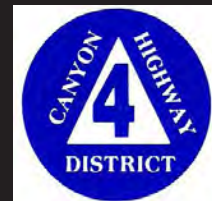


MIDDLETON ROAD CORRIDOR PLAN

Canyon County, Idaho
October 2016

Prepared for:
City of Middleton
City of Caldwell
Canyon Highway District #4

Prepared by:
Kittelson & Associates, Inc.
Precision Engineering



Middleton Road Corridor Plan

Canyon County, Idaho

Final

October 2016

Middleton Road Corridor Plan

Canyon County, Idaho

Prepared For:

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Project No. 19390

October 2016



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APPENDICES

- Appendix A Traffic Count Data
- Appendix B Crash Data Summary Sheets
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- Appendix E Technical Memorandum #3 – Alternative Analysis
- Appendix F Virtual Online Open House Memorandum
- Appendix G Detailed Concept Drawings

Section 1
Executive Summary

EXECUTIVE SUMMARY

The City of Middleton, Canyon Highway District #4 (CHD4), and the City of Caldwell have developed a long-term vision for Middleton Road from State Highway 44 in Middleton to Ustick Road in Caldwell. Middleton Road is an important connection for both cities and Canyon County, as it provides the only north-south connection across the Boise River for 4 to 6 miles in either direction. This corridor plan has been developed to provide for the long-term efficient flow of motor vehicle traffic and reduce crashes as development and traffic volumes increase along the corridor and in Canyon County.

Figure 1 shows the overall corridor plan that resulted out of this collaborative effort. This plan includes:

- The long-term vision for the corridor is a divided four-lane roadway with full access limited to public street intersections at approximately ½-mile spacing.
 - Roundabouts are proposed to be the intersection form for these full-access public street intersections, based on their safety and operational performance.
 - Median U-turn opportunities will be provided at approximately every ¼-mile along the corridor between intersections. Unless necessary, no direct access to individual parcels will be allowed to Middleton Road. When direct parcel access is necessary, it will be limited to right-in/right-out access.
- An extension of N Middleton Road from State Highway (SH) 44 to Sawtooth Lake Drive will be built, per the City of Middleton Comprehensive Plan, with the intent for this new roadway to serve as the primary regional route.
 - The existing alignment of Middleton Road from Sawtooth Lake Drive to SH 44 will remain for access to local streets and businesses.
 - It is expected that this project will be constructed using local funds.
 - A traffic signal warrant analysis will be required at the N Middleton Road/SH 44 intersection before a signal will be installed at the intersection. After the construction of the extension is completed, a traffic signal removal study could also be conducted to determine if the existing traffic signal at the Middleton Road/SH 44 intersection still meets warrants or if it should be removed.
- Wide sidewalks and shoulders will be provided along Middleton Road for people walking and bicycling.
- Marble Front Road will be disconnected from Middleton Road and traffic will be rerouted to use Lincoln Road or other collector roadways.
- Lincoln Road will be realigned such that it is a single four-legged intersection, instead of two three-legged intersections.
- US 20/26 will be built-out as currently proposed by ITD as a half continuous flow intersection (CFI).

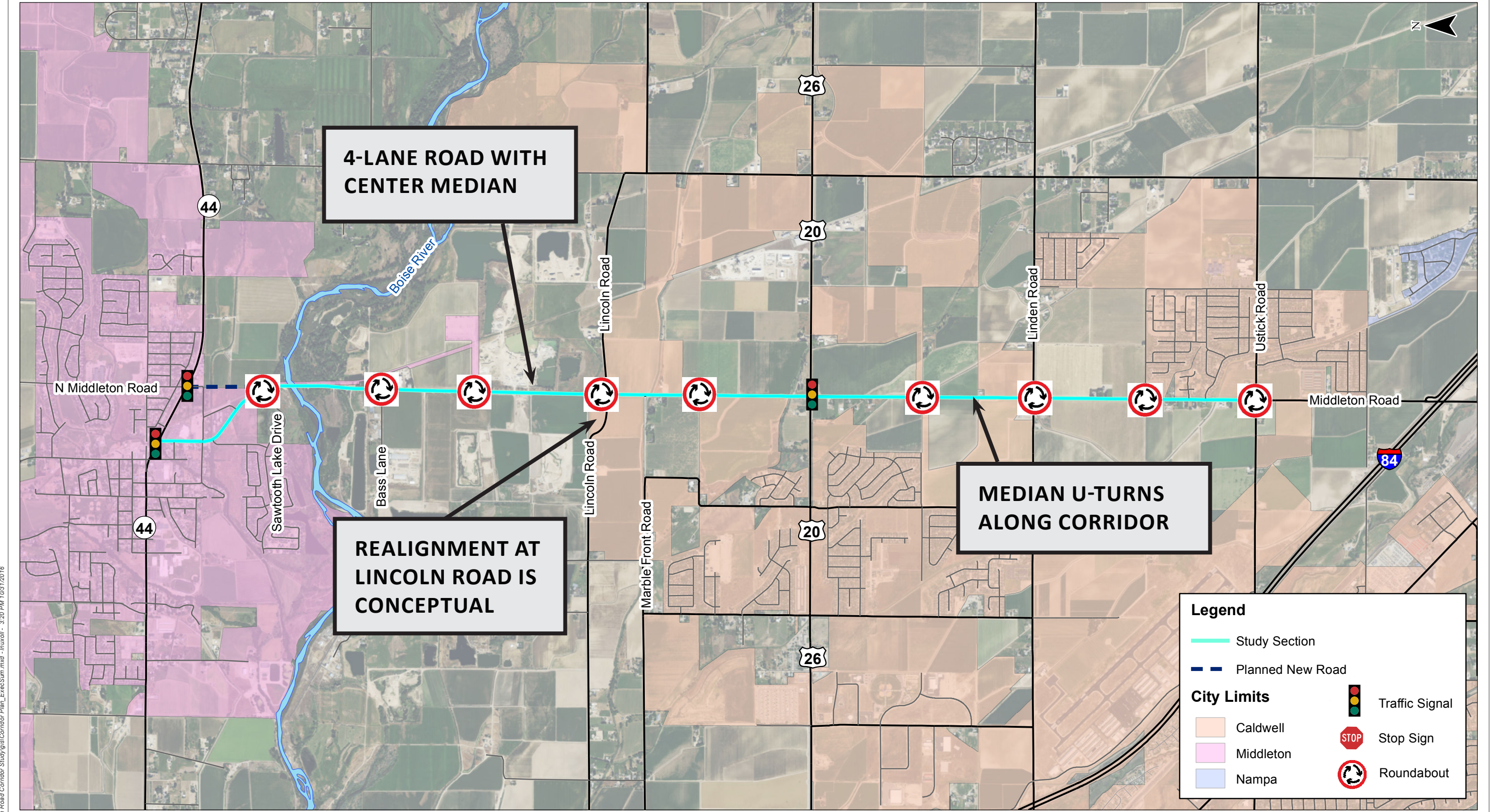
- The only additional change to the Linden Road and Ustick Road intersections, beyond the planned roundabouts, is the addition of the four-lane cross-section on Middleton Road (i.e., no additional changes are made to Linden Road or Ustick Road).
- The design speed of the road is anticipated to be reduced over time from 50 mph to 45 mph in most sections south of the Boise River.

The expected benefits from these improvements are the following:

- Improved projected traffic operations at study intersections and along Middleton Road at or better than standards.
- Fewer crashes at intersections and along Middleton Road than what would be expected if no improvements were constructed.
- Controlled access along Middleton Road.

The Idaho Transportation Department (ITD) also is currently conducting the SH 44 Corridor Study. An alternative being considered in this study is the construction of a bypass route that would be located south of the existing SH 44 through Middleton. The specific alignment of this bypass is still under consideration at the writing of this plan and is not included in this plan. A SH 44 bypass will likely not affect most of this plan, particularly any plans south of the Boise River; however, if the bypass is recommended by this study and adopted by the implementing agencies, its effect on this plan should be considered.

The following sections in this report summarize the steps taken to develop the Middleton Road Corridor Plan and provide more details regarding the planned improvements.



4-LANE ROAD WITH CENTER MEDIAN

REALIGNMENT AT LINCOLN ROAD IS CONCEPTUAL

MEDIAN U-TURNS ALONG CORRIDOR

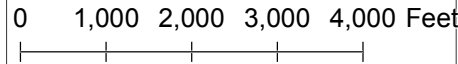
Legend

- Study Section
- Planned New Road

City Limits

- Caldwell
- Middleton
- Nampa

- Traffic Signal
- Stop Sign
- Roundabout



**Corridor Plan
Canyon County, Idaho** **Figure 1**

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Section 2
Introduction

INTRODUCTION

The City of Middleton, Canyon Highway District #4 (CHD4), and the City of Caldwell completed a corridor plan for Middleton Road, which provides the only north-south connection across the Boise River for 4 to 6 miles in either direction. Figure 2 shows the study limits. This report summarizes the process to develop the Middleton Road Corridor Plan and the plan itself.

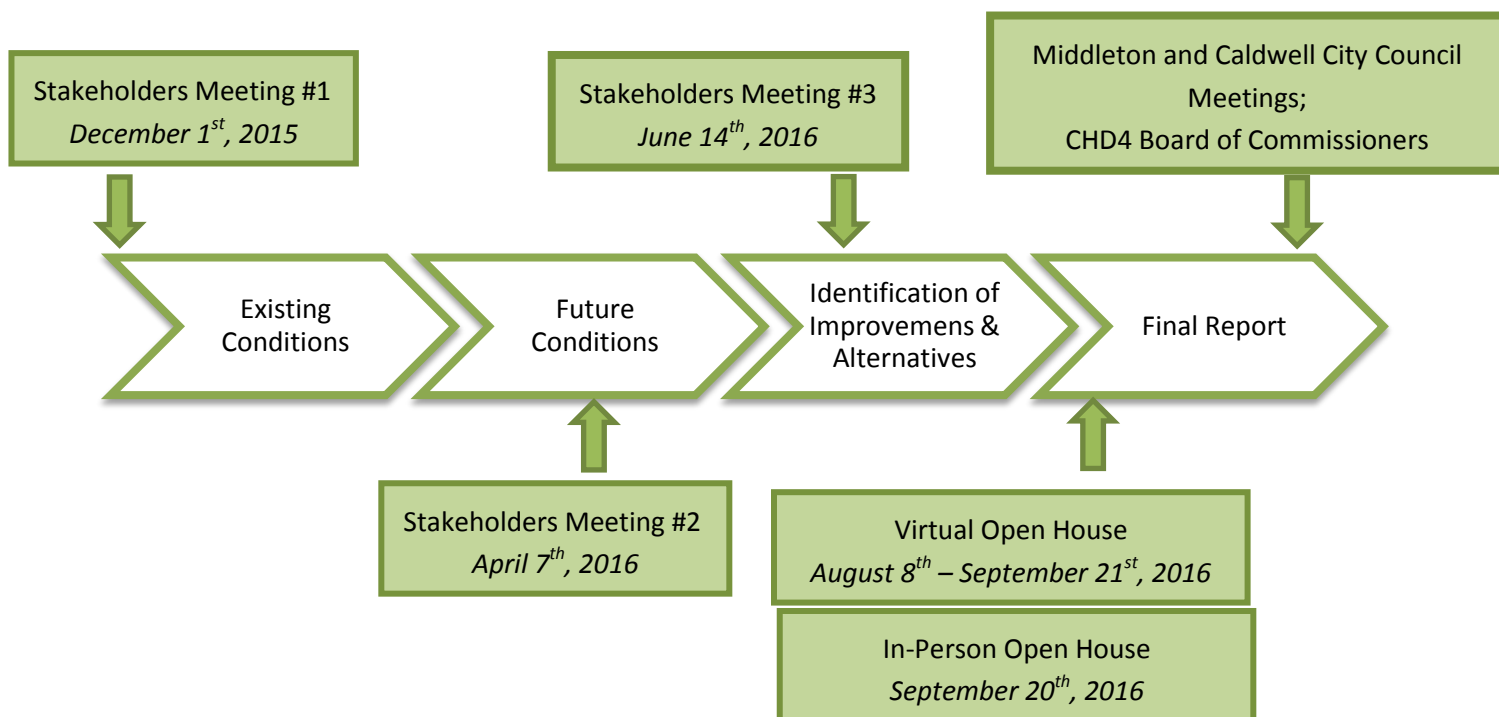
PURPOSE

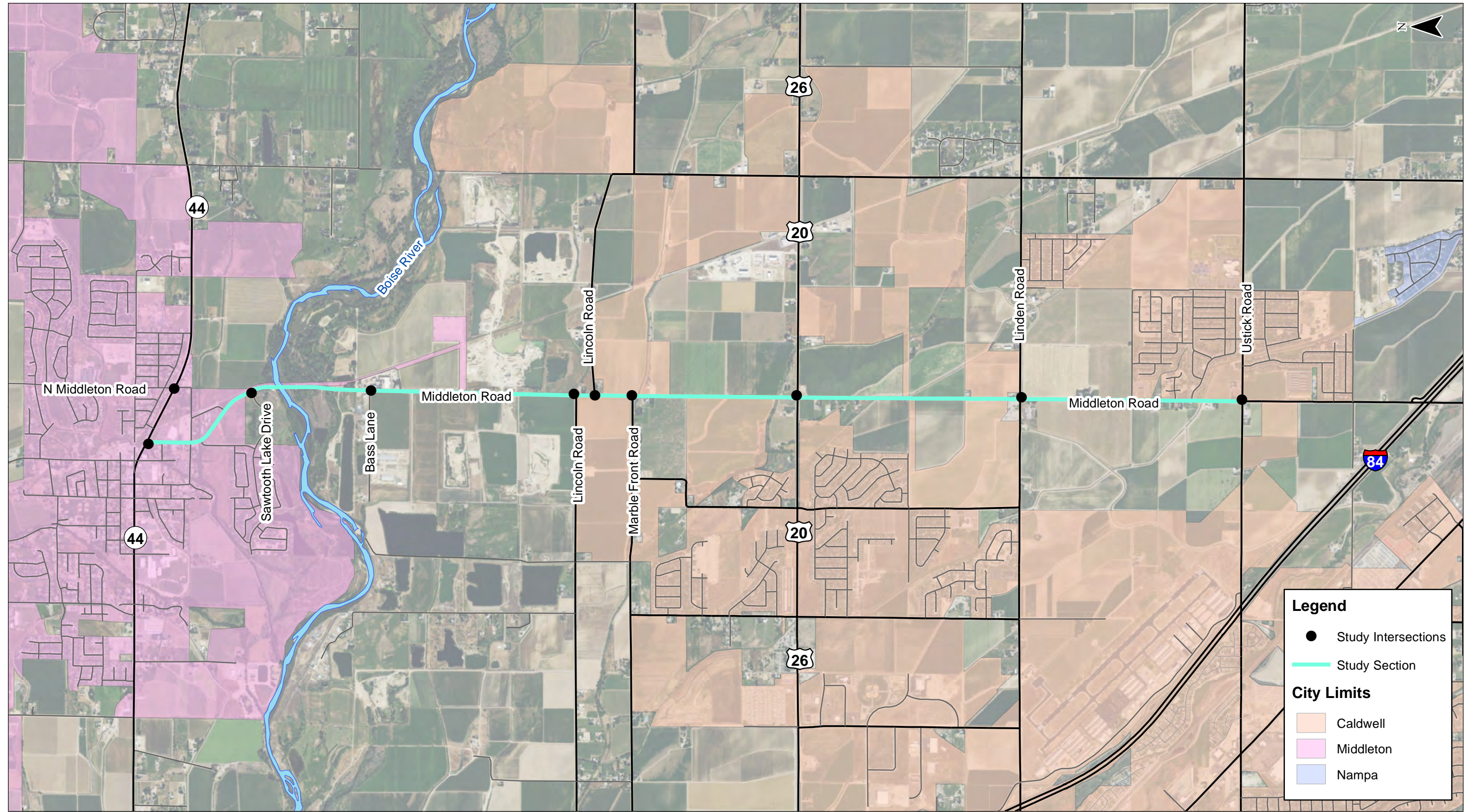
The purpose of this corridor plan is to provide for future growth along the corridor and in Canyon County. Looking at the future developments and land use projected by the Community Planning Association of Southwest Idaho (COMPASS) and the cities of Middleton and Caldwell's comprehensive plans, this corridor plan outlines a vision for maintaining Middleton Road's function as a principal arterial by identifying projects and polices to provide for motor vehicle traffic mobility and to reduce the potential for severe crashes. To achieve this goal, this plan identifies the following:

- Typical roadway sections, including right-of-way requirements;
- Access management objectives and strategies for Middleton Road to ensure long-term mobility; and
- Conceptual layouts for improvements at select intersections.

PROCESS

To complete the corridor study the following tasks were completed and public involvement meetings held:



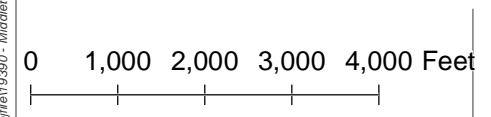


Legend

- Study Intersections
- Study Section

City Limits

- Orange: Caldwell
- Pink: Middleton
- Light Blue: Nampa



**Study Limits
Canyon County, Idaho**

**Figure
2**

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Section 3
Corridor Plan

CORRIDOR PLAN

The proposed Middleton Corridor Plan and the analysis of no-build conditions are described below.

EXISTING TRAFFIC CONDITIONS

Middleton Road is a critical piece of the transportation network in Canyon County as it provides the only north-south connection across the Boise River for 4 to 6 miles in either direction. Currently, the corridor has one vehicle travel lane in each direction with two signalized intersections (SH 44 and US 20/26).

Existing Walking and Bicycling Conditions

Sidewalks are limited along Middleton Road to the section with the City of Middleton and to the few areas along recently developed residential subdivisions. There are currently no dedicated bicycle facilities along most of Middleton Road. The Middleton Bike Path starts by the bridge over the Boise River and connects into the City of Middleton. There are no transit routes operating along Middleton Road.

Existing Traffic Volumes and Operations

The project team obtained weekday p.m. peak hour turning movement counts at the intersections listed below.

- N Middleton Road/SH 44
- Middleton Road/ SH 44
- Middleton Road/Bass Lane
- Middleton Road/Lincoln Road
- Middleton Road/US 20/26
- Middleton Road/Linden Road
- Middleton Road/Ustick Road

Intersection Operations

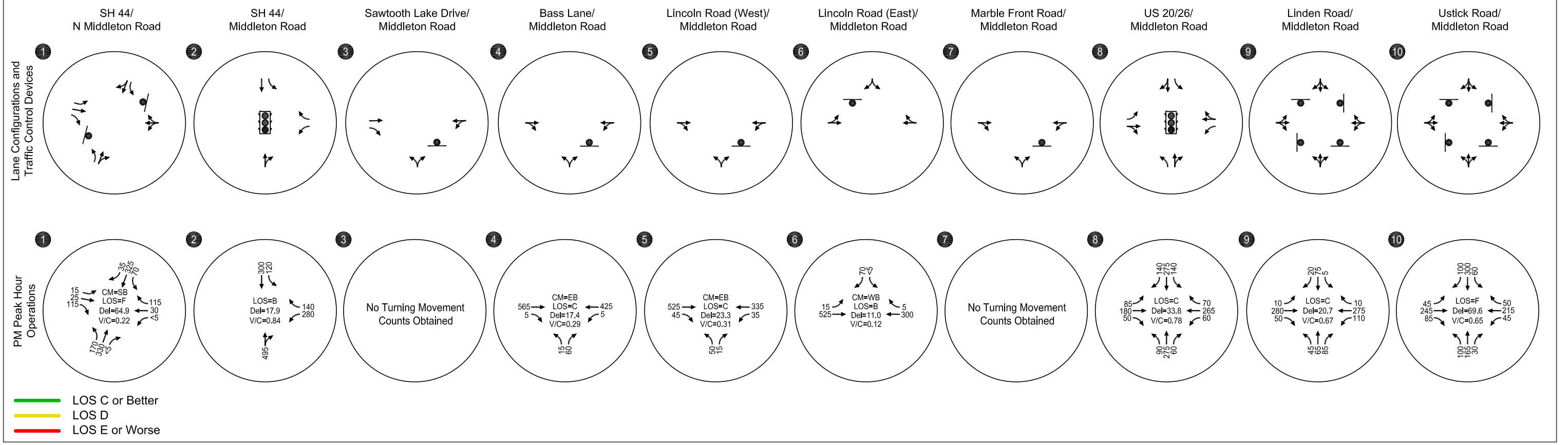
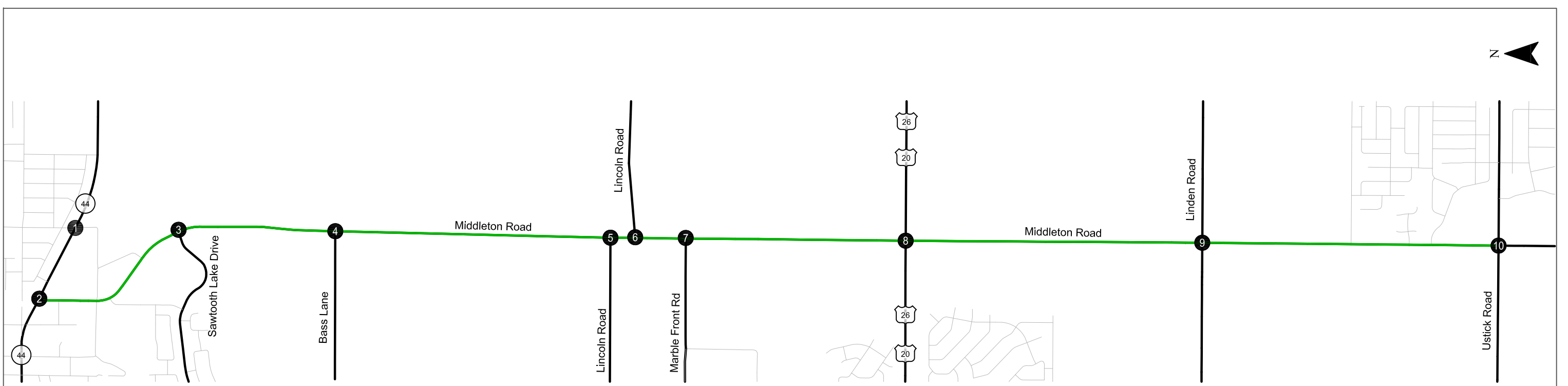
All level-of-service (LOS) analyses described in this report were performed in accordance with the procedures outlined in the Highway Capacity Manual 2010 (Reference 1) using Synchro 8 as the software implementation tool. Figure 3 shows the existing traffic operations for the intersections listed above. *Appendix A contains the turning movement counts.* LOS “D” is the CHD4 threshold for Middleton Road intersections.

Most of the study intersections currently operate at LOS “C” or better and with sufficient capacity for existing volumes during the weekday p.m. peak hour. One of the exceptions is the Ustick Road intersection, which operates at LOS “F” during the weekday p.m. peak hour. The westbound and

southbound approaches are also at capacity during this time period. The single lane roundabout planned for construction at this intersection is forecast to operate at LOS "B" with a v/c of 0.66 when it opens around the year 2020 according to the Middleton Road/Ustick Concept Report (Reference 2). The other exception is the N Middleton Road/SH 44 intersection, which operates at LOS "F" during the weekday p.m. peak hour. The southbound left-turn movement is below capacity with a v/c ratio of 0.22, but has a high delay waiting for a gap across both lanes of SH 44. No mitigation is recommended in the near-term; however, if traffic volumes increase at the intersection, a signal may be warranted in the future.

Roadway Segment Analysis

A planning-level segment analysis was completed to identify how the existing two-lane undivided section operates under year 2015 existing conditions. The results of this analysis are shown in Figure 3. For more detailed information on this analysis see *Technical Memorandum #1* (Appendix C).



█ LOS C or Better
█ LOS D
█ LOS E or Worse

- Study Intersections
 - Stop Sign
 - Traffic Signal
 - Roundabout

CM = CRITICAL MOVEMENT (TWSC)
 LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC) / CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)

V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
 TWSC = TWO-WAY STOP CONTROL
 AWSC = ALL-WAY STOP CONTROL

2015 Existing Traffic Control Devices, Lane Configurations, and Traffic Operations Canyon County, Idaho

Figure 3

CRASH SUMMARY

Crash data for the study intersections and segments along Middleton Road were reviewed in an effort to identify crash patterns that could potentially be mitigated. Crash records were obtained from the Idaho Transportation Department for the five-year period from January 1, 2010 through December 31, 2014. Figures 4 and 5 illustrate the severity of crashes at each intersection and segment. Figure 6 shows the locations, types, and severity of crashes along Middleton Road. *Appendix B provides the crash data summary sheets.* More detail about the crash analysis can be found in *Appendix C.*

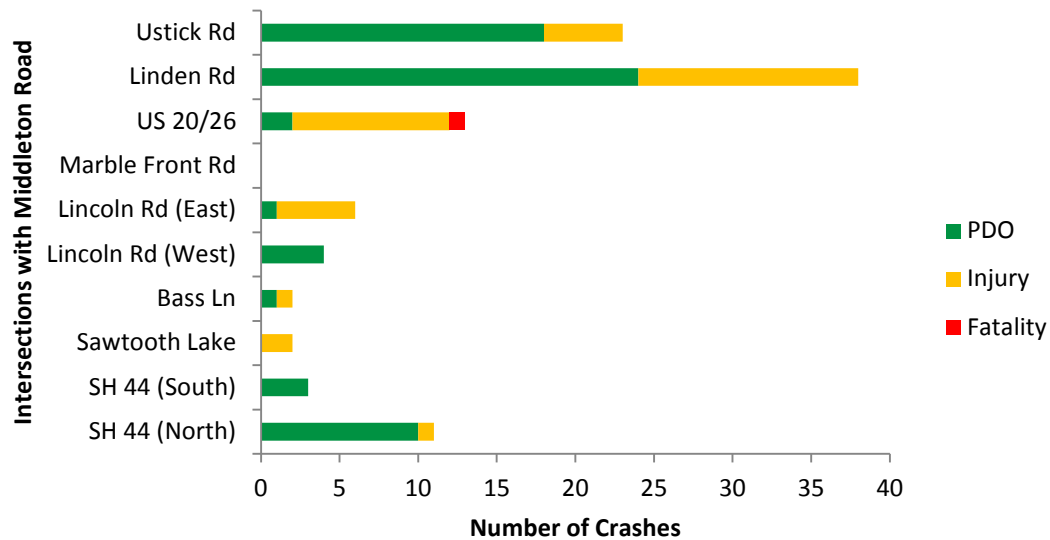


Figure 4. Crash Severity at the Study Intersections

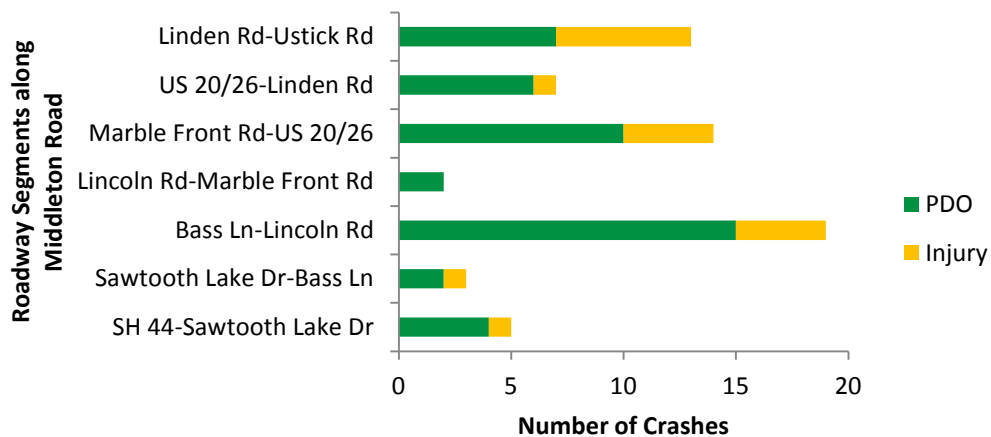
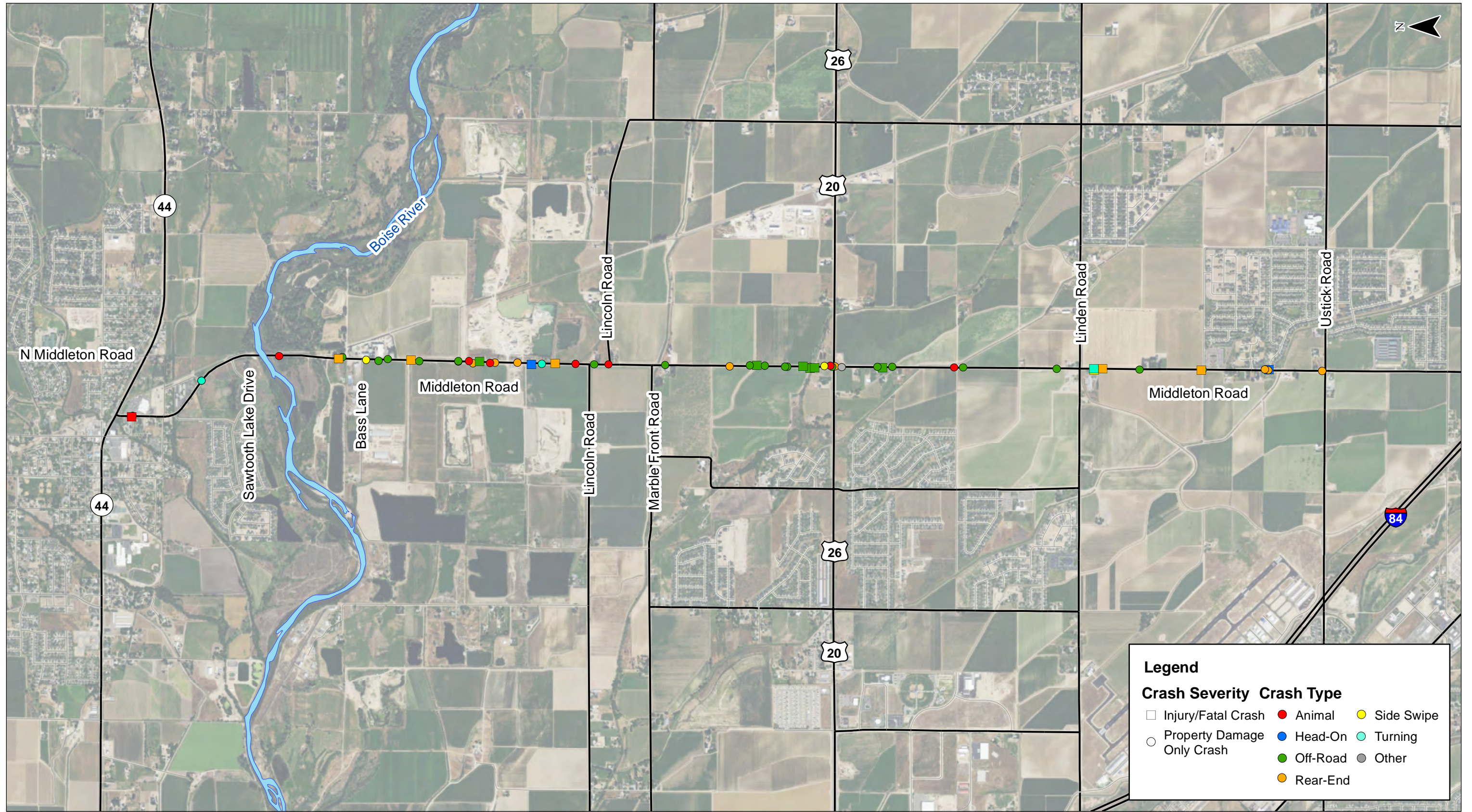


Figure 5. Crash Severity along Segments on Middleton Road



0 1,000 2,000 3,000 Feet

**Segment Crash Locations (2010-2014)
Canyon County, Idaho**

**Figure
6**

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PLANNED PROJECTS

The project team reviewed relevant past plans and studies provided by the applicable agencies to identify planned improvements and understand previous work completed along the corridor. Planned projects were incorporated into the future conditions and alternatives analyses to ensure that future planning for the corridor is consistent with existing plans.

The previously planned and ongoing projects along Middleton Road are listed below and shown in Figure 7:

- Middleton Road/Ustick Road (Planned Roundabout)
- Middleton Road/Linden Road (Planned Roundabout)
- Middleton Road/US 20/26 (Planned Half-Continuous Flow Intersection)
- Middleton Road Extension (Planned straightening extension of Middleton Road between Sawtooth Lake Drive to SH 44)

For more information on these projects, see *Technical Memorandum #1 – 2015 Existing Traffic Conditions* (Appendix C).

The Idaho Transportation Department (ITD) also is currently conducting the SH 44 Corridor Study, which was not incorporated in this corridor study. An alternative being considered in this study is the construction of a bypass route that would be located south of the existing SH 44 through Middleton. The specific alignment of this bypass is still under consideration at the writing of this plan and is not included in this plan. A SH 44 bypass will likely not affect most of this plan, particularly any plans south of the Boise River; however, if the bypass is recommended by this study and adopted by the implementing agencies, its effect on this plan should be considered.

YEAR 2040 NO-BUILD FUTURE TRAFFIC CONDITIONS

The Community Planning Association of Southwest Idaho (COMPASS) projects year 2040 demographics based on adopted community land use plans. Population is expected to grow the most in the areas surrounding US 20/26. Conversely, population growth is projected to be the lowest in the areas between Lincoln Road and the Boise River and near I-84, which are mostly designated for industrial uses in the comprehensive plans of the cities of Middleton and Caldwell and Canyon County. The greatest increases in employment are projected for the area between Lincoln Road and US 20/26 and the west side of Middleton Road between I-84 and US 20/26.

The year 2040 traffic conditions analysis identifies how key intersections along Middleton Road are expected to operate in the future, assuming the levels of growth found from the COMPASS models. The analysis assumes that the existing transportation network generally remains in place (e.g., Middleton Road remains a two-lane road, Marble Front Road still connects to Middleton Road). The only exceptions to this assumption are projects that are part of specific adopted studies or have been proposed in public forums. These projects are:

- The Middleton Road/US 20/26 intersection is expanded to be a half continuous flow intersection.
- The intersection of Middleton Road/Linden Road is a multilane roundabout; and
- The intersection of Middleton Road/Ustick Road is a single-lane roundabout with separate right-turn lanes.

These assumptions are reflected in the assumed lane configurations and traffic control devices at the study intersections shown in Figure 8.

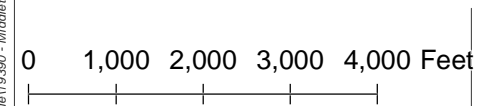
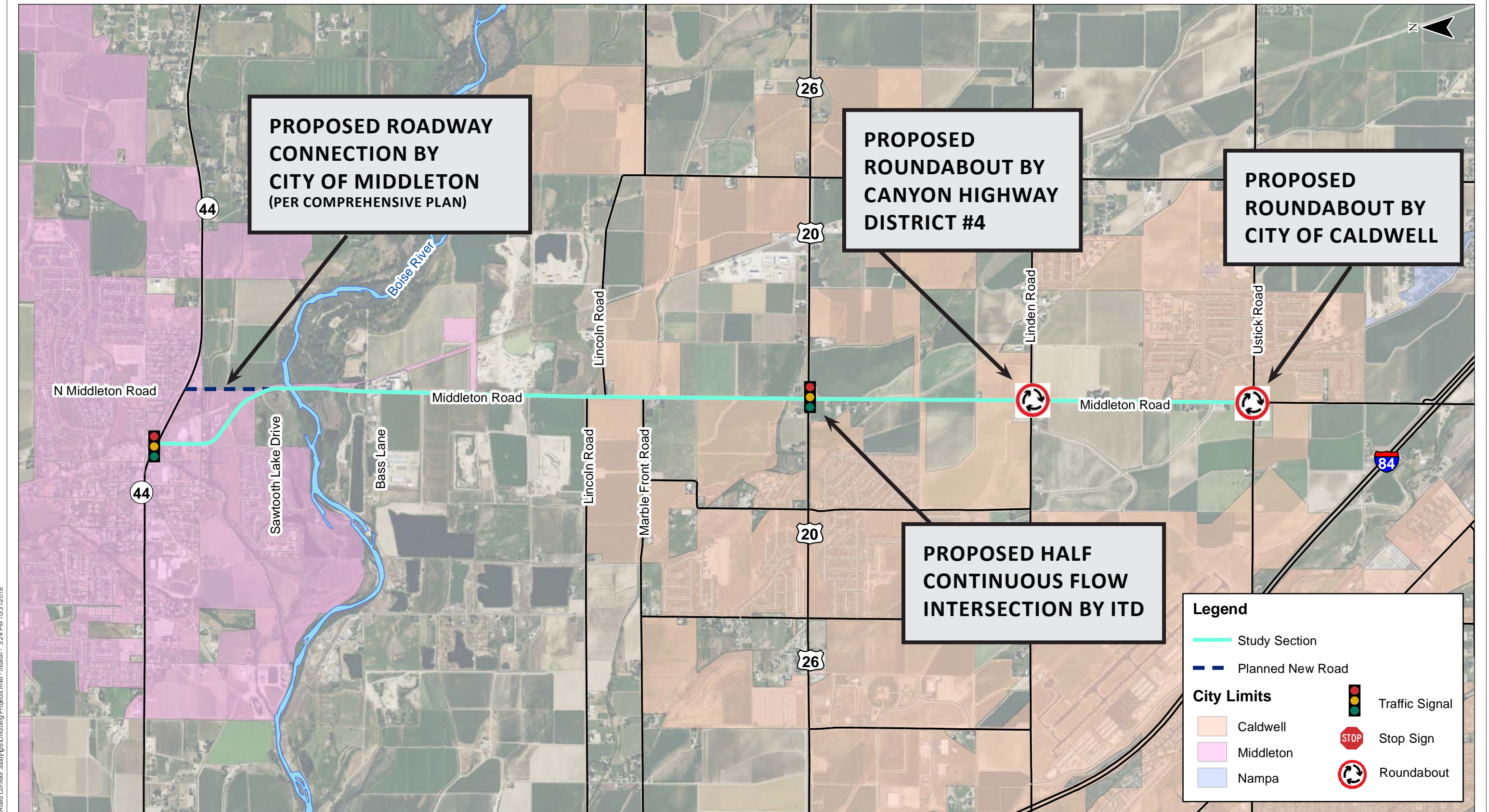
Future year 2040 traffic volumes were developed from the year 2040 volumes projected by the COMPASS travel demand model using the procedures from National Cooperative Highway Research Program (NCHRP) Report 255 (Reference 3). For more information on how the volumes were developed please see *Technical Memorandum #2 – 2040 Future Traffic Conditions* (Appendix D).

Intersection Operations

Intersection operations analyses were performed using the projected year 2040 traffic volumes shown in Figure 8. Most of the study intersections are forecast to operate at LOS “F” and at capacity during the weekday p.m. peak hour in the year 2040, based on the current projected traffic growth. The exception is Linden Road is expected to operate LOS “C” with the multilane roundabout. Figure 8 also shows the estimated year 2040 roadway level-of-service by segment along Middleton Road.

Roadway Segment Analysis

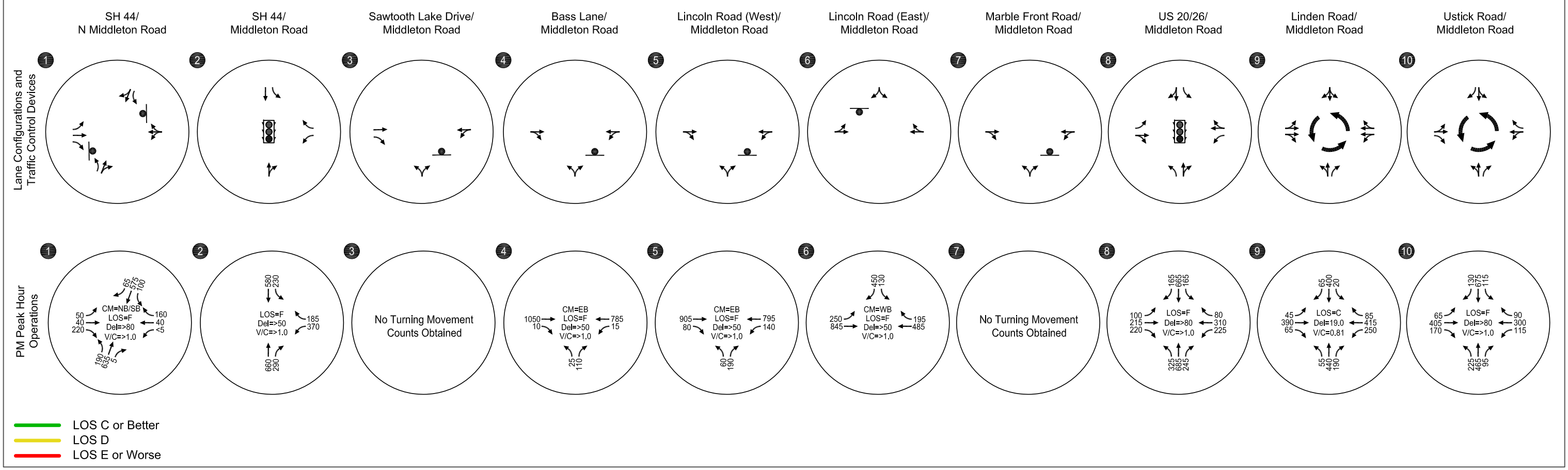
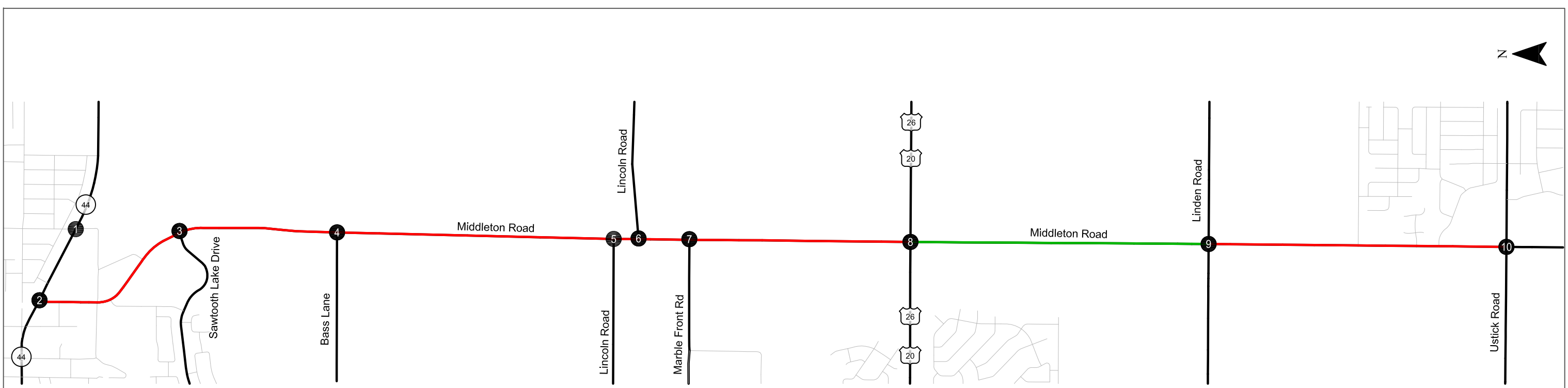
A planning-level segment analysis was to identify how the two-lane undivided section is expected to operate under year 2040 conditions. The results of this analysis are shown in Figure 8. The sections from State Highway 44 to US 20/26 and from Linden Road to Ustick Road are expected to operate at LOS “E” or worse. Middleton Road from US 20/26 to Linden Road is forecast to operate at LOS “C” or better.



Previously Planned/Ongoing Projects Canyon County, Idaho

Figure 7

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█ LOS C or Better
█ LOS D
█ LOS E or Worse

- Study Intersections
 - Stop Sign
 - Traffic Signal
 - Roundabout

CM = CRITICAL MOVEMENT (TWSC)
 LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC) / CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)
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V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
 TW = TWO-WAY STOP CONTROL
 AWSC = ALL-WAY STOP CONTROL

2040 No-Build Future Traffic Control Devices, Lane Configurations, and Traffic Operations Canyon County, Idaho

Figure 8

CORRIDOR PLAN

Alternative intersection and roadway configurations were considered in the development of this corridor plan. More information regarding these alternatives can be found in Appendix E.

Improvements for the Middleton Road corridor have been identified based on the project team's technical analysis, as documented in this and previous memos, and input from the City of Middleton, CHD4, and City of Caldwell. The proposed corridor plan has also been reviewed with the general public. A summary of comments received during this process can be found in Appendix F. The plan includes the following elements:

- The long-term vision for the corridor is a divided four-lane roadway with full access limited to public street intersections at approximately ½-mile spacing.
 - Roundabouts are proposed to be the intersection form for these full-access public street intersections, based on their safety and operational performance.
 - Median U-turn opportunities will be provided at approximately every ¼-mile along the corridor between intersections. Unless necessary, no direct access to individual parcels will be allowed to Middleton Road. When direct parcel access is necessary, it will be limited to right-in/right-out access.
- An extension of N Middleton Road from State Highway (SH) 44 to Sawtooth Lake Drive will be built, per the City of Middleton Comprehensive Plan, with the intent for this new roadway to serve as the primary regional route.
 - The existing alignment of Middleton Road from Sawtooth Lake Drive to SH 44 will remain for access to local streets and businesses.
 - It is expected that this project will be constructed using local funds.
 - A traffic signal warrant analysis will be required at the N Middleton Road/SH 44 intersection before a signal will be installed at the intersection. After the construction of the extension is completed, a traffic signal removal study could also be conducted to determine if the existing traffic signal at the Middleton Road/SH 44 intersection still meets warrants or if it should be removed.
- Wide sidewalks and shoulders will be provided along Middleton Road for people walking and bicycling.
- Marble Front Road will be disconnected from Middleton Road and traffic will be rerouted to use Lincoln Road or other collector roadways.
- Lincoln Road will be realigned such that it is a single four-legged intersection, instead of two three-legged intersections.
- US 20/26 will be built-out as currently proposed by ITD as a half continuous flow intersection (CFI).

- The only additional change to the Linden Road and Ustick Road intersections, beyond the planned roundabouts, is the addition of the four-lane cross-section on Middleton Road (i.e., no additional changes are made to Linden Road or Ustick Road).
- The design speed of the road is anticipated to be reduced over time from 50 mph to 45 mph in most sections south of the Boise River.

The existing and proposed cross-sections of Middleton Road are shown in Figure 9 and Figure 10. Figure 11 illustrates the proposed corridor plan for intersections along Middleton Road. Detailed drawings of the proposed Middleton Road are in Appendix G. The drawings in Appendix G are conceptual. It is expected that the final design of the corridor projects will follow appropriate design standards and that additional details regarding the projects will be developed during the final design phase.

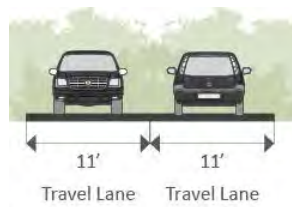


Figure 9. Existing Middleton Road Cross Section

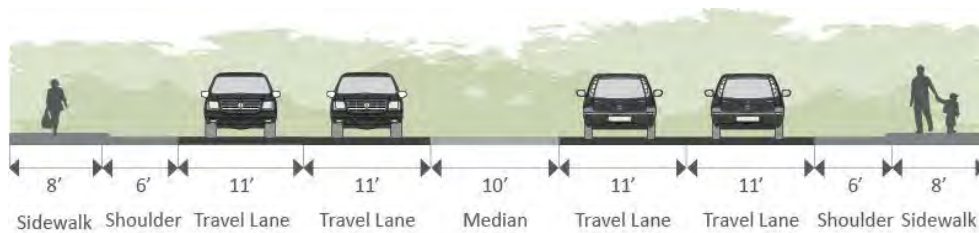
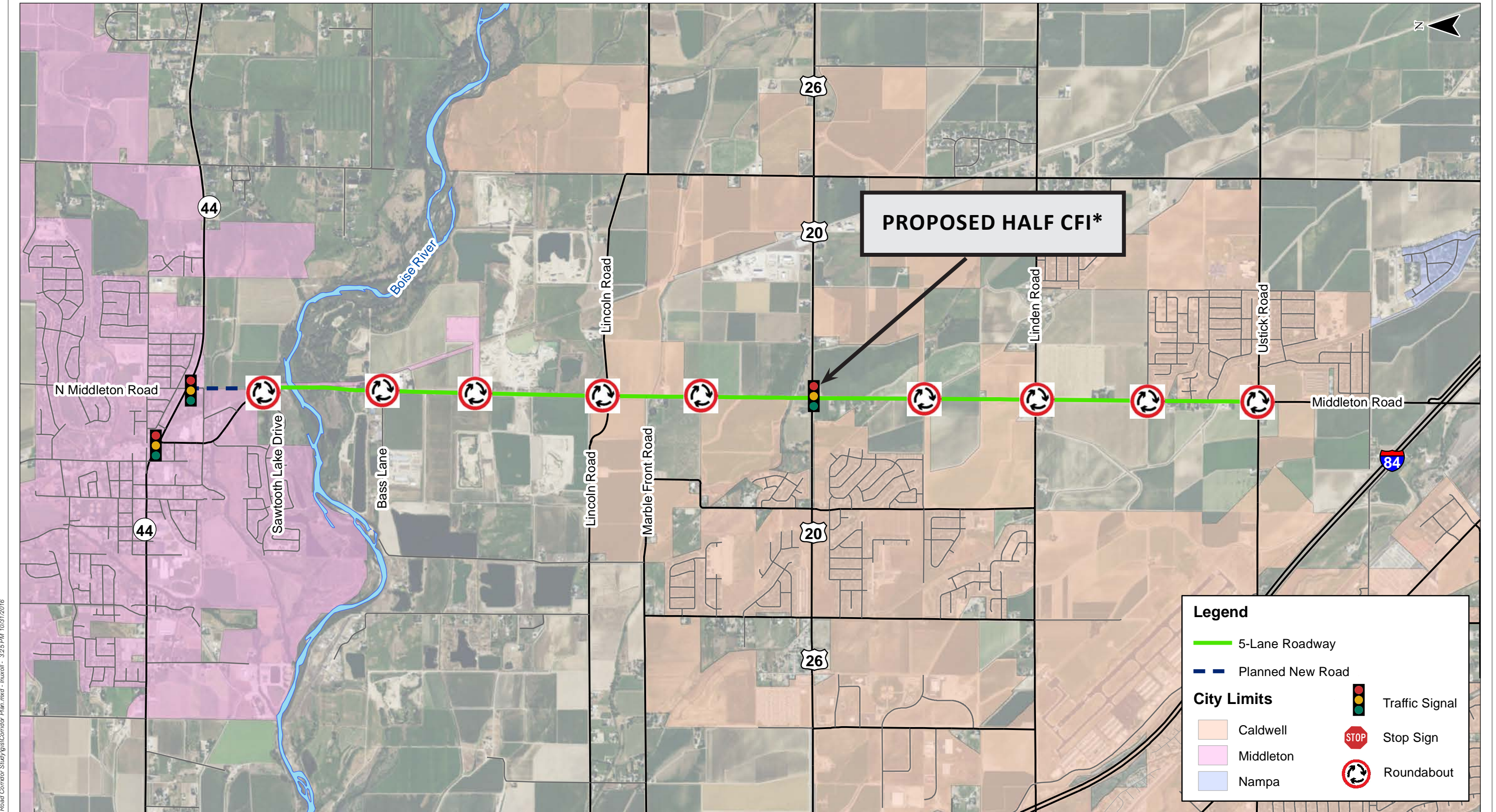


Figure 10. Proposed Middleton Road Cross Section

The following section describes the details of the improvements as well as the operations and safety analysis of these improvements.



Legend

- 5-Lane Roadway
- Planned New Road

City Limits

- Caldwell
- Middleton
- Nampa

- Traffic Signal
- Stop Sign
- Roundabout

0 1,000 2,000 3,000 4,000 Feet

*Continuous Flow Intersection

**Corridor Plan
Canyon County, Idaho**

**Figure
11**

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Year 2040 Build Traffic Operations

Traffic operations analyses were performed on for year 2040 with the proposed improvements at the intersection and roadway segment level as described in the following sections.

Roadway Segment Analysis

A planning-level segment analysis was completed to identify how the proposed four-lane divided section is expected to operate under year 2040 conditions.

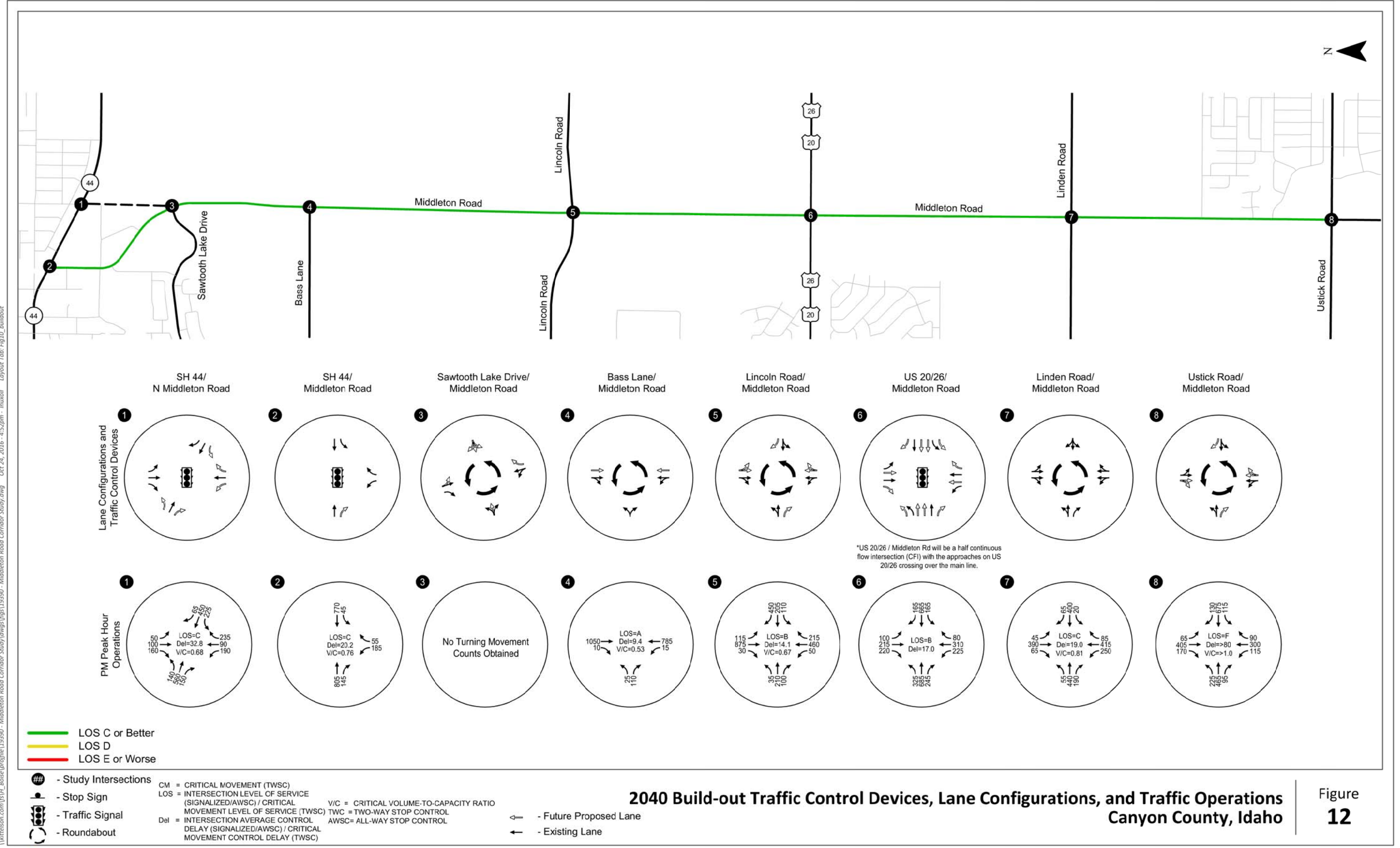
Figure 12 shows the estimated year 2040 build roadway level-of-service by segment along Middleton Road, including the proposed northern alignment. All segments are expected to operate at LOS “C” or better if they are built to a four-lane divided section. This is an improvement from the no-build condition analyzed in the future conditions, where LOS “E” or worse is forecast along most sections of Middleton Road in the year 2040.

Intersection Operations

Intersection operations analyses were performed using the projected year 2040 build traffic volumes and future proposed intersection lane configurations. The proposed lane configurations and traffic control devices are based on the goal of achieving LOS “D” (CHD4 threshold) or better at most of the study intersections, except the US 20/26 and Ustick Road intersections, which are the subject of separate studies by ITD and the City of Caldwell, respectively. Figure 12 shows the results of the traffic operations analysis for the study intersections. *Appendix F contains the analysis reports and further description in the Technical Memorandum #3.*

Most of the study intersections are forecast to operate at LOS “D” or better under the proposed year 2040 build configurations. This is an improvement from the year 2040 no-build conditions where most intersections are forecast to operate at LOS “F.” The one exception is the Ustick Road intersection, which will require additional widening to the intersecting roadways, or an alternative configuration, in order to improve operations to LOS “D” or better. This finding is consistent with the analysis performed for the City of Caldwell’s Concept Report (Reference 4).

The Sawtooth Lake Drive intersection with a realigned Middleton Road is shown as single-lane roundabout based on the forecast annual average daily traffic (AADT) volumes. A detailed intersection operations analysis should be performed when determining the ultimate configuration of the realigned Middleton Road and how it effects this intersection in order to better identify the desirable lane configurations at this intersection.



2040 Build-out Traffic Control Devices, Lane Configurations, and Traffic Operations Canyon County, Idaho

Figure 12

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Year 2040 Safety

A safety analysis was conducted of the proposed improvements shown in the corridor plan shown in Figure 11, using methods from the Highway Safety Manual (HSM) (Reference 5) published by the American Association of State Highway and Transportation Officials (AASHTO). Included in the HSM are crash prediction models based on national data that can be used with local calibration factors and site-specific geometric and traffic data to estimate the predicted average crash frequency (i.e., crashes/year) at a site in a future condition.

The predicted average crash frequency for the proposed build condition is compared to the predicted average crash frequency of the no-build condition to identify the potential change in crashes that may occur if the proposed improvements are built. The results of this analysis are shown in Figure 13 and Figure 14 (results shown in Figure 14 assume roundabouts at the Lincoln Road and Bass Lane intersections). Idaho-specific calibration factors have not yet been developed for four-lane divided roadways or urban/suburban roads. Therefore, this analysis is not calibrated to local conditions and only represents an approximation of what might occur. *The numbers in Figure 13 and Figure 14 should not be taken as absolute estimates, but instead used to identify potential trends that may occur with the build-out of the proposed improvements.*

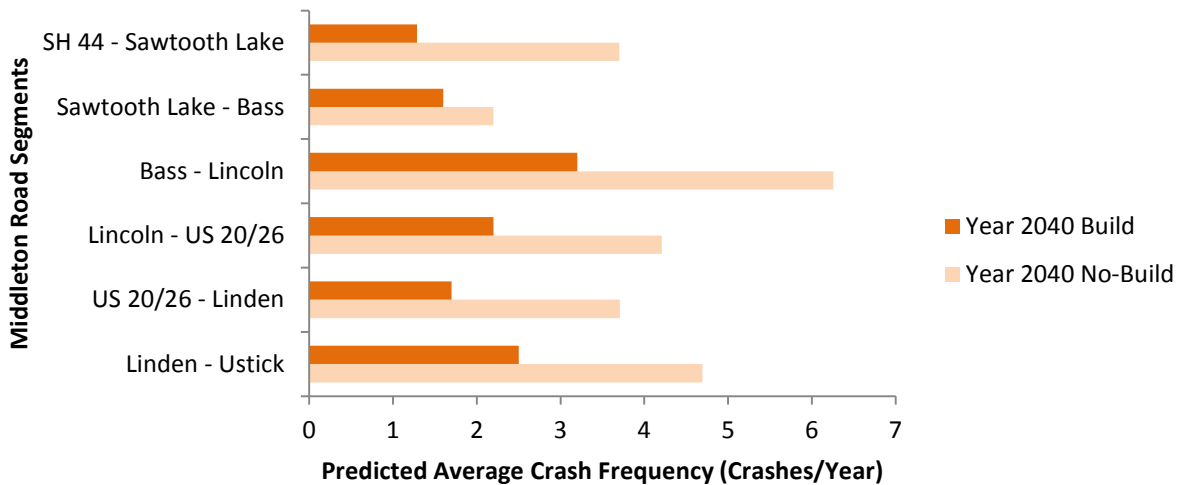


Figure 13. Year 2040 Predicted Average Crash Frequency - Build vs. No-Build, Segments

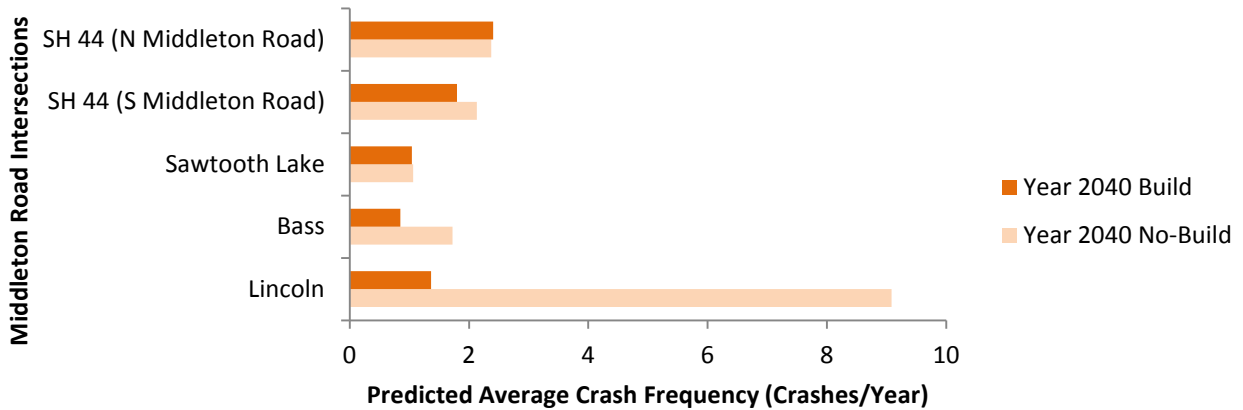


Figure 14. Year 2040 Predicted Average Crash Frequency - Build vs. No-Build, Intersections (with Roundabouts at Lincoln Road and Bass Lane)

Based on this analysis, the proposed improvements to Middleton Road are generally expected to reduce crashes along the roadway and at key intersections. The N Middleton Road intersection may be the one exception, but that is because of the expected increase in traffic volumes due to the new southern connection to Middleton Road. In total, the predicted average crash frequency is expected to decrease at the two SH 44 intersections, based on the results of this analysis.

The frequency of crashes is expected to be similar at Sawtooth Lake under the build and no-build conditions. This is because the expected crash reduction impact of constructing a roundabout at this intersection is somewhat mitigated by the addition of a fourth leg to the intersection, which is currently a three-legged intersection.

Three of the study intersections are not shown in Figure 4 above: US 20/26, Linden Road, and Ustick Road. ITD is currently proposing a half-CFI at US 20/26. There is currently not sufficient data available to quantify the expected change in crashes for the proposed intersection form. The Linden Road and Ustick Road intersections are both currently all-way stop controlled (AWSC) intersections and there is not currently a method to predict crashes at AWSC intersections. Based on data contained in the HSM, it is not clear whether converting an AWSC intersection to a roundabout will have an effect on crashes (i.e., the crash modification factor’s margin of error crosses 1.0, indicating the conversion may result in an increase, decrease, or no change in crashes).

Access Management

Middleton Road is classified as a principal arterial and provides the only north-south connection across the Boise River for 4 to 6 miles in either direction. As a result, it is an important route for local traffic as well as regional traffic. Recognizing this, agency representatives have indicated their desire is to provide for mobility while reducing potential conflicts on the corridor. Access management is an important part of meeting these objectives.

Access Management Guidelines

Potential access management guidelines have been developed for the Middleton Road corridor based on existing agency policies and national best practices. The intent of these access recommendations is to develop guidelines that support the previously stated overall vision of full-access along the corridor limited to arterial road intersections, generally located approximately every mile, and collector-level public street intersections located approximately ½-mile from the adjacent arterial intersections.

The following are general access recommendations for Middleton Road:

- With the exception of collector streets located approximately ½-mile from adjacent arterial intersections, all new accesses, public or private, onto Middleton Road will be restricted to right-in/right-out access spaced a minimum of 660 feet apart with the construction of the proposed median.
 - If accesses are built before the median is constructed, then this future restriction should be part of the permit or a short section of temporary median should be constructed.
- Direct access to private property should be permitted only when reasonable access cannot be obtained from side streets.
 - New direct accesses to private property should be built to provide for cross-access to adjacent parcels, when possible (e.g., by placing the access on the property line).
- No additional access should be provided upon the splitting or dividing of parcels of land or contiguous parcels.
 - Additional access should be provided internally from the existing access.
- Limit access near intersections to no closer than 660 feet and outside the functional area of the intersection in cases where the functional area may extend beyond the minimum distance.

Median U-Turns

In an effort to promote mobility and safety along the corridor, raised median islands are being proposed. The medians will eliminate left-turn movements, except at designated locations. The designated locations for left-turns are planned at the full access intersections located at approximately ½-mile spacing. Between intersections, U-turn opportunities will be provided at approximately every ¼-mile along the corridor.

The median U-turns will reduce travel time for through traffic and increase capacity at the ½-mile full access intersections by removing vehicles from the major intersections. To minimize right-of-way width along the entire corridor, a 10-foot median is proposed which will be widened at intersection and U-turn locations to provide for sufficient width to accommodate turn lanes. The U-turn locations will also include widening of the shoulders area to create wider spots called “loons” in order to accommodate a

passenger vehicle towing a trailer and single unit utility vehicles. It is assumed the larger tractor trailer vehicles (W-50 and above) will utilize the ½-mile full access intersection to make left-turns and find appropriate routes to access properties between major intersections. The following are key advantages of median U-turns with loons according to the National Cooperative Highway Research Program (NCHRP) Report 524 "Safety of U-turns at Unsignalized Median Openings":

- Widening in the shoulder area on the far side of the turn makes it possible to make a U-turn without stopping or backing and reduces interference between U-turn and through traffic, particularly for large vehicles.
- This design prevents overlapping U-turns.
- Midblock access is provided for vehicles to (a) make a U-turn and (b) reach driveways on the opposite side of the street.
- Since only major-road traffic is involved, delays to vehicles making U-turns will be less than where an intersection is present.
- Crash rates at midblock median openings are lower than at median openings at intersections.

A primary disadvantage of this design is that the loons require additional right-of-way to construct. They may also make snow removal and other maintenance work more difficult.

Intelligent Transportation Systems (ITS)

In an effort to promote mobility, safety efficiency, dependability, and cost effective solutions along the corridor, ITS infrastructure is planned along the entire corridor. FHWA defines Intelligent Transportation Systems (ITS) as "electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system."

The Middleton Road Corridor is planned to be an ITS corridor linking multiple agencies. As such each agency has their minimum ITS infrastructure requirements within their jurisdiction. It is recommended that prior to the corridor developing; the agencies collaborate to identify the information that will be gathered and managed on the corridor and create a singular standard for application and equipment throughout the corridor for consistency.

IMPLEMENTATION

The next steps for implementing the proposed Middleton Road Corridor Plan are shown below.



The next step is the adoption of this plan by the Cities of Middleton and Caldwell and Canyon Highway District #4. Once this step is completed, right-of-way can be preserved along Middleton Road for future improvements. It is currently expected that additional right-of-way to implement the corridor plan will be acquired as part of the development of adjacent parcels along the corridor; though one or more of the agencies may also choose to purchase right-of-way.

Projects to implement the corridor plan are expected to be built as right-of-way is obtained and funds are available. This will likely occur as development occurs along Middleton Road. It is expected that additional details regarding the projects to be built along the corridor will be determined during more detailed design and analyses phases. These individual projects may result in some deviations from the specifics of this plan, but it is expected that the guiding principles and overall corridor vision will be adhered to as closely as is practical. There is currently no timeline for the buildout of the corridor.

Section 4
References

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