



APPENDIX B

ALTERNATIVE EVALUATION

REPORT

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Bismarck-Mandan Metropolitan Planning Organization



City of Bismarck



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Introduction

The primary activities completed as part of the alternative evaluation process include preparing evaluation criteria, assessing potential impacts of each alternative, and presenting rankings in an evaluation matrix. In response to the study's purpose and need, concept alternatives for three segments along the East Main Avenue corridor have been identified. The corridor segments include 7th Street to 12th Street, 12th Street to Airport Road, and Airport Road to 26th Street.

Preliminary Purpose and Need Statement

The purpose of the study is to achieve the following goals for East Main Avenue, from 7th Street to 26th Street, by the year 2045:

- Improve the aging corridor pavement
- Ensure all modes of transportation are safely and comfortably accommodated
- Support economic development opportunities
- Minimize impacts to adjacent corridors
- Provide a gateway to Bismarck/Downtown

The need for the study is underscored by the following issues:

- Pavement deterioration
- Snow control/maintenance
- Safety concerns throughout the corridor – crash history, access, pedestrians and bicyclists
- Pedestrians and bicyclists – gaps & comfort
- Environmental justice populations – access & mobility needs
- Maintain freight access
- Redevelopment accommodation / economic development pressure
- Improve corridor image

East Main Avenue Alternatives

The study purpose and need was established to provide the basis for the development of alternative concepts. The alternative development process was comprehensive using a range of inputs, including technical data, public comments, design parameters, and direction from the Study Review Committee (SRC).

The study team identified the following build-alternatives for East Main Avenue between 7th Street and 26th Street:

- Five-Lane Alternative
- Three-Lane Alternative
- Three-Lane with Median Alternative

Details of these alternative layouts are included in **Appendix A**.

The No Build (existing 5-lane) Alternative is not included in evaluation criteria, analysis, or matrices.

Evaluation Criteria

Evaluation criteria were developed based on the issues and needs information. In addition to measurable technical criteria, public preference and planning-level costs were used in the evaluation process. The screening criteria include:

- Vehicular Mobility (operations/congestion)
- Property Access
- Safety
- Freight
- Parking
- Planning-Level Cost*
- Pedestrian Access & Mobility
- Environmental Justice
- Bike Access & Mobility
- Transit
- Snow Control/Maintenance
- Corridor Image
- Agency/Public Input*
- Redevelopment Opportunity

**note that stakeholder and public input, as well as costs will be provided after Nov. 30/Dec. 1 input is received.*

Evaluation Scoring

The alternatives were evaluated based on a qualitative estimate of each alternative's ability to address the evaluation factors. The rating system is as follows:

	Good; best meets criteria
	Ok; meets criteria well
	Moderate; close to achieving criteria
	Marginal; does not meet criteria
	Poor; fails to meet criteria

Table 17 thru Table 19 at the end of this document indicate a summary evaluation of each evaluation criteria for each segment of East Main Avenue.

Vehicular Mobility Evaluation

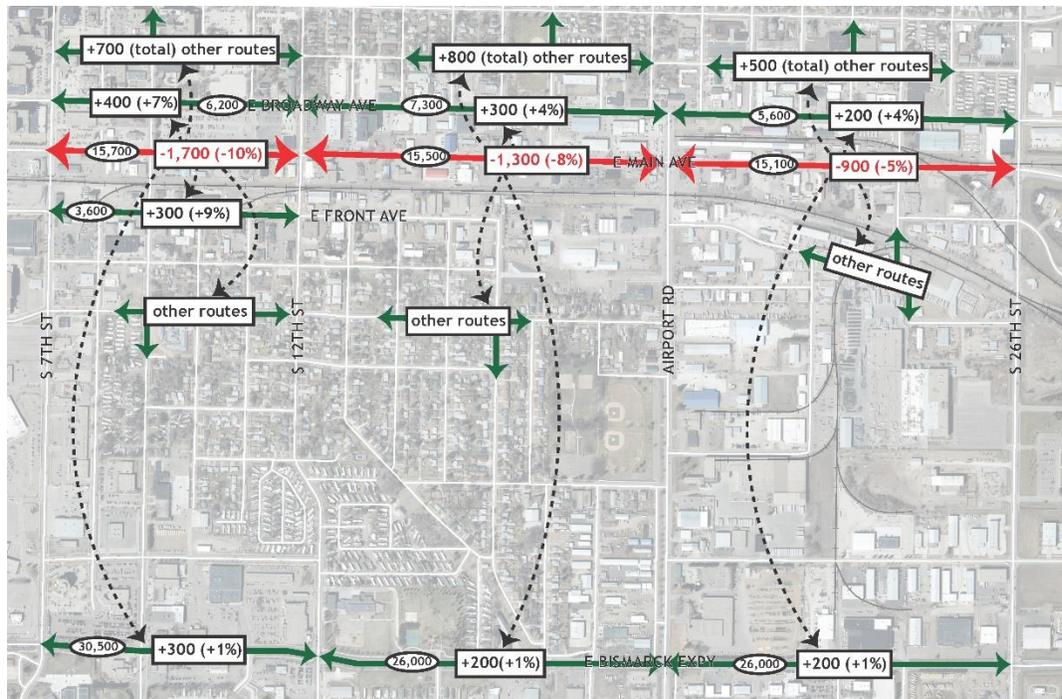
Route Traffic Diversion Impacts

Future daily volumes were reviewed under each East Main Avenue alternative. Two future year scenarios were modeled by North Dakota State University's Advanced Traffic Analysis Center (ATAC) using the Bismarck-Mandan MPO (BMMPO) travel demand model (TDM) to capture the daily diversion from East Main Avenue if the corridor was reduced to three lanes. Based on the results from the TDM, a daily diversion ranging between approximately 900 and 1,700 vehicles per day (vpd) from East Main Avenue to parallel routes is expected. The parallel routes include:

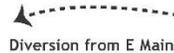
- Broadway Avenue: daily traffic volumes expected to increase by 200 to 400 vpd when East Main Avenue is converted to a three-lane roadway
- Front Avenue: daily traffic volumes expected to increase by approximately 300 vpd when East Main Avenue is converted to a three-lane roadway
- Bismarck Expressway: daily traffic volumes expected to increase by 200 to 300 vpd East Main Avenue is converted to a three-lane roadway
- Diversion to other routes is expected to be 500 to 800 vpd

The diversion to the routes listed above will not have a significant impact on the congestion level or how those routes operate on a daily basis.

Figure 1 | 3-Lane Alternatives Traffic Diversion Map



Legend



3-Lane Alternatives Traffic Diversion Map



2045 Intersection Capacity Analysis

An intersection capacity analysis was conducted to provide a more detailed assessment of corridor operations. The purpose of this analysis is to understand how area intersection delays, queuing, and travel times can be expected to change under future conditions. For comparison purposes, the evaluation focuses on key intersection level of service (LOS). Under the Five-Lane Alternative conditions, all intersections operate at an acceptable LOS C or better during the a.m. and p.m. peak hours with existing traffic controls. The traffic operations results observed under each of the East Main Avenue alternatives are shown in Table 1.

Table 1 | East Main Avenue Alternative Traffic Operations Results

East Main Avenue Intersection	Level of Service (LOS)					
	AM Peak Hour			PM Peak Hour		
	2045 5-Lane	2045 3-Lane	2045 3-Lane with Median	2045 5-Lane	2045 3-Lane	2045 3-Lane with Median
7 th Street	B	B	B	B	B	C
9 th Street	B	B	B	C	B	B
12 th Street	B	B	B	B	B	B
Airport Road	B	B	B	B	C	C
26 th Street	B	B	B	B	B	B

Under each of the East Main Avenue alternatives, all intersections operate at a LOS C or better during both the AM and PM peak hours.

Main Avenue Travel Times

Corridor travel times along East Main Avenue were reviewed for existing and future year conditions. The average corridor travel times from 7th Street to 26th Street are shown in Table 2.

Table 2 | East Main Avenue Alternative Corridor Travel Times

Alternative	Travel Time (minutes)					
	AM Peak Hour			PM Peak Hour		
	Eastbound	Westbound	Average	Eastbound	Westbound	Average
Existing Conditions ¹	3.72	4.03	3.90	3.90	4.40	4.20
Year 2045 5-Lane ²	3.80	4.09	3.90	4.00	4.69	4.30
Year 2045 3-Lane	4.24	4.66	4.40	4.67	4.74	4.70
Year 2045 3-Lane with Median	4.32	4.69	4.50	4.71	4.54	4.60

1|Year 2022. 2|Same as 2045 No Build

Under future year 2045 Five-Lane Alternative conditions, the travel times increase slightly compared to existing conditions. The three-lane alternatives result in a more significant increase in travel time along the corridor.

Five-Lane

- All intersections operate at a LOS C or better in both the AM and PM peak hour
- Average corridor travel times slightly higher than existing in PM peak hour

Three-Lane

- Diversion to parallel routes of approximately 900 to 1,700 vpd
- All intersections operate at a LOS C or better in both the AM and PM peak hour
- Average corridor travel times 9% - 13% higher than Five-Lane Alternatives

Three-Lane with Median

- Diversion to parallel routes of approximately 900 to 1,700 vpd
- All intersections operate at a LOS C or better in both the AM and PM peak hour
- Average corridor travel times 7% - 15% higher than Five-Lane Alternative

Property Access Evaluation

Under existing conditions there are approximately 86 private access points and seven side-street (public) access points within the East Main Avenue study area. Each of the alternatives considered along East Main Avenue recommend shifts, consolidations, and right-in/right-out restrictions of private access points along the corridor. These recommendations involve some properties along East Main Avenue. A summary of access recommendations along the East Main Avenue corridor is shown in Table 3. These recommendations are made in order to improve safety along the corridor (see the next section focused on safety).

Table 3 | East Main Avenue Alternative Access Recommendation Summary

Segment	Five-Lane	Three Lane	Three-Lane with Median
7 th Street to 12 th Street	<ul style="list-style-type: none"> • Five access shifts/consolidations • No right-in/right-out recommendations 	<ul style="list-style-type: none"> • Five access shifts/consolidations • No right-in/right-out recommendations 	<ul style="list-style-type: none"> • Two access shifts/consolidations • 17 right-in/right-out recommendations • Total of 19 access locations recommended for change
12 th Street to Airport Road	<ul style="list-style-type: none"> • 13 access shifts/consolidations • No right-in/right-out recommendations 	<ul style="list-style-type: none"> • 13 access shifts/consolidations • No right-in/right-out recommendations 	<ul style="list-style-type: none"> • Four access shifts/consolidations • 26 right-in/right-out recommendations • Total of 30 access locations recommended for change
Airport Road to 26 th Street	<ul style="list-style-type: none"> • 14 access shifts/consolidations • No right-in/right-out recommendations 	<ul style="list-style-type: none"> • 14 access shifts/consolidations • No right-in/right-out recommendations 	<ul style="list-style-type: none"> • Six access shifts/consolidations • 15 right-in/right-out recommendations • Total of 21 access locations recommended for change

Safety Evaluation

There are two intersections along the East Main Avenue corridor which are currently identified by both the NDDOT and BMMPO as high crash locations: 7th Street and 9th Street. Additionally, most of the remaining intersections and all segments along the East Main Avenue corridor have both crash and severity rates above the respective crash rates, which indicates a crash issue.

Each of the alternatives considered along East Main Avenue include recommendations that will result in a reduction of total private access points along the corridor. The intent is to improve safety. Access reduction is a proven safety countermeasure, especially for rear-end crashes, the most prevalent crash type along East Main Avenue (see Existing Conditions Memorandum). Another common crash type along the corridor includes angle crashes. Angle crashes will be reduced through signal timing improvements, less queuing, and less lanes to turn across, varying by scenario.

In addition, other alternative improvements along the East Main Avenue corridor such as on-street parking, curb extensions, lane reduction or reduction of curb-to-curb width, and

construction of a median are known vertical deflection traffic calming measures¹. Traffic calming measures are safety countermeasures proven to reduce vehicle speeds and are typically installed to support the livability and vitality of residential and commercial areas. New and/or expanded sidewalks and reducing vehicular speeds will also increase pedestrian safety along the corridor. A summary of safety along the East Main Avenue corridor is shown in Table 4.

Table 4 | East Main Avenue Alternative Safety Impact Summary

Five-Lane	Three Lane	Three Lane with Median
<ul style="list-style-type: none"> • 32 access shifts/consolidations along the corridor resulting in a decrease in conflict points • 6' sidewalk and 2' stamped concrete buffer on both sides of East Main Avenue to improve pedestrian safety • Curb extensions • Signal timing improvements 	<ul style="list-style-type: none"> • 32 access shifts/consolidations along the corridor resulting in a decrease in conflict points • 10' – 15' sidewalk buffer on both sides of East Main Avenue to improve pedestrian safety • Curb extensions • On-street parking • Lane reduction • Less through-lanes for left-turns to cross • Less queuing • Signal timing improvements 	<ul style="list-style-type: none"> • 12 access shifts/consolidations and 58 right-in/right-out location recommendations along the corridor resulting in a decrease in conflict points • 10' – 14' sidewalk with buffer on both sides of East Main Avenue to improve pedestrian safety • Curb extensions • On-street parking • Lane reduction • Construction of median • Less through-lanes for left-turns to cross • Less queuing • Signal timing improvements

Freight Evaluation

There are several *wholly freight dependent* properties along East Main Avenue including Prairie Farms, Bismarck Lumber Company, and Ferrellgas. Note there are many other properties along the corridor which rely on freight for their operations, including deliveries. Freight mobility is also supported through the area by intersecting roadways identified as truck routes including 7th Street, 9th Street, 12th Street between East Main Avenue and Front Avenue, Airport Road south of East Main Avenue, and 26th Street south of East Main Avenue. No proposed alternative would change East Main Avenue's truck route designation.

¹ <https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer>

Five-Lane

The Five-Lane alternative will have minimal impacts to freight movements along the East Main Avenue corridor compared to existing conditions.

7th Street to 12th Street

- There are no freight dependent properties along this segment which will be impacted

12th Street to Airport Road

- The Prairie Farms building is located on the SE corner of the intersection of 12th Street and East Main Avenue. Under the Five-Lane Alternative, the access to this property will be preserved and freight traffic will still be able to access this property via East Main Avenue.

Airport Road to 26th Street

- The Bismarck Lumber Company building is located on the north side of East Main Avenue between Airport Road and 24th Street. Under the Five-Lane Alternative, the access to this property will be preserved and freight traffic will still be able to access this property via East Main Avenue.
- The Ferrellgas building is also located on the north side of East Main Avenue between Airport Road and 24th Street. Under the Five-Lane Alternative, two private access approaches will be fully closed. However, freight traffic will still be able to access this property via the remaining access locations on East Main Avenue, closer to 24th Street.

Three-Lane

The Three Lane alternative will have minimal impacts to freight movements along the East Main Avenue corridor compared to existing conditions. The addition of on-street parking under this alternative may allow for flexibility for freight unloading at properties along the corridor which rely on freight traffic for deliveries. Note that freight unloading using on-street parking is only feasible during off-peak periods of traffic. Discussion with some corridor business owners noted freight unloading often occurs in the early morning before morning peak traffic.

7th Street to 12th Street

- There are no freight dependent properties along this segment which will be impacted

12th Street to Airport Road

- The Prairie Farms building is located on the SE corner of the intersection of 12th Street and East Main Avenue. Under the Three-Lane alternative, the access to this property will be preserved and freight traffic will still be able to access this property via East Main Avenue.

Airport Road to 26th Street

- The Bismarck Lumber Company building is located on the north side of East Main Avenue between Airport Road and 24th Street. Under the Three Lane alternative, the access to this property will be preserved and freight traffic will still be able to access this property via East Main Avenue
- The Ferrellgas building is also located on the north side of East Main Avenue between Airport Road and 24th Street. Under the Three-Lane alternative, two private access approaches will be fully closed. However, freight traffic will still be able to access this property via the remaining access locations on East Main Avenue, closer to 24th Street.

Three-Lane with Median

As with the three-lane alternative, the addition of on-street parking under this alternative may allow for flexibility for freight unloading at properties along the corridor which rely on freight traffic for deliveries.

7th Street to 12th Street

- There are no freight dependent properties along this segment which will be impacted

12th Street to Airport Road

- The Prairie Farms building is located on the SE corner of the intersection of 12th Street and East Main Avenue. Under the Three-Lane with Median alternative, the two private access approaches to this property along East Main Avenue will be partially closed, likely impacting freight traffic. Additionally, with the construction of the median along East Main Avenue, westbound freight traffic accessing this property will have to reroute to access this property from a different direction. Freight traffic will likely have to access the Prairie Farms building from 12th Street under this alternative.

Airport Road to 26th Street

- The Bismarck Lumber Company building is located on the north side of East Main Avenue between Airport Road and 24th Street. Under the Three-Lane with Median alternative, the private access approach to this property will be partially closed, likely impacting freight traffic. Additionally, with the construction of the median along East Main Avenue, eastbound freight traffic accessing this property will have to reroute to access this property from a different direction. Freight traffic will likely have to access the Bismarck Lumber Company building from Airport Road under this alternative.
- The Ferrellgas building is also located on the north side of East Main Avenue between Airport Road and 24th Street. Under the Three-Lane with Median alternative, all of the private access approaches to this property along East Main

Avenue will be partially closed, likely impacting freight traffic. Additionally, with the construction of the median along East Main Avenue, eastbound freight traffic accessing this property will have to reroute to access this property from a different direction. Freight traffic will likely have to access the Ferrellgas building from 24th Street.

Parking Evaluation

There is no existing on-street parking available along East Main Avenue except for a limited amount located on the north side between 7th Street and 9th Street. The summary of on-street parking for each of the alternatives is shown in Table 5.

Table 5 | East Main Avenue Alternative Parking Summary

Segment	Five-Lane	Three-Lane	Three-Lane with Median
7 th Street to 12 th Street	<ul style="list-style-type: none"> Limited on-street parallel parking spaces on north side of street between 7th Street and 9th Street (approx. 15 stalls) 	<ul style="list-style-type: none"> Abundant on-street parking on both sides of the street (approx. 80 stalls) 	<ul style="list-style-type: none"> Abundant on-street parking on both sides of the street (approx. 75 stalls)
12 th Street to Airport Road	<ul style="list-style-type: none"> There is no on-street parking along this segment 	<ul style="list-style-type: none"> Abundant on-street parking on both sides of the street (approx. 140 stalls) 	<ul style="list-style-type: none"> Abundant on-street parking on both sides of the street (approx. 95 stalls)
Airport Road to 26 th Street	<ul style="list-style-type: none"> There is no on-street parking along this segment 	<ul style="list-style-type: none"> Abundant on-street parking on both sides of the street (approx. 115 stalls) 	<ul style="list-style-type: none"> Abundant on-street parking on both sides of the street (approx. 105 stalls)

Pedestrian Access & Mobility

There is generally a sidewalk on both sides of East Main Avenue, except along the north side between 24th Street and 26th Street. The gap in the sidewalk network at this location decreases pedestrian access and mobility along the corridor.

There are numerous private vehicular access points along the corridor as well, which also decreases pedestrian access and mobility. With more vehicular access points, there is a greater chance for pedestrian and vehicular conflicts, which impacts pedestrian safety and

comfort along the corridor. Another factor in safety, access, and mobility is the existing 60-foot curb-to-curb width and five lanes of East Main Avenue. Anecdotally, traffic has been noted by stakeholders to often travel at excess of the speed limit of 35 mph. It is estimated that 80 percent of pedestrians struck at 40 mph will die². The distance required to cross the corridor and the multiple lanes of traffic in each direction decreases pedestrian access, mobility, and safety.

Given the proximity of Downtown Bismarck and the vital connection provided by East Main Avenue, pedestrian access and mobility should be a critical component of any proposed alternative for the corridor. Pedestrian counts taken in May of 2022 showed total pedestrian peak hour (both morning and afternoon) counts generally increased with proximity to Downtown³. Any intensification of commercial land uses along the corridor, and the potential increase in residential development along or adjacent to the corridor is expected to increase pedestrian volumes in the future. These impacts are expected to a greater degree approaching Downtown where more such development opportunities are present.

Because pedestrian access and mobility are a critical component of the existing corridor, all segments of East Main Avenue have been evaluated for pedestrian accommodation.

For all alternatives, pedestrian improvements exist in the form of new sidewalk on either side of East Main Avenue and new curb ramps and ADA accommodation at intersections. Note that all alternatives accommodate a minimum 6' wide sidewalk standard required in commercial and industrial areas.

The three-lane alternatives are anticipated to improve pedestrian safety. A reduction of travel lanes from four to two is anticipated to result in slower traffic speeds and would thus lead to the potential for less severe vehicle and pedestrian incidents. The shorter crossing distance will also increase pedestrian safety.

Table 6 | East Main Avenue Pedestrian Access & Mobility Summary

Segment	Five-Lane	Three-Lane	Three-Lane with Median
7 th Street to 12 th Street	<ul style="list-style-type: none"> • 6' sidewalk • 2' stamped concrete buffer • closes 5 of 19, or 26% of existing 	<ul style="list-style-type: none"> • 10-15' sidewalk with buffer • closes 5 of 19, or 26% of existing 	<ul style="list-style-type: none"> • 10-14' sidewalk with buffer • closes 2 of 19, or 11% of existing

² Retrieved from <https://one.nhtsa.gov/About-NHTSA/Traffic-Techs/current/ci.Literature-Reviewed-On-Vehicle-Travel-Speeds-And-Pedestrian-Injuries.print>

³ Peak hour pedestrian counts shown in parenthesis at each intersection in the corridor, from west to east: 7th St (55), 9th St (28), 12th St (20), 17th St (4), Airport Rd (11), 24th St (8), 26th St (16).

	<p>private access approaches</p> <ul style="list-style-type: none"> • 60' curb-to-curb width • 2 mid-block crossings 	<p>private access approaches</p> <ul style="list-style-type: none"> • 36' minimum, 52' maximum curb-to-curb width • 2 mid-block crossings • on-street parallel parking • curb extensions at 9th Street and 12th Street 	<p>private access approaches</p> <ul style="list-style-type: none"> • converts 100% (17 of 17) of remaining private access approaches to partial access (median restricted movements) • 12' minimum, 52' maximum curb-to-curb width • 2 mid-block crossings with median refuge • on-street parallel parking • curb extensions at 9th Street and 12th Street
12 th Street to Airport Road	<ul style="list-style-type: none"> • 6' sidewalk • 2' stamped concrete buffer • closes 13 of 38, or 34% of existing private access approaches • 60' curb-to-curb width • curb extensions at 17th Street 	<ul style="list-style-type: none"> • 10-15' sidewalk with buffer • closes 13 of 38, or 34% of existing private access approaches • 36' minimum, 52' maximum curb-to-curb width • on-street parallel parking • curb extensions at 17th Street and Airport Road 	<ul style="list-style-type: none"> • 10-14' sidewalk with buffer • closes 4 of 38, or 11% of existing private access approaches • converts 88% (30 of 34) of remaining private access approaches to partial access (median restricted movements) • 12' minimum, 52' maximum curb-to-curb width • on-street parallel parking

			<ul style="list-style-type: none"> • curb extensions at 17th Street and Airport Road
Airport Road to 26th Street	<ul style="list-style-type: none"> • 6' sidewalk • 2' stamped concrete buffer • closes 14 of 29, or 48% of existing private access approaches • 60' curb-to-curb width 	<ul style="list-style-type: none"> • 10-15' sidewalk with buffer • closes 14 of 29, or 48% of existing private access approaches • 36' minimum, 52' maximum curb-to-curb width 	<ul style="list-style-type: none"> • 10-14' sidewalk with buffer • closes 6 of 29, or 21% of existing private access approaches • converts 87% (20 of 23) of remaining private access approaches to partial access (median restricted movements) • 12' minimum, 52' maximum curb-to-curb width • on-street parallel parking

Five-Lane

All Segments

- 6' sidewalk on north and south sides enhances pedestrian access and mobility along the corridor. Pedestrian continuity is enhanced.
- 2' stamped concrete buffer between the roadway and sidewalk provides a visual buffer and offers some pedestrian scaled aesthetics appropriate for East Main Avenue however, 2' stamped concrete provides only a visual and is not a significant separation between pedestrians and vehicles.
 - Width of pedestrian zone is not increased
 - East Main Avenue crossing distance for pedestrians is not improved

7th Street to 12th Street

- Within the Downtown Bismarck defined subarea
- Closes five of the 19 (26%) existing private access approaches to improve pedestrian mobility and pedestrian friendliness. Reduces pedestrian and vehicular conflict.
 - Two mid-block crossings between 9th Street and 12th Street makes crossing East Main Avenue more comfortable and could be enhanced through

signage, lighting (i.e. HAWK signal), median refuge island, or other safety countermeasures.

12th Street to Airport Road

- Closes 13 of the 38 (34%) existing private access approaches to improve pedestrian mobility and pedestrian friendliness. Reduces pedestrian and vehicular conflict.
- Curb extensions at 17th Street (excluding extensions into East Main Avenue) increase visibility of pedestrians crossing 17th Street, significantly decrease pedestrian crossing distance, and help calm traffic or slow vehicles down by visually narrowing the roadway. Curb extensions effectively enhance pedestrian safety at intersections.

Airport Road to 26th Street

- Constructs a sidewalk on the north side of East Main Avenue between 24th Street and 26th Street, filling an existing gap in the pedestrian network and improving pedestrian access and mobility along the entire corridor.
- Closes 14 of the 29 (48%) existing private access approaches to improve pedestrian mobility and pedestrian friendliness. Reduces pedestrian and vehicular conflict.

Three-Lane

All Segments

- 10'-15' sidewalk with buffer on north and south sides enhances pedestrian access and mobility along the corridor. Pedestrian continuity is enhanced.
- The width of sidewalk with buffer provides substantial separation between pedestrians and vehicles.
- The addition of on-street parallel parking provides an additional and very effective buffer between pedestrians and vehicles although, parking is not continuous along the entire corridor, as there are private access approaches that prohibit where on-street parking can go. Pedestrian comfort and safety is improved where on-street parking exists.
- Width of pedestrian zone is increased.
- Crossing distance for pedestrians is improved from 60' to a range of 36-50'. Fewer travel lanes to cross also reduces pedestrian and vehicular conflict.

7th Street to 12th Street

- Within the Downtown Bismarck defined subarea. Three-lane cross section matches the rest of East Main Avenue through Downtown, west of the Study area.
- Closes five of the 19 (26%) existing private access approaches to improve pedestrian mobility and pedestrian friendliness. Reduces pedestrian and vehicular conflict.
- Two mid-block crossings between 9th Street and 12th Street makes crossing East Main Avenue more comfortable and could be enhanced through signage, lighting (i.e. HAWK signal), median refuge island, or other safety countermeasures.

- Curb extensions at 9th Street (excluding northeast corner) and 12th Street increase visibility of crossing pedestrians, decrease pedestrian crossing distance, and help calm traffic or slow vehicles down by visually narrowing the roadway. Curb extensions effectively enhance pedestrian safety at intersections.

12th Street to Airport Road

- Closes 13 of the 38 (34%) existing private access approaches to improve pedestrian mobility and pedestrian friendliness. Reduces pedestrian and vehicular conflict.
- Curb extensions at 17th Street (excluding extensions into East Main Avenue) increase visibility of pedestrians crossing 17th Street, significantly decrease pedestrian crossing distance, and help calm traffic or slow vehicles down by visually narrowing the roadway. Curb extensions effectively enhance pedestrian safety at intersections.
- Curb extensions at Airport Road (excluding northeast corner) increase visibility of crossing pedestrians, decrease pedestrian crossing distance, and help calm traffic or slow vehicles down by visually narrowing the roadway. Curb extensions effectively enhance pedestrian safety at intersections.

Airport Road to 26th Street

- Constructs a sidewalk on the north side of East Main Avenue between 24th Street and 26th Street, filling an existing gap in the pedestrian network and improving pedestrian access and mobility along the entire corridor.
- Closes 14 of the 29 (48%) existing private access approaches to improve pedestrian mobility and pedestrian friendliness. Reduces pedestrian and vehicular conflict.

Three-Lane with Median

All Segments

- 10'-14' sidewalk with buffer on north and south sides enhances pedestrian access and mobility along the corridor. Pedestrian continuity is enhanced.
- The width of sidewalk with buffer provides substantial separation between pedestrians and vehicles.
- The addition of on-street parallel parking provides an additional and very effective buffer between pedestrians and vehicles although, parking is not continuous along the entire corridor, as there are private access approaches that prohibit where on-street parking can go. Pedestrian comfort and safety are improved where on-street parking exists.
- Width of pedestrian zone is increased.
- Crossing distance for pedestrians is improved from 60' to a range of 12-50'. Fewer travel lanes to cross also reduces pedestrian and vehicular conflict.
- Center median makes all existing private access approaches partial-access or right-in/right-out, which reduces pedestrian and vehicular conflict however, the median may create more risk for pedestrians walking in the opposite direction of traffic,

where drivers may not be looking for traffic separated by the median (traveling the opposite direction) before making a maneuver onto East Main Avenue.

7th Street to 12th Street

- Within the Downtown Bismarck defined subarea.
- Closes two of the 19 (11%) existing private access approaches to improve pedestrian mobility and pedestrian friendliness. Reduces pedestrian and vehicular conflict.
- Two mid-block crossings with median refuge island between 9th Street and 12th Street makes crossing East Main Avenue more comfortable and could be enhanced through signage, lighting (i.e. HAWK signal), or other safety countermeasures.
- Curb extensions at 9th Street (excluding northeast corner) and 12th Street increase visibility of crossing pedestrians, decrease pedestrian crossing distance, and help calm traffic or slow vehicles down by visually narrowing the roadway. Curb extensions effectively enhance pedestrian safety at intersections.
- The east side of the 9th Street intersection has a median refuge island, making crossing East Main Avenue more comfortable and safer for pedestrians.

12th Street to Airport Road

- Closes four of the 38 (11%) existing private access approaches to improve pedestrian mobility and pedestrian friendliness. Reduces pedestrian and vehicular conflict. Four of the existing private access approaches retain full access.
- Curb extensions at 17th Street (excluding extensions into East Main Avenue) increase visibility of pedestrians crossing 17th Street, significantly decrease pedestrian crossing distance, and help calm traffic or slow vehicles down by visually narrowing the roadway. Curb extensions effectively enhance pedestrian safety at intersections.
- The east side of the 17th Street intersection has a median refuge island, making crossing East Main Avenue more comfortable and safer for pedestrians.
- Curb extensions at Airport Road (excluding northeast corner) increase visibility of crossing pedestrians, decrease pedestrian crossing distance, and help calm traffic or slow vehicles down by visually narrowing the roadway. Curb extensions effectively enhance pedestrian safety at intersections.

Airport Road to 26th Street

- Constructs a sidewalk on the north side of East Main Avenue between 24th Street and 26th Street, filling an existing gap in the pedestrian network and improving pedestrian access and mobility along the entire corridor.
- Closes six of the 29 (21%) existing private access approaches to improve pedestrian mobility and pedestrian friendliness. Reduces pedestrian and vehicular conflict. Three of the existing private access approaches retain full access.

Environmental Justice

Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color, national origin in programs receiving federal financial assistance. In 1994, President Clinton issued Executive Order 12898, which states that each federal agency “shall make achieving environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.”

There are environmental justice factors present adjacent to the East Main Avenue Study area. Based on the Existing Conditions Memo and demographic analysis which utilized American Community Survey data, the most significant environmental factors based on percentage of the population include those living in poverty, those with a disability, and those who are non-white. These populations of people are considered to be the most vulnerable within the Study area.

Each alternative evaluated for East Main Avenue will have a positive impact on these vulnerable populations. By investing in and improving the corridor, the BMMPO and City of Bismarck are sustaining mobility and access to economic opportunity, healthcare, and other essential services which vulnerable populations rely upon. The proposed alternatives will positively impact all users of East Main Avenue but extra care and consideration of the most vulnerable populations within the vicinity of the Study area should be taken to assess disproportionate impacts from any construction on East Main Avenue.

Given the environmental factors of poverty, disability, and non-white population concentrations along and near the corridor, a focus on multimodal access and mobility is considered in the alternative evaluation below.

Each alternative provides benefits to a vulnerable population in the way of updated infrastructure and associated improvements such as high-quality pavement surface, updated striping, crosswalks, signage, etc. Each alternative also improves multimodal access and mobility to a certain degree by creating a continuous sidewalk along East Main Avenue and ensuring ADA compliance for curb ramps at intersections. Each alternative is evaluated more thoroughly below:

Five-Lane

- The Five-Lane Alternative includes improvements for transit access, pedestrian access and mobility, and to a lesser extent bike access and mobility. See the Transit, Pedestrian Access & Mobility, and Bike Access & Mobility sections above for further information.
- Crossing five lanes of traffic still poses a barrier to vulnerable populations who may rely on non-vehicular or alternative transportation modes to go about their everyday lives.

Three-Lane

- The Three-Lane alternative includes improvements for transit access, pedestrian access and mobility, and to a lesser extent bike access and mobility.
- Greater sidewalk width compared to the five-lane alternative allows more room to accommodate a potential transit stop, pedestrians, and bicyclists.
- Crossing distances are decreased and curb extensions create higher visibility for pedestrians crossing East Main Avenue.

Three-Lane with Median

- The Three-Lane with Median alternative includes improvements for transit access, pedestrian access and mobility, and to a lesser extent bike access and mobility.
- Greater sidewalk width compared to the five-lane alternative allows more room to accommodate a potential transit stop, pedestrians, and bicyclists.
- Crossing distances are decreased and curb extensions create higher visibility for pedestrians crossing East Main Avenue.
- Median provides more green space and refuge for crossing pedestrians, enhancing the comfort and safety of pedestrians.

Bike Access & Mobility

The Bismarck-Mandan Bicycle + Pedestrian Plan (2017) planned and prioritized future bicycle facilities throughout the Bismarck-Mandan area. East Main Avenue, although identified as a priority route in the 2017 plan, was not forwarded on by that plan's Study Review Committee for implementation.

Given the traffic volumes, traffic speed, and lack of available right-of-way on East Main Avenue, parallel roadways such as East Broadway Avenue and East Rosser Avenue can also be used to accomplish complete street objectives for bike access and mobility in the area. There are existing bicycle lanes on East Rosser Avenue, which parallels East Main Avenue just three blocks to the north. The Active Mobility Plan in draft *Together 2045* identifies parallel streets of Rosser Avenue and Bowen Avenue as Safe Bicycle Street Connections. Bisecting East Main Avenue, 12th Street is also shown as a Safe Bicycle Street, and 26th Street south of East Main Avenue is identified as having a Future Shared-Use Trail.

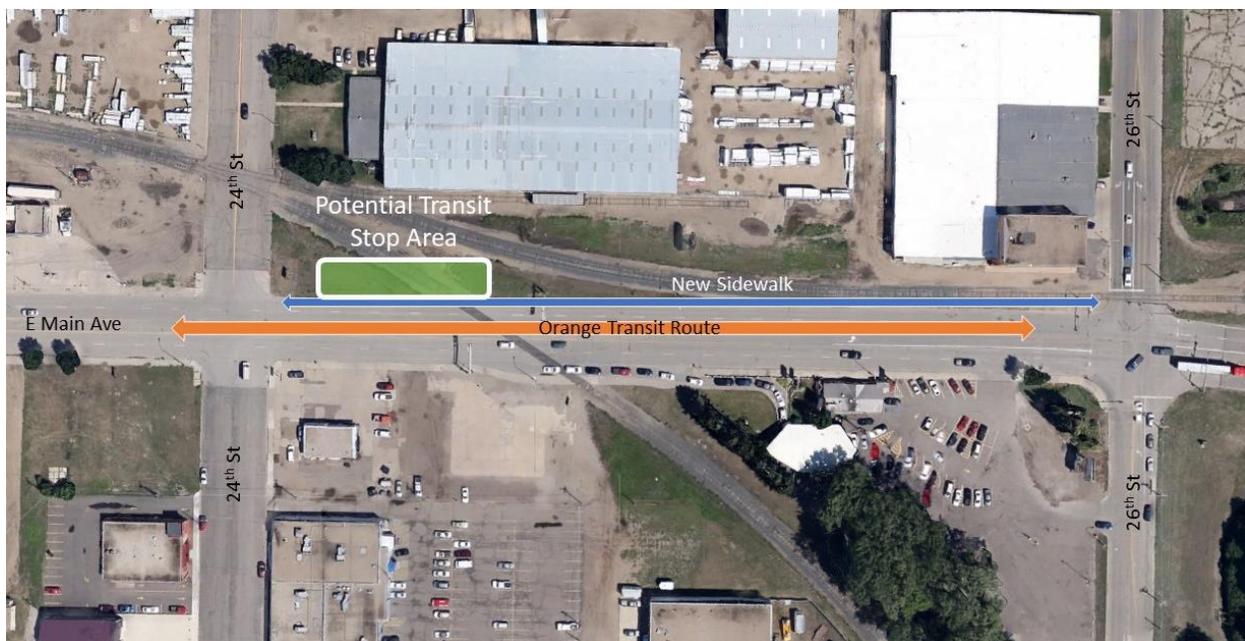
Dedicated bike facilities are not included in any East Main Avenue alternatives. However, that does not mean that alternatives would not improve accessibility and mobility for bicyclists. It should be noted that most of the pedestrian access and mobility factors are also applicable to bicyclists who bike off-street. No on-street bike facilities are proposed in the alternatives. Bicycling is allowed on sidewalks except in Downtown Bismarck, which can be considered to include the segment of East Main Avenue between 7th Street and 12th Street. Wider sidewalks may indirectly improve bicycle access and mobility where bicycling on the sidewalk is legal. Wider sidewalks are proposed along East Main Avenue in the following alternatives:

- Three-Lane
- Three-Lane with Median

Transit

The orange route shown in Figure 2 follows the eastern part of the East Main Avenue corridor, running from 26th Street west along East Main Avenue to Airport Road. A timing point along the orange route is located along East Main Avenue between 24th Street and 26th Street. Timing points are locations where the bus will be departing a specific location. Currently, this timing point does not include any transit stop improvements, such as signage or a shelter. Present challenges to providing transit stop improvements include the lack of a sidewalk on the north side of East Main Avenue and the high traffic speeds which makes it difficult for buses to stop in the right lane of East Main Avenue. Note that the railroad spur crossing East Main Avenue was removed in the summer of 2022.

Figure 2 | East Main Avenue Orange Transit Route



Since the orange route is the predominant transit route along East Main Avenue and includes a timing point on the corridor, only the Airport Road to 26th Street segment of East Main Avenue was evaluated for transit accommodation.

For all alternatives, space may be available to accommodate a transit shelter to the northeast of the intersection of East Main Avenue and 24th Street. This area includes a private property that would likely need to be acquired to accommodate the space necessary for a transit shelter. The recent removal of a rail spur through the area makes improvements in the area possible.

Five-Lane

- The inclusion of a sidewalk provides a safe way for pedestrians to access a potential transit stop at the current orange route timing point between 24th Street and 26th Street.
- Room is limited for a bus pullout in the area to avoid conflicts with traffic. Property acquisition to the north may allow for enough room to accommodate a bus pullout.

Three-Lane

- Greater sidewalk width compared to the Five-Lane Alternative allows more room to accommodate a potential transit stop and pedestrians.
- There is the potential to create a bus pullout on the north side of East Main Avenue between 24th Street and 26th Street, which would allow through traffic to avoid buses stopping in the area. Less property acquisition compared to the Five-Lane Alternative would be required to accommodate a bus pullout.

Three-Lane with Median

- Similar issues as the Three-Lane alternative.

Snow Control/Maintenance

Under current conditions, space for snow storage is limited along the corridor. Outside of the curb, sidewalk space ranges from four to eight feet in width—snow is stored within this sidewalk space as there is no boulevard space between the backside of the curb and the sidewalk. Areas of limited sidewalk width are due to trees planted on the backside of the sidewalk, opposite the curb.

All three East Main Avenue improvement alternatives consider at least some additional space to accommodate snow storage outside of the sidewalk. Impacts related to snow control/maintenance are summarized across the entire corridor, rather than by segment, as the impacts are similar across each segment.

Table 7 | East Main Avenue Alternative Snow Control/Maintenance Impact Summary

Five Lane	Three-Lane	Three-Lane with Median
<ul style="list-style-type: none">• Minimal (2' stamped concrete buffer) area along the backside of the curb on each side of the street to accommodate snow storage. This allows 6' sidewalk widths.• Least conflicts with on-street parking—limited on-street parking along	<ul style="list-style-type: none">• Total sidewalk width with buffer area along the backside of the curb ranges from 10'-15' on each side of the street. At a minimum, a 4' wide area for snow storage is allowed that allows for 6' wide sidewalk.	<ul style="list-style-type: none">• Similar to the Three-Lane alternative with capacity for snow storage on the sides of the street however, raised medians will decrease the volume of snow needing to be cleared from the roadway.

corridor (between 7 th Street and 9 th Street).	<ul style="list-style-type: none"> • More conflicts with on-street parking—on-street parking incorporated across corridor. 	<ul style="list-style-type: none"> • Similar to the Three-Lane alternative for on-street parking conflicts. • Medians present challenge for plow maneuverability and ease of clearing snow.
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Corridor Image

Referred to in the previous section, the corridor does have street trees to a limited extent. These trees are located toward the outside edge of the sidewalk. Other streetscaping and aesthetic improvements within the corridor right of way are nonexistent. One exception is a City of Bismarck welcome sign with tree and shrub plantings on the southwest corner of East Main Ave and 26th Street. Each improvement alternative is evaluated below by corridor segment for opportunities to improve the corridor’s image, including the capacity to accommodate streetscaping improvements (street trees, other landscaping, street furniture, decorative lighting).

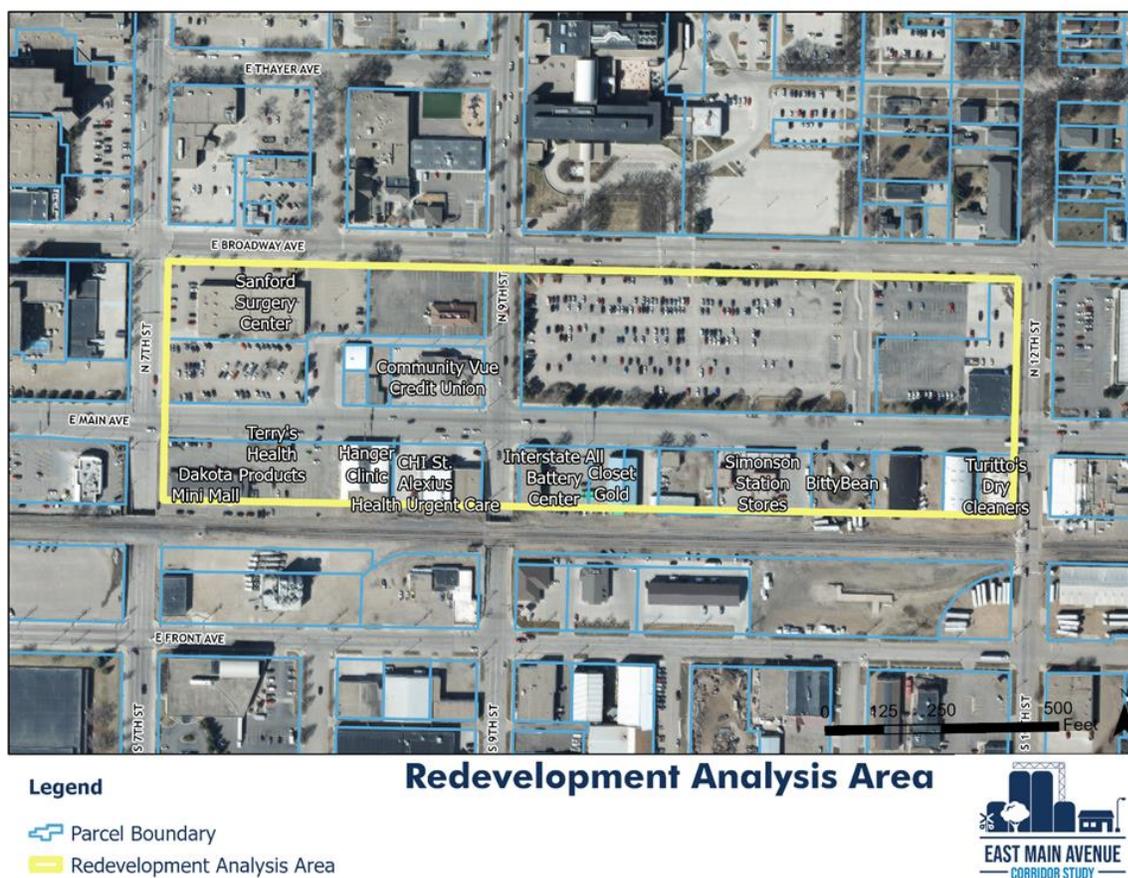
Table 8 | East Main Avenue Alternative Corridor Image Impact Summary

Five-Lane	Three-Lane	Three-Lane with Median
<ul style="list-style-type: none"> • 2’ buffer on the backside of the curb does not allow sufficient room for landscaping improvements (City recommends minimum 4’ width for planting area). • Space likely not sufficient for any street furniture or adjacent retail use of sidewalk space (such as sandwich board signs). • Adequate room provided for lighting improvements on the backside of the curb. • Sidewalk and buffer area would not align with downtown streetscaping standards (applies between 7th Street and 12th Street) 	<ul style="list-style-type: none"> • Adequate space for landscaping improvements (meets minimum City width recommendation) • Potential for some accommodation of street furniture and/or adjacent retail use of sidewalk space. • Adequate room provided for lighting improvements on the backside of the curb. • The Downtown Bismarck Subarea Plan specifies 15’ recommended sidewalk width from 1st Street to 6th Street. This could be accommodated east to 12th Street with some lane width reduction. 	<ul style="list-style-type: none"> • Similar opportunities as with the Three Lane alternative. • Median presents additional landscaping and lighting opportunity. • Median landscaping requires irrigation and additional maintenance needs. • Limited 8’ width limits landscaping opportunities—10’ is more ideal

Redevelopment Opportunity

Public infrastructure improvements often trigger property investment, including redevelopment. Redevelopment is defined as land use intensification on parcels that have some degree of existing development. In meetings with impacted businesses and public stakeholders, redevelopment opportunities within the study corridor were discussed with respect to the corridor evaluation alternatives. Redevelopment potential was considered for the first segment of East Main Avenue located within Downtown Bismarck (7th Street to 12th Street), as shown in Figure 3. Redevelopment potential was not considered for the remaining segments (12th Street to Airport Road and Airport Road to 26th Street), as these corridor segments are less conducive to redevelopment and are located outside of Bismarck's Downtown area.

Figure 3 | East Main Avenue Redevelopment Analysis Area



Comprehensive Plan Guidance

A city-wide analysis of redevelopment potential was performed in 2021 to support Bismarck's updated comprehensive plan, *Together 2045*. City planning staff created an

index to predict the relative likelihood of redevelopment for qualifying parcels, based on the following variables:

- Land value to improvement value ratio (higher ratios increase redevelopment potential)
- Age of building (older buildings increase redevelopment potential)
- Zoning conformance (non-conformance increases redevelopment potential)
- Excess off-street parking (excess parking increases redevelopment potential)
- Size of lot (redevelopment potential increases with lot size)

Bismarck's analysis shows that redevelopment potential is moderate to high between 7th Street and 12th Street on East Main Avenue, particularly along the south corridor frontage. The parking lot for CHI St. Alexius Health, located on the north frontage between 9th Street and 12th Street, was not assigned a redevelopment score, but is presumed to have redevelopment potential given the lack of improvements on this site.

Development Concepts

Redevelopment would produce new retail, office, and residential uses within the analysis area. The scale of redevelopment opportunity depends to some degree on which roadway design alternative is selected for the corridor. Two corridor design alternatives are evaluated in this analysis:

- Five-Lane (existing cross-section)
- Three-Lane (with or without median)

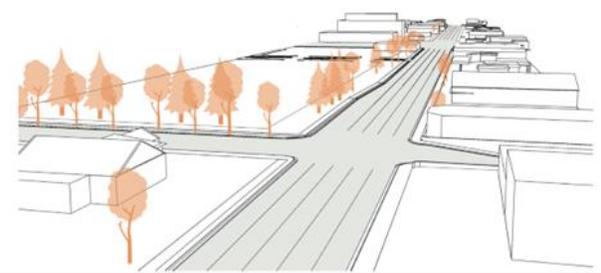
Redevelopment is possible in each alternative, but the opportunity for development is assumed to be greater under the Three-Lane alternative because this would be a more transformational change. Lane reductions are demonstrated to improve walkability, slow vehicular traffic, and help create a sense of place that is attractive to residents and businesses. In conversations with area development stakeholders, there appears to be more support for redevelopment under the Three-Lane alternative.

A 3-D massing model was created for each alternative to illustrate redevelopment potential and estimate development quantities. The five-lane concept includes approximately 210,000 square feet of new commercial space and one new parking structure, with development focused on the north side of the street. The three-lane concept introduces approximately 525,000 square feet of new multiuse space, two new parking structures, and includes development on both sides of the street. Table 9 provides a concept rendering and development quantities for each alternative.

Earlier input from the development community and as promoted in the Downtown Bismarck Subarea Plan, the three-lane alternatives are expected to promote development opportunities similar to development in Downtown Bismarck, such as mixed commercial

retail, office, and residential uses. As the three-lane alternatives will maximize the pedestrian environment, improve landscaping, and provide more on-street parking, it is expected that development opportunities will be more significant than in the five-lane alternative. These improvements are expected to promote a greater development investment when compared to the five-lane alternative.

Table 9 | Redevelopment Scenarios vs. Existing Condition

Existing Condition	
	<ul style="list-style-type: none"> No change
Five-Lane	
	<ul style="list-style-type: none"> 210,000 sf in new commercial on north frontage (one 2-story building and three 1-story buildings) 339,000 sf in parking structures (two 5-story buildings)
Three-Lane	
	<ul style="list-style-type: none"> 373,000 sf in new multiuse on north frontage (three 3-story buildings and one 2-story building) 154,000 sf in new multiuse on south frontage (two 2-story buildings) 339,000 sf in parking structures (two 5-story buildings)

Household and Employment Impacts

The impact of development can be quantified in terms of the number of jobs and households at buildout, assuming the buildings are fully occupied. Employment assumptions for retail and non-retail uses are given as follows:

- Retail: 1.6 employees/1,000 square feet
- Non-retail: 0.8 employees/1,000 square feet

The household impact is estimated by the number of dwelling units that can be built on the site, where each dwelling unit is equivalent to one household. The residential development assumption is 0.8 households per 1,000 square feet. This assumption is based on the national median size for multiple-family units (about 1,000 square feet) and an assumption that 80 percent of the building floor area devoted to residential is gross saleable space.

Five-Lane Alternative

The Five-Lane alternative produces 212,000 square feet of commercial development along the north frontage of East Main Avenue, which is housed in one two-story building and

three single-story buildings. The two-story building, located at the 7th Street intersection, is assumed to contain medical office uses related to St. Alexius. The three single-story buildings are assumed to contain 50 percent retail and 50 percent non-retail uses.

Table 10 summarizes development quantities and employment impacts under the Five-Lane alternative. The development concept for this alternative would provide for 223 jobs, assuming buildings are fully occupied.

Table 10 | Employment Projections – Five-Lane Alternative

Development Component	Total Floor Area (square feet)	Use Fractions	Floor Area Breakdown	Jobs Impact
1-story buildings	130,000	50% ret. 50% non-ret.	65,000 sf ret. 65,000 sf non-ret.	104 ret. jobs 52 non-ret. jobs
2-story buildings	81,600	0% ret. 100% non-ret.	81,600 sf non-ret.	0 ret. jobs 65 non-ret. jobs
Total	212,000	31% ret. 69% non-ret.	65,000 sf ret. 146,600 sf non-ret.	104 ret. jobs 117 non-ret. jobs 223 total jobs

Three-Lane Alternative

The Three-Lane alternative produces 373,000 square feet of multiuse on the north side of East Main Avenue and 154,000 square feet of commercial development on the south side. The two-story buildings on the north side of the street are assumed to contain 50 percent retail and 50 percent non-retail uses (medical offices); the three-story buildings on the north side are assumed to contain 25 percent retail, 25 percent non-retail, and 50 percent residential; and the 2-story buildings on the south side are assumed to contain 100 percent non-retail.

Table 11 summarizes development quantities and employment impacts under the Three-Lane alternative. The development concept for this alternative would provide for 449 jobs and 81 households once buildings are fully occupied.

Table 11 | Employment and Household Projections – Three-Lane Alternative

Development Component	Total Floor Area (square feet)	Use Fractions	Floor Area Breakdown	Jobs/Households Impact
2-story buildings (north side)	171,200 sf	50% ret. 50% non-ret.	85,600 85,600	137 ret. jobs 68 non-ret. jobs
3-story buildings (north side)	201,800 sf	25% ret. 25% non-ret. 50% res.	50,450 sf ret. 50,450 sf non-ret. 100,900 sf res.	81 ret. jobs 40 non-ret. jobs 81 households
2-story buildings (south side)	154,200 sf	0% ret. 100% non-ret.	154,200 sf non-ret.	123 non-ret. jobs
Total	527,000 sf	26% ret. 55% non-ret. 19% res.	136,000 sf ret. 290,000 sf non-ret. 101,000 sf res.	218 ret. jobs 231 non-ret. jobs 449 total jobs 81 total households

Summary of Household and Employment Impacts

The degree to which redevelopment ultimately occurs and conforms to the assumptions in this analysis is unknown. However, the Three-Lane alternative is understood to create conditions that would allow for redevelopment to increase in variety and scale. In attempting to quantify employment impacts, this analysis projects that the employment impact of the Three-Lane alternative could be two times greater than the employment impact of the Five-Lane alternative. However, the total jobs impact should not be misconstrued as net new jobs, because many jobs would be filled by Bismarck’s current workforce, whether shifting to a new employment opportunity or simply relocating to a new workspace. The larger impact is the addition of jobs in downtown, which would improve vitality in Downtown Bismarck. The Three Lane alternative also introduces residential development, which would further activate Bismarck’s core. Note that the future travel forecasts along the East Main Avenue corridor described in this document reflect the redevelopment potential and resulting household and job increases identified herein.

Fiscal Impacts

Most private development generates annual property tax revenues for the City of Bismarck, which the City uses to capitalize, operate, and maintain public facilities and services. Infill development is particularly beneficial, because it increases the value of taxable property that is served by existing infrastructure. This section attempts to quantify the fiscal impact of redevelopment on East Main Avenue in terms of the taxable

contribution to the City's general fund. It relies on several case studies from Bismarck and Fargo (peer-city), as well as information provided by Denizen Partners, who are developing a mixed-use building, 630 Main, just west of the project corridor.

Effect of Incentives

Several case study examples were financed through tax incentives – i.e., tax abatements, tax increment financing (TIF), and/or a Renaissance Zone. (Bismarck's Renaissance Zone program was discontinued in 2022.) Use of these tools and programs offsets some of the tax gains to municipalities. However, they can be useful for promoting downtown revitalization and seeing success, as Fargo has demonstrated. Fargo has been willing to subsidize development within downtown to increase jobs, residents, and business activity within its urban core. Bismarck's Downtown growth has produced a vibrant atmosphere and improved quality of life for the entire community. For simplicity, this analysis disregards the effect of incentives.

Fargo Case Studies

Four mixed-use developments were reviewed from Fargo:

- Gateway Center (310 Main Ave)
- Mercantile (4th Ave North)
- Roberts Commons (625 2nd Ave North)
- Uptown and Main (2633 55th St South)

Table 12 depicts these developments. Gateway Center, Mercantile, and Roberts Commons are located within Downtown Fargo. The current mill levy for all three is 296.01. Uptown and Main is located in a suburban area. The mill levy for this property is 284.79.

The full value of building improvements ranges from \$10.6 million (Gateway Center) to \$35.4 million (Roberts Commons). Each development features commercial retail on the ground floor with residential above. Residential units are moderately priced, generally ranging from \$1,000 to \$2,300 per month.

Estimated property taxes in 2022 range from \$168,681 (Uptown and Main) to \$412,577 (Roberts Commons) Since property taxes help fund roadway improvements, it may be useful to consider revenue within the context of roadway design life, which is typically 20 years. If compounded over 20 years at a rate of 3% annual interest, estimated taxes from Uptown and Main would contribute approximately \$4.5 million to Fargo's general fund, while estimated taxes from Roberts Commons would contribute \$11.1 million to the general fund.

Table 13 provides statistics for the Fargo development examples.

Table 12 | Fargo Cast Studies

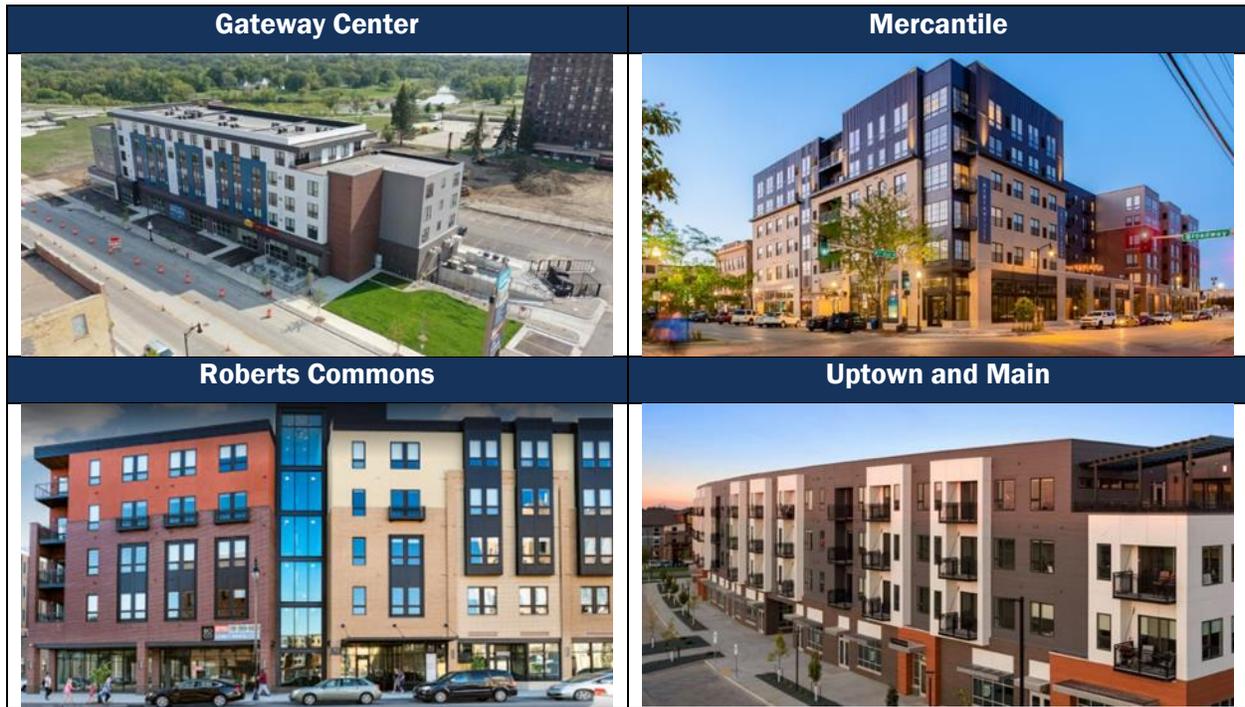


Table 13 | Fargo Case Studies – Development Statistics

Development	Location	Max Stories	Total Market Value ¹	Com./ Non-Com. ²	Taxable Area (square feet) ²	Estimated Taxes ³
Mercantile	Downtown	6	18,052,900	18%/82%	120,049	\$168,681
Roberts Commons	Downtown	7	36,154,800	21%/79%	161,382	\$412,577
Gateway Center	Downtown Fringe	5	NA, partial assessment	9%/91%	189,569	\$177,088
Uptown and Main	Suburban Highway	4	13,754,000	25%/75%	92,738	\$195,850

(1) Includes parking

(2) Excludes parking

(3) Estimated gross revenue in 2022

Bismarck Case Studies

Three developments were reviewed from Bismarck:

- 630 Main (630 East Main Avenue)
- Schilling Building (1400 43rd Ave NE)
- Broadway Center (100 West Broadway Ave)

630 Main is a valuable example because it is located on East Main Avenue, just west of the project area. This is a three-story, multiuse building that could be replicated along the corridor under the Three Lane alternative. Broadway Center is larger in scale and contains upscale residential, office, and retail commercial. The Schilling Building consists primarily of commercial uses, which generally mirrors the corridor development concepts. The mill levy for each property is 0.25414.

Table 14 depicts case study developments from Bismarck and Table 15 provides development statistics.

Table 14 | Bismarck Case Studies



Table 15 | Bismarck Case Studies – Development Statistics

Development	Location	Max Stories	Total Market Value ¹	Com./ Non-Com. ²	Taxable Area (square feet) ²	Estimated Taxes ³
630 Main	Downtown Fringe	3	Unknown – estimated at \$10M-\$11M	32%/68%	47,934	Unknown
Schilling Building	Suburban Highway	4	\$9,524,100	87%/13%	89,783	\$121,023
Broadway Center	Downtown	3	\$19,746,200	32%/68%	142,689	\$240,656

(1) Includes parking

(2) Excludes parking

(3) Estimated gross revenue in 2022

Analysis

This section attempts to quantify the fiscal impact of development for each roadway design alternative. The analysis is consistent with the development quantities rendered for each design concept.

Parking Structures

Structured parking would likely be needed to support high-density, walkable infill development along East Main Avenue. Each development concept includes two five-story parking structures. The west structure has a gross floor area of 172,375 square feet and the east structure has a gross floor area of 166,500 square feet, for a total of 338,875 square feet (includes circulation areas). These structures would be comparable in size to the existing parking structure on Thayer Avenue and North 6th Street, which contains 165,630 square feet.

While Bismarck's property data does not display market value for parking structures, two examples from Fargo provide a valuation for parking structures (Roberts Commons and the Mercantile). The parking structure at Roberts Commons is valued at \$50.74 per square foot and the parking structure at the Mercantile is valued at \$45.83 per square foot (true value).

Assuming \$50 per square foot, the market value of the parking structures in both the Three-Lane alternative and the Five-Lane alternative is projected to be \$16.9 million in 2022-dollar amounts.

Parking areas are generally tax-exempt, so the parking structures are not anticipated to generate tax income for the City. However, the value of parking may be partially captured in the cost of rent and absorbed into taxes. Bismarck's Parking Authority does charge for use however, it is unlikely that user fees would generate a net positive revenue for the City.

Multiuse Buildings

The commercial and residential components of development are taxable. To project taxable income, the full market value for residential and commercial must be estimated. Then, the assessed value and taxable value can be determined using standard appraisal formulas. Finally, annual tax income can be projected using the existing mill levy for comparable developments.

The simplest way to estimate the full market value for multiuse development in the three-lane and five-lane alternative concepts is to apply the value per square foot of comparable developments to the entire concept. This value can be estimated by discounting the parking area from calculations when that information is available (Table 16).

Table 16 | Value per Square Foot of Multiuse Buildings

Development	City	Full Market Value/SF of combined Com. And Res.
Mercantile	Fargo	\$95
Roberts Commons	Fargo	\$173
Gateway Center	Fargo	\$156
Uptown and Main	Fargo	\$148
Broadway Center	Bismarck	\$160

The Mercantile appears to be an outlier. The average market value per square foot for the other four developments is \$160.

The Three Lane alternatives produce 527,200 square feet of multiuse development. Assuming \$160 per square foot, the full market value of multiuse development is estimated to be \$84 million. The assessed value of comparable development is half of full market value and the taxable value is one-tenth of assessed value. Given these standards, the combined taxable value of multiuse buildings in the Three-Lane alternative is estimated to be \$4.2 million in 2022 dollars. Using Bismarck’s current mill levy for comparable development (0.25414), annual property tax revenue would be \$1.07 million in 2022 dollars. This results in \$28.75 million over 20 years.

The Five-Lane alternative produces 211,600 square feet of mixed commercial development. Using the same method as above, the full market value for multiuse buildings in the Five Lane alternative is estimated to be \$34 million, taxable value is \$1.7 million, and property tax revenue is \$430,200 in 2022 dollars. This results in \$11.55 million over 20 years.

A more rigorous analysis could be performed by calculating the values of the commercial and non-commercial use fractions independently, but there is not a straightforward way to do this using the case study data and there are few comparable examples in Downtown Bismarck. This analysis also ignores the cost of lost taxes that may occur by demolishing existing buildings to prepare sites for redevelopment.

Summary Evaluation Tables

	Good; best meets criteria
	Ok; meets criteria well
	Moderate; close to achieving criteria
	Marginal; does not meet criteria
	Poor; fails to meet criteria

Table 17 | 7th Street to 12th Street Evaluation Matrix

Evaluation Criteria	7 th Street - 12 th Street		
	Five-Lane Alternative	Three-Lane Alternative	Three-Lane Alternative with Median
Vehicular Mobility			
Property Access			
Safety			
Freight			
On-street Parking			
Pedestrian Access & Mobility			
Environmental Justice			
Bike Access & Mobility			
Transit	NA	NA	NA
Snow Control/Maintenance			
Corridor Image			
Redevelopment Opportunity			

Table 18| 12th Street to Airport Road Evaluation Matrix

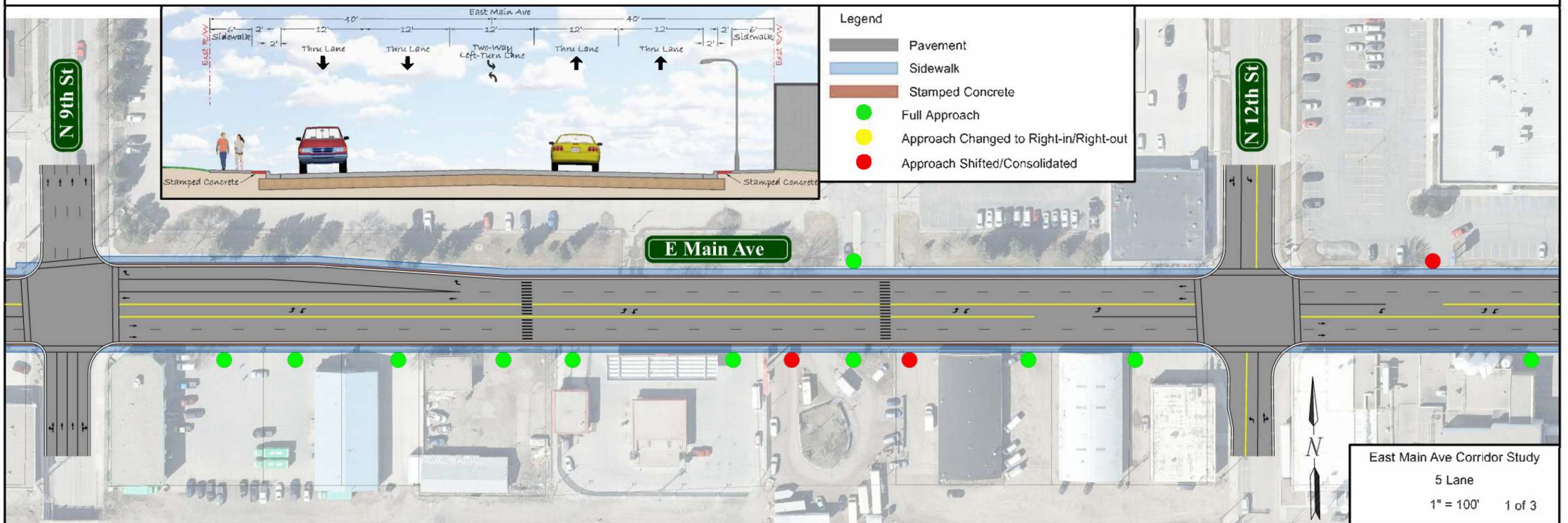
Evaluation Criteria	12 th Street – Airport Road		
	Five-Lane Alternative	Three-Lane Alternative	Three-Lane Alternative with Median
Vehicular Mobility	Light Green	Yellow	Light Green
Property Access	Green	Green	Yellow
Safety	Yellow	Light Green	Green
Freight	Green	Yellow	Orange
On-street Parking	Red	Green	Light Green
Pedestrian Access & Mobility	Yellow	Green	Green
Environmental Justice	Yellow	Light Green	Green
Bike Access & Mobility	Yellow	Light Green	Light Green
Transit	NA	NA	NA
Snow Control/Maintenance	Yellow	Green	Yellow
Corridor Image	Orange	Light Green	Green
Redevelopment Opportunity	Orange	Light Green	Light Green

Table 19| Airport Road to 26th Street Evaluation Matrix

Evaluation Criteria	Airport Road – 26 th Street		
	Five-Lane Alternative	Three-Lane Alternative	Three-Lane Alternative with Median
Vehicular Mobility	Light Green	Yellow	Light Green
Property Access	Green	Green	Yellow
Safety	Yellow	Light Green	Green
Freight	Green	Yellow	Orange
On-street Parking	Red	Green	Light Green
Pedestrian Access & Mobility	Orange	Green	Green
Environmental Justice	Yellow	Light Green	Green
Bike Access & Mobility	Yellow	Light Green	Light Green
Transit	Yellow	Green	Green
Snow Control/Maintenance	Yellow	Green	Yellow
Corridor Image	Orange	Light Green	Green
Redevelopment Opportunity	Orange	Light Green	Light Green

APPENDIX A

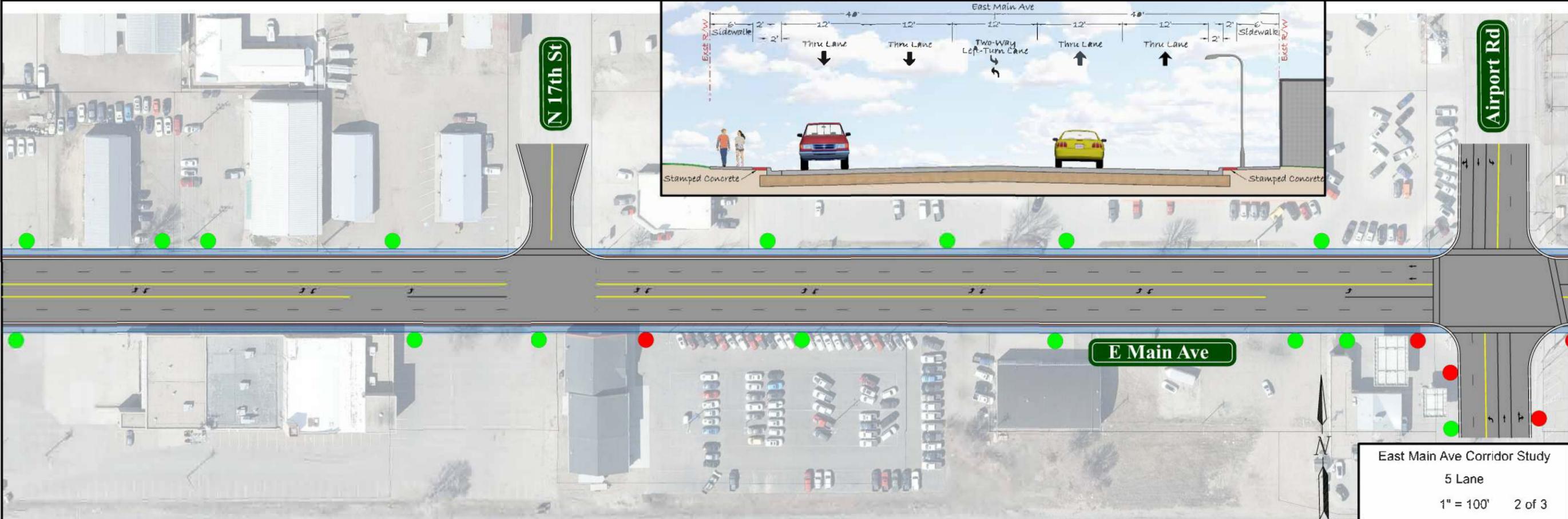
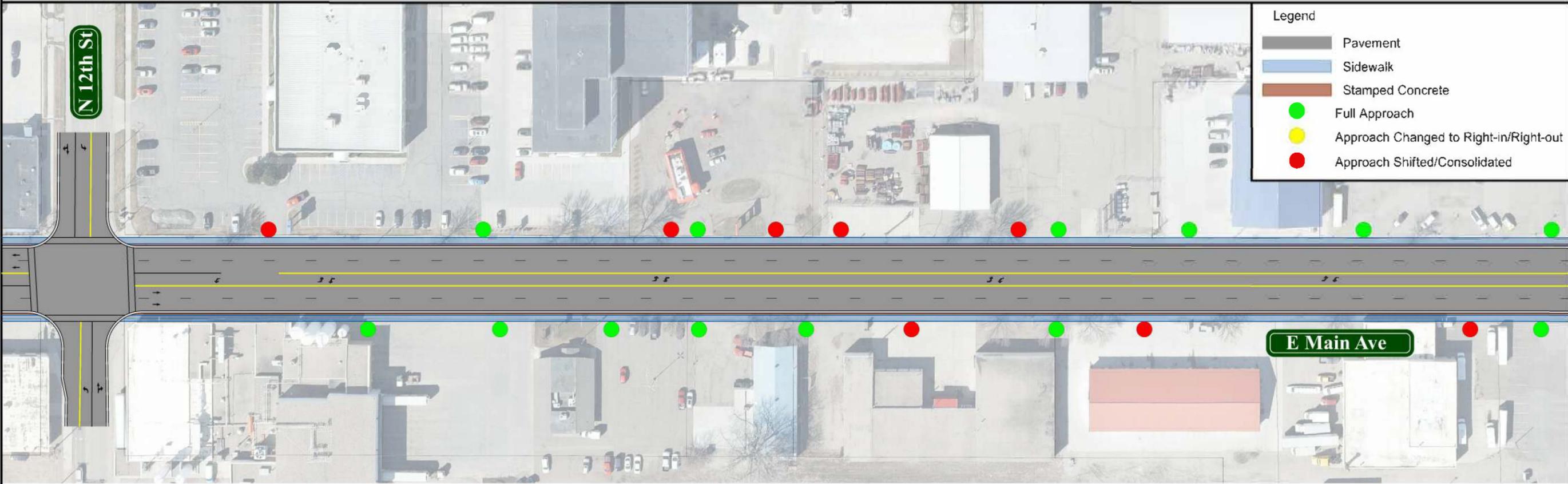
Segment 1 - 7th Street to 12th Street - 5 Lane



Segment 2 - 12th Street to Airport Road - 5 Lane

Legend

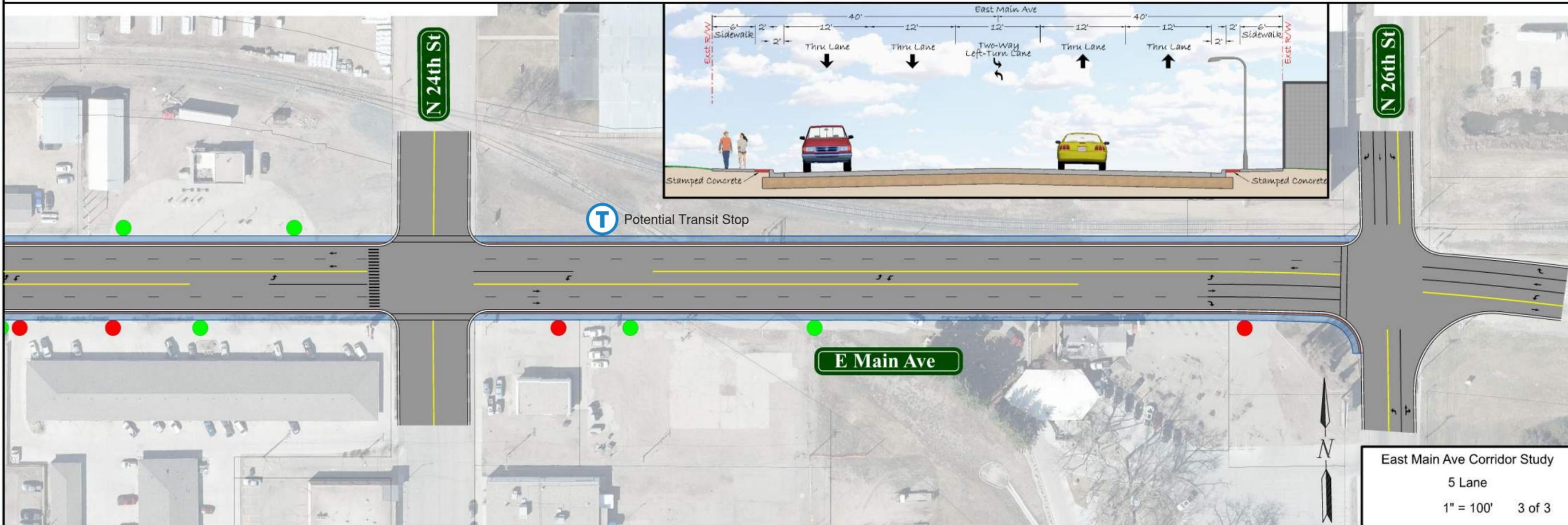
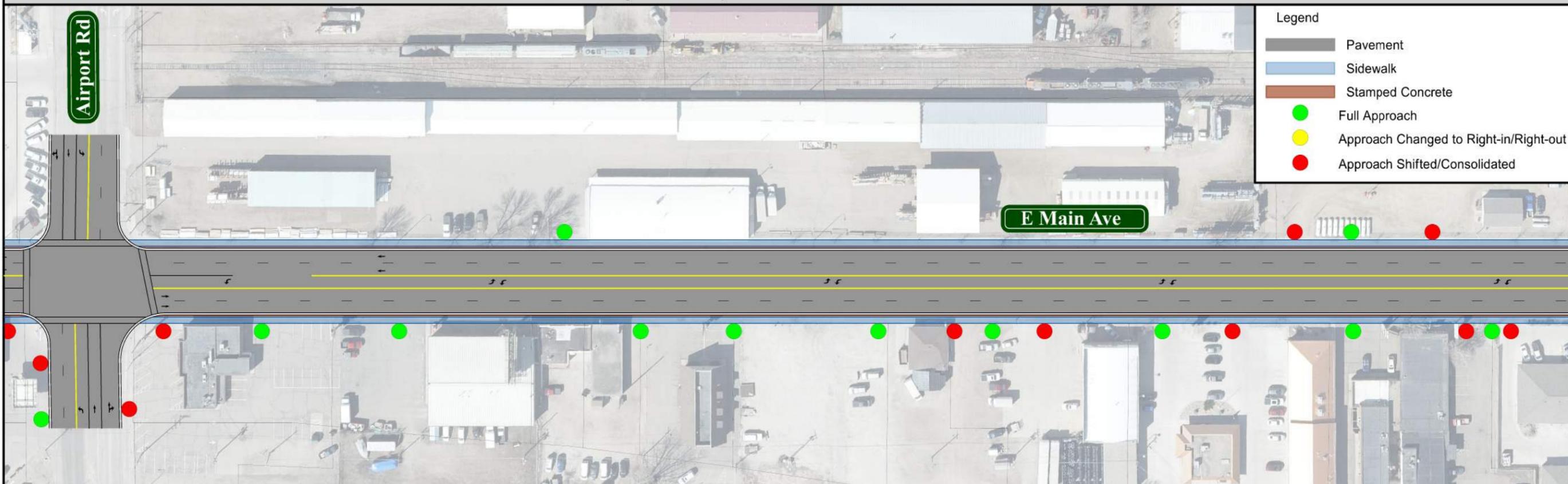
-  Pavement
-  Sidewalk
-  Stamped Concrete
-  Full Approach
-  Approach Changed to Right-in/Right-out
-  Approach Shifted/Consolidated



East Main Ave Corridor Study
 5 Lane
 1" = 100' 2 of 3

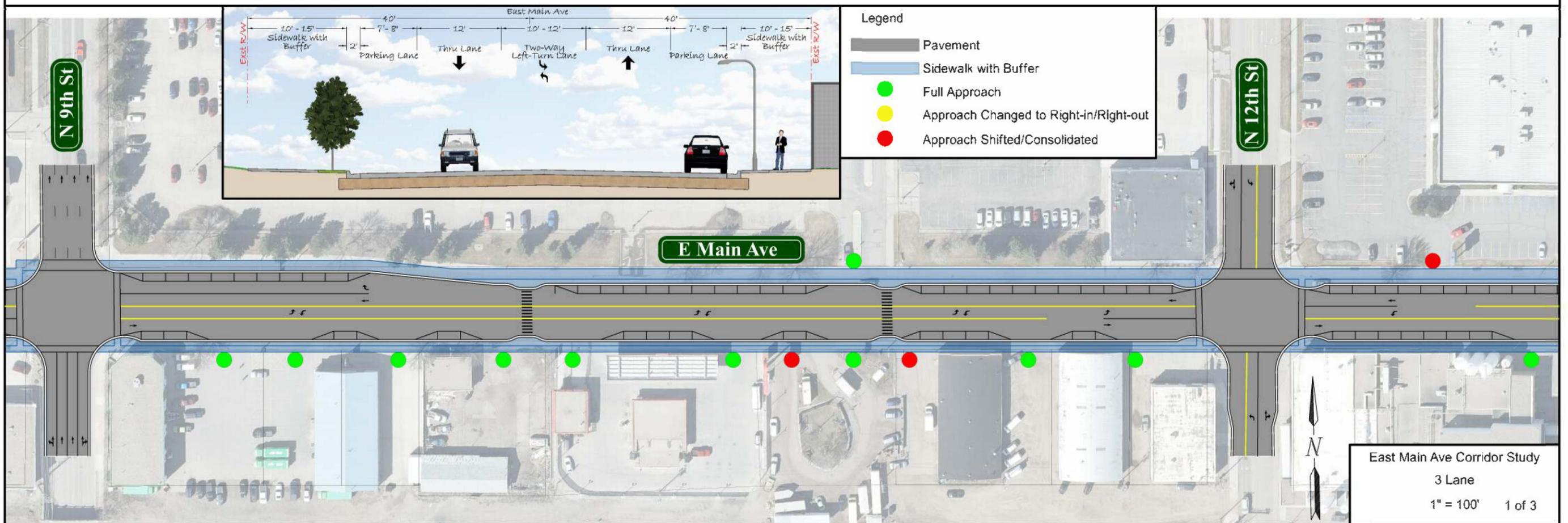
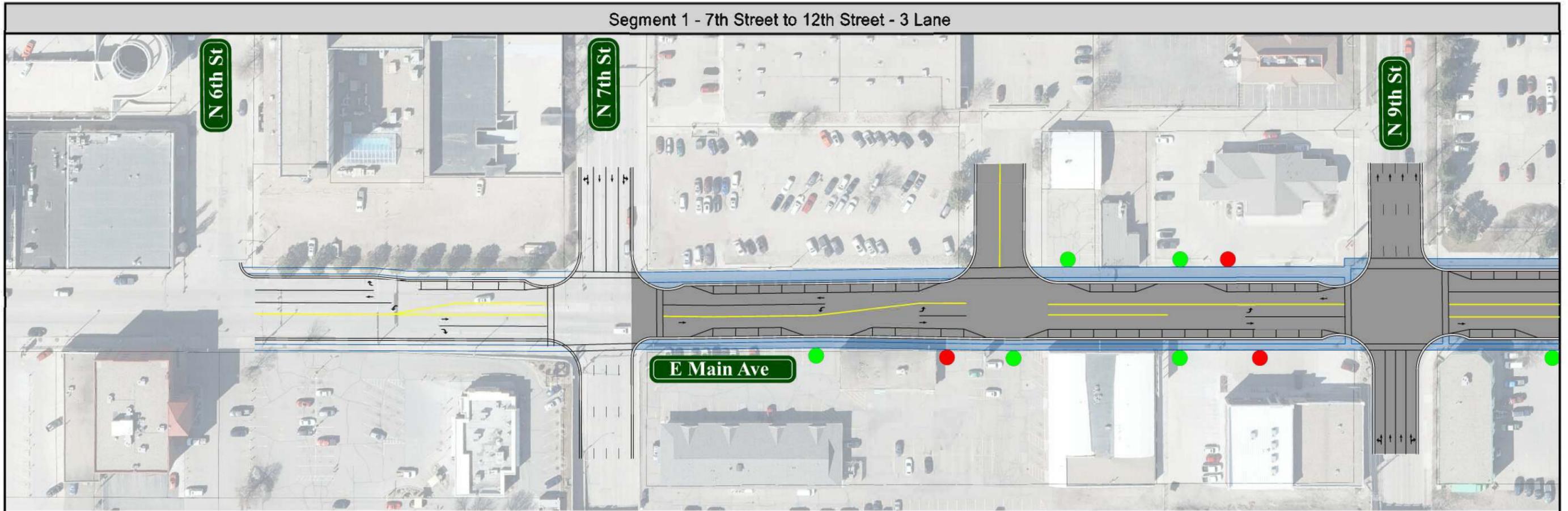
Segment 3 - Airport Road to 26th Street - 5 Lane

- Legend
- Pavement
 - Sidewalk
 - Stamped Concrete
 - Full Approach
 - Approach Changed to Right-in/Right-out
 - Approach Shifted/Consolidated

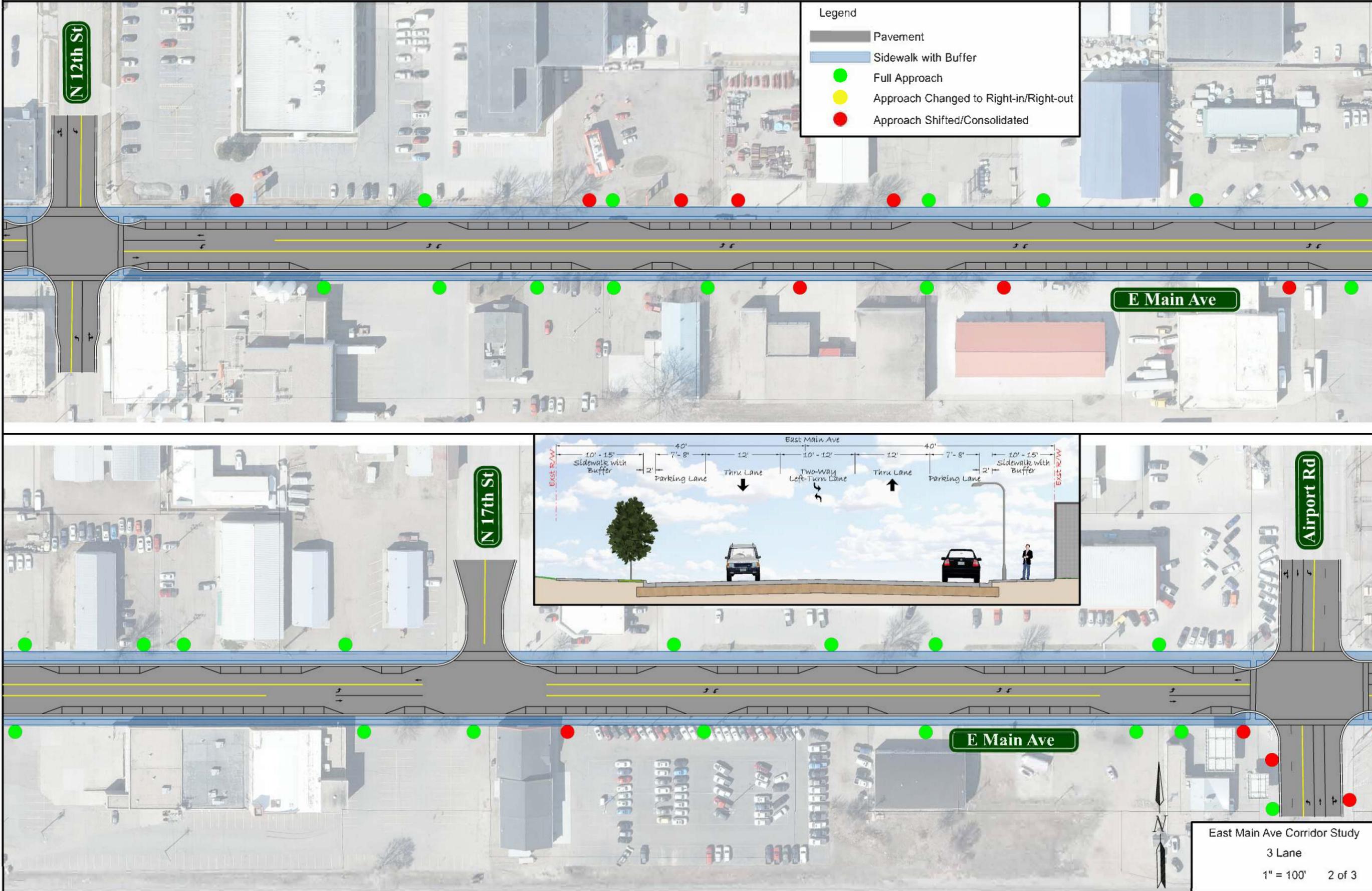


East Main Ave Corridor Study
 5 Lane
 1" = 100' 3 of 3

Segment 1 - 7th Street to 12th Street - 3 Lane

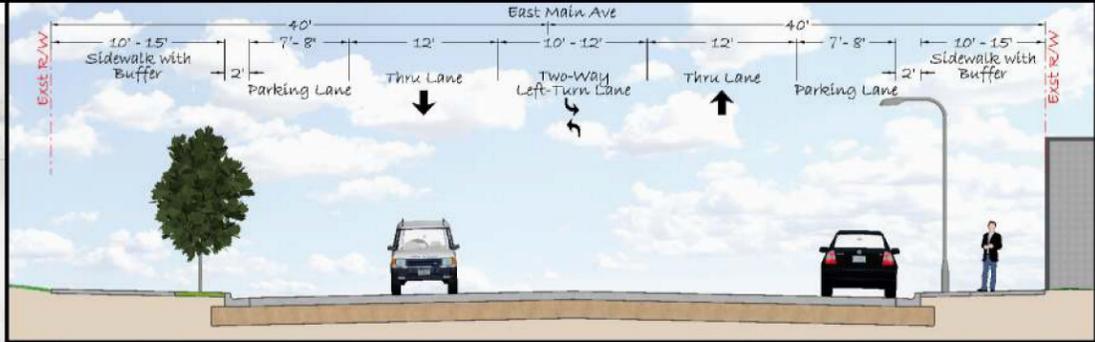


Segment 2 - 12th Street to Airport Road - 3 Lane



Legend

- Pavement
- Sidewalk with Buffer
- Full Approach
- Approach Changed to Right-in/Right-out
- Approach Shifted/Consolidated

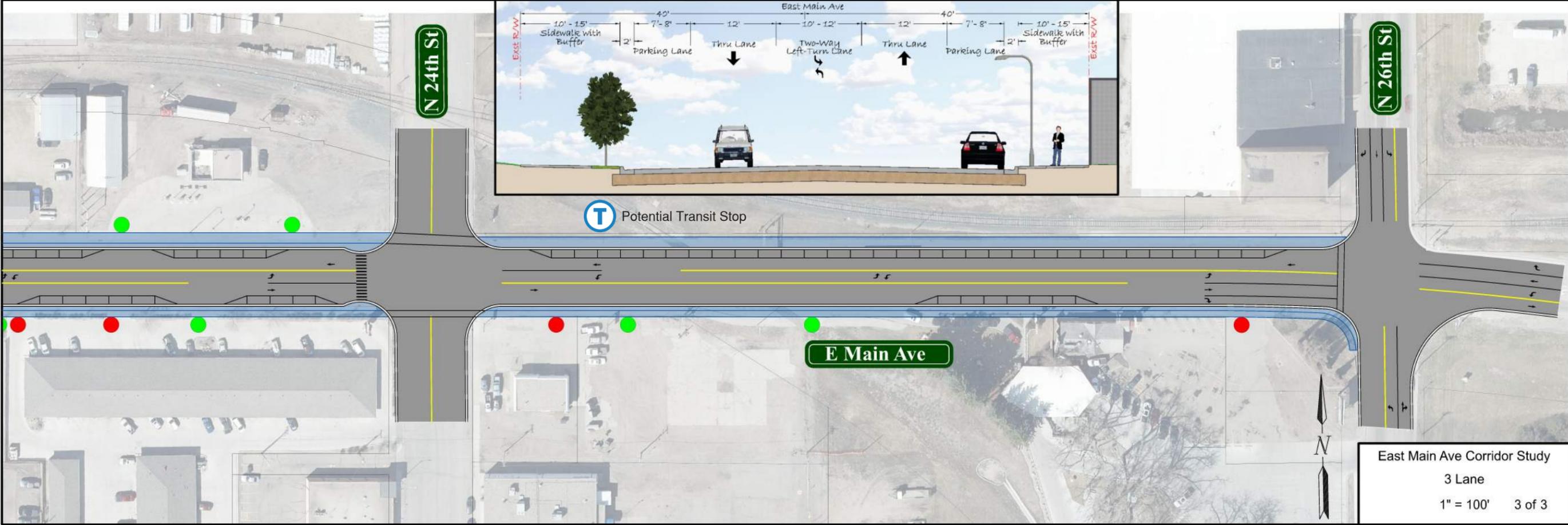
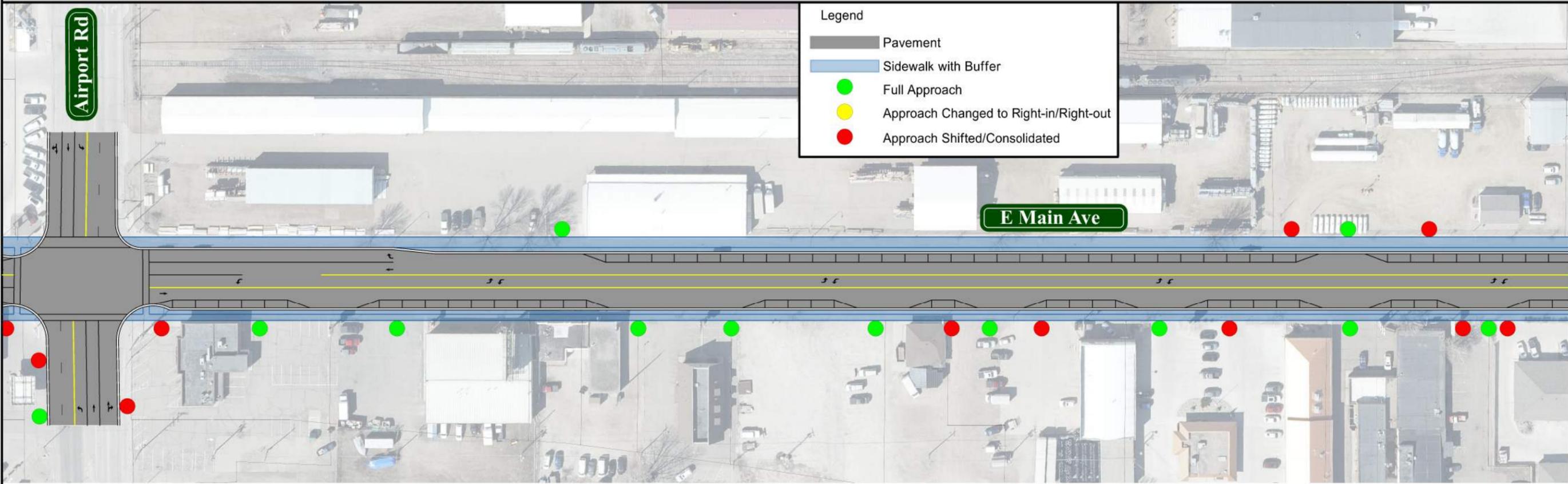


East Main Ave Corridor Study
 3 Lane
 1" = 100' 2 of 3

Segment 3 - Airport Road to 26th Street - 3 Lane

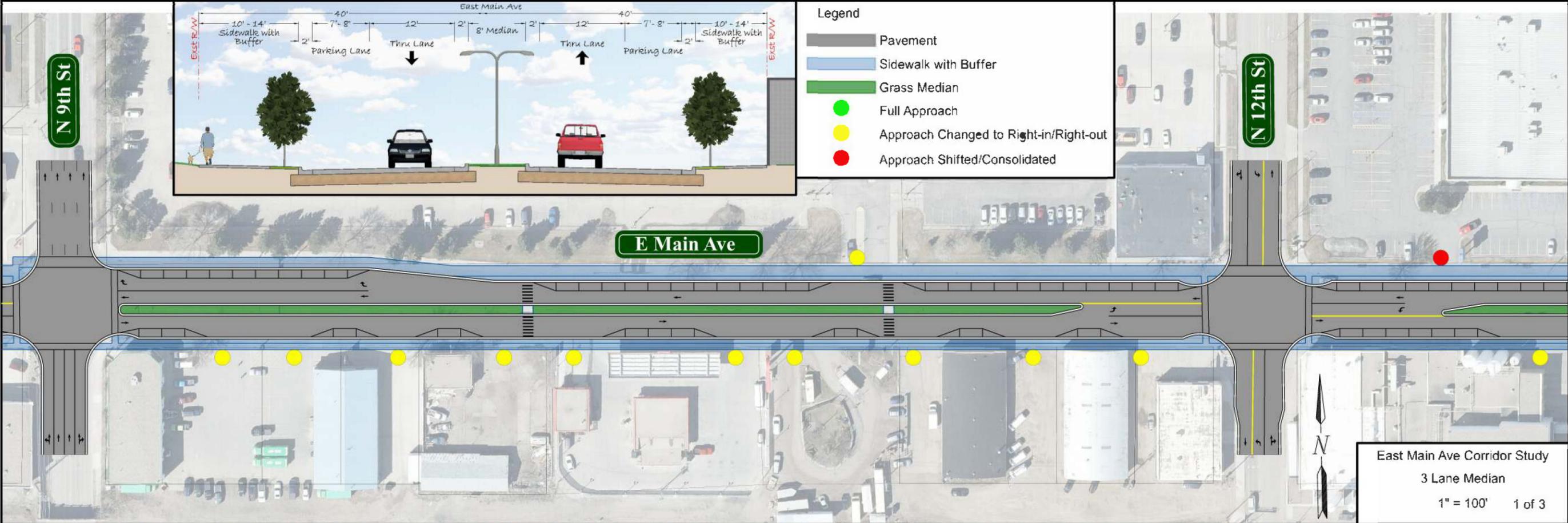
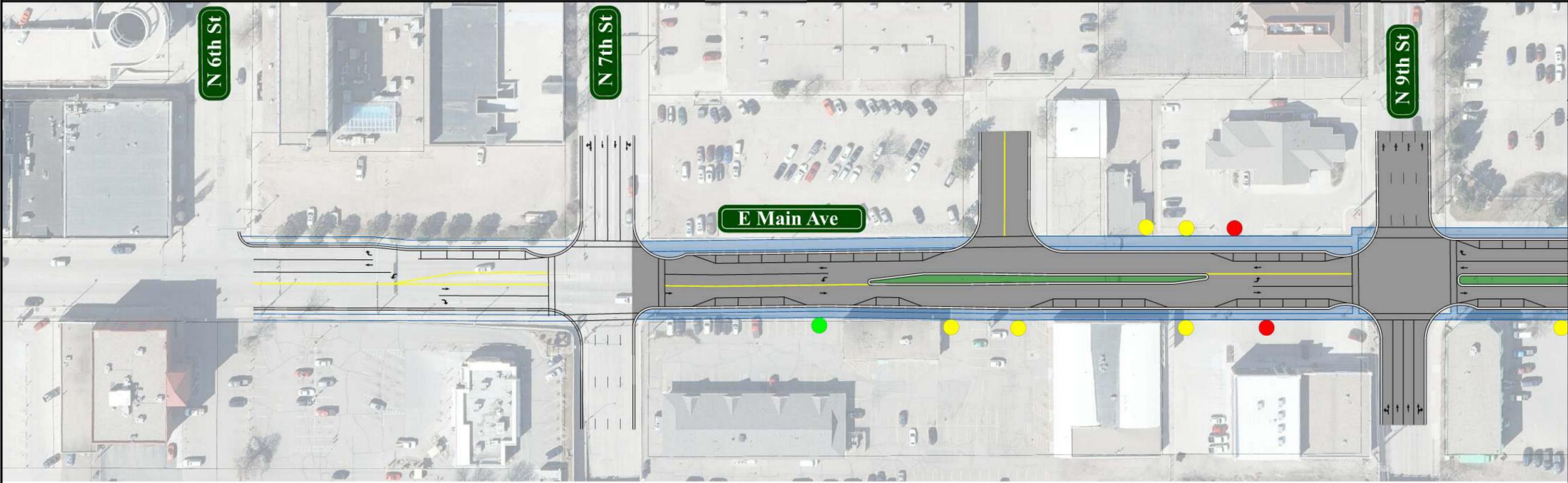
Legend

- Pavement
- Sidewalk with Buffer
- Full Approach
- Approach Changed to Right-in/Right-out
- Approach Shifted/Consolidated

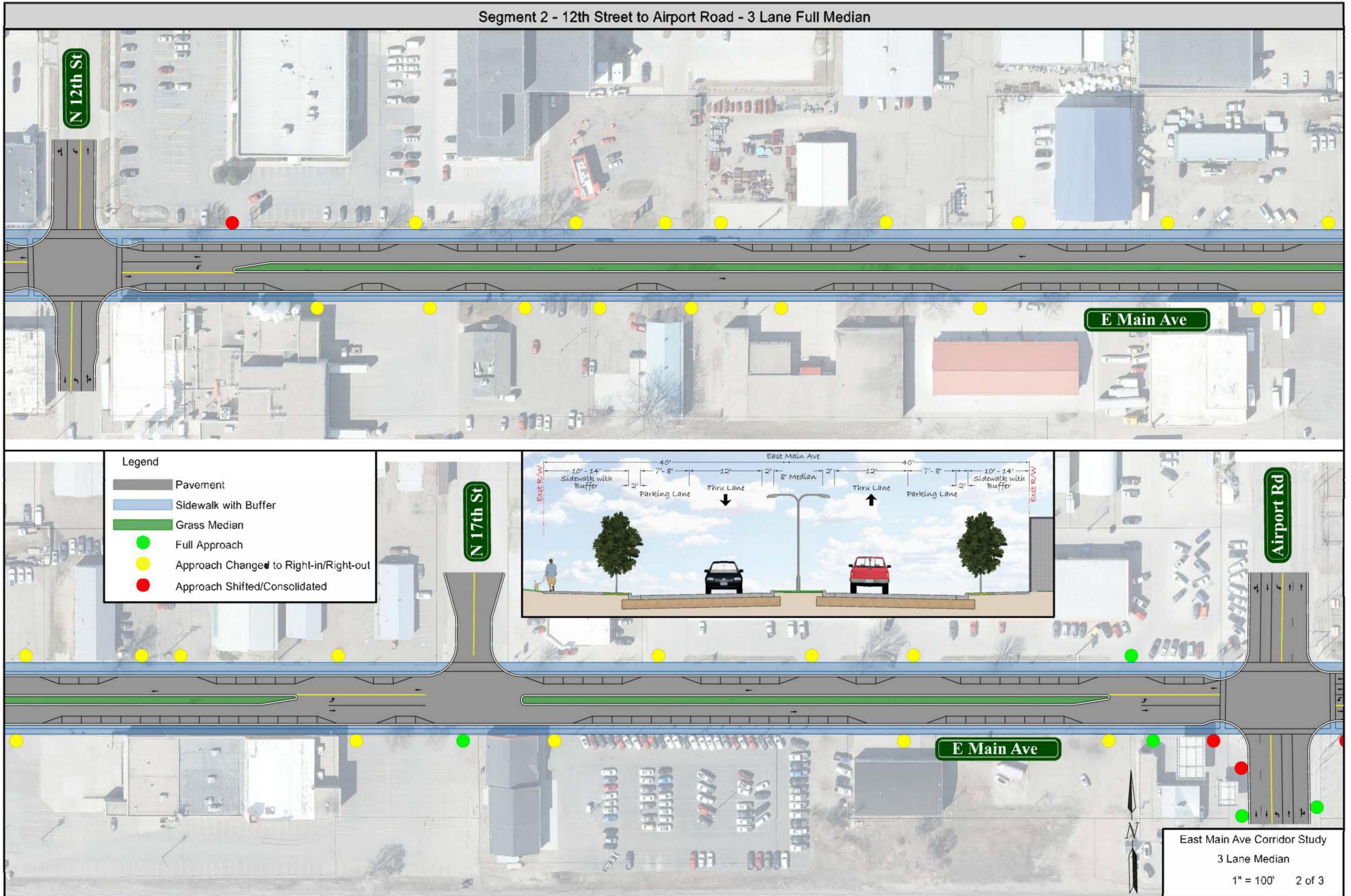


East Main Ave Corridor Study
 3 Lane
 1" = 100' 3 of 3

Segment 1 - 7th Street to 12th Street - 3 Lane Full Median



Segment 2 - 12th Street to Airport Road - 3 Lane Full Median

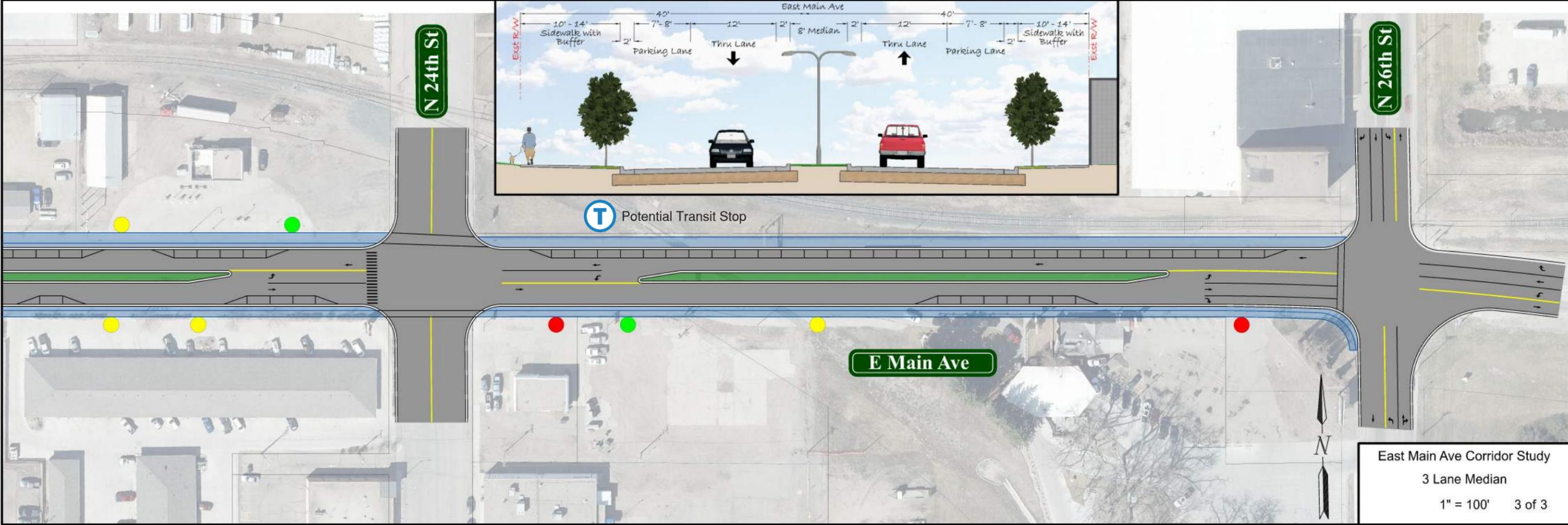
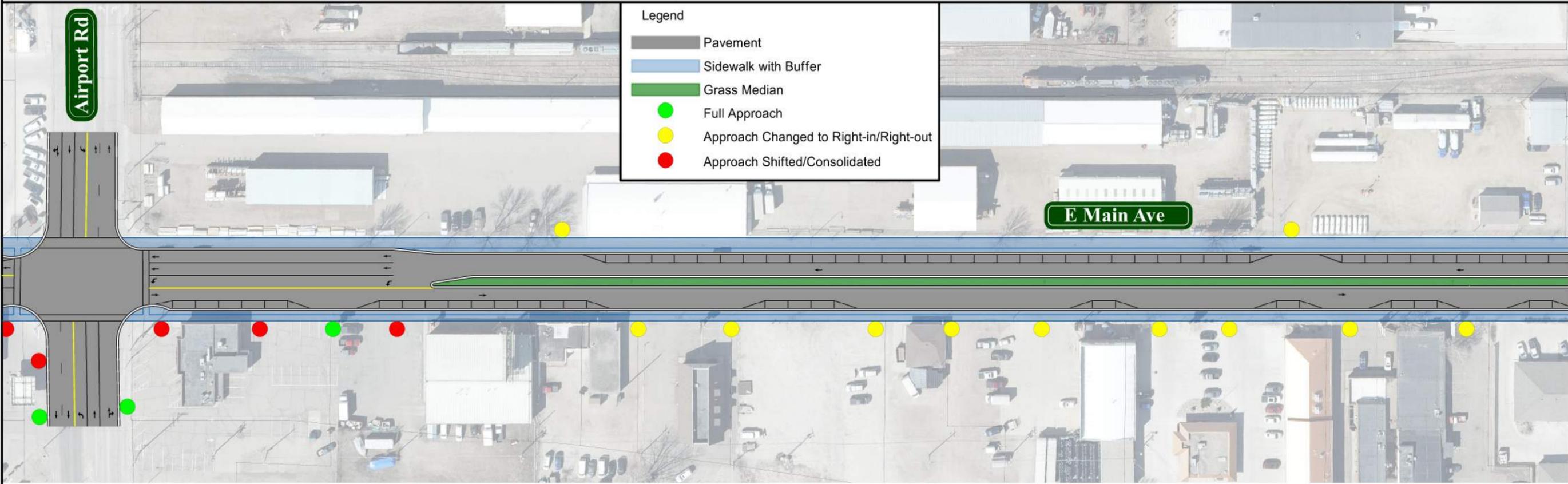


East Main Ave Corridor Study
 3 Lane Median
 1" = 100' 2 of 3

Segment 3 - Airport Road to 26th Street - 3 Lane Full Median

Legend

- Pavement
- Sidewalk with Buffer
- Grass Median
- Full Approach
- Approach Changed to Right-in/Right-out
- Approach Shifted/Consolidated



East Main Ave Corridor Study
 3 Lane Median
 1" = 100' 3 of 3