5,422,287	$3,304,283	$5,528,342	$3,410,339
2028	$4,814,677	$1,039,257	$728,603	$42,554	$108,442	$114,519	$1,483,030	$8,222,640	$5,436,134	$3,188,882	$5,544,576	$3,297,323
2029	$5,000,343	$1,056,816	$732,350	$43,869	$110,719	$117,775	$1,531,457	$8,482,608	$5,444,664	$3,074,488	$5,555,382	$3,185,206
2030	$5,186,008	$1,074,514	$736,097	$45,184	$112,887	$121,031	$1,579,883	$8,742,716	$5,448,172	$2,961,460	$5,561,059	$3,074,348
2031	$5,371,674	$1,092,351	$739,844	$46,498	$113,152	$124,287	$1,628,309	$9,002,963	$5,446,941	$2,850,108	$5,560,093	$2,963,260
2032	$5,557,340	$1,110,327	$743,591	$47,813	$116,903	$127,544	$1,676,735	$9,263,349	$5,441,241	$2,740,691	$5,558,144	$2,857,594
2033	$5,743,006	$1,128,442	$747,338	$49,127	$118,752	$130,800	$1,725,161	$9,523,874	$5,431,333	$2,633,431	$5,550,085	$2,752,183
2034	$5,928,672	$1,146,697	$751,085	$50,442	$120,498	$134,056	$1,773,587	$9,784,539	$5,417,462	$2,528,511	$5,537,960	$2,649,009
2035	$6,114,338	$1,165,091	$754,832	$51,757	$122,142	$137,312	$1,822,013	$10,045,343	$5,399,867	$2,426,082	$5,522,009	$2,548,224
2036	$6,300,004	$1,183,624	$758,579	$53,071	$123,685	$140,569	$1,870,439	$10,306,286	$5,378,773	$2,326,264	$5,502,458	$2,449,949
2037	$6,485,670	$1,202,296	$762,326	$54,386	$126,917	$143,825	$1,918,866	$10,567,368	$5,354,398	$2,229,153	$5,481,315	$2,356,070
								Total	$106,757,369	$65,099,180	$108,848,148	$67,189,959
								Check	$106,757,369	$65,099,180	$108,848,148	$67,189,959

COSTS

Analysis Year	Capital Costs	Operation and Maintenance Costs	RCV (3%)	RCV (7%)	Subtotal (3%)	Subtotal (7%)	3% Discount	7% Discount
2016	$15,291,836	$0	N/A	N/A	$15,291,836	$15,291,836	$14,414,022	$13,356,482
2017	$15,291,836	$0	N/A	N/A	$15,291,836	$15,291,836	$13,994,196	$12,482,693
2018	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$1,173,647	$1,007,747
2019	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$1,139,463	$941,819
2020	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$1,106,275	$880,205
2021	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$1,074,053	$822,621
2022	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$1,042,770	$768,805
2023	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$1,012,398	$718,509
2024	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$982,911	$671,504
2025	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$954,283	$627,574
2026	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$926,488	$586,518
2027	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$899,503	$548,147
2028	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$873,304	$512,287
2029	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$847,868	$478,773
2030	$4,400,000	$1,320,950	N/A	N/A	$5,720,950	$5,720,950	$3,565,107	$1,937,884
2031	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$799,197	$418,179
2032	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$775,919	$390,822
2033	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$753,319	$365,254
2034	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$731,378	$341,359
2035	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$710,076	$319,027
2036	$0	$1,320,950	N/A	N/A	$1,320,950	$1,320,950	$689,394	$298,156
2037	$0	$1,320,950	$9,687,487	$11,371,510	-$8,366,536	-$10,050,560	-$4,239,255	-$2,120,134
						Total Cost	$44,226,317	$36,354,230
						Check	$44,226,317	$36,354,230

SUMMARY

	3%	7%
Benefits	$108,848,148	$67,189,959
Costs	$44,226,317	$36,354,230
B/C Ratio	**2.46**	**1.85**

APPENDIX B: Ridership Forecast

Central Omaha Bus Rapid Transit:

Connecting the Dots

2014 TIGER Application

Metro BRT Tiger Application Input
based on MAPA Travel Demand Modeling

	2010 Existing	2010 + BRT	2040 LRTP	2040 LRTP + BRT
New Service Ridership	n/a	2,740	n/a	3,156
Drive Access		*1,012*		*1,198*
Walk Access		*1,728*		*1,958*
System Transit Ridership	11,705	13,538	16,095	18,330
Drive Access	*781*	*1,576*	*3,865*	*4,986*
Walk Access	*10,923*	*11,962*	*12,230*	*13,345*
Travel Time from Westroads to Downtown- by auto (minutes)	15.6	15.6	18.1	18.1
Travel Time from Westroads to Downtown- by transit (minutes)	(via local bus)	(via BRT)	(via local bus)	(via BRT)
	45.1	29.4	44.9	29.1
VMT				
All Region	14,665,782	14,649,457	23,426,749	23,383,587
Sub-Region (1 Mi Buffer)	1,156,213	1,140,167	1,354,691	1,347,016
VHT				
All Region	345,376	344,972	723,183	721,251
Sub-Region (1 Mi Buffer)	31,695	31,233	43,049	42,773
Passenger Miles- Total Transit System	51,720	61,126	87,432	100,370
Passenger Hours- Total Transit System	254,788	282,280	390,240	428,833

Notes:

1. *Results based on the MAPA TransCAD Travel Demand Model, HDR 2014. Model script reflects drive access travel time skims based on congested travel time (official MAPA model version as of November 2013).*
2. *For scenarios with BRT service, Route 2 headways were increased to 30 minutes AM, PM and Off Peak.*
3. *BRT alignment from 11th/Farnam to 102nd/Nicholas (Westroads), with intermediate stops at 13th, 16th, 20th, 24th, 31st, 33rd, 36th, 42nd, 50th, 62nd, 72nd, 84th, 90th.*
4. *2040 LRTP refers to the version of the MAPA model with year 2040 socioeconomic data and roadway network reflective of the 2035 LRTP fiscally constrained projects.*
5. *System VMT and VHT statistics are compiled from the regional model area- all links, except for centroid connectors.*
6. *Travel Times are based on EB route from Westroads to Downtown- AM Period.*
7. *For scenarios with BRT new service, PnR nodes were assumed at Westroads and Midtown (required for modeling only- provides drive-access).*
8. *BRT service assumes AM and PM peak 10 minute headways, 15 minute headways off-peak.*
9. *BRT service fare $1.25.*

APPENDIX C: Economic Development Forecast

Central Omaha Bus Rapid Transit:

Connecting the Dots

2014 TIGER Application

Forecast of Development Impacts for BRT Extension

HDR Engineering Inc.

September 24, 2013

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OVERVIEW

HDR was asked by the City of Omaha and Omaha Metro to forecast the impact of BRT on real estate development for two proposed route extensions to the Central Omaha Transit Alternatives Analysis. This study serves as a supplement to the *SB Friedman* study[1] on the economic development impacts of BRT and Streetcar alternatives. The following report highlights the impacts of BRT on the new study areas and the methods employed. The report is organized into the following sections:

- A definition of the BRT Route Extension and study areas, as well as an analysis of the historical development within the study areas.
- The methods used to calculate the increased future development potential within each study area resulting from BRT.
- An estimate of the future development impact that a BRT route extension will likely have.
- Development Construction Cost Estimates for both the original study area and for the two BRT route extensions.

BRT ROUTE EXTENSION

The three alternatives under review were studied in further detail to consider bus rapid transit (BRT) being carried farther down Dodge Street. The two route extensions are as follows:

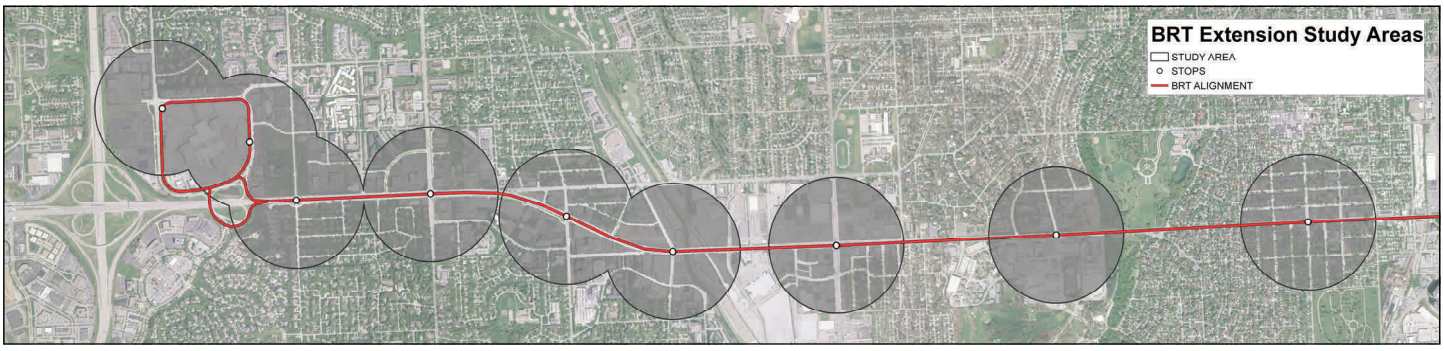
Extension 1: Continuing BRT west on Dodge Street from the terminus of the original study area (42nd Street) to 72nd Street and Dodge Street, with stops at 50th Street and Dodge Street, 62nd Street and Dodge Street, and 72nd Street and Dodge Street.

Extension 2: Continuing the BRT west on Dodge Street from the end of Extension 1 (72nd Street) to the Westroads Mall, where the BRT would loop west on California Street, north on 102nd Street, east on Nicholas Street, south on 98th Street, and south again on Regency Parkway to continue onto Dodge Street eastbound. This route would include stops at 76th Street and Dodge Street, 84th Street and Dodge Street, 90th Street and Dodge Street, 96th Street and Dodge Street, 102nd Street and Nicholas Street, and on the west side of 98th Street near the Westroads Mall parking garage.

STUDY AREAS

In order to calculate the development impacts of BRT service along the Dodge Street corridor, the analysis focused on the immediate area around each stop. The three block extent around the transit line used in the original study was not applicable for the BRT extension due to the irregular size of the blocks and the larger distances between stops. Instead, the best study area was determined to be a one-quarter mile radius around each stop. This distance corresponds with a five minute walk, which is the average reasonable distance a person is expected to travel on foot, and is shown in **Figure 1**.

Figure 1. BRT Extension Study Areas 1 and 2



[1] *SB Friedman,* Central Omaha Transit Alternatives Analysis—Forecast of Development Impacts of BRT and Streetcar Alternatives, Memorandum, July 19, 2013

METHODOLOGY

In order to maintain consistency with the original study, many of the same methodologies were employed. Regional capture from the study areas from the past ten years was used to create a baseline study area capture rate for residential, office, and hotel uses (**Tables 1-3**). In **Table 4,** a forecast for the future development impacts of BRT was determined by applying the Omaha BRT multiplier produced by *SB Friedman*[1] to these capture rates.

Table 1. Historical Development Activity in Study Areas (2002—2012)

Land Use	Study Area 1 Units or SF	Study Area 2 Units or SF
Residential	11	0
Office	8,400	282,900
Hotel	0	102
Retail/Service	160,785	256,000

Table 2. Historical Development Activity in Omaha Region vs. Study Areas

Land Use	Region	Study Area 1		Study Area 2	
	Units or SF	Units or SF	Capture Rate	Units or SF	Capture Rate
Residential	52,800	11	0.02%	0	0.00%
Office	6,800,000	8,400	0.12%	282,900	4.16%
Hotel	4,400	0	0.00%	102	2.32%

Table 3. Baseline Regional and Study Area Capture Forecast: Residential, Office and Hotel Demand

Land Use	Region	Study Area 1		Study Area 2	
	Units or SF	Capture Rate	Market Demand	Units or SF	Capture Rate
Residential	65,000	0.02%	13	0.00%	0
Office	14,900,000	0.12%	17,880	4.16%	619,840
Hotel	5,600	0.00%	0	2.32%	130

Table 4. Calculation of Study Area Office and Residential Multipliers with Transit Improvements

Capture Rate Without Transit		BRT Multipler	New Capture Rate with Transit	
Study Area 1	Study Area 2	Selected for Omaha	Study Area 1	Study Area 2
0.02%	0.00%	1.5x	0.03%	0.00%
0.12%	4.16%	1.1x	0.13%	4.58%
0.00%	2.32%	1x	0.00%	2.32%

RECONCILIATION OF "TOP-DOWN" AND "BOTTOM-UP" APPROACHES

Table 5 shows the *SB Friedman*[1] capture rates applied to Study Areas 1 and 2 to arrive at the market demand for each study area with transit. HDR identified the maximum development potential for each study area, highlighting sites which may transition to a higher density use over time. These sites are identified in **Figure 2** and **Figure 4**, and they are calculated in **Table 6**. Using the numbers developed in the "top-down" forecast, HDR reconciled the maximum development potential with the market demand by selecting sites within each study area that are the most susceptible to change. These sites are mapped out in **Figure 3** and **Figure 5**.

[1] *SB Friedman,* Central Omaha Transit Alternatives Analysis—Forecast of Development Impacts of BRT and Streetcar Alternatives, Memorandum, July 19, 2013: 12

Figure 2. Study Area 1 Maximum Future Development Potential

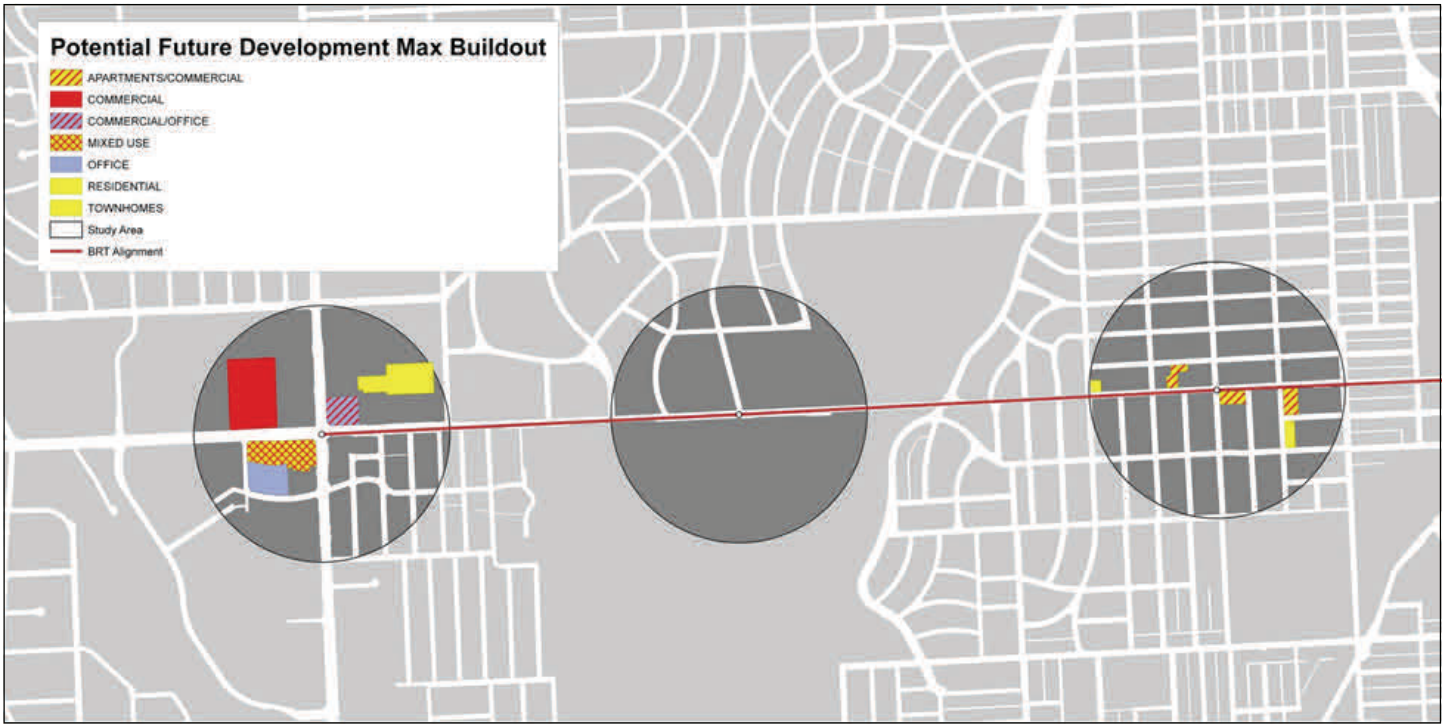


Figure 3. Study Area 1 Reconciled Future Development Potential

Figure 4. Study Area 2 Maximum Future Development Potential

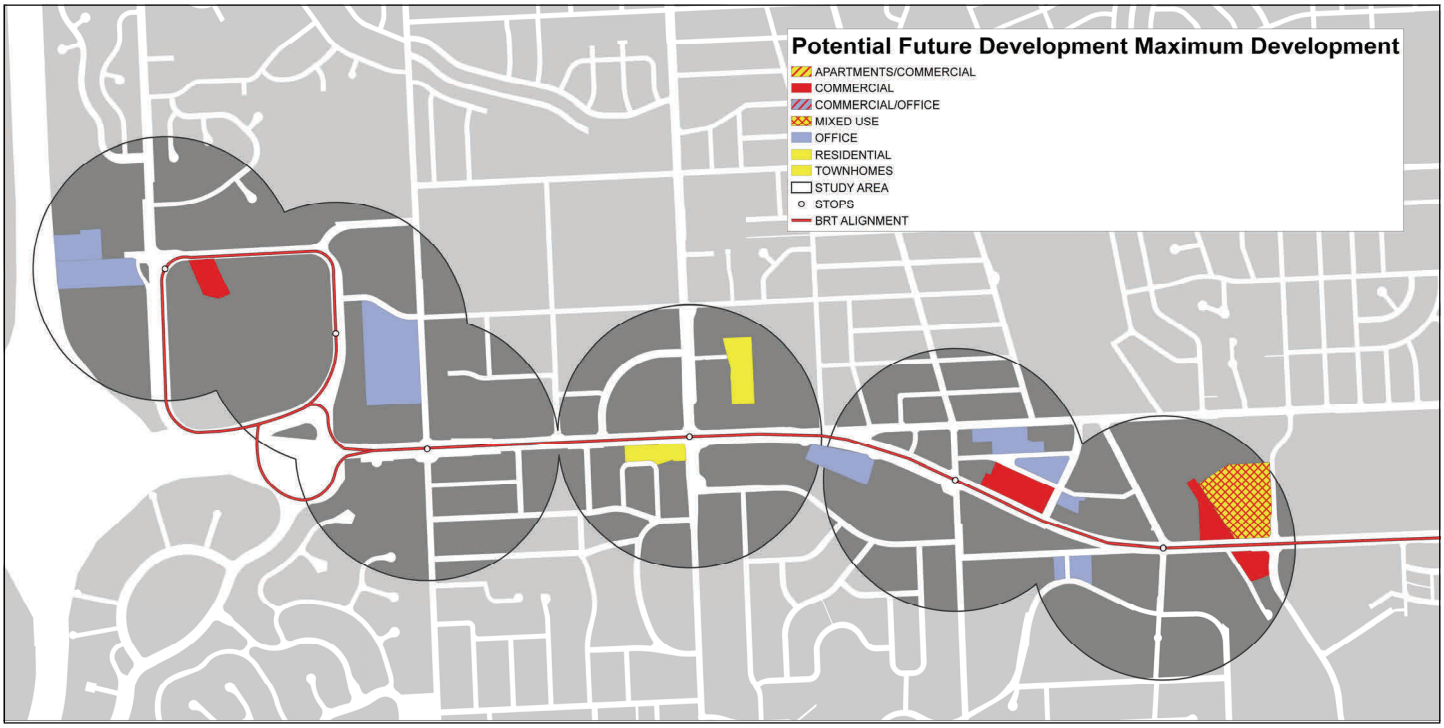
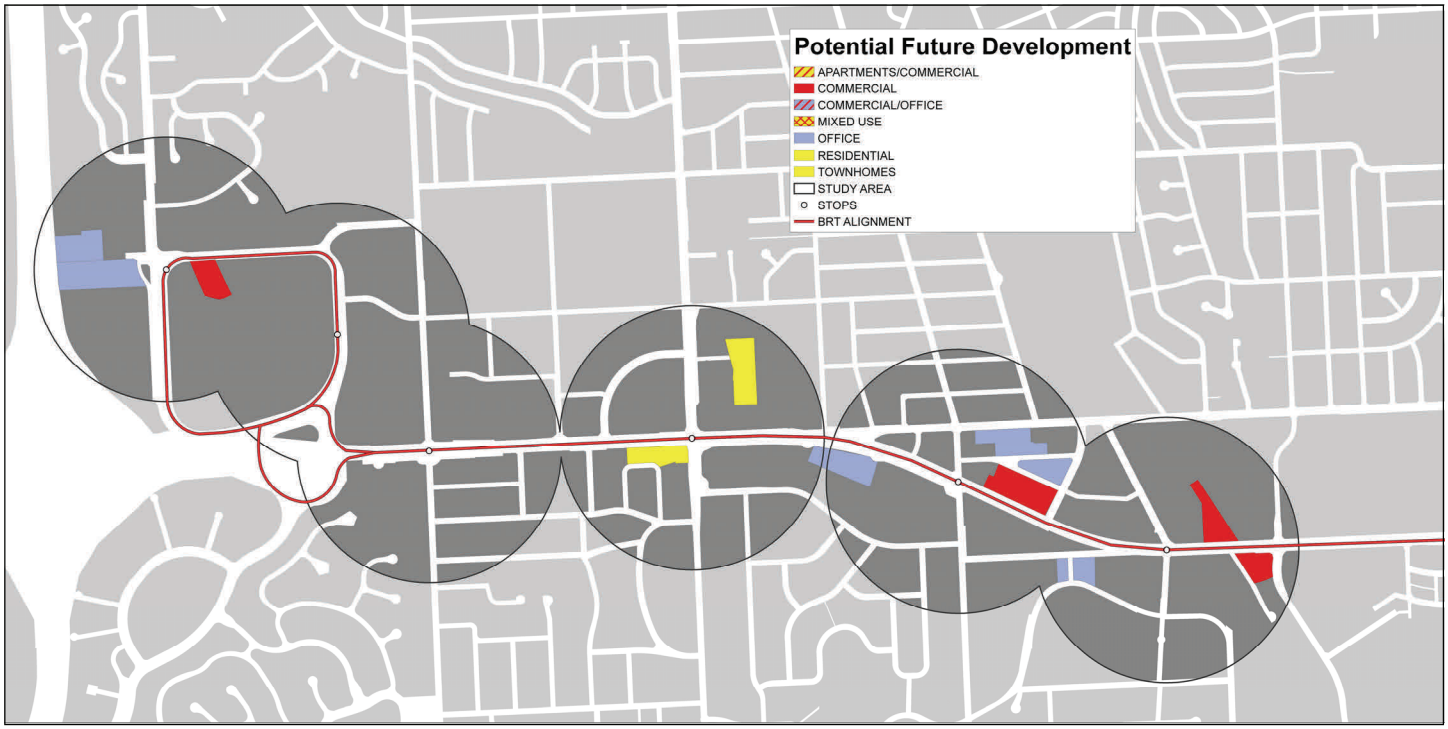


Figure 5. Study Area 2 Reconciled Future Development Potential



RETAIL CAPTURE METHODOLOGY

The retail model developed by *SB Friedman*[1] projects retail demand from three sources: new residents, new office workers, and regional demand. This approach was used to estimate retail demand from new office workers and residents within the study areas. Combined with estimates for new regional retail within the study area, this number provides a retail projection for Study Area 1. However, the unique regional character of retail within Study Area 2 made accurate numbers difficult to project and therefore retail projections for Study Area 2 were omitted from the report.

Table 5. Study Area Capture Forecast with Transit Improvements

Land Use	Regional Projections	Study Area 1		Study Area 2	
	Units or SF	Capture Rate	Market Demand	Capture Rate	Market Demand
Residential	65,000	0.03%	20	0.00%	0
Office	14,900,000	0.13%	19,370	4.58%	682,420
Hotel	5,600	0.00%	0	2.32%	130
Retail/Service	N/A	N/A	247,900*	N/A	N/A**

*The retail projections modeled for this study are based on retail and services used by the residential and office development in the study areas, as well as regional spending by outside visitors.

**Due to the unique nature and character of the 76th to Westroads Mall corridor, accurate retail numbers were difficult to project and therefore omitted from this report.

Table 6. Maximum Development Capacity by Land Use

Land Use	Study Area 1	Study Area 2
Residential	216 units	0 units
Office	80,500 SF	824,000 SF
Hotel	0 units	180 units
Retail/Service	279,300 SF	81,100 SF

Table 7. Reconciled Forecast of Development for Each Study Area

Land Use	Study Area 1			Study Area 2		
	Market Demand with Transit	Site Capacity	Forecast	Market Demand with Transit	Site Capacity	Forecast
Residential	20	216	20	0	110	0
Office	19,370	80,500	19,370	682,420	824,000	682,420
Hotel	0	100	0	130	180	130
Retail/Service	247,900	279,300	247,900	N/A	81,100	N/A**

**Due to the unique nature and character of the 76th to Westroads Mall corridor, accurate retail numbers were difficult to project and therefore omitted from this report.

[1] *SB Friedman,* Central Omaha Transit Alternatives Analysis—Forecast of Development Impacts of BRT and Streetcar Alternatives, Memorandum, July 19, 2013: 12

Table 7 shows the reconciled forecast for each of the BRT extensions. As stated in the *SB Friedman* Report, the reconciled forecast is achieved by taking the market demand and the site capacity, and choosing the lesser of the two numbers[1]. **Table 8** summarizes the results of the reconciled approach for Alternative 1 from Westroads to North Downtown, Alternative 2 from Westroads to North Downtown, and Alternative 3 from 42nd Street to North Downtown.

Table 8. Reconciled Forecast For Each Alternative including BRT Extension to Westroads

Land Use	Alternative 1 (BRT) Westroads to North Downtown			Alternative 2 (BRT) Westroads to North Downtown			Alternative 3 (BRT) 42nd to North Downtown		
	Market Demand	Site Capacity	Forecast	Market Demand	Site Capacity	Forecast	Market Demand	Site Capacity	Forecast
Residential	3,120	3,826	3,120	2,920	4,426	2,920	4,200	4,100	4,100
Office	4,001,790	5,704,500	4,001,790	4,001,790	6,804,500	4,001,790	5,400,000	5,900,000	5,400,000
Hotel	1,230	1,580	1,230	1,230	1,580	1,230	1,100	1,400	1,100
Retail/ Service	588,900	1,660,400	588,900	583,900	1,960,400	583,900	490,000	1,600,000	490,000

DEVELOPMENT CONSTRUCTION COST ESTIMATES

Original Study Areas

Using the reconciled forecast development numbers, the project team determined the construction cost estimates for new construction occurring within the study areas. This number is beneficial because it represents private development dollars that are invested into the study areas. In order to arrive at the construction cost estimate, the cost per square foot of development was used. Standard sizes were used for residential units and hotel rooms to convert them into average square feet per each. **Table 9** breaks down the construction cost by land use for the three alternatives. **Table 10** shows the baseline of development without transit. **Table 11** highlights the net gain of development investment for each alternative over the projected baseline.

Table 9. Development Construction Cost Estimate for Alternatives 1-3

Land Use	Alternative 1 (BRT) 42nd to North Downtown		Alternative 2 (BRT) 42nd to North Downtown		Alternative 3 (Streetcar) 42nd to North Downtown	
	Forecast	Development Investment (Construction Cost)	Forecast	Development Investment (Construction Cost)	Forecast	Development Investment (Construction Cost)
Residential (units)	3,100	$ 651,000,000	2,900	$ 609,000,000	4,100	$ 861,000,000
Office	3,300,000	$ 693,000,000	3,300,000	$ 693,000,000	5,400,000	$ 1,134,000,000
Hotel (rooms)	1,100	$ 58,987,500	1,100	$ 58,987,500	1,100	$ 58,987,500
Retail/Service	341,000	$ 49,445,000	336,000	$ 48,720,000	490,000	$ 71,050,000
TOTAL		$ 1,452,432,500		$ 1,409,707,500		$ 2,125,037,500

Calculations Used:	
Construction Cost per SF:	
Office	$ 210
Retail	$ 145
Residential	$ 175
Hotel	$ 165
Typ Residential Unit	1200 sf
Typ Hotel Room	325 sf

[1] *SB Friedman,* Central Omaha Transit Alternatives Analysis—Forecast of Development Impacts of BRT and Streetcar Alternatives, Memorandum, July 19, 2013: 13

Table 10. Baseline Development Construction Cost Estimate for 42nd Street to North Downtown

Land Use	Baseline Forecast	Baseline Development Investment
Residential (units)	2,000	$ 420,000,000
Office	2,980,000	$ 625,800,000
Hotel (rooms)	1,100	$ 58,987,500
Retail/Service	296,000	$ 42,920,000
TOTAL		$ 1,147,707,500

Table 11. Net Gain for Development Construction Costs for 42nd Street to North Downtown

Net Gain:	
Alternative 1	$ 304,725,000
Alternative 2	$ 262,000,000
Alternative 3	$ 977,330,000

BRT Extension

Table 12 separates the BRT extension study areas to show their independent development potential. Both BRT extensions are combined into the original BRT route in **Table 13**, which compares the development investment potential for Alternative 1 from North Downtown to the Westroads Mall, Alterative 2 from North Downtown to the Westroads Mall, and Alternative 3 from North Downtown to 42nd Street and Dodge Street. **Table 14** shows the net gain of development investment over the baseline for the two extended BRT alternatives as well as the original streetcar alternative.

Table 12. Breakdown of Development Construction Costs for new Study Areas

Land Use	Study Area 1 50th to 72nd Forecast	Study Area 1 50th to 72nd Development Investment	Study Area 2 76th to Westroads Forecast	Study Area 2 76th to Westroads Development Investment
Residential (units)	20	$ 4,200,000	0	$ -
Office	19,370	$ 4,067,700	682,420	$ 143,308,200
Hotel (rooms)	0	$ -	130	$ 6,971,250
Retail/Service	247,900	$ 35,945,500	N/A	N/A
TOTAL		$ 44,213,200		$ 150,279,450

Table 13. Development Construction Cost Estimate for Alternatives 1-3 including BRT Extension to Westroads

Land Use	Alternative 1 (BRT) Westroads to North Downtown Forecast	Alternative 1 (BRT) Westroads to North Downtown Development Investment	Alternative 2 (BRT) Westroads to North Downtown Forecast	Alternative 2 (BRT) Westroads to North Downtown Development Investment	Alternative 3 (Streetcar) 42nd to North Downtown Forecast	Alternative 3 (Streetcar) 42nd to North Downtown Development Investment
Residential (units)	3,120	$ 655,200,000	2,920	$ 613,200,000	4,100	$ 861,000,000
Office	4,001,790	$ 840,375,900	4,001,790	$ 840,375,900	5,400,000	$ 1,134,000,000
Hotel (rooms)	1,230	$ 65,958,750	1,230	$ 65,958,750	1,100	$ 58,987,500
Retail/Service	588,900	$ 85,390,500	583,900	84,665,500	490,000	$ 71,050,000
TOTAL		$ 1,646,925,150		$ 1,604,200,150	-	$ 2,125,037,500

Table 14. Net Gain for Construction Costs including BRT Extension to Westroads

Net Gain:	
Alternative 1 (Westroads to NoDo)	$ 499,217,650
Alternative 2 (Westroads to NoDo)	$ 456,492,650
Alternative 3 (42nd Street to NoDo)	$ 977,330,000

RESULTS

The results from the extension of this study shows that while extending BRT to Westroads Mall is beneficial for comprehensive transit connectivity and does increase development, the development potential for transit west of 42nd Street is limited when compared to the corridor to the east. This limitation occurs partially because the transit route runs through established neighborhoods with little land available for redevelopment. Limited development potential further west along the route also occurs because of existing land development patterns, land values, limited physical space and lack of additional financial incentives to develop the land at a much higher intensity than its current use.

SB Friedman
Development Advisors

S. B. Friedman & Company | 221 North LaSalle Street, Suite 820 | Chicago, IL 60601 | T (312) 424-4250 | F (312) 424-4262

FINAL MEMORANDUM

TO: HDR Engineering, Inc.

FROM: SB Friedman Development Advisors

DATE: September 4, 2013

RE: Central Omaha Transit Alternatives Analysis – Forecast of Development Impacts of BRT and Streetcar Alternatives

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The City of Omaha and Omaha Metro are considering three transit alternatives to connect Downtown and North Downtown ("NoDo") with areas to the west, including Midtown, the University of Nebraska Medical Center, and Crossroads, as part of the Federal Transit Administration's Alternatives Analysis process. As part of the process, *SB Friedman Development Advisors* ("*SB Friedman*") forecasted the impact that each transit alternative would have on real estate development in the area served by transit. This memorandum describes the forecasted impacts as well as the methods used to construct the forecast, and is organized as follows:

- Alternatives and Study Areas: This section briefly describes each transit alternative under consideration and the study areas defined for the purpose of the development forecast.
- Baseline Estimate of Future Development: This section forecasts future study area development without transit investment, based on regional forecasts of future development activity and the historical rate of development in study areas relative to the region.
- Estimating the Future Development Impact of Transit Alternatives: This section relies on a case study assessment of transit development impacts to forecast the increase in future development activity associated with each transit alternative.

Alternatives, Study Areas and Timeframe

ALTERNATIVES

The three transit alternatives under consideration would all run from 16th Street to 10th Street along Fahey Street, then along 10th Street to Downtown, where they continue as follows:

- Alternative 1: On Dodge Street west to 72nd Street, then returning east on Dodge Street until 31st Street, then south to Douglas Street, then west on Douglas Street to 10th Street
- Alternative 2: On Farnam Street to 44th Street, then on 44th Street to Dodge Street, then on Dodge Street to 72nd Street, then returning east via the same path until 31st Street, then south to Harney Street, then east on Harney Street to 10th Street

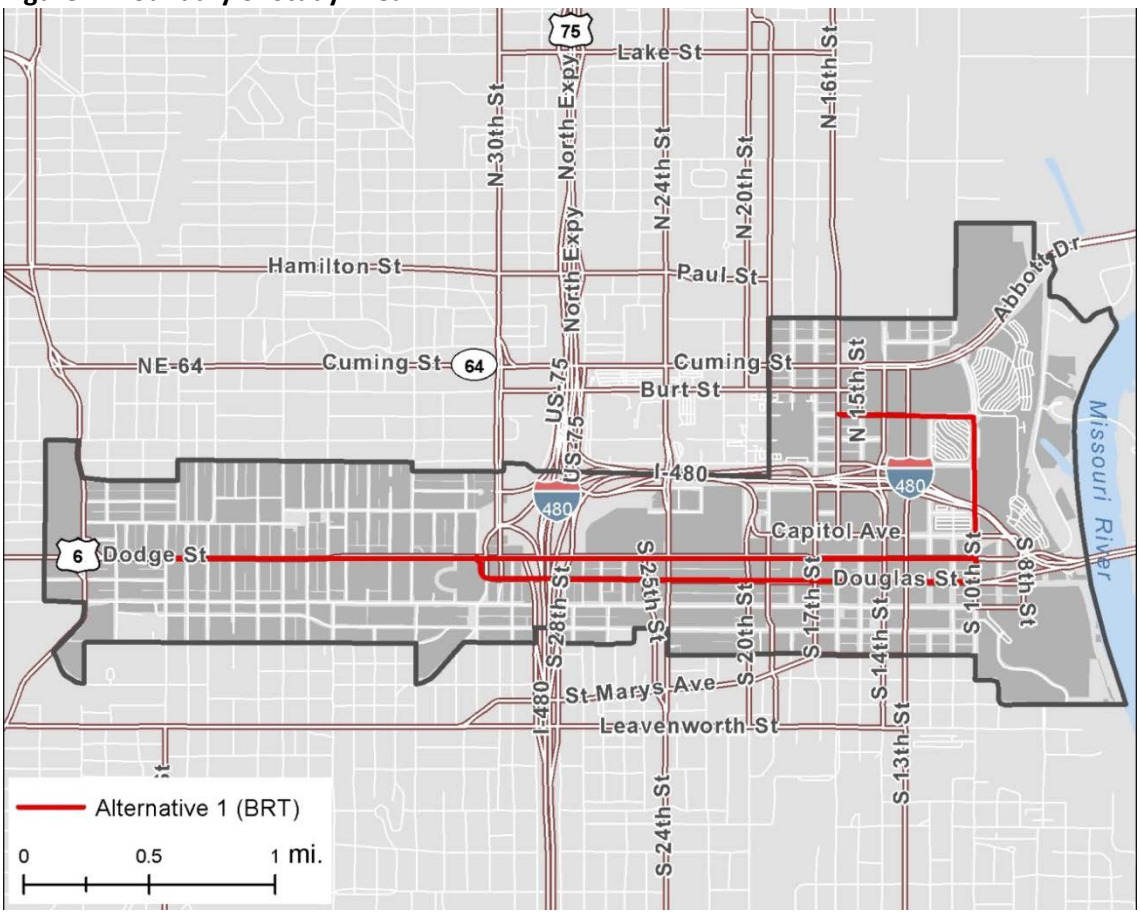
- Alternative 3: On Farnam Street to 42nd Street, then returning east via the same path until 31st Street, then south to Harney Street, then east on Harney Street to 10th Street

STUDY AREAS

The primary goal of the real estate development impact study is to compare the alternatives based on differences in routes and technologies. Alternatives 1 and 2 present a clear test of the impact of different routes, since both involve BRT technology. However, the shorter streetcar route of Alternative 3 makes it difficult to isolate the impact of technology differences: both BRT alternatives extend into areas between 42nd Street and 72nd Street that have distinct development patterns compared to Midtown and Downtown, and may consequently differ from Alternative 3 in their development potential.

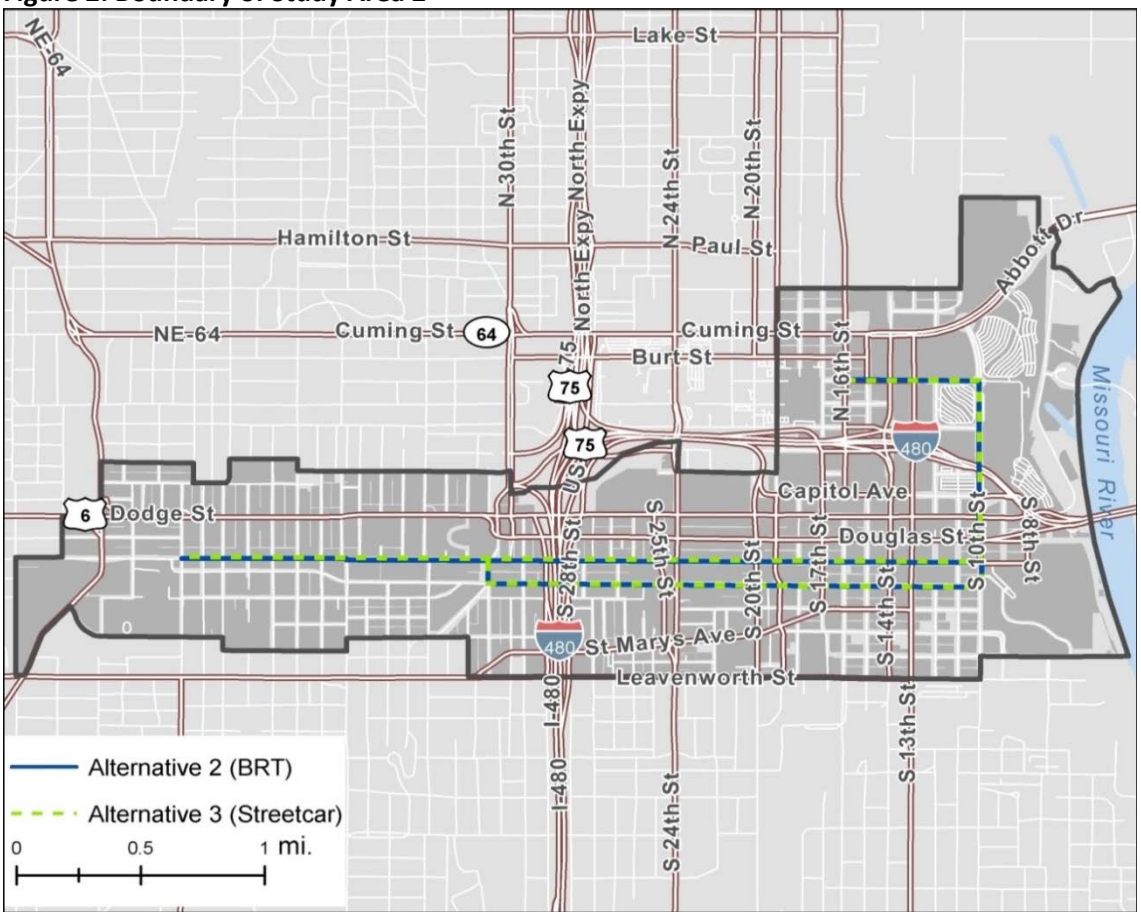
In order to make a more direct comparison between streetcar and BRT technologies, *SB Friedman*'s analysis focuses on the alternative routes from 42nd Street east. The extent of each study area was defined by a three-block buffer around each alternative line. A three-block extent was selected based on a review of other studies of transit development impacts, which generally found that the most meaningful impacts occurred within two to three blocks of the transit line. **Figure 1** shows the study area extent for Alternative 1. Since Alternatives 2 and 3 follow the same route between Downtown and 42nd Street, they share a single study area, which is shown on **Figure 2**.

Figure 1: Boundary of Study Area 1



Sources: HDR Engineering, Inc.; SB Friedman Development Advisors

Figure 2: Boundary of Study Area 2



Sources: HDR Engineering, Inc.; SB Friedman Development Advisors

The frequency, level of service, and key features (e.g., level boarding, fare pre-payment, signal prioritization, dedicated lanes) of each transit alternative were not conclusively defined at the time of analysis, and were not directly considered in *SB Friedman*'s analysis. However, the Estimation of Development Impact section comments on the design and service-level differences in the case study transit systems, and the potential implications for the development impacts of Omaha's transit alternatives.

FORECAST TIMEFRAME

The future period covered by this forecast starts in 2015 and ends in 2030. The initial year was selected to match the anticipated timeframe in which transit line construction would begin and/or the new line would be placed in service. A 15-year forecast period was selected, since 15 years is the lifespan of tax increment financing (TIF) districts in Nebraska, and TIF has been discussed as one source of local funding for the transit alternatives.

Where historical data was used to construct a baseline forecast, the timeframe for historical observation was defined as the 2002 to 2012 period. Data is widely available for this period, and it covers two full economic cycles up to the present.

Baseline Estimate of Future Development

In order to forecast the impact of the transit alternatives on future development within the study areas, we first need to estimate future development without transit improvements to provide a baseline for comparison. We do this via the following steps:

1. Determine the historical share of the development in the region captured by the study area;
2. Forecast future regional development for residential, office and hotel uses;
3. Apply historical study area capture rates for residential, office and hotel uses with adjustments for changes in market conditions (as specified in this memo) to future regional development to estimate future study area development; and
4. Forecast future growth of retail and ground floor service uses in the study area, based on future household and office worker spending from new residential and office development in the study area and the continued regional attraction of the downtown as a restaurant destination.

HISTORICAL DEVELOPMENT IN STUDY AREAS

SB Friedman acquired data on historical development activity within the boundaries of each study area from CoStar Group, Inc. (CoStar). *SB Friedman* vetted this data by comparing it with Douglas County Assessor records, building permits, online articles and information about specific projects, and Consultant Team members' local knowledge of development activity. To the extent possible, building rehabilitation was excluded unless it represented a new addition of units or square footage to the market. **Table 1** below summarizes the amount of development activity that took place during the reference period within each study area.

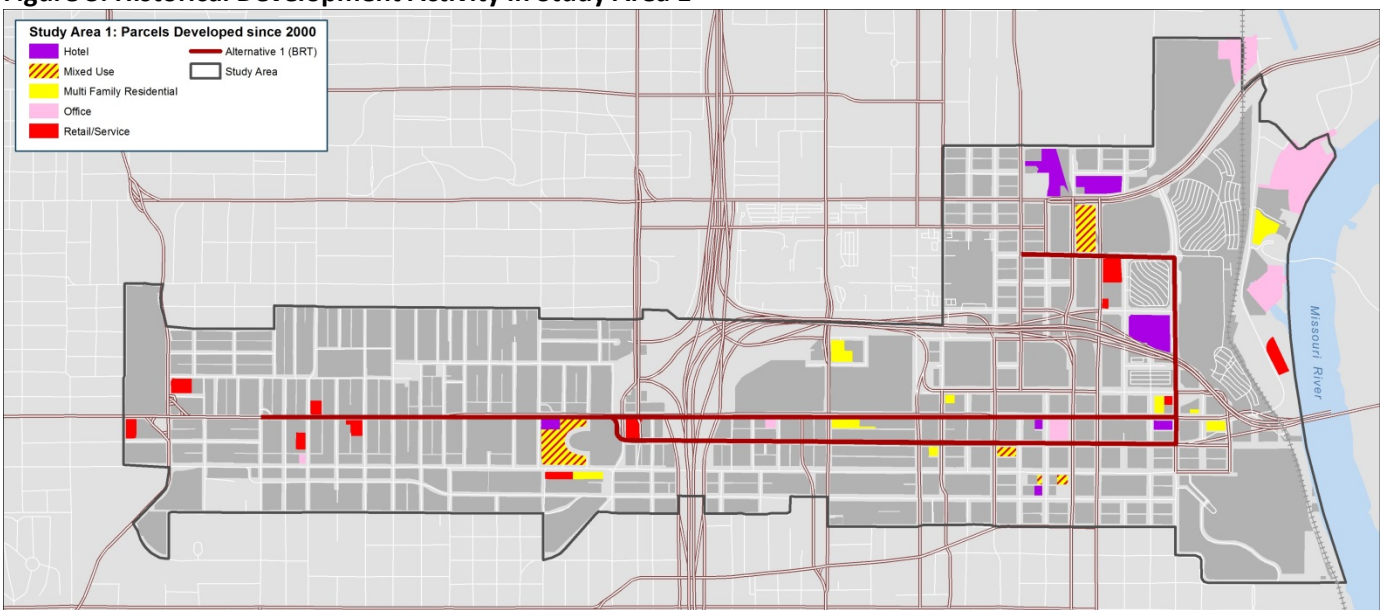
Table 1. Historical Development Activity in Study Areas (2002-2012)

Land Use	Study Area 1	Study Area 2
Residential	1,640 units	1,600 units
Office	1,500,000 SF	1,500,000 SF
Hotel	1,200 keys	1,200 keys
Retail/Service	450,000 SF	470,000 SF

Sources: Costar Group, Inc.; Douglas County Assessor; HDR Engineering, Inc.; SB Friedman Development Advisors

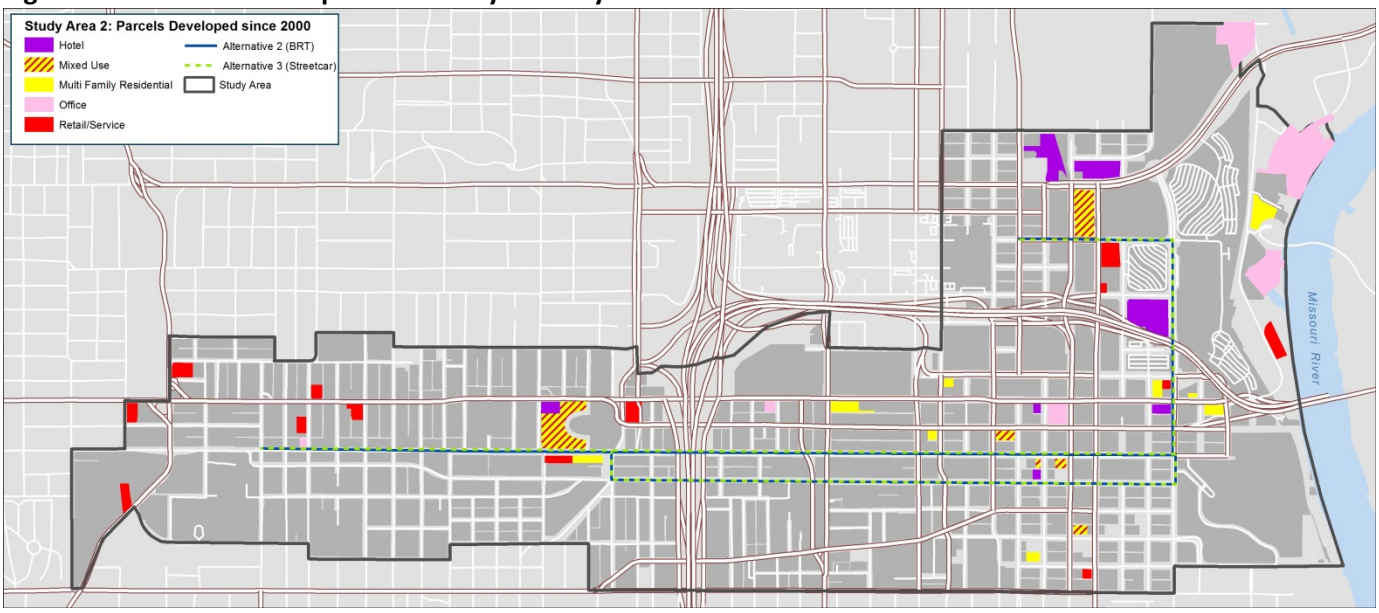
Since the study areas overlap significantly, the difference in development activity overall is relatively minor. This is illustrated in more detail on **Figures 3 and 4** on the following page, which show where development activity occurred by land use.

Figure 3. Historical Development Activity in Study Area 1



Sources: Costar Group, Inc.; Douglas County Assessor; HDR Engineering, Inc.; SB Friedman Development Advisors

Figure 4: Historical Development Activity in Study Area 2



Sources: Costar Group, Inc.; Douglas County Assessor; HDR Engineering, Inc.; SB Friedman Development Advisors

HISTORICAL RESIDENTIAL, OFFICE AND HOTEL DEVELOPMENT IN THE OMAHA REGION

Historical residential development in the Omaha metropolitan region was estimated using building permit data collected by the U.S. Census Bureau for the 2002 to 2012 period. Historical office development was sourced from Costar's office analytics report, which tracks quarterly office inventory and deliveries of new building space. Hotel development was sourced from the Smith Travel Research (STR) hotels database. Since the most current year in the STR database was 2011, the reference period was set to 2001 to 2011. Historical regional retail and service development was not investigated, since it

will be forecast based on anticipated demand from residential and office development as well as regional growth. **Table 2** below compares regional historical development with development in each study area and shows the percentage of regional development captured by the study areas.

Table 2. Historical Development Activity in Omaha Region vs. Study Areas

Use	Region	Study Area 1		Study Area 2	
	Units or SF	Units or SF	Capture Rate	Units or SF	Capture Rate
Residential	52,800 units	1,640 units	3.1%	1,600 units	3.0%
Office	6,800,000 SF	1,500,000 SF	22%	1,500,000 SF	22%
Hotel	4,400 units	1,200 units	27%	1,200 units	27%

Sources: CoStar Group, Inc.; SB Friedman Development Advisors; Smith Travel Research; U.S. Census Bureau

BASELINE FORECAST OF FUTURE DEVELOPMENT WITHOUT TRANSIT

This forecast of future development within the study areas assumes that without new transit service, the study areas will continue to capture the same share of residential development that they have historically. The capture rate for office was adjusted slightly downward, to 20 percent from 22 percent, based on the relatively lower likelihood of the study areas physically accommodating another large-scale office campus development, such as the Gallup Campus, in the future. Similarly, the baseline forecast for hotels assumes that the future capture rate for hotel development will decline to 20 percent. This is the historical hotel capture rate excluding the 600-room Hilton Omaha, which is a convention-related headquarter hotel facility that is unlikely to be duplicated within the study area in the 15-year forecast timeframe (2015 to 2030). However, the forecast does account for 660 hotel rooms that are known to be under construction or in planning stages.

Future regional development trends were forecast for each land use as follows:

- **Residential:** Population forecasts for Omaha metropolitan area counties were taken from the 2007 update to the University of Nebraska at Lincoln (UNL) Bureau of Business Economic Research's "Omaha Projections to 2050" report. Since the dataset was published in 2008, *SB Friedman* updated the original forecast by replacing the 2010 population numbers with actual Census figures, then growing future population at the same rate as in the original forecast. Population forecasts were divided by average household size to yield a forecast of future households.[1] The number of households was then divided by 97 percent, the assumed occupancy rate for new housing units, to derive a forecast of housing unit production.
- **Office:** *SB Friedman* constructed an office supply forecast using office employment forecasts from Moody's and historical office supply data from CoStar Group, Inc. The forecast assumes that office demand is driven primarily by expansion of office-related employment, which includes the information, financial activities, professional and business services, and educational services sectors. The analysis also assumes that the ratio of employees per thousand square feet of occupied office space will increase over time from 3.34 in 2012 to 3.64 in 2026 before

[1] From 2000 to 2010, average household size in the Omaha metropolitan area decreased from 2.46 to 2.39. It was assumed that household size would continue to decline into the future, but at a slower rate: from 2.39 in 2010 to 2.35 in 2030.

plateauing. It also assumes that the office vacancy rate will decrease from 7.9 percent in 2012 to 7.0 percent in 2020. Demolition of obsolete office space is assumed to be 0.40 percent of all space per year, which is less than the historical average of 0.61 percent from 2008 through 2012.

- **Hotel:** Hotel data from Smith Travel Research includes information on hotels under development in the region, including the number of rooms and anticipated year of opening. Between 2001 and 2011, hotel room inventory increased at an average annual rate of 4.2 percent. During this period, both the CenturyLink Center and TD Ameritrade Park were developed, which likely had a significant regional impact on the hotel market. At the same time, hotel occupancy in 2011 was 55 percent, whereas hotel experts generally consider an occupancy rate of 65 percent indicative of a healthy hotel market. Given the absence of a new convention center or major stadium on the horizon, as well as soft occupancy conditions, the regional hotel forecast assumed that the annual rate of hotel supply increase would fall to 2.25 percent through 2030. This rate of increase would allow for 2030 occupancy levels to return to 65 percent through the projection period, assuming that hotel demand grows by roughly 3 percent per year.

Full tables showing the regional residential, office and hotel forecasts are included in **Appendix 1**. **Table 3** below shows the baseline forecast for these three land uses within the study area based on the regional forecast and assumed study area capture rates.

Table 3. Baseline Regional and Study Area Capture Forecast: Residential, Office and Hotel Demand

	Region	Study Area 1		Study Area 2	
Use	Units or SF	Capture Rate	Market Demand	Capture Rate	Market Demand
Residential	65,000 units	3.1%	2,000	3.0%	2,000
Office	14,900,000 sf	20%	2,980,000	20%	2,980,000
Hotel	5,600 units	20%	1,100	20%	1,100

Sources: City of Omaha; CoStar Group, Inc.; HDR Engineering, Inc.; SB Friedman Development Advisors; UNL Bureau of Business Research; U.S. Census Bureau

SB Friedman determined that the capture methodology would not be useful for retail and service uses due to quality issues with the available retail data for case study communities that were discussed in a separate memorandum regarding case studies ("Case Study Memorandum"). Consequently, the regional capture analysis does not directly forecast future development of retail and service uses. Instead, *SB Friedman* constructed a separate, but related, model to forecast spending on retail and services induced by residential and office development in the study areas, as well as spending by outside visitors. These three demand sources were modeled as follows:

- **Residents**: ESRI Business Analyst was used to estimate current spending per household within the study areas for categories of retail and services that were deemed most compatible with urban infill projects (grocery stores, drug stores, personal care establishments, etc.). Since the timeframe of analysis extends through 2030, 2030 spending was estimated by assuming a 1

percent annual real increase in spending.[2] This household spending forecast was then multiplied by the number of new residential units in the baseline study area forecast to estimate total new household spending.

- **Office Workers**: The International Council of Shopping Centers (ICSC) publishes benchmarks of office worker spending on retail and services near their place of work based on survey data. The most recently updated version of these benchmarks was used to estimate spending per office worker. As with the household spending estimate, 2030 spending was estimated by assuming a 1 percent annual real increase in spending. New office employees were estimated using the baseline office square footage forecast, assuming an occupancy rate of 93 percent and an average of 3.5 employees per thousand square feet. The number of new office employees was then multiplied by average office worker spending to estimate net new spending by office workers.
- **Visitors**: Existing visitor spending was derived from the current retail sales surplus (the amount by which sales within the study area exceed retail demand from residents within the study area) as estimated by ESRI Business Analyst for restaurants, clothing, and health and personal care stores. This surplus was extrapolated to 2030 by applying the UNL Bureau of Business Economic Research's forecast rate of regional population growth. The difference between the 2030 surplus and current surplus was then used to estimate retail spending by new visitors.

Total forecast sales from each source were converted to square feet of retail space using benchmark sales per square foot figures from *The Dollars and Cents of Shopping Centers*, published by ICSC and the Urban Land Institute (ULI). Benchmarks were inflated to 2013 dollars using the U.S. Bureau of Labor Statistics' consumer price index. **Table 4** below summarizes the resulting baseline forecast of retail square footage by demand source. Full tables illustrating the calculation of demand from each source are located in **Appendix 2**.

Table 4. Baseline Forecast of Study Area Retail/Services Development

Category	Retail Spending in 2030 (2013 $)	Retail SF
Residents	$15 - $16 million	53,000 - 56,000
Office Workers	$40 - $54 million	124,000 - 166,000
Visitors	$23 - $24 million	73,000 - 74,000
TOTAL	**$78 - $94 million**	**250,000 - 296,000**

Sources: ESRI Business Analyst; ICSC- "Office Worker Retail Spending in a Digital Age"; ICSC & ULI- "Dollars & Cents of Shopping Centers"; SB Friedman Development Advisors

[2] Nationally, retail sales have increased at a real rate of approximately 1 percent annually from 1992 through 2010 after accounting for inflation and population growth.

Estimating the Future Development Impact of Transit Alternatives

The baseline forecast generated in the previous section estimates future development within the study areas without any of the three transit alternatives in place. This section develops a forecast of the impact of each alternative on future study area development. Two methods are used to estimate total future development with transit investment:

- **"Top-Down" Method**: This method builds on the regional capture approach used to create the baseline forecast of future development in the previous section. It estimates an increase in the regional share of development captured by the study area, based on the increase that occurred in five case study communities that implemented BRT or streetcar service.
- **"Ground-Up" Method**: This method estimates the maximum development capacity of the study area based on:
    - Development Pipeline: Projects that developers are either building or planning are identified and added to study area capacity.
    - Sites Susceptible to Change: Vacant lots, surface parking and other underutilized sites are identified throughout the study area.
    - Local Planning Documents: Zoning and master plan goals are used to program sites susceptible to change, and the resulting development program is added to site capacity along with the development pipeline.

The results of these two methods are then reconciled to produce a final estimate, which reflects the market demand for development that can be accommodated based on the capacity of sites within each study area.

"TOP-DOWN" METHOD: BRT AND STREETCAR DEVELOPMENT IMPACTS FROM NATIONAL CASE STUDIES

Within the last two decades, public transportation has experienced a resurgence; communities that initially developed around private vehicles are implementing a variety of transit lines that go beyond traditional bus service. In addition to light rail and heavy rail projects, streetcar and bus rapid transit have become increasingly popular with communities due in part to their ability to operate in mixed traffic on existing roads. However, relatively few studies have sought to investigate the impact of streetcar and BRT systems on real estate development in the vicinity of stations and service lines. Existing studies are generally cursory in nature, describing development that occurred after transit systems were implemented, without controlling for existing development patterns or broader economic conditions that could be influential.

In an effort to at least partially account for these factors, *SB Friedman* undertook a case study analysis that identified the following five communities with streetcar or BRT systems for which real estate data was available before and after the systems were implemented:

- BRT
    - Cleveland (Healthline)
    - Kansas City (Main Street MAX)

- Streetcar

- Portland (Portland Streetcar)
- Seattle (South Lake Union)
- Tampa (TECO Line)

Case studies were selected based on city size, recent establishment of transit service, and service quality. Each case study and selection criteria are described in greater detail in *SB Friedman*'s Case Study Memorandum.

SB Friedman developed a method to control for broader economic conditions by comparing development within a study area (defined by the three blocks on either side of each BRT or streetcar line) to regional development both before and after the transit line was placed in service. In this way, booms and busts that impact the broader real estate market are accounted for. However, it is important to note that this method does not control for other policy changes and actions that might shift development to transit corridors, nor does it control for broader shifts in household and firm preferences that might favor mixed-use urban centers. The analysis focuses exclusively on private new construction activity, excluding public and institutional (e.g., hospitals and universities) investment, as well as rehabilitation of existing buildings. A more complete account of this methodology is provided in the Case Study Memorandum.

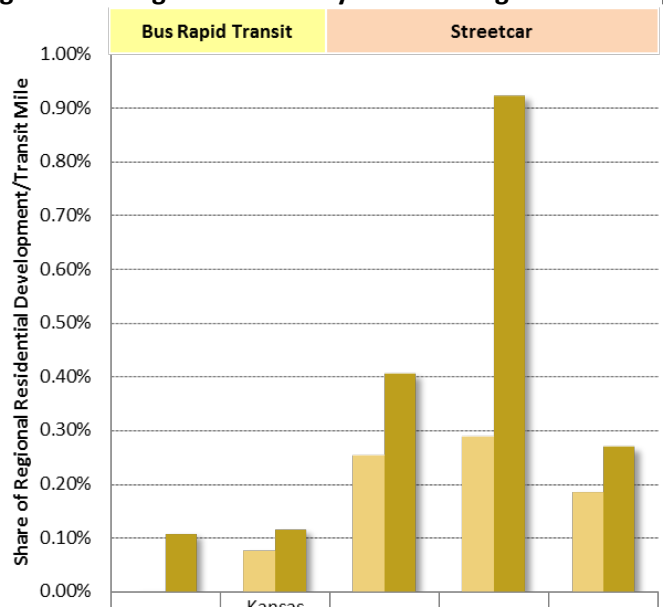
Figure 5 summarizes the share of residential and office development captured by the study area in each case study community before and after each transit line was placed in service.[3] The table also provides a "multiplier," or measure of the proportional factor by which the amount of regional development captured by the study area changes after transit improvements are put in place. The multiplier is simply the ratio of the post-transit regional share of development to the pre-transit regional share. A multiplier greater than one indicates that development increased subsequent to the opening of the transit line for the analysis period; conversely, a number less than one indicates that development decreased after the opening of the line. It is important to note that the multiplier can be greater than one even if the pace of development in the study area slows after the line is opened. Such an outcome would be expected in a general recession, where the pace of regional development activity slows down more than development activity within the study area.

Forecast Change in Omaha Study Area Capture Based on Case Study Impacts

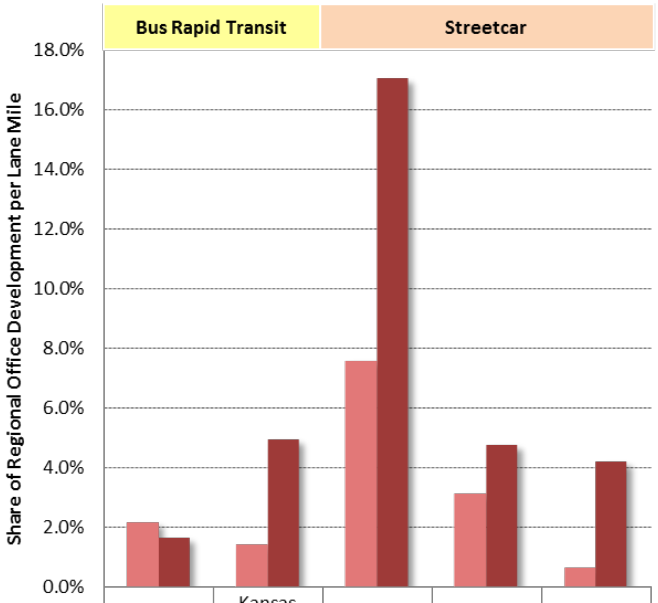
Variation in the development capture multipliers for BRT and streetcar case studies reflects local conditions that may or may not be comparable to conditions in Omaha. In order to select appropriate multipliers to forecast the impact of the transit alternatives on the study areas' development capture in the Omaha region, *SB Friedman* excluded multipliers that appeared to be outliers. In addition, *SB Friedman* reviewed local conditions in order to focus on case studies that most closely resemble the anticipated real estate conditions and transit improvements in Omaha.

[3] While the original case study analysis included an analysis of retail and hotel development, these were excluded from this analysis due to problems with the comprehensiveness and accuracy of the underlying data. The methods used to forecast retail and hotel development are described elsewhere in this memorandum.

Figure 5. Change in Case Study Share of Regional Development



	Cleveland	Kansas City	Seattle	Portland	Tampa
Before	0.00%	0.08%	0.25%	0.29%	0.19%
After	0.11%	0.12%	0.41%	0.92%	0.27%
Multiplier	43.5	1.51	1.60	3.19	1.45



	Cleveland	Kansas City	Seattle	Portland	Tampa
Before	2.2%	1.4%	7.6%	3.1%	0.6%
After	1.6%	4.9%	17.0%	4.7%	4.2%
Multiplier	0.76	3.53	2.25	1.52	6.75

Source: SB Friedman Development Advisors

Residential development multipliers were selected as follows:

- BRT: Cleveland was removed from consideration due to its limited dataset (which produced an unusually large capture rate increase), leaving Kansas City's 1.5 capture rate multiplier for BRT systems.
- Streetcar: The average multiplier (2.1) was used.

Multipliers for office development were selected as follows:

- BRT: Cleveland actually registered a decline in office capture rates, while Kansas City registered a large increase due primarily to a large headquarters consolidation that started before the BRT line was announced. Consequently, Cleveland was removed from consideration and the multiplier for Kansas City was recalculated without the headquarters project, yielding a multiplier of 1.1.
- Streetcar: With a multiplier of 6.8 and a very low base capture rate (0.6 percent), Tampa was considered an outlier and removed. Seattle and Portland multipliers were then averaged to 1.8.

Demand for hotel nights is driven primarily by activity generators such as convention centers, sports, concerts, and major attractions and events. Therefore, BRT and streetcar service are unlikely to drive additional hotel demand. A hotel multiplier of 1 was assigned to both BRT and streetcar alternatives to reflect this lack of anticipated impact. However, over time, greater transit connectivity between key convention and sports destinations in NoDo with dining and entertainment venues in the Old Market area could help make downtown Omaha a more vibrant destination.

The selected multipliers were applied to the baseline study area capture rates for residential and office development to calculate capture rates for each study area with either BRT or streetcar service. Table 5 summarizes these calculations.

Table 5. Calculation of Study Area Office and Residential Multipliers with Transit Improvements

Use	Capture Rate Without Transit	Case Study Multiplier Range		Multiplier Selected for Omaha		New Capture Rate with Transit	
		BRT	Streetcar	BRT	Streetcar	BRT	Streetcar
Residential	3.0% -3.1%*	1.5x - 43.5x	1.5x - 3.2x	1.5x	2.1x	4.5% - 4.7%	6.5%
Office	20%	0.8x - 3.5x	1.5x - 6.8x	1.1x	1.8x	22%	36%
Hotel	20%	N/A	N/A	1x	1x	20%	20%

** Range is due to differences in study area boundaries*

These new capture rates were then applied to the same regional market forecast used to produce the baseline forecast of study area demand for residential, office and hotel uses without transit improvements. The new residential and office demand figures were then used to recalculate induced development of retail and service uses (full tables illustrating this recalculation of retail and service demand are located in **Appendix 2**). The estimated market demand for development for each transit alternative is summarized in **Table 6**.

Table 6. Study Area Capture Forecast with Transit Improvements

Use	Regional Projections	Alternative 1		Alternative 2		Alternative 3	
		Capture Rate	Market Demand	Capture Rate	Market Demand	Capture Rate	Market Demand
Residential	65,000	4.7%	3,100	4.5%	2,900	6.5%	4,200
Office	14,900,000	22%	3,300,000	22%	3,300,000	36%	5,400,000
Hotel	5,600	20%	1,100	20%	1,100	20%	1,100
Retail/Service	N/A	N/A	341,000	N/A	336,000	N/A	490,000

Sources: City of Omaha; CoStar Group, Inc.; HDR Engineering, Inc.; SB Friedman Development Advisors; UNL Bureau of Business Research; U.S. Census Bureau

GROUND-UP METHOD: SITE CAPACITY OF STUDY AREAS

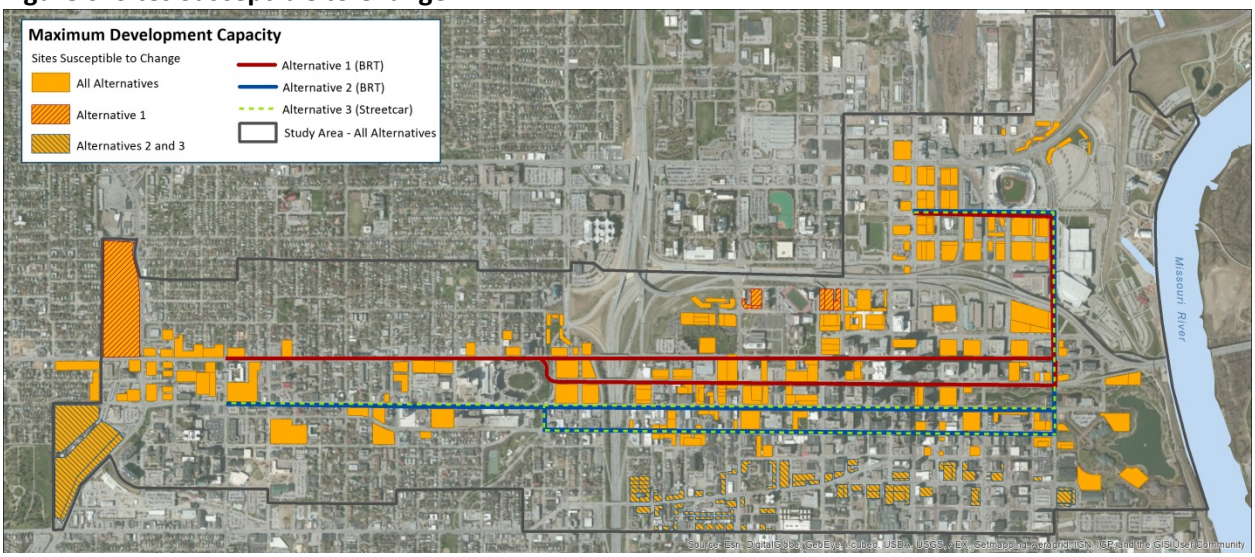
HDR's Omaha office estimated the maximum development that could be accommodated in each study area based on its knowledge of planned projects, a parcel-by-parcel assessment of vacant and underutilized sites susceptible to change, and current zoning and planning prescriptions for land use. This assessment produced a parcel-by-parcel estimate of the maximum development capacity of each site susceptible to change. **Table 7** summarizes the total capacity of sites within each study area boundary, while **Figure 6** shows the location of each site susceptible to change.

Table 7. Maximum Development Capacity by Land Use and Alternative

Use	Alternative 1	Alternatives 2 and 3
Residential	3,500 units	4,100 units
Office	4,800,000 SF	5,900,000 SF
Hotel	1,300 units	1,400 units
Retail/Service	1,300,000 SF	1,600,000 SF

Source: HDR Engineering, Inc.

Figure 6. Sites Susceptible to Change



Sources: HDR Engineering, Inc.; SB Friedman Development Advisors

RECONCILIATION OF "TOP-DOWN" AND "GROUND-UP" APPROACHES

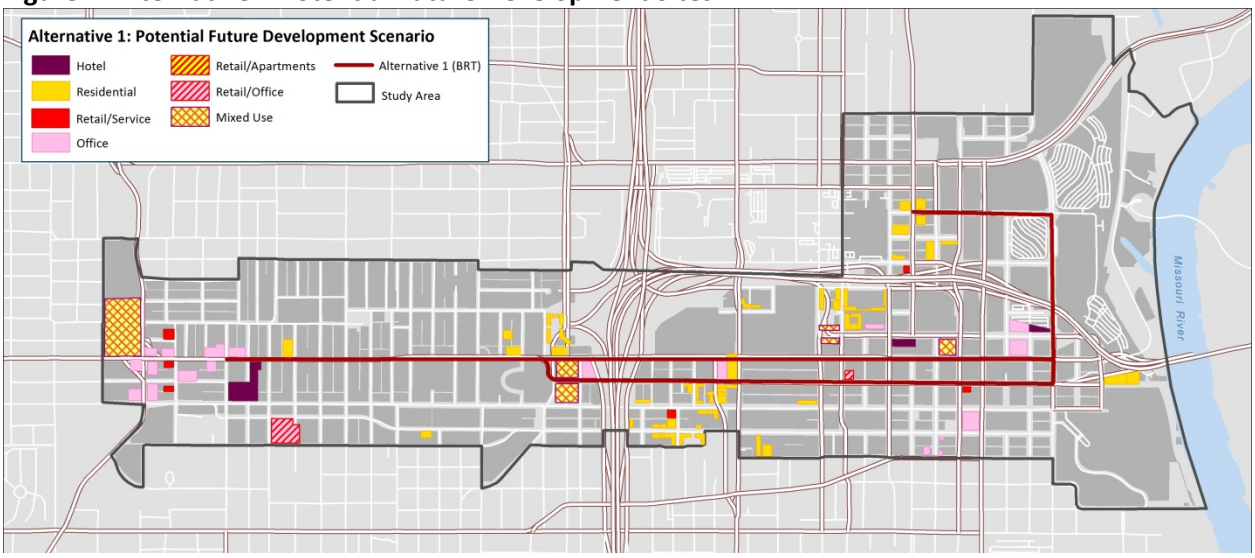
As previously stated, the "top-down" approach forecasts the amount of real estate demand that could be captured in the study areas based on regional market conditions for each transit alternative, while the "ground-up" approach estimates the capacity of sites within each study area to accommodate development based on physical conditions and policy decisions. This study reconciles these two approaches by assuming that they are mutually constraining, i.e., the amount of development that will occur in each alternative can exceed neither market demand nor site capacity. As a result, the lesser of the two numbers is always selected for each land use in each alternative. **Table 8** summarizes the results for each approach and the reconciled forecast of future development using this logic. Based on the reconciled forecast for each alternative, HDR revisited its sites susceptible to change and identified the sites most likely to be redeveloped. **Figure 7**, **Figure 8** and **Figure 9** highlight the sites corresponding to each transit alternative.

Table 8. Reconciled Forecast of Development for Each Transit Alternative

Land Use	Alternative 1			Alternative 2			Alternative 3		
	Market Demand	Site Capacity	Forecast	Market Demand	Site Capacity	Forecast	Market Demand	Site Capacity	Forecast
Residential	3,100	3,500	3,100	2,900	4,100	2,900	4,200	4,100	4,100
Office	3,300,000	4,800,000	3,300,000	3,300,000	5,900,000	3,300,000	5,400,000	5,900,000	5,400,000
Hotel	1,100	1,300	1,100	1,100	1,300	1,100	1,100	1,400	1,100
Retail/Service	341,000	1,300,000	341,000	336,000	1,600,000	336,000	490,000	1,600,000	490,000

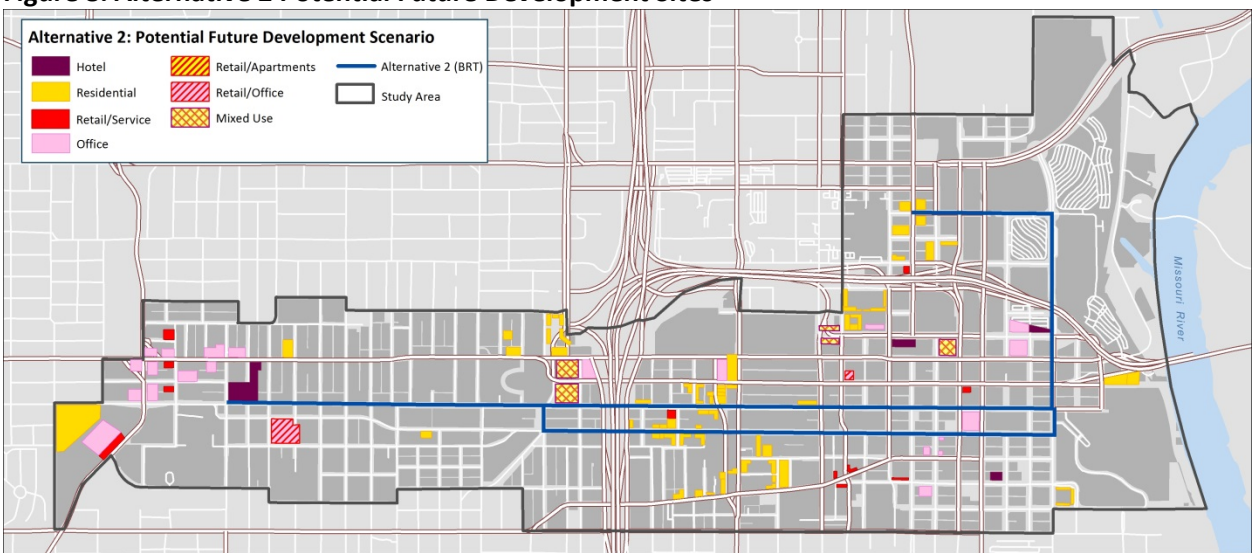
Source: HDR Engineering, Inc.; SB Friedman Development Advisors

Figure 7. Alternative 1 Potential Future Development Sites



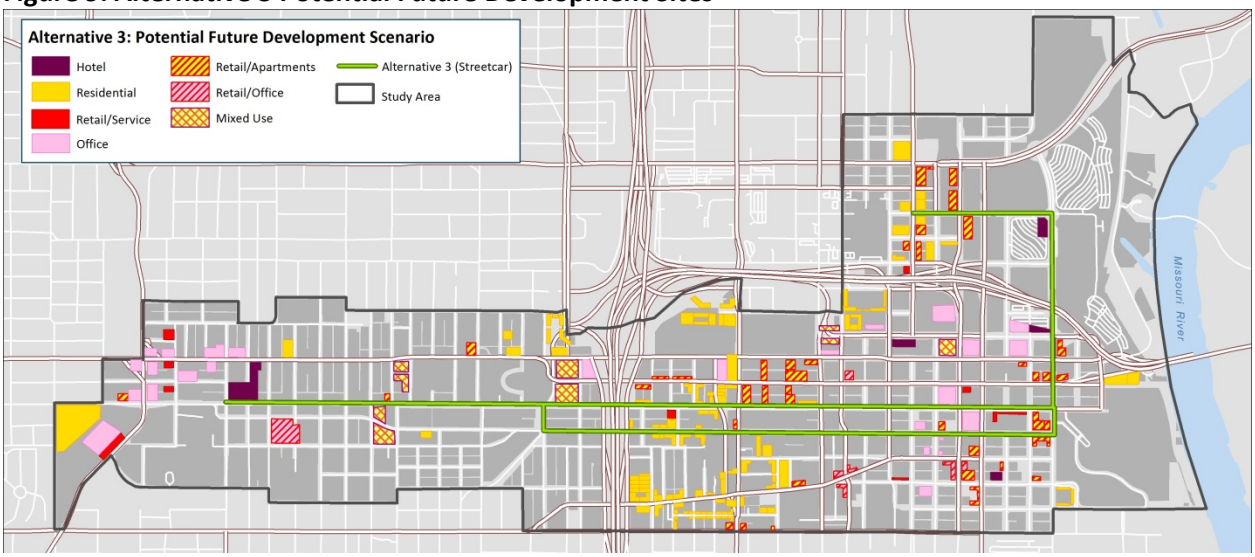
Sources: HDR Engineering, Inc.; SB Friedman Development Advisors

Figure 8. Alternative 2 Potential Future Development Sites



Sources: HDR Engineering, Inc.; SB Friedman Development Advisors

Figure 9. Alternative 3 Potential Future Development Sites



Sources: HDR Engineering, Inc.; SB Friedman Development Advisors

Conclusions

Based on the findings of *SB Friedman's* assessment, both streetcar and BRT alternatives are associated with greater development activity in the study areas compared to a no-transit alternative (see **Table 9**). Moreover, it is anticipated that the streetcar alternative may precede greater development than the BRT alternatives within the study areas. This could be due to differences in perceptions of quality, permanence, or other issues among members of the real estate community. There may also be real differences in service quality in the case study systems that were used to establish benchmarks for BRT and streetcar systems that we were unable to account for.

Table 9. Summary of Study Area Baseline and Alternative Development Forecasts

Land Use	Baseline	Alternative 1	Alternative 2	Alternative 3
Residential	2,000	3,100	2,900	4,100
Office	3,000,000	3,300,000	3,300,000	5,400,000
Hotel	1,100	1,100	1,100	1,100
Retail/Service	296,000	341,000	336,000	490,000

Source: SB Friedman Development Advisors

On that note, it is important to acknowledge that modern streetcar and BRT systems are still uncommon in the U.S. compared with more established systems (i.e., heavy rail, traditional bus and light rail), and our study methodology consequently relied on a small set of case studies to establish their development impacts. We attempted to control for differences in quality in our selection of case studies (for instance, by focusing on BRT systems with permanent stations, as well as dedicated lanes and signal prioritization on at least 50% of the route), but all systems are unique.

It is also worth observing that many of the case study transit systems were implemented in coordination with investments by other public agencies, major institutions and real estate interests. In Seattle, the South Lake Union streetcar was supported by Vulcan Inc., a major real estate owner in the affected neighborhood that subsequently attracted Amazon and other large firms to the area. In Cleveland, medical institutions and universities invested heavily in new facilities along the Healthline route, and streetscape improvements were a significant component of the project. In Portland, a development agreement with a key land owner provided higher minimum densities in exchange for key rights of way and a private contribution to the Local Improvement District that helped fund the streetcar. Such coordination may play a key role in the development realized by a new BRT or streetcar line.

Limitations

This memorandum is based on estimates, assumptions and other information developed from research of the market, secondary sources, and knowledge of the industry. The sources of information and bases of the estimates and assumptions are stated in the memorandum. Some assumptions inevitably will not materialize, and unanticipated events and circumstances may occur; therefore, actual results achieved during the period covered by our analysis will necessarily vary from those described in our report, and the variations may be material.

The terms of this engagement are such that we have no obligation to revise the memorandum or to reflect events or conditions which occur subsequent to the date of the memorandum. These events or conditions include, without limitation, economic growth trends, governmental actions, additional competitive developments, interest rates and other market factors. However, we are available to discuss the necessity for revision in view of changes in the economic or market factors affecting the proposed project.

Our study did not ascertain the legal and regulatory requirements applicable to this project, including zoning, other state and local government regulations, permits and licenses. No effort was made to determine the possible effect on this project of present or future federal, state or local legislation, including any environmental or ecological matters.

Furthermore, we neither evaluated management's effectiveness, nor are we responsible for future marketing efforts and other management actions upon which actual results will depend.

Our memorandum is intended solely for your information and for submission to economic development organizations, financial institutions and developers, and should not be relied upon by any other person, firm or corporation, or for any other purposes. Neither the memorandum nor its contents, nor any reference to our Firm, may be included or quoted in any offering circular or registration statement, appraisal, sales brochure, prospectus, loan or other agreement, or any document intended for use in obtaining funds from individual investors.

We acknowledge that our memorandum may become a public document within the meaning of the Freedom of Information Acts of the various governmental entities. Nothing in these terms and conditions is intended to block the appropriate dissemination of the document for public information purposes.

Appendix 1: Regional Residential, Office and Hotel Forecast Tables

Regional Residential Forecast

Population in Core Counties	2000	2005	2010	2015	2020	2025	2030
Douglas	463,585	486,929	511,227	532,354	550,918	567,702	583,538
Sarpy	122,595	139,371	156,696	174,201	191,540	208,441	224,709
Cass	24,334	25,734	27,733	30,037	32,600	35,385	38,381
Saunders	19,830	20,458	21,220	22,525	24,306	26,500	29,084
Washington	18,780	19,772	21,235	23,053	25,140	27,460	30,024
Harrison (IA)	15,666	15,884	16,242	16,753	17,386	18,102	18,885
Mills (IA)	14,547	15,284	16,213	17,164	18,100	18,999	19,879
Pottawattamie (IA)	87,704	89,738	92,378	95,111	97,943	100,850	103,872
Metro Population (Woods & Poole)	767,041	813,170	862,944	911,198	957,933	1,003,439	1,048,372
2010 Census-Adjusted Metro Population	767,175	834,401	865,350	913,739	960,604	1,006,237	1,051,295
Average Persons per Housing Unit	2.46	2.43	2.39	2.38	2.37	2.36	2.35
Housing Unit Forecast	311,601	344,058	362,327	383,924	405,318	426,371	447,360
15-Yr Change in Units	-	-	-	**72,323**	-	-	**63,436**

Sources: UNL Bureau of Business Economic Research; U.S. Census Bureau, SB Friedman Development Advisors

Regional Office Forecast

Assumptions	
Demolition Rate, 2008-2012 (actual)	0.61%
Demolition Rate, 2013+ (assumed)	0.40%

Year	Office Employment	Employees / 1000 SF	Occupied Office SF	Total Inventory SF	SF Demolished	SF New Deliveries	Vacant Office SF	Vacancy Rate
2002	118,082	3.37	35,072,829	37,511,047	150,044	**596,732**	2,438,218	6.5%
2003	120,965	3.43	35,300,693	37,957,735	151,831	**429,664**	2,657,041	7.0%
2004	120,406	3.44	34,985,545	38,235,568	152,942	**1,578,913**	3,250,023	8.5%
2005	121,070	3.35	36,191,154	39,661,539	158,646	**1,083,487**	3,470,385	8.75%
2006	123,959	3.37	36,832,139	40,586,380	162,346	**691,137**	3,754,240	9.25%
2007	126,549	3.45	36,710,475	41,115,171	249,909	**460,334**	4,404,696	10.7%
2008	128,842	3.49	36,888,856	40,801,267	748,029	**434,125**	3,912,411	9.6%
2009	125,028	3.29	37,969,966	41,797,142	-	**995,875**	3,827,176	9.2%
2010	125,598	3.24	38,800,199	42,235,908	203,888	**642,654**	3,435,709	8.1%
2011	128,111	3.31	38,671,136	42,320,413	73,827	**158,332**	3,649,277	8.6%
2012	130,593	3.34	39,063,654	42,394,063	247,948	**321,598**	3,330,409	7.9%
2013	132,673	3.35	39,603,732	43,000,795	172,003	**778,735**	3,397,063	7.9%
2014	136,659	3.40	40,193,855	43,594,203	174,377	**767,785**	3,400,348	7.80%
2015	142,554	3.49	40,846,509	44,230,112	176,920	**812,830**	3,383,604	7.65%
2016	148,519	3.57	41,601,943	44,975,073	179,900	**924,861**	3,373,130	7.50%
2017	152,863	3.61	42,403,043	45,766,911	183,068	**974,905**	3,363,868	7.35%
2018	155,940	3.61	43,196,750	46,548,222	186,193	**967,504**	3,351,472	7.20%
2019	158,976	3.62	43,976,896	47,312,422	189,250	**953,450**	3,335,526	7.05%
2020	162,100	3.62	44,779,071	48,149,538	192,598	**1,029,714**	3,370,468	7.00%
2021	165,214	3.63	45,576,141	49,006,604	196,026	**1,053,092**	3,430,462	7.00%
2022	168,341	3.63	46,413,219	49,906,687	199,627	**1,099,710**	3,493,468	7.00%
2023	171,325	3.63	47,210,031	50,763,474	203,054	**1,059,842**	3,553,443	7.00%
2024	174,146	3.63	47,960,798	51,570,751	206,283	**1,013,559**	3,609,953	7.00%
2025	176,838	3.63	48,675,441	52,339,184	209,357	**977,790**	3,663,743	7.00%
2026	179,526	3.64	49,388,119	53,105,505	212,422	**978,743**	3,717,385	7.00%
2027	182,183	3.64	50,091,503	53,861,831	215,447	**971,774**	3,770,328	7.00%
2028	184,806	3.64	50,784,894	54,607,413	218,430	**964,011**	3,822,519	7.00%
2029	187,394	3.64	51,467,596	55,341,501	221,366	**955,454**	3,873,905	7.00%
2030	189,942	3.64	52,138,915	56,063,350	224,253	**946,102**	3,924,434	7.00%

Sources: CoStar Group, Inc.; SB Friedman Development Advisors

Regional and Study Area Hotel Forecast

Year	Region		Study Area
	Inventory	New Units	New Units
2002	9,078	-	-
2003	9,078	133	-
2004	9,211	739	600
2005	9,950	185	-
2006	10,135	268	-
2007	10,403	604	139
2008	11,007	761	236
2009	11,768	1,041	114
2010	12,809	328	132
2011	13,137	102	-
2012	13,239	397	
2013	13,636	273	
2014	13,909	300	
2015	14,209	300	
2016	14,509	218	
2017	14,727	350	
2018	15,077	339	
2019	15,416	347	
2020	15,763	355	
2021	16,117	363	
2022	16,480	371	
2023	16,851	379	
2024	17,230	388	
2025	17,618	396	
2026	18,014	405	
2027	18,419	414	
2028	18,834	424	
2029	19,257	433	
2030	19,691	443	
Units Developed 2002-2011		**4,161**	**1,221**
Historical Study Area Capture Rate			**29%**
Forecast Capture Rate (No Convention Hotel)			**20%**
Projected Units (2015-2030)		**5,625**	**1,125**

Sources: Smith Travel Research; SB Friedman Development Advisors

Appendix 2: Retail Development Forecast Tables

Retail Spending Benchmarks

	2030 Spending Estimate (2013 $)		
Retail Category	Per Household	Per Office Worker	Per Regional Resident
Home Furnishings Stores	$97	$0	$0
Electronics & Appliance Stores	$545	$407	$0
Bldg Material & Supplies Dealers	$299	$0	$0
Food & Beverage Stores	$2,377	$1,172	$0
Health & Personal Care Stores	$1,167	$764	$39
Clothing & Clothing Accessories Stores	$819	$591	$15
Sporting Goods/Hobby/Musical Instr Stores	$229	$162	$0
Book, Periodical & Music Stores	$125	$0	$0
Miscellaneous Store Retailers	$242	$854	$0
Food Services & Drinking Places	$1,778	$1,582	$121
Total	$7,678	$5,532	$174

Sources: ESRI Business Analyst; ICSC; SB Friedman Development Advisors

Baseline Forecast

Assumptions	
Number of New Residents	2,000
Number of New Office Workers	9,700
Number of New Regional Residents	137,556

Retail Category	2030 Spending Estimate (2013 $)					
	Household Total	Office Worker Total	Region Total	Total Spending	Sales/ SF	SF
Home Furnishings Stores	$193,344	$0	$0	$193,344	$138	1,404
Electronics & Appliance Stores	$1,090,479	$3,951,787	$0	$5,042,266	$327	15,421
Building Material & Supplies Dealers	$598,179	$0	$0	$598,179	$156	3,828
Food & Beverage Stores	$4,753,641	$11,367,132	$0	$16,120,773	$511	31,524
Health & Personal Care Stores	$2,334,246	$7,409,601	$5,310,601	$15,054,448	$465	32,397
Clothing & Accessories Stores	$1,637,314	$5,732,389	$1,996,254	$9,365,957	$168	55,634
Sporting Goods/Hobby/Musical Instrument Stores	$458,579	$1,568,078	$0	$2,026,657	$216	9,391
Book, Periodical & Music Stores	$250,242	$0	$0	$250,242	$266	940
Miscellaneous Stores	$484,222	$8,288,414	$0	$8,772,636	$235	37,320
Food Services & Drinking Places	$3,555,365	$15,341,894	$16,598,364	$35,495,623	$329	108,050
Total	**$15,355,612**	**$53,659,294**	**$23,905,218**	**$92,920,124**		**295,909**

Sources: ESRI Business Analyst; ICSC; ICSC & ULI; SB Friedman Development Advisors; UNL Bureau of Business Economic Research

Alternative 1 (BRT)

Assumptions	
Number of New Residents	3,100
Number of New Office Workers	10,742
Number of New Regional Residents	137,556

Retail Category	2030 Spending Estimate (2013 $)					
	Household Total	Office Worker Total	Region Total	Total Spending	Sales/ SF	SF
Home Furnishings Stores	$299,684	$0	$0	$299,684	$138	2,177
Electronics & Appliance Stores	$1,690,242	$4,376,095	$0	$6,066,337	$327	18,553
Building Material & Supplies Dealers	$927,177	$0	$0	$927,177	$156	5,933
Food & Beverage Stores	$7,368,144	$12,587,633	$0	$19,955,777	$511	39,023
Health & Personal Care Stores	$3,618,082	$8,205,178	$5,310,619	$17,133,878	$465	36,872
Clothing & Accessories Stores	$2,537,837	$6,347,882	$1,996,260	$10,881,979	$168	64,640
Sporting Goods/Hobby/Musical Instrument Stores	$710,797	$1,736,445	$0	$2,447,242	$216	11,340
Book, Periodical & Music Stores	$387,875	$0	$0	$387,875	$266	1,457
Miscellaneous Store Retailers	$750,544	$9,178,350	$0	$9,928,894	$235	42,239
Food Services & Drinking Places	$5,510,816	$16,989,171	$16,598,419	$39,098,406	$329	119,017
Total	**$23,801,198**	**$59,420,753**	**$23,905,298**	**$107,127,250**		**341,250**

Sources: ESRI Business Analyst; ICSC; ICSC & ULI; SB Friedman Development Advisors; UNL Bureau of Business Economic Research

Alternative 2 (BRT)

Assumptions	
Number of New Residents	2,900
Number of New Office Workers	10,742
Number of New Regional Residents	137,556

Retail Category	2030 Spending Estimate (2013 $)					
	Household Total	Office Worker Total	Region Total	Total Spending	Sales/ SF	SF
Home Furnishings Stores	$280,349	$0	$0	$280,349	$138	2,036
Electronics & Appliance Stores	$1,581,194	$4,376,095	$0	$5,957,289	$327	18,219
Building Material & Supplies Dealers	$867,359	$0	$0	$867,359	$156	5,550
Food & Beverage Stores	$6,892,780	$12,587,633	$0	$19,480,413	$511	38,093
Health & Personal Care Stores	$3,384,657	$8,205,178	$5,310,619	$16,900,454	$465	36,370
Clothing & Accessories Stores	$2,374,106	$6,347,882	$1,996,260	$10,718,248	$168	63,667
Sporting Goods/Hobby/Musical Instrument Stores	$664,939	$1,736,445	$0	$2,401,384	$216	11,128
Book, Periodical & Music Stores	$362,851	$0	$0	$362,851	$266	1,363
Miscellaneous Store Retailers	$702,122	$9,178,350	$0	$9,880,472	$235	42,033
Food Services & Drinking Places	$5,155,279	$16,989,171	$16,598,419	$38,742,869	$329	117,935
Total	**$22,265,637**	**$59,420,753**	**$23,905,298**	**$105,591,688**		**336,394**

Sources: ESRI Business Analyst; ICSC; ICSC & ULI; SB Friedman Development Advisors; UNL Bureau of Business Economic Research

Alternative 3 (Streetcar)

Assumptions	
Number of New Residents	4,200
Number of New Office Workers	17,577
Number of New Regional Residents	137,556

Retail Category	2030 Spending Estimate (2013 $)					
	Household Total	Office Worker Total	Region Total	Total Spending	Sales/ SF	SF
Home Furnishings Stores	$406,023	$0	$0	$406,023	$138	2,949
Electronics & Appliance Stores	$2,290,006	$7,160,883	$0	$9,450,888	$327	28,904
Building Material & Supplies Dealers	$1,256,175	$0	$0	$1,256,175	$156	8,038
Food & Beverage Stores	$9,982,646	$20,597,946	$0	$30,580,592	$511	59,800
Health & Personal Care Stores	$4,901,917	$13,426,655	$5,310,619	$23,639,191	$465	50,871
Clothing & Accessories Stores	$3,438,360	$10,387,443	$1,996,260	$15,822,063	$168	93,984
Sporting Goods/Hobby/Musical Instrument Stores	$963,015	$2,841,455	$0	$3,804,470	$216	17,629
Book, Periodical & Music Stores	$525,508	$0	$0	$525,508	$266	1,974
Miscellaneous Store Retailers	$1,016,866	$15,019,118	$0	$16,035,985	$235	68,220
Food Services & Drinking Places	$7,466,267	$27,800,461	$16,598,419	$51,865,147	$329	157,879
Total	**$32,246,785**	**$97,233,960**	**$23,905,298**	**$153,386,043**		**490,248**

Sources: ESRI Business Analyst; ICSC; ICSC & ULI; SB Friedman Development Advisors; UNL Bureau of Business Economic Research

ECONOMIC COMPETITIVENESS - SHORT TERM JOB CREATION

Analysis Year	Base Capital Cost in Constant Dollars	Short Term Job Years Created	Value of Short Term Jobs	3% Discount	7% Discount	
2014	$15,291,500	199	$8,377,157	$8,133,162	$7,829,119	
2015	$15,291,500	199	$8,377,157	$7,896,274	$7,316,933	
2016	0	0	0	$0	$0	
2017	0	0	0	$0	$0	
2018	0	0	0	$0	$0	
2019	0	0	0	$0	$0	
2020	0	0	0	$0	$0	
2021	0	0	0	$0	$0	
2022	0	0	0	$0	$0	
2023	0	0	0	$0	$0	
2024	0	0	0	$0	$0	
2025	0	0	0	$0	$0	
2026	0	0	0	$0	$0	
2027	0	0	0	$0	$0	
2028	$4,400,000	57	$2,410,456	$1,547,180	$873,660	* purchase of replacement vehicles
2029	0	0	0	$0	$0	
2030	0	0	0	$0	$0	
2031	0	0	0	$0	$0	
2032	0	0	0	$0	$0	
2033	0	0	0	$0	$0	
2034	0	0	0	$0	$0	
2035	0	0	0	$0	$0	
				$17,576,616	$16,019,712	

Table 1 - Average Omaha-Council Bluffs Metro Area Construction Worker Wage

All Jobs - Mean Salary	$20.26
Hours worked per year	2,080
Average yearly salary	$42,140.80

NOTES:

1.) Short term jobs were estimated using by dividing the capital expenditure by $76,923 to determine job years. This number was provided in the *Notice of Funding Availability for the Department of Transportation's National Infrastructure Investments under the Consolidated and Further Continuing Appropriations Act, 2013 (NOFA)* .

APPENDIX D: Project Capital Budget Using SCC Format

Central Omaha Bus Rapid Transit:

Connecting the Dots

2014 TIGER Application

Central Omaha Transit Alternatives Analysis (AA)
Capital Cost Estimate (All Costs Shown in Thousands)

						Alternative 2 Modified BRT Contraflow	
SCC	Item	Unit Cost (2013)	Unit	Contingency	Escalation to Construction	Quantity	Amount
10	**GUIDEWAY & TRACK ELEMENTS**						**5040.00**
10.02	Guideway: At-grade semi-exclusive (BRT)	$ 2,000	Per mile	20%	0%	*1.50*	*3600.00*
10.03	Guideway: At-grade mixed traffic (BRT)	$ 75	Per stop	20%	0%	*16*	*1440.00*
20	**STATIONS, STOPS, TERMINALS, INTERMODAL**						**10560.00**
20.01	At-grade stop: Large	$ 400	Per stop	20%	0%	*12*	*5760.00*
20.01	At-grade stop: Small	$ 250	Per stop	20%	0%	*16*	*4800.00*
40	**SITEWORK & SPECIAL CONDITIONS**						**430.10**
40.06	Pedestrian/bike access and accommodation, landscaping	$ 25	Per mile	10%	0%	*15.64*	*430.10*
50	**SYSTEMS**						**3204.00**
50.02	Traffic signals: Full replacement	$ 150	Per intersection	20%	0%	*2*	*360.00*
50.02	Traffic signals: Major modifications	$ 50	Per intersection	20%	0%	*10*	*600.00*
50.02	Traffic signals: Minor modifications	$ 15	Per intersection	20%	0%	*4*	*72.00*
50.02	Traffic signal priority	$ 30	Per intersection	10%	0%	*16*	*528.00*
50.05	Communications	$ 50	Lump sum	20%	0%	*1*	*60.00*
50.06	Fare collection system and equipment	$ 40	Per unit	10%	0%	*36*	*1584.00*
	CONSTRUCTION SUBTOTAL (10-50)						*19234.10*
60	**RIGHT-OF-WAY, LAND, EXISTING IMPROVEMENTS**						**300.00**
60.01	Purchase or lease of real estate: Curb cuts and substations	$ 50	Each	20%	0%	*5*	*300.00*
70	**VEHICLES**						**4400.00**
70.04	Bus	$ 500	Per bus	10%	0%	*8*	*4400.00*
80	**PROFESSIONAL SERVICES**						**5193.21**
80.02	Final design	8%	Lump sum				*1538.73*
80.03	Program management for design and construction	6%	Lump sum				*1154.05*
80.04	Construction administration and management	6%	Lump sum				*1154.05*
80.05	Professional liability	3%	Lump sum				*577.02*
80.06	Legal, permits, review fees	1%	Lump sum				*192.34*
80.07	Survey, testing, investigation, inspection	1%	Lump sum				*192.34*
80.08	Start up	2%	Lump sum				*384.68*
	SUBTOTAL (10-80)						**29127.31**
90	**PROJECT RESERVE (UNALLOCATED CONTINGENCY)**	**5%**					**1456.37**
	SUBTOTAL (10-90)						**30583.67**
100	**FINANCE CHARGES**						
	TOTAL (10-100)						**30583.67**
	COST PER MILE					7.82	**3910.96**

General Assumptions

Distances do not distinguish between route mile and track mile
Distances used are the same as the O&M cost estimate
Assumes cost for two-way conversion of Farnam St between 42nd and 36th St is paid for by others
Assumes maintenance and storage facility location to be determined in Phase 2

Stop Hierarchy

Stop	BRT
Westroads TC	n/a
90th/Dodge	S
84th/Dodge	S
72nd/Dodge	L
62nd/Dodge	S
50th/Dodge	S
42nd/Farnam	L
36th/Farnam	S
33rd/Farnam	L
31st/Farnam	L
24th/Farnam/Harney	S
20th/Farnam/Harney	S
16th/Farnam/Harney	L
13th/Farnam/Harney	L
11th/Farnam/Harney	S
Total	
L = Large	12
S = Small	16

Fare Collection

Stop	BRT
Westroads TC	2
90th/Dodge	2
84th/Dodge	2
72nd/Dodge	2
62nd/Dodge	2
50th/Dodge	2
42nd/Farnam	2
36th/Farnam	2
33rd/Farnam	4
31st/Farnam	2
24th/Farnam/Harney	2
20th/Farnam/Harney	2
16th/Farnam/Harney	4
13th/Farnam/Harney	4
11th/Farnam/Harney	2
Total	**36**

Traffic Signals

Intersection	BRT
72nd/Dodge	L
42nd/Farnam	L
31st	S
Freeway #1	S
Freeway #2	S
24th Ave/Farnam/Harney	F
24th St/Farnam/Harney	F
20th/Farnam	L
19th/Farnam	L
18th/Farnam	L
17th/Farnam	L
16th/Farnam	L
15th/Farnam	L
14th/Farnam	L
13th/Farnam	L
10th/Farnam/Harney	S
Total	
F = Full Replacement	2
L = Major modification	10
S = Minor modification	4

Traffic Signal Priority

Intersection	BRT
90th/Dodge	T
84th/Dodge	T
72nd/Dodge	T, Q
62nd/Dodge	T
Farnam/Happy Hollow/Dodge	T
50th/Dodge	T
42nd/Farnam	T, Q
33rd/Farnam	T
31st/Farnam	T
Freeway #1	T
Freeway #2	T
24th/Farnam/Harney	T
20th/Farnam/Harney	T
16th/Farnam/Harney	T
13th/Farnam/Harney	T
10th/Farnam/Harney	T
Total	
T = Traffic Signal Priority	16
Q = Queue Jump	2

Central Omaha Bus Rapid Transit: Connecting the Dots

Project Budget by Funding Source (thousands)

	TIGER	CMAQ	STP	TAP	DTTC	Crossroads	5339	Local	Total
Guideway	$3,032.00	$1,000.00						$1,008.00	$5,040.00
Stations, Stops, Terminals	$6,776.10			$391.90	$640.00	$640.00		$2,112.00	$10,560.00
Sitework & Special Conditions - Pedestrian and Bicycle Access &	$0.00			$344.08				$86.02	$430.10
Systems – Traffic Signals, Communications, Fare collection	$2,371.20				$64.00	$128.00		$640.80	$3,204.00
ROW – Curb cuts and substations	$240.00							$60.00	$300.00
Professional Services – Design, construction management, geotechnical survey	$4,154.57							$1,038.64	$5,193.21
Vehicles	$853.00		$1,707.00				$960.00	$880.00	$4,400.00
Project Reserve	$1,165.10							$291.27	$1,456.37
Totals	$18,591.96	$1,000.00	$1,707.00	$735.98	$704.00	$768.00	$960.00	$6,116.74	$30,583.68

APPENDIX E: Summary of Complementary Studies and Projects

Central Omaha Bus Rapid Transit:

Connecting the Dots

2014 TIGER Application

SUMMARY: Complementary Studies

For the last 10 years, Metro, in partnership with the City of Omaha and MAPA, has been evaluating and implementing enhanced transit alternatives to address congestion and housing-jobs linkage gaps present in the area. Successfully implemented projects over the last six years include:

- New express service route from west Omaha to downtown Omaha providing improved connectivity to residential areas and jobs in the urban core while reducing congested along the Dodge Street corridor;
- Route alignment to provide a one-seat ride fixed route service connecting two major transit centers, providing more direct connections to multi-directional travel;
- Increased frequencies to the Dodge Street corridor fixed route service; currently, 11 percent of Metro weekday passenger trips are on the Dodge Street service;

Coincidental with these new services, we've similarly partnered to fund two major studies identifying strategic policies, procedural requirements, regulatory initiatives and infrastructure investments for premium transportation alternatives that would greatly enhance transit capacity, reduce travel time for transit users, and create competitive alternatives for choice riders. Additionally, study findings recommended the need to improve transit connections to areas immediately adjacent to the downtown core, commonly called Midtown and extended west along the Dodge Street corridor, serving the University of Nebraska Medical Center (UNMC), University of Nebraska at Omaha, Crossroads Redevelopment Area, Methodist and Children's medical complexes and Westroads Mall.

Central Omaha Alternative Analysis

The Central Omaha Transit Alternatives Analysis, a two-year process, was conducted to evaluate the best transit options to provide a safe, efficient, economical, attractive, and integrated transit system that offers convenient, accessible, and affordable mobility within Omaha's urban core.

Initial study boundaries included the Missouri River on the east, 72nd Street on the west, Cuming Street on the north, and Center Street on the south. Ultimately 72nd Street on the west and Center Street on the south were eliminated from the study as the areas could be served by other connections within the existing Metro bus system.

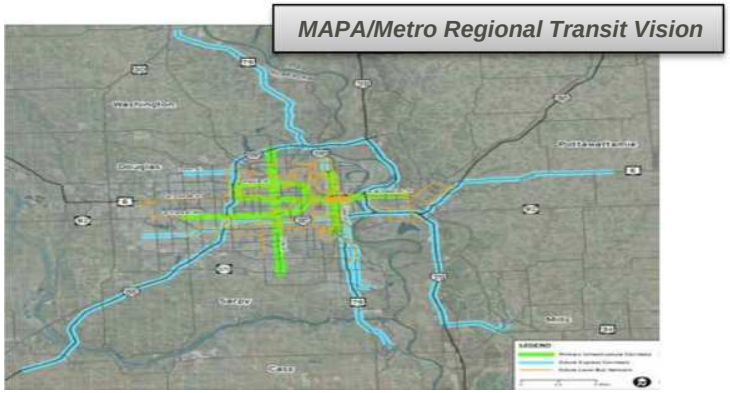
Evaluation and public participation identified the Locally Preferred Alternative (LPA), a combination of a bus rapid transit (BRT) and urban circulator (modern streetcar) to serve the central Omaha area. The BRT was extended to the Westroads Mall Transit Center based on public input.

Metro is preparing to initiate preliminary engineering and NEPA evaluation on the LPA. The preparation of all NEPA documentation and 30% engineering plans will be completed in August 2015.

MAPA/Metro Regional Transit Vision

The Regional Transit Vision is one component of the MAPA Heartland 2050 Regional Vision

An analysis of Metro's current and anticipated needs for public transit service in the region was conducted identifying opportunities for near term efficiency and long-term service improvements that leverages transportation investment to fulfill broader and multifaceted goals. System design is recommended to focus on incremental system growth, with a combination of "leading" demand in the core area inside I-680 (encouraging and supporting density) and "following" demand in outlying areas, focusing on key existing and emerging "nodes" of higher density.



Furthermore, a number of other studies and plans in the project area have identified a need for improved transit and developed specific concepts to improve the urban fabric of our community at large and at specific nodes along the proposed BRT route. These plans and their implementation have direct, concrete impacts on the viability of transit, an improved pedestrian environment and development along this corridor.

MAPA Heartland 2050 Regional Vision *(Ongoing)*

Funded by a HUD Sustainable Community grant, "Heartland 2050", a long-range visioning process for the Omaha-Council Bluffs Metropolitan Statistical Area, is being conducted by MAPA. A consortium of over 300 regional partners is developing a regional plan addressing land use, housing, transportation, infrastructure, economic development and public health.

Source: Heartland

Omaha Transportation Master Plan Update *(2012)*

The Transportation Element ("TE") of the Omaha Master Plan provides a blueprint for building a transportation system, including BRT, where there are balanced options on how to get around, such as roads, paths, and sidewalks that contribute to safe and healthy environments, infrastructure to improve livability and connectivity in Omaha's neighborhoods, and fiscally sustainable investments with sound economic returns.

The TE is driven by four community goals developed throughout the planning process:

1. Provide balanced options for enhanced mobility;

2. Attain a safe and healthy environment;
3. Create livable and connected neighborhood;
4. Promote economic returns with fiscal sustainability;

Durham Research Towers at UNMC

S-Curve Area Connectivity Project *(Ongoing)*

Concept evolved from the Destination Midtown Master Plan

Developing and evaluating alternatives to reconfigure the Dodge Street "S" curve near Turner Park where two-way Dodge Street transitions to the one-way Dodge/Douglas Street one-way couplet. Preferred Alternative will include an Environmental Assessment and Preliminary Design.

S-Curve - Connectivity Project Study Area

Harney Street Bicycle Study *(Ongoing)*

As part of the Omaha Transportation Master Plan, the Harney Street Bikeway ranked first of 266 possible street, trail or other transportation projects. The plan calls for converting one eastbound lane of the current four vehicular lanes of traffic to a trail, set off by a landscaped median, designated for walking, biking and to connect Downtown, Midtown Crossing, and UNMC.

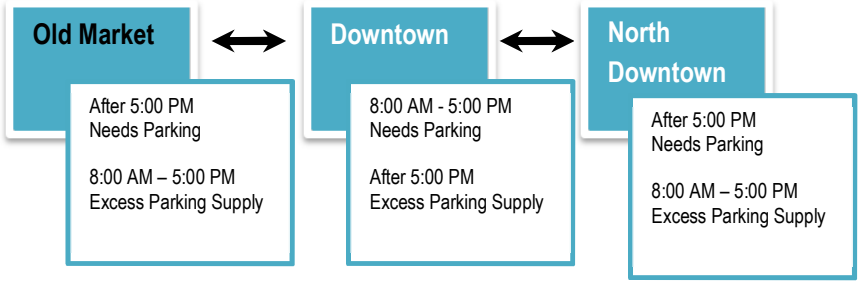
Developing the Cycle Track on Harney Street, which is one block south of the BRT, will facilitate multi-modal trip chaining.

Harney Cycletrack Concept
Omaha Transportation Master Plan

Example Cycletrack - Seattle, WA

Omaha Downtown Parking Management Plan *(2011)*

Findings revealed downtown parking plentiful with an inventory primarily consisting of on-street metered parking and mostly publically owned garages.

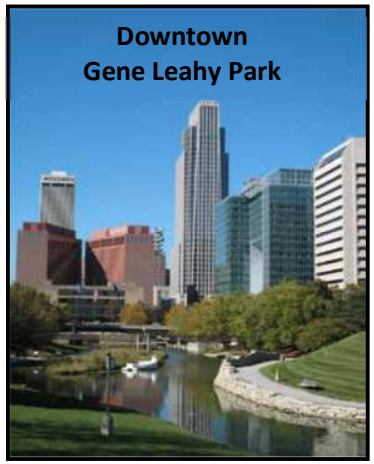


However, locations and pricing is disproportionate with garages having plenty of availability versus on-street metered parking which is in in high demand.
The metered parking contributes to unnecessary vehicle circulation as the public searches for closer access to their destinations. Compounding the problem is fee-free parking during prime times (weekday evenings and weekends).

The garages, in low demand, have affordable monthly and hourly rates and are located near entertainment / restaurants, city and county facilities and special event venues. One factor contributing to the low demand is not offering reduced pricing or fee-free parking at any time.

Omaha Master Plan Environment Element *(2010)*

The Environment Element (EE) of the *Omaha Master Plan* is a guide for City actions and policies and a vision for long-term environmental health and sustainability.



Development of the EE more comprehensively incorporates the issues to serve the purposes called for in the City Charter, which include establishing policies, goals, and standards as a general guide for physical development.

The EE's Urban Form and Transportation category provides direction for Omaha to substantially reduce its impact on the environment and the per capita cost of critical infrastructure and municipal services to increase its level of urban quality and community health by supporting an efficient city form with a balanced transportation network that increased the role of low impact and active transportation modes in providing access to all parts of the city.

Urban Form and Transportation Goals:

1. *Large-Scale City Form*: Develop a city form that both reduces the per capita cost of providing city services and establishes the density necessary to support more energy efficient forms of transportation.
2. *Land Use and Development Policy*: Generate development at higher residential densities and true mixed uses that produce more diverse environments and reduce the number of necessary automobile trips.
3. *Land Development*: Create individual developments with components that are connected, walkable, and accessible to all modes of transportation, by providing safe, defined, and pleasant routes from the public realm to destinations.
4. *Transportation Network*: Develop a transportation network that moves people and freight within and through the metropolitan area efficiently, maximizing access and minimizing vehicle miles traveled, energy consumed, and pollutants emitted.
5. *Transit*: Develop a public transportation system that offers a degree of coverage, convenience, and amenity, that both provides transportation equity for dependent customers and makes transit an attractive option for discretionary passengers.

6. *Active Transportation*: Provide a high level of citywide access and continuity to pedestrians and bicyclists, making active transportation a realistic and integral part of the city's transportation network.

As adopted by the Omaha City Council, success is measured by achieving the following measurements toward sustainability by 2030:

1. Omaha's population density will grow to 4,500 people per square mile. The current population density is 3,489 people per square mile. As a point of comparison, the population density was 6,171 people per square mile in 1950.
2. Ten percent of all trips in Omaha will be made by active transportation modes (pedestrian, bicycle, and public transportation). Today, about 2 percent of all trips and 4.4 percent of commute trips are made by these modes.
3. Fewer than 65 percent of all work commuting trips will be made in single-occupant automobiles by 2030. Currently, about 82 percent of commuting trips are made in single occupancy automobiles.
4. Decrease per capita motor vehicle miles traveled by Omaha motorists by 10 percent.

Downtown Omaha Master Plan *(2009)*

Developed by the City of Omaha and Heritage Services, the Plan, encompassing a 2.2 square mile area, laid out an ambitious, but achievable vision through 2030 to make the Downtown area a world class place to live, work, play and provide a resources for residents and workers, regional visitors, and tourists. Incorporated are specifics related to the need for a modern, multimodal, Downtown transit center.

Approved by the Omaha City Council, the Plan's Ten Downtown Principles say the Downtown should:

1. Be the dominant economic engine for the region;
2. Be a great place to live, work, play, visit, and learn;
3. Be home to the unique civic and cultural resources of the region;
4. Have distinct neighborhoods, districts and corridors;
5. Be urban;
6. Have a comprehensive system of integrated, diverse open spaces for public use;
7. Be a multi-modal environment where one can live everyday life without using a car;
8. Comprise a series of integrated "park once" districts;
9. Be a model of sustainable urbanism;
10. Strive to cultivate a culture of design excellence;

North Downtown: Omaha's New Urban Neighborhood *(2005)*

The study, encompassing an 80-block area, established a redevelopment plan for Omaha's Downtown area "front door" from I-480 and Eppley Airfield. Managed by the City of Omaha and approved by the Omaha City Council, the study focused on strategic policies, procedural requirements, regulatory initiatives, and infrastructure

investments. The planning process reviewed public and private sector initiatives and actions necessary to initiate and propel the desired level of redevelopment activity. Additionally, it examined a variety of potential build-out scenarios and ultimately created a comprehensive implementation strategy to move the plan from vision to reality.

In 2009, many of the goals and objectives established during for this plan were incorporated as part of the Downtown Omaha Master Plan.

TD Ameritrade Park, North Downtown, hosts NCAA Men's College World Series

Destination Midtown Plan *(2005)*

The Destination Midtown vision represents a unique partnership of public and private interests working together to make Midtown a destination of choice in Omaha. Using the vision as a guide throughout the planning process, recommendations incorporate a comprehensive framework for the resurgence of Midtown. The *Destination Midtown Plan* was funded by the Greater Omaha Chamber (GOC) and approved by the Omaha City Council. Originally, managed by a board to provide plan oversight, the GOC created a position to manage the area, program implementation and prioritize neighborhood, economic and transportation / corridor development and vision realization.

Improved quality of life and environmental goals associated to neighborhood development, walkability for nearby residences, and community activities have been achieved.

SUMMARY: Complementary Projects

Service Improvements Implementation

Metro is in the Public Participation phase of proposed transit service improvements. Implementation is scheduled during the fourth quarter 2014 or first quarter 2015. The estimated timeframe accommodates the potential proposal revisions based on public comments and suggestions which may require additional public meetings prior to approval by Metro's Board of Directors.

Proposed service improvements include realignment of routes, route segment elimination, increased route frequencies and hours of service by day type (weekday, Saturday and Sunday). The Regional Transit Vision Study (Study) and Central Omaha Alternative Analysis (AA) findings and recommendations were instrumental in the development of the proposals.

The Study's Network Evolution Plan recommends identifying a balance between service coverage and frequencies, focusing on key, transit supportive corridors where frequent service can support increased ridership.

Additionally, onboard, online and social media survey findings completed as part of AA findings which had increased frequencies and additional service hours on weekdays and weekends ranked highly.

Service improvement implementation aligns Metro's service network for the integration with the Dodge Street BRT service.

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Metro Fare Collection Equipment Upgrade

On Monday, November 11th, 2013 upgraded electronic fare collection equipment was introduced on the entire fleet (bus and ADA paratransit vehicles), replacing a 23 year-old onboard system with outdated technology and increasing mechanical failures.

The upgraded equipment is more customer-friendly with additonal fare media options includiong issuing a Value Card for fare over payment and "Smart" card compatible.

The BRT stations will have pre-boarding fare collection reducing boarding and alighting delay (dwell time) which assists in predictable travel speeds and overall travel-time competitiveness.

When introduced, Smart cards will be compatible with the entire Metro fleet and the BRT station fare collection equipment.

Existing Metro Intelligent Systems

- Metro Transit's website, www.ometro.com includes Google Maps Trip Planning and Language Translation.
- Installed on all the revenue vehicles is a state-of the-art video and voice Surveillance System with five cameras (four interior and one exterior) which can provide "Real-Time" information, if needed. BRT vehicles will have like equipment.

Planned Metro Intelligent Systems

The following intelligent systems have been explored. Planned procurement is within the next 12 months. Metro has over $1,000,000 in grant funding for the projects for the system that will complement the BRT.

- **Automated Vehicle Location (AVL)**

  AVL is an automated vehicle tracking system using navigation technologies such as Global Positioning System (GPS).

  It not only determines the location of a specific revenue vehicle and predicts its arrival, but, is integral in the functionality of the following systems.

- **Real Time Information**

  Electronic display of a vehicle arrival time to be installed at transit centers and BRT stations have a significant positive impact on passengers. They have been identified as a key component in reductions in wait time uncertainty, increased sense of security and increasing overall satisfaction with transit by instilling confidence and comfort by helping passengers reach destinations and transfer connections most efficiently.

- **Automated Passenger Counters**

  The onboard recording equipment documents passenger boardings and alightings at each stop. This application is a valuable tool to evaluate individual route performance and to improve the systems level of performance.

- **Stop Voice Annunciation**

  AVL automatically produces internal and external stop announcements which are an Americans with Disabilities Act requirement and currently a task performed by Metro drivers.

Transit Centers

Metro has two transit centers currently in project development that are being designed with considerations for the BRT. These transit centers are both along the BRT route and are being planned for the Crossroads area at 72 and Dodge Streets and in Downtown Omaha.

The planned transit center at Crossroads will include multimodal on-street transfer facilities that are designed to operate as one of the BRT station pairs. The transit facility also incorporates signal modification and traffic prioritization at this busy intersection. The planned transit center in downtown Omaha also includes accommodations for a BRT station pair in its design.

Both transit centers, anticipated to be completed in 2015 or early 2016, will allow for ease of transfer activity between the BRT and local routes without the need for out of direction travel.

APPENDIX F: Alternative Analysis Final Report

Central Omaha Bus Rapid Transit:

Connecting the Dots

2014 TIGER Application

Central Omaha TRANSIT ALTERNATIVES ANALYSIS

Final Draft

April 2014

metro

ACKNOWLEDGEMENTS

Metro

City of Omaha

Metropolitan Area Planning Agency

Federal Transit Administration

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Omaha Public Power District

Metropolitan Utilities District

City of Omaha

Omaha Downtown Improvement District

Metropolitan Area Planning Agency (MAPA)

Metro Transit

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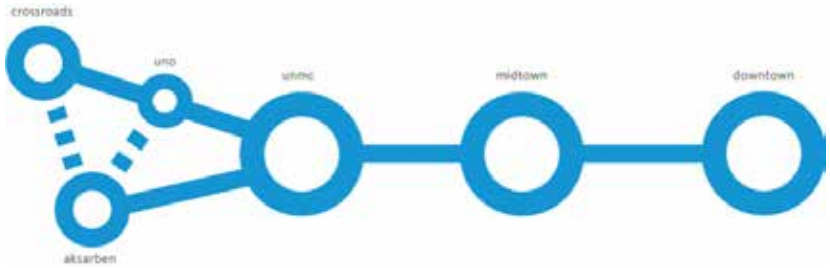
EXECUTIVE SUMMARY

This document describes the process by which a Locally Preferred Alternative (LPA) was selected for the Central Omaha Transit Alternative Analysis (AA) Study.

The study is led by Metro in partnership with the City of Omaha and the Metropolitan Area Planning Agency (MAPA). The study considers urban circulator transit alternatives to connect activity centers and neighborhoods in Central Omaha while tying together the regional transit network to improve mobility and aid employment growth and economic development.

The study strives to address the challenges of navigating an under-connected corridor by providing a transportation connection between the following districts: Downtown, Midtown, University of Nebraska Medical Center (UNMC), University of Nebraska at Omaha (UNO), and the Crossroads and Aksarben Village areas.



Locally Preferred Alternative

The LPA includes a 7.98-mile Bus Rapid Transit (BRT) line between Downtown, Midtown, UNMC, UNO, Crossroads, and Westroads, as well as a 3.22-mile Modern Streetcar line between North Downtown, Downtown, Midtown, and UNMC.

The LPA recommendation follows a two-year study to develop and evaluate transit alternatives in Central Omaha. The project included extensive public engagement, stakeholder involvement, and one-on-one meetings.

Table ES-1 Locally Preferred Alternative (Combined Alternative)

Feature	Locally Preferred Alternative	
	Bus Rapid Transit	Modern Streetcar
East terminus	Downtown (10th St/Farnam/ Harney)	North Downtown (12th St/ Fahey)
West terminus	Westroads Transit Center	UNMC (42nd St/Farnam)
Alignment between 31st and 10th St	Farnam/Harney Couplet or Farnam Contraflow	Farnam/Harney Couplet or Farnam Contraflow
Frequency (peak/off-peak/evening)	10/15/20 minutes	10/15/20 minutes
Daily operating hours (M-F/Sat/Sun)	19/18/12 hours	19/18/12 hours
Distance	7.98 miles	3.22 miles
Vehicle travel time	26:59	15:24
Vehicle requirement (peak/total)	6/8 buses	4/5 streetcars
Capital cost ($2013) couplet / contraflow	$34,466,000 / $39,185,000	$134,457,000 / $133,844,000
Capital cost per mile ($2013) couplet / contraflow	$4,319,000 / $5,011,000	$41,757,000 / $43,740,000
Annual O&M cost ($2013)	$3,008,844	$6,347,246

Purpose and Need

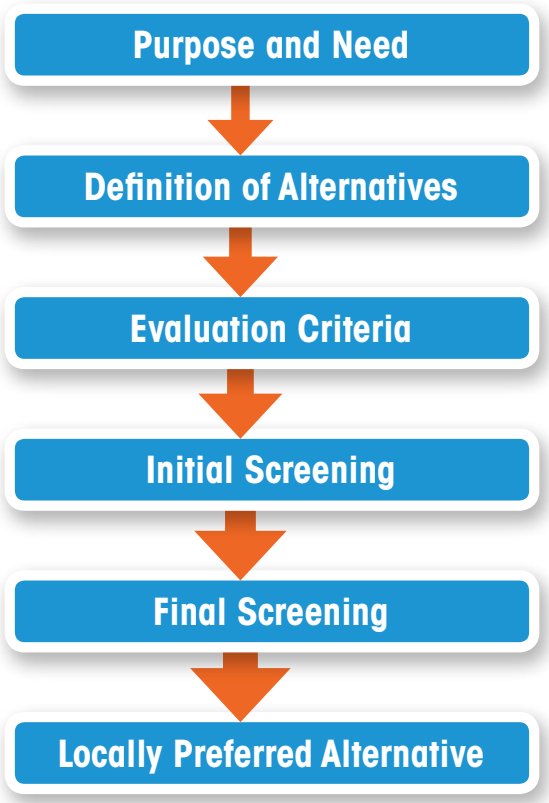
What is the problem?

- *Spatially disconnected activity centers*
- *Lack of transit priority corridor*
- *Increased transit demand from population and employment growth*
- *Imbalanced parking availability and capacity*
- *Poor trip circulation for special events*
- *Lack of transit access to jobs*
- *Lack of adequate stop and service amenities*
- *Sustainability goals/measures in adopted plans*

What is the purpose of the transit solution?

- *Connect major districts, destinations, and activity centers*
- *Provide simple, localized, high-frequency transit service*
- *Support population and employment growth, and revitalization*
- *Balance parking availability and capacity*
- *Improve transit circulation for special events*
- *Maximize transit access to highest employment corridor*
- *Provide adequate stop and service amenities*
- *Contribute to meeting sustainability goals/measures in adopted plans*

Study Process



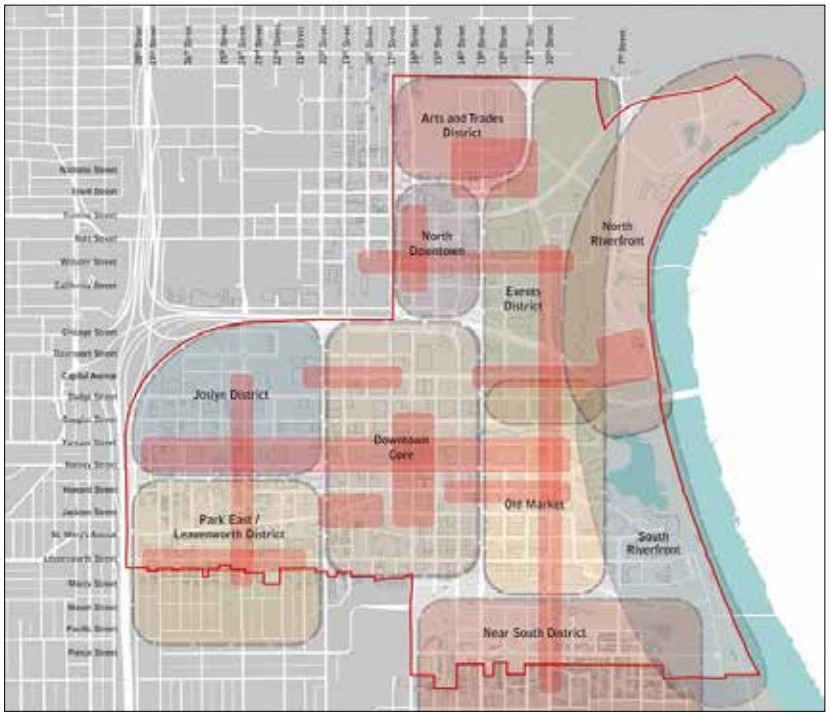
Project Justification

- The project is built around the *Downtown Master Plan's* Guiding Principles, and the goals from the *Omaha Master Plan* Environment and Transportation Elements.
- It looked at public transit as a part of the overall development and redevelopment strategies of the City.
- It focused on the Downtown to Crossroads corridor but with links to the overall Metro bus system.

How is this project different from previous studies?

As a result of the *Downtown Master Plan*, the BRT and Modern Streetcar systems are completely different concepts from the "tourist trolley" and other circulators considered in the past.

- They are now part of a citywide transit strategy that will reduce transportation costs, improve Omaha's economic competitiveness, and enhance the overall quality of life for the City's residents.
- They are the same as any other suburban or redevelopment City investment.
- Together with improvements to Metro's citywide bus service, the proposed BRT and Modern Streetcar systems will complement each other, and improve connections into and circulation around Downtown.
- The BRT will enhance regional transit service between Westroads and Downtown while the Modern Streetcar will serve as a "Downtown Connector" that connects people and places between UNMC and North Downtown.



Downtown Omaha Master Plan Districts and Corridors

How does the Downtown Connector work? And how does it complement the BRT?

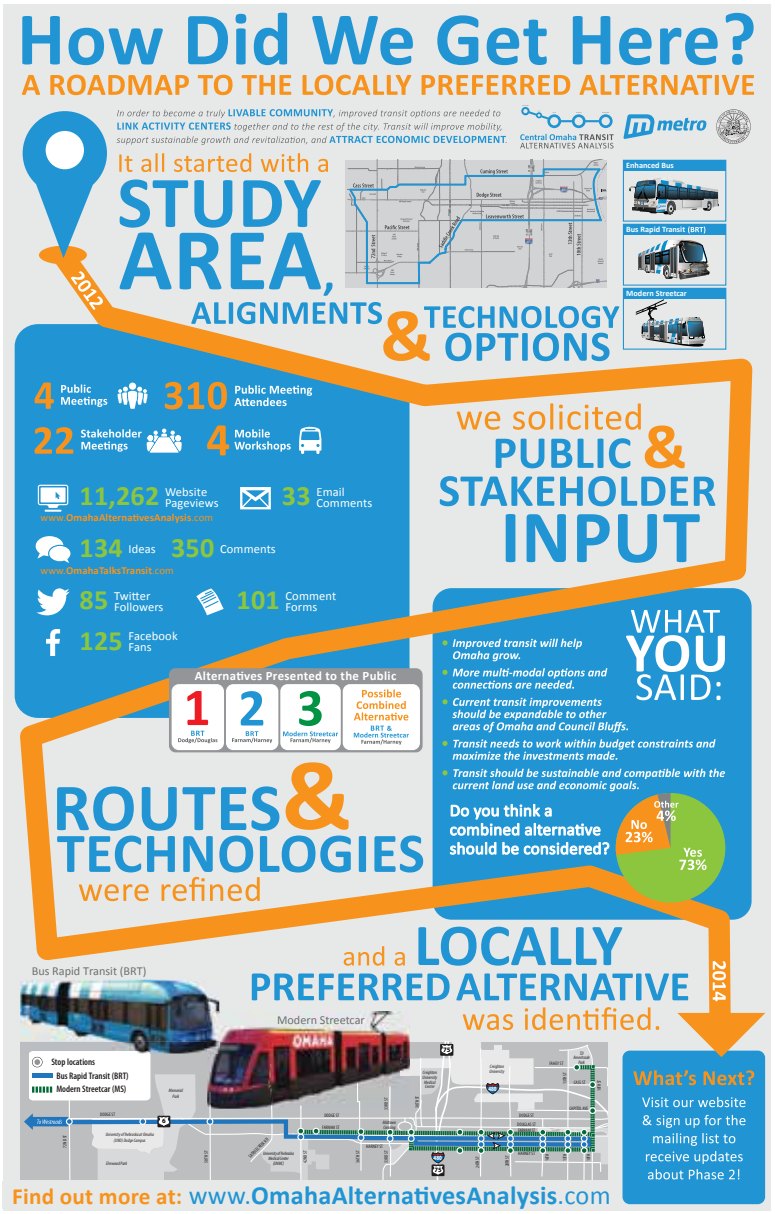
- The Downtown Connector (Modern Streetcar between UNMC and North Downtown) will allow Downtown residents to move easily between their home and work, campus or entertainment venues.
- The Downtown Connector will reduce parking expenses for commuters, residents, businesses, campuses, and visitors and reduce the hassle and expense of driving and parking every time you move from one part of Downtown to another.
- The Downtown Connector will allow for the more efficient use of existing parking facilities and reduce the amount of parking needed for future development thus opening more land for development and reducing development costs.

- The BRT and Downtown Connector will act as a catalyst for new development and increased property values in Downtown.
  - Over a 15-year period, the BRT could attract up to:
    - 1,200 additional jobs
    - 1,350 additional residents
    - $262 million in additional new construction
- Over the same 15-year period, the Downtown Connector could attract up to:
    - 8,500 additional jobs
    - 3,150 additional residents
    - $1 billion in additional new construction
- The combination of the BRT and Downtown Connector will allow the City to achieve the vision outlined in the *Downtown Master Plan*.
- Without the BRT and Downtown Connector systems, the additional jobs, residents, construction, and valuation increases will not be possible because of the amount of land that will need to be devoted to parking to accommodate the lesser development that is expected to occur in the corridor.

Development potential in Downtown Omaha
Source: *Downtown Omaha Master Plan*

What is the next step?

Following adoption of the LPA, the project will begin Environmental Documentation, Advanced Conceptual Engineering, and Finance Plans for both projects. This is the next step in a two-step planning process.

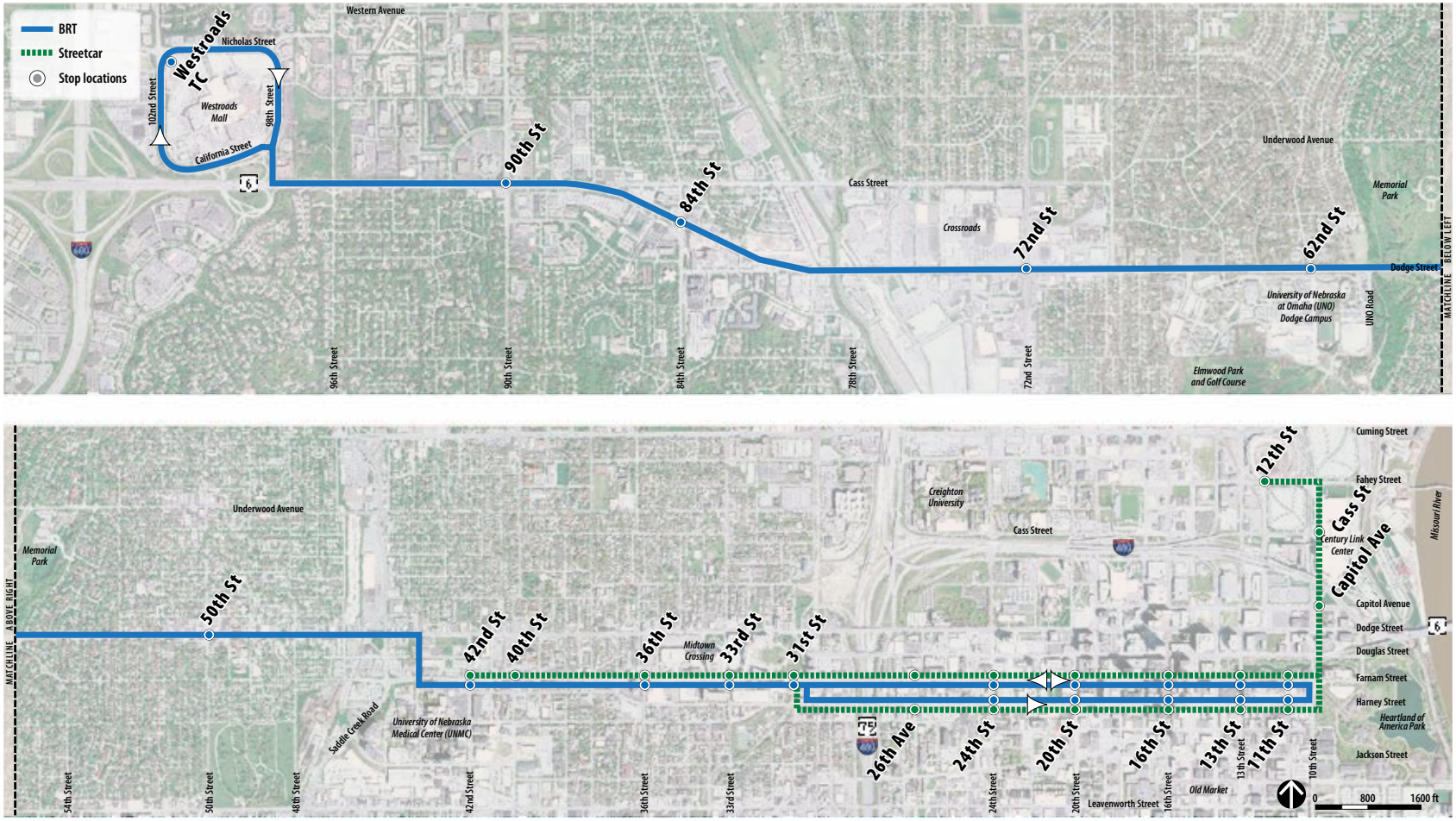


Handout summarizing public participation for the Central Omaha Transit Alternatives Analysis

Conceptual rendering of Farnam couplet design option

Conceptual rendering of Farnam contraflow design option

Figure ES-1 Locally Preferred Alternative (Combined Alternative)



1 PURPOSE AND NEED

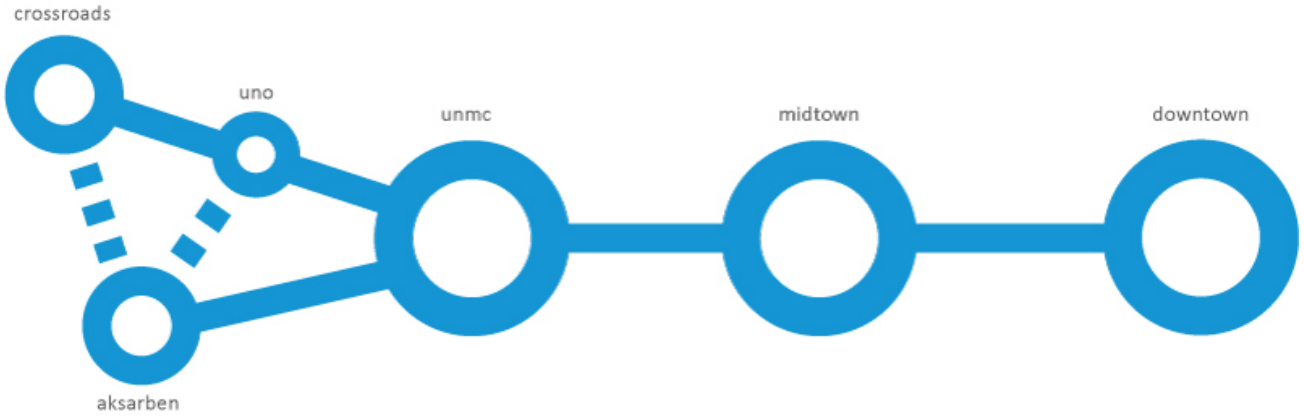
1.1 Introduction

This section describes the Purpose and Need for the Central Omaha Transit Alternatives Analysis (AA) Study. The study is being led by Metro in partnership with the City of Omaha and the Metropolitan Area Planning Agency (MAPA). The study considers urban circulator transit alternatives to connect activity centers and neighborhoods in Central Omaha while tying together the regional transit network to improve mobility and aid employment growth and economic development.

The study strives to address the challenges of navigating an under-connected corridor by providing a transportation connection between the following districts: Downtown, Midtown, University of Nebraska Medical Center (UNMC), University of Nebraska at Omaha (UNO), and the Crossroads and Aksarben Village areas.

By connecting employment and educational hubs, residential, shopping areas, civic resources, historic districts, cultural landmarks and entertainment venues in Central Omaha, the proposed transit alternatives will increase mobility and accessibility for the people who live, work, and visit the corridor. They will provide better linkages to the regional transit network and connect with key Metro bus routes. They will also promote transit use, biking, and walking within the corridor while reducing the need to travel by automobile and decreasing greenhouse gas emissions. They will provide improved transit service to low to moderate income populations in Downtown and throughout the study area.

In concert with local efforts, the proposed transit alternatives will play a pivotal role in improving pedestrian connections to the Missouri riverfront. Local plans such as the *Destination Midtown Plan* and *North Downtown Plan* identify needs to improve transit connections to areas immediately adjacent to the Downtown core. The *Downtown Omaha Master Plan* envisioned a need to create a transit loop to provide more effective service throughout Downtown and connect to a future Downtown transit center, and extend to the new Midtown Crossing development and UNMC. In addition, recent development at Crossroads, the UNO Dodge, Pacific, and Center campuses, and Aksarben Village have created demand for new connections between these points and a desire for a revitalized transit system throughout the study area.




crossroads redevelopment
crossroads
destination midtown redevelopment plan
north downtown master plan
uno
aksarben
unmc
midtown
downtown
aksarben village master plan
destination midtown redevelopment plan
downtown master plan

1.1.1 Previous and Ongoing Studies

In an effort to enhance, connect and activate the downtown core, the Omaha community realized the need for better transit service and in 1995 undertook the first of several feasibility studies to determine the possibility of implementing a streetcar in the downtown area, in response to the public's desire for a streetcar. Early results of these studies were positive, but focused on connecting tourist related facilities and proved to require more research. Development of additional studies, such as the *Destination Midtown Master Plan*, *North Downtown Plan*, and the *Downtown Omaha Master Plan* identified the need to improve transit connections to areas immediately adjacent to the downtown core.

Special attention was paid to the recently adopted Environmental Element of the *Omaha Master Plan* (2010). Specific goals, strategies, and measurements have been adopted therein, by which identification and implementation of a transit alternative in this corridor can greatly contribute. Subsequent studies have built on the previous efforts to identify a transit connection extending to Midtown and UNMC, as well as additional connections to the UNO campus and Aksarben Village and Crossroads areas, traffic studies, and other non-build environmental considerations.

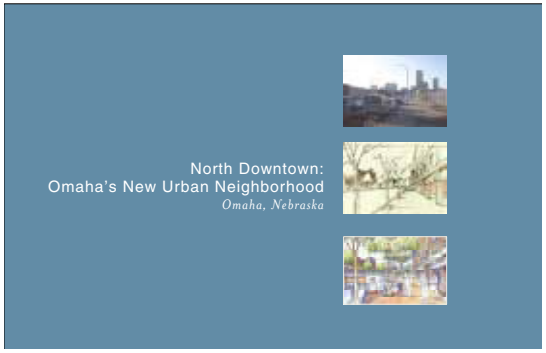
Destination Midtown Plan (2005)

The vision for Destination Midtown represents a unique partnership of public and private interests working together to make Midtown a destination of choice in Omaha. Using the vision as a guide throughout the planning process, recommendations incorporate a comprehensive framework for the resurgence of Midtown. The *Destination Midtown Plan* was funded by the Greater Omaha Chamber and approved by the Omaha City Council. This plan was managed by a board formed to provide oversight of the plan. A position was later created through the Greater Omaha Chamber to manage the area and program implementation, and prioritizes the following neighborhood development, economic development, transportation/corridor development, and vision realization.

Midtown Crossing

Most recently, consideration has been given to update the plan and analyze the program implementation goals and objectives. While no formal decisions have been made to update the plan, the position created through the Greater Omaha Chamber to manage the Midtown area is currently active. Quality of life and environmental goals associated to neighborhood development, walkability for nearby residences, and community activities have been achieved. In addition, the *Dodge Street S-Curve Study* (described below) evolved from the *Destination Midtown Plan*, with concept refinement underway, and subsequent phases to follow.

North Downtown: Omaha's New Urban Neighborhood (2005)

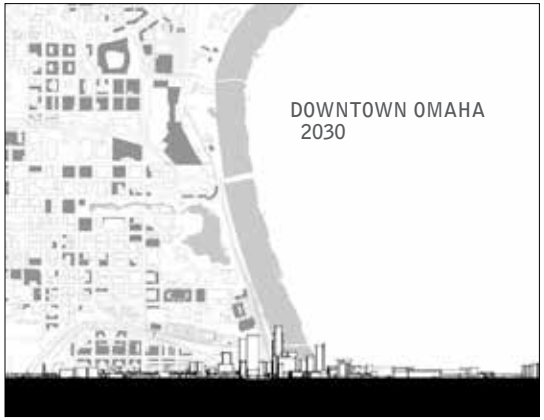


The *North Downtown Conceptual Redevelopment Study*, as it was originally called, was undertaken in order to establish a redevelopment plan for Omaha's "front door" as the gateway to the Downtown area from I-480 and Omaha Eppley Airfield airport. The 80 block study area examined a variety of potential build-out scenarios for the area and ultimately created an implementation strategy to move the plan from vision to reality. The planning process established a comprehensive implementation strategy that examined both public sector and private sector initiatives and actions necessary to initiate and propel the desired level of redevelopment activity. The study was managed by the City of Omaha and approved by the Omaha City Council and focused on strategic policies, procedural requirements, regulatory initiatives,

TD Ameritrade Park in North Downtown hosts the NCAA Men's College World Series

and infrastructure investments. In 2009, many of the goals and objectives established during this plan were incorporated as part of the *Downtown Omaha Master Plan*.

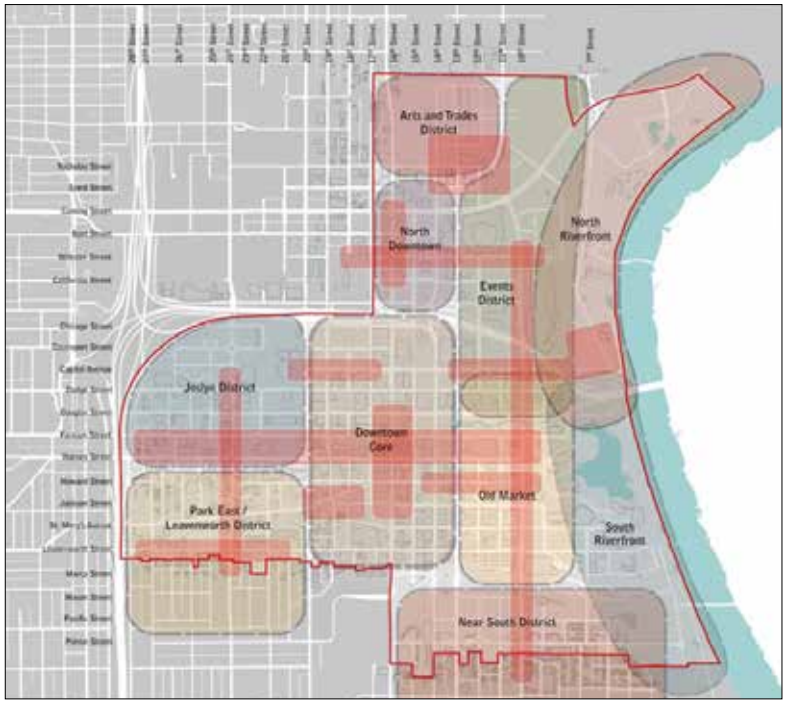
Downtown Omaha Master Plan (2009)



1. Be the dominant economic engine for the region
2. Be a great place to live, work, play, visit, and learn
3. Be home to the unique civic and cultural resources of the region
4. Have distinct neighborhoods, districts and corridors
5. Be urban
6. Have a comprehensive system of integrated, diverse open spaces for public use
7. Be a multi-modal environment where one can live everyday life without using a car
8. Comprise a series of integrated "park once" districts
9. Be a model of sustainable urbanism
10. Strive to cultivate a culture of design excellence

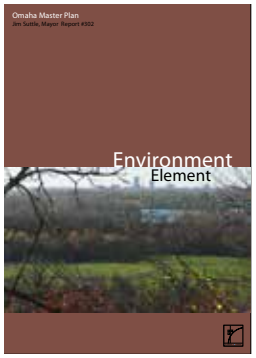
The *Downtown Omaha Master Plan* was developed jointly by the City of Omaha and Heritage Services and lays out an ambitious, but achievable vision through 2030 to make the Downtown area a world class place to live, work, and play and provide a resource for residents and workers, regional visitors, and tourists. The study area is 2.2 square miles in size and incorporates specifics related to the need for development of a modern, multi-modal, Downtown transit center.

Ten principles were developed collaboratively during the planning process and summarize the community's goals. These principles were approved by the Omaha City Council and say that Downtown should:



Downtown Omaha Master Plan Districts and Corridors

Omaha Master Plan Environment Element (2010)



The Environment Element of the *Omaha Master Plan* is a guide for City actions and policies and a vision for the long-term environmental health and sustainability. Development of the Environment Element more comprehensively incorporates the issues to serve the purposes called for in the City Charter, which include establishing policies, goals, and standards as a general guide for physical development.

The Urban Form and Transportation category of the Environmental Element provides direction for Omaha to substantially reduce its impact on the environment and the per capita cost of critical infrastructure and municipal services to increase its level of urban quality and community health by supporting an efficient city form with a balanced transportation network that increased the role of low impact and active transportation modes in providing access to all parts of the city

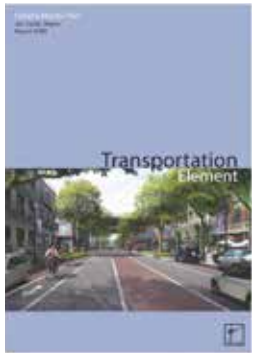
Goals under the Urban Form and Transportation category include:

- **Large-scale City Form:** Develop a city form that both reduces the per capita cost of providing city services and establishes the density necessary to support more energy-efficient forms of transportation.
- **Land Use and Development Policy:** Generate development at higher residential densities and true mixed uses that produce more diverse environments and reduce the number of necessary automobile trips.
- **Land Development:** Create individual developments with components that are connected, walkable, and accessible to all modes of transportation, by providing safe, defined, and pleasant routes from the public realm to destinations.
- **Transportation Network:** Develop a transportation network that moves people and freight within and through the metropolitan area efficiently, maximizing access and minimizing vehicle miles traveled, energy consumed, and pollutants emitted.
- **Transit:** Develop a public transportation system that offers a degree of coverage, convenience, and amenity, that both provides transportation equity for dependent customers and makes transit an attractive option for discretionary passengers.
- **Active Transportation:** Provide a high level of citywide access and continuity to pedestrians and bicyclists, making active transportation a realistic and integral part of the city's transportation network.

The City of Omaha will measure success (as adopted by the Omaha City Council) by achieving the following measurements toward sustainability by 2030:

- ***Omaha's population density will grow to 4,500 people per square mile. The current population density is 3,489 people per square mile. As a point of comparison, the population density was 6,171 people per square mile in 1950.***
- ***Ten percent of all trips in Omaha will be made by active transportation modes (pedestrian, bicycle, and public transportation). Today, about 2 percent of all trips and 4.4 percent of commute trips are made by these modes.***
- ***Fewer than 65 percent of all work commuting trips will be made in single-occupant automobiles by 2030. Currently, about 82 percent of commuting trips are made in single occupancy automobiles.***
- ***Decrease per capita motor vehicle miles traveled by Omaha motorists by 10 percent.***

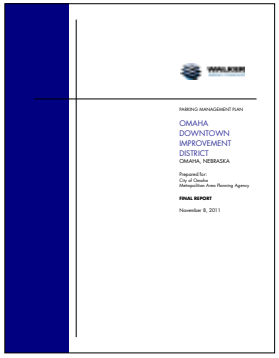
Omaha Transportation Master Plan Update (2012)



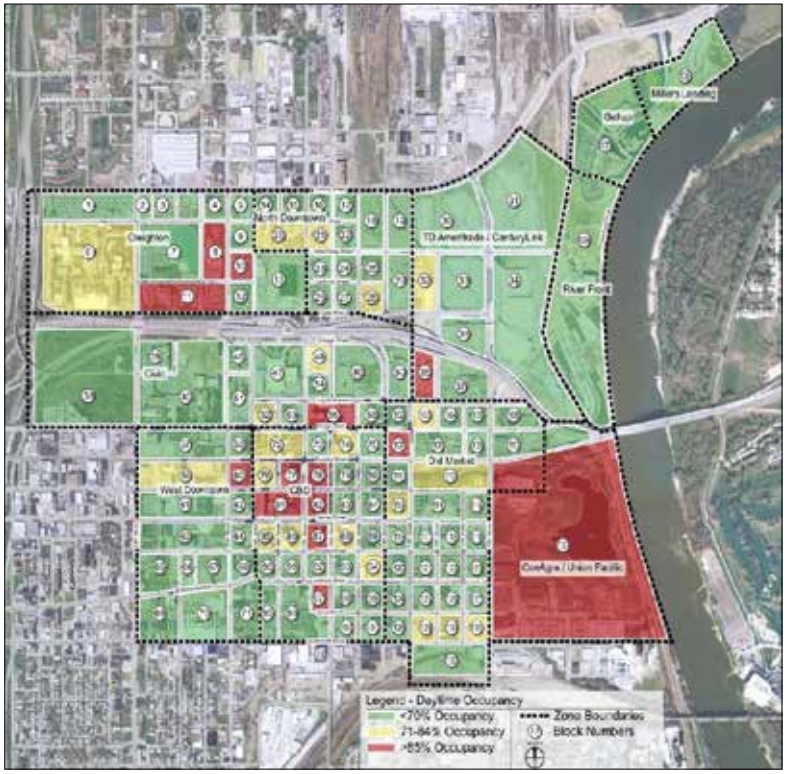
The Transportation Element of the *Omaha Master Plan* provides a blueprint for building a transportation system, including BRT and streetcar, where there are balanced options on how to get around, such as roads, paths, and sidewalks that contribute to safe and healthy environments, infrastructure to improve livability and connectivity in Omaha's neighborhoods, and fiscally sustainable investments with sound economic returns. The Transportation Element is driven by four community goals developed throughout the planning process:

- Provide balanced options for enhanced mobility
- Attain a safe and healthy environment
- Create livable and connected neighborhoods
- Promote economic returns with fiscal sustainability

Omaha Downtown Parking Management Plan (2011)



The *Parking Management Plan* provides decision-making information for the on-street and off-street municipal parking system in Downtown. The report addresses seemingly disparate elements and policies of the parking system that impact each other, the parking system as a whole. The overriding theme within the findings and recommendations in each area is that a comprehensive approach improves the City's ability to manage its parking assets.



Daytime Parking Occupancy in Downtown
Source*: Olsson Associates, Walker Parking Consultants*

S-Curve Area Connectivity Project (Ongoing)

The S-Curve project is developing and evaluating alternatives to reconfigure the Dodge Street "S" curve near Turner Park where two-way Dodge Street transitions to the one-way Dodge/Douglas Street one-way couplet. This concept evolved from the *Destination Midtown Master Plan*. The study will include an Environmental Assessment and Preliminary Design for the Preferred Alternative as required by the Federal government for a project of this size.

S-Curve Area Connectivity Project Study Area

Harney Street Bicycle Study (Ongoing)

As part of the *Omaha Transportation Master Plan*, the Harney Street Bikeway ranked first of 266 possible street, trail, or other transportation projects. The plan calls for converting one eastbound lane of the current four vehicular lanes of traffic to a trail, set off by a landscaped median, that is designated for walking and biking and to connect Downtown, Midtown Crossing, and UNMC.

Harney cycletrack concept
Source: *Omaha Transportation Master Plan*

Example of cycletrack, Seattle, WA

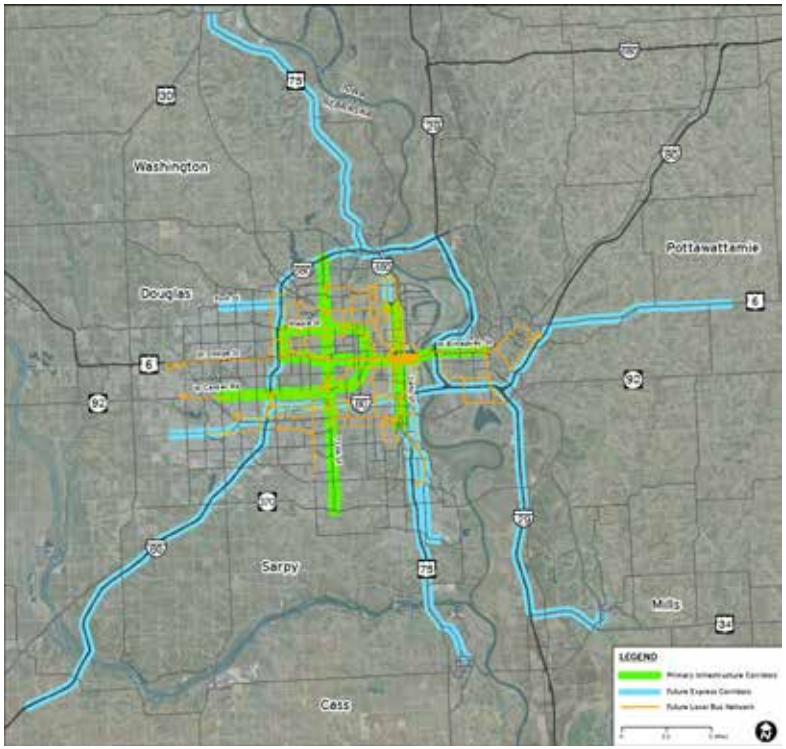
MAPA Heartland 2050 Regional Vision (Ongoing)

MAPA received a Housing and Urban Development Sustainable Communities Grant to conduct a Regional Visioning process entitled "Heartland 2050." This award will be used to develop a long-range vision for the Omaha-Council Bluffs Metropolitan Statistical Area. MAPA is leading a consortium of over 300 partners in the region to develop a regional plan addressing land use, housing, transportation, infrastructure, economic development and public health.

Source: *Heartland 2050*

MAPA/Metro Regional Transit Vision (2014)

The Regional Transit Vision is one component of the MAPA *Heartland 2050*. MAPA collaborated with Metro to assess current and anticipated needs for public transit service in the region, and the steps necessary to realize short- and long-term transit enhancements. This study also evaluated the possibility of creating a regional transit authority and other steps to enhance transit service in the metropolitan area. Four guiding principles for service development were established through the Regional Transit Vision: 1) Right size service to market, 2) Strengthen network structure, 3) Improve the customer experience, and 4) Build financial sustainability. The map below highlights the study's identified and prioritized capital transit projects.



MAPA/Metro Regional Transit Vision map of identified and prioritized capital transit projects

Table 1 Previous and Ongoing Studies

Previous and Ongoing Studies	Description
Destination Midtown Plan (2005)	Discusses enhancing the transit system to include extension of the bus circulator routes into Midtown and/or establishing a streetcar line linking Midtown to adjacent areas.
North Downtown: Omaha's New Urban Neighborhood (2005)	Plans ultimate build-out of North Downtown over next 10-15 years. The strategy allows for a phased approach to be undertaken by both the City of Omaha and the private sector development community.
Downtown Omaha Master Plan (2009)	Identifies future options for Downtown transit service, including a transit corridor using the one-way couplet on Farnam and Harney Streets.
Environmental Element (2010)	Identifies 2030 sustainability measurements: Density of 4,500 people per square mile, 10 percent of trips be made by active transportation modes, fewer than 65 percent of work trips be made by single-occupant vehicles, vehicle miles traveled reduced by 10 percent.
Omaha Transportation Master Plan Update (2012)	Multi-modal transportation plan focused on walkability, biking, and transit which recommends both capital projects and transportation policy changes.
Omaha Downtown Parking Management Plan (2011)	Recommends for on-street/off-street parking, on-street parking enforcement, and planning and zoning provide the framework for a uniform system.
MAPA/Metro Regional Transit Vision (2014)	Analyzed current and anticipated needs for public transit service in the region, and evaluated steps to enhance transit service in the metropolitan area.
S-Curve Area Connectivity Project (Ongoing)	Examines the Destination Midtown study findings and provide recommendations to reconfigure the Dodge Street "S" curve near Turner Park.
Harney Street Bicycle Study (Ongoing)	Proposes converting one eastbound lane of the current four vehicular lanes of traffic to a trail that is set off by a landscaped median designated for walking and biking and to connect Downtown, Midtown Crossing, and UNMC.
MAPA Heartland 2050 Regional Vision (Ongoing)	Analyzing the region's transportation, housing, utilities, and land use patterns to develop principles that guide physical growth and aid in regional decision making.

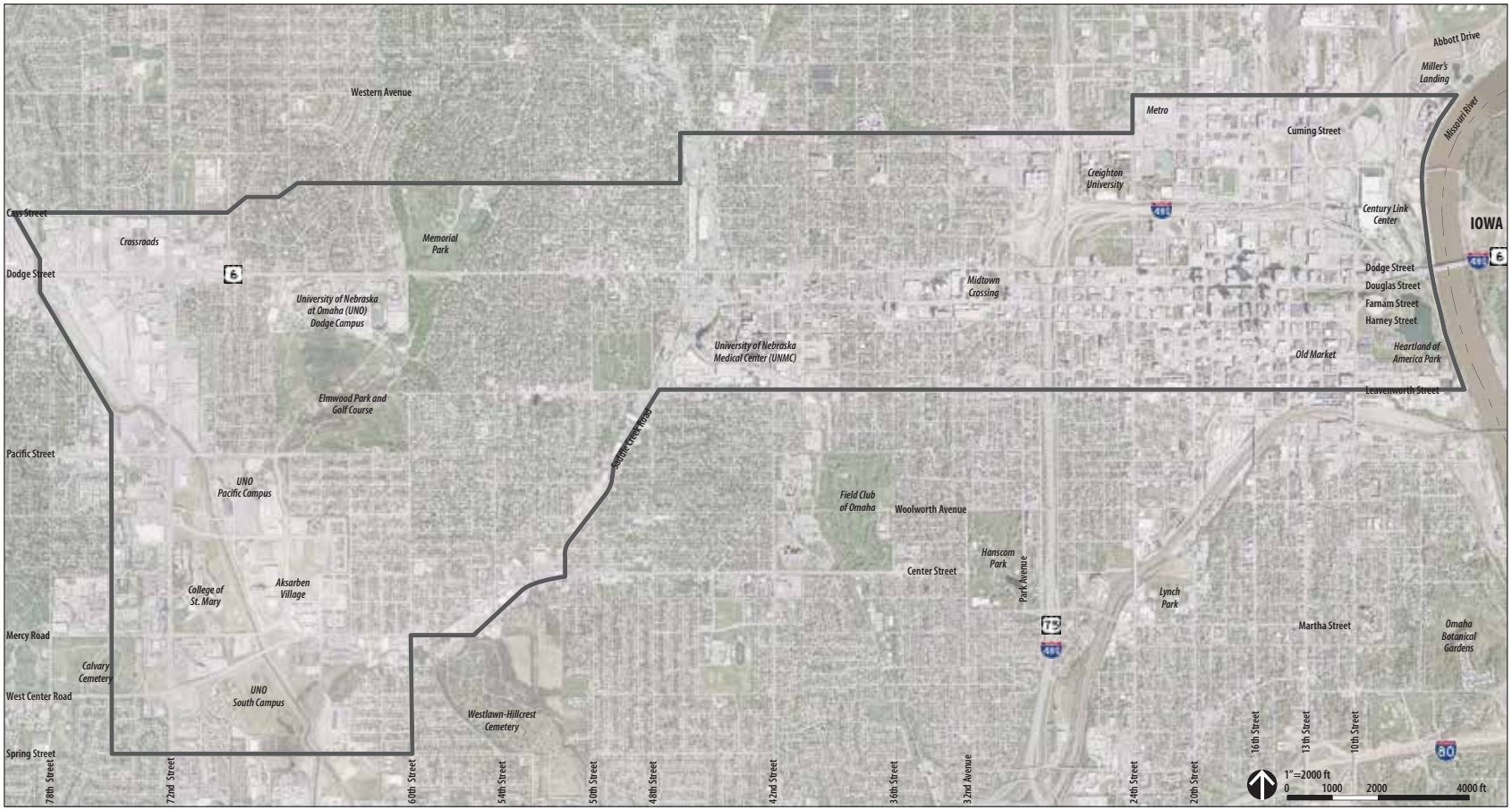
1.2 Study Area Description

1.2.1 Overview

The study area is located within Central Omaha (Figure 1, next page), and is generally bounded by 72nd Street on the west, the Missouri River on the east, Cuming Street on the north, and Center Road on the south. The study area encompasses the following districts: Downtown, Midtown, UNMC, UNO, and the Crossroads and Aksarben Village areas.

A portion of the project study area once included a major streetcar system. Incorporated in 1886 and making its last run in 1955, the streetcar system connected Omaha with Council Bluffs, Iowa over the Missouri River via the Douglas Street Bridge. Some of the tracks from this streetcar system are still embedded in Downtown streets and adjacent

Figure 1 Study Area

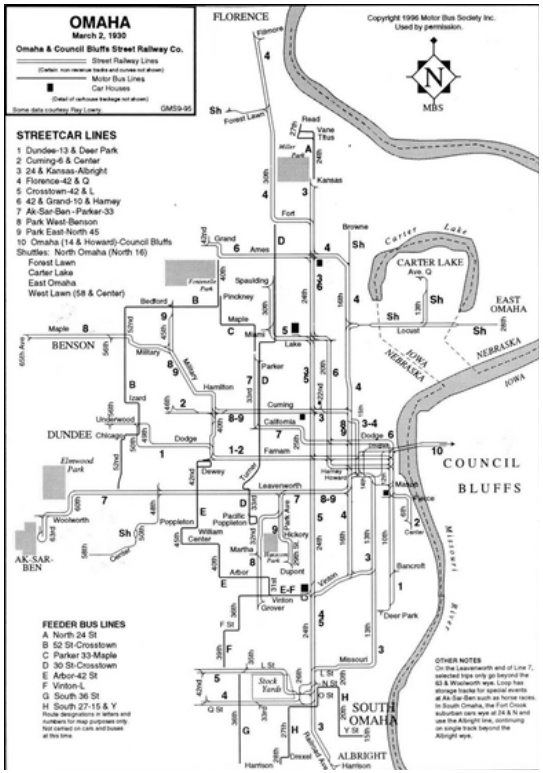


neighborhoods. A map of historic streetcar service is shown in Figure 2.

The study area is a medium-to-dense urban core that includes the highest concentration of population and employment in the region. It is also home to many of the region's historic, cultural, and visitor attractions, such as the Durham Western Heritage Museum, Omaha Civic Auditorium, CenturyLink Center, TD Ameritrade Park, Holland Performing Arts Center, Omaha Children's Museum, Bemis Center for Contemporary Arts, Heartland of America Park and Fountain, and the Joselyn Art Museum.

Table 2 describes districts within the study area, while Figure 3 shows the location of these districts.

Figure 2 Historic Streetcar Service

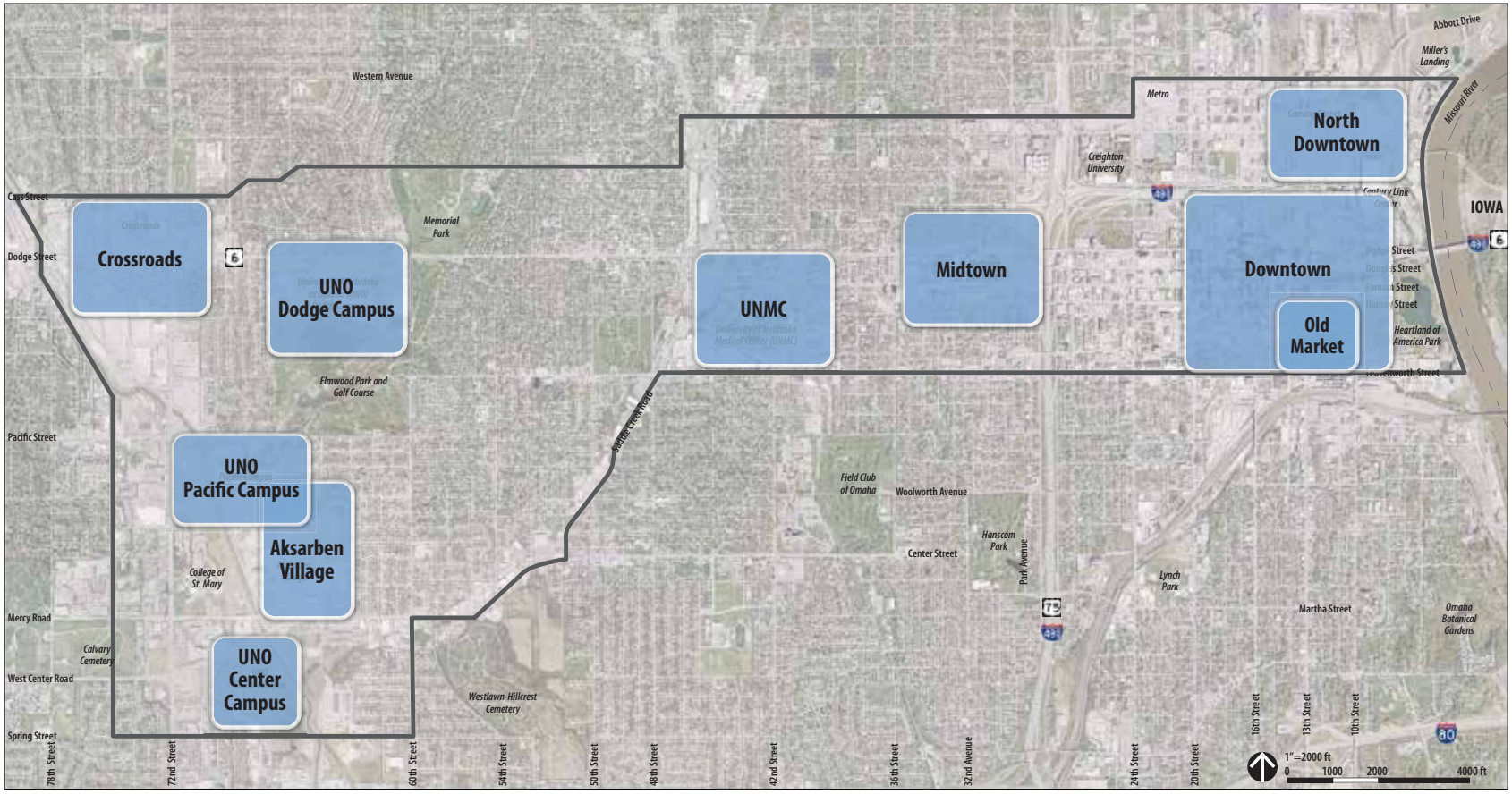


Downtown Omaha
Source*: Downtown Omaha Master Plan*

Table 2 Districts

District	Description
Downtown	Downtown includes the largest concentration of civic, cultural, and employment facilities in Omaha, as well as a growing residential population.
Old Market	Premier arts and entertainment district in Downtown featuring dining, shopping, corporate meeting facilities, hotels, and night life.
North Downtown	Developing mixed-use area with multiple event venues, notably CenturyLink Center and TD Ameritrade Park.
Midtown Crossing	New mixed use development with restaurants, housing, and hotel; adjacent to Mutual of Omaha headquarters.
UNMC	UNMC includes six colleges and two institutes serving more than 3,400 students. Total employment at UNMC and adjacent hospital is over 11,000.
UNO	UNO is the largest university in Omaha with over 15,000 students and offers nearly 200 programs of study on three campuses (Dodge, Pacific, and Center).
Crossroads	The Crossroads Mall is redeveloping to become a mixed-use development with stores, restaurants, and apartments.
Aksarben Village	Research and business district with a mix of uses including dining and entertainment options, residential, shopping, a community park, and hospitality amenities.

Figure 3 Districts



Gene Leahy Park in Downtown Omaha

Filmstreams/Ruth Sokolof Theater in North Downtown

Turner Park at Midtown Crossing

Durham Research Towers at UNMC

1.2.2 Land Use and Development Potential

Existing land use in the study area is characterized by a mix of commercial, industrial, civic, academic, parks, open spaces, high/low density residential, and mixed-use development. In general, the area between Downtown, Midtown, and UNMC is characterized by commercial and civic land uses, along with parks/open spaces and mixed use development. Between UNMC, UNO Dodge Campus, and Crossroads, the land use primarily includes commercial uses in the eastern portion with low density residential, academic, and parks/opens spaces to the west. The area linking Crossroads, UNO Pacific Campus, Aksarben Village, and UNO Center Campus includes more commercial and academic land uses, and some mixed-use development. Existing land use in the study area is shown in Figure 4.

Existing land use correlates to development potential in the study area. The potential development sites are located throughout the study area, but particularly in the corridor that connects Downtown, Midtown, UNMC, UNO, and the Crossroads and Aksarben Village areas. Potential development sites in the study area are shown in Figure 5.

Development potential in Downtown Omaha
Source: *Downtown Omaha Master Plan*

Figure 4 Land Use

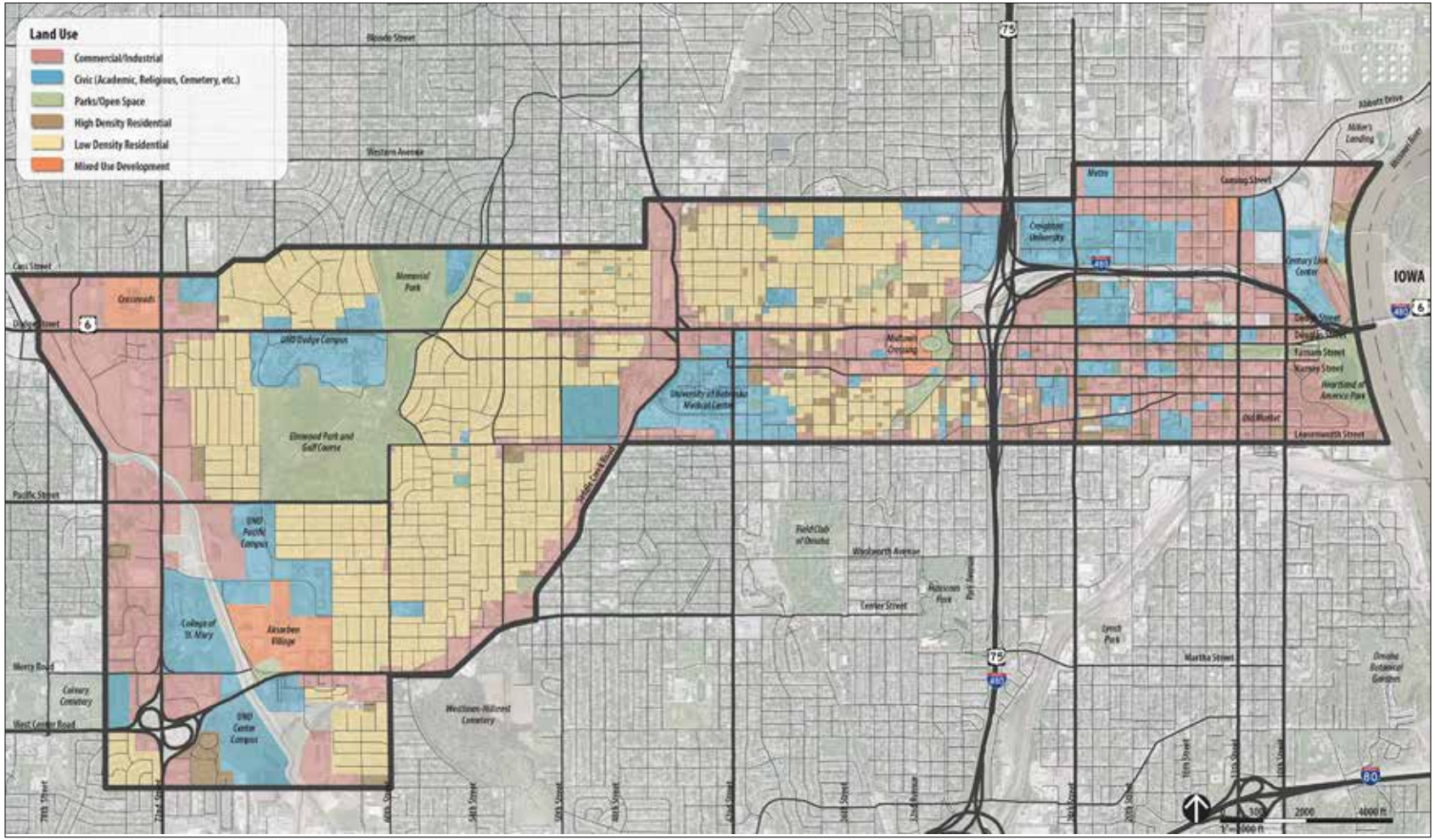
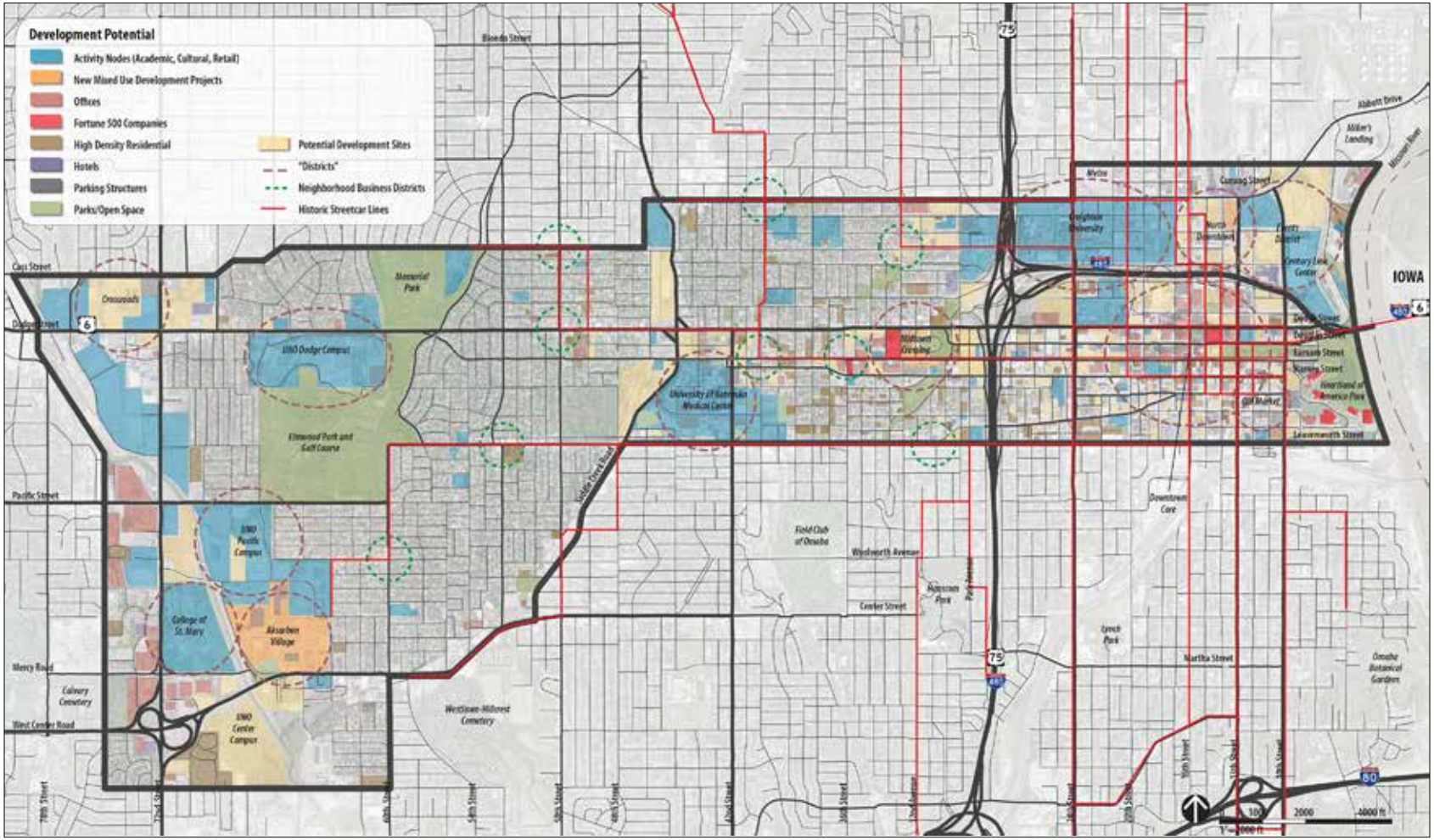


Figure 5 Development Potential



1.2.3 Demographics of Study Area

Existing demographic data for the study area is available from Census 2010. This includes population, population change between 2000 and 2010, households, low income households, zero car households, minority population, population under 18, and population over 65. Employment is not available from Census 2010 but is available from MAPA. The census tracts located in the study area are shown in Figure 6 while study area demographics are summarized by census tract in Table 3. These totals are adjusted according to the percentage of the census tract in the study area. The study area demographics by census tract are shown in Figures 7 through 16.

In general, demographics in the study area are characterized by proximity to the corridor's activity centers: Downtown, Midtown, UNMC, UNO, and Crossroads and Aksarben Village areas. These activity centers have the highest concentration of employment (particularly Downtown, Midtown, UNMC, and UNO) in the study area. The areas surrounding these activity centers generally have the most population, although the largest increase in population between 2000 and 2010 is found in Downtown and around the UNO Pacific and Center Campuses and Aksarben Village. Other demographic trends in the study area are that the area around North Downtown and Creighton University and the area between Downtown and Midtown have the highest percentage of low income households and minority populations, while the latter also has the highest percentage of zero car households.

Demographics of Study Area

- ***Total Population***
- ***Population Change (2000-2010)***
- ***Total Employment***
- ***Employment Change (2000-2010)***
- ***Total Households***
- ***Low Income Households***
- ***Minority Population***
- ***Zero Car Households***
- ***Population 18 and Under***
- ***Population 65 and Older***

Figure 6 Census Tracts

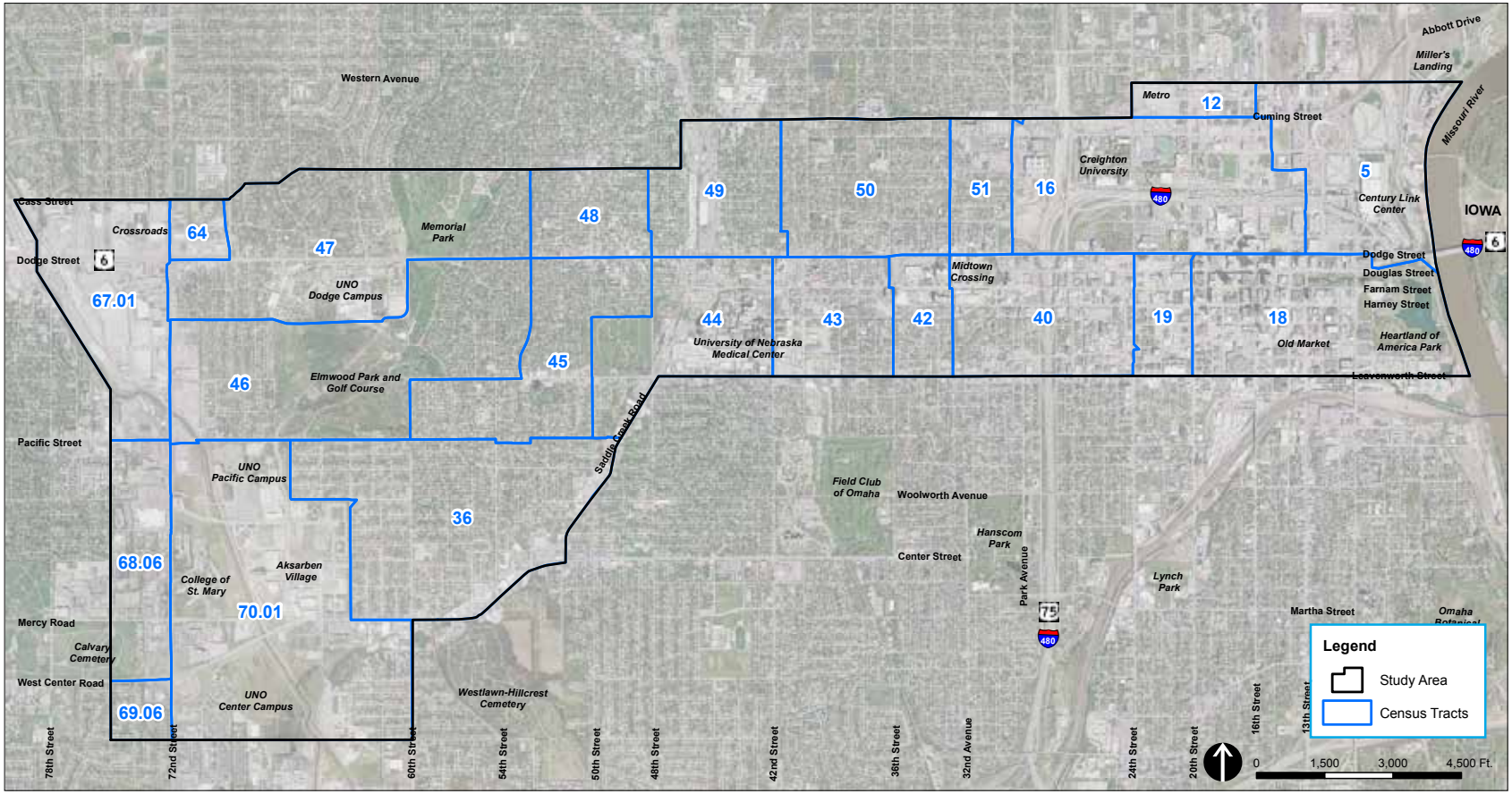


Table 3 Demographics

Census Tract	Total Population (2010)	Percent Population Change (2000-2010)	Total Employment	Percent Employment Change (2000-2010)	Total Households	Low Income Households	Minority Population	Zero Car Households	Population 18 and Under	Population 65 and Older
70.01	2,683	25.09	3,260	-6	1,081	407	614	122	316	249
69.06	232	1.85	100	-21	111	29	19	10	40	57
5	135	40.92	260	21	30	12	45	2	14	7
12	300	9.84	239	0	92	50	250	12	95	20
16	2,577	-3.99	13,035	8	147	147	459	16	51	31
18	2,442	31.85	14,790	80	955	324	685	137	129	75
19	759	-24.39	747	-48	460	257	348	146	133	43
36	4,178	-5.71	2,401	152	2,023	207	289	97	747	468
40	2,731	-8.78	2,631	-32	1,348	889	1,103	507	449	326
42	1,139	10.41	2,988	695	509	165	455	82	266	39
43	1,885	-2.63	1,080	-17	1,070	525	515	279	202	143
44	932	-17.19	2,087	12	450	91	91	41	152	70
45	2,844	-7.33	400	-44	1,453	326	161	60	523	545
46	2,318	-4.18	762	-24	1,049	274	319	110	467	261
47	2,315	10.69	582	-28	606	35	134	25	450	224
48	1,763	0.34	730	-4	934	329	352	120	351	123
49	1,944	-3.18	712	-3	894	433	846	181	441	125
50	3,903	-5.45	871	126	1,768	765	1,336	418	822	237
51	1,167	-11.04	895	636	479	218	637	96	297	69
64	275	-3.11	44	-13	112	28	43	9	62	33
68.06	740	-11.08	3,447	-5	296	104	192	20	153	123
67.01	779	-5.2	2,349	-40	359	76	80	28	166	157
TOTAL	**38,042**	**-1.24**	**54,410**	**18**	**16,226**	**5,690**	**8,974**	**2,517**	**6,326**	**3,425**

Source: *Census 2010, except Total Employment (MAPA 2000 and 2010)*

Note: *2000 and 2010 MAPA employment numbers were compiled using different source data (2000 employment data received from the State of Nebraska and 2010 data received from InfoGroup), but provide the best available comparison.*

Figure 7 Total Population

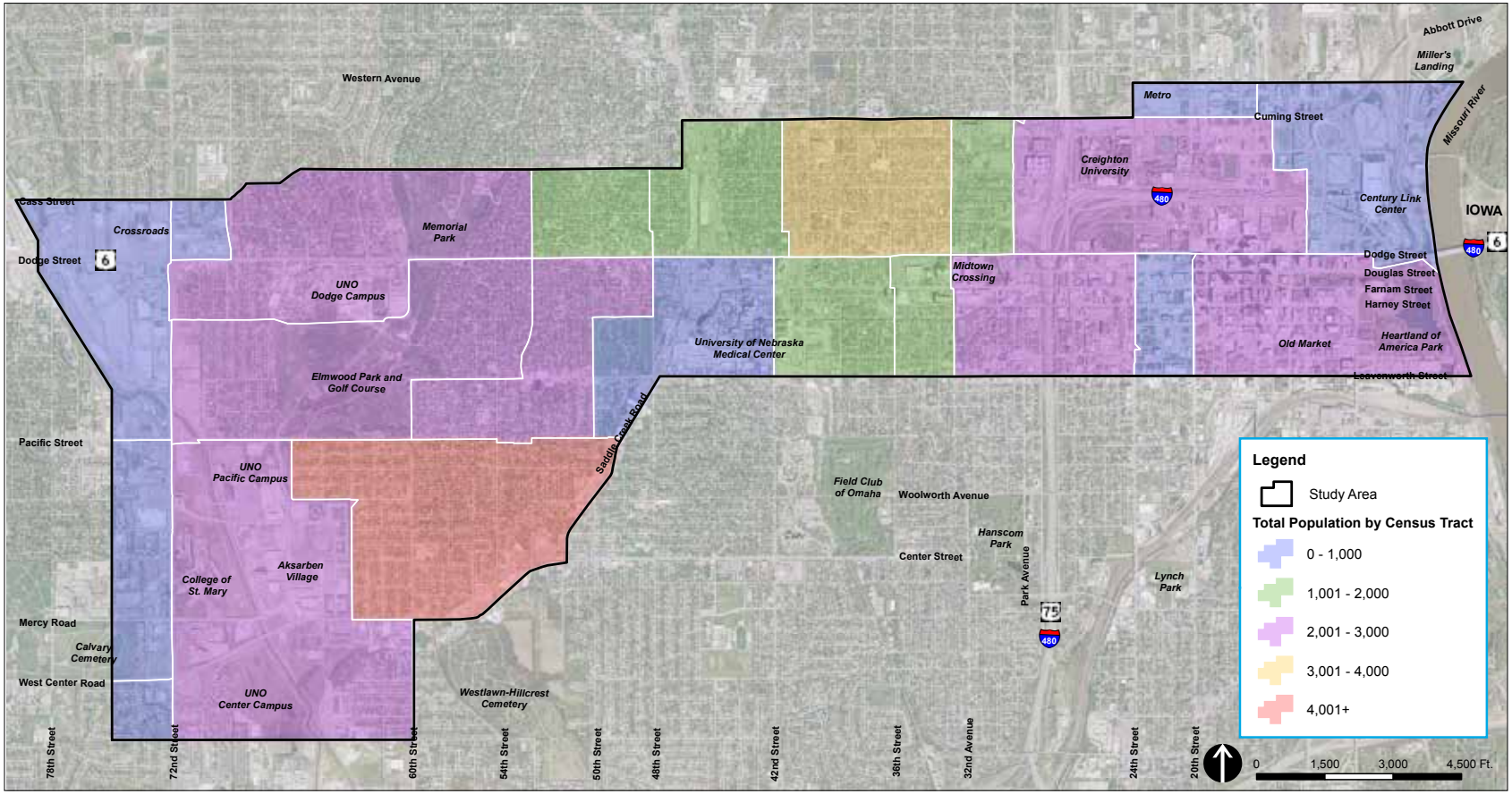


Figure 8 Population Change (2000-2010)

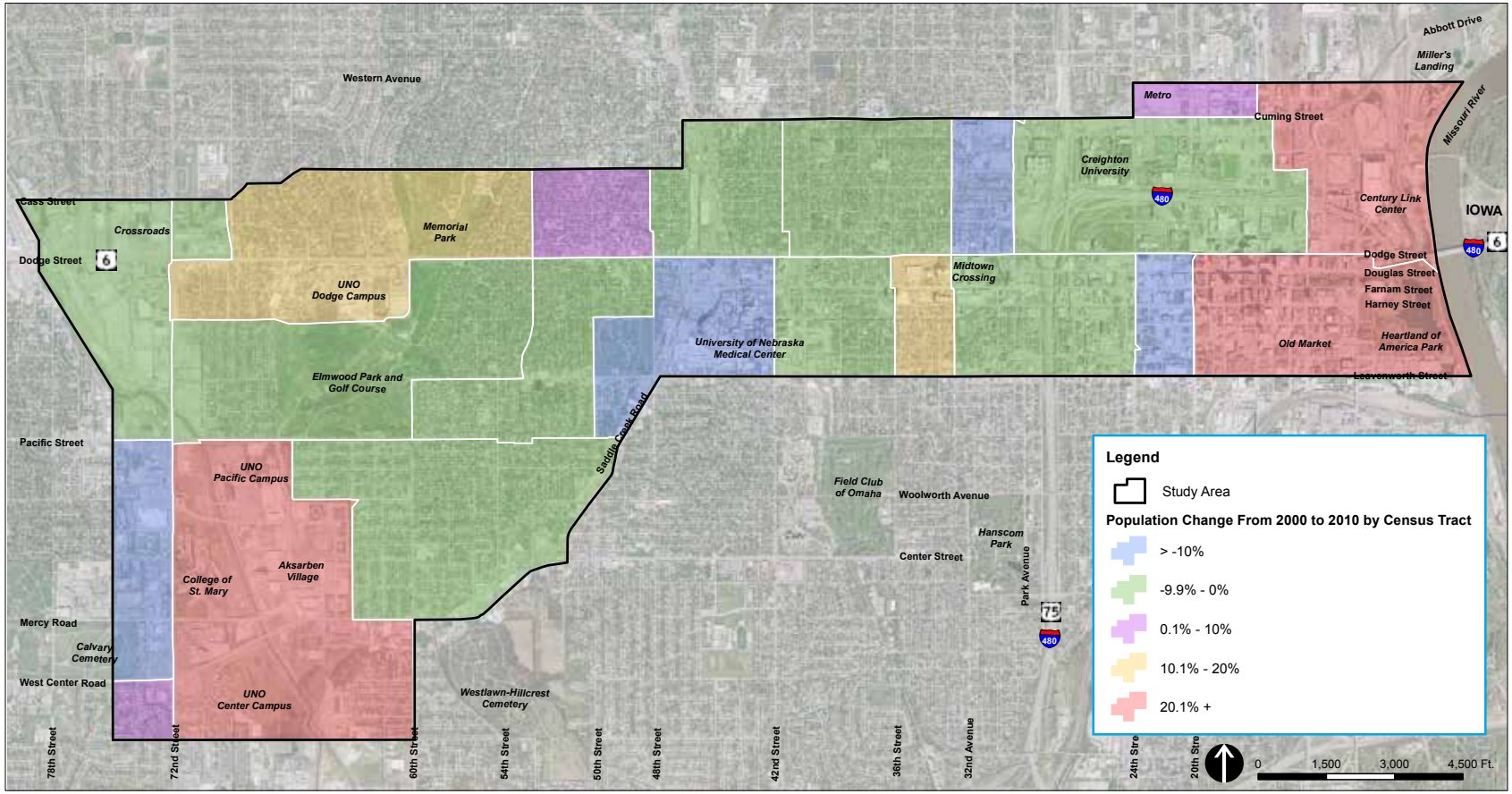


Figure 9 Total Employment

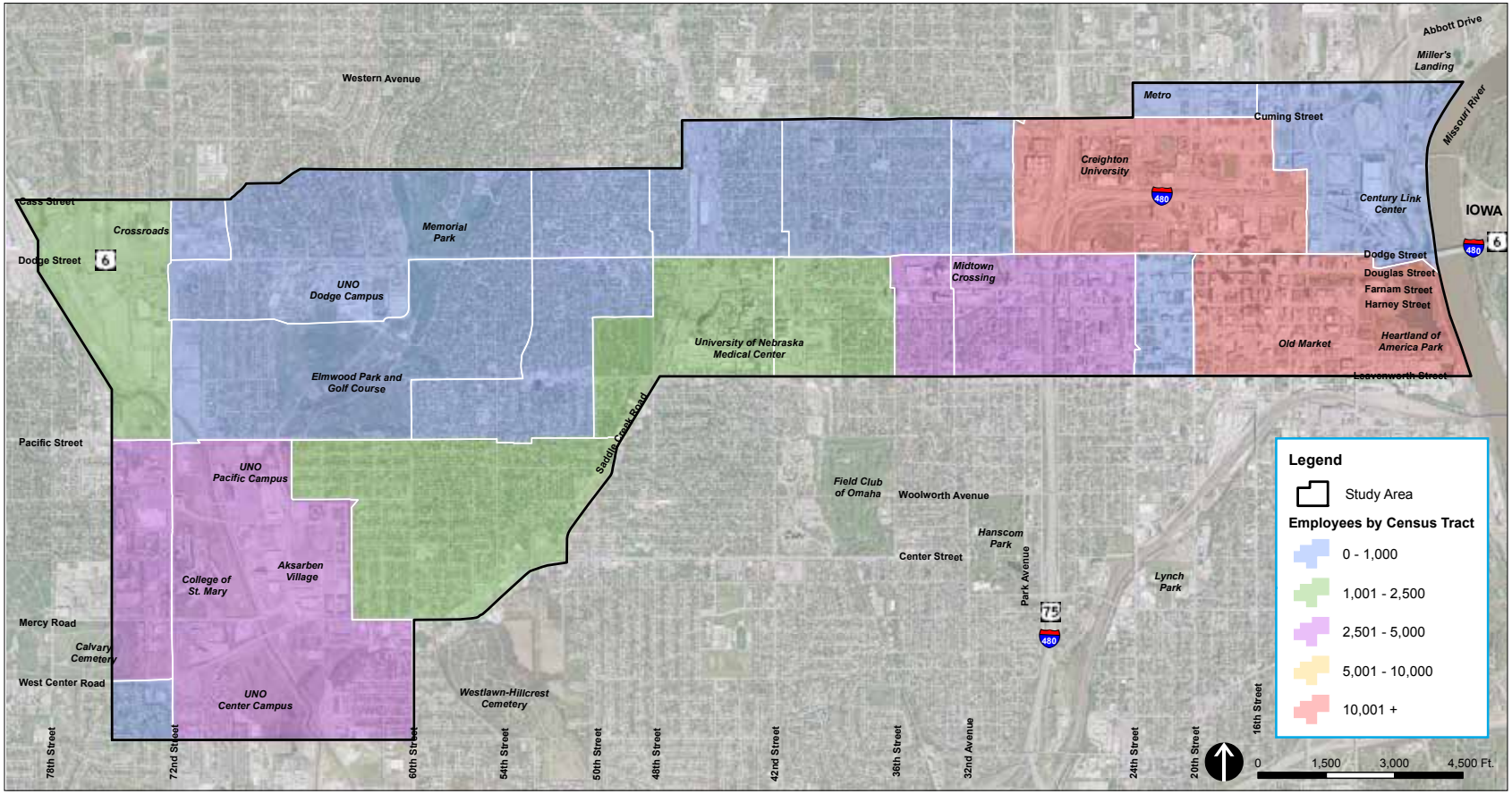


Figure 10 Employment Change (2000-2010)

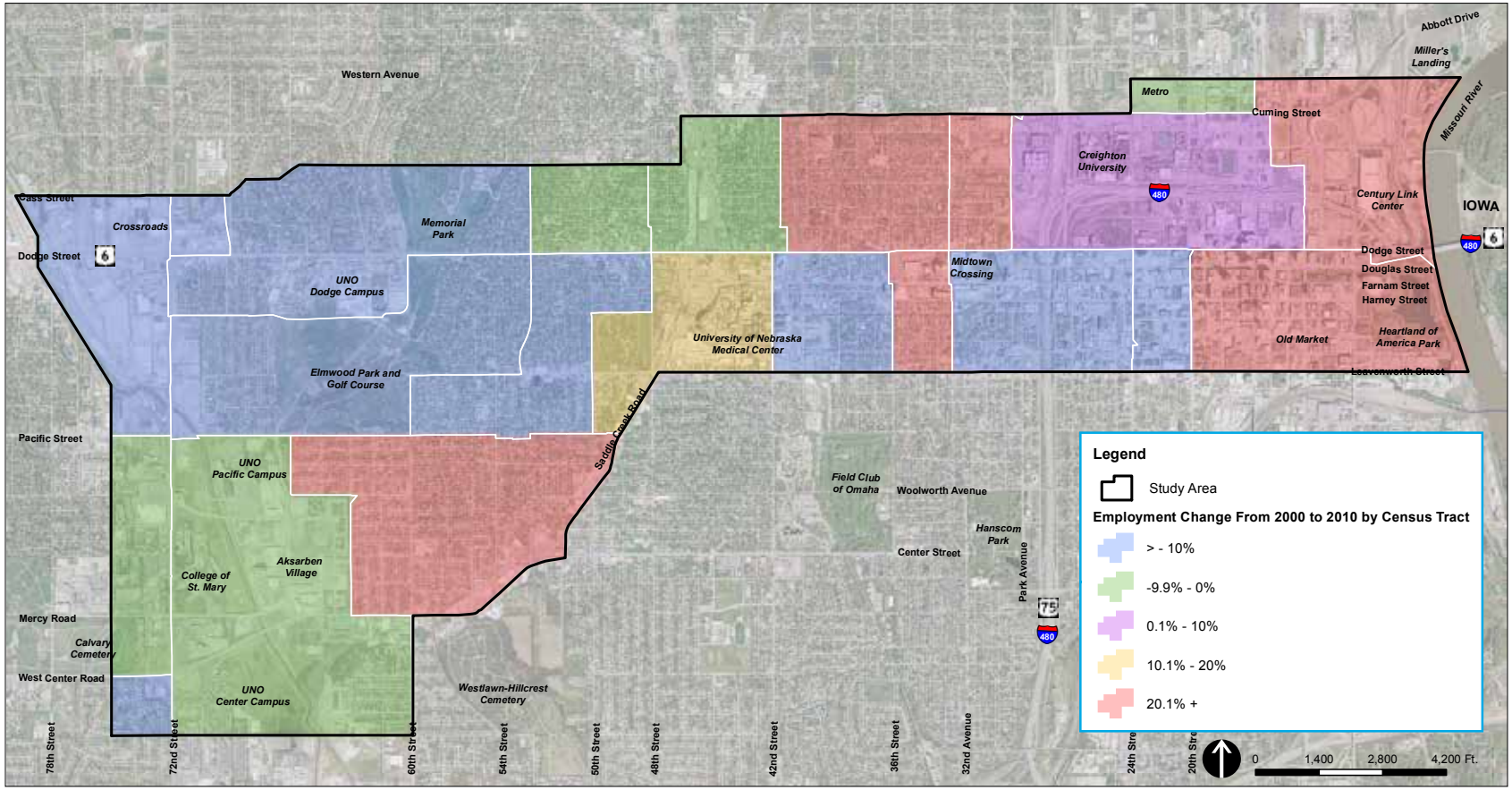


Figure 11 Households

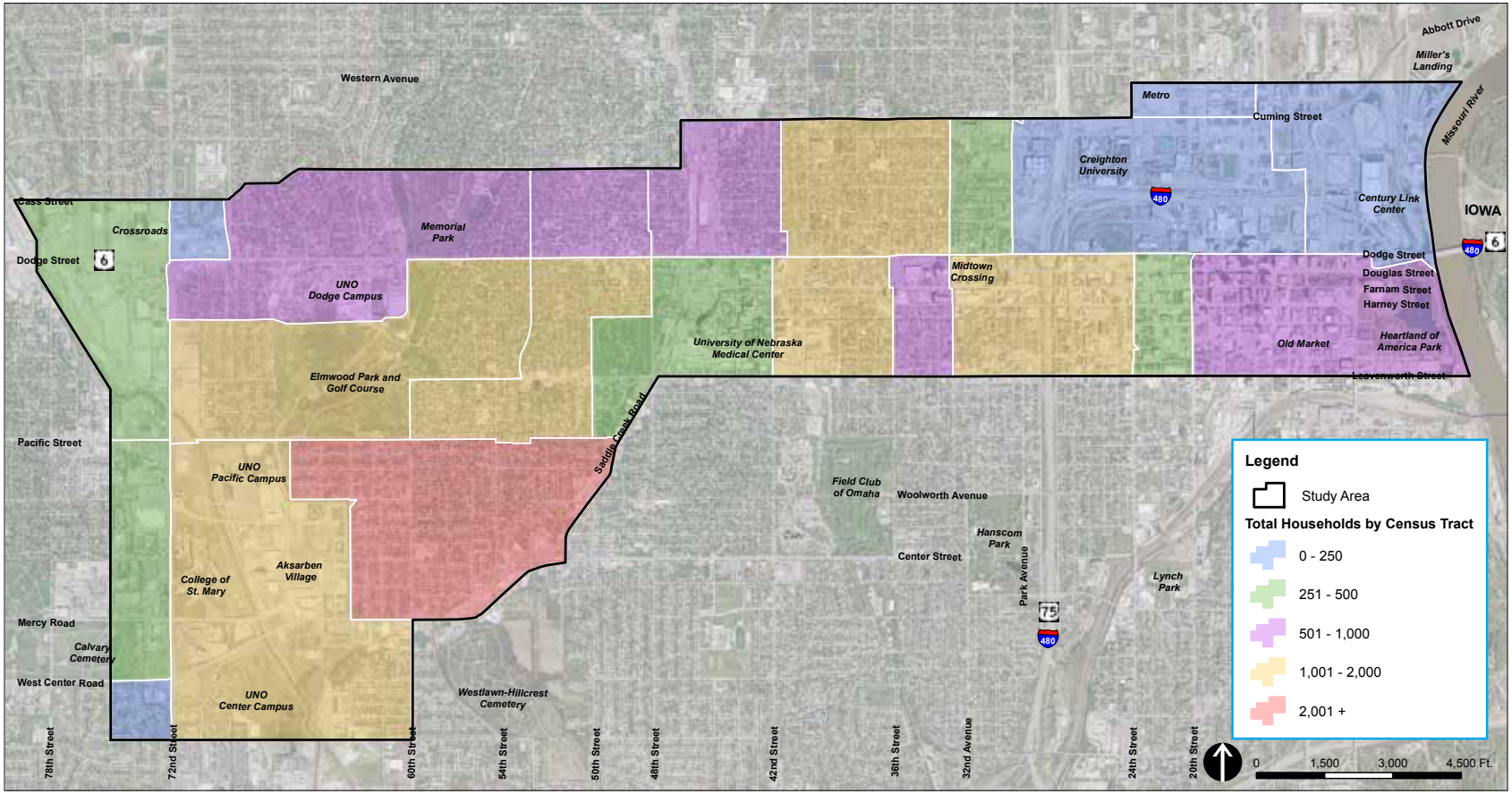


Figure 12 Low Income Households

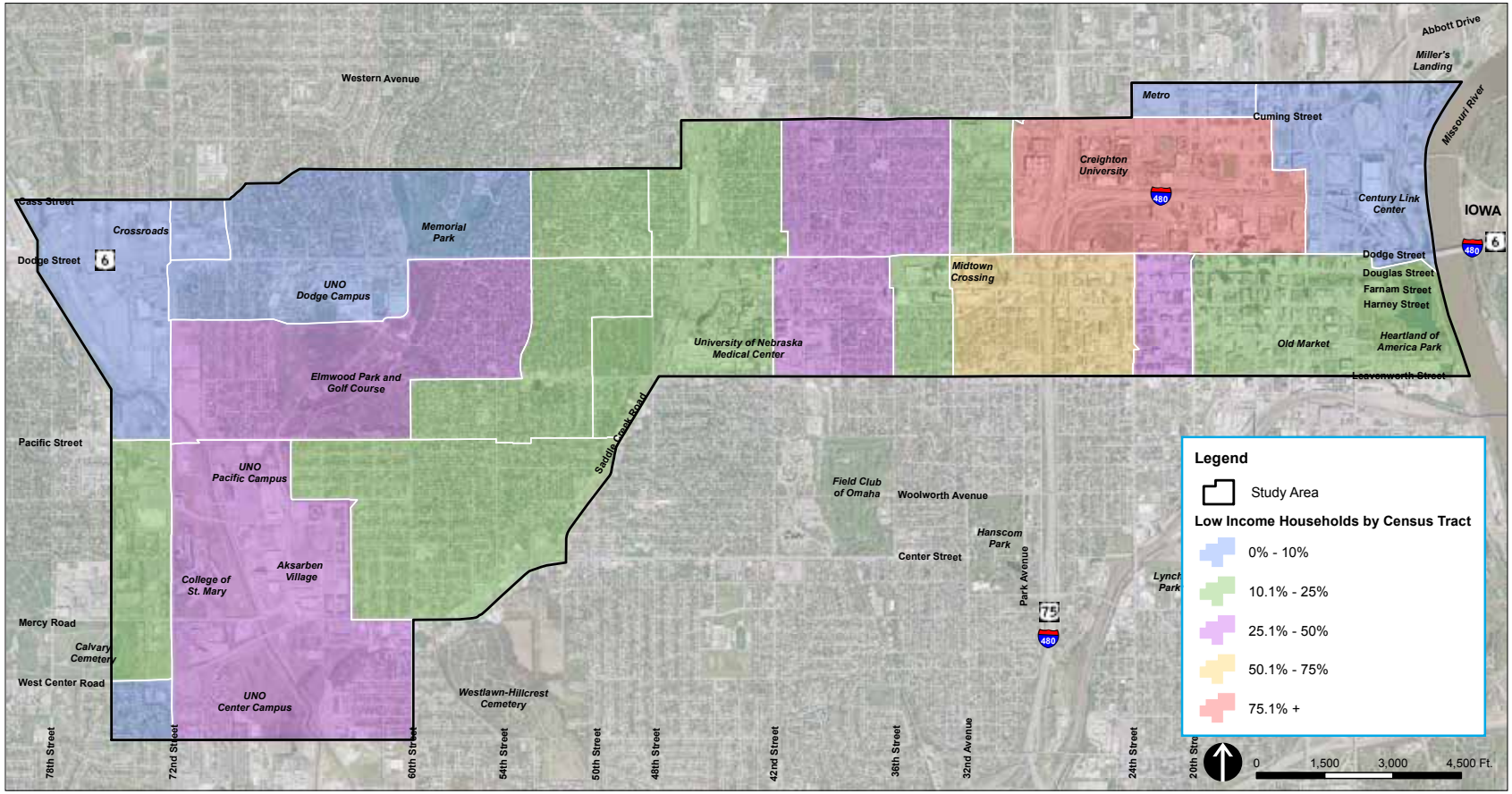


Figure 13 Zero Car Households

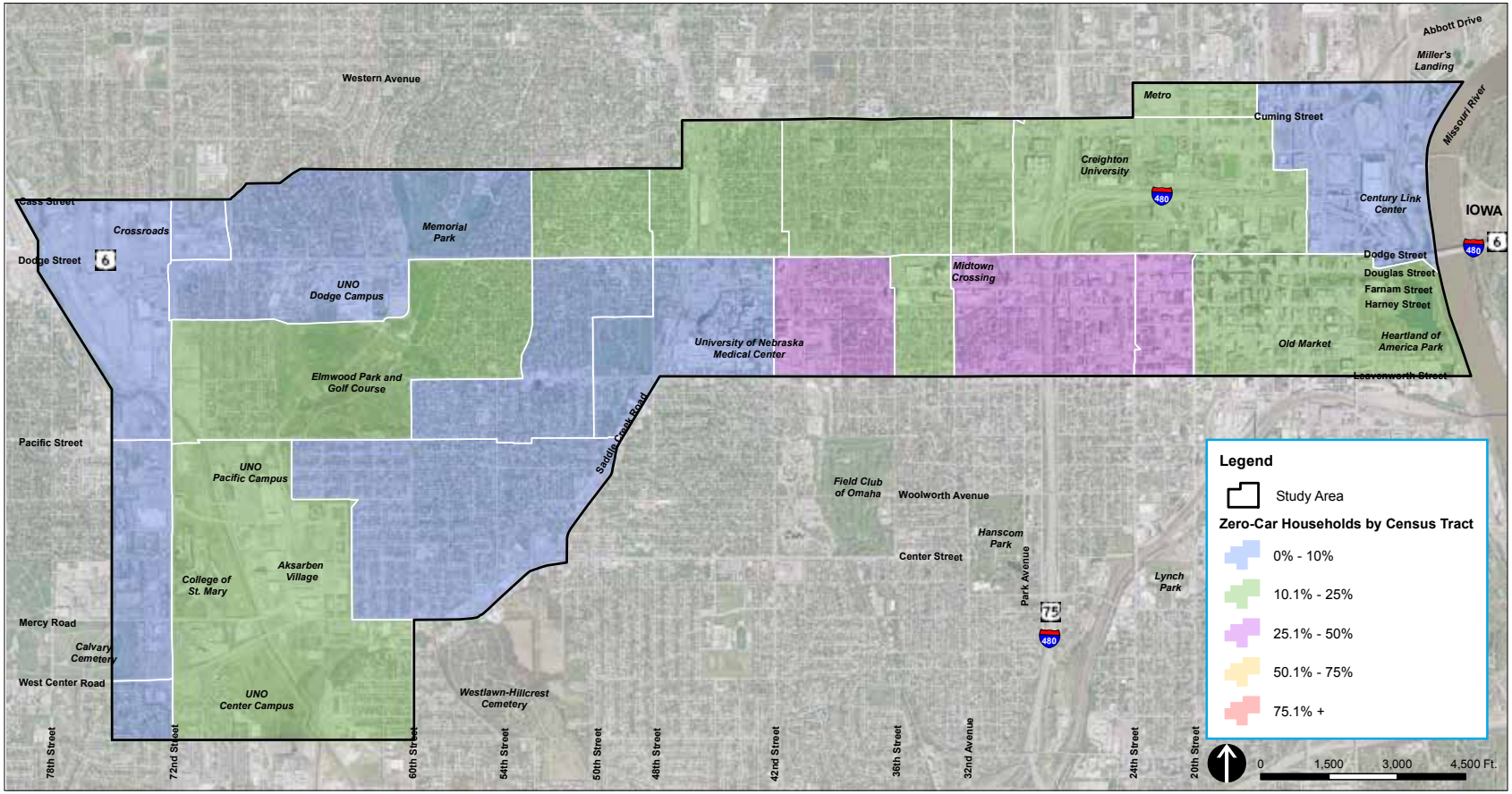


Figure 14 Minority Population by Race

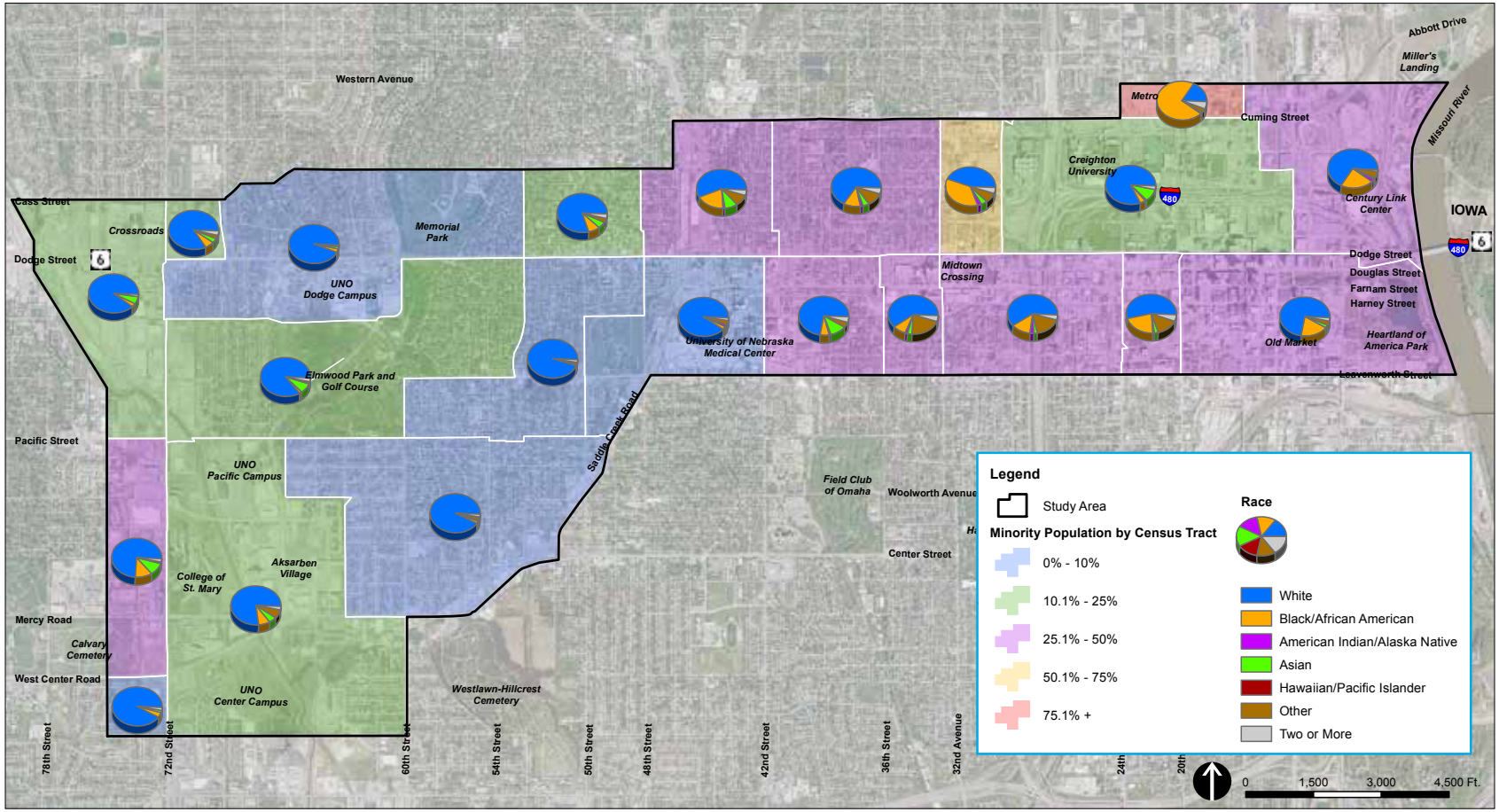


Figure 15 Population Under 18

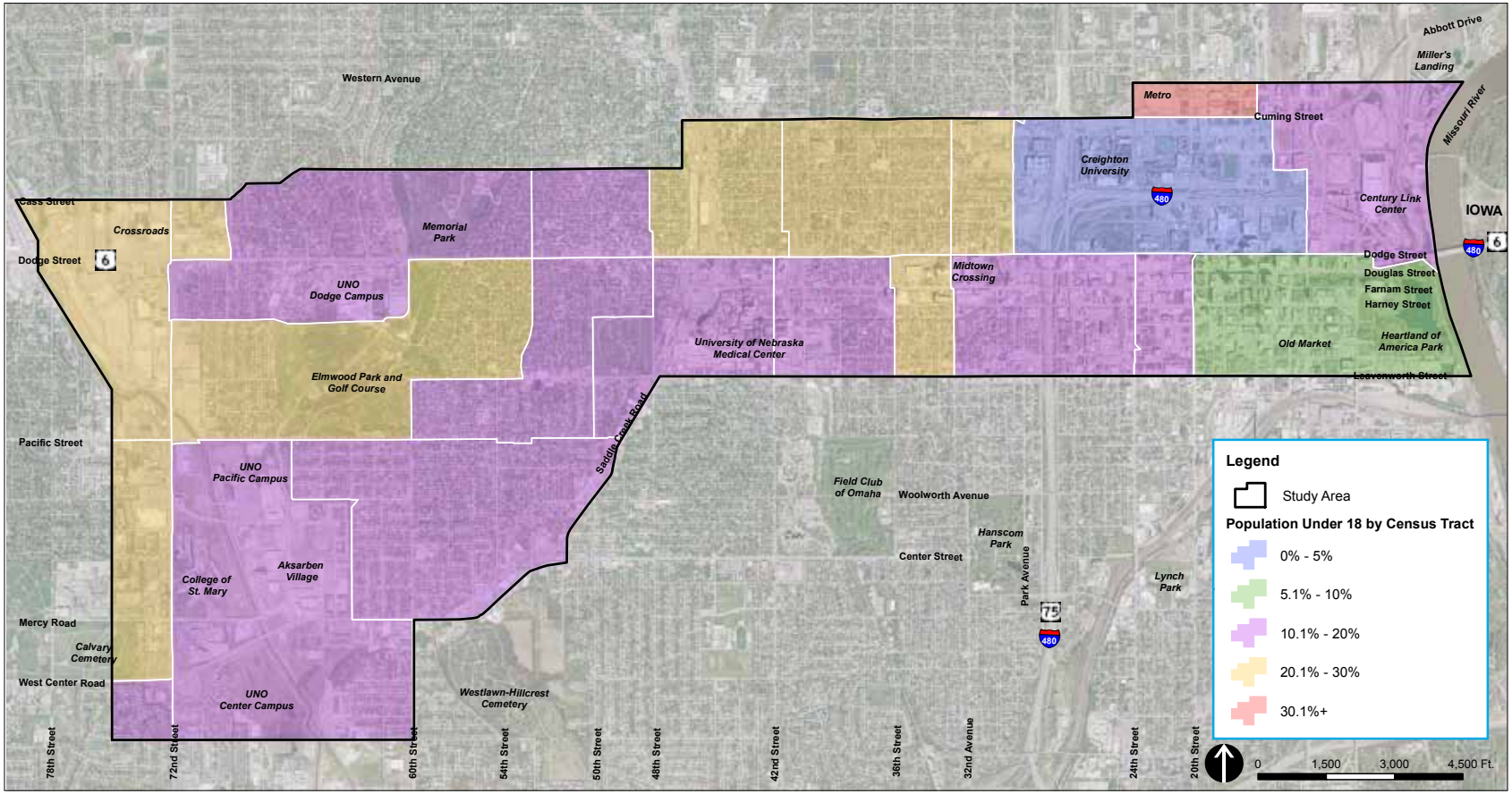
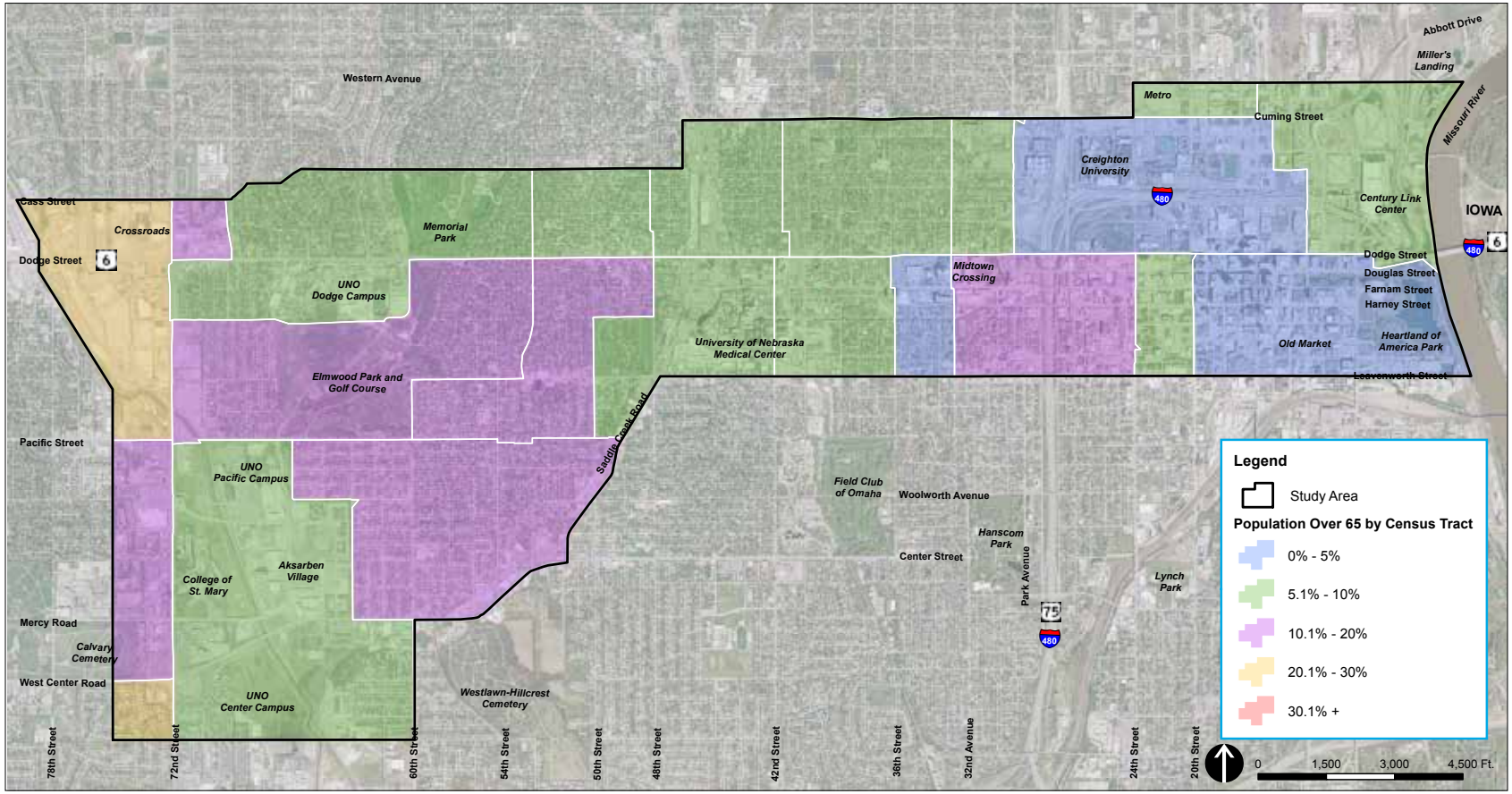


Figure 16 Population Over 65



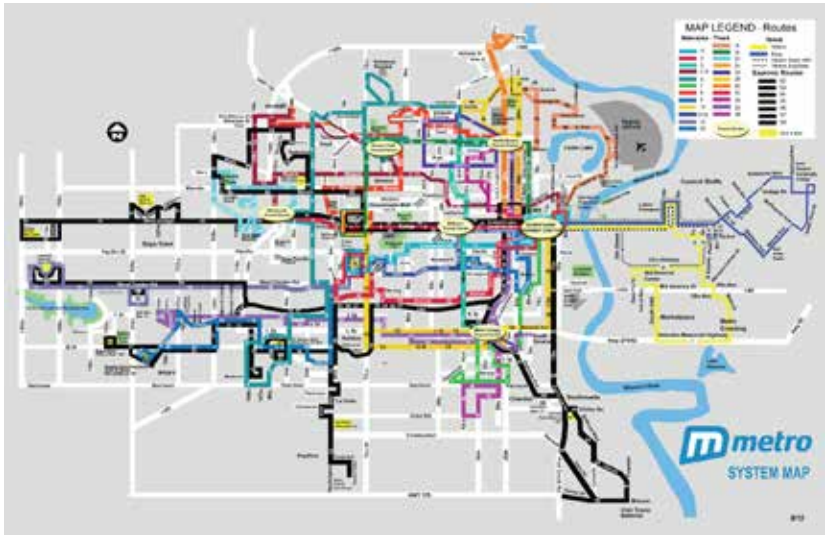
1.2.4 Transit Service in Study Area

Metro is responsible for the operation of fixed route local and express bus service, as well as American with Disabilities Act (ADA) complementary paratransit service (MOBY) within the study area. Metro also operates a Downtown Circulator on weekdays during peak hours as well as the Stadium Circulator during the College World Series in June of each year.

Metro operates a fleet of 138 buses, with an average age of 11 years. Metro's fleet is 100 percent ADA accessible and includes 35 foot and 40 foot buses, as well as cut-a-way vans for MOBY service. Many bus shelters and benches within Metro's service area were built in the 1970s. Shelters and benches are spread out throughout the study area, with a few new stop amenities within the study area.

Metro's core routes, such as the Route 2 on Dodge Street, provide weekday service from 5am-11pm, with 15 minutes service during the peak and 20 minute service during the off-peak. Saturday service is provided between 6am-9pm and Sunday service between 7am-7pm, both with 30 minute frequency. The Green Route (Downtown Circulator) operates during peak hours (5:30am-9:00am and 3:30pm-7:30pm) with 6 minute frequency. Metro local and express bus route coverage in the study area is shown in Figures 17 and 18. The Green Route (Downtown Circulator) and Stadium Circulator are shown in Figures 19 and 20.

Source*: Metro*



Source*: Metro*

Figure 17 Metro Local Bus Routes

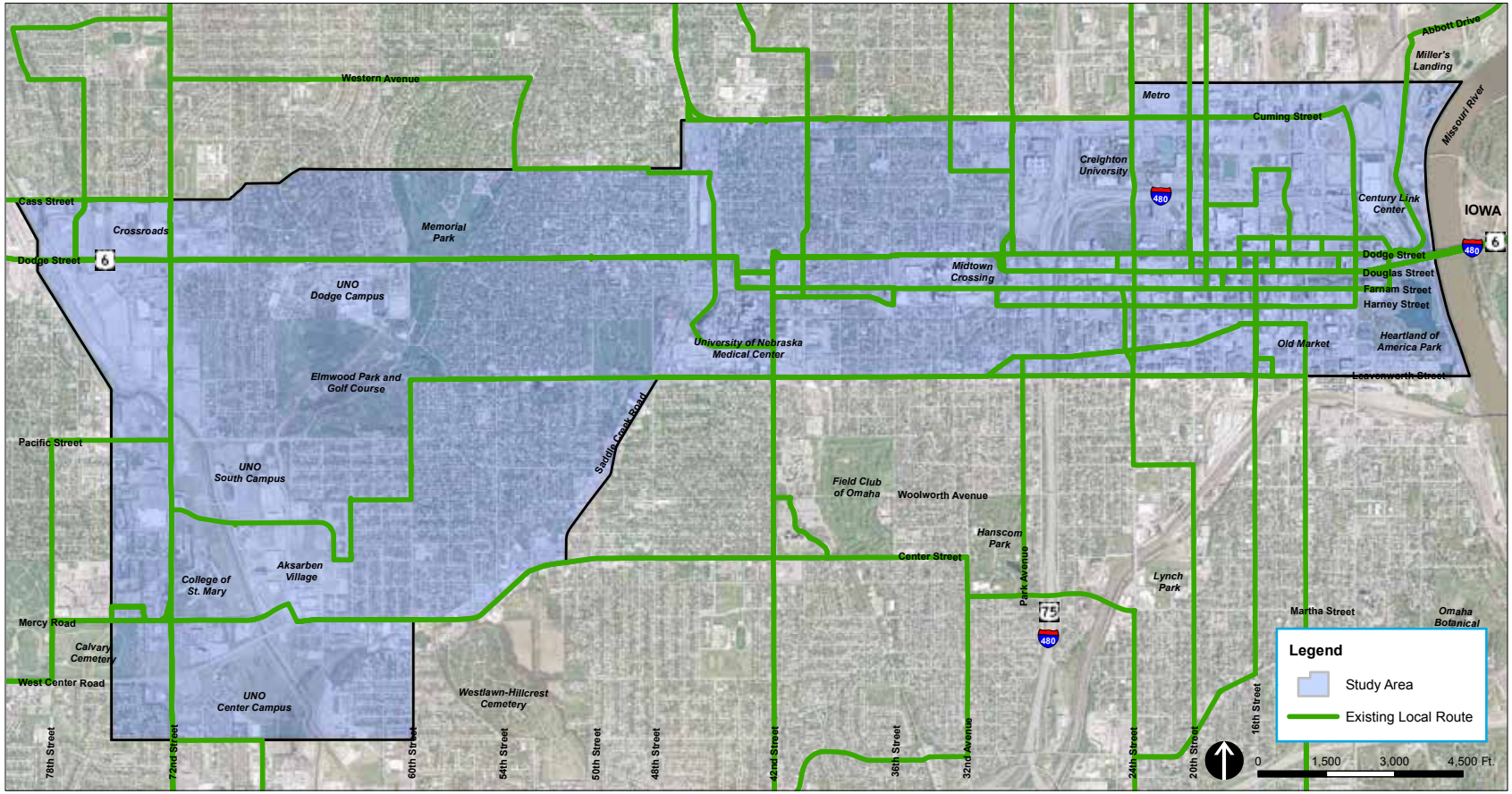


Figure 18 Metro Express Bus Routes

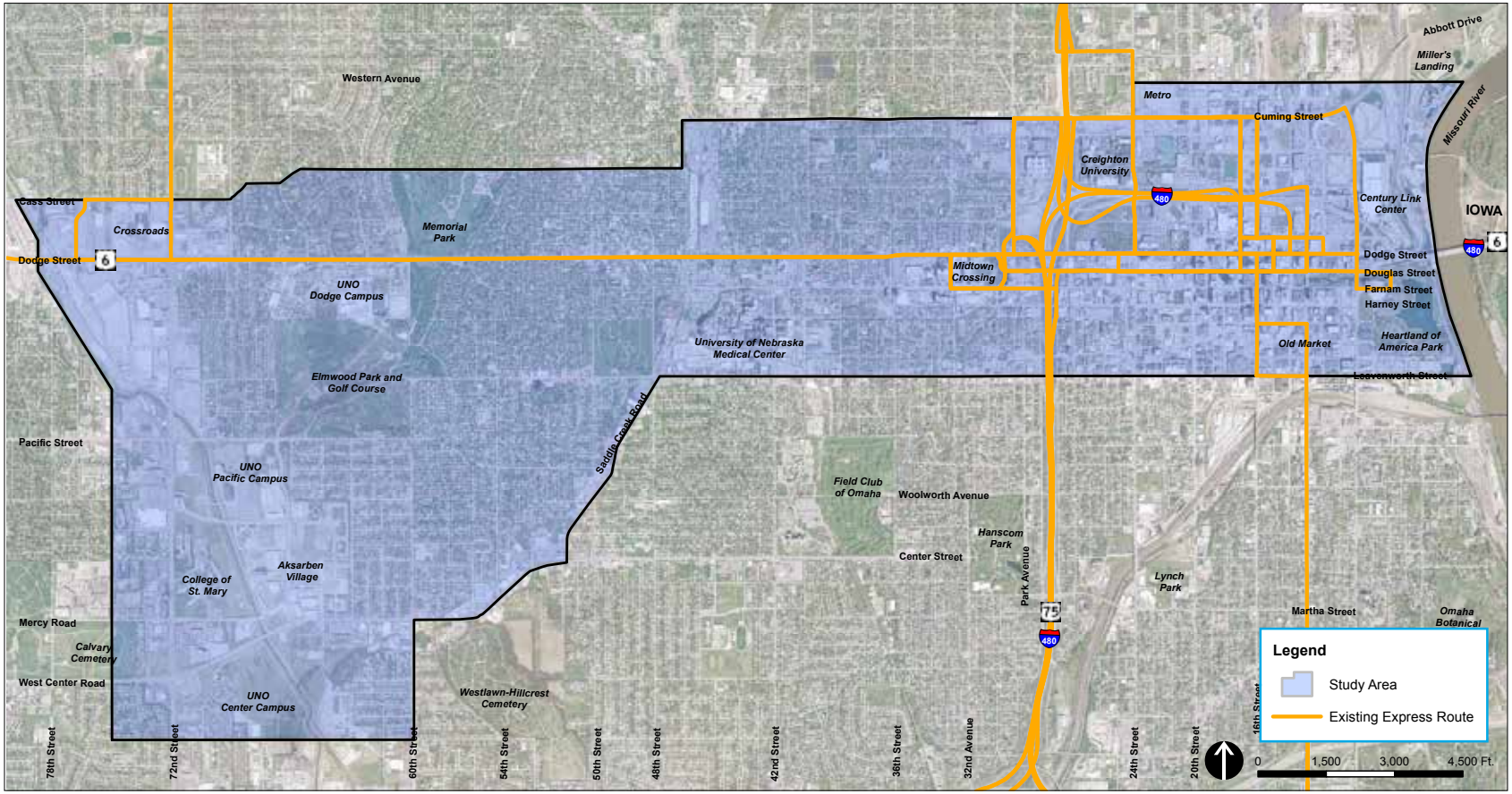
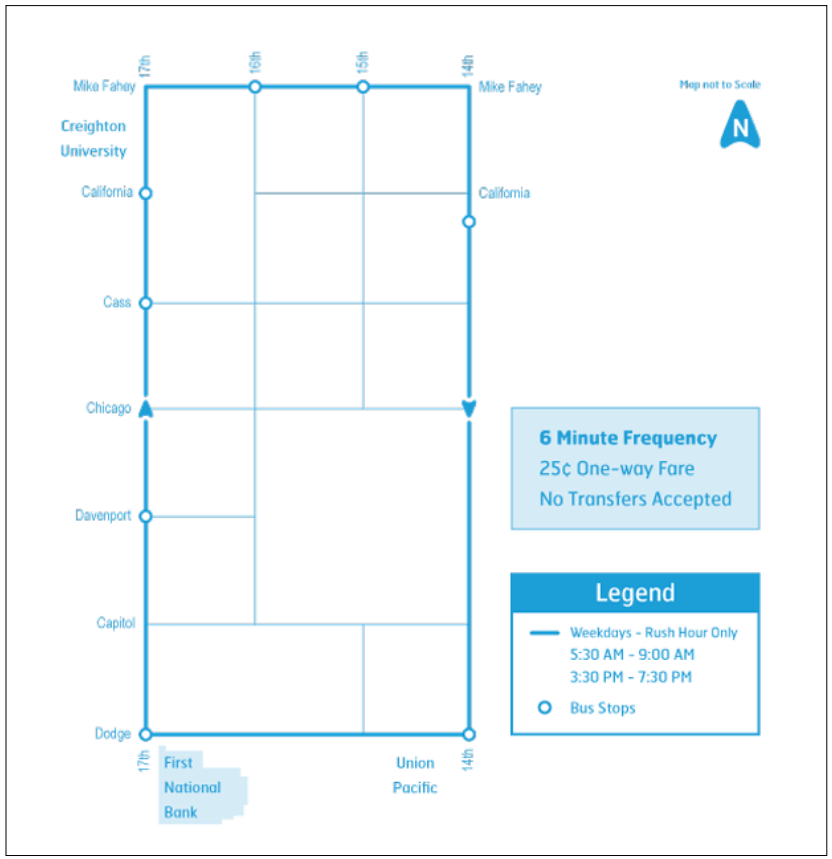
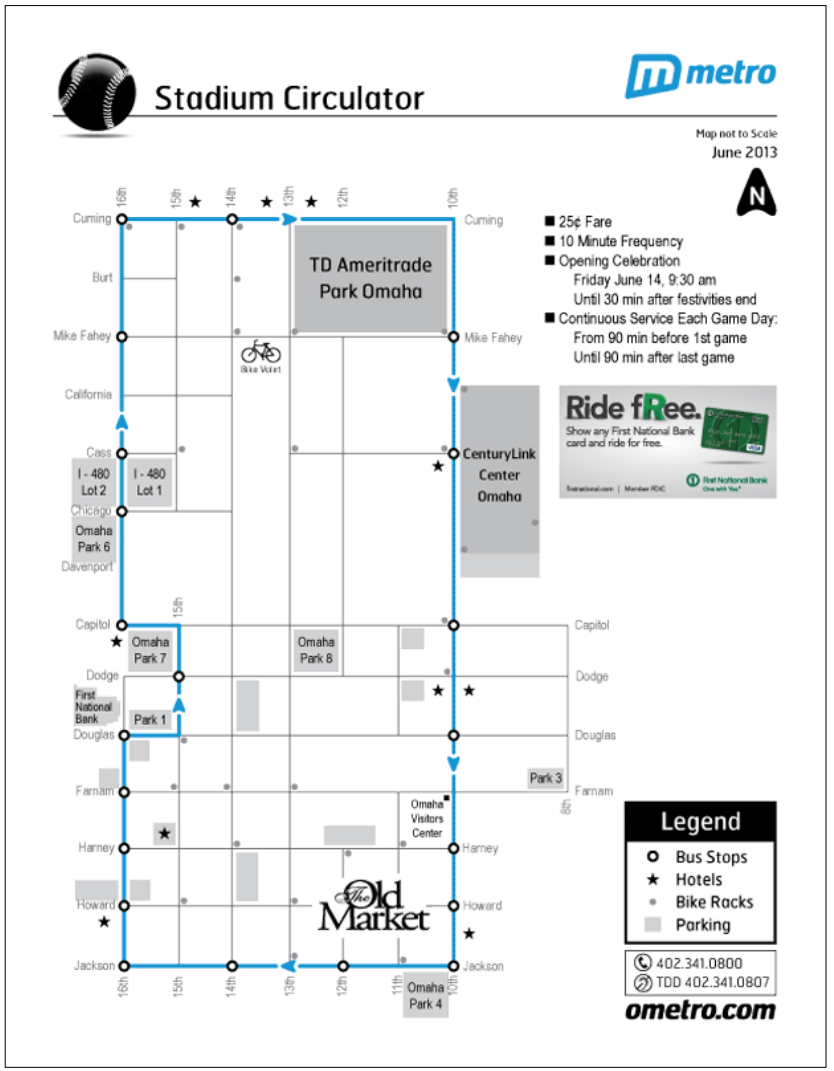


Figure 19 Metro Downtown Circulator (Green Route)



Source: *Metro*

Figure 20 Metro Stadium Circulator



Source: *Metro*

Metro's fares are $1.25 for local bus routes and $1.50 for express bus routes, while transfers are $0.25. The fare for the Green Route (Downtown Circulator) and Stadium Circulator is $0.25 and no transfers are allowed. There are a number of fare discounts for students, children, and seniors, disabled, and Medicare passengers with Metro identification.

Metro is currently in the process of planning a new Downtown transit center, which will reorient much of the downtown bus service network. Currently, Metro uses an on-street transit facility on 16th Street between Dodge Street and Howard Street.

Ridership

Metro weekday ridership data is provided for April 2012, with ridership for the total system shown in Table 4 and the study area shown in Table 5. This data shows that the total average weekday ridership for the Metro bus system is 14,877. The highest ridership Metro bus routes are the Route 2 (Dodge), 13 (Beltway South), 18 (Beltway North), and 30 (Florence). Each of these routes serves over 1,000 riders per day, with the Routes 2 and 18 serving over 1,600 riders per day. All of these routes with the highest ridership serve the study area, with the Route 2 (Dodge) providing east/west service throughout the length of the corridor.

Bus stop on Farnam Street and 31st Street at Midtown Crossing

Table 4 Metro Weekday Ridership (System)

Route	Total Weekday Ridership	Average Weekday Ridership	Weekday Miles	Weekday Hours	Passengers per Mile	Passengers per Hour
1	887	42	98.71	6.93	0.4	6.1
2	35,580	1,694	939.82	75.43	1.8	22.5
3	14,955	712	471.86	35.80	1.5	19.9
4	14,636	697	590.85	40.55	1.2	17.2
5	12,015	572	840.22	51.93	0.7	11.0
7	16,905	805	534.59	45.30	1.5	17.8
8	9,174	437	653.11	44.20	0.7	9.9
9	2,940	140	159.93	13.10	0.9	10.7
11	10,360	493	552.44	43.83	0.9	11.3
13	21,209	1,010	881.18	64.10	1.1	15.8
14	15,060	717	807.45	54.25	0.9	13.2
15	14,419	687	839.43	59.88	0.8	11.5
16	2,058	98	236.28	13.45	0.4	7.3
18	33,951	1,617	1,079.30	82.82	1.5	19.5
22	2,729	130	246.51	15.33	0.5	8.5
24	11,397	543	282.02	30.00	1.9	18.1
25	2,508	119	179.97	12.63	0.7	9.5
26	4,995	238	206.42	14.93	1.2	15.9
30	23,788	1,133	519.15	41.87	2.2	27.1
32	6,379	304	394.48	34.15	0.8	8.9
34	456	22	58.19	3.17	0.4	6.9
35	11,850	564	346.57	29.73	1.6	19.0
48	769	37	110.44	6.93	0.3	5.3

(Table continues on next page)

Table 4 (cont)

Route	Total Weekday Ridership	Average Weekday Ridership	Weekday Miles	Weekday Hours	Passengers per Mile	Passengers per Hour
55	14,794	704	720.51	52.25	1.0	13.5
92	3,501	167	200.03	9.55	0.8	17.5
93	673	32	122.97	5.27	0.3	6.1
94	965	46	140.04	5.80	0.3	7.9
95	1,119	53	99.36	5.12	0.5	10.4
96	922	44	99.25	4.88	0.4	9.0
97	3,255	155	265.40	11.33	0.6	13.7
98	904	43	107.91	6.10	0.4	7.1
Green	3,110	148	164.16	16.20	0.9	9.1
Blue	7,389	352	333.82	23.92	1.1	14.7
Yellow	6,546	312	331.22	22.60	0.9	13.8
Other	215	10				
TOTAL	**312,415**	**14,877**	**13,613.59**	**983.33**	**1.1**	**15.1**

Source: *Metro, April 2012*

Table 5 Metro Weekday Ridership (Study Area)

Route	Total Weekday Ridership	Average Weekday Ridership	Weekday Miles	Weekday Hours	Passengers per Mile	Passengers per Hour
2	35,580	1,694	939.82	75.43	1.8	22.5
3	14,955	712	471.86	35.80	1.5	19.9
4	14,636	697	590.85	40.55	1.2	17.2
7	16,905	805	534.59	45.30	1.5	17.8
8	9,174	437	653.11	44.20	0.7	9.9
9	2,940	140	159.93	13.10	0.9	10.7
11	10,360	493	552.44	43.83	0.9	11.3
13	21,209	1,010	881.18	64.10	1.1	15.8
14	15,060	717	807.45	54.25	0.9	13.2
15	14,419	687	839.43	59.88	0.8	11.5
16	2,058	98	236.28	13.45	0.4	7.3
18	33,951	1,617	1,079.30	82.82	1.5	19.5
24	11,397	543	282.02	30.00	1.9	18.1
30	23,788	1,133	519.15	41.87	2.2	27.1
32	6,379	304	394.48	34.15	0.8	8.9
34	456	22	58.19	3.17	0.4	6.9
35	11,850	564	346.57	29.73	1.6	19.0
55	14,794	704	720.51	52.25	1.0	13.5
92	3,501	167	200.03	9.55	0.8	17.5
93	673	32	122.97	5.27	0.3	6.1
94	965	46	140.04	5.80	0.3	7.9

(Table continues on next page)

Table 5 (cont)

Route	Total Weekday Ridership	Average Weekday Ridership	Weekday Miles	Weekday Hours	Passengers per Mile	Passengers per Hour
95	1,119	53	99.36	5.12	0.5	10.4
96	922	44	99.25	4.88	0.4	9.0
97	3,255	155	265.40	11.33	0.6	13.7
98	904	43	107.91	6.10	0.4	7.1
Blue	7,389	352	333.82	23.92	1.1	14.7
Yellow	6,546	312	331.22	22.60	0.9	13.8
TOTAL	**285,185**	**13,581**	**11,767.16**	**858.45**	**0.98**	**13.71**

Source: *Metro, April 2012*
Note: *The data in this table reflects the ridership, miles, and hours of the routes in their entirety and is not isolated to the study area.*

1.3 Statement of Need

This section describes the existing problems and deficiencies within the study area to demonstrate the need for the project. In evaluating the existing conditions in the study area, the themes below emerged which describe the need for the project.

STATEMENT OF NEED

- *Spatially disconnected activity centers*
- *Lack of transit priority corridor*
- *Increased transit demand from population and employment growth*
- *Imbalanced parking availability and capacity*
- *Poor trip circulation for special events*
- *Lack of transit access to jobs*
- *Lack of adequate stop and service amenities*
- *Sustainability goals/measures in adopted plans*

1.3.1 Spatially Disconnected Activity Centers

Activity centers and districts within and adjacent to the study area are spatially disconnected due to its size, topography, street grid, and location of freeways. The study area is large in size and stretches approximately 6 miles from Downtown on the east to Crossroads on the west, and 2 miles from Crossroads on the northwest and Aksarben Village on the southwest.

Topography poses a challenge for pedestrians and bicyclists who walk or bike to bus stops, many of which exceed a comfortable walking distance of a quarter- to half-mile bus service access. Steep grades to the west of UNMC rise 67 feet on Farnam Street between 46th and 48th Streets with an average slope of 9.3 percent. In addition, steep grades around UNMC rise 34 feet on Farnam Street between 42nd and 41st Streets with an average slope of 10.3 percent.

Distances between key activity centers and districts which can create voids of investment and activity:

North Downtown to Old Market	*0.9 miles*
Old Market to Midtown	*1.8 miles*
Midtown to UNMC	*1.0 mile*
UNMC to UNO Dodge Street Campus	*1.8 miles*
Downtown to Crossroads	*5.0 miles*
Crossroads to Aksarben Village	*1.9 miles*

Interstate 480 divides the study area, with six bridges and two streets connecting both sides, which limits opportunities for effective pedestrian and bicycle movement. Sidewalk quality is poor at times, or nonexistent, and interruptions to the street grid network are commonplace. The Gene Leahy Mall, Doubletree Hotel on 16th Street, and a few large activity and shopping centers also create barriers for direct pedestrian and bicycle trips.

Weather conditions can limit pedestrian and bicycle circulation to bus stops and shelters. When temperatures drop below 32 degrees Fahrenheit during five months out of the year and the average precipitation is 2 inches per month for seven months out of the year, traveling comfortably as a pedestrian or cyclist within the study area becomes difficult.

The combination of these spatial factors means that many trips within the study area often exceed a comfortable walking distance of a quarter- to half-mile, and inhibit pedestrian circulation to and from bus stops, especially stops without shelters and benches.

Interstate 480 divides Downtown from Midtown and UNMC

1.3.2 Lack of Transit Priority Corridor

Metro provides a high level of bus service to and from Downtown, but this service is a complex network of over a dozen bus routes, many of which require long transfer waits along the study corridor which can be confusing and time consuming to riders and can make trips difficult to navigate. No single bus route effectively serves the Downtown core and nearby activity centers, making the choice to use Metro more difficult than walking or driving in many instances. For example, the distance between TD Ameritrade Park and the Old Market is just under a mile, yet walking between these points is often faster than taking the bus due to the lack of direct and frequent service. The exception is during the College World Series in June when Metro operates the Stadium Circulator with a simple route structure and 10 minute frequency.

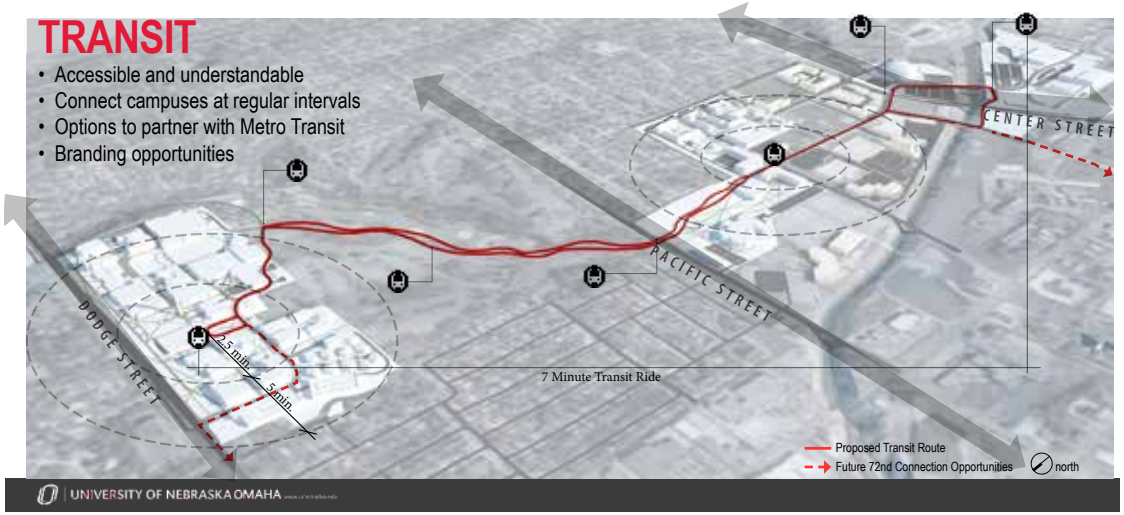
The success of the Stadium Circulator demonstrates the need to serve Downtown and surrounding travel markets with a high quality transit service. On the other hand, the Green Route (Downtown Circulator) is limited to the peak hour and does not provide service during lunch hour or late evenings when many workers or visitors may want to use it. Overall, the use of the Metro bus system is challenging as currently configured for Downtown circulation and connections to surrounding areas, especially for novice transit users.

While there is frequent Metro bus service to and from Downtown, the surrounding districts (particularly the west end of the corridor) lack frequent connection opportunities. A more developed transit priority corridor is key in providing an intuitive, user-friendly, and high quality transit service between Downtown and surrounding activity centers. Reconfiguring existing Metro bus routes and schedules could partially or fully resolve some connection and access issues. These issues will be examined along with the current Metro timed transfer system in the MAPA/Metro Regional Transit Vision study.

1.3.3 Increased Transit Demand from Population and Employment Growth

A study of the alternative modes is needed in order to determine a preferred mode that will provide increased transit service to support future population and employment growth within the study area. According to Census 2010, the highest percentage of population growth in the study area between 2000 and 2010 occurred in Downtown and the UNO Pacific and Center campuses and Aksarben Village areas. These areas are at opposite ends of the corridor and have different transit service characteristics. Downtown has the highest level of transit service in the region while transit services around the UNO Pacific and Center campuses and Aksarben Village areas are much more limited. This indicates a need to redistribute existing transit resources and reprioritize transit investments to serve existing and growing population centers.

Most of the region's largest employment centers are located within the study area (Downtown, Midtown, UNMC, UNO, and Crossroads and Aksarben Village areas). Each of these employment centers has mobility



UNO Master Plan
Source: *UNO*

Future Buffett Cancer Center at UNMC
Source: *UNMC*

Midtown Crossing

Aerial view of AA study Corridor looking west (Downtown in forefront; Midtown and UNMC in rear)

Aerial view of Aksarben Village Development

Creighton University of North Downtown

constraints, which may inhibit future growth. For example, UNMC is almost landlocked with limited to no availability for parking expansion. Improved transit connections and increased service are needed to support UNMC's growth for employees, patients and visitors of UNMC. Both UNMC and UNO operate shuttle systems for their employees and students, but more connections are needed for these users as well as other employers and universities (i.e., Mutual of Omaha and Creighton).

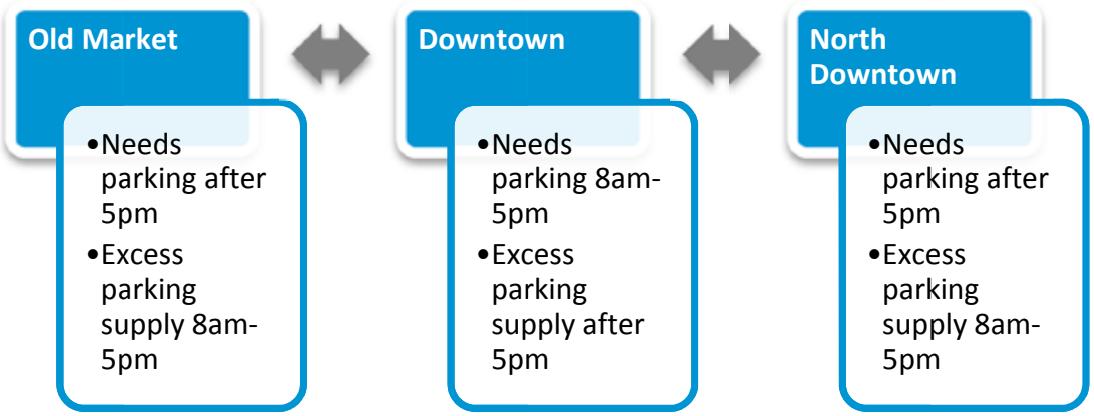
1.3.4 Imbalanced Parking Availability and Capacity

The Omaha *Downtown Parking Management Plan* concluded that the parking supply in downtown is plentiful but disproportionate. On-street parking is regularly in high demand and creates unnecessary automobile circulation traffic while drivers try to locate on-street parking spots that are better located and free at prime times of the day. While most of the garages are publicly owned and affordable for either monthly or hourly options, there is an imbalance of garages with plenty of availability versus on-street parking in high demand areas. As such, management of the City's parking assets is spread thin with disparate elements and policies that are not cohesive.

Improved transit circulation is needed to support better parking management by connecting parking supply and demand. For example, many of the parking lots and garages in Downtown are empty during special events in North Downtown at CenturyLink Center and TD Ameritrade Park. Conversely, many of the

On-street parking at Midtown Crossing

Surface and structured parking around TD Ameritrade Park and CenturyLink Center



parking lots around these event centers are empty during regular office hours in Downtown.

The success of Metro's Stadium Circulator during the College World Series demonstrates the ability to use the existing parking supply in Downtown for special events. The same approach could be used on a daily basis as part of a comprehensive parking management strategy supported by improved transit circulation.

1.3.5 Poor Trip Circulation for Special Events

Existing Metro bus service does not provide the everyday circulation needed for special events, particularly to and from North Downtown. As described earlier, there are a number of physical barriers separating Downtown and North Downtown, including Interstate 480, Gene Leahy Mall, and the Doubletree Hotel on 16th Street. These barriers, along with the distance between Downtown and the North Downtown event venues, provide obstacles for trip circulation for special events.

TD Ameritrade Park

Metro's Stadium Circulator demonstrates the travel demand between Downtown and North Downtown for special events. However, this service does not operate during other times of the year when there are many other special events at CenturyLink Center, TD Ameritrade Park, Holland Performing Arts Center, Orpheum, and other venues, in addition to the multitude of seasonal events such as the Farmers Market, Summer Arts Festival, and other niche events. Similarly, many of the hotels are located in Downtown and North Downtown, with many hotel patrons needing to go from a hotel in North Downtown to Downtown, or vice versa to special events.

1.3.6 Lack of Timely Transit Access to Jobs

The project is needed to address a lack of timely transit access to jobs. Based on the demographic information obtained from Census 2010 and MAPA, the census tracts with the highest population, low income households, and minority populations are different from those with the highest employment. While many of these areas are

"Where the Jobs Are: Employer Access to Labor by Transit (July 2012)" *by the Metropolitan Policy Program at Brookings*

According to this paper, "the suburbanization of jobs obstructs transit's ability to connect workers to opportunity and jobs to local labor pools." Based on the results of this study, 76.2 percent of jobs in the Omaha metropolitan area are in neighborhoods with transit service, which ranks 38th among the 100 largest metropolitan areas. In addition, the typical job can reach 28.5 percent of the Omaha metropolitan population in 90 minutes via public transit, which ranks 32nd among metropolitan areas surveyed. While in the top 50 percent in both categories, there remains a need to improve the labor access rate in Omaha. One of the key findings from the Brookings paper is that "expanded transit networks and integrated land use decisions can improve transit's utility to employers." These figures and finding support the need for the project to further address a lack of transit access to jobs in Omaha.

Metro began installing new Odyssey fareboxes in 2013
Source: *Metro*

connected by the existing Metro bus service, the level of service is not conducive to providing improved access to jobs. This is further needed since the employment centers in Omaha are in a linear corridor between Downtown, Midtown, UNMC, UNO, and the Crossroads and Aksarben Village areas. In addition, there is increased opportunity for development of office space and other employment in Downtown and throughout the corridor.

1.3.7 Lack of Adequate Stop and Service Amenities

There is a need for more stop and service amenities within the study area. Many of the older bus shelters and benches in the study area were built to standards different than today. Many stops do not have adequate amenities for patrons as they wait for buses (especially during inclement weather), and in some instances, are not easy to locate or get to because of topography. Service reliability, passenger comfort, and quicker boarding times are difficult to achieve as the system continues to age. Some stop amenities within the study area are slightly newer than the rest of the Metro service area, as new developments have implemented new amenities. Mutual of Omaha recently built bus shelters in the Midtown Crossing area and implemented an agreement to provide maintenance service for the shelters. In addition, Metro upgraded fareboxes in 2013. They now accommodate new fare media including smart card expansion in the future.

1.3.8 Sustainability Goals/Measures in Adopted Plans

The project is needed to address the 2030 sustainability goals outlined in the *Omaha Master Plan Environmental Element (2010)*. The Urban Form and Transportation category of this plan provides direction for Omaha to substantially reduce its impact on the environment and the per capita cost of critical infrastructure and municipal services to increase urban quality and community health. Increasing density and encouraging pedestrian activity and alternative modes of transportation (especially transit) are critical.

1.4 Statement of Purpose

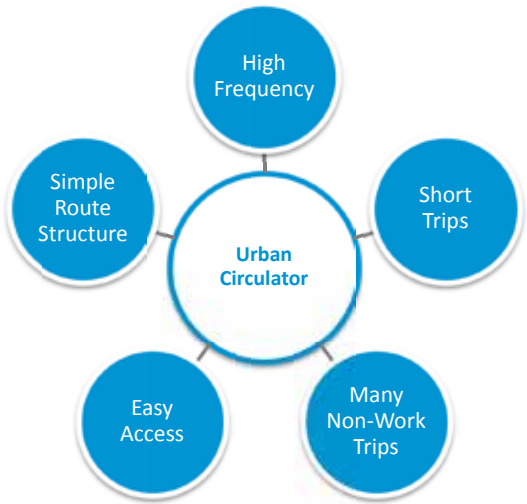
The purpose of the project is to improve transit connections for residents, employees, and visitors to employment centers, educational facilities, various services, areas of interest, and the regional transit network while serving as a driver for employment growth and economic development. The project will improve transit connectivity and increase opportunities for mobility between Downtown, Midtown, UNMC, UNO, and the Crossroads and Aksarben Village areas. The box on this page describes the purpose for the project.

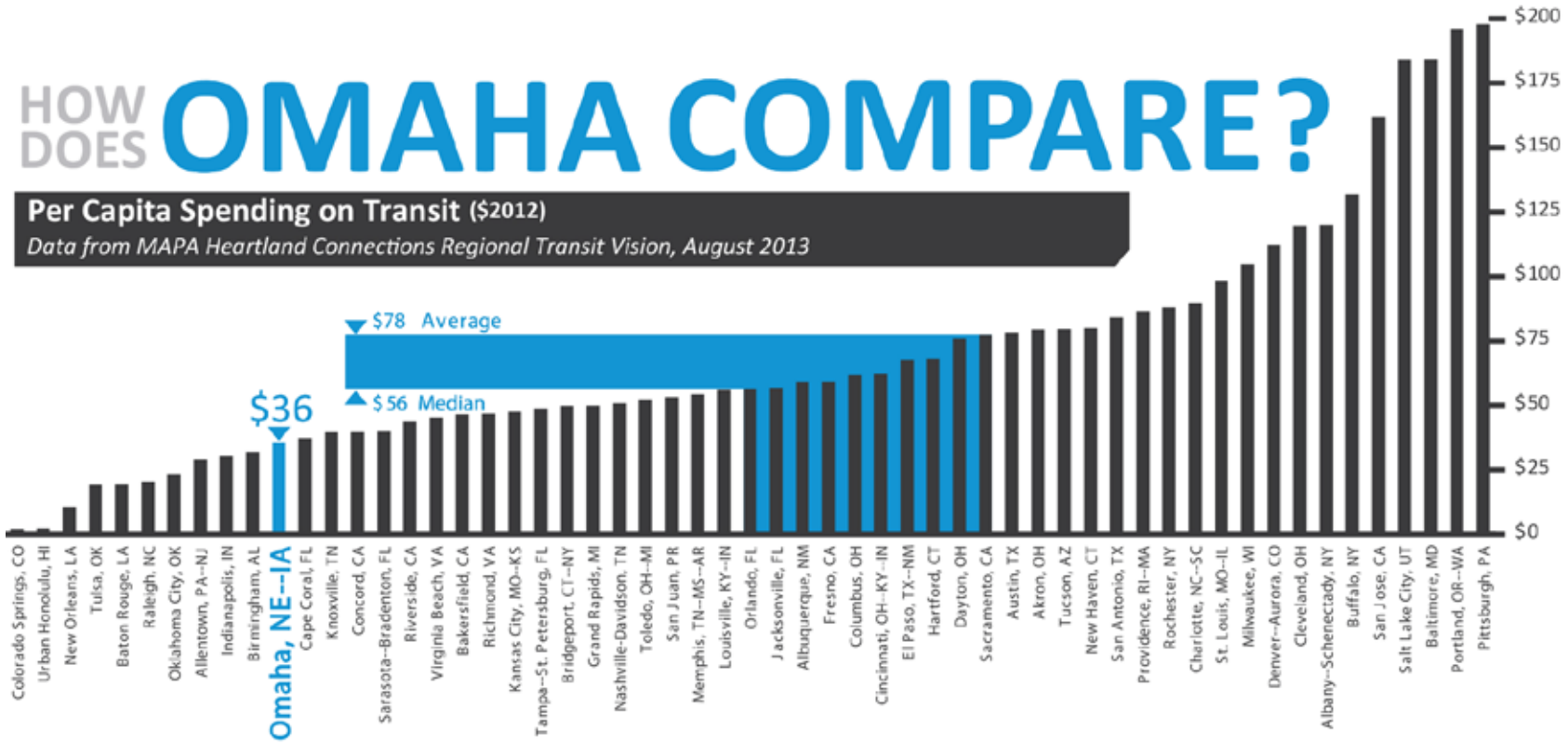
STATEMENT OF PURPOSE

- ***Connect major districts, destinations, and activity centers***
- ***Provide simple, localized, high-frequency transit service***
- ***Support population and employment growth, and revitalization***
- ***Balance parking availability and capacity***
- ***Improve transit circulation for special events***
- ***Maximize transit access to highest employment corridor***
- ***Provide adequate stop and service amenities***
- ***Contribute to meeting sustainability goals/measures in adopted plans***

1.4.1 Connect Major Districts, Destinations, and Activity Centers

The project will strengthen the connection between major districts, destinations, and activity centers within the study area, fostering a more unified and cohesive corridor through the Downtown, Midtown, UNMC, UNO, and the Crossroads and Aksarben Village areas. The project will enable easy, frequent, and convenient travel throughout the study area for residents, employees, and visitors. This includes providing connections that overcome existing physical barriers (size of the study area, topography and street grades, and interrupted street grid) as well as improving trip circulation for special events.




HOW DOES OMAHA COMPARE?
Per Capita Spending on Transit ($2012)
Data from MAPA Heartland Connections Regional Transit Vision, August 2013
$78 Average
$56 Median
$36
$200
$175
$150
$125
$100
$75
$50
$25
$0
Colorado Springs, CO
Urban Honolulu, HI
New Orleans, LA
Tulsa, OK
Baton Rouge, LA
Raleigh, NC
Oklahoma City, OK
Allentown, PA--NJ
Indianapolis, IN
Birmingham, AL
Omaha, NE--IA
Cape Coral, FL
Knoxville, TN
Concord, CA
Sarasota--Bradenton, FL
Riverside, CA
Virginia Beach, VA
Bakersfield, CA
Richmond, VA
Kansas City, MO--KS
Tampa--St. Petersburg, FL
Bridgeport, CT--NY
Grand Rapids, MI
Nashville-Davidson, TN
Toledo, OH--MI
San Juan, PR
Memphis, TN--MS--AR
Louisville, KY--IN
Orlando, FL
Jacksonville, FL
Albuquerque, NM
Fresno, CA
Columbus, OH
Cincinnati, OH--KY--IN
El Paso, TX--NM
Hartford, CT
Dayton, OH
Sacramento, CA
Austin, TX
Akron, OH
Tucson, AZ
New Haven, CT
San Antonio, TX
Providence, RI--MA
Rochester, NY
Charlotte, NC--SC
St. Louis, MO--IL
Milwaukee, WI
Denver--Aurora, CO
Cleveland, OH
Albany--Schenectady, NY
Buffalo, NY
San Jose, CA
Salt Lake City, UT
Baltimore, MD
Portland, OR--WA
Pittsburgh, PA

1.4.2 Provide Simple, Localized, High-Frequency Transit Service

This project will improve transit mobility and circulation within the study area by improving frequency, service coverage and quality, and providing stronger intermodal connections. In particular, the project will enhance transit mobility as well as accelerate longer walking and biking distances within the study area. The project will provide high quality transit service that will differ from existing Metro bus service in terms of its operating characteristics.

The project will provide an urban circulator transit service with the following characteristics:

- Simple route network that is user-friendly
- High-frequency all-day service that facilitates short trips
- Larger vehicle capacity to accommodate higher passenger load factors during peak hours and special events
- Low-floor vehicles to facilitate easy access and rapid boardings and alightings

1.4.3 Support Population and Employment Growth, and Revitalization

The project will support population growth in the study area, particularly in the areas with the largest population growth between 2000 and 2010 (Downtown, UNO Pacific and Center campuses, and Aksarben Village areas). The project will also support employment growth at some of the region's largest employment centers. Many of these employment centers, such as UNMC and UNO, are physically constrained. The project will support their growth by improving connectivity between their multiple campuses and supporting less of a need for on-street parking and parking lots.

The project will build stronger physical connections between employment hubs, educational centers, residential neighborhoods, shopping areas, civic resources, historic districts, cultural landmarks and entertainment destinations, and unify the Downtown, Midtown, UNMC, UNO, Crossroads, and Aksarben Village areas into a unified corridor rather than a series of fragmented nodes. The connectivity will revitalize and strengthen the area's economic competitiveness and help reactivate isolated neighborhoods.

1.4.4 Balance Parking Availability and Capacity

The project will help reduce the need to travel by car and promote a "park once" strategy to better utilize existing parking resources and discourage short automobile trips. Increased transit coverage and circulation within the study area will encourage people to take transit, further reducing the need for parking facilities and the intense demand for prime on-street parking spaces. By reducing the need for parking in the corridor, particularly in Downtown, the project will allow the City to maximize the density of development that can be supported in Downtown, North Downtown, and along the corridor, which will in turn support additional transit service and help the City meet its overall sustainability goals. Opportunities to effectively utilize the City's parking assets will be maximized through the project and provide consistency with the sustainability and quality of life goals identified in the *Downtown Omaha Master Plan*.

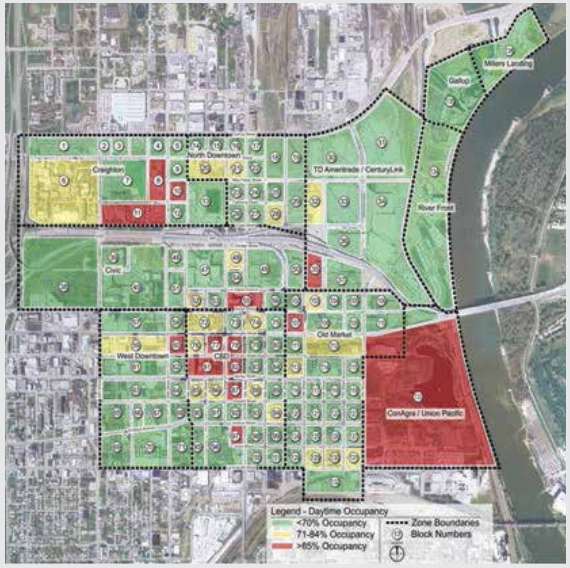
1.4.5 Improve Trip Circulation for Special Events

The project will improve everyday trip circulation for special events. The project will provide a transit investment that addresses the distance and physical barriers separating Downtown and North Downtown. The project will facilitate movement between employment centers, special event venues, and hotels in and around Downtown, and provide new connections to other activity centers in the study area, such as Midtown Crossing. This improved trip circulation will distribute the economic benefit of these special events throughout Downtown and build upon a "park once" strategy.

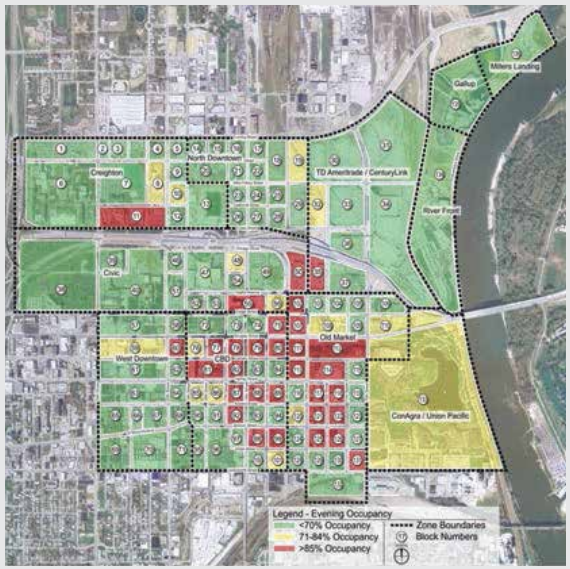
Outside the NCAA Men's College World Series at TD Ameritrade Park

1.4.6 Maximize Transit Access to Highest Employment Corridor

The project will create a transit priority corridor in the area with the region's largest employment centers in Omaha. This concentration of transit service and employment will improve transit access to jobs and facilitate intermodal connections. In many cases, the project will provide the benefit of serving locations that are both major employment and educational hubs, such as UNMC and UNO. In addition, the project will allow future employment to further concentrate in a corridor with high quality transit service.



Daytime Parking Occupancy Rates
Average Weekday Occupancy= 53%



Evening Parking Occupancy Rates
Average Evening Occupancy= 46%

HOW CAN WE MAXIMIZE DOWNTOWN?

Based on the 2011 Omaha Downtown Improvement District Parking Management Plan there are currently

40,979 Parking Spaces

in the Omaha Downtown Improvement District

Source: Olsson Associates, Walker Parking Consultants, May 2011

1.4.7 Provide Adequate Stop and Service Amenities

The project will support additional stop and service amenities such as benches, shelters and transportation modes to improve the Metro rider experience and help promote a unified system identity. The project will identify opportunities for benches and/or shelters at locations that are easy to locate and get to, while considering inclement weather, topography, and connections to the Metro system. By providing adequate service amenities, passengers will benefit from a comfortable ride, service reliability, quicker boarding times, and overall improvements to travel time.

1.4.8 Contribute to Meeting Sustainability Goals/Measures in Adopted Plans

The project will address the 2030 sustainability goals outlined in the *Omaha Master Plan Environmental Element (2010)*. The project will help to address specific measures for increasing density, improving the mode split for active transportation modes, reducing commute trips by single occupant vehicles, and decreasing per capita motor vehicle miles traveled. These measures cannot be achieved without the implementation of a major transit investment in the area of the highest population and employment density in Omaha.

Goals under the Urban Form and Transportation category from *Omaha Master Plan Environmental Element(2010)* provide:

- **Large-scale City Form:** Develop a city form that both reduces the per capita cost of providing city services and establishes the density necessary to support more energy-efficient forms of transportation.
- **Land Use and Development Policy**: Generate development at higher residential densities and true mixed uses that produce more diverse environments and reduce the number of necessary automobile trips.
- **Land Development:** Create individual developments with components that are connected, walkable, and accessible to all modes of transportation, by providing safe, defined, and pleasant routes from the public realm to destinations, based on the needs of each mode.
- **Transportation Network:** Develop a transportation network that moves people and freight within and through the metropolitan area efficiently, maximizing access and minimizing vehicle miles traveled, energy consumed, and pollutants emitted.
- **Transit:** Develop a public transportation system that offers a degree of coverage, convenience, and amenity, that both provides transportation equity for dependent customers and makes transit an attractive option for discretionary passengers.
- **Active Transportation:** Provide a high level of citywide access and continuity to pedestrians and bicyclists, making active transportation a realistic and integral part of the city's transportation network.

1.5 Alternatives Analysis Goals

These five comprehensive goals will guide the Central Omaha Transit AA based on the study's Purpose and Need. These goals will provide the basis by which the transit alternatives will be defined, and will establish the methodology used to evaluate the transit alternatives within the study area.

- **Improve mobility between Downtown, Midtown, UNMC, UNO, and the Crossroads and Aksarben Village areas**
- **Maximize the efficiency and effectiveness of the transit investment**
- **Increase support for Omaha's Master Plan land use and economic development goals and enhance the use of transit-supported land use, planning, and design strategies**
- **Increase sustainable transit investments that are compatible with the built environment**
- **Provide a transit investment that can be implemented within budget constraints for capital and operating expenses**

2 EVALUATION METHODOLOGY

This section describes the Evaluation Methodology for the Central Omaha Transit AA Study.

2.1 Evaluation Process

The AA Study includes an evaluation of the transit alternatives under consideration. The evaluation process will develop project information in sufficient detail so that citizens, stakeholders, agencies, elected officials, and other study participants can make informed decisions on the transit alternatives. The evaluation process includes two phases: Initial Screening and Final Screening. Figure 21 shows how the evaluation process fits into the overall AA Study process.

2.2 Initial Screening

The initial screening evaluation analyzes the initial list of alternatives being considered using a set of qualitative evaluation criteria. Its purpose is to eliminate alternatives that have fatal flaws, do not meet project goals, or do not have public support. The alternatives are rated High, Medium, or Low for each criterion, with High meaning optimal performance and Low indicating sub-standard performance. Table 6 describes the evaluation criteria to be used in initial screening.

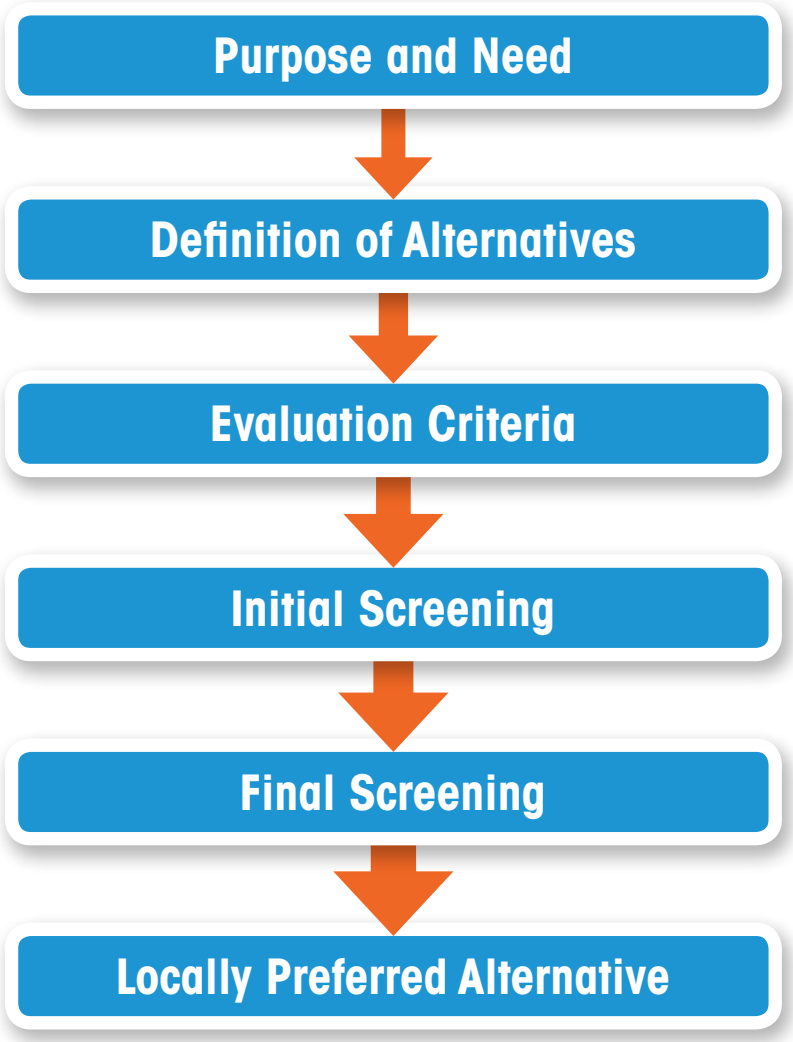


Table 6 Initial Screening Evaluation Criteria

Category	Evaluation Criteria
Mobility	What is the relative potential of the alternative to improve mobility?
Ridership potential	What is the relative potential of the alternative to attract riders?
Capital costs	What is the relative capital cost of the alternative?
O&M costs	What is the relative operating and maintenance (O&M) cost of the alternative?
Points of origin	How well does the alternative serve existing populations?
Destinations	How well does the alternative serve major destinations?
Fatal flaw	Does the alternative have a potential fatal flaw that prevents implementation?
Transit system integration	How well does the alternative integrate with existing Metro bus service?
Expandability	Does the alternative have the ability to be physically expanded?
Traffic	Does the alternative use a route that experiences substantial traffic delay?
Transportation plans and policy	How well does the alternative compliment transportation plans and policies?
Land use and density	How well does the alternative compliment land use/density plans and policies?
Urban design	How well does the alternative compliment urban design plans and policies?
Economic development	How well does the alternative serve areas with potential economic development opportunities?
Community support	How much community support is there for the alternative?
Passenger benefits	What are the relative passenger benefits of the alternative (e.g., travel time reliability, comfort, rapid boarding, fare payment)?
Safety	What is the relative safety of the alternative from an operations and passenger perspective?
Access	How accessible is the alternative by other travel modes (e.g. pedestrian, bicycle)?
System identification	How easy is it for new riders to navigate and understand the alternative?
Funding sources	What is the relative local funding potential for each alternative?
Social equity	Does the alternative have social equity concerns?

2.3 Final Screening

The alternatives advancing from initial screening are evaluated in more detail in final screening. The final screening evaluation criteria are more quantitative than the initial screening evaluation criteria and are grouped into the following categories:

- Ridership
- Capital Costs
- Operation and Maintenance Costs
- Cost Benefit
- Mobility
- Origins/Destinations
- Service Characteristics
- Physical Constraints
- Environmental Issues
- Land Use and Urban Design
- Safety
- Economic Development
- Funding Sources

Table 7 describes the evaluation criteria to be used in final screening.

Table 7 Final Screening Evaluation Criteria

Category	Evaluation Criteria
RIDERSHIP	
Ridership	What is the estimated ridership for each alternative?
CAPITAL COSTS	
Capital costs	What is the capital cost of each alternative?
Cost per mile	What is the capital cost per mile of each alternative?
OPERATION AND MAINTENANCE COSTS	
O&M costs	What is the operating and maintenance (O&M) cost of each alternative?
COST BENEFIT	
Cost per user	What is the cost per user for each alternative?
MOBILITY	
Mobility	What is the relative potential of the alternative to improve mobility?
ORIGINS/DESTINATIONS	
Origins	What existing population/land use is served by the alternative?
Destinations	What destinations are served by the alternative?
Connectivity	Are priority origins and destinations connected through linear/direct routing (without transfers, deviations, etc.)?
SERVICE CHARACTERISTICS	
Transit integration	Does the alternative integrate with existing and planned Metro bus operations?
Transit vehicle delay	What are the potential transit vehicle delay issues for each alternative?
Vehicle requirement (peak/total)	How many transit vehicles are required to operate the service?
Transit vehicle lifespan	What is the lifespan of the transit vehicle?
Passenger capacity	What is the passenger capacity of the transit vehicle?
Bicycle capacity	What is the bicycle capacity of the transit vehicle?
Passenger benefits	What are the relative passenger benefits of the alternative (e.g., travel time reliability, comfort, rapid boarding, fare payment)?

(Table continues on next page)

Table 7 (cont)

Category	Evaluation Criteria
Access	How accessible is the alternative by other travel modes?
System identification	Is the alternative easy for new riders to navigate and understand?
Expansion opportunities	What are the expansion opportunities for each alternative?
PHYSICAL CONSTRAINTS	
Transit operations	Are there transit operations issues associated with each alternative?
Right-of-way	Are there right-of-way or regulatory issues associated with each alternative?
Street grade	Does the alternative operate on streets with steep grades?
Bridge structures	Does the alternative operate on any bridge structures?
ENVIRONMENTAL ISSUES	
Air quality	Does the alternative have air quality issues?
Consistency with local/state plans	Is the alternative consistent with local and state plans?
Land use	Is the alternative consistent with existing and future land use?
Land acquisitions and relocations	Does the alternative require property acquisition or relocation and what are the implications?
Environmental justice	Does the alternative affect low income and minority populations?
Noise and vibration	Does the alternative affect sensitive noise receptors?
Hazardous materials	Does the alternative have hazardous material issues?
Wetlands/waters of the U.S.	Does the alternative affect wetlands or waters of the U.S.?
Clean Water Act/Section 402	Does the alternative create stormwater and/or sediment runoff?
Floodplains/flooding	Is the alternative within a 100 year floodplain?
Navigable waterway	Does the alternative affect navigable waterways?
Wild and scenic rivers	Does the alternative affect wild and scenic rivers?
Biological resources	Does the alternative affect biological resources?
Traffic and parking	Does the alternative increase traffic volumes or reduce parking?
Energy	Does the alternative affect overall energy consumption?
Cultural resources	Does the alternative affect cultural resources?
Section 4(f) resources	Does the alternative affect parklands?

(Table continues on next page)

Table 7 (cont)

Category	Evaluation Criteria
Construction issues	Does the alternative have construction issues?
Secondary development	Does the alternative create secondary development?
Prime or unique farmlands	Does the alternative affect prime or unique farmland?
Utilities	Does the alternative affect utilities?
LAND USE AND URBAN DESIGN	
Land use and density	Does the alternative compliment land use/density plans and policies?
Urban design	Does the alternative compliment urban design plans and policies?
SAFETY	
Safety	How safe is the alternative from an operations and passenger perspective?
ECONOMIC DEVELOPMENT	
Economic development	What is the economic development potential for each alternative?
FUNDING SOURCES	
Funding sources	What is the local funding potential for each alternative?

3 INITIAL SCREENING

This section describes the initial screening of alternatives for the Central Omaha Transit AA Study.

3.1 Initial Screening Alternatives

The alternatives evaluated during initial screening include a combination of transit technologies and alignments. The technologies considered included Enhanced Bus, Bus Rapid Transit, and Modern Streetcar. Multiple alignments were considered for each technology. In order to better evaluate the range of alternatives, the study area was divided into five segments. Dividing the corridor into segments reduced the number of potential combinations that needed to be evaluated and allowed the differences between the alternatives to be clearly identified.

The five segments are:

- Segment A (Downtown)
- Segment B (Midtown – UNMC)
- Segment C (UNMC – Crossroads)
- Segment D (Crossroads – Aksarben)
- Segment E (UNMC – Aksarben)

Table 8 provides further detail on each of the transit technologies. Figure 22 illustrates the initial screening alternatives while Table 9 describes the initial screening alternatives by segment.

Table 8 Transit Technologies

Enhanced Bus	Bus Rapid Transit	Modern Streetcar
		
· Improvements to existing Metro bus service · Operates in mixed traffic · Low floor 40-foot buses · Bikes on front of bus (3 max) · Improved frequency and span of service · Minor capital improvements · 40-60 passengers per bus	· Advanced bus service · Operates in mixed traffic and/or dedicated lanes · Low floor 40 to 60-foot buses · Bikes on front of bus (3 max) · Preferential treatments (queue jumps, traffic signal priority) · Specially branded service · 40-90 passengers per bus	· Electric rail service on tracks · Operates in mixed traffic and/or dedicated lanes · Low floor 65-foot streetcars · Bicycles on board (4-6 max) · Preferential treatments (queue jumps, traffic signal priority) · 130-160 passengers per streetcar

Figure 22 Initial Screening Alternatives

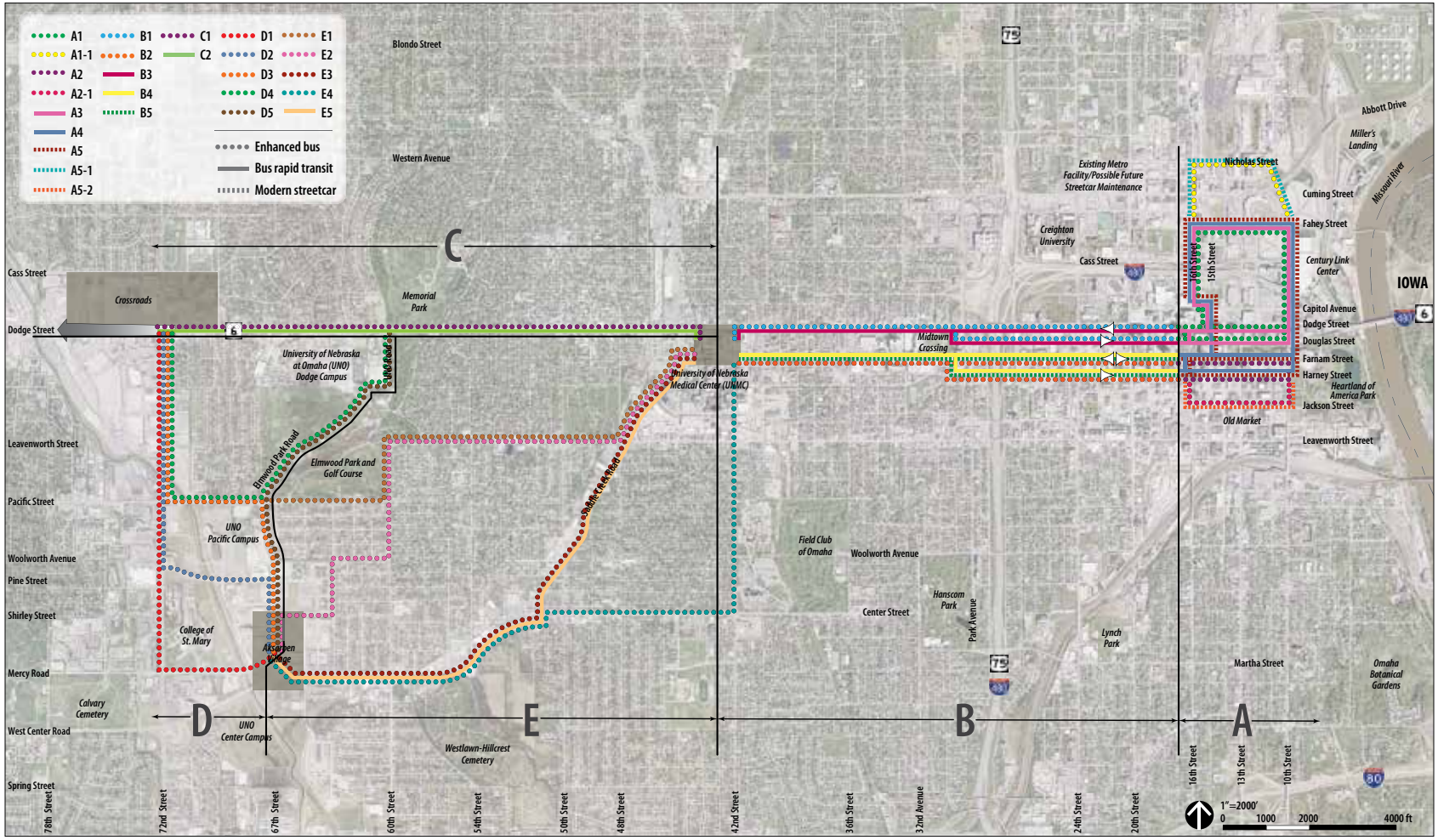


Table 9 Initial Screening Alternatives

Alt	Technology	Descriptions	Issues
SEGMENT A			
A1	Enhanced Bus	· One way or two way loop using Dodge/Douglas St, 10th St, Fahey St, 16th St, Capitol Ave, and 15th St	· Assumes two-way conversion of 15th St · At-grade crossing of Union Pacific spur line on Fahey St · Closure of Fahey St during CWS
A1-1	Enhanced Bus	· Extension of A1 to Nicholas St, using new 10th St connection between Cuming St and Nicholas St and 16th St	· Requires new 10th St connection between Cuming St and Nicholas St · At-grade crossing of Union Pacific spur line on Nicholas St
A2	Enhanced Bus	· East on Harney St, north on 10th St, and west on Farnam St	· Requires a transfer to reach North Downtown
A2-1	Enhanced Bus	· Extension of A2 to Jackson St, using 16th St and 10th St	· Requires a transfer to reach North Downtown
A3	Bus Rapid Transit	· One way or two way loop using Dodge/Douglas St, 10th St, Fahey St, 16th St, Capitol Ave, and 15th St	· Assumes two-way conversion of 15th St · At-grade crossing of Union Pacific spur line on Fahey St · Closure of Fahey St during CWS
A4	Bus Rapid Transit	· One way or two way loop using Farnam/Harney St, 10th St, Fahey St, 16th St, Capitol Ave, and 15th St	· Assumes two-way conversion of 15th St · At-grade crossing of Union Pacific spur line on Fahey St · Closure of Fahey St during CWS
A5	Modern Streetcar	· One way or two way loop using Farnam/Harney St, 10th St, Fahey St, 16th St, Capitol Ave, and 15th St	· Assumes two-way conversion of 15th St · At-grade crossing of Union Pacific spur line on Fahey St · Closure of Fahey St during CWS
A5-1	Modern Streetcar	· Extension of A5 to Nicholas St, using new 10th St connection between Cuming St and Nicholas St and 16th St	· Requires new 10th St connection between Cuming St and Nicholas St · At-grade crossing of Union Pacific spur line on Nicholas St
A5-2	Modern Streetcar	· Extension of A5 to Jackson St, using 16th St and 10th St	· Requires a transfer to reach North Downtown
SEGMENT B			
B1	Enhanced Bus	· East on Dodge St, south on Turner Blvd, east on Douglas St; west on Dodge St	· S curve study alternatives
B2	Enhanced Bus	· East on Farnam St, south on Turner Blvd, east on Harney St; west on Farnam St · Or East/West on Farnam St	· Assumes two-way conversion of Farnam St between 42nd St and 36th St · East/west Farnam St requires eastbound contraflow transit lane
B3	Bus Rapid Transit	· East on Dodge St, south on Turner Blvd, east on Douglas St; west on Dodge St	· S curve study alternatives

(Table continues on next page)

Table 9 (cont)

Alt	Technology	Descriptions	Issues
B4	Bus Rapid Transit	· East on Farnam St, south on 31st St, east on Harney St; west on Farnam St · Or East/West on Farnam St	· Assumes two-way conversion of Farnam St between 42nd St and 36th St · East/west option on Farnam St requires eastbound contraflow transit lane
B5	Modern Streetcar	· East on Farnam St, south on 31st St, east on Harney St; west on Farnam St · Or East/West on Farnam St	· Assumes two-way conversion of Farnam St between 42nd St and 36th St · East/west option on Farnam St requires eastbound contraflow transit lane
SEGMENT C			
C1	Enhanced Bus	· East/west on Dodge St	· Operating environment on Dodge St
C2	Bus Rapid Transit	· East/west on Dodge St	· Operating environment on Dodge St
SEGMENT D			
D1	Enhanced Bus	· North/south on 72nd St and east/west on Mercy Rd	· Operating environment on 72nd St
D2	Enhanced Bus	· North/south on 72nd St, east/west on Pine St, north/south on 67th St	· Operating environment on 72nd St
D3	Enhanced Bus	· North/south on 72nd St, east/west on Pacific St, north/south on 67th St	· Operating environment on 72nd St
D4	Enhanced Bus	· North/south on 72nd St, east/west on Pacific St, north/south on Elmwood Park Rd and University Dr East	· Operating environment on 72nd St · Alignment through Elmwood Park and UNO Dodge campus
D5	Enhanced Bus	· North/south on University Dr East, Elmwood Park Rd, and 67th St	· Alignment through Elmwood Park and UNO Dodge campus
SEGMENT E			
E1	Enhanced Bus	· East/west on Pacific St, north/south on 60th St, east/west on Leavenworth St, and north/south on Saddle Creek Rd	· Does not serve Dodge St west of UNMC
E2	Enhanced Bus	· North/south on 67th St, east/west on Shirley St, north/south on 63rd St, east/west on Woolworth Ave, north/south on 60th St, east/west on Leavenworth St, and north/south on Saddle Creek Rd	· Does not serve Dodge St west of UNMC
E3	Enhanced Bus	· East/west on Center St and north/south on Saddle Creek Rd	· Does not serve Dodge St west of UNMC
E4	Enhanced Bus	· East/west on Center St and north/south on 42nd St	· Does not serve Dodge St west of UNMC
E5	Bus Rapid Transit	· East/west on Center St and north/south on Saddle Creek Rd	· Does not serve Dodge St west of UNMC

3.2 Initial Screening Evaluation

The initial screening evaluation analyzes the initial list of alternatives being considered using a set of qualitative evaluation criteria. Its purpose is to eliminate alternatives that have fatal flaws, do not meet project goals, or do not have public support.

The alternatives are rated High (3), Medium (2), or Low (1) for each criterion, with High meaning optimal performance and Low indicating sub-standard performance. All of the criteria are weighted equally for the initial screening. Overall, the higher the score equals the higher the performance of the alternative.

Table 10 shows the results of the initial screening.

EMX Bus Rapid Transit, Eugene, OR

King County Metro Enhanced Bus, Seattle, WA

Tacoma Link Streetcar, Tacoma, WA

Table 10 Initial Screening of Alternatives

Category	Segment A									Segment B				
	A1	A1-1	A2	A2-1	A3	A4	A5	A5-1	A5-2	B1	B2	B3	B4	B5
	EB	EB	EB	EB	BRT	BRT	MS	MS	MS	EB	EB	BRT	BRT	MS
Mobility	2	2	2	2	3	3	3	3	3	2	2	3	3	3
Ridership potential	1	1	1	1	3	3	3	1	2	1	1	3	3	3
Capital costs	3	2	3	2	2	2	1	1	1	3	3	2	2	1
O&M costs	3	2	3	2	2	2	2	1	2	3	3	2	2	2
Points of origin	3	3	3	2	3	3	3	3	2	3	3	3	3	3
Destinations	3	1	3	3	3	3	3	1	3	3	3	3	3	3
Fatal flaw	2	2	3	3	2	2	2	2	3	3	3	2	3	2
Transit system integration	3	2	3	3	3	3	3	2	3	3	3	3	3	3
Expandability	3	1	3	2	3	3	3	1	2	3	3	3	3	3
Traffic	3	3	3	3	3	3	3	3	3	1	3	1	3	3
Transportation plans and policy	3	2	3	3	3	3	3	2	3	3	3	3	3	3
Land use and density	2	2	2	2	3	3	3	3	3	2	2	3	3	3
Urban design	2	2	2	2	3	3	3	3	3	2	2	3	3	3
Economic development	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Community support	1	1	1	1	3	3	3	1	1	1	1	3	3	3
Passenger benefits	1	1	1	1	3	3	3	3	3	1	1	3	3	3
Safety	3	3	3	3	3	3	3	3	3	2	3	2	3	3
Access	2	2	2	2	3	3	3	3	3	2	2	3	3	3
System identification	1	1	1	1	3	3	3	3	3	1	1	3	3	3
Funding sources	1	1	1	1	2	2	3	2	2	1	1	2	2	3
Social equity	3	2	3	2	3	3	3	2	2	3	3	3	3	3
TOTAL	**48**	**39**	**49**	**44**	**59**	**59**	**59**	**46**	**53**	**46**	**49**	**56**	**60**	**59**
RANK	**6**	**9**	**5**	**8**	**1**	**1**	**1**	**7**	**4**	**5**	**4**	**3**	**1**	**2**

Rating: High (3) = Optimal Performance, Medium (2) = Moderate Performance, Low (1) = Substandard Performance
Technology: EB = Enhanced Bus, BRT = Bus Rapid Transit, MS = Modern Streetcar

(Table continues on next page)

Table 10 (cont)

Category	Segment C		Segment D					Segment E				
	C1	C2	D1	D2	D3	D4	D5	E1	E2	E3	E4	E5
	EB	BRT	EB	EB	EB	EB	EB	EB	EB	EB	EB	BRT
Mobility	2	3	2	2	2	2	2	2	2	2	2	3
Ridership potential	1	3	1	1	1	1	2	1	1	1	1	2
Capital costs	3	2	3	3	3	3	3	3	3	3	3	2
O&M costs	3	2	3	3	3	3	3	3	3	3	3	2
Points of origin	3	3	2	2	2	3	3	2	3	3	3	2
Destinations	3	3	3	3	3	3	3	2	2	3	3	3
Fatal flaw	3	2	3	3	3	2	2	3	3	3	3	3
Transit system integration	3	3	3	3	3	3	3	2	2	3	3	3
Expandability	3	3	2	2	2	1	2	2	2	3	3	3
Traffic	1	1	1	1	2	1	3	3	3	2	2	2
Transportation plans and policy	3	3	2	3	3	3	3	3	3	3	3	3
Land use and density	2	3	2	2	2	2	2	2	2	2	2	3
Urban design	2	3	2	2	2	2	2	2	2	2	2	3
Economic development	3	3	3	3	3	3	3	2	2	2	2	3
Community support	1	3	1	1	2	1	2	1	1	1	1	2
Passenger benefits	1	3	1	1	1	1	1	1	1	1	1	3
Safety	2	2	3	3	3	3	3	3	3	3	3	3
Access	2	3	2	2	2	2	2	2	2	2	2	3
System identification	1	3	1	1	1	1	1	1	1	1	1	3
Funding sources	1	3	1	1	1	1	1	1	1	1	1	2
Social equity	3	3	3	3	3	3	3	2	2	3	3	3
TOTAL	**46**	**57**	**44**	**45**	**47**	**44**	**49**	**43**	**44**	**47**	**47**	**56**
RANK	**2**	**1**	**4**	**3**	**2**	**4**	**1**	**5**	**4**	**2**	**2**	**1**

Rating: High (3) = Optimal Performance, Medium (2) = Moderate Performance, Low (1) = Substandard Performance
Technology: EB = Enhanced Bus, BRT = Bus Rapid Transit, MS = Modern Streetcar

3.3 Initial Screening Results

Based on the results of the initial screening evaluation, it is recommended that Alternatives A3, A4, A5, B3, B4, B5, and C2 be advanced into final screening. These alternatives are being advanced because of the following reasons:

- Simplified transit routing
- Most operational flexibility
- Balance local and regional transit needs
- Best connection through Downtown core
- Best connection to North Downtown and special events
- Integrates well with Metro bus network

In addition, the following is noted:

- All Enhanced Bus alternatives are being eliminated because they do not meet the project Purpose and Need
- All alternatives in Segments D and E are being eliminated, but could be considered in future phases

Table 11 summarizes the results of the initial screening. Figure 23 illustrates the alternatives that are being advanced into final screening.

MAX Bus Rapid Transit, Kansas City, MO

Portland Streetcar, Portland, OR

South Lake Union Streetcar, Seattle, WA

Table 11 Initial Screening Results

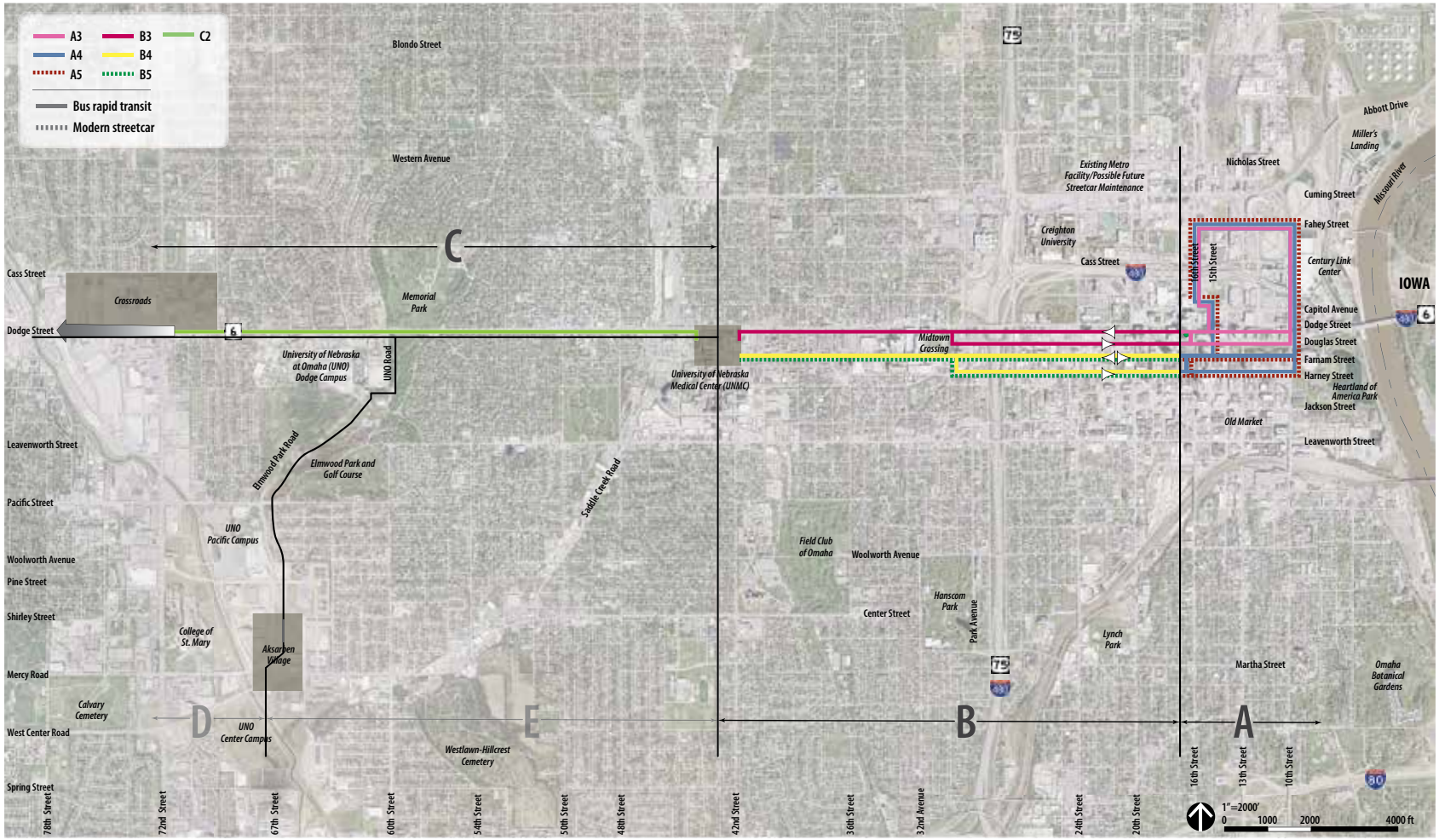
Alt	Technology	Recommendation	Description
SEGMENT A			
A1	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need
A1-1	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need · Requires new 10th St connection between Cuming St and Nicholas St
A2	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need · Does not serve North Downtown
A2-1	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need · Does not serve North Downtown
A3	Bus Rapid Transit	Advance	· Simplified transit routing and most operational flexibility · Best connection to North Downtown and special events
A4	Bus Rapid Transit	Advance	· Simplified transit routing and most operational flexibility · Best connection to North Downtown and special events
A5	Modern Streetcar	Advance	· Simplified transit routing and most operational flexibility · Best connection to North Downtown and special events
A5-1	Modern Streetcar	Eliminate	· Requires new 10th St connection between Cuming St and Nicholas St
A5-2	Modern Streetcar	Eliminate	· Does not serve North Downtown
SEGMENT B			
B1	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need
B2	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need
B3	Bus Rapid Transit	Advance	· Simplified transit routing and most operational flexibility · Best connection through Downtown core
B4	Bus Rapid Transit	Advance	· Simplified transit routing and most operational flexibility · Best connection through Downtown core
B5	Modern Streetcar	Advance	· Simplified transit routing and most operational flexibility · Best connection through Downtown core

(Table continues on next page)

Table 11 (cont)

Alt	Technology	Recommendation	Description
SEGMENT C			
C1	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need
C2	Bus Rapid Transit	Advance	· Simplified transit routing and most operational flexibility · Integrates well with Metro bus network
SEGMENT D			
D1	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need
D2	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need
D3	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need
D4	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need
D5	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need
SEGMENT E			
E1	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need · Does not serve Dodge St west of UNMC
E2	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need · Does not serve Dodge St west of UNMC
E3	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need · Does not serve Dodge St west of UNMC
E4	Enhanced Bus	Eliminate	· Enhanced Bus does not meet Purpose and Need · Does not serve Dodge St west of UNMC
E5	Bus Rapid Transit	Eliminate	· Does not serve Dodge St west of UNMC

Figure 23 Initial Screening Results



4 FINAL SCREENING

This section describes the final screening of alternatives for the Central Omaha Transit AA Study.

4.1 Final Screening Alternatives

The alternatives evaluated during final screening include the alternatives that advanced from initial screening. These include Alternatives A3, A4, A5, B3, B4, B5, and C2.

In order to simplify the final screening evaluation, the remaining alternative segments will be combined into three alternatives:

- **Alternative 1 (Red)**
  - Bus Rapid Transit
  - Combines Segments A3, B3, C2
- **Alternative 2 and 2A (Blue)**
  - Bus Rapid Transit
  - Combines Segments A4, B4, C2
- **Alternative 3 and 3A (Green)**
  - Modern Streetcar
  - Combines Segments A5, B5

In addition, the following changes were made to the alternatives between initial screening and final screening based on input from the Project Management Team, Stakeholder Committee, and public (via public meeting and online participation).

- **Alternative 2 (Bus Rapid Transit)** and **Alternative 3 (Modern Streetcar)** includes two design options in the Farnam Street/Harney Street corridor between 10th Street and 31st Street.
  - Couplet using Farnam Street/Harney Street couplet (**Alternative 2** and **Alternative 3**)
  - Contraflow using Farnam Street (**Alternative 2A** and **Alternative 3A**)
- The loop in North Downtown was eliminated for all alternatives because it requires the two-way conversion of 15th Street. The remaining alternatives will begin/terminate at 16th Street and Fahey Street in North Downtown.
- The alignment for **Alternative 2** was refined to use 44th Street between Farnam Street and Dodge Street near UNMC.

Figure 24 illustrates the final screening alternatives while Table 12 describes the final screening alternatives.

4.1.1 Farnam/Harney Street Corridor Design Options

Alternative 2 (Bus Rapid Transit) and **Alternative 3 (Modern Streetcar)** include two design options in the Farnam Street/ Harney Street corridor between 10th Street and 31st Street. The first option (**Alternative 2** and **Alternative 3**) operates transit using the Farnam/Harney Street one-way couplet. The second option (**Alternative 2A** and **Alternative 3A**) operates two-way transit on Farnam Street using an eastbound contraflow lane.

A contraflow lane is a transit only lane that allows transit operation in the reverse direction on a one-way street. In the case of Farnam Street, the eastbound contraflow lane would be located on the south side of the roadway adjacent to the curb. On-street parking (both parallel and angle parking) would be maintained wherever possible.

Conceptual rendering of Farnam couplet design option

Conceptual rendering of Farnam contraflow design option

Figure 24 Final Screening Alternatives

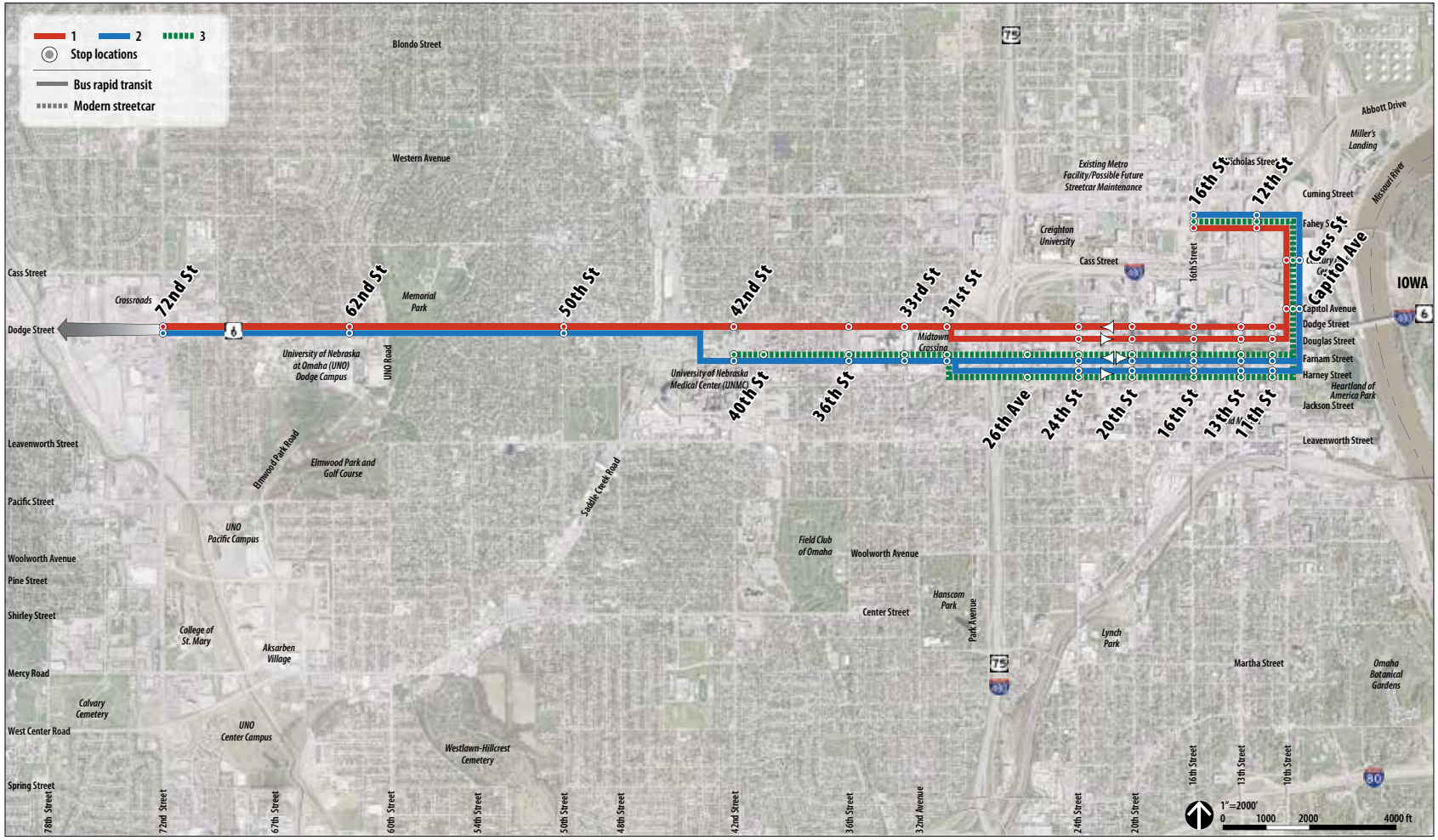


Table 12 Final Screening Alternatives

Feature	Alternative 1	Alternative 2	Alternative 2A	Alternative 3	Alternative 3A
	BRT	BRT		Streetcar	
	Dodge/Douglas	Farnam/Harney Couplet	Farnam Contraflow	Farnam/Harney Couplet	Farnam Contraflow
East Terminus	Couplet	North Downtown (16th St/Fahey)		North Downtown (16th St/Fahey)	
West Terminus	Crossroads (72nd St/Dodge)	Crossroads (72nd St/Dodge)		UNMC (42nd St/Farnam)	
Description	· Fahey between 16th and 10th St · 10th St between Fahey and Douglas · Dodge/Douglas between 10th and 31st St · Dodge between 31st and 72nd St	· Fahey between 16th and 10th St · 10th St between Fahey and Harney · Farnam/Harney between 10th and 31st St · Farnam between 31st and 44th St · 44th St between Dodge and Farnam · Dodge between 31st and 72nd St	· Fahey between 16th and 10th St · 10th St between Fahey and Harney · Farnam between 10th and 44th St · 44th St between Dodge and Farnam · Dodge between 31st and 72nd St	· Fahey between 16th and 10th St · 10th St between Fahey and Harney · Farnam/Harney between 10th and 31st St · Farnam between 31st and 42th St	· Fahey between 16th and 10th St · 10th St between Fahey and Harney · Farnam between 10th and 42nd St
Issues	· At-grade crossing of Union Pacific spur line on Fahey · Closure of Fahey during CWS · Future S curve alignment	· At-grade crossing of Union Pacific spur line on Fahey · Closure of Fahey during CWS · Assumes two-way conversion of Farnam between 36th and 42nd St		· At-grade crossing of Union Pacific spur line on Fahey · Closure of Fahey during CWS · Assumes two-way conversion of Farnam between 36th and 42nd St	

4.2 Final Screening Evaluation

The final screening evaluation analyzes the final list of alternatives being evaluated using a set of quantitative evaluation criteria. The final screening criteria are grouped into the following categories:

- Ridership
- Capital Costs
- Operation and Maintenance Costs
- Cost per User
- Mobility
- Origins/Destinations
- Service Characteristics
- Physical Constraints
- Environmental Issues
- Land Use and Urban Design
- Safety
- Economic Development
- Funding Sources
- Community Support

The final screening alternatives are evaluated based on same operating plan in terms of frequency and hours of service. Table 13 shows the operating plan for the final screening alternatives. Table 14 shows the results of the final screening.

Bus Rapid Transit Conceptual Rendering

Modern Streetcar Conceptual Rendering

Table 13 Operating Plan

Feature	Alternative 1	Alternative 2	Alternative 2A	Alternative 3	Alternative 3A
	BRT	BRT		Streetcar	
	Dodge/Douglas Couplet	Farnam/Harney Couplet	Farnam Contraflow	Farnam/Harney Couplet	Farnam Contraflow
East terminus	North Downtown	North Downtown		North Downtown	
West terminus	Crossroads	Crossroads		UNMC	
Frequency (peak/ off-peak/evening)	10/15/20 minutes	10/15/20 minutes		10/15/20 minutes	
Daily operating hours (M-F/Sat/Sun)	19/18/12 hours	19/18/12 hours		19/18/12 hours	
Distance	5.87 miles	6.15 miles		3.34 miles	
Vehicle travel time	23:55	24:52		17:34	
Annual revenue vehicle-hours	$40,380	$40,380		$31,740	
Annual revenue vehicle-miles	$365,700	$383,300		$208,100	
Vehicle requirement (peak/total)	6/8 buses	6/8 buses		4/5 streetcars	

Table 14 Final Screening of Alternatives

Criteria	Alternative 1	Alternative 2	Alternative 2A	Alternative 3	Alternative 3A
	BRT	BRT		Streetcar	
	Dodge/Douglas Couplet	Farnam/Harney Couplet	Farnam Contraflow	Farnam/Harney Couplet	Farnam Contraflow
RIDERSHIP					
Ridership[1]	1,180 passengers	1,430 passengers		1,380 passengers	
CAPITAL COSTS					
Capital cost ($2013)	$36,638,000	$37,196,000	$42,543,000	$141,386,000	$141,724,000
Annualized capital cost	$2,007,000	$2,037,000	$2,330,000	$7,745,000	$7,763,000
Cost per mile	$6,242,000	$6,048,000	$7,102,000	$42,331,000	$44,567,000
OPERATION AND MAINTENANCE COST (O&M)					
Annual O&M cost ($2013)	$2,647,486	$2,681,234		$6,883,515	
COST BENEFIT					
Cost per user[2] = (Annualized Capital Cost + Annualized O&M Cost) / Daily Ridership	$3.94	$3.30	$3.50	$10.60	$10.61

[1] *Ridership estimates were calculated using the Small Area Model.*
[2] *Cost per user was calculated using the Small Area Model ridership estimate.*

(Table continues on next page)

Table 14 (cont)

Criteria	Alternative 1	Alternative 2	Alternative 2A	Alternative 3	Alternative 3A
	BRT	BRT		Streetcar	
	Dodge/Douglas Couplet	Farnam/Harney Couplet	Farnam Contraflow	Farnam/Harney Couplet	Farnam Contraflow
MOBILITY					
Mobility	Urban circulator and regional connectivity	Urban circulator and regional connectivity		Urban circulator only	
ORIGINS/DESTINATIONS					
Origins Destinations Connectivity	North Downtown (Yes), Downtown (Yes), Midtown (Yes), UNMC (Yes), UNO (Yes), Crossroads (Yes)	North Downtown (Yes), Downtown (Yes), Midtown (Yes), UNMC (Yes), UNO (Yes), Crossroads (Yes)		North Downtown (Yes), Downtown (Yes), Midtown (Yes), UNMC (Yes), UNO (No), Crossroads (No)	
SERVICE CHARACTERISTICS					
Transit integration	Coordination with Metro bus network (specifically Route 2)	No transit integration issues identified		No transit integration issues identified	
Transit vehicle delay	Peak hour delay on Dodge west of 42nd St	Peak hour delay on Dodge west of 42nd St		No transit vehicle delay issues	
Vehicle requirement (peak/total)	6 buses/8 buses	6 buses/8 buses		4 streetcars/5 streetcars	
Transit vehicle lifespan	12 years	12 years		30 years	
Passenger capacity	40-90 passengers	40-90 passengers		130-160 passengers	
Bicycle capacity	3 maximum	3 maximum		4-6 maximum	

(Table continues on next page)

Table 14 (cont)

Criteria	Alternative 1	Alternative 2	Alternative 2A	Alternative 3	Alternative 3A
	BRT	BRT		Streetcar	
	Dodge/Douglas Couplet	Farnam/Harney Couplet	Farnam Contraflow	Farnam/Harney Couplet	Farnam Contraflow
Passenger benefits	Narrow aisle unless 2+1 seating; modern low floor vehicle, reliable travel time, platform fare collection	Narrow aisle unless 2+1 seating; modern low floor vehicle, reliable travel time, platform fare collection		Wider aisle; modern low floor vehicle, reliable travel time, platform fare collection	
Access	Near level boarding (requires bridge plates or ramps/lifts)	Near level boarding (requires bridge plates or ramps/lifts)		Level boarding	
System identification	Unique branding, custom vehicles/stops	Unique branding, custom vehicles/stops		Unique branding, custom vehicles/stops	
Expansion opportunities	Extension to Westroads	Extension to Westroads		Possible but not identified	
PHYSICAL CONSTRAINTS					
Transit operations	No transit operation issues	No transit operation issues	Potential transit queuing in single contraflow lane	At-grade crossing of UP spur line on Fahey	At-grade crossing of UP spur line on Fahey; potential transit queuing in single contraflow lane
Right-of-way	Dodge St right-of-way controlled by Nebraska Department of Roads	No right-of-way issues identified		Right-of-way needed for maintenance and storage facility, substations, minor curb cuts	
Street grade	No street grade issues	No street grade issues		Farnam between 42nd St and 40th St	
Bridge structures	I-480 bridge structures on Dodge/Douglas if modified for S-curve	No bridge structure issues		10th St bridge; I-480 bridge structure on Farnam	

(Table continues on next page)

Table 14 (cont)

Criteria	Alternative 1	Alternative 2	Alternative 2A	Alternative 3	Alternative 3A
	BRT	BRT		Streetcar	
	Dodge/Douglas Couplet	Farnam/Harney Couplet	Farnam Contraflow	Farnam/Harney Couplet	Farnam Contraflow
ENVIRONMENTAL ISSUES					
Air quality	No air quality issues identified	No air quality issues identified		No air quality issues identified	
Consistency with local/state plans	Yes; Consistent with previous and ongoing plans: Downtown Master Plan (2009), Environmental Element (2010), Transportation Master Plan Update (2012), Downtown Parking Management Plan (2011), MAPA Heartland 2050 (Ongoing), and MAPA/ Metro Regional Transit Vision (Ongoing)	Yes; Consistent with previous and ongoing plans: Downtown Master Plan (2009), Environmental Element (2010), Transportation Master Plan Update (2012), Downtown Parking Management Plan (2011), MAPA Heartland 2050 (Ongoing), and MAPA/Metro Regional Transit Vision (Ongoing)		Yes; Consistent with previous and ongoing plans: Downtown Master Plan (2009), Environmental Element (2010), Transportation Master Plan Update (2012), Downtown Parking Management Plan (2011), and MAPA Heartland 2050 (Ongoing)	
Land use	Consistent with existing and future land use	Consistent with existing and future land use		Consistent with existing and future land use	
Land acquisitions and relocations	Dodge Street right-of-way controlled by Nebraska Department of Roads	No land acquisition and relocation issues identified		Right-of-way needed for maintenance and storage facility, substations, minor curb cuts	
Environmental justice	Unknown; Title VI analysis to be completed during environmental documentation	Unknown; Title VI analysis to be completed during environmental documentation		Unknown; Title VI analysis to be completed during environmental documentation	
Noise and vibration	No noise and vibration issues identified	No noise and vibration issues identified		Noise and vibration/ electromagnetic interference at UNMC	

(Table continues on next page)

Table 14 (cont)

Criteria	Alternative 1	Alternative 2	Alternative 2A	Alternative 3	Alternative 3A
	BRT	BRT		Streetcar	
	Dodge/Douglas Couplet	Farnam/Harney Couplet	Farnam Contraflow	Farnam/Harney Couplet	Farnam Contraflow
Hazardous materials	No hazardous material issues identified	No hazardous material issues identified		Possible at maintenance and storage facility site location	
Wetlands/Waters of the U.S.	Does not affect wetlands or waters of the U.S.	Does not affect wetlands or waters of the U.S.		Does not affect wetlands or waters of the U.S.	
Clean Water Act/ Section 402	Unlikely to create new stormwater and/or sediment runoff	Unlikely to create new stormwater and/or sediment runoff		Unlikely to create new stormwater and/or sediment runoff	
Floodplains/flooding	Outside 100 year floodplain based on Flood Insurance Rate Map	Outside 100 year floodplain based on Flood Insurance Rate Map		Outside 100 year floodplain based on Flood Insurance Rate Map	
Navigable waterway	Does not affect navigable waterways	Does not affect navigable waterways		Does not affect navigable waterways	
Wild and scenic rivers	Does not affect wild and scenic rivers	Does not affect wild and scenic rivers		Does not affect wild and scenic rivers	
Biological resources	Does not affect biological resources	Does not affect biological resources		Does not affect biological resources	
Traffic	Restricts outside lane on Dodge/Douglas between 31st St and 10th St to transit, right turns, and parallel parking	Restricts outside lane on Farnam/Harney between 31st St and 10th St to transit, right turns, and parallel parking	Lane reduction to 2 lanes for westbound Farnam; may restrict some driveway access.	Restricts outside lane on Farnam/Harney between 31st St and 10th St to transit, right turns, and parallel parking	Lane reduction to 2 lanes for westbound Farnam; may restrict some driveway access.
Parking	Parking loss at stop locations	Parking loss at stop locations	Parking loss at stop locations and south side of Farnam; conversion of angle parking to parallel parking on Farnam	Parking loss at stop locations	Parking loss at stop locations and south side of Farnam; conversion of angle parking to parallel parking on Farnam

(Table continues on next page)

Table 14 (cont)

Criteria	Alternative 1	Alternative 2	Alternative 2A	Alternative 3	Alternative 3A
	BRT	BRT		Streetcar	
	Dodge/Douglas Couplet	Farnam/Harney Couplet	Farnam Contraflow	Farnam/Harney Couplet	Farnam Contraflow
Energy	Creates net energy consumption reduction	Creates net energy consumption reduction		Creates net energy consumption reduction	
Cultural resources	Unknown; Cultural resources analysis to be completed during environmental documentation	Unknown; Cultural resources analysis to be completed during environmental documentation		Unknown; Cultural resources analysis to be completed during environmental documentation	
Section 4(f) resources	Unknown; Section 4(f) resource analysis of parklands to be completed during environmental documentation	Unknown; Section 4(f) resource analysis of parklands to be completed during environmental documentation		Unknown; Section 4(f) resource analysis of parklands to be completed during environmental documentation	
Construction issues	No construction issues identified	No construction issues identified	Conversion of Farnam for contraflow; BRT guideway construction	Streetcar guideway construction	Conversion of Farnam for contraflow; streetcar guideway construction
Secondary development	Moderate potential for secondary development	Moderate potential for secondary development		Large potential for secondary development	
Prime or unique farmlands	Does not affect prime or unique farmland	Does not affect prime or unique farmland		Does not affect prime or unique farmland	
Utilities	No utility issues identified	No utility issues identified	Utility relocation in BRT guideway	Utility relocation in streetcar guideway	Utility relocation in streetcar guideway

(Table continues on next page)

Table 14 (cont)

Criteria	Alternative 1	Alternative 2	Alternative 2A	Alternative 3	Alternative 3A
	BRT	BRT		Streetcar	
	Dodge/Douglas Couplet	Farnam/Harney Couplet	Farnam Contraflow	Farnam/Harney Couplet	Farnam Contraflow
LAND USE AND URBAN DESIGN					
Land use and density	Compliments land use/ density and urban design plans and policies, particularly Downtown Master Plan (2009), Environmental Element (2010), Transportation Master Plan Update (2012), and MAPA Heartland 2050 (Ongoing)	Compliments land use/density and urban design plans and policies, particularly Downtown Master Plan (2009), Environmental Element (2010), Transportation Master Plan Update (2012), and MAPA Heartland 2050 (Ongoing)		Compliments land use/density and urban design plans and policies, particularly Downtown Master Plan (2009), Environmental Element (2010), Transportation Master Plan Update (2012), and MAPA Heartland 2050 (Ongoing)	
Urban design					
SAFETY					
Safety	Pedestrian environment on Dodge (higher travel speeds/ volumes); at-grade crossing of Union Pacific spur line on Fahey	At-grade crossing of Union Pacific spur line on Fahey	Pedestrian access from parallel parking between contraflow lane and travel lane; at-grade crossing of Union Pacific spur line on Fahey	At-grade crossing of Union Pacific spur line on Fahey	Pedestrian access from parallel parking between contraflow lane and travel lane; at-grade crossing of Union Pacific spur line on Fahey
ECONOMIC DEVELOPMENT					
Economic development	1,200 jobs; 1,650 residents, $305 million development (based on 15 year forecast)	1,200 jobs; 1,350 residents; $262 million development (based on 15 year forecast)		8,500 jobs; 3,150 residents; $1 billion development (based on 15 year forecast)	

(Table continues on next page)

Table 14 (cont)

Criteria	Alternative 1	Alternative 2	Alternative 2A	Alternative 3	Alternative 3A
	BRT	BRT		Streetcar	
	Dodge/Douglas Couplet	Farnam/Harney Couplet	Farnam Contraflow	Farnam/Harney Couplet	Farnam Contraflow
FUNDING SOURCES					
Funding sources	Funding from Metro transit reallocation, joint transit improvements, federal grants, tax increment financing, and other creative financing strategies	Funding from Metro transit reallocation, joint transit improvements, federal grants, tax increment financing, and other creative financing strategies		Funding from parking revenue, private resources, business improvement districts, tax increment financing, and/or federal grants	
Consistency with local/state plans	Yes; Consistent with previous and ongoing plans: Downtown Master Plan (2009), Environmental Element (2010), Transportation Master Plan Update (2012), Downtown Parking Management Plan (2011), MAPA Heartland 2050 (Ongoing), and MAPA/Metro Regional Transit Vision (Ongoing)	Yes; Consistent with previous and ongoing plans: Downtown Master Plan (2009), Environmental Element (2010), Transportation Master Plan Update (2012), Downtown Parking Management Plan (2011), MAPA Heartland 2050 (Ongoing), and MAPA/Metro Regional Transit Vision (Ongoing)		Yes; Consistent with previous and ongoing plans: Downtown Master Plan (2009), Environmental Element (2010), Transportation Master Plan Update (2012), Downtown Parking Management Plan (2011), and MAPA Heartland 2050 (Ongoing)	

SCREENING RESULTS

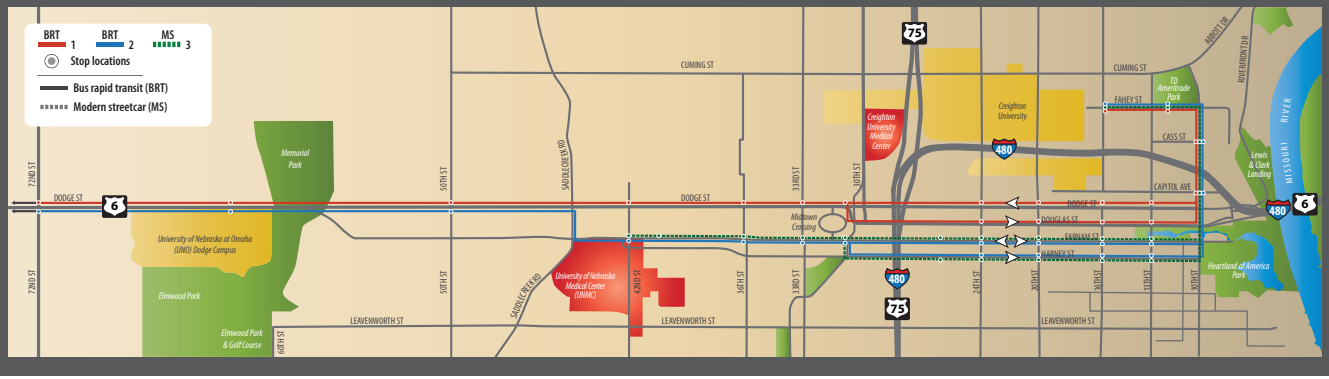
Transit Frequency and Daily Operating Hours remain the same for all Alternatives.

Transit Frequency	Peak	Off-Peak	Evening
	10 MINS	15 MINS	20 MINS

Daily Operating Hours	Mon-Fri	Sat	Sun
	19 HOURS	18 HOURS	12 HOURS

Alternatives	1	2	2A	3	3A
SERVICE	BRT Dodge/Douglas	BRT Farnam/Harney Couplet	BRT Farnam Contraflow	Streetcar Farnam/Harney Couplet	Streetcar Farnam Contraflow
Vehicle Requirement					
Capacity (= 10 passengers)					
Riders per day (= 1000 passengers)	1,180	1,430	1,430	1,380	1,380
CAPITAL COST (in millions) ($ = $100 million)	$ $36.7	$ $37.2	$ $42.5	$$ $141.4	$$ $141.7
ANNUAL O&M (in millions) ($ = $1 million)	$$$ $2.6/year	$$$ $2.7/year	$$$ $2.7/year	$$$$$$$ $6.9/year	$$$$$$$ $6.9/year

Figures from S.B. Friedman: *Central Omaha Transit Alternatives Analysis - Forecast of Development Impacts of BRT and Streetcar Alternatives*



Example of a Contra-Flow Alternative

Example of a Couplet Alternative

WHAT DOES OMAHA SAY?

Improved transit will help Omaha grow.

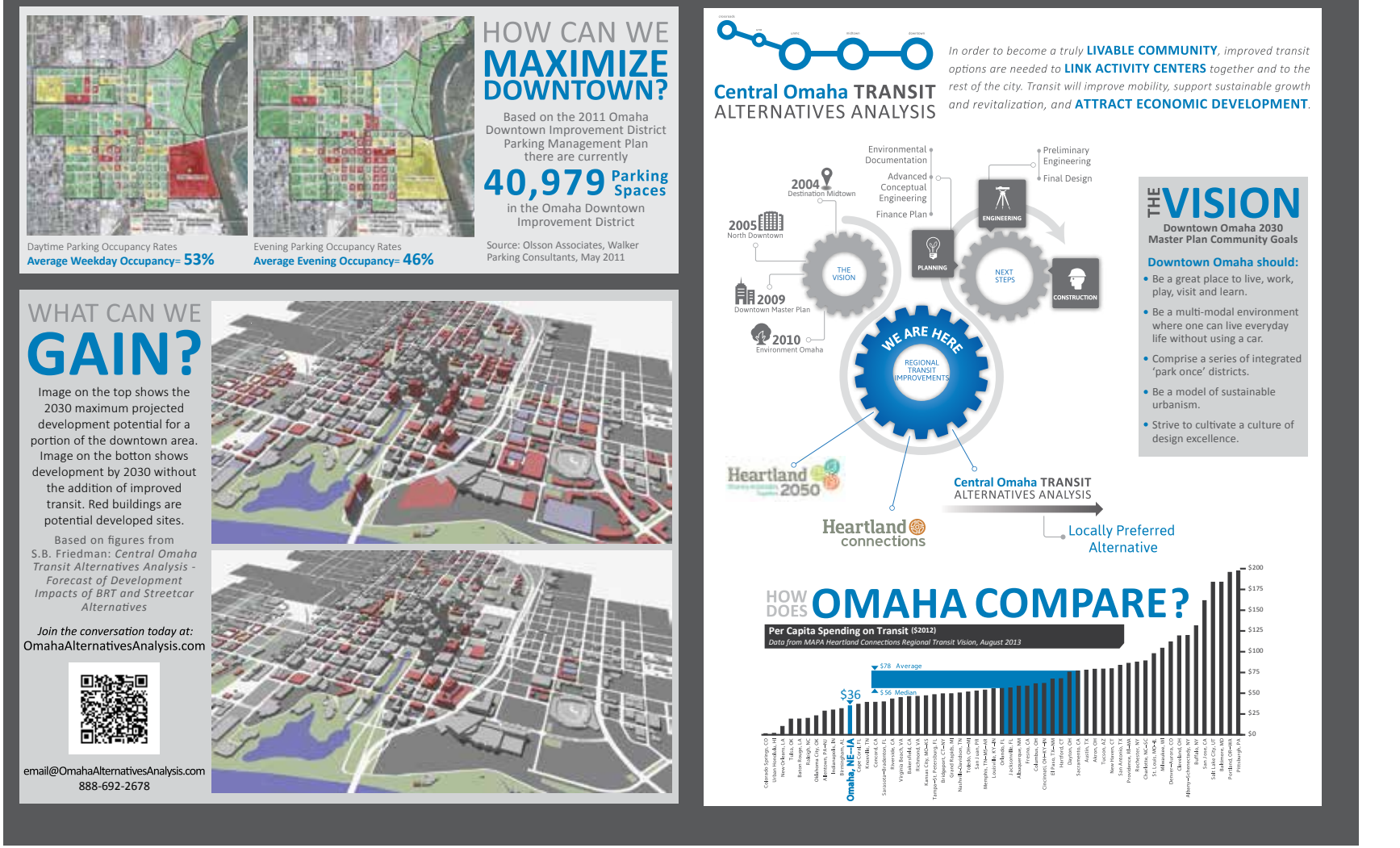
More multi-modal options and connections are needed.

Current transit improvements should be expandable to other areas of Omaha and Council Bluffs.

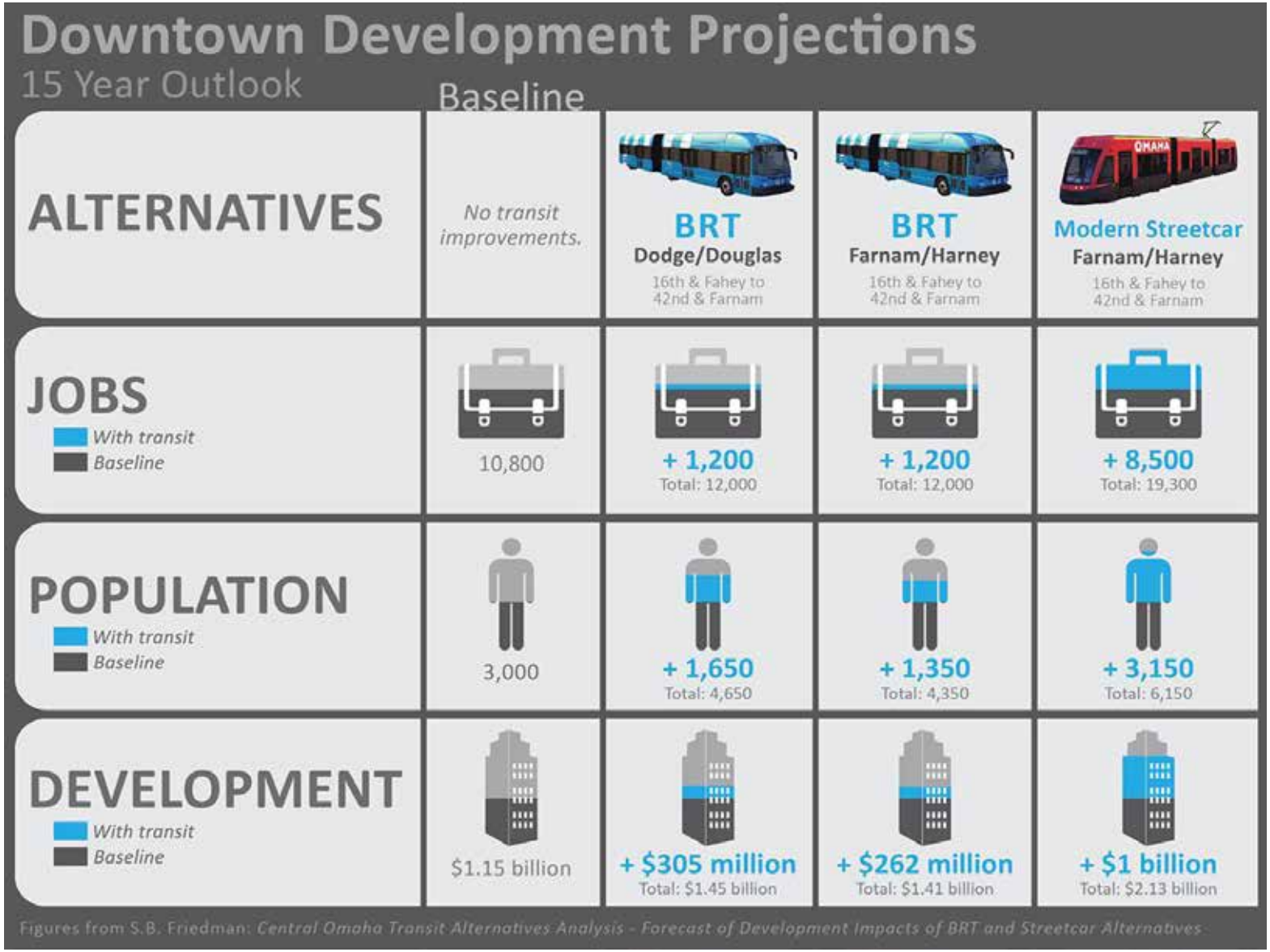
Transit needs to work within budget constraints and maximize the investments made.

Transit should be sustainable and compatible with the current land use and economic goals.

Handout showing final screening results that was distributed at the last public meeting (side 1)



Handout showing final screening results that was distributed at the last public meeting (side 1)



Handout showing final screening results that was distributed at the last public meeting (handout insert)

4.2.1 Additional Issues for Discussion

Travel Forecasting

The transit component of the MAPA Model was still being developed when Final Screening began. Therefore, an "off-model" ridership forecast was produced using the Small Area Model. This ridership estimate was based on a regression analysis in which the transit ridership at the stop level is related to key variables such as population density, employment density, and transit service frequency. This model is not based on the transportation network model and, therefore, does not look at the transit system as a whole. While the ridership forecasts were relatively high for all alternatives, the Small Area Model does not forecast ridership in the context of future changes to the regional transit network.

It is recommended that the BRT and Modern Streetcar ridership estimates in Phase 2 (Environmental Documentation and Conceptual Engineering) be made using the MAPA Model. These estimates will consider changes to the background bus network, development, and land use assumptions.

Utilities

Given the uncertainty related to the future roadway cross-section for transit within each of the corridors, it is not possible to identify specific utility issues during this phase of study. Therefore, it is recommended that detailed utility investigation be included in Phase 2 (Environmental Documentation and Conceptual Engineering).

Because the evaluation during this phase of study is focused at the route level, a general overview of utility issues is provided. Approximately 15 utility entities have utility infrastructure within the study area. This consists of City owned sewers, water and gas owned by the Metropolitan Utilities District (MUD), Energy Systems downtown steam/chilled water system, Omaha Public Power District power, and a number of communication lines owned by several private companies.

In general, Bus Rapid Transit alternatives would have minor impacts to utilities. Subsequent phases of project development will determine the need for bypass lanes or other minor street construction. Such construction might result in localized impacts to utilities. A dedicated contra flow lane for transit only will require a policy decision as to if parallel utilities running underneath the travel lane should be relocated in order to avoid pro-longed shut down of the transit way for utility maintenance or replacement.

With the construction of track and guideway, a modern streetcar system has the potential for more underground utility conflict. Due to the electrical propulsion, underground utility owners have concern for the impact of stray currents. Pipe corrosion was found to be a problem in early 20th century streetcar systems but modern streetcar track systems are now constructed with cathodic protection systems to prevent stray current issues to underground pipes.

A streetcar track system typically requires a 10-foot wide, 18-inch deep cut be made into the street. Due to the shallow nature of the street cut, direct impacts to underground

utilities are not typically encountered. Of greatest concern are underground utilities running longitudinally under the streetcar line. As noted with the Bus Rapid Transit contraflow lane, a decision will need to be made jointly between the modern streetcar operator, the City, and the respective utility companies as to if shut down times for maintenance or line replacement can be tolerated, or if the modern streetcar line should be free of underground utilities. Modern streetcar lines across the United States have approached this both ways. Underground utilities transversely crossing the modern streetcar line are unavoidable and not subject to relocation. In such cases it is common practice to encase utility lines that are within 2 feet of the track slab.

Regardless of utility conflicts, utility companies may take this opportunity to replace aging infrastructure while the street is under construction. Many of the underground utilities within the study area date back to the mid 20th century or earlier.

The overhead traction power typically requires overhead utilities crossing the streetcar line to be raised to provide 26 feet of vertical clearance. Utilities within the downtown are almost exclusively underground and thus overhead conflicts would be minimal. Overhead conflicts west of I-480 are more probable, but overhead utility changes are relatively inexpensive.

By ordinance, utilities within the public right of way have to relocate due to a street project at their own expense. During conceptual engineering, a legal opinion will need to be made as to if a modern streetcar line constitutes a street project subject to the City ordinance. Another factor may be the ownership structure of the modern streetcar system and its applicability to the City Ordinance.

As such, the utility relocation costs directly attributable to the project could range from city sewer conflict resolution only, to inclusive of all utility conflicts regardless of the owner. This is additionally subject to policy decision related to leaving underground utilities under the track slab that are not directly impacted.

In recognition of this, a placeholder cost of $1 million per mile for utility relocations has been included in the capital cost estimate. During initial engineering stages, detailed surveys of utilities will be conducted such that precise utility conflicts can be determined and subsequent utility policy decisions made.

4.3 Final Screening Results

Based on the results of the final screening evaluation, it is recommended that **Alternatives 2/2A** and **3/3A** be advanced pending further refinement. These alternatives are being advanced because of the following reasons:

- **Alternatives 2/2A** and **3/3A** serve different travel markets so both are being advanced.
  - **Alternative 2/2A** (Bus Rapid Transit) serves a regional travel market between Downtown Omaha, Midtown, UNMC, UNO, and Crossroads.
  - **Alternative 3/3A** (Modern Streetcar) serves an urban circulator travel market between North Downtown, Downtown, Midtown, and UNMC.
- The Farnam/Harney Street corridor received the most support for a transit priority corridor.
  - The Farnam/Harney Street corridor more directly serves Midtown and UNMC.
  - The MAPA/Metro Regional Transit Vision (RTV) study identifies Farnam Street as a potential transitway.
- The Farnam/Harney Street corridor is controlled by the City of Omaha, whereas the Dodge/Douglas Street corridor is a state highway and controlled by the Nebraska Department of Roads.

Table 15 summarizes the results of the final screening. Figure 25 illustrates the alternatives that are being advanced from final screening as a "Combined Alternative".

Tacoma Link Streetcar, Tacoma, WA

EMX Bus Rapid Transit, Eugene, OR

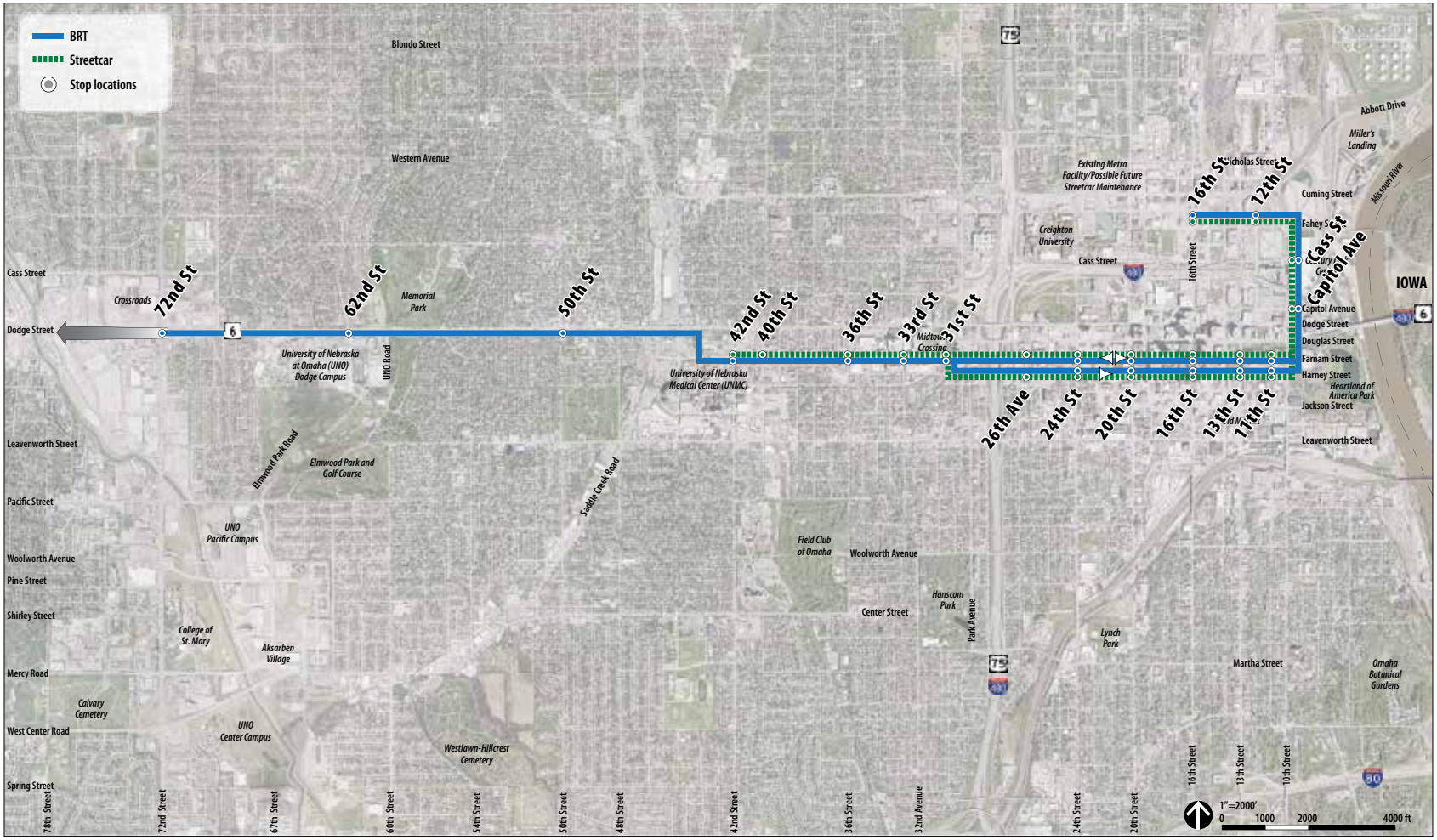
16th Street MallRide, Denver, CO

Table 15 Final Screening Results Summary

Feature	Alternative 1	Alternative 2	Alternative 2A	Alternative 3	Alternative 3A
	BRT	BRT		Streetcar	
	Dodge/Douglas Couplet	Farnam/Harney Couplet	Farnam Contraflow	Farnam/Harney Couplet	Farnam Contraflow
East terminus	North Downtown	North Downtown		North Downtown	
West terminus	Crossroads	Crossroads		UNMC	
Frequency (peak/off-peak/evening)	10/15/20 minutes	10/15/20 minutes		10/15/20 minutes	
Daily operating hours (M-F/Sat/Sun)	19/18/12 hours	19/18/12 hours		19/18/12 hours	
Distance	5.87 miles	6.15 miles		3.34 miles	
Vehicle travel time	23:55	24:52		17:34	
Vehicle requirement (peak/total)	6/8 buses	6/8 buses		4/5 streetcars	
Ridership[1]	1,180 passengers	1,430 passengers		1,380 passengers	
Capital cost ($2013)	$36,638,000	$37,196,000	$42,543,000	$141,386,000	$141,724,000
Capital cost per mile ($2013)	$6,242,000	$6,048,000	$7,102,000	$42,331,000	$44,567,000
Annual O&M cost ($2013)	$2,647,486	$2,681,234		$6,883,515	
RECOMMENDATION	**Eliminate**	**ADVANCE**	**ADVANCE**	**ADVANCE**	**ADVANCE**

[1] *Ridership estimates were calculated using the Small Area Model.*

Figure 25 Final Screening Results



4.4 Alternative Refinement

Alternative 2/2A (Bus Rapid Transit) and **Alternative 3/3A (Modern Streetcar)** are being advanced because they serve different travel markets in the Farnam/Harney Street corridor. However, these alternatives were evaluated separately during final screening so they need to be reevaluated if they both will operate together. Therefore, it is necessary to refine the "Combined Alternative" to maximize the potential for each technology and alignment.

4.4.1 Combined Alternative

The following modifications are recommended for the Combined Alternative:

Alternative 2/2A (Bus Rapid Transit)

- Modify the east terminus to be at 10th Street in Downtown Omaha instead of 16th Street/Fahey Street in North Downtown.
  - The travel market in North Downtown is more suitable for a Modern Streetcar urban circulator than regional Bus Rapid Transit.
  - The MAPA/Metro RTV identifies the Farnam/Harney Street transit way and terminates at 10th Street.
  - The terminus at 10th Street preserves future expansion opportunities to the Omaha Airport and Council Bluffs, Iowa.
- Modify the west terminus to extend BRT from 72nd Street/Dodge Street (Crossroads) to the Westroads Transit Center with additional stops at 84th Street, 90th Street, and at the Westroads Transit Center.
  - The project team received consistent feedback throughout the AA study that Bus Rapid Transit needs to be extended to Westroads. While the study area stops at 72nd Street/Dodge Street, it is recommended that the Bus Rapid Transit alternative be modified to serve Westroads.
  - The MAPA/Metro RTV Study identifies Bus Rapid Transit to the Westroads Transit Center.

Alternative 3/3A (Modern Streetcar)

- Modify east terminus to be at 12th Street/ Fahey Street so the Modern Streetcar alignment does not cross the Union Pacific spur line on Fahey Street.
  - The at-grade crossing of the Union Pacific spur line is a high risk item that will require substantial mitigation. The project team decided that much of the North Downtown travel market could be served by an initial line terminating the Modern Streetcar at 12th Street/Fahey Street.
- The terminus at 12th Street and Fahey Street preserves future expansion opportunities to other areas of North Downtown, Creighton University, and the Civic Auditorium Site.

4.4.2 Additional Issues for Discussion

Travel Forecasting

The ridership estimates for the Combined Alternative were calculated independently. The BRT ridership estimate includes the extended corridor from Crossroads to Westroads and was developed using the MAPA Model, which became available after Final Screening. The MAPA Model uses TransCAD software and runs concurrently with the vehicular highway network model to estimate transit ridership. This BRT ridership estimate for the Combined Alternative is the same ridership estimate included in the BRT TIGER application (April 2014). The Modern Streetcar ridership estimate for the Combined Alternative continues to use the Small Area Model since the current MAPA Model does not modify future development and land use assumptions.

It is recommended that the BRT and Modern Streetcar ridership estimates in Phase 2 (Environmental Documentation and Conceptual Engineering) be made using the MAPA Model. These estimates will consider changes to the background bus network, development, and land use assumptions.

Dodge/Douglas Street Corridor

Given the complexity of implementing both a Bus Rapid Transit and Modern Streetcar

project in the Farnam/Harney Street corridor, it is recommended that the Dodge/Douglas Street corridor between UNMC and 10th Street be preserved as a secondary option for Bus Rapid Transit in Phase 2 (Environmental Documentation and Conceptual Engineering). There are a number of conceptual design and construction phasing issues that may require additional evaluation to determine the feasibility of operating multiple technologies in the same corridor.

Table 16 provides further detail on the Combined Alternative and the alignment modifications to **Alternative 2/2A (Bus Rapid Transit)** and **Alternative 3/3A (Modern Streetcar)**. Based on the alternative refinement, the Combined Alternative is identified as the Locally Preferred Alternative (LPA). Figure 26 illustrates the LPA.

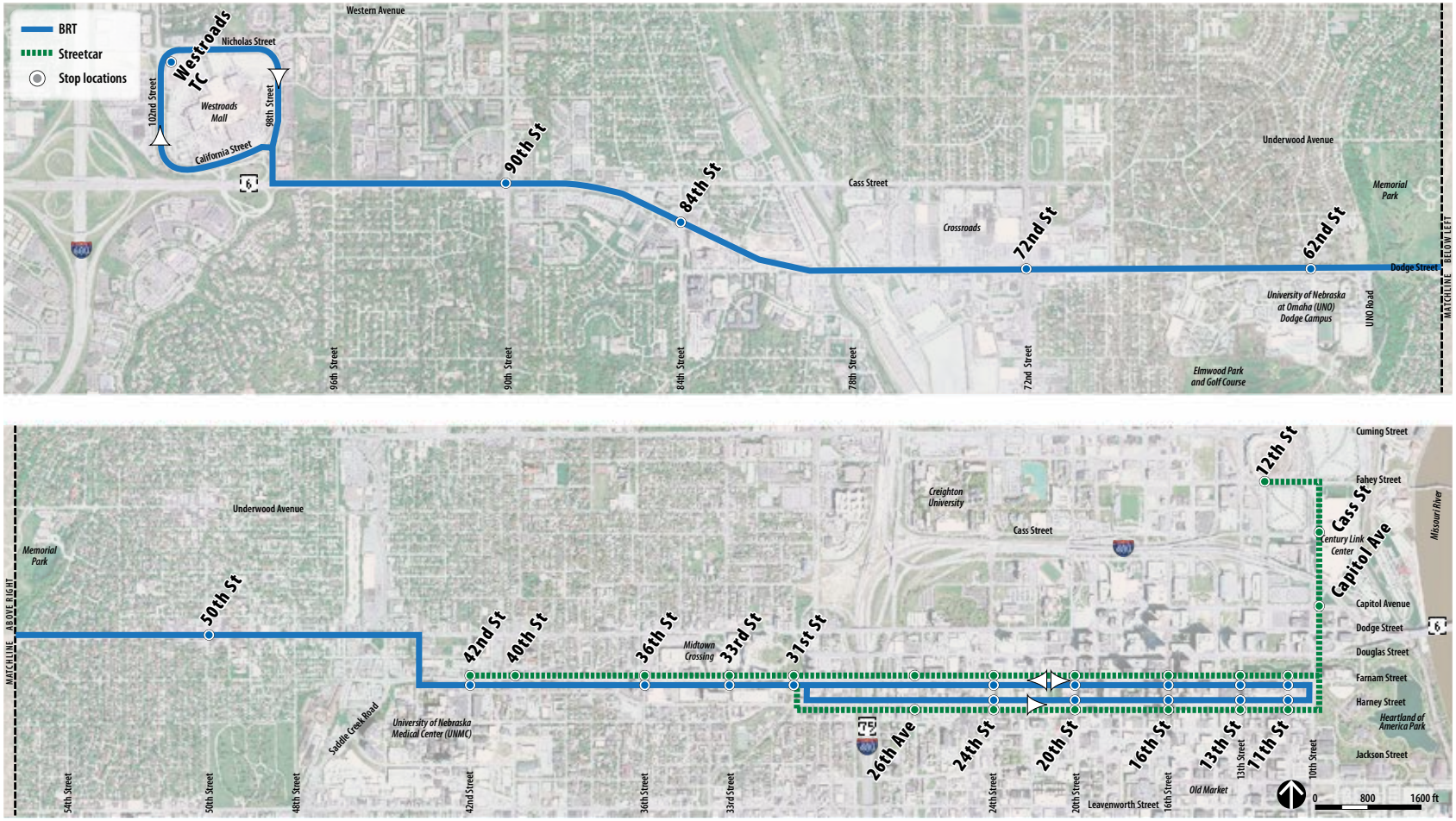
The ridership, capital cost, and annual operation and maintenance (O&M) cost estimates for the Combined Alternative were calculated independently. This was done so the individual project elements could be identified. It is likely there would be capital cost and O&M cost savings if the Bus Rapid Transit and Modern Streetcar projects were planned, designed, and constructed simultaneously.

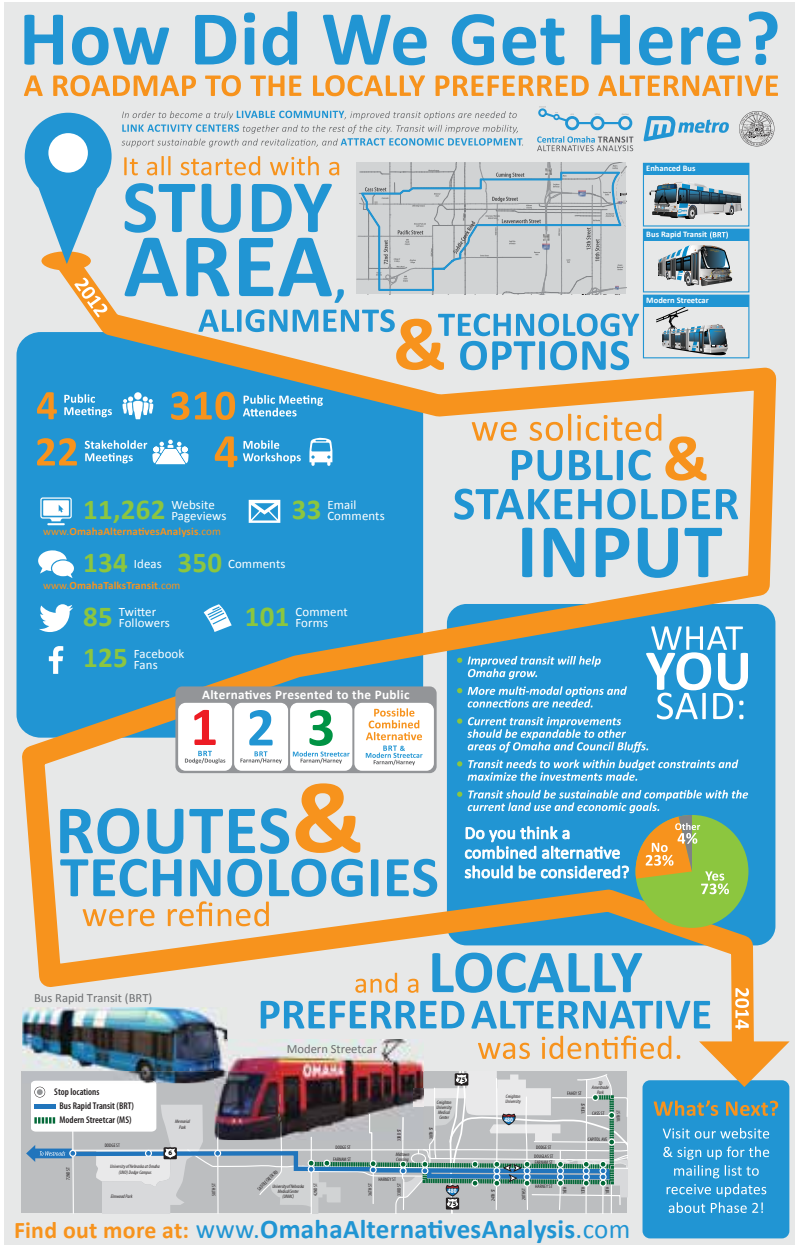
Table 16 Locally Preferred Alternative (Combined Alternative)

Feature	Locally Preferred Alternative (Combined Alternative)	
	Alternative 2 (Modified)	Alternative 3 (Modified)
	Bus Rapid Transit (BRT)	Modern Streetcar
East terminus	Downtown (10th St/Farnam/Harney)	North Downtown (12th St/Fahey)
West terminus	Westroads Transit Center	UNMC (42nd St/Farnam)
Alignment between 31st and 10th St	Farnam/Harney Couplet or Farnam Contraflow	Farnam/Harney Couplet or Farnam Contraflow
Modification	Modify the east terminus to be at 10th St in Downtown Omaha instead of 16th St/Fahey in North Downtown. Modify the west terminus to extend BRT from 72nd St/Dodge (Crossroads) to the Westroads Transit Center with additional stops at 84th St, 90th St, and at the Westroads Transit Center.	Modify east terminus to be at 12th St/Fahey so the Modern Streetcar alignment does not cross the Union Pacific spur line on Fahey
Frequency (peak/off-peak/evening)	10/15/20 minutes	10/15/20 minutes
Daily operating hours (M-F/Sat/Sun)	19/18/12 hours	19/18/12 hours
Distance	7.98 miles	3.22 miles
Vehicle travel time	26:59	15:24
Vehicle requirement (peak/total)	6/8 buses	4/5 streetcars
Ridership	2,740[1] passengers	1,380[2] passengers
Capital cost ($2013) couplet / contraflow	$34,466,000 / $39,185,000	$134,457,000 / $133,844,000
Capital cost per mile ($2013) couplet / contraflow	$4,319,000 / $5,011,000	$41,757,000 / $43,740,000
Annual O&M cost ($2013)	$3,008,844	$6,347,246

[1] Alternative 2 (BRT modified) ridership estimate is from the BRT TIGER application using the MAPA Model.
[2] Alternative 3 (Streetcar Modified) ridership estimate is from the Small Area Model and includes the segment between North Downtown (12th St/Fahey) and UNMC (42nd St/Farnam).

Figure 26 Locally Preferred Alternative (Combined Alternative)





Handout summarizing public participation for the Central Omaha Transit Alternatives Analysis

Central Omaha

TRANSIT ALTERNATIVES ANALYSIS

April 2014