SECTION 4

Future Conditions

This section provides an analysis of potential transportation demand based on future population and employment growth and transportation system changes. The impacts of projected growth, as well as potential improvements to the existing transportation system, are presented below.

PROJECTED FUTURE CONDITIONS ANALYSIS

As described in Section 2, population and employment growth and transportation improvements are input into the regional travel demand model in order to create a projection of future traffic volumes on roadways and intersections. These projections are conducted for a "2040 No-Build" scenario, which assumes that no changes will be made to the transportation network; and a "2040 Build" scenario, which incorporates transportation projects that have been identified for construction on the system, which are expected to be constructed by 2040 (the list of projects included can be found in Appendix E).

The projected future conditions of roadways and intersections are evaluated using a simplified volume to capacity ratio estimate (see Section 3). These estimates are not based on the same Highway Capacity Manual calculation used to develop detailed intersection levels of service. Therefore, the volume-to-capacity ratios reported by the travel demand model should only be used in comparison with one another and not used to compare with volume-to-capacity ratios calculated by the Highway Capacity Manual procedures.

Although a significant number of intersections and roadway segments are identified as deficient in the 2040 No Build and 2040 Build, this does not necessarily mean that each of the road segments and intersections identified by the model will become congested beyond their design capacity. Instead, it is a forecast of *relative* potential problem areas that will need further consideration during the next MTP Update.

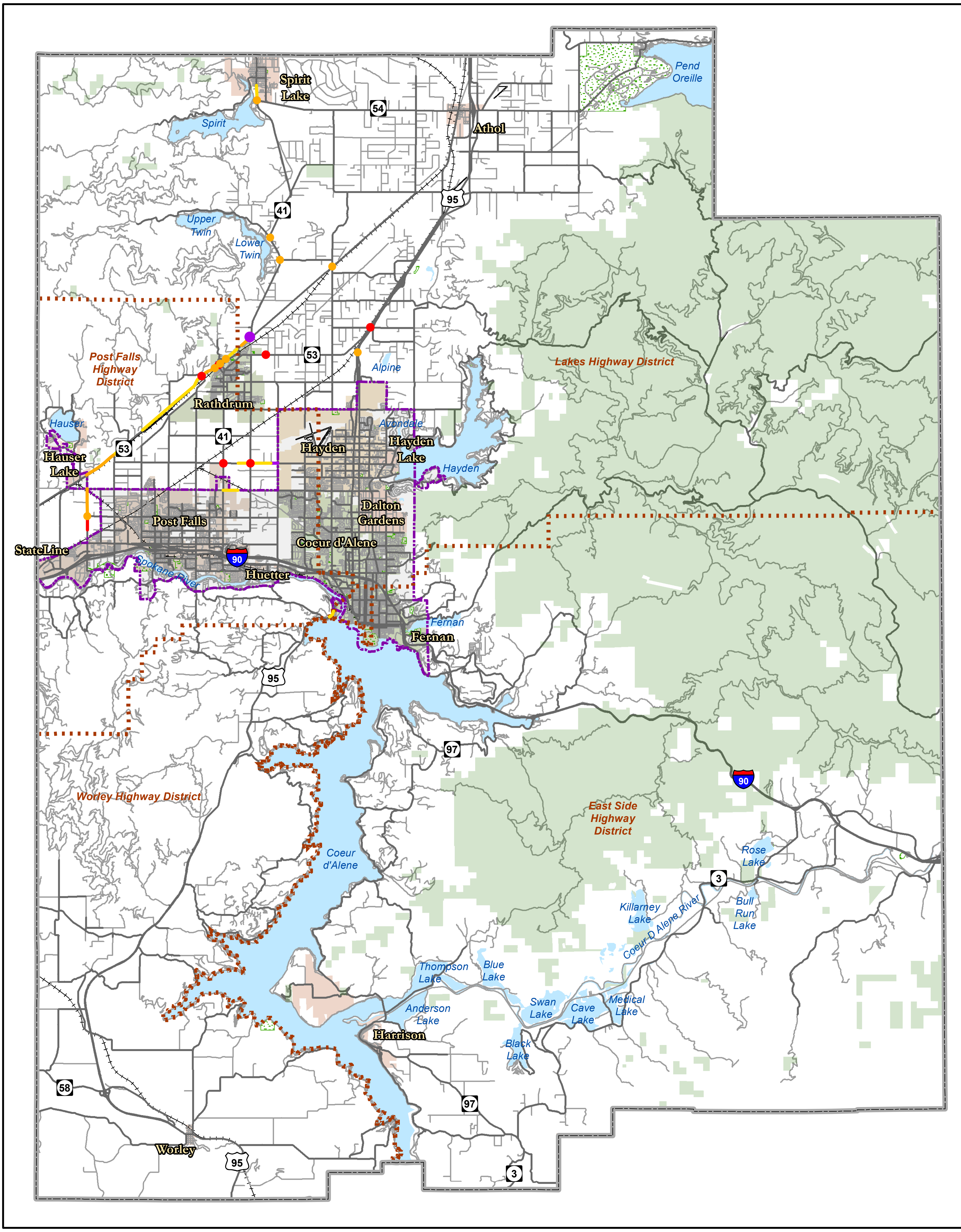
2040 NO-BUILD MODEL

While it is unlikely that not one single roadway improvement will be made between the 2018 base year and 2040, the No-Build scenario assumes just that. This allows for a direct comparison of the impacts of future growth on the current street system against the proposed system (2040 Build).

Roadways and intersections projected to be congested in the 2040 No-Build scenario are presented in Figures 4.1 – 4.2. Tables of the results can be found in Appendix D.

The 2040 No-Build model VISUM version file used for this MTP update is KMPO_2040_NoBuild 12-31-19.

KOOTENAI METROPOLITAN TRANSPORTATION PLAN
2020 - 2040



N
W E
S

0 1 2 4 6 8

Miles

FUTURE CONDITIONS 2040 NO BUILD MODEL AM PEAK LEVEL OF SERVICE, KOOTENAI COUNTY

Link V/C Ratios
- Level C - >70%
- Level D - >80%
- Level E - >90%
- Level F - >100%

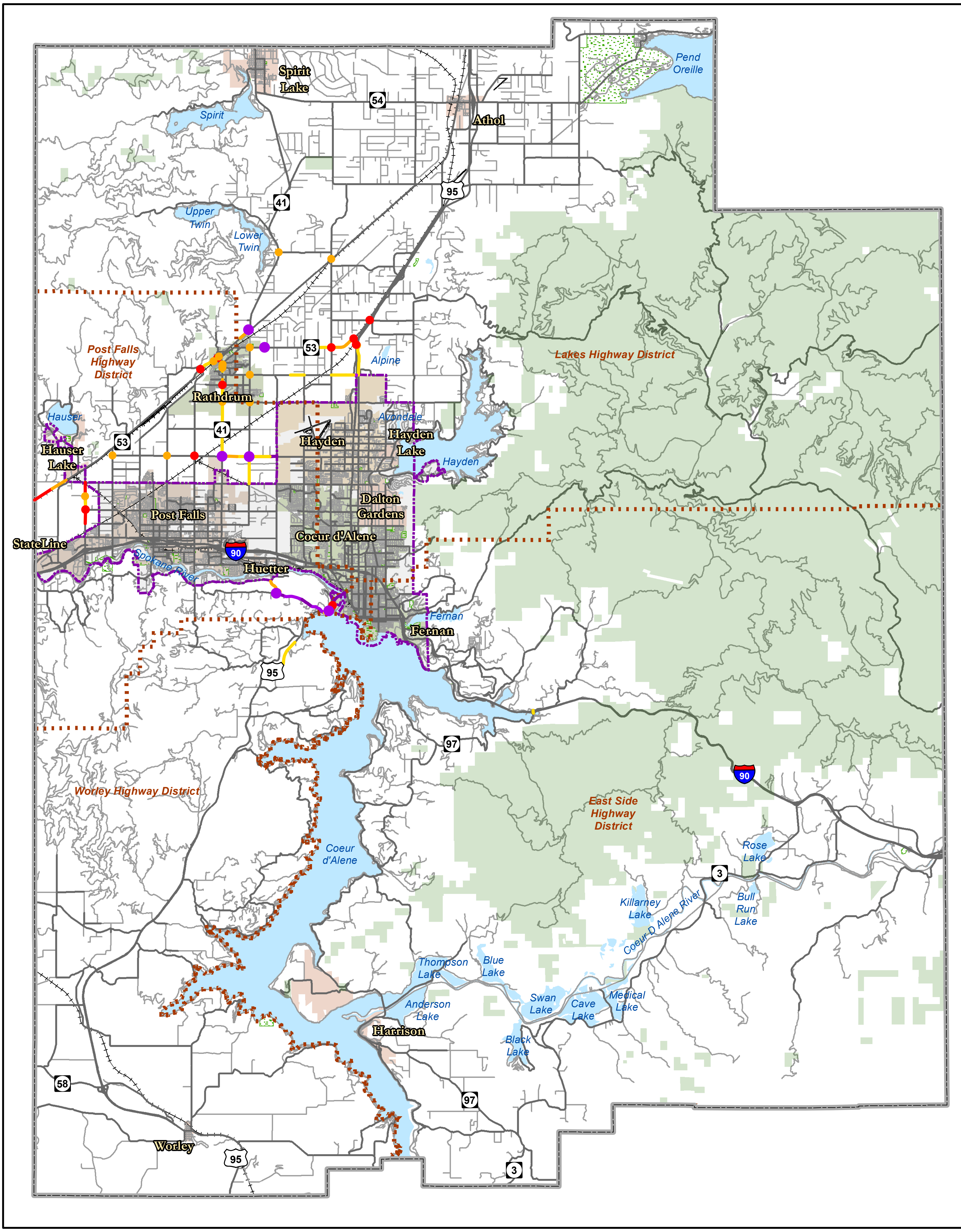
Node V/C Ratios
- >80%
- >90%
- >100%

Physical Characteristics
- Highway Districts
- Roads
- Railroad
- Urban Area Boundary
- County Boundary
- National Forests
- Water_Features
- Parks

*Data based on best available information.*Data for illustrative purposes only.

Figure 4.1a

KOOTENAI METROPOLITAN TRANSPORTATION PLAN
2020 - 2040



FUTURE CONDITIONS 2040 NO BUILD MODEL
PM PEAK LEVEL OF SERVICE, KOOTENAI COUNTY

N
W E
S

0 1 2 4 6 8
Miles

Kootenai MPO

Link V/C Ratios
- Level C - >70%
- Level D - >80%
- Level E - >90%
- Level F - >100%

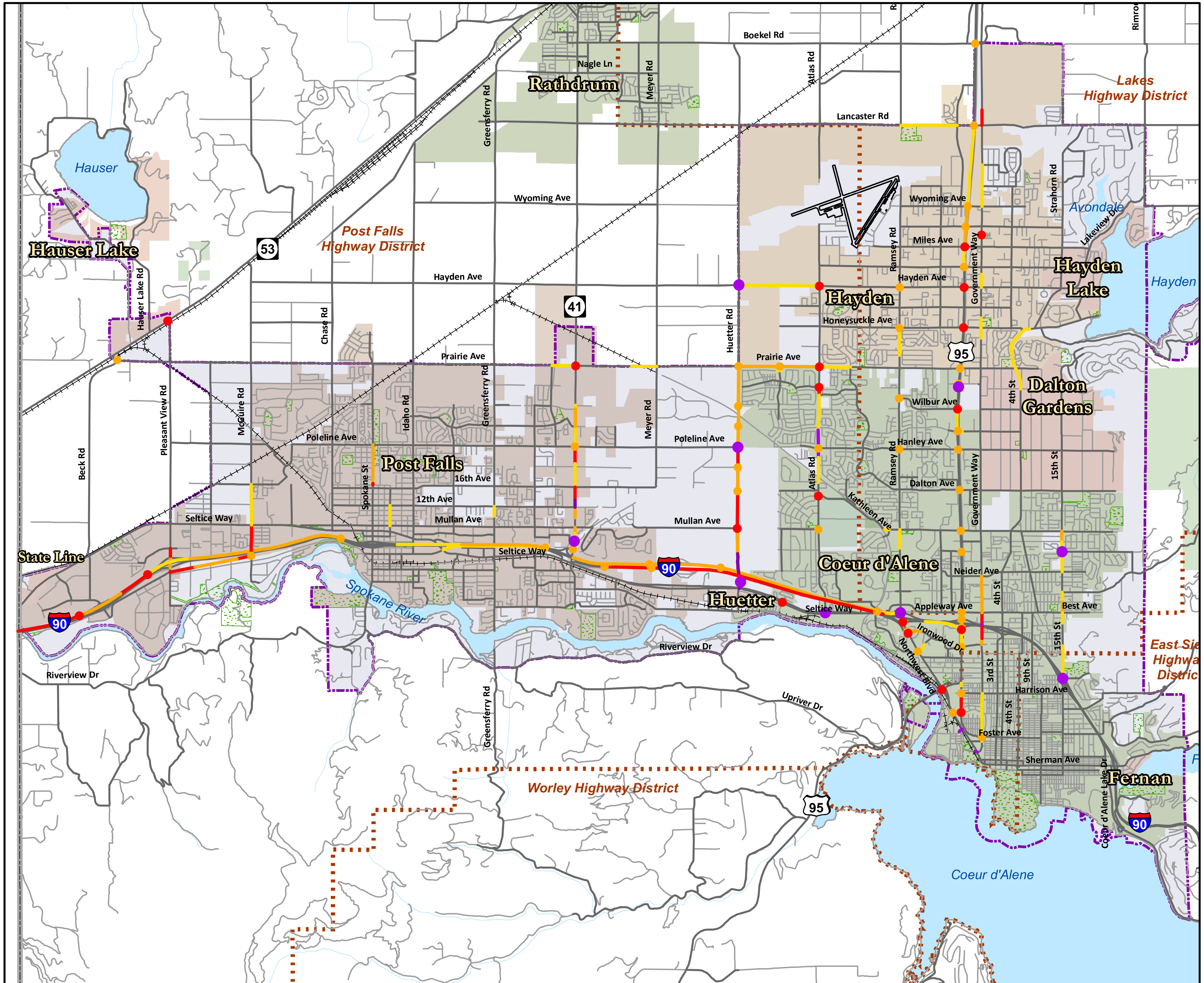
Node V/C Ratios
- > 80%
- > 90%
- >100%

Physical Characteristics
- Highway Districts
- Roads
- Railroad
- Urban Area Boundary
- County Boundary
- National Forests
- Water_Features
- Parks

*Data based on best available information.*Data for illustrative purposes only.

Figure 4.1b

Figure 4.2a



KOOTENAI METROPOLITAN TRANSPORTATION PLAN
2020 - 2040

FUTURE CONDITIONS 2040 NO BUILD AM PEAK LEVEL OF SERVICE, URBAN AREA

Link V/C Ratios

- Level C - >70%
- Level D - >80%
- Level E - >90%
- Level F - >100%;

Node V/C Ratios

- > 80%
- > 90%
- >100%

Physical Characteristics

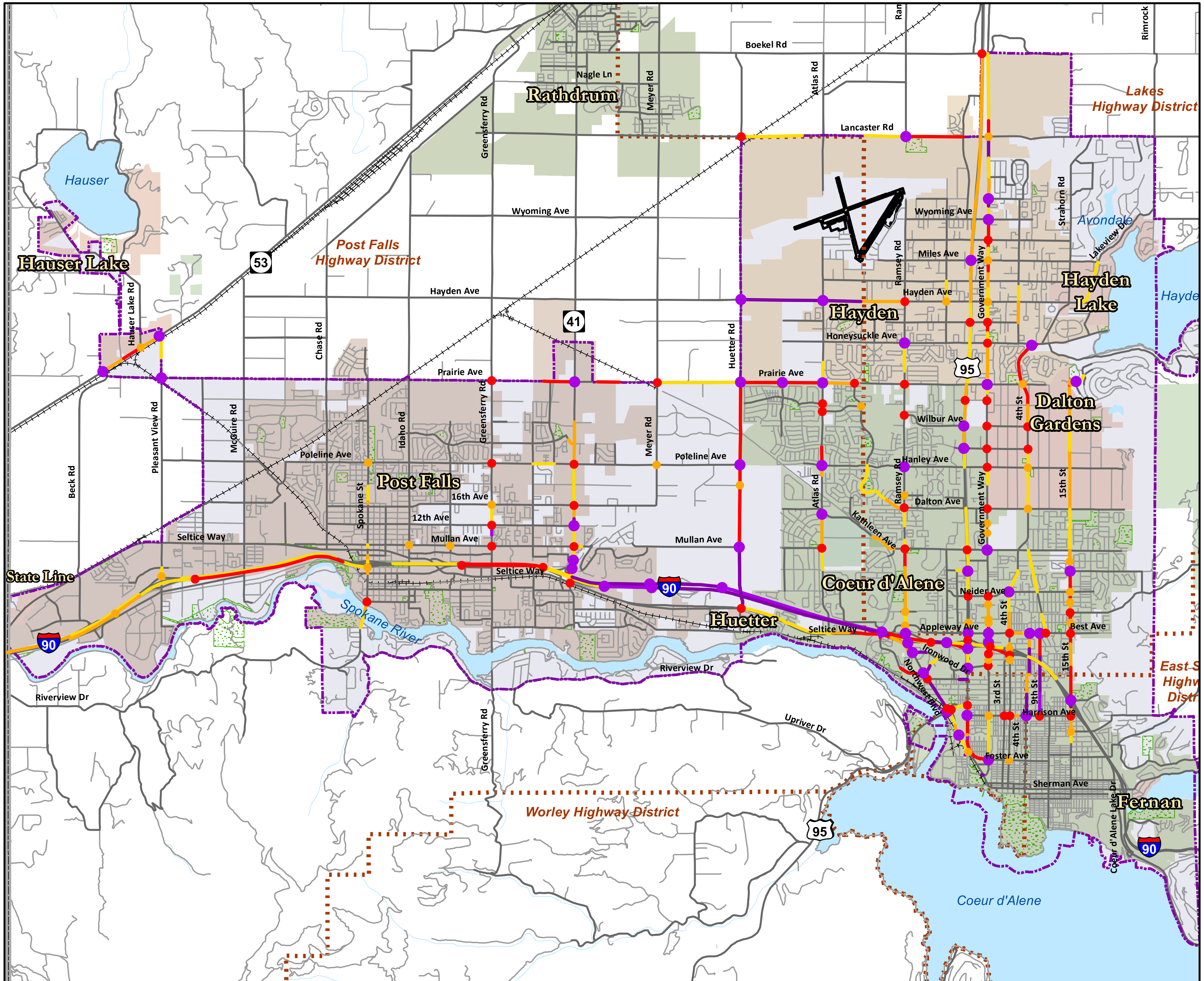
- Highway Districts
- Roads
- Railroad
- County Boundary
- Urban Area Boundary
- National Forests
- Water_Features
- Parks

N W E S

0 0.275 0.55 1.1 1.65 2.2
Miles

Kootenai MPO

*Data based on best available information. *Data for illustrative purposes only.



KOOTENAI METROPOLITAN TRANSPORTATION PLAN
2020 - 2040

FUTURE CONDITIONS 2040 NO BUILD PM PEAK LEVEL OF SERVICE, URBAN AREA

Link V/C Ratios

- Level C - >70%
- Level D - >80%
- Level E - >90%
- Level F - >100%

Node V/C Ratios

- \> 80%
- \> 90%
- \>100%

Physical Characteristics

- Highway Districts
- Roads
- Railroad
- County Boundary
- Urban Area Boundary
- National Forests
- Water_Features
- Parks

N E S W

0 0.25 0.5 1 1.5 2
Miles

Kootenai MPO

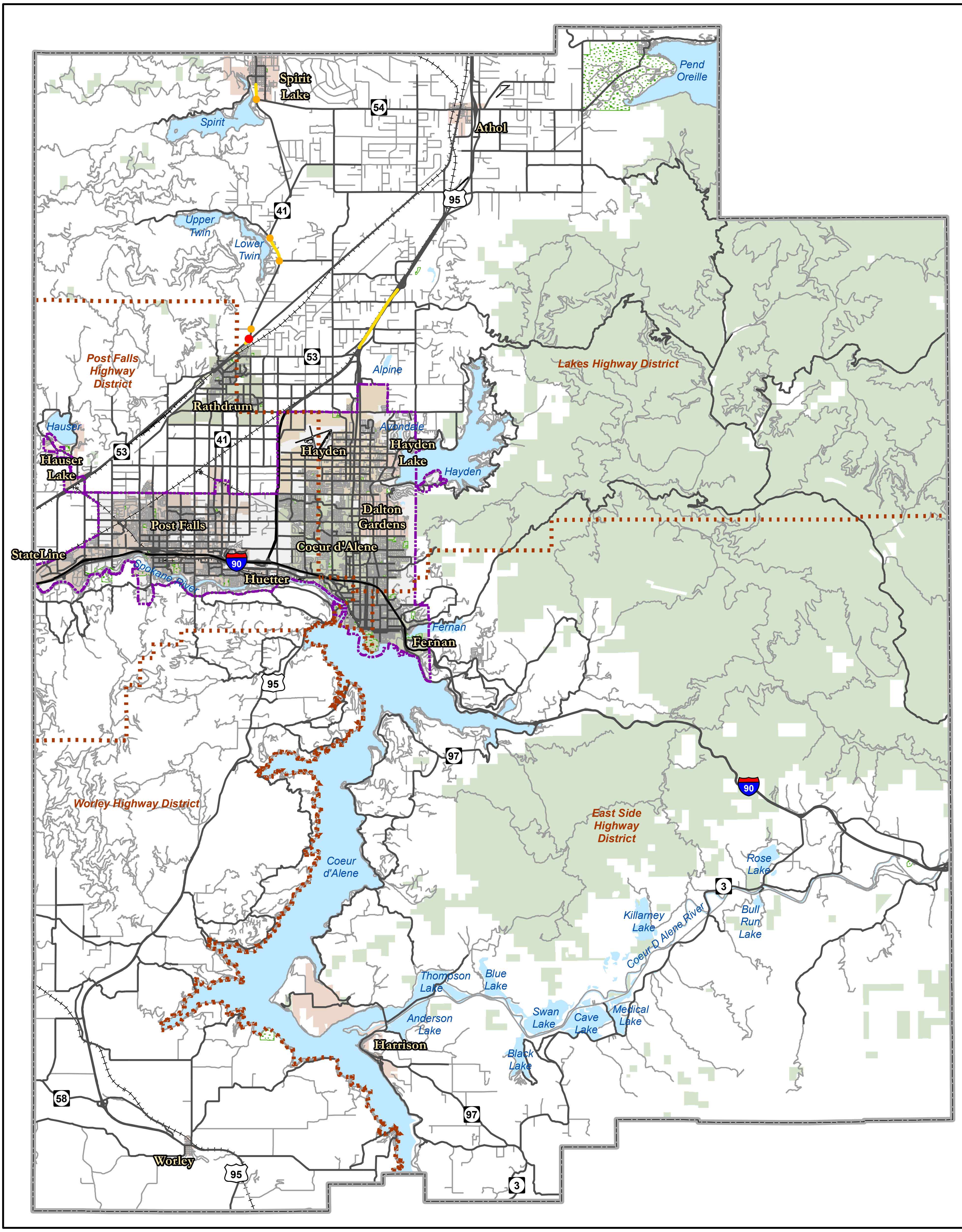
*Data based on best available information. *Data for illustrative purposes only.

2040 BUILD MODEL

The 2040 Build scenario incorporates planned transportation improvement projects to the 2018 base roadway network. A detailed list of included projects can be found in Appendix E. This scenario is compared directly against the 2040 No-Build scenario in order to evaluate the composite regional impact of planned projects. Roadways and intersections projected to be congested in 2040 are presented in Figures 4.3-4.4. Tables of the detailed information can be found in Appendix D.

The 2040 Build model VISUM version file used for this MTP update is KMPO_2040_Build 1-21-20.

KOOTENAI METROPOLITAN TRANSPORTATION PLAN
2020 - 2040



FUTURE CONDITIONS 2040 BUILD MODEL
AM PEAK LEVEL OF SERVICE, KOOTENAI COUNTY

0 1 2 4 6 8
Miles

Kootenai MPO

Link V/C Ratios
- Level C - > 70%
- Level D - > 80%
- Level E - > 90%
- Level F - > 100%

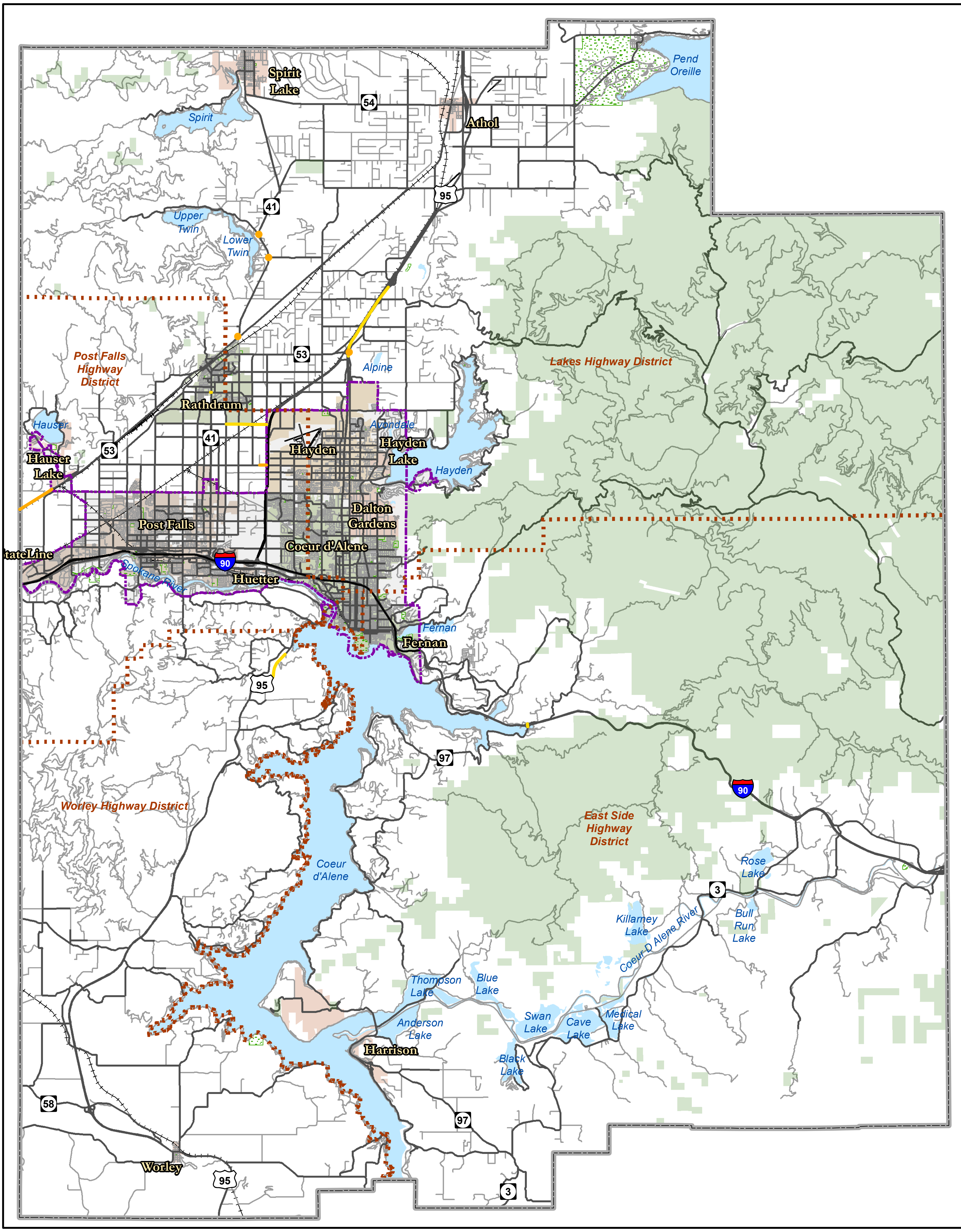
Node V/C Ratios
- > 80%
- > 90%
- >100%

Physical Characteristics
- Highway Districts
- Roads
- Railroad
- Urban Area Boundary
- County Boundary
- National Forests
- Water_Features
- Parks

*Data based on best available information.*Data for illustrative purposes only.

Figure 4.3a

KOOTENAI METROPOLITAN TRANSPORTATION PLAN
2020 - 2040



N
W E
S

0 1 2 4 6 8
Miles

Kootenai MPO

FUTURE CONDITIONS 2040 BUILD MODEL
PM PEAK LEVEL OF SERVICE, KOOTENAI COUNTY

Link V/C Ratios
- Level C - > 70%
- Level D - > 80%
- Level E - > 90%
- Level F -> 100%

Node V/C Ratios
- > 80%
- > 90%
- > 100%

Physical Characteristics
- Highway Districts
- Roads
- Railroad
- Urban Area Boundary
- County Boundary
- National Forests
- Water_Features
- Parks

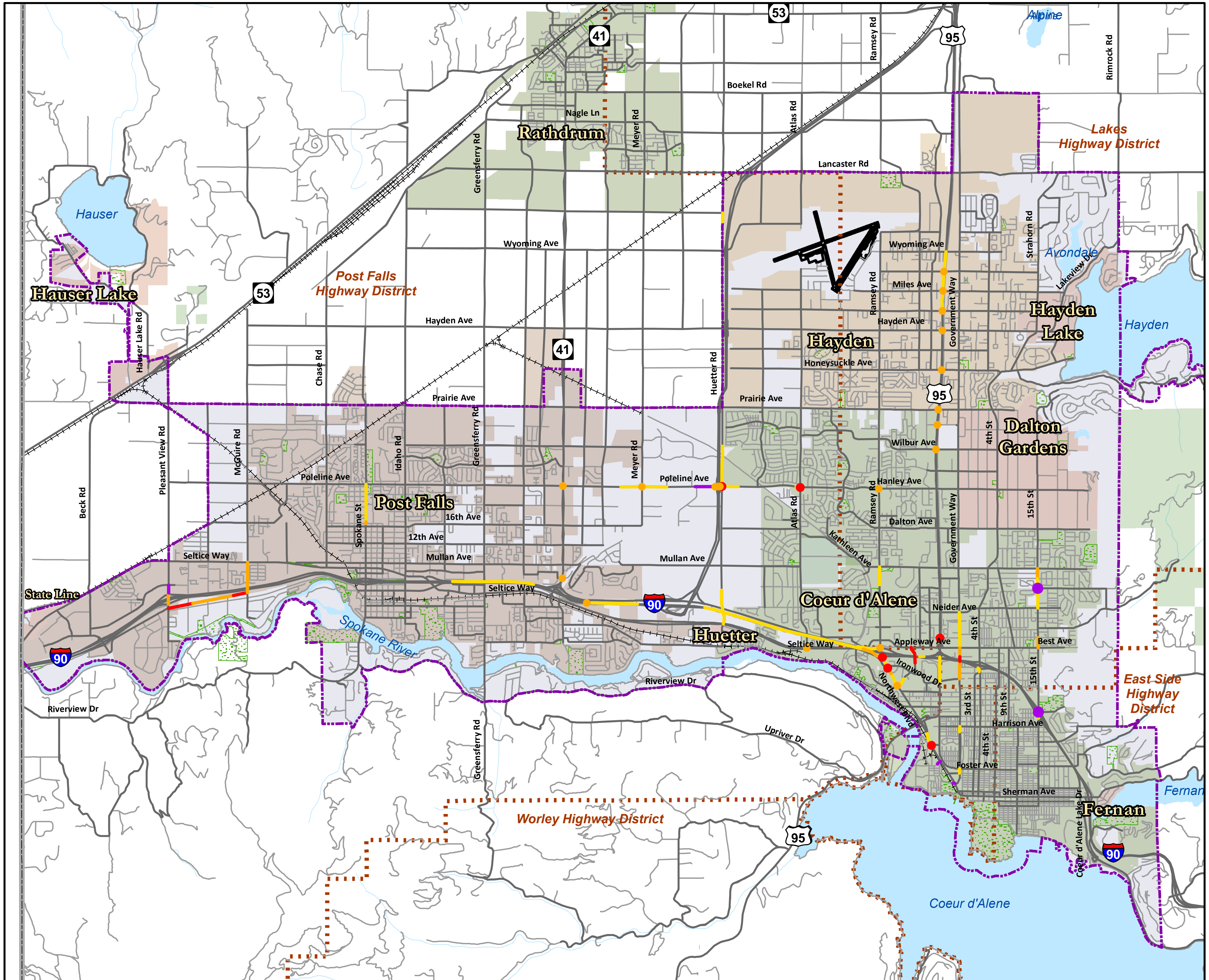
*Data based on best available information.*Data for illustrative purposes only.

Figure 4.3b

Figure 4.4a

KOOTENAI METROPOLITAN TRANSPORTATION PLAN 2020 - 2040

FUTURE CONDITIONS 2040 BUILD AM PEAK LEVEL OF SERVICE, Urban Area



Link V/C Ratios

- Level C - > 70%
- Level D - > 80%
- Level E - > 90%
- Level F - >100%

Node V/C Ratios

- > 80%
- > 90%
- >100%

Physical Characteristics

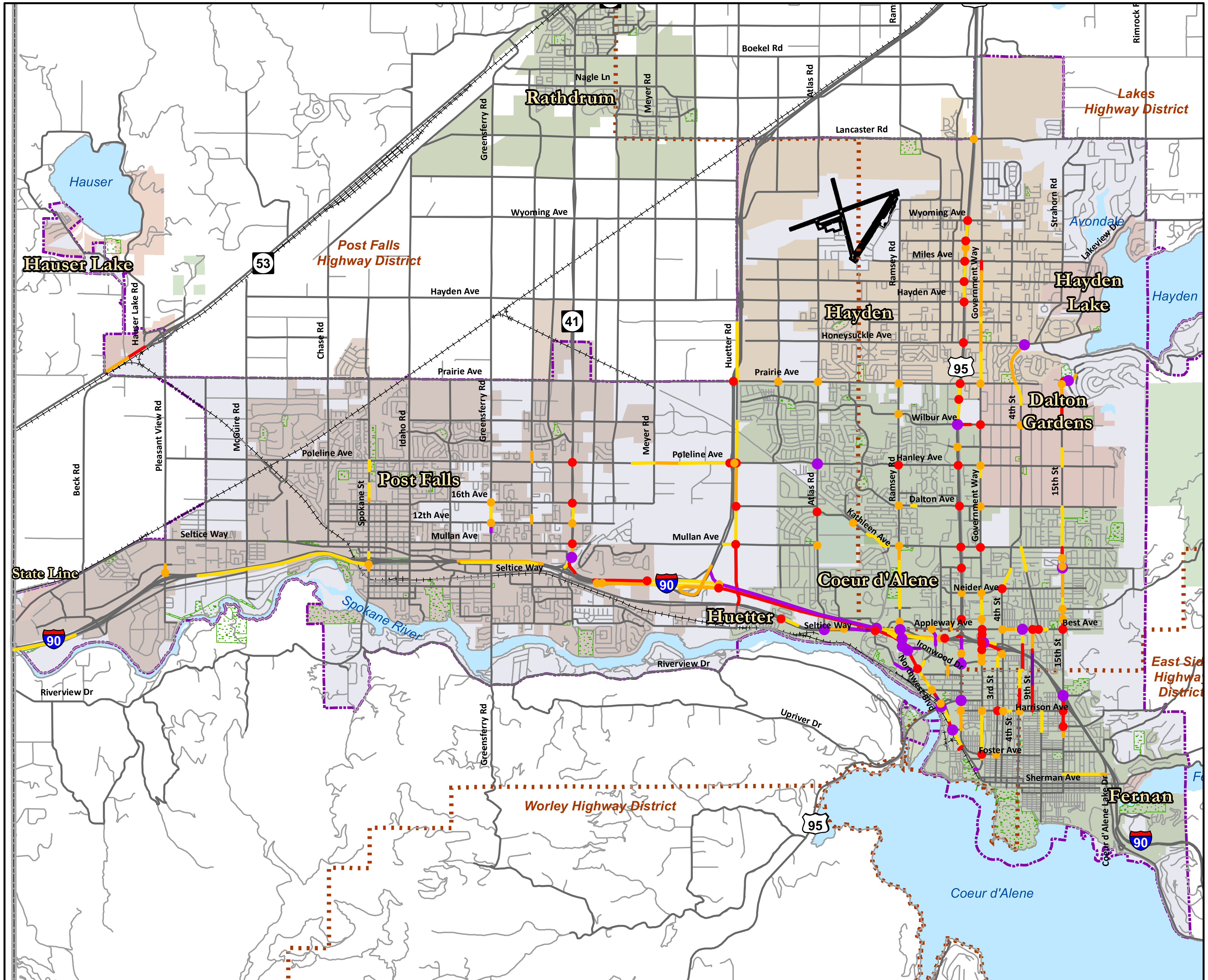
- Highway Districts
- 2040Build_PM_link
- Railroad
- County Boundary
- Urban Area Boundary
- National Forests
- Water_Features
- Parks

N W E S

0 0.275 0.55 1.1 1.65 2.2 Miles

Kootenai MPO

*Data based on best available information. *Data for illustrative purposes only.



KOOTENAI METROPOLITAN TRANSPORTATION PLAN
2020 - 2040

FUTURE CONDITIONS 2040 BUILD PM PEAK LEVEL OF SERVICE, URBAN AREA

Link V/C Ratios

- Level C - > 70%
- Level D - > 80%
- Level E - > 90%
- Level F - > 100%

Node V/C Ratios

- > 80%
- > 90%
- >100%

Physical Characteristics

- Highway Districts
- 2040Build_PM_link
- Railroad
- County Boundary
- Urban Area Boundary
- National Forests
- Water_Features
- Parks

N W E S

0 0.25 0.5 1 1.5 2
Miles

Kootenai MPO

*Data based on best available information. *Data for illustrative purposes only.

FINDINGS

As expected, roadways and intersections on the regional transportation system will be overwhelmed by increased travel demand by both personal vehicles and freight carriers by the year 2040. Table 4.1 illustrates the modeled changes of PM Peak Hour Conditions from 2018 to 2040. The emerging congestion seen today at isolated locations will be much more prevalent and pervasive, as heavily used highways and arterials exceed their capacity and motorists seek to find alternative routes to avoid excessive congestion and delay. This is expected to be true for both the No-Build and Build conditions.

Tables D.6 and D.10, found in Appendix D, provide percent of capacity used on roadway segments exceeding 70% within Kootenai County on both State highways and local roads. These tables indicate that, by 2040, sixty (60) roadway segments are expected to exceed their design capacity during the evening peak hour in the No-Build scenario; while twenty-five (25) roadway segments are expected to exceed their design capacity during the evening peak hour, even with major transportation investments. The figures below illustrate the breakdown of congested road segments by percent of capacity used.

Table 4.1 Changes in PM Peak Hour Conditions 2018 to 2040

	2018 Existing	2040 Build	2040 No Build
Population	166,667	304,234	
Dwelling Units	64,858	117,471	
Employment	55,804	93,648	
Number of Trips	58,206	100,377	
Vehicle Miles Traveled (VMT)	374,354 mi.	615,485 mi.	587,543 mi.
Vehicle Hours Traveled (VHT)	10,424 hrs.	21,307 hrs.	26,078 hrs.

Figure 4.5 Number of Congested Road Segments by Percent of Capacity Used, 2040 No Build

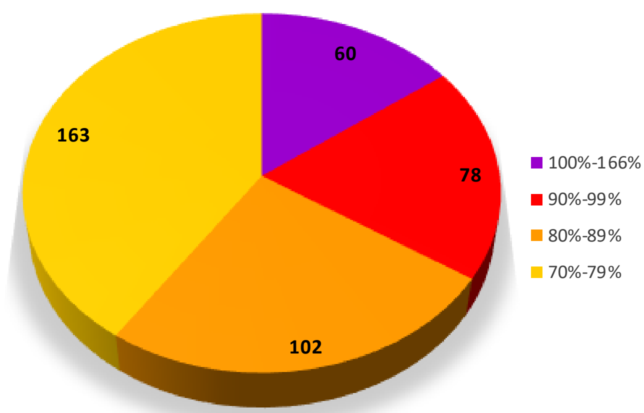
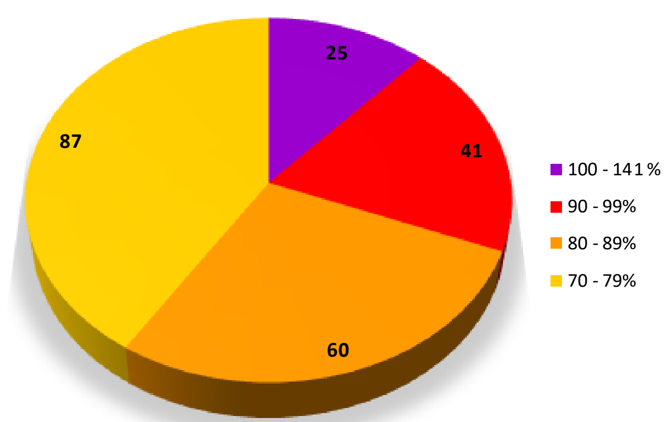


Figure 4.6 Number of Congested Road Segments by Percent of Capacity Used, 2040 Build



A similar but more significant issue arises at intersections along these highly congested corridors. Tables D.8 and D.11, found in Appendix D, provide the percent of capacity used at roadway intersections exceeding 80% within Kootenai County on both State highways and local roads. The tables indicate that, by 2040, ninety-two (92) roadway intersections are expected to exceed their design capacity during the evening peak hour in the No-Build scenario; while nineteen (19) intersections are expected to exceed their design capacity during the evening peak hour, even with major transportation investments. Limiting the number of intersections exceeding their capacity, as represented in the Build scenario, would be accomplished by directing vehicles to higher capacity highways and arterials that have more limited access, which would then reduce hours of delay created at intersections. The figures below illustrate the breakdown of congested intersections by percent of capacity used.

The analysis of future growth forecasts indicates that, with the Build scenario, there will be a positive change by lessening the conditions of severity, as local, state and federal resources become available to make strategic investments that will be necessary to maintain the regional transportation system's reliability. As such, regionally significant transportation investments, transportation system management measures, and improved collaboration among transportation, economic development, and land use decision makers will be necessary to ensure the timing and location of major infrastructure is consistent with desired development patterns.

Figure 4.7 Number of Congested Intersections by Percent of Capacity Used,2040 No Build

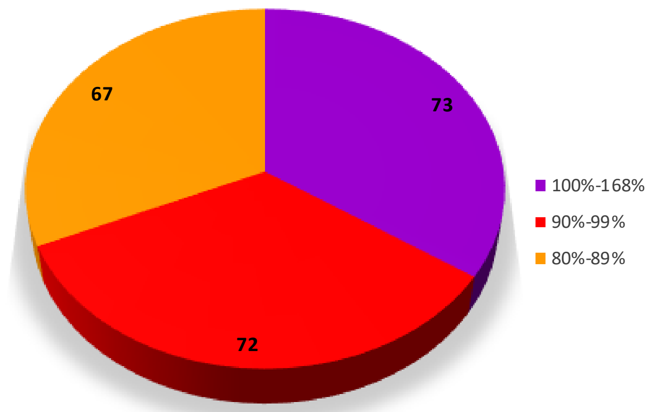
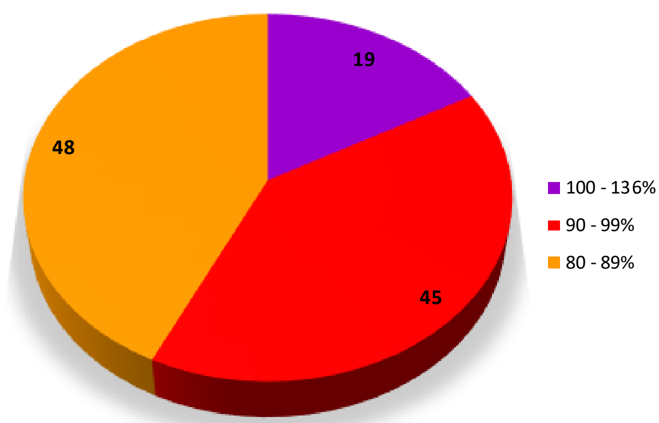


Figure 4.8 Number of Congested Intersections by Percent of Capacity Used,2040 Build



FUTURE DEVELOPMENT OF ALTERNATIVE MODES OF TRANSPORTATION

Separate regional plans have been developed for additional modes of transportation such as bike, pedestrian and public transportation (as discussed in Section 3). Each demonstrates their unique and essential role to the regional transportation system. Unfortunately, due to their small size and limited data, there is limited ability to evaluate them using the VISUM model.

Their ability to contribute to meeting current and upcoming regional transportation demands are challenged by the lack of sustainable local, state, and federal funding programs to support ongoing capital investments, operations, and maintenance. Weather also plays a significant role in their ability to make a substantial difference in reducing the reliance on automobiles.