

CLOSE THE GAP:

Analysis of Potential Transportation Corridors
in the Omaha-Council Bluffs Metro Area

Heartland 2050 White Paper Task Force

JULY 2018

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TABLE OF CONTENTS

1. Background.....	page 3
2. Benefits of Enhanced Transportation.....	page 5
3. Transportation Corridors.....	page 9
4. Future Land Use and Development.....	page 18
5. Transit Technologies.....	page 20
6. Transit Scenario Ridership Forecast.....	page 23
7. Costs of Premium Transit.....	page 27
8. Commuter Rail Scenario.....	page 30
9. Conclusion.....	page 33
10. Appendix.....	page 34

WHITE PAPER TASK FORCE

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BACKGROUND

Heartland 2050 is a regional initiative coordinated by the Omaha-Council Bluffs Metropolitan Area Planning Agency (MAPA). The original planning process, conducted in 2013 and 2014, included significant public and private sector engagement. During 2015 and 2016, the effort transitioned into the implementation phase with the development of an Action Plan and specific tasks. The Heartland 2050 Vision calls for:

- Increased regional collaboration.
- A quality growth strategy with increased housing and transportation options.
- Opportunities for all residents to prosper.

In the summer of 2016, the Heartland 2050 Executive Committee endorsed the “Close the Gap” Plan as the project’s “big idea,” or primary focus area. This theme was raised in various committees and connected multiple goals. Close the Gap has many applications:

- Close the gap on the lack of transportation access to jobs and education.
- Close the “brain drain” gap by attracting and retaining more local talent.
- Close the gap of significant racial and ethnic disparities in income and educational attainment.
- Close the gap between neighborhood nodes, town centers and corridors that are isolated and difficult to reach without a vehicle.
- Close the gap between infrastructure needs and available funding.
- Close the transportation gap by increasing options for multi-modal transportation, such as walking, biking and public transit.

The Close the Gap Plan recommends creating vibrant places that are more livable and walkable, which are connected better through a robust regional transit network that connects residents to jobs, education, and other destinations. Experiences from other regions indicate that such an investment has the potential to yield a transformative impact on development patterns and opportunities for economic growth.

By 2050 the region anticipates adding as many as a half-million more residents. Without a Plan, we will continue to grow primarily by outward expansion in development patterns conducive solely to automobiles. The region will add significantly more land that requires expensive infrastructure. We will walk less, drive more, and experience more congestion on our roadways.

In contrast, the Close the Gap concept offers a compelling alternative. The walkable nodes and town centers will provide great places with increased housing choices for young adults, elderly residents, and families. By investing more in existing communities, it will cost the public less money to support infrastructure and services. New transportation options, including walking and biking facilities, as well as convenient and fast transit service, help close the gap between neighborhoods and provide connections throughout the region.

Close the Gap builds on the visions from other regional planning efforts with similar goals. These include:

- City of Omaha’s Downtown Master Plan and Transportation Master Plan.
- Omaha by Design Environmental Element.
- Central Omaha Transit Alternatives Analysis.
- Heartland Connections Regional Transit Vision.
- Belt Line concept proposed by Emerging Terrain.
- Council Bluffs West Broadway Corridor Study.

All of these plans envision more compact, efficient communities with enhanced transportation options.

The call for walkable development and increased transit comes as Omaha is on the cusp of its most significant transit investments in decades. Metro Transit is scheduled to begin operating new Bus Rapid Transit (BRT) service along the Dodge Street corridor from Downtown Omaha to Westroads Mall in Fall 2018. BRT utilizes many of the same streamlining features of a light rail system without the added cost of tracks in the ground. The City of Omaha is considering a modern streetcar service to operate between the North Downtown Sports Complex and the University of Nebraska Medical Center (UNMC), likely along the Farnam-Harney Street corridor that could begin as early as 2020.

As part of the Heartland 2050 project, a delegation of 24 people from the Greater Omaha region traveled to Salt Lake City in October 2016. The conversations and experience reiterated the potential for transportation investments and focused community redevelopment to unleash economic growth and revitalize depressed communities. Members of the delegation expressed the desire for additional data to understand the options available for our region and magnitude of costs in pursuing this plan. This White Paper explores some initial proposals for the development of a robust regional transit system.

This White Paper does not analyze the economic impacts of an enhanced regional transit network. MAPA plans to evaluate this in more detail in a separate study that will assess the economic return-on-investment for such a system.

This analysis was drafted by a Committee convened for the purpose of exploring the expansion of regional transit service and its potential impacts on selected corridors. A high-level assessment of redevelopment potential, anticipated ridership, and cost estimates is provided. The Committee consisted of local public and private planners and engineers with expertise in transportation engineering, urban planning, public finance and real estate development.

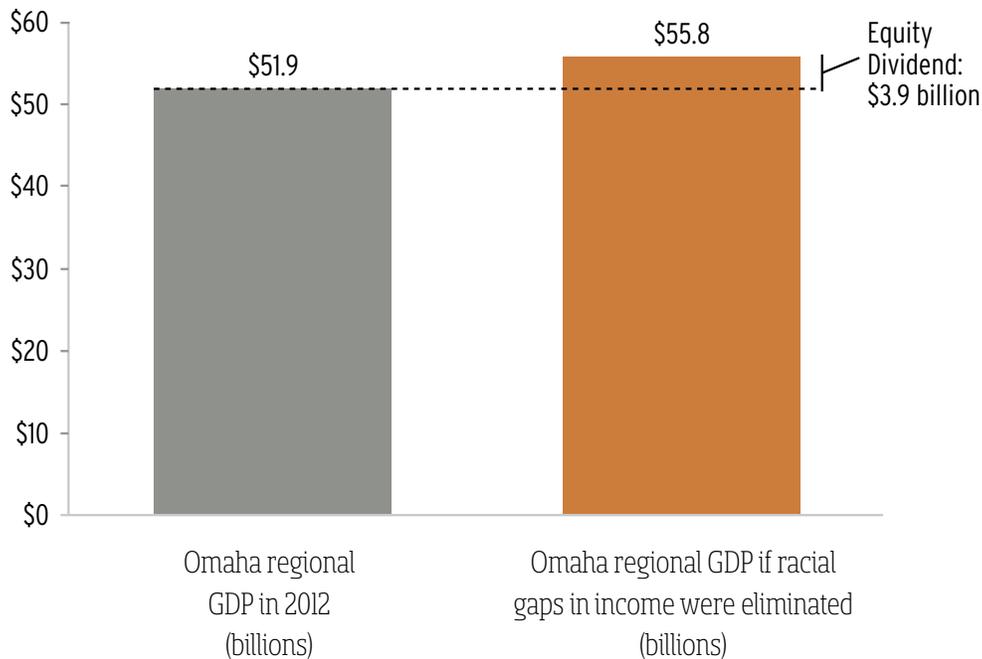
BENEFITS OF ENHANCED TRANSPORTATION

Access to Jobs and Education

The Omaha metro area has a low unemployment rate of 3.2%. Thousands of jobs go unfilled, and attracting employees to these jobs is a significant challenge. While the region as a whole has a high standard of living and surveys show that most residents enjoy a high quality of life, there are portions of the metro area with high concentrations of poverty, unemployment, and underemployment.

A market analysis conducted for the Central Omaha Alternatives Analysis (AA) that led to the current BRT and Streetcar projects showed that the area could attract as much as 20,000 new jobs in the Downtown and Midtown area if parking was managed better. This would be helpful as Downtown Omaha has lost 21,000 jobs since 1963. These jobs were in close proximity to low-income neighborhoods in the urban core on both sides of the river, and the current trend of increased jobs in the peripheries of the metro area makes it more difficult for unemployed and underemployed persons to access these jobs.

The Omaha-Council Bluffs region faces significant racial and ethnic gaps in income, wages, education, and poverty. The Regional Equity Profile conducted as part of the Heartland 2050 process showed that the region's Gross Domestic Product (GDP) would have been nearly \$4 billion higher in 2012 if there were no racial disparities in income. Increasing access to training and jobs is an important component of fostering more inclusive growth.



Transportation is known to be one of the primary obstacles to connecting potential employees to jobs. In 2010, only 32% of households and 45% of jobs were located within one-quarter mile of transit routes. According to Nebraska's Next Economy, a report commissioned by the State of Nebraska, "The lack of an adequate system of public transport limits access for these groups, even as employers in the same city face constant workforce shortages. Omaha's leaders understand the transportation challenge."

More frequent and reliable transportation improves mobility and connects those seeking employment or job training better, so they can participate more fully in the local economy. Better connections reduce transportation costs for employers, enhancing their stability.

Providing better transportation options is a critical piece of solving the challenge of workforce and poverty in the metro area.

The Transportation Corridors discussed in the following section highlight in more detail how the corridors proposed in this White Paper address this issue through connecting residents to jobs and educational institutions.

Attract and Retain Talent

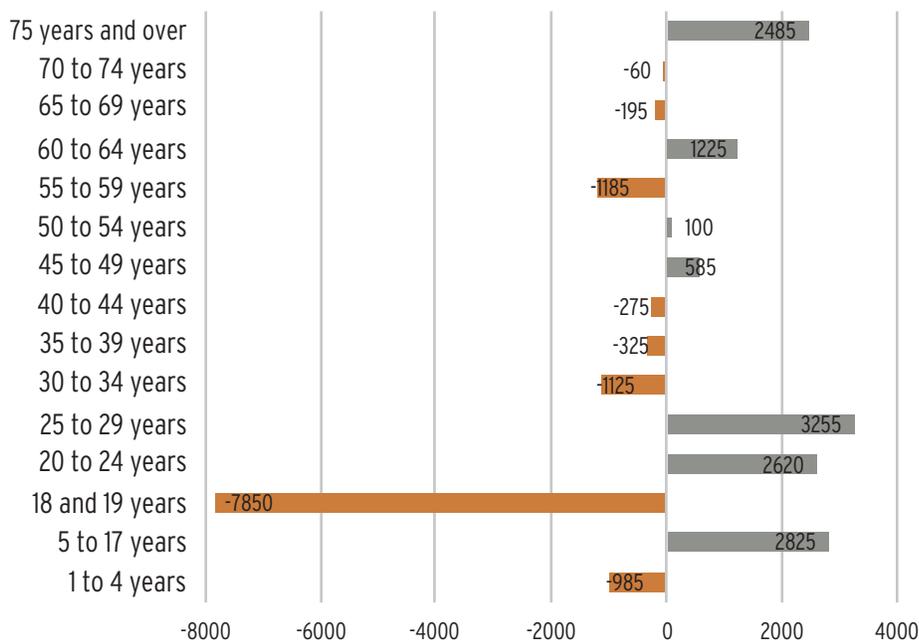
Millennials are known for “voting with their feet;” that is, they frequently choose an attractive place to live before finding a job. Driving is less popular among millennials than previous generations. Other transportation options, such as walking, biking and transit are more popular and even preferred to driving by many young adults.

The Omaha metro area is experiencing a net loss of residents with college degrees each year. Between 2006 and 2010 the State of Nebraska Data Center estimates that the Metropolitan Statistical Area (MSA) lost more than 4,000 people with college degrees. According to the Nebraska State Data Center that rate is estimated to have grown by as much as double that between 2011 and 2015.

For the Greater Omaha region to reach its potential, increased efforts to attract and retain young people should be made to increase its desirability and opportunities. A key part of this strategy includes developing and expanding vibrant areas with entertainment and shopping options near residential and commercial development.

Companies face increased competition to attract young talent, and are often choosing locations with a high quality of life for their facilities.

Domestic Net Migration 2010 - 2015



Create Great, Vibrant Places

Communities with vibrant, walkable neighborhoods with transportation options beyond the automobile are popular throughout the country, especially among young adults and empty nesters. Recent developments such as the Blackstone District in Midtown Omaha, the 100 Block in Council Bluffs, in

addition to established nodes such as Benson, Dundee, and Downtown Omaha, show the market for pedestrian-oriented places is strong, and there is no end to their growth in sight.

The City of Omaha's Downtown Master Plan identified the potential to add as much as \$2 billion in additional development in the area of Dodge Street between the Missouri River and Saddle Creek Road. However, this potential is contingent upon additional transportation options that reduce the need for parking, which requires large amounts of land and, consequently, reduces walkability.

The Close the Gap Plan for more walkable nodes of development distributed across the region begins with Downtown Omaha as the metro area's hub of commercial and entertainment activity. It extends to neighborhoods and town centers, as well as historic Main Street districts in surrounding communities across the region. This dispersed development of nodes and corridors reflects the preferences indicated strongly by the public during the extensive outreach activities conducted for the Heartland 2050 project.



Improve Public Health

Transit systems help people to live healthy, active lifestyles by connecting them to jobs and providing opportunity for walking or biking at each end of the trip. Evidence supports the positive health impacts of transportation, which is why the Centers for Disease Control (CDC) is promoting public transportation as a key strategy in its Health Impact in 5 Years (HI-5) initiative. The Douglas County Health Department recognized this important health connection recently by adding the Metro Transit Executive Director as an Ex-Oficio Board Member.

Congestion Relief

The Omaha area is often described as a “20-minute city,” in which many destinations are accessible within a short drive relatively. The Omaha region is growing and expected to cross the threshold of one million residents in the next decade. The area will experience increased strain on the roadway system, which will lead to increased congestion and commute times. Funding challenges and physical constraints will limit the ability to widen and expand the highway system in the manner that has been done during past decades.

Currently, the Nebraska Department of Transportation (NDOT) and MAPA are leading a major transportation study for the Omaha-Council Bluffs metro area called the Metro Area Travel Improvement Study (MTIS). This study identifies long-term investments that NDOT and local jurisdictions need to make in order to ensure that the region's transportation network functions as a whole. According to the MTIS, delay (the amount of extra time people spend in their vehicles due to congestion) on our major roadways would increase 28% without substantial investments in our transportation system. This amounts to an increase in total Vehicle Hours Traveled for each household from 1.37 hours per day to nearly 2 hours per day.

Solutions utilized in larger metropolitan areas will be increasingly important to consider. These include increased emphasis on ride-sharing and other travel demand management practices, technological solutions, as well as other modes such as increased walking, biking, and public transit. Providing increased transportation options is important, so the metro area's growth does not result in heavy congestion also.

Cost-Effective Infrastructure

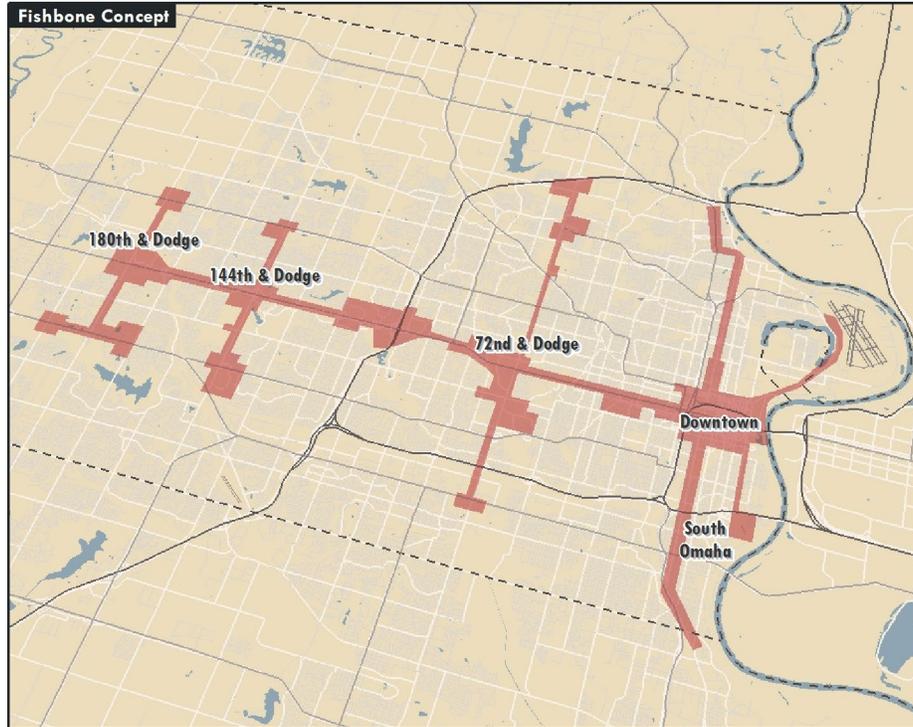
If the region continues to develop as it has in recent decades, by focusing primarily on new outward development that is auto-oriented, the region will add an area the size of the City of Omaha in new developed land area across the entire five-county region. This new development requires extensive infrastructure, such as water, sewer, power, roads and bridges, in addition to basic services such as police, fire, schools, and parks. In addition, after it is built, it must also be maintained and replaced ultimately, a fact often overlooked in considering the costs of growth, as illustrated by recent debates in Omaha concerning infrastructure replacement costs.

The forecasts conducted for Heartland 2050 showed that if current growth trends continue, it's likely we will face a \$1.3 billion budget shortfall to pay for necessary public costs to support the anticipated new development. The shortage of funding needed to maintain and add current transportation infrastructure is significant and projected to increase.

On the other hand, the Heartland 2050 preferred growth scenario would result in a \$1 billion surplus. By concentrating jobs, housing and development around nodes of walkable development, the same amount of growth in jobs or population can be supported with less infrastructure and public expenditures. Well-planned, efficient growth will reduce strain on roadways and reduce public costs, for the economic well-being of the region.

TRANSPORTATION CORRIDORS

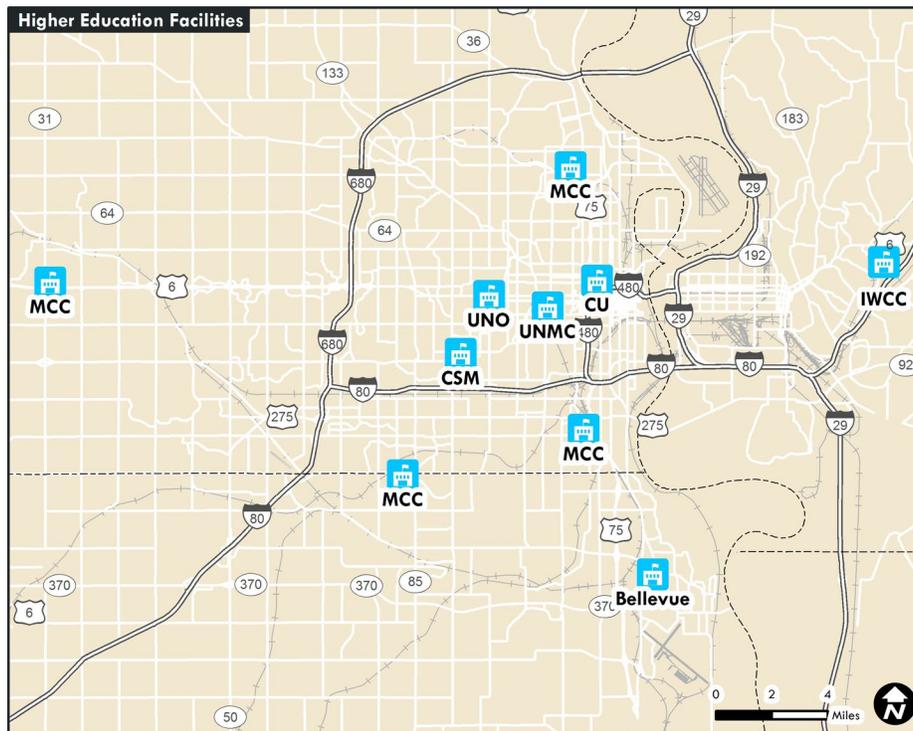
The Close the Gap Plan calls for the development of transportation corridors that connect walkable nodes such as mixed-use developments, town centers and historic main streets. Many of these were part of the “Fishbone” concept in the City of Omaha’s Urban Design Element originally, which resulted in Areas of Civic Importance (ACI) designated by the City of Omaha and are shown in the map below.



The Fishbone concept was further developed by the Heartland Connections Regional Transit Vision led by MAPA and Metro and completed in 2013. This study assessed and recommended priority corridors for their ability to expand transit coverage and facilitate multi-modal access while remaining cost effective. These corridors are included in the NDOT-MAPA MTIS Preferred Strategy Package, and include:

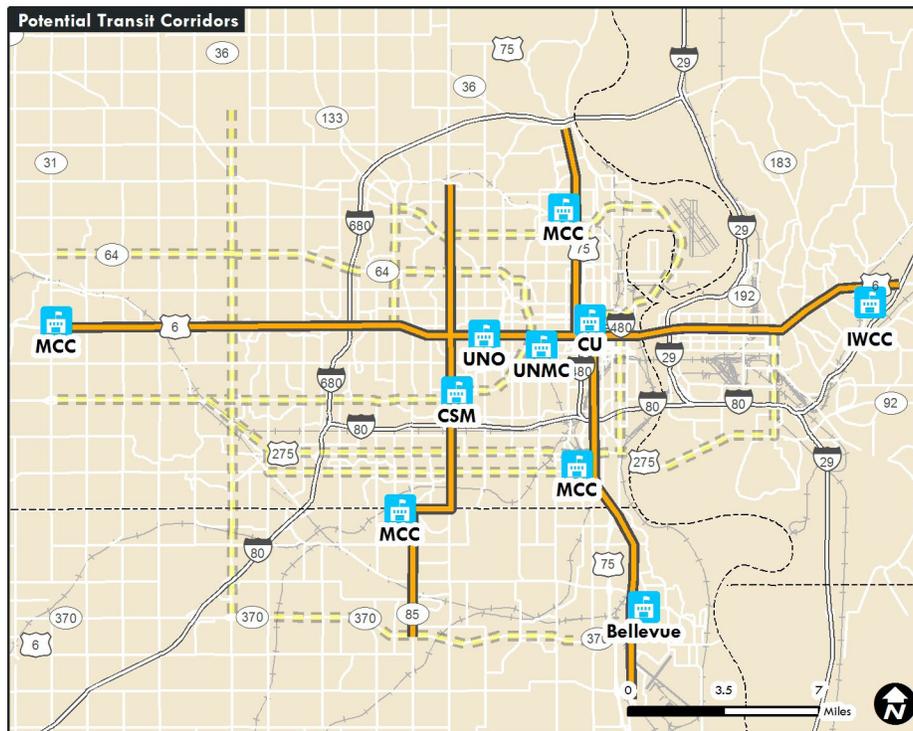
- East-west spine along Dodge and Broadway
- North-south spine that connects Florence to Offutt Air Force Base along a combination of 30th Street, 24th Street and Fort Crook Road
- North-south spine along 72nd and 84th Street into Sarpy County
- East-west spine along Center from West Omaha to UNMC via Saddle Creek
- East-west spine along Maple from West Omaha to UNMC via Northwest Radial Highway
- Expanded service along other key routes to feed the primary BRT trunks

The Heartland 2050 project took the transit vision a step further by connecting the transit corridors explicitly to the metro area's higher education institutions. Given the focus on the need to develop workforce and connect residents better to jobs and training, the transportation corridors were compared to the locations of universities and community colleges. This map shows the primary universities and community colleges in the metro area:



Another reason for considering colleges and universities is that young people are a prime market for transit and transit-friendly development. By focusing nodes of walkable development along transportation corridors, a natural source of ridership will be provided that increases the usage of transit. Student programs such as Metropolitan Community College's Pass to Class and UNO's MavRide have been very successful. Just recently, Creighton University also instituted a student transit pass program. Additionally, more empty nesters are heading to places where they attended school in the past or where their children live currently as students, according to Forbes. The region has the potential to build upon this concept through focused infill development, transit service as well as walking and biking infrastructure.

The identified transportation corridors, shown in the following map, connect the region's educational institutions to a striking degree. In fact, the majority can be reached by a single east-west and north-south spine. This geography represents a tremendous opportunity for the region to connect residents better to educational and training opportunities.



Omaha/Council Bluffs East-West Spine: Dodge/Broadway

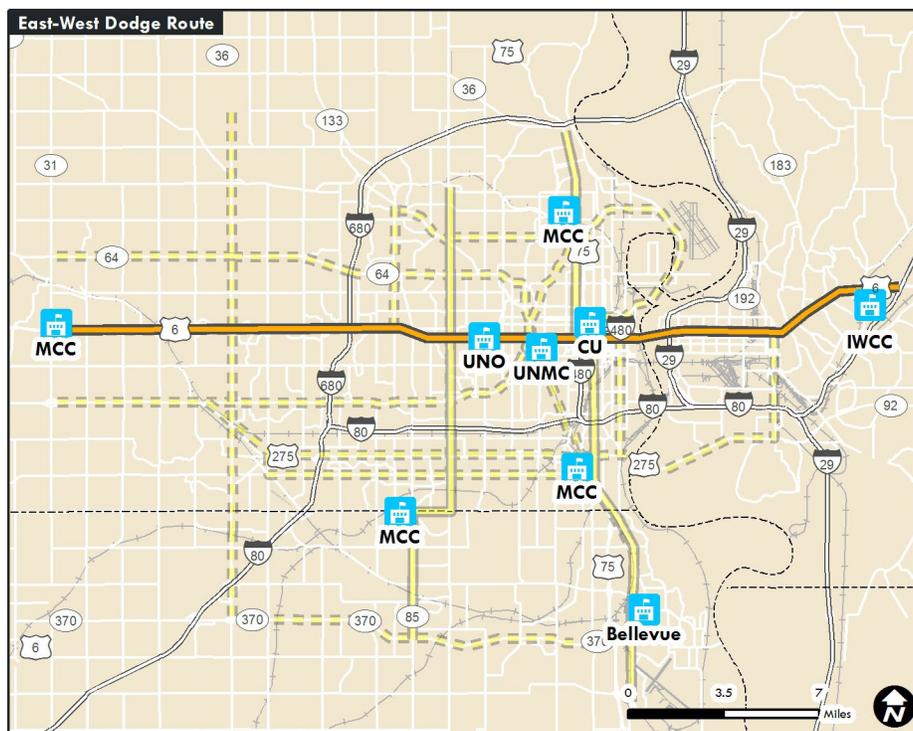
The Dodge corridor is the highest traveled arterial roadway in the metro area and connects major employment centers, dense residential areas, universities, hospitals and other health care facilities, shopping, and more. It is considered to be Omaha's "Main Street," and has long been identified in the Omaha Master Plan as a transit corridor.

Metro is working currently on the Bus Rapid Transit (BRT) to connect Westroads to Downtown Omaha with high-frequency rapid service. In addition, the streetcar project along the Farnam-Harney Street Corridor improves mobility and economic development potential within the Downtown, North Downtown, and Midtown areas.

The regional Dodge/Broadway Corridor would extend the BRT to include West Omaha and Council Bluffs. The job-rich West Dodge Road Expressway corridor and the Elkhorn community offer connections to high employment and residential connections. Premium transit service could be extended to the east into Council Bluffs along the First Avenue corridor, as identified in the West Broadway Corridor Plan. This former railroad corridor, in which the rails have been removed, provides an ideal route to support planned redevelopment between the River's Edge redevelopment and Downtown Council Bluffs. In addition, given the important focus on workforce and economic development, continuing the route to Iowa Western Community College should be given strong consideration.

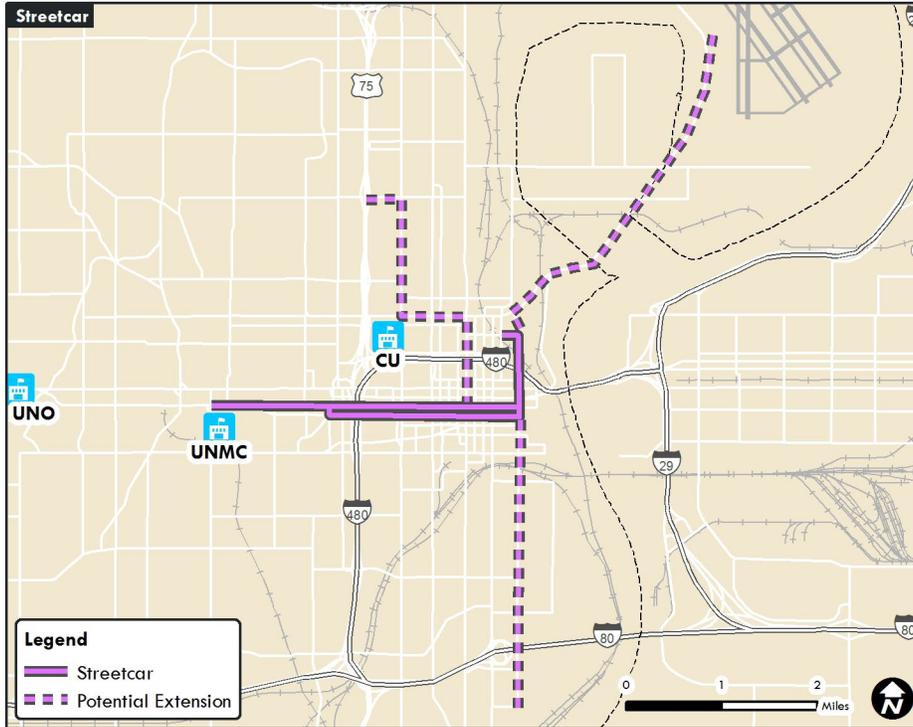
These extensions from Elkhorn to Council Bluffs establish an east-west spine of a regional transit system. It spans from the Metro Community College Elkhorn Campus to Iowa Western Community College, connecting numerous people, jobs, and other destinations along the way.

Currently, Metro provides bus service on this corridor with Route 2, Blue-Yellow Routes, and with the Route 92 Dodge Express in the peak hour.



Omaha Streetcar

The proposed Omaha streetcar route is within close vicinity of the Dodge corridor. It would run between North Downtown and UNMC. The streetcar provides an important economic development and mobility connection and would connect North Downtown to UNMC along Farnam or Harney Streets. Potential future expansions include connections to Henry Doorly Zoo, Eppley Airfield, and North Omaha. Currently, Metro provides bus service on this corridor with Route 15.



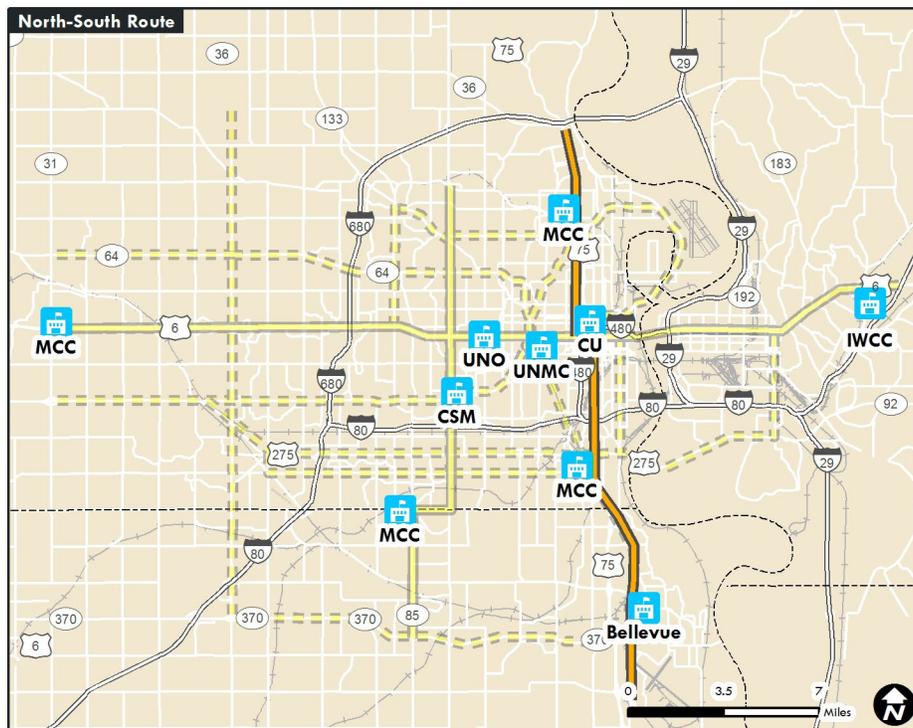
Omaha/Bellevue North-South Spine: 30th-24th-Fort Crook

A north-south line connects North Omaha, Downtown, South Omaha, and Bellevue. The concept in the Regional Transit Vision includes a route along 30th Street and 24th Street in Omaha, connecting to Fort Crook Road in Bellevue via Railroad Avenue, and terminates ultimately at Capehart Road near Offutt Air Force Base. Extending the route north of the North Omaha Transit Center (located off 30th Street just south of Ames) along 30th Street would connect Metro Community College and origins and destinations in Florence. The corridor on 30th Street would connect North Omaha to Midtown and then travel through South Omaha via 24th Street. An option for evaluation as a potential alternative is 25th Street, if 24th Street proves too difficult through Downtown South Omaha.

Interest has also been expressed in evaluating 10th or 13th Street as an alternative to 24th Street from Downtown to Bellevue, which would connect to Fort Crook Road also. This corridor was proposed originally in the late 1990s and remains a viable concept. It would connect Downtown to the Henry Doorly Zoo, which covers a hot real estate market and would have high usage by tourists. Although this corridor was not evaluated for this current White Paper, it is a concept that merits additional study.

The north-south 30th/24th/Fort Crook Road corridor runs perpendicular to the east-west BRT and streetcar routes and connects many of the region's employment and educational centers, including two Metro Community College campuses, Creighton University and Medical Center, and Bellevue University. It traverses some of the metro area's most economically depressed neighborhoods, which have some of the highest transit ridership and transit mode share also. Much of the corridor has modest traffic and/or excess right-of-way that could accommodate dedicated transit service easily. For example, 24th and 30th Streets in North Omaha do not carry high traffic volumes, while the Fort Crook Road corridor in Bellevue, which is the former US-73/75 route and has extensive right-of-way that could be repurposed for transit.

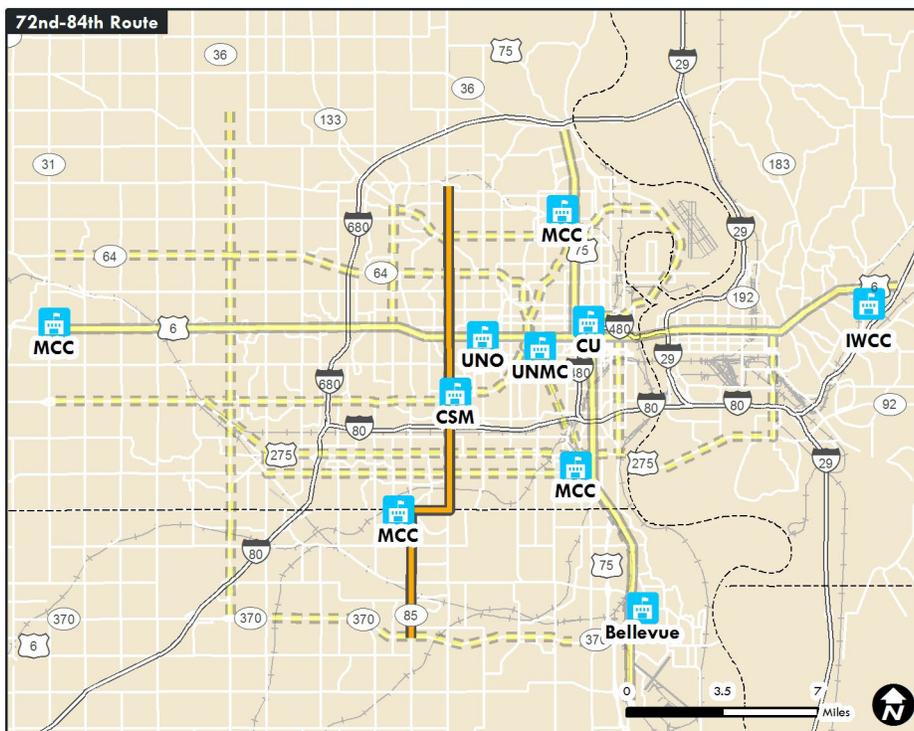
Currently, Metro provides bus service on this corridor with Routes 30, 24, and with the Route 95 Bellevue Express in the peak hour.



72nd & 84th Street Spine

The 72nd Street corridor is a north-south artery that spans the City of Omaha and a vital transportation corridor that could connect North Omaha to the dense employment corridor along 72nd south of Dodge Street, as well as to Sarpy County via 84th Street. The proposed corridor route jogs to the west on Harrison Street to connect to 84th Street, although other options such as Center Street or L Street should be given additional study. The 84th Street corridor in La Vista and Papillion connects many jobs and destinations, including Downtown Papillion and the planned La Vista Town Centre on 84th Street, north of Giles Road. Since Metro's implementation of system-wide route changes, the 18 Route (72nd/Ames) currently has the highest ridership in the system. This route travels along 72nd Street from Bergan Mercy Hospital to Ames, 24th Street, and south on 24th Street to Downtown.

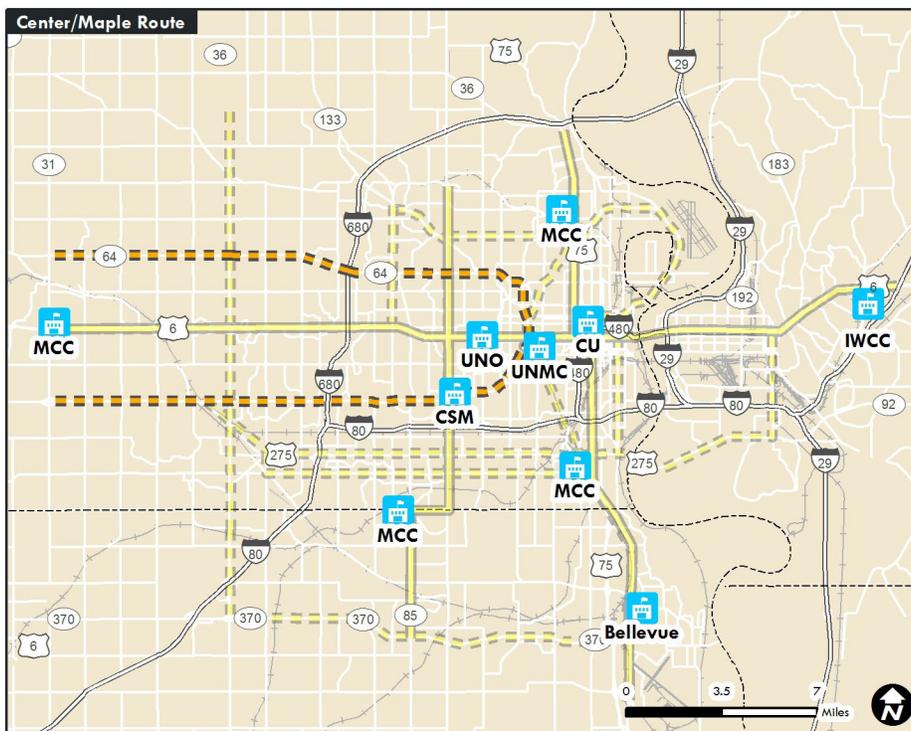
Currently, Metro provides bus service on portions of this corridor with Routes 18, 13, 55, and with the Route 93 South 84th Express in the peak hour.



Center & Maple Corridors

These proposed east-west routes along the Maple and Center corridors connect West Omaha to Central Omaha, converging near the University of Nebraska Medical Center (UNMC). These streets are identified in the Omaha Master Plan as transit corridors where higher density residential and employment locations have been concentrated. The Center Street corridor has tremendous potential for redevelopment with pedestrian-friendly or transit-oriented development, including the presence of Aksarben Village, the UNO Scott Campus, and Baxter Arena, and could serve as a viable route to extend rail service from the western terminus for the streetcar at UNMC planned currently. A corridor route along Maple and Northwest Radial Highway would connect Northwest Omaha and the many residential and employment concentrations. Benson is a key neighborhood center along Maple, although navigating through Benson would present some challenges.

Currently, Metro provides bus service on portions of these corridors with Routes 4 and 15.



Secondary or Long-Range Corridors

Additional corridors, many of which have been proposed in other plans and studies, would improve access to the region. These secondary corridors may be longer-range priorities for implementation after the core system described above is established. The long-range options include:

South Omaha/Council Bluffs East-West Corridor

The L Street or Q Street corridor from West Omaha to Metro Community College South Omaha Campus, with an extension into Council Bluffs along Veteran's Memorial Highway.

Eppley Airfield - Henry Doorly Zoo Connector

Connect Eppley Airport, Downtown and the Henry Doorly Zoo via a route along Abbott Drive and the 10th Street or 13th Street corridor. The preferred mode would likely be a streetcar, particularly given the high number of tourists in this corridor. This route would connect the Zoo and the CenturyLink Center, the two largest tourist attractions in the State. It could be extended south of the zoo along 13th Street to connect to the 30th/24th/Fort Crook line as well.

Sarpy County Highway 370 Corridor

East-west connection in Sarpy County from western Sarpy County to Olde Towne Bellevue.

Ames Street Connection

Ames Street between the North Omaha Transit Center and 72nd Street is a key connection for the system. Metro Transit's Route 18 connects 72nd Street to Ames and has the highest ridership in the system.

144th Street Spine

North-south connection of West Omaha and western Sarpy County along 144th Street/Highway 50.

Belt Line

This proposal by Emerging Terrain utilizes the former Belt Line Railroad right-of-way that begins near 30th and Ames, connects to UNMC, then travels along the Field Club Trail corridor south into Bellevue along the Fort Crook Road corridor.

North 90th Street

This corridor from West Maple Road to Blair High Road is a high commercial corridor that is a prime candidate for redevelopment.

North Downtown to North Omaha Connector

This concept would connect from Abbott Drive to North Omaha at 30th and Lake Streets via Cuming Street, 24th Street and Lake Street.

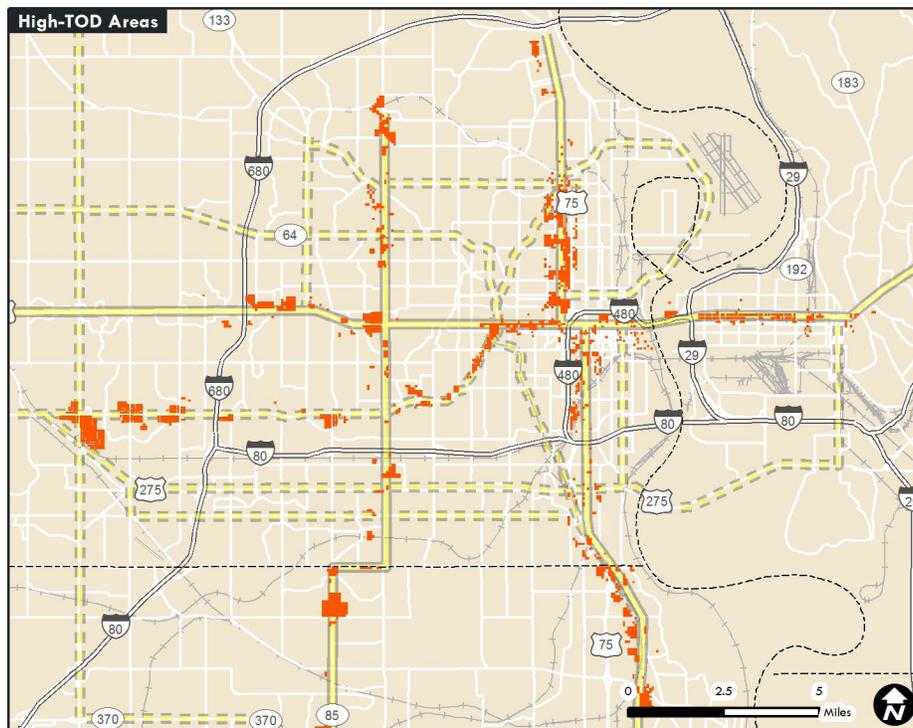
FUTURE LAND USE AND DEVELOPMENT

MAPA develops population and employment forecasts for the region as part of its transportation planning process. A model allocates the forecasted population and employment to zones throughout the metro area which are used for traffic forecasts.

As part of the analysis for this white paper, an exercise was conducted to provide an estimate of redevelopment potential along transportation corridors and its effect on the transportation system. MAPA's approved 2040 model forecasts are based on the Heartland 2050 Regional Vision. Heartland 2050 calls for increased nodes of redevelopment and mixed-use development both in the urban core and in neighborhoods and town centers throughout the broader metropolitan area, in addition to suburban expansion. The approved forecast allocates additional housing units and employees along the transportation corridors compared to 2010. This 2040 forecast will be referred to as the "Moderate Transit-Oriented Development," or "2040 Mod-TOD" land use scenario. This scenario sprinkles redevelopment throughout the metro area, but focused much of it along the transportation corridors to correspond with the "BRT Bonanza" scenario described below.

In addition, after reviewing the development forecasts, the White Paper Committee created a separate forecast. Development nodes and individual parcels along the transportation corridors were reviewed for their redevelopment potential. Regional population and employment totals were held constant, and housing and employees were reallocated to infill along the transportation corridors. This will be referred to in this white paper as the "High Transit-Oriented Development," or "2040 High-TOD" land use scenario.

In the 2040 High-TOD scenario, approximately 30,000 housing units and nearly 11,000 jobs were shifted to locations along the transportation corridors, in addition to the population and employment allocated in the "Mod-TOD" scenario (see the orange areas on the map below). Most of the additional population and employment was allocated in Downtown Omaha, Midtown Omaha, Aksarben/UNO Scott Campus area, and West Center Road from 72nd to 144th Street, which was selected for more intense development due to the presence of rail transit in the Center LRT scenario.



The tables below show the population and employment along the transportation corridors in the 2040-Mod TOD scenario, 2040 High-TOD, as well in 2010, which is the base year for the travel model, for each of the corridors within one-quarter mile and one mile buffers. One-quarter mile is generally considered a distance that many residents are willing to walk to access transit: a 5-minute walk. One-mile provides a broader idea of a more extended area that could be accessed with adequate “last-mile connections” through longer walks, bicycle, or other modes of transportation, including ridesharing or potentially new mobility options through emerging technologies.

This exercise represents an attempt to address the “chicken-and-egg” relationship of transportation and land use. Major transportation investments affect real estate development. Other regions show that transit systems with permanent investments, when coupled with transit-supportive development policies, allow for more concentrated housing, employment and entertainment uses. Premium transit that is attractive and convenient is critical to reducing the amount of land devoted to parking and creating a more walkable environment. Conversely, transit-friendly development results in higher ridership along the transit system. These land use scenarios represent the potential for such a transportation system to affect development patterns and, conversely, how new development patterns might affect the transportation system.

Although some corridors in the City of Omaha have used mixed-use and higher density nodes in recent decades, they are largely designed around automobile use. A commitment to higher levels of transit is critical to achieving truly malleable, mixed-use neighborhoods and town centers.

Population and Employment Projections within 1/4 mile of Corridors

Corridor	2010 Pop	2010 Emp	2040 Mod-TOD Pop	2040 Mod-TOD Emp	2040 High-TOD Pop	2040 High-TOD Emp
Dodge/Broadway	51,575	98,990	95,855	129,579	106,125	134,002
30th/24th/Ft. Crook	32,313	33,782	68,596	47,516	70,268	49,013
72nd/84th	27,238	36,524	42,685	46,159	45,817	46,518
Center	29,017	60,985	41,169	69,015	54,952	73,368
Maple	42,106	22,457	53,398	27,562	54,525	27,826
TOTAL	182,249	252,738	301,703	319,831	331,687	330,727

Population and Employment Projections within 1 mile of Corridors

Corridor	2010 Pop	2010 Emp	2040 Mod-TOD Pop	2040 Mod-TOD Emp	2040 High-TOD Pop	2040 High-TOD Emp
Dodge/Broadway	171,016	184,253	268,482	235,436	282,914	240,927
30th/24th/Ft. Crook	129,798	89,540	222,117	128,980	228,120	132,383
72nd/84th	102,363	69,391	138,802	93,135	143,285	93,857
Center	104,558	116,719	135,709	128,558	154,643	133,545
Maple	134,699	75,005	181,787	88,544	186,000	89,428
TOTAL	642,434	534,908	946,897	674,653	994,962	690,140

TRANSIT TECHNOLOGIES

This White Paper explores various options for what modes of transit could be provided. This is intended to provide initial information and not a comprehensive study. Each corridor will require more detailed analysis to conclude which mode is most appropriate.

The following overview provides various transit technologies, or modes, as described in the Regional Transit Vision conducted for MAPA and Metro.

Bus Rapid Transit (BRT)

Bus Rapid Transit offers upgraded urban arterial bus service with many of the passenger amenities and conveniences of rail. BRT provides faster service by limiting stops to enhanced passenger stations located near major activity centers along an arterial roadway corridor and other advantages such as signal priority or queue jumps at intersections. Stations are spaced one-third (1/3) to one mile apart typically.

The term “BRT” covers a wide variety of applications. For purposes of this white paper, “BRT-Lite” refers to enhanced bus service with some of the aspects of BRT that operates in mixed traffic. An example would be the Max service in Kansas City. “Busway” BRT is premium transit service that operates in a dedicated right-of-way and includes high level features that make it approach rail service. Examples of this include the Cleveland Health Line or the Orange Line operated by the Los Angeles County Metro. “Freeway” BRT operates on freeways and utilizes the freeway shoulder or High-Occupancy-Vehicle (HOV) or High-Occupancy Toll (HOT) lanes frequently, with limited stops and satellite park-and-ride sites.



EmX BRT in Eugene, Oregon

Streetcar / Rapid Streetcar / Light Rail Transit (LRT)

Streetcars and Light Rail (LRT) operate on a fixed guideway and provide a spectrum of service, ranging from local circulators to high capacity regional service. Traditionally, streetcars operate on a fixed guideway, offering urban circulator service. Stations are spaced between one-quarter (1/4) to one-third (1/3) mile apart. Service can be provided in an exclusive right-of-way, such as in the median of a major arterial, or streetcars may be street running depending upon existing or projected traffic volumes. Electric vehicle technology is used typically, arriving and departing from permanent boarding platforms that may include shelters. Light Rail Transit service operates on a fixed guideway, offering high capacity regional or urban service. Stations are spaced between approximately one-half (1/2) to two miles apart typically, depending upon vehicle type and the existing or anticipated density of development. LRT service is often provided in an exclusive right-of-way, such as within the median of a major arterial, but it can be operated in mixed traffic. Electric or hybrid (diesel and electric) vehicle technology is used typically, arriving and departing from permanent boarding platforms that often include shelters.

Currently, the rail transit industry is trending toward increased merging of technologies. For instance, on systems a single line can vary from streetcar/circulator service in one segment to LRT in another portion, utilizing the same vehicles throughout the route.



Modern Streetcar in Kansas City



Light Rail Transit in Minneapolis

Commuter Rail

Commuter rail service provides rail service typically between cities and towns throughout the larger region, rather than linking population and employment centers as LRT or other rail services do. Commuter rail services utilize railroad passenger cars and are propelled typically by diesel or electric power.



Commuter Rail in Salt Lake City region

Autonomous Transit

Autonomous vehicles and connected vehicles are technologies emerging rapidly that will have an impact on transit service. While some have predicted that it will impact transit negatively, others have suggested that these emerging technologies, combined with a presumed decline in auto ownership will increase transit usage.

Many companies are developing autonomous buses, ranging from full-size vehicles to microtransit shuttles. Transit agencies, such as the Kansas City Area Transportation Authority (KCATA) and the Pinellas Suncoast Transit Authority (PSTA) in the Tampa region are partnering with mobility companies to offer last-mile solutions.

While the final result of these technologies remains unknown, there are exciting possibilities. The potential massive reduction in the cost of public transit through eliminating the largest cost, which is labor, could allow transit agencies to expand their systems vastly at a far less cost than was thought possible previously. These technologies could also have dedicated right-of-way and operate as a BRT, Streetcar, or LRT technology would today.



*Recent demonstration of the EZ10
Autonomous Shuttle in Omaha*

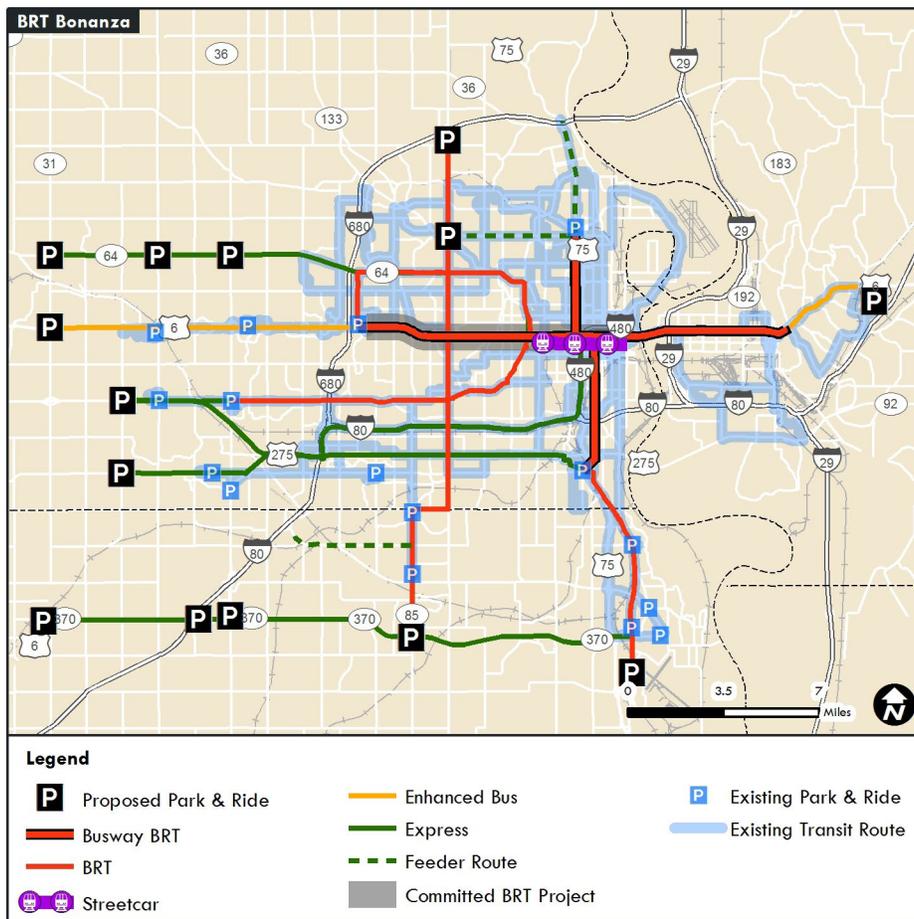
TRANSIT SCENARIO RIDERSHIP FORECASTS

To provide an initial estimate for ridership along an expanded regional transit system, different levels of transit investment were tested in the MAPA regional travel demand model with various land use forecasts as part of the MTIS conducted by NDOR and MAPA. Following are the transportation scenarios that were analyzed:

Base Year. This scenario includes the transit system in 2010 model base year.

Status Quo (MTIS Scenario Package 5). This scenario assumes that status-quo transportation investment continues, with a continuation of funding sources available currently for some roadway expansion and no significant additional transit service. It assumes the MAPA 2040, or “Moderate-TOD” land use, which includes additional redevelopment and infill along transit routes.

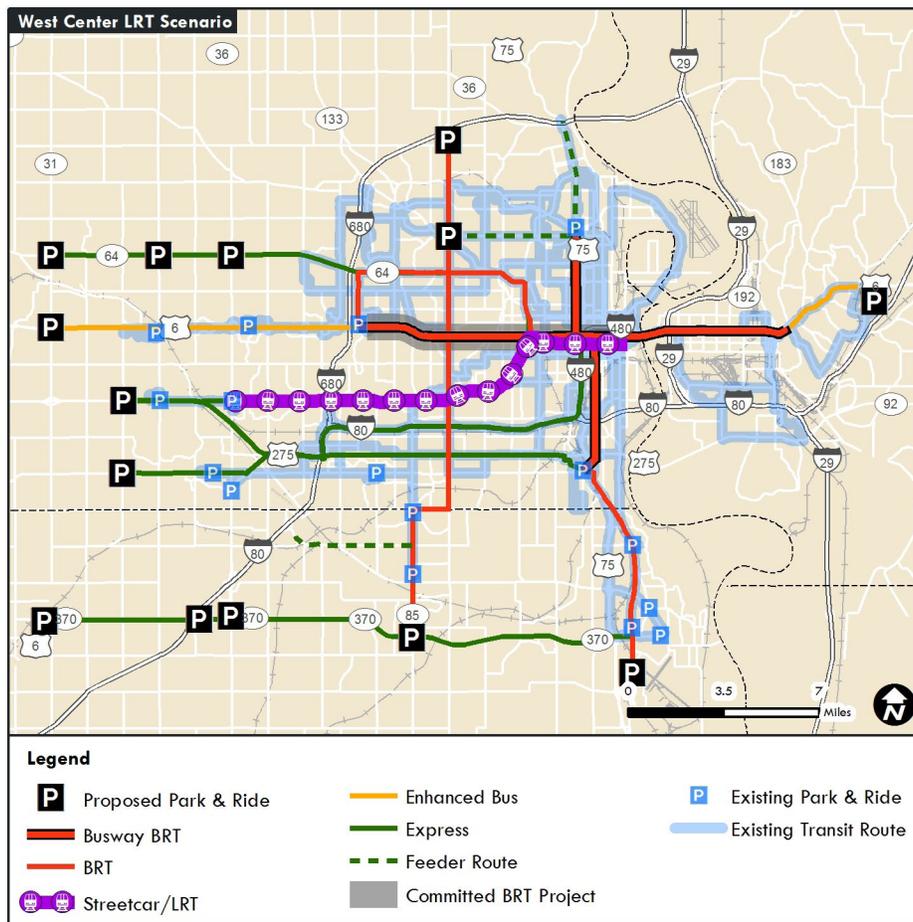
BRT Bonanza (MTIS Preferred Scenario Package 7). This scenario includes a balance of freeway and arterial street improvements and signal technologies. The scenario also includes enhanced regional transit service, by largely following the Regional Transit Vision recommendations for the transportation corridors (Dodge/Broadway, 30th-24th-FtC, 72nd-84th, Center, Maple). Premium “Busway” BRT is along Dodge from Westroads to the Missouri River and along 1st Avenue from the River to Downtown Council Bluffs as well as on the 30th/24th/Fort Crook Road corridor between 30th and Fort and Offutt Air Force Base. “BRT-Lite” is utilized in the 72nd/84th corridor and the Center and Maple corridors. Enhanced bus service is used along other key routes in the system. Modern streetcar is included in this scenario and limited to the current planned route between UNMC and North Downtown. This scenario is illustrated in the map below:



West Center LRT Scenario. This special scenario was tested for the purpose of this White Paper. It extends rail service from the streetcar route planned currently between North Downtown and UNMC to the west along West Center Road via Saddle Creek Road (other routes that connect through UNO should be given consideration also). As described above in the Transit Technologies section, LRT and streetcar technologies are merging as seen in other regions. Along a single line, the characteristics of the service, such as speed, spacing of stops, and station design, may vary with the context of the surrounding community.

The West Center Road corridor was selected as the most attractive candidate to test LRT service for the following reasons:

- Proximity of Aksarben/UNO Scott Campus to proposed western terminus of the streetcar at UNMC
- Wide rights-of-way along West Center Road as former Nebraska Highway 38.
- Corridor is identified in Omaha’s Master Plan with a node and corridor concept and is set up with large mixed-use nodes that contain the high concentrations of office, retail and multi-family land uses that are designed specifically to support transit routes.
- Ample opportunity to repurpose aging retail/commercial nodes along the corridor west of 72nd-144th Street as transit-oriented development.

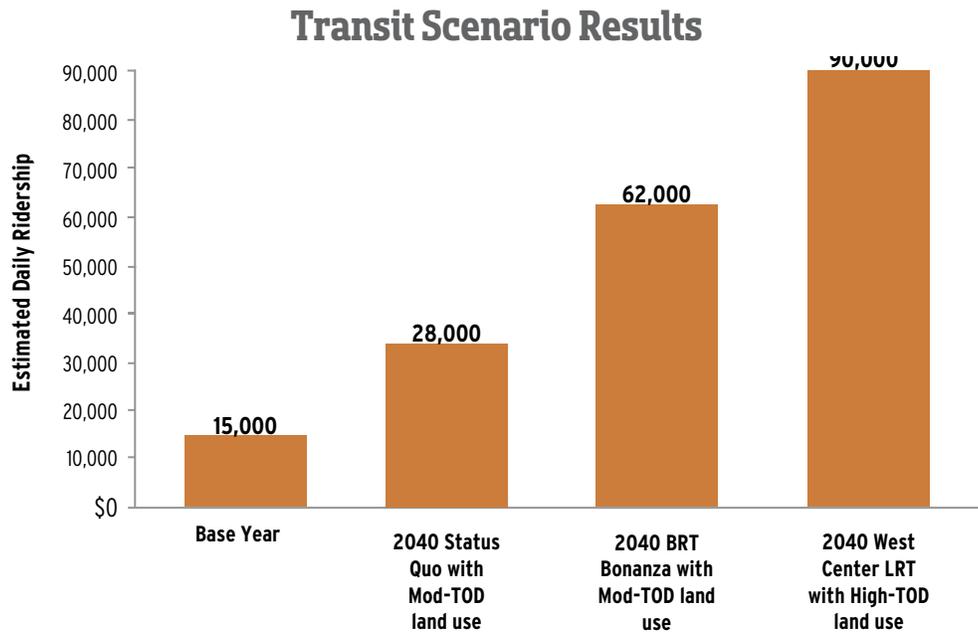


The Status Quo scenario and the BRT Bonanza Scenario were tested using the base “Mod-TOD” population and employment forecast. This comparison shows that transit service and land use have a large impact on anticipated ridership. The Status Quo scenario increases the total amount of transit trips without any increased transit service by nearly double from 15,000 to 28,000 trips per day as a result of increased population and redevelopment along transit-friendly corridors. This indicates that redevelopment and increased population along transit-

friendly corridors will benefit transit even without increased service. However, when the BRT Bonanza scenario is run, the number increases four-fold from the base year ridership to 62,000 total trips per day.

The West Center LRT scenario was tested using the “High-TOD” forecast that concentrated additional population and employment along the transit corridors. The additional development that rail transit has the potential to attract can be used to help pay for the additional cost of LRT.

The result of this scenario was nearly 90,000 trips per day throughout the system, a six-fold increase in ridership from today. The graph below illustrates the results of this analysis in terms of ridership:



The transit ridership estimates are shown in the table below. The numbers assume BRT service as well as local service, with the corridor total shown below. Note that the highest performing route in Metro’s current system, the Route 18, attracts 2,500 trips per day currently. These totals represent significant increases in transit ridership in the system.

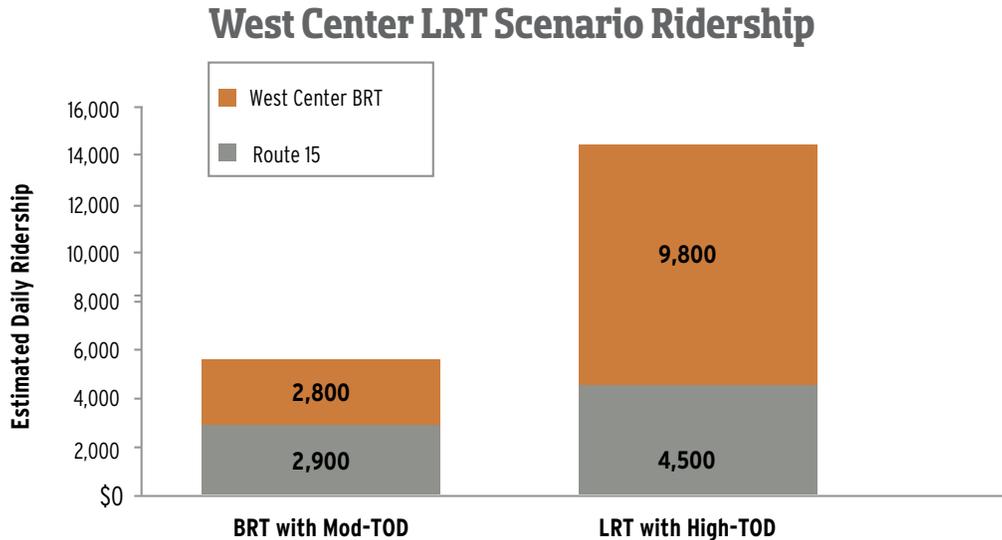
Daily Ridership Estimates for BRT Bonanza Scenario:

Corridor	2040 Ridership with Mod-TOD	2040 Ridership with High-TOD
Dodge/Broadway	11,600	14,700
Dodge (Elkhorn-Downtown)	9,000	11,600
Broadway to IWCC	2,600	3,100
30th/24th/Ft C.	10,900	16,600
72nd/84th	4,400	8,700
Center BRT	4,700	11,800 *
Maple	6,500	8,100

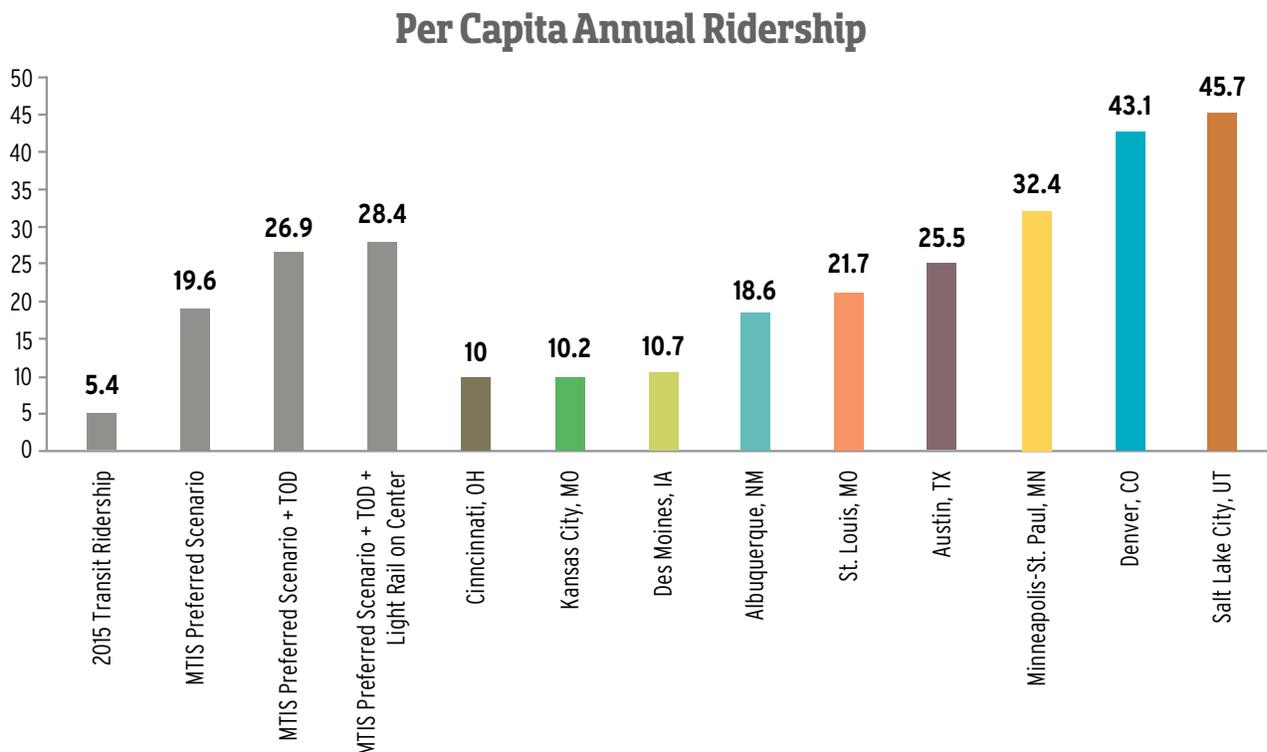
* - Center BRT ridership is particularly high due to land use along West Center Road corridor in the High-TOD land use for the West Center LRT

Ridership Estimates for West Center LRT Scenario

When the West Center LRT scenario is considered, the influence of technology and land use is pronounced. Whereas the BRT corridor is estimated to have a daily ridership of 4,700, LRT with High-TOD land use would attract 14,300 trips per day.



Per capita transit ridership in the Omaha region was 5.4 transit rides per person in 2015. The various transportation and land use scenarios increase that number to between 19.6 and 28.4. The graph below shows how these figures compare with peer cities and aspirational cities. Two transit oriented development scenarios would place the Omaha region between Austin and Minneapolis-St. Paul's per capita annual ridership.



COSTS OF PREMIUM TRANSIT

This White Paper includes average cost estimates for transit technologies and the proposed packages. Cost development for premium transit services involves capital and annual operating/maintenance expenses typically, including rolling stock and infrastructure requirements. Estimates prepared during these early development stages assume future conditions in our region will be similar to historical trends in other similar communities implementing premium transit services.

Each transit system and community has unique characteristics, which can result in wide variation in project costs. For example, some transit systems are built through existing commercial or residential corridors, requiring extensive right-of-way acquisitions. Other examples include transit that may be accommodated within the managed roadway. In some locations constructing LRT, transit agencies have purchased existing railroad successfully from rail companies, which can provide significant savings from new construction. Utility costs are another critical variable that vary widely and can be extremely difficult to predict.

The following high level estimates provide reasonable cost assumptions for the multiple transit modes, until further detailed information is available at the corridor level. However, note these represent average cost ranges and that projects can vary both higher and lower than the ranges provided based on the specific project costs.

Transit Mode	Characteristics	Cost per mile
BRT "Lite"	Little to no exclusive busway	\$2.5M - \$7.5M
	Traffic priority	
	Flexible route design	
	Substantial stations	
	Can attract some development	
BRT	Exclusive busway	\$10M - \$50M
	Traffic priority	
	Flexible route design	
	Substantial stations	
	Can attract moderate development	
Light Rail (LRT)	Higher Capacity than BRT	\$50M - \$100M
	Level platform loading	
	Attracts high levels of development	
Streetcar	Medium capacity	\$40M - \$75M
	May act as a circulator	

From a capital cost perspective and as shown in the table above, light rail and or fixed rail transit services cost more to build than bus rapid transit, due to the requirement for rail, electrical infrastructure, substations, and other equipment not needed for buses. BRT-Lite is less expensive than the other transit modes due to the availability of operating in and out of the existing roadway.

It is estimated that the premium corridors contained in the BRT Bonanza scenario could be constructed for approximately **\$500-\$750 million**. The proposed system contains about 60 miles of BRT for an average of slightly less than \$10M per mile. This assumes a good quality BRT system with a mixture of BRT-Lite characteristics (i.e., some mixed traffic lanes) with some higher-level BRT characteristics at targeted locations.

The proposed route for the Omaha Streetcar would run from North Downtown to UNMC along Farnam and/or Harney Streets. The streetcar cost is estimated between **\$150-200M**.

The cost for West Center Road LRT assumes \$75M per mile. It is reasonable to anticipate that LRT along this corridor may be on the lower end of the cost spectrum for LRT since there is ample right-of-way along this former State highway route. The corridor to extend from the western terminus of the Streetcar to Oak View Mall is approximately nine miles, for an estimated total cost of **\$675M**.

A rough estimate for the total capital costs to construct the entire system, including all of the BRT corridors, the Streetcar and the West Center LRT is approximately **\$1.5 billion**. For comparison, the total cost of the Council Bluffs Interstate Project is \$2B. A detailed study for each proposed line should be conducted for more refined cost estimates.

Operating and Maintenance Expenditures

The operational and maintenance costs (O&M) for premium transit service will depend upon the selected mode, length of the system, headways, ridership, and other requirements and features. The annual costs will change as the system matures.

According to the MTIS, by 2040 it will cost approximately \$1B to operate, maintain, rehabilitate, and replace the buses and facilities associated with the current system (estimates are inflated to reflect the anticipated year of expenditure). To expand the system and provide the additional operations and maintenance necessary for the BRT Bonanza scenario would increase costs by approximately 80%, or \$800M.

The LRT operating cost, approximately \$200 per revenue hour, is more expensive than the BRT average, of approximately \$125 per revenue hour. The LRT costs include additional maintenance expenses for track right of way, switches, signals, and stations.

It is estimated that annual operating costs for the LRT corridor along West Center Road in this White Paper could be more than \$3M annually. These estimates assume route length of 15 miles, 20 minute headways, 18 hours per day of service, and 6 days of operation per week.

Enhanced Feeder Service

If transit is expanded regionally, the parts of the system beyond premium transit routes such as BRT or LRT would also be enhanced and should be considered as an additional cost. The Regional Transit Vision included several scenarios with enhanced bus service with bus rapid transit and light rail service, similar to the network described within this White Paper. For consistency, the estimates below for the enhanced feeder network are derived from the Aggressive Scenario for the RTV. Annual operating and maintenance costs for the feeder service are estimated to range from \$45M to \$60M, depending upon the number of corridors implemented.

Many regions are exploring new types of transit service that take advantage of innovative technology. Public private partnerships in Tampa and other cities between transit agencies and companies such as Uber and Lyft are exploring avenues to solve the “last-mile” problem. Demand response transit service has been in existence for a long time, but new technology provides transit agencies opportunities to make it more cost effective and increase mobility for residents.

COMMUTER RAIL SCENARIO

The establishment of a Commuter Rail Service between Lincoln and Omaha has been a topic for many years. In 2003, the Nebraska Transit and Rail Advisory Council (NTRAC) completed a report that focused on new rail and bus transit options for several corridors in eastern Nebraska. The study determined that there is potential demand for transit service between Lincoln and Omaha and that there were no apparent fatal flaws. However, the lower capital costs for the bus transit option indicated that it would likely be easier to implement than commuter rail. Current intercity bus service is provided by Burlington Trailways and Arrow Stage Lines. With that understanding, the purpose of this analysis is to provide an update to the commuter rail analysis and associated costs to provide that service.

The *Nebraska Transit Corridors Study* was utilized as a baseline for several aspects of this analysis. The original study considered service to operate on the BNSF mainline tracks between the Omaha and Lincoln Amtrak stations. The California Zephyr operates on this line currently, with an operating time of approximately one hour. For purposes of this update, two scenarios were evaluated for the capital improvements associated with providing Commuter Rail service. The first scenario assumes the same configuration and investments as identified in the original study. The second scenario considered the cost of upgrading the track to two tracks for the entire length between Lincoln and Council Bluffs as well as providing additional stations based upon how the areas have grown during the past 14 years. For Scenario 1, the minimum service option identified in the original study was assumed, which consisted of operating two train sets, which would allow for two early morning trips and two evening trips in each direction daily. Scenario 2 assumes three train sets and five morning and five evening trips.

Scenario #1	Scenario #2
Service Options <ul style="list-style-type: none"> • 2 train sets • 2 am trains/2 pm trains daily 	Service Options <ul style="list-style-type: none"> • 3 train sets • 5 am trains/5 pm trains daily
Track Improvements <ul style="list-style-type: none"> • Siding improvements at 3 locations • 2.6 miles of new track 	Track Improvements <ul style="list-style-type: none"> • 25 miles of new second mainline track • Construction of 26 railroad bridges and culverts • Reconstruction of 13 railroad viaducts
Station Locations <ul style="list-style-type: none"> • Lincoln Amtrak Station • Lincoln – Havelock Area • Gretna • Omaha Suburban (Chalco area) • Omaha Amtrak Station 	Station Locations <ul style="list-style-type: none"> • Lincoln Amtrak Station • Lincoln – Havelock Area • Waverly • Greenwood • Ashland • Gretna • La Vista • Ralston • Omaha Amtrak Station • Council Bluffs (near Downtown)

For Scenario #1, the capital improvement, operating and rolling stock costs identified in that study were updated to reflect recent costs. This scenario included the construction or modification of five stations, two additional facilities for layover and maintenance, two park and ride facilities, three siding track upgrade locations to allow for passing on the single-track sections of the mainline and construction of 2.6 miles of new track. The capital costs for construction of the Scenario #1 improvements were estimated at \$61.5 million. The purchase of three DMU train sets is estimated at approximately \$22.5 million, resulting in a total capital investment of \$84.0 million. The operations and maintenance costs were also updated and estimated at \$6.6 million annually. However, it should be noted that a more in depth evaluation of daily operations and current rail facilities should be conducted if the establishment of commuter rail service moves forward.

For Scenario #2, proposed locations for stations were adjusted based on expected growth and the opportunity to link the towns along the corridor to both metro areas. These adjustments included additional stations in Waverly, Greenwood, Ashland, La Vista, and Ralston, with a change from the Omaha Suburban station to a Gretna location. A station was also assumed near the Downtown area of Council Bluffs.

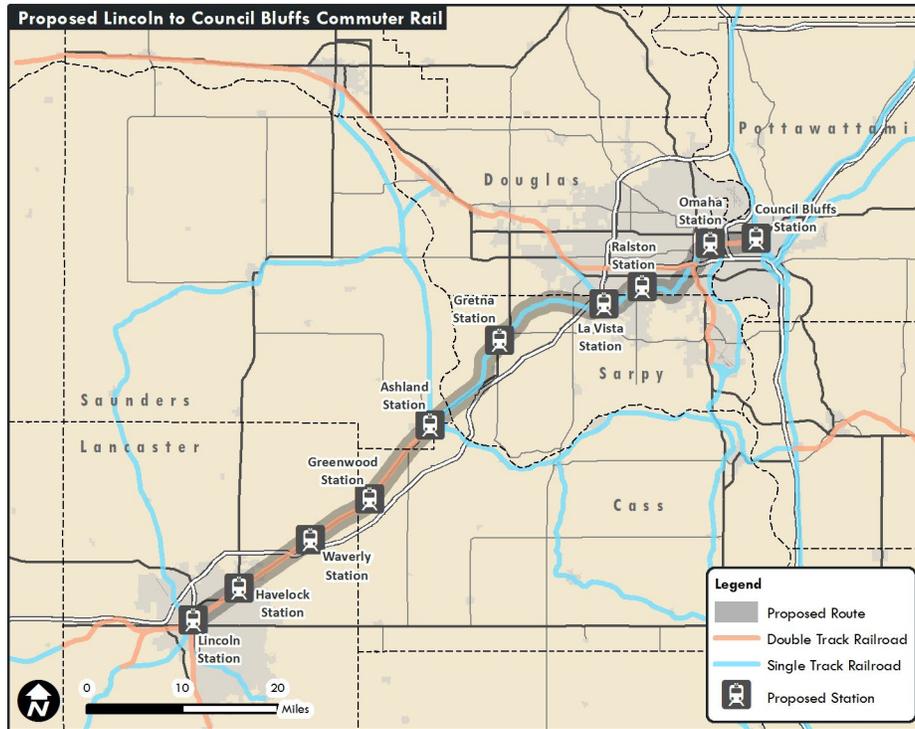
An inspection of current facilities was performed to determine a preliminary estimate of improvements required to implement Scenario #2, with double mainline track the entire length of the commuter rail service. This review found that there are approximately 25 miles that provide only a single lane track currently. Along this segment, there are several bridges, culverts and underpasses that would need further analysis to determine if they would need to be modified to accommodate construction of a second mainline track. Below is a summary of the structures that may require modification or expansion for the new track.

Segment	Single Track Bridges	Estimated Length (feet)	Single Track Viaducts	Single Track Culverts
Ashland-Gretna	7	2,645	1	0
Gretna-La Vista	5	610	6	3
La Vista-Ralston	4	780	4	0
Ralston-Omaha	7	1,580	2	0

A preliminary cost estimate, using updated construction prices, the construction cost for 25 miles of a second mainline track and assuming a worst-case scenario of rebuilding every bridge, culvert, and viaduct, results in a construction cost of \$118.9 million approximately. The construction of an additional five stations would increase the costs by \$7.8 million approximately, for a total of \$34.8 million for the ten stations, the maintenance facility in Lincoln, and the layover facility in Omaha. The total investment to construct the additional track, stations and maintenance facilities would total \$153.6 million approximately. The purchase of four DMU train sets would be an additional \$30 million, resulting in a total capital investment of \$183.6 million. It was assumed that the annual operating costs would be \$10M for Scenario #2.

The ridership forecasts assumed in the original study were maintained for purposes of this analysis. In the year 2030, annual ridership on the commuter rail was estimated to range from a low of 186,200 trips to a high of 263,400 trips. It's likely the high end

of that estimate would be realized by utilization of an enhanced service option, providing up to five trips per day in each direction. It is also assumed that with this enhanced service option, the second mainline track described in Scenario #2 would be required. By the year 2030, the associated annual revenue was estimated to range from \$2.2 to \$3.1 million, resulting in an annual subsidy of \$4.40 to \$6.80 million.



CONCLUSION

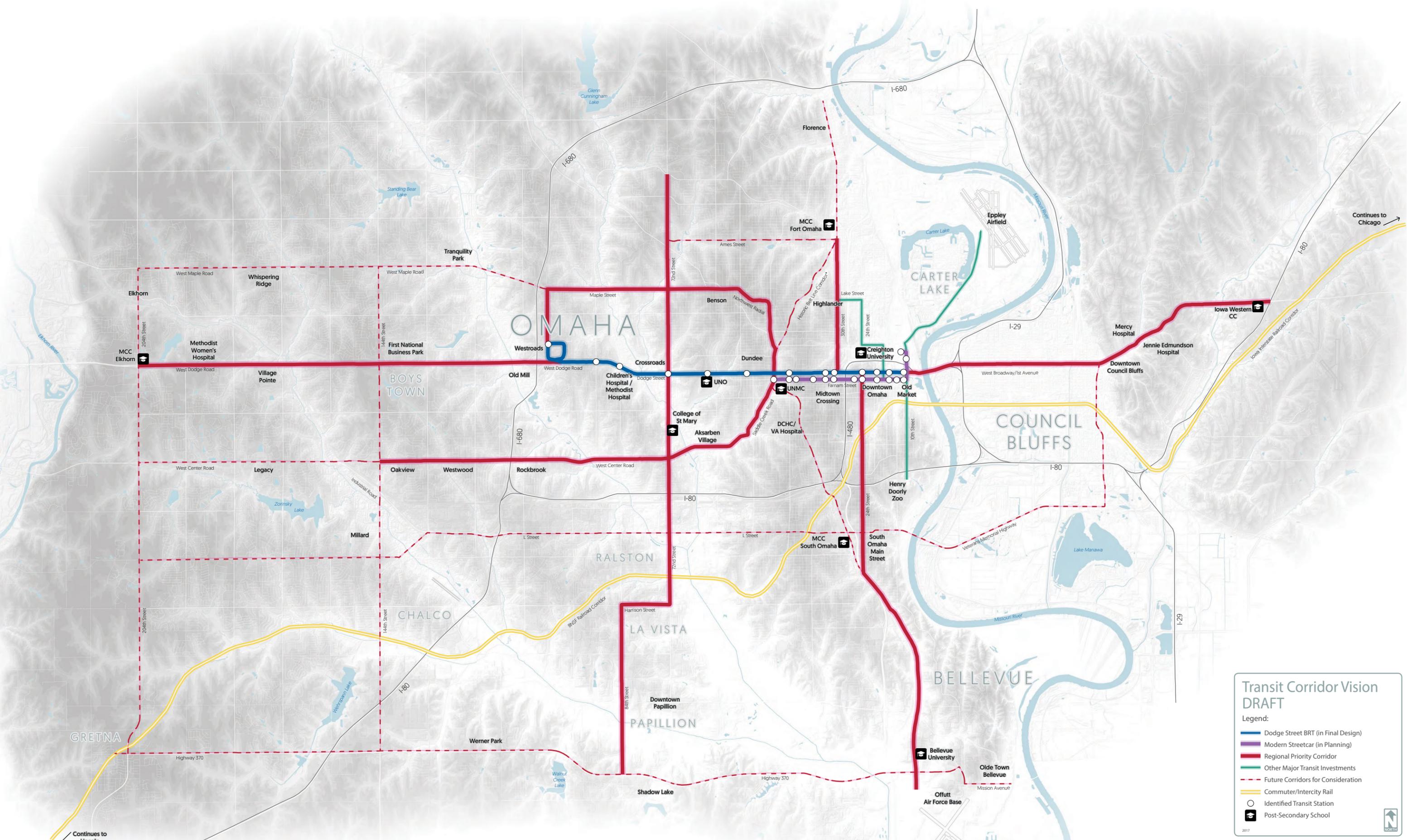
The Heartland 2050 goal of expanding transportation options to connect nodes of walkable development could have a dramatic effect on the Omaha-Council Bluffs region's future growth. By focusing growth along transportation corridors and providing premium transit service as well as robust pedestrian and bicycle infrastructure, the metro area will see transit usage increase by as much as six-fold, which would make it more competitive with transit-friendly metros such as Twin Cities and Denver. This would help the region address its challenges of increasing access to jobs and training as well as fostering more walkable and vibrant neighborhoods and town centers.

The high-capacity corridors identified in many of the region's planning studies and included in this White Paper serve as "trunks" of a future system that would bring reliable and convenient transit service within reach of thousands more residents than today. The locations of employment and education concentrations lend themselves to connections along these key routes. Development policies and investments will be critical to ensure that growth is transit-oriented and realizes the potential benefits that such a transportation system provides.

Technology that is developing rapidly may open new horizons for public and private transit systems. Previous obstacles to premium transit systems such as high capital costs and large right-of-way requirements may be reduced or eliminated through introduction of such technologies.

The commuter rail route is a topic of great interest among the public. Estimates show that the route would provide great benefits to the region in fostering economic growth and providing multi-modal transportation options. This concept should be reconsidered as part of future planning efforts.

The concerted efforts of public, private and philanthropic partnerships will be critical to developing the Close the Gap vision and preparing the region to flourish for the generations ahead.



Transit Corridor Vision DRAFT

Legend:

- Dodge Street BRT (in Final Design)
- Modern Streetcar (in Planning)
- Regional Priority Corridor
- Other Major Transit Investments
- Future Corridors for Consideration
- Commuter/Intercity Rail
- Identified Transit Station
- 🎓 Post-Secondary School

2017

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MAPA Omaha - Council Bluffs Metropolitan Area Planning Agency

*Note: The Belt Line Corridor was studied extensively by the local nonprofit Emerging Terrain. Any future work on the Belt Line as a transportation corridor or linear public space will seek to honor that organization's vision and live up to its impeccable standards.



Continues to Lincoln

Continues to Chicago