Appendix C – Roadway Analysis and Methodology for the 2035 MTP

Roadway Analysis Tools

Roadway analysis tools used by MRMPO include traffic and transportation data collection, travel forecasting using sophisticated models and Geographic Information Systems (GIS) analysis tools that integrate spatial elements with travel statistics. Data from the Traffic Counts Program, which consists of more than two decades of system traffic monitoring statistics, is used to analyze historical trends in roadway travel in order to help make projections about future travel scenarios. GIS-based analysis tools are used to expand the capabilities of traditional model-based travel analysis to integrate alternative mode and transit travel and to identify opportunities for expanding transportation options for the public.

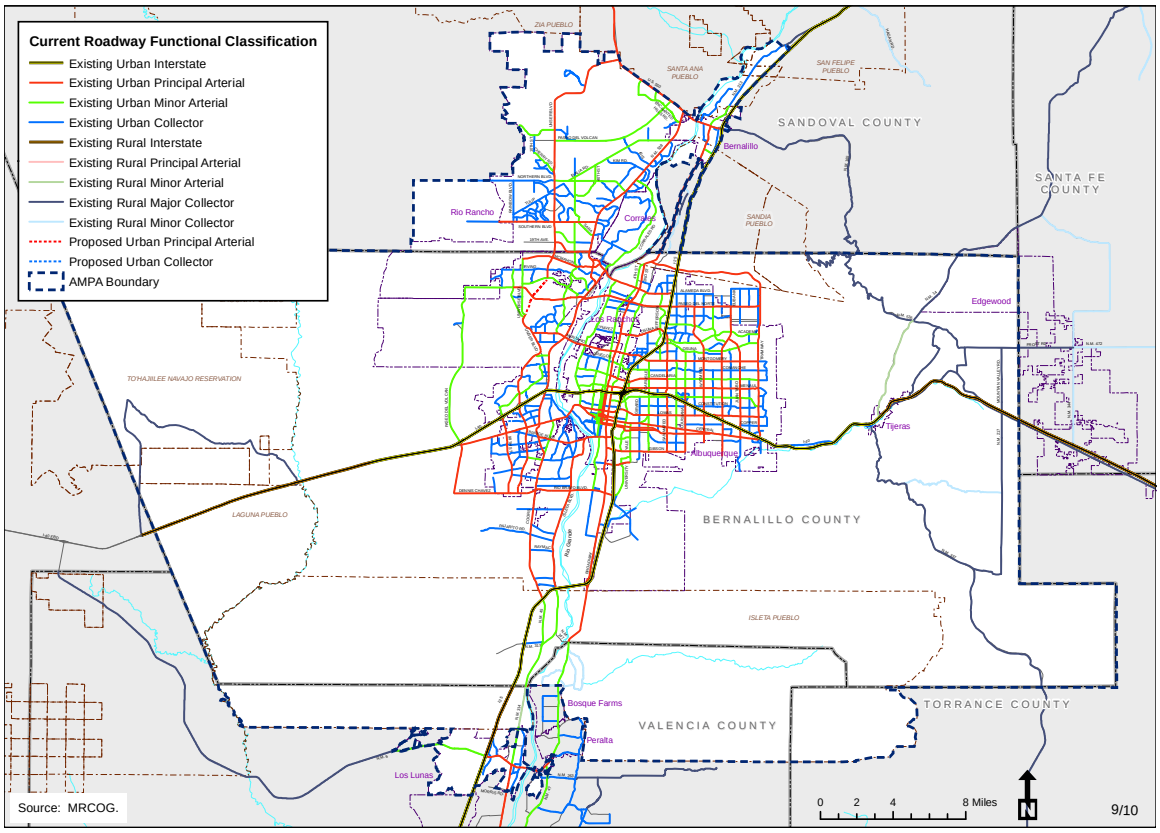
Traffic Monitoring

Monitoring traffic conditions is one of MRMPO's ongoing responsibilities. The Traffic Counts Program monitors volume on all federal-aid eligible roadways in the counties of Bernalillo, Torrance, Sandoval and Valencia (see Map C-1). The program counts approximately 2,800 roadway segments (80 percent of which are within the AMPA) over a three-year period. Average Annual Weekday Traffic counts (AWDT) are collected based on 48-hour short-term tube counts, which form the basis of the program. The program contains quality screening criteria that ensure the data collected is representative of a typical "weekday" and does not include any anomalies related to incidents, weather or atypical travel conditions.

Traffic volume data collection supports several key planning functions such as the Congestion Management Process (CMP), project level forecast and analyses, validation of the travel demand model, assuring that appropriate federal formula funds come to the area, meeting the State's data collection and reporting requirements, air quality monitoring and crash data analysis.

Traffic volume data is reported in the annual Traffic Flow Map (available on the MRCOG website under Technical Services) and more detailed summary statistics are routinely shared with private developers, government agencies and interest groups. In addition, the counts database provides insight into the actual patterns of traffic flow on the AMPA system. For example, the historical trends monitored at key network locations such as river crossings and the Big-I provide insight into the magnitude of past travel demand, which can frame the analysis of future travel conditions identified with the travel demand model.

Map C-1: Current Roadway Functional Classification Map



The Traffic Counts Program is increasing its capacity to analyze continuous count data, particularly from permanent count stations located on identified congested corridors throughout the AMPA. The benefit of continuous count data over short-term tube count data is that these permanent count stations allow planners to analyze non-recurring and special event congestion, as well as other events that would not necessarily be saved as part of the normal data collection process. In addition, continuous count data complements MRMPO's 48-hour counts by allowing for more accurate adjustment factors. Through ongoing coordination with NMDOT Intelligent Transportation Systems (ITS) Operations, MRMPO now has access to archived data collected for 75 stations. MRMPO planners are also pursuing traffic data collected by the City of Albuquerque and are working with other municipal agencies to improve data collection along congested facilities. Updates to the TIP Policies and Procedures document and the ITS Regional Architecture stress the importance of data collection for congestion management and regional planning.

Travel Demand Model

MRMPO's travel demand model is a computer program that relies on a complex set of data inputs and scripting programs in a GIS environment to predict traffic conditions in the AMPA in future years. A major component of the MTP development involves modeling future transportation scenarios. This modeling allows the roadway system performance to be evaluated prior to project programming and implementation. The model's base year data assumptions reflect local agencies' efforts, through their participation in MRMPO's planning process.

The base year conditions establish a reference for the evaluation of future travel conditions allowing appropriate system capacity expansion projects to be identified and programmed accordingly. In the case of the 2035 MTP, the 2008 base year scenario was established using current socioeconomic conditions (population, housing, and jobs), as well as the current roadway network (including number of lanes, speeds and roadway type/functional classification). Next, anticipated socioeconomic growth datasets for each of the interim years of the MTP are combined with transportation network scenarios in the travel model in order to evaluate system performance and identify additional infrastructure needs.

Scenarios depicting *no-build* conditions are used to evaluate system deficiencies and identify the location and type of system expansions needed to serve areas of new growth. *No-build* scenarios include anticipated socioeconomic conditions and the current roadway network along with projects that have committed funding. The *no-build* scenario therefore shows how the roadway network would function in the absence of additional infrastructure investments.

Build scenarios include the same elements as the *no-build* scenarios (socioeconomic, existing network conditions and committed projects), but also include planned transportation projects identified to meet the modeled travel demand. Planned transportation projects are identified and interim networks are developed based on the timeframe in which projects are likely to be constructed. This process establishes *build* scenarios for each MTP forecast year (2015, 2025, and 2035). It is through this iterative process that transportation projects are programmed for implementation in each MTP interim year and a program is created for the MTP.

Periodically, the data and methodology assumptions included in the travel demand model are updated through a process known as model "validation." This process involves review of all background travel data inputs, calculations and travel characteristics to ensure accurate replication (modeling) of the travel patterns in the region. This process was completed for the MRMPO travel model in early 2010. For a link to the validation report visit the MRCOG website at www.mrcog-nm.gov and click on the Technical Services link.

Roadway Performance by MTP Scenario Year

Roadway network performance was analyzed for each of the proposed scenario years (2015, 2025, and 2035) for the 2035 MTP. The roadway network scenarios have been developed for both *no-build* and *build* conditions. *No-build* scenarios are those that do not include programmed projects. Build scenarios are those that show how the roadway network would perform with the addition of programmed projects. Build and *no-build* scenario comparisons for years 2015, 2025 and 2035 are provided below. Conditions for future years are compared against existing conditions in the 2008 base year.

Year 2015 Roadway Scenarios

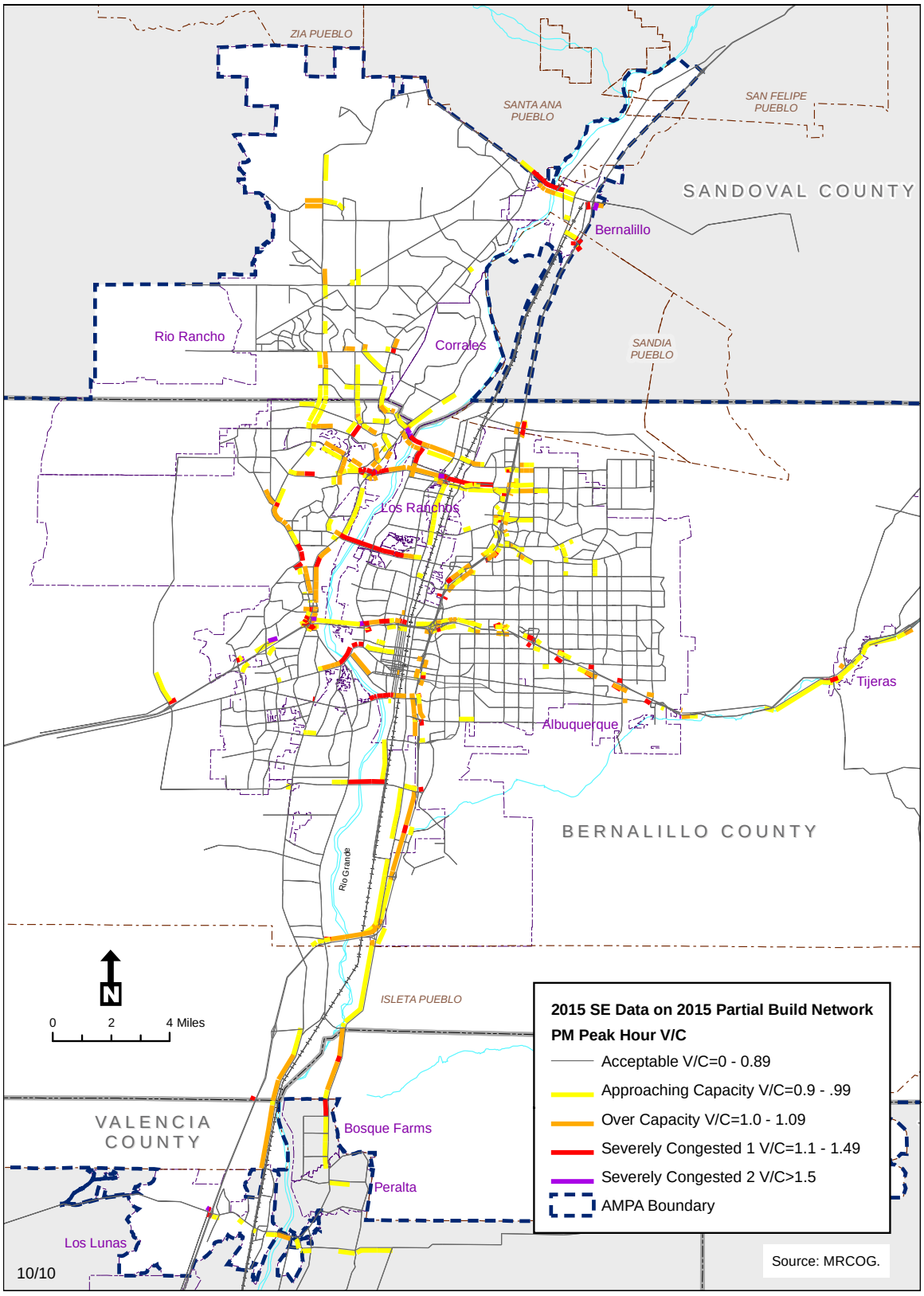
The 2015 scenario map depicts the near-term committed projects that are programmed in the current 2010-2015 Transportation Improvement Program (TIP). A comparison with 2008 base year conditions shows that although congestion levels increase with projected socioeconomic growth, the *build* network does in large part mitigate this growth with reduced levels of roadway congestion. A comparison between the 2008 base scenario and 2015 *no-build* and 2015 *build* scenarios for PM peak-hour roadway performance measures is shown in Table C-1.

Table C-1: Roadway Performance Differences in 2008 and 2015 (Build and No-build) Modeling Scenarios

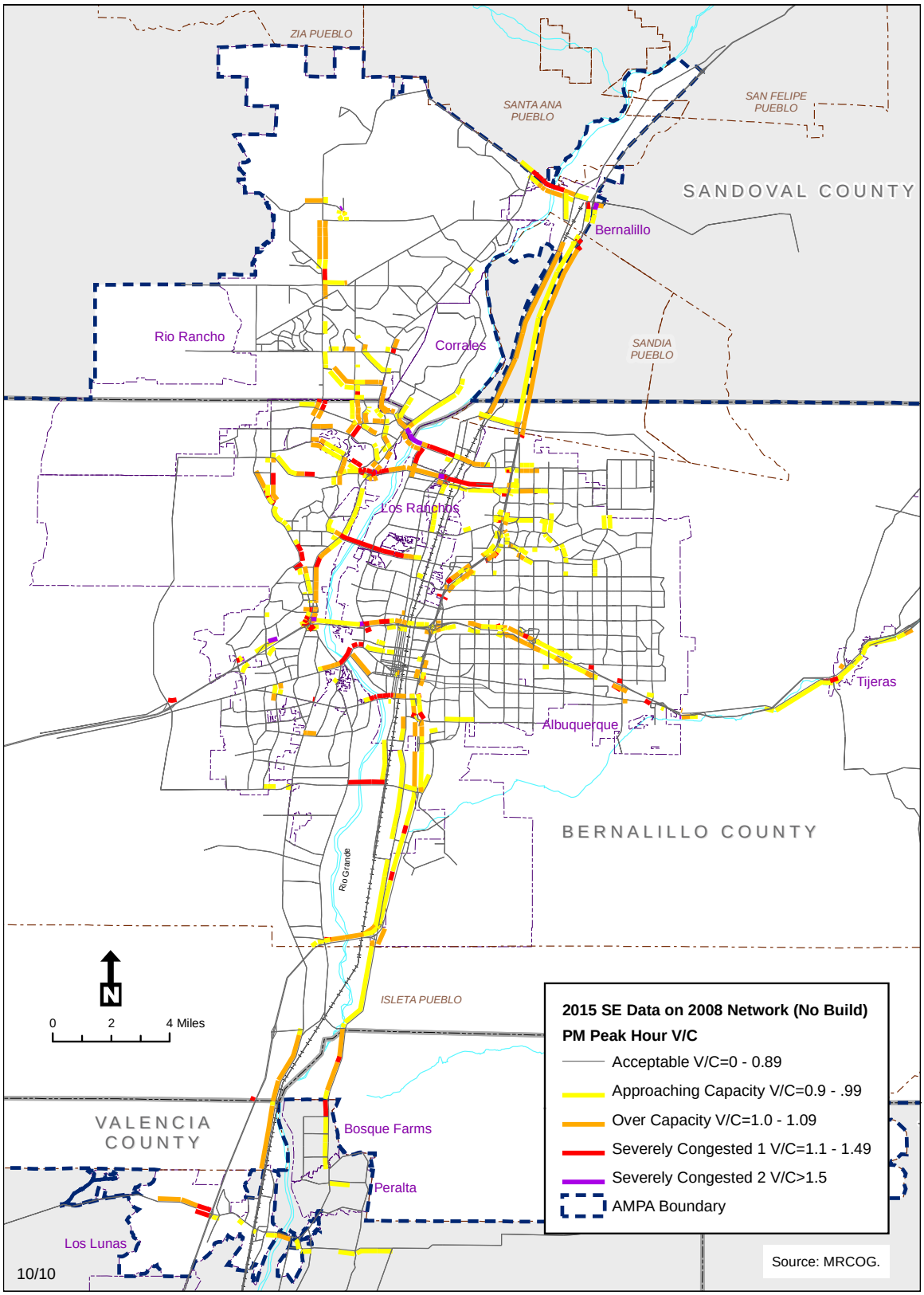
PM Peak Hour	2008	2015 No-build	2015 Build	Percent Difference (2015 Build to 2015 No-build)
Vehicle Hours Traveled	42,634	59,318	56,529	-4.7%
Vehicle Miles Traveled	1,568,108	1,833,249	1,833,233	0.0%
Vehicle Hours of Delay	8,855	18,573	16,813	-9.5%
Average Speed (mph)	36.8	30.9	32.4	5%

Map C-2 shows the 2015 *build* scenario PM peak-hour volume-to-capacity ratios. When comparing the 2015 *build* scenario to the same maps for the 2008 base year and the 2015 *no-build* scenario (see Map C-3), the effectiveness of the 2015 *build* scenario is apparent. It is important to note that although both vehicle hours traveled and vehicle miles traveled show minimal change, the improvement in vehicle hours of delay, as well as improvements to average speeds experienced by travelers, is considerable.

Map C-2: 2015 Build PM Peak Hour Volume to Capacity



Map C-3: 2015 No-Build PM Peak Hour Volume to Capacity



Year 2025 Roadway Scenarios

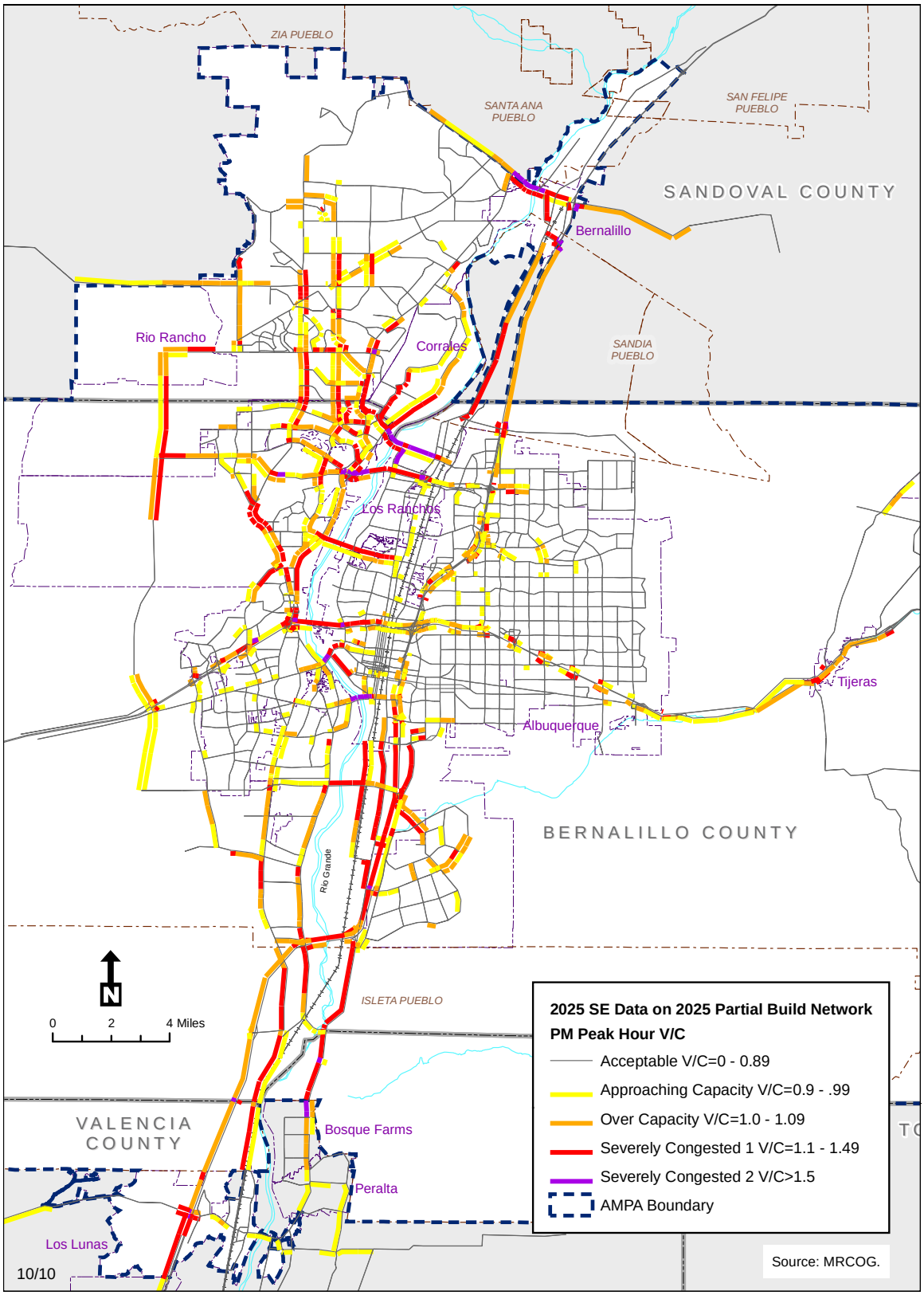
The 2025 scenario map depicts roadway conditions in the interim MTP year. This timeframe includes projects that are beyond the current TIP but that have been identified for future implementation by sponsoring agencies through mechanisms such as ten-year Capitol Improvement Programs (CIPs), bonding or other methods. Projects included in this timeframe can be in various stages of mid and long-term planning.

Differences in the 2025 scenario and the 2008 base year clearly show the impact of projected population growth and associated travel demand on the transportation system and the formidable challenges associated with meeting that demand. However, the 2025 *build* scenario does demonstrate meaningful improvements to the roadway network as vehicle hours of travel and vehicle hours of delay are significantly lower in the 2025 *build* scenario compared to the 2025 *no-build* conditions. A review of Map C-4 and Map C-5 shows these differences geographically. One noteworthy comparison involves the portions of Rio Rancho where planned network expansion absorbs anticipated travel demand growth. Other interesting additions are the privately funded Mesa del Sol network expansion and new connections on the Westside of the metro area in the vicinity of Double Eagle II north of Paseo del Norte.

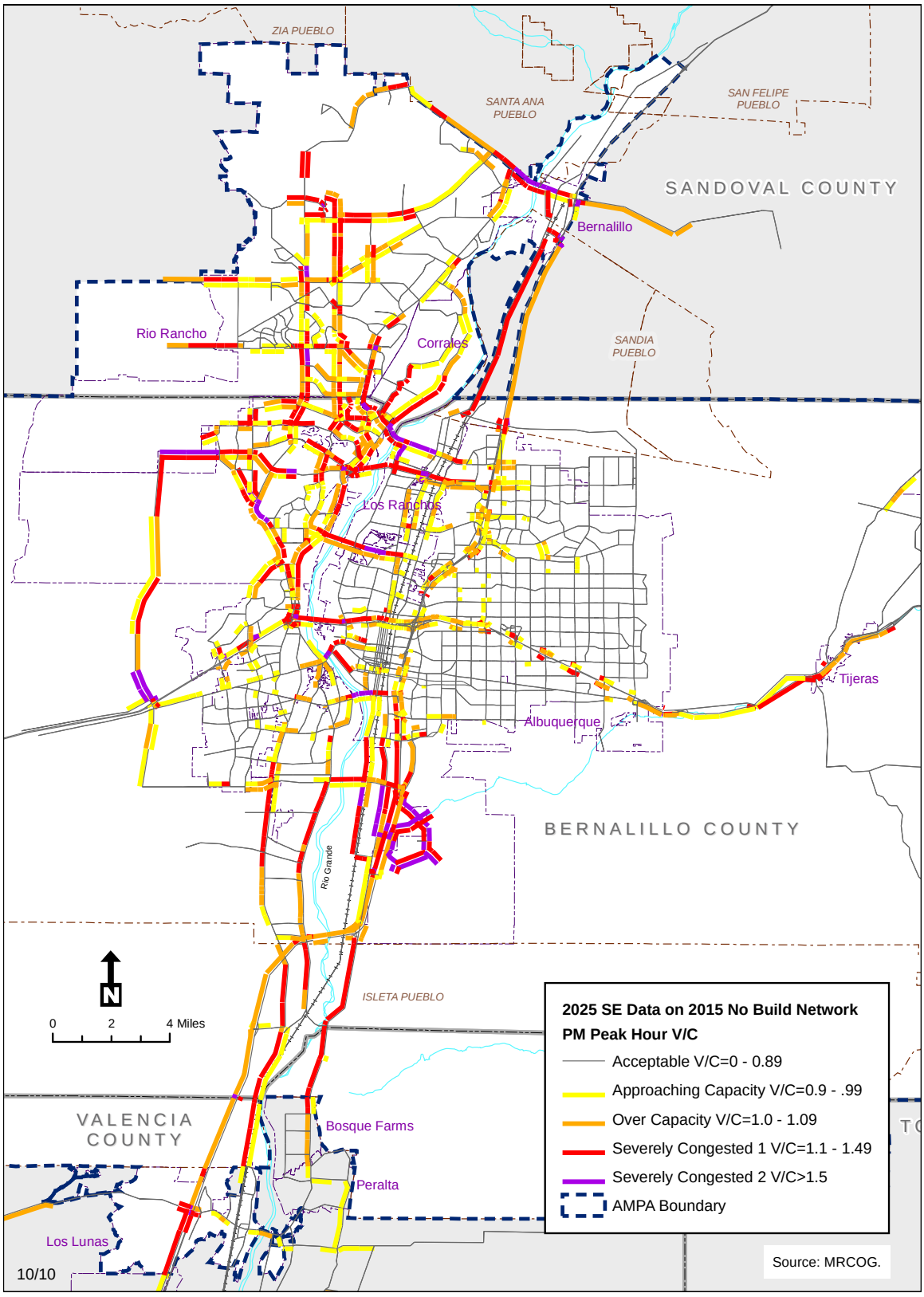
Table C-2: Roadway Performance Differences for 2008 and 2025 (Build and No-build) Modeling Scenarios

PM Peak Hour	2008	2025 No-build	2025 Build	Percent Difference (2025 Build to 2025 No-build)
Vehicle Hours Traveled	42,634	178,828	117,052	-35%
Vehicle Miles Traveled	1,568,108	2,482,698	2,492,219	0.0%
Vehicle Hours of Delay	8,855	124,258	62,376	-50%
Average Speed (mph)	36.8	13.9	21.3	53%

Map C-4: 2025 Build PM Peak Hour Volume to Capacity



Map C-5: 2025 No-Build PM Peak Hour Volume to Capacity



Year 2035 Roadway Scenarios

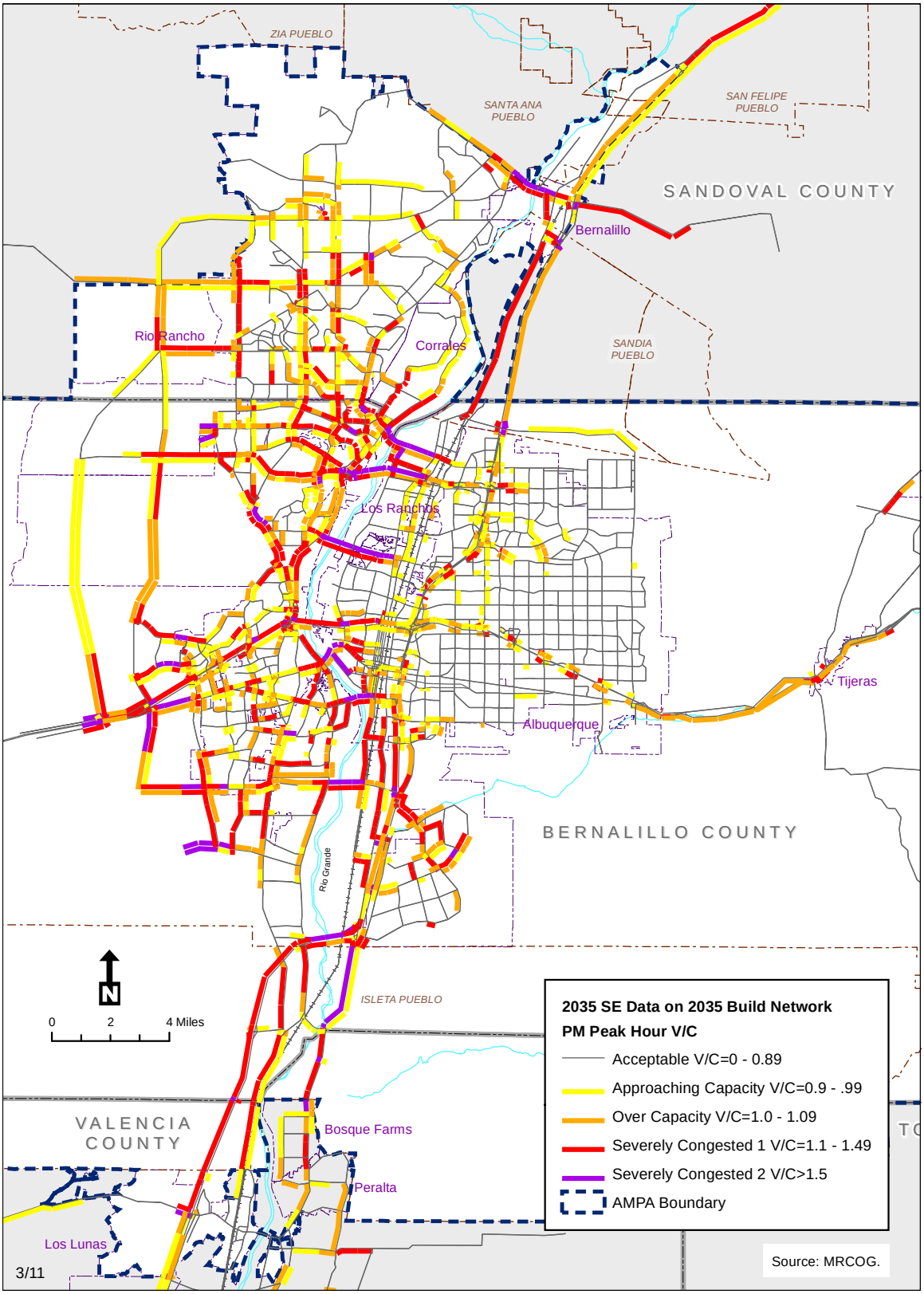
The 2035 scenario represents the planning horizon for this MTP. In other words, it includes all projects anticipated for funding under the financially constrained program. As in the earlier MTP scenarios (2015 and 2025) a *build* and a *no-build* analysis was performed and comparisons were made with the 2008 base year.

Differences in the 2035 scenarios and the 2008 base year clearly show the demands the increased travel associated with the socioeconomic forecasts put on the transportation system and the formidable challenges associated with meeting that demand. Map C-6 and Map C-7 show these differences geographically. Similar patterns of congestion seen in earlier MTP roadway scenarios are exhibited, but in larger magnitude. It is interesting to compare the portions of Rio Rancho where planned network expansion absorbs anticipated demand from growth. Other interesting additions are the privately funded Mesa del Sol network expansion and new connections on the Westside of the metro area in the vicinity of Double Eagle II north of Paseo del Norte. Especially noteworthy are the additional north/south roadways and added capacity on the western edge of the transportation network. This additional infrastructure supports major travel movements within the vicinity and mitigates travel demand on east/west connections toward the center of the urban area and employment opportunities. However, despite this additional roadway infrastructure and improved roadway capacity, anticipated levels of congestion far exceed what is considered acceptable by the traveling public, reinforcing the need to explore multi-modal options and other strategies.

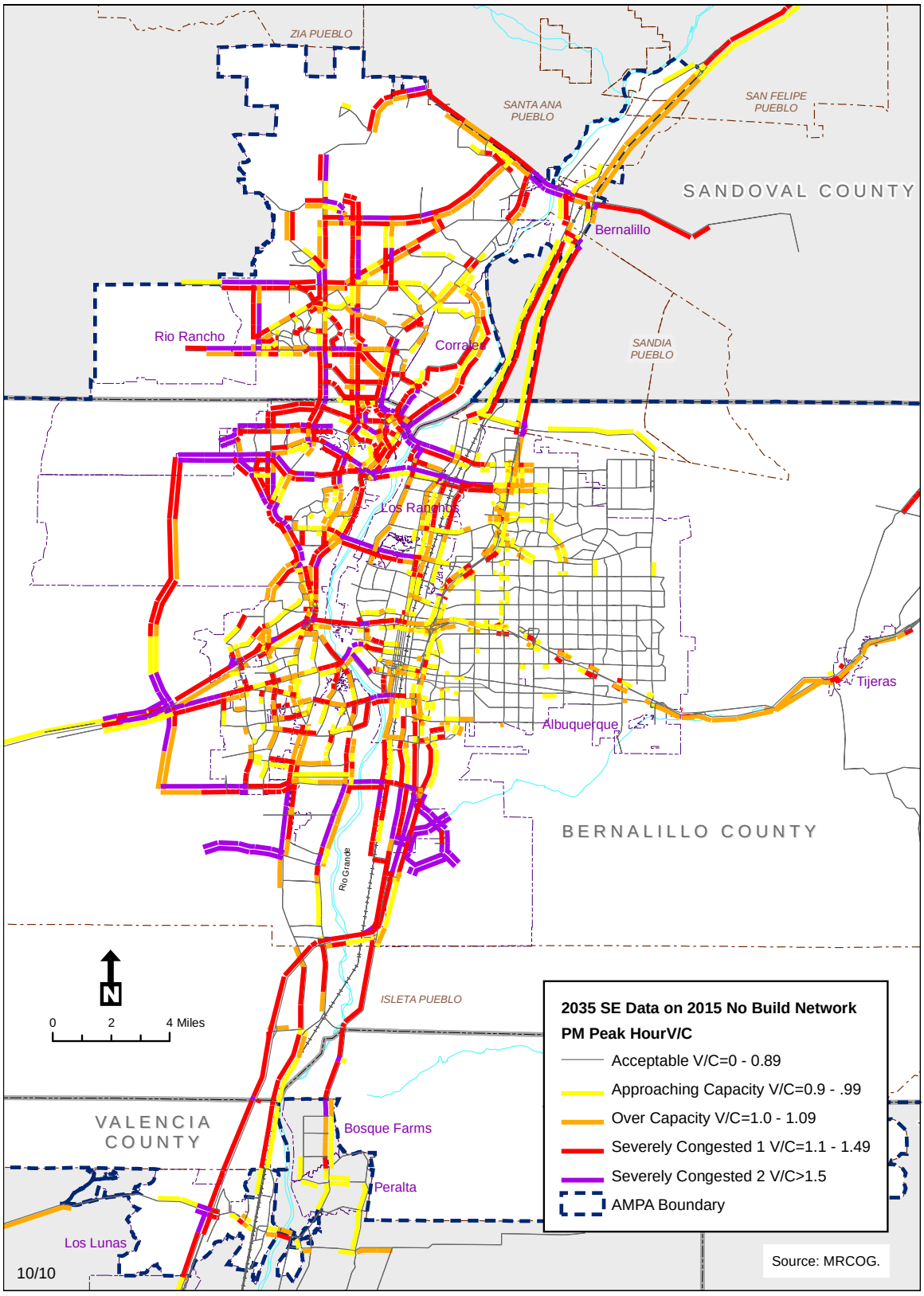
Table C-3: Roadway Performance Differences for 2008 and 2035 (Build and No-build) Modeling Scenarios

PM Peak Hour	2008	2035 No-build	2035 Build	Percent Difference (2035 Build to 2035 No-build)
Vehicle Hours Traveled	42,634	389,762	205,570	-47%
Vehicle Miles Traveled	1,568,108	3,007,466	3,065,101	1.9%
Vehicle Hours of Delay	8,855	322,691	137,618	-57%
Average Speed (mph)	36.8	7.7	14.9	94%

Map C-6: 2035 Build PM Peak Hour Volume to Capacity



Map C-7: 2035 No-Build PM Peak Hour Volume to Capacity



Daily Summaries

Daily travel performance summaries offer another category of roadway performance measurement. These travel measurements over the course of the entire day provide relative comparisons with other published data such as MRMPO's traffic count maps and other federal sources of traffic data.

Table C-4: Daily Summaries for 2008, 2015, 2025 and 2035

Daily Summaries Build Scenario:	2008	2015	2025	2035	Percent Change (2008 to 2035)
Vehicle Hours Traveled (VHT)	406,043	509,596	885,957	1,403,963	246%
Vehicle Miles Traveled (VMT)	16,288,169	19,008,931	25,748,738	31,554,951	94%
Total Vehicle Trips	2,007,482	2,257,744	2,858,816	3,461,551	72%
Network Lane Miles	3,409	3,514	3,800	4,009	18%
Lane Miles per Capita	224.9			331.6	47%
Average Speed	40.1	37.3	29.1	22.5	-43%
VMT/Capita	21.2	22.5	24.0	23.7	12%

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