2014 Corridor Rankings:

Findings and Methodology

The Most Congested Corridors in the

Albuquerque Metropolitan Planning Area

MRMPO
Mid-Region Metropolitan Planning Organization

MR COG
Communities
Working Together

Executive Summary

Every two years the Mid Region Metropolitan Planning Organization (MRMPO) ranks the most congested corridors in the metropolitan region as part of its Congestion Management Process (CMP). The **2014 Corridor Rankings** focus on a subset of 31 corridors that comprise the CMP congested network for the Albuquerque metropolitan area. The corridors in the congested network were selected by the CMP Committee, a group of transportation professionals from agencies across the region, to be continuously monitored. The core responsibility of the CMP is to monitor system performance through the collection and interpretation of transportation data and develop strategies to manage congestion. The biennial congested corridor rankings provide an assessment of the locations with the greatest transportation challenges in the region. The goal of the rankings is to provide an in-depth analysis of the source and extent of congestion along those corridors. The rankings assist local agencies in identifying transportation needs and in project development and are used by the Mid Region Metropolitan Planning Organization (MRMPO) to help determine which projects should receive federal funding.

This executive summary provides a brief overview of the CMP concepts and corridors. The full document explores in greater detail the methodology used to create the rankings and how they differ from previous years.

Data Inputs and Methodology

The corridor rankings rely on three types of data: peak hour traffic volume, average peak hour travel speed, and crash rates. Traffic volume and travel speed measure "recurring" congestion, while crash rates measure "non-recurring" congestion caused by incidents. Recurring congestion is routine congestion that takes place at the same time and location each weekday. Non-recurring congestion is caused by an unusual traffic disturbance such as a wreck or stalled vehicle.

- Traffic volume is used to determine a roadway's **volume to capacity (V/C) ratio**. V/C ratios compare a roadway's peak hour volume to its intended capacity.
- Average peak hour travel speed is used to determine a roadway's **speed differential,** which is the difference between the observed peak hour speed and the posted speed. Speed differential is expressed as a percentage.
- **Crash rates** are determined for every intersection where crash data is available. Crash rates higher than the regional average indicate a corridor is more prone to nonrecurring congestion.

Data that measure the severity of each type of congestion is collected for each roadway segment and combined to form a composite corridor score. Rankings by source are also included in the document. The congestion score allows corridors from across the region to be compared to each other and ranked from most to least congested.

Results at a Glance

As was the case in past years, **Alameda Blvd.** remains the most congested corridor in the Albuquerque metropolitan area as it experiences both high volumes and slow speeds. While all corridors experience some degree of signal related speed delay, not all corridors experience peak hour traffic volumes that exceed capacity. The top five places in the 2014 corridor rankings are all river crossings and all experience high traffic volume and significant speed delay. **San Mateo Blvd.**, which experiences slow speeds and high crash rates, ranks sixth overall despite low traffic volumes in relation to its capacity. Three Westside corridors that feed river crossings, **Isleta Blvd.**, **Arenal Rd.**, and **Paradise Blvd.**, round off the top ten. While slow speeds and crashes are an issue on many of Albuquerque's Eastside roadways, volumes are typically below capacity. The high amount of roadway capacity (i.e., travel lanes) relative to observed traffic volumes explains the low ranking of major Eastside corridors such as **Lomas**, **Menaul**, **Louisiana**, **Tramway** and **Broadway** Boulevards.

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I. Introduction

A region's success depends on its ability to connect people to other people and activities. Demand for transportation of goods and people throughout a metropolitan region is reflective of a healthy economy. However, an overreliance on vehicles to meet transportation needs in Albuquerque has resulted in roadway congestion; and congestion has a cost. Valuable fuel and time are consumed as residents navigate their vehicles through gridlock. The Texas Transportation Institute estimates Albuquerque lost $501 million in economic value to congestion in 2014, or about $886 per commuter[1].

Congestion can be a big challenge in metropolitan areas where economic activity is highest. In fact, the nation's most economically viable regions are often the most congested on a per capita basis. Completely eradicating congestion in a region where people and economic activities are concentrated is not possible and may not be desirable. Singular focus on the goal of high speed vehicle throughput can come at the expense of safe infrastructure for pedestrians, cyclists, and even motorists, and compromises the kind of conditions considered important in supporting neighborhood-scale retail activity. However, efforts can be made to manage congestion.

The Mid Region Metropolitan Planning Organization (MRMPO) is charged with transportation planning activities for the Albuquerque Metropolitan Planning Area (AMPA) and facilitates a Congestion Management Process (CMP). A CMP is a federal requirement for Metropolitan Planning Organizations with populations above 200,000, known as Transportation Management Areas (TMAs). The goal of the CMP is to assess the performance of the regional transportation system through data collection and analysis, and to make specific strategy recommendations based on actual conditions. Collecting traffic data helps identify the sources and extent of congestion. Key corridors are identified and monitored for congestion and safety, which allows the region's stakeholders to focus scarce resources to those facilities in most need of improved mobility. With a better understanding of the sources of congestion in the AMPA, the CMP recommends appropriate strategies to manage congestion and improve mobility, and provides a mechanism for monitoring the effectiveness of proposed and implemented transportation projects and programs on the overall transportation network.

This document is an explanation of the 2014 CMP Corridor Rankings Table. There have been key changes in the data inputs used to measure and monitor congestion in the Albuquerque region since the 2012 CMP Corridor Rankings Table was created, which is why this document differs from previous years in its heightened focus on methodology and data inputs. This document is broken into four sections. The first section provides background on the CMP and how it is utilized by MRMPO. Section two includes a detailed description of the methodology (including revisions) used to create this year's Corridor Rankings Table. Section three of this document explores the 2014 Corridor Rankings Table in more depth with additional tables to break down corridors by data input type. Section four of this document is dedicated to discussion and analysis of the data, including an interpretation of the major changes in rankings from 2012.

[1] Texas Transportation Institute, "Urban Mobility Report 2015" http://d2dtl5nnlpfr0r.cloudfront.net/tti.tamu.edu/documents/mobility-scorecard-2015.pdf

What is the CMP?

The Fixing America's Surface Transportation (FAST) Act, signed into law by President Obama on December 4, 2015, mandates that all Transportation Management Areas (TMAs) continue to maintain a Congestion Management Process (CMP). The federal requirement for a CMP was established in 2005 by the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

The CMP is important to long range planning to help guide investments toward the most regionally beneficial transportation projects. The core responsibility of the CMP is to monitor system performance through the collection and interpretation of transportation data. With an in-depth understanding of the congestion issues facing the region, congestion management strategies are proposed and, if implemented, assessed. The CMP disseminates congestion data and related analyses to local government agencies and the public. CMP products are meant to inform the public and local municipalities about regional transportation challenges and MRMPO's suggested management strategies. Such resources help local decision makers understand congestion in the AMPA and inform the programming of projects and mitigation strategies.

Corridor Rankings Table

Every two years the most congested corridors in the metropolitan region are ranked based on severity of congestion. 2014's performance analysis focuses on the subset of 31 corridors that comprise the CMP congested network. These corridors were selected by the CMP Committee – a working group of technical experts from agencies in the AMPA – based on a series of qualitative and quantitative criteria.

A biennial inventory of roadway conditions enables MRMPO to track congestion over time. This historical understanding of congestion helps MRMPO forecast travel demand and anticipate infrastructure needs. MRMPO and its various committees, including the CMP, use traffic forecasts to create congestion reduction strategies and guide infrastructure investment to the most beneficial projects. The Corridor Rankings Table helps member agencies determine where projects are needed and which are more likely to receive federal funding. The two-year periodic timeframe of these updates coincides with the development of the Transportation Improvement Program (TIP) and informs the development the update of the Metropolitan Transportation Plan (MTP).

CMP and the Transportation Improvement Program

The Transportation Improvement Program (TIP) is a short-term plan that prioritizes projects for funding based on the goals in the MTP, the Long Range Transportation Plan for the region. All projects within the AMPA receiving federal highway or transit funding must be programmed in the TIP. To make it into the TIP, a project must go through the Project Prioritization Process (PPP), an evaluation tool that measures the extent to which an individual project addresses the transportation needs of the region.

The Corridor Rankings Table is a crucial input to the PPP. Points are awarded to projects that improve mobility on congested corridors. The higher a corridor is on the Corridor Rankings Table, the more points it will receive on the PPP. Points are also awarded based on which congestion management strategies the project implements. High priority strategies are determined for all corridors in the congested network. A corridor's high priority strategies vary based on its characteristics and the type of congestion it experiences. If a project implements a corridor's high priority strategies it will receive more points.

Figure 1: Location and ranking of congested network corridors

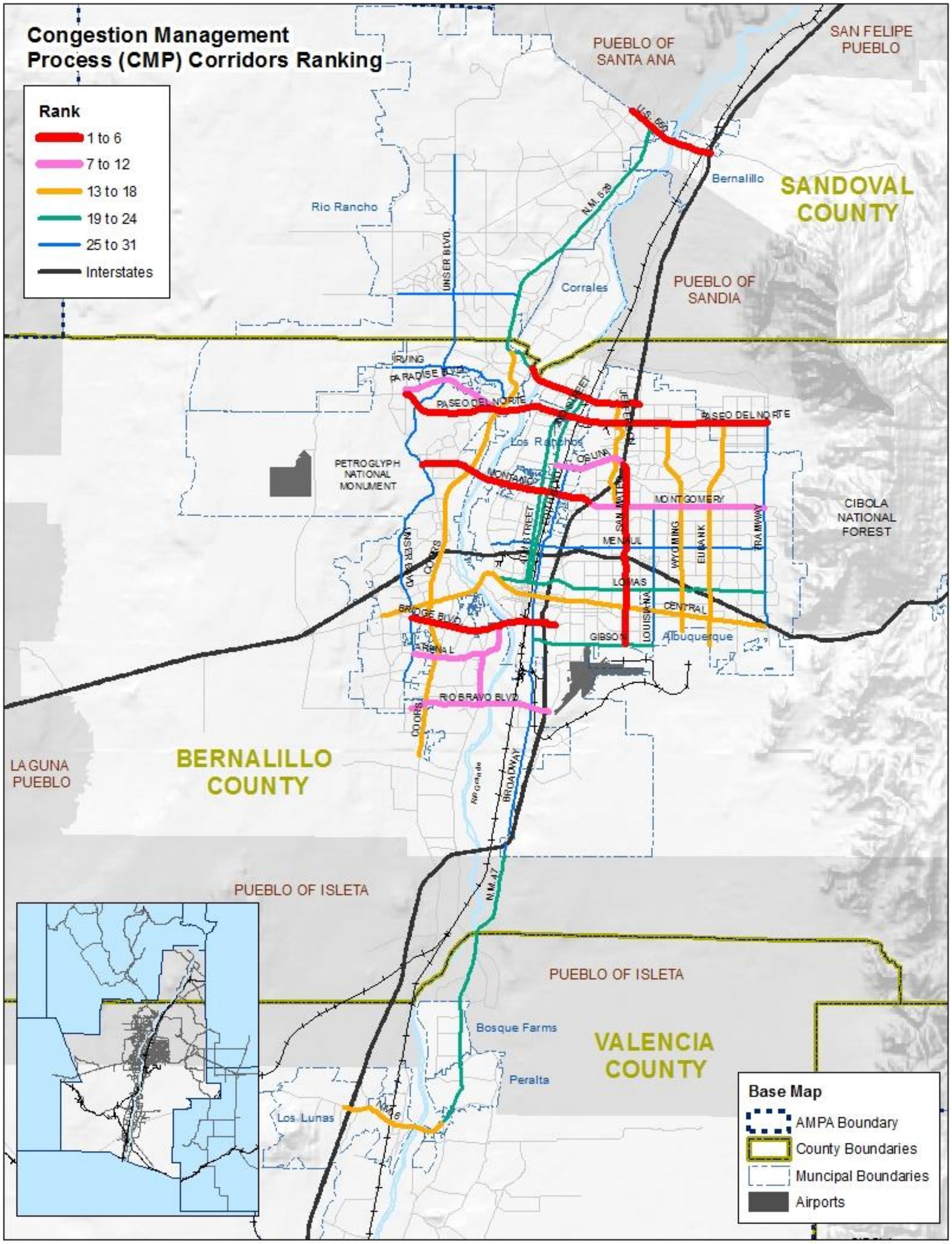

Table 1: Summary Corridor Rankings 2014

Rank	Route	V/C Points	Speed Points	Crash Points	Final Score
1	Alameda Blvd.	68.19	23.97	3.64	95.80
2	Montano Rd.	41.25	25.88	11.82	78.95
3	Bridge/Cesar Chavez Blvd.	48.61	15.08	11.33	75.02
4	U.S. 550	52.87	17.14	3.33	73.35
5	Paseo Del Norte	33.68	16.89	16.32	66.89
6	San Mateo Blvd.	9.19	38.78	18.13	66.10
7	Paradise Blvd.	30.65	18.86	16.00	65.51
8	Isleta Blvd.	40.16	19.21	4.62	63.98
9	Osuna Rd.	15.92	38.17	9.33	63.42
10	Arenal Rd.	27.82	21.54	10.00	59.35
11	Montgomery Blvd.	7.27	27.78	20.83	55.88
12	Rio Bravo/Dennis Chavez Blvd.	24.13	14.69	14.29	53.11
13	Jefferson St.	22.63	22.19	7.78	52.60
14	Coors Blvd.	15.68	16.53	13.44	45.64
15	Wyoming Blvd.	4.86	24.99	13.33	43.18
16	Central Ave.	10.99	16.97	14.25	42.21
17	N.M. 6	8.50	29.02	4.00	41.52
18	Eubank Blvd.	8.22	20.25	12.00	40.47
19	2nd St.	11.07	18.78	9.62	39.47
20	4th St.	11.47	22.88	5.00	39.35
21	N.M. 47	29.82	3.65	1.25	34.72
22	Gibson Blvd.	10.13	17.18	6.67	33.98
23	N.M. 528	13.86	13.50	6.19	33.56
24	Lomas Blvd.	1.73	22.36	9.17	33.26
25	Louisiana Blvd.	3.00	16.34	10.48	29.82
26	Unser Blvd.	11.37	9.42	8.80	29.59
27	Menaul Blvd.	3.00	15.00	9.09	27.10
28	Southern Blvd.	7.46	11.23	5.83	24.52
29	Irving Blvd.	2.98	11.31	10.00	24.29
30	Broadway/Edith Blvd.	1.69	15.81	5.91	23.41
31	Tramway Blvd.	8.74	3.83	6.47	19.04
Point totals		586.92	589.26	298.90	1475.08
Data input portion of points		40%	40%	20%	100%

II. Methodology

There are many different causes of roadway congestion, including poor traffic signal timing, stalled or crashed vehicles, or simply when the volume of traffic flowing on a roadway exceeds its capacity. Because congestion can be a result of different variables, the FHWA advises MPOs to use multiple performance measures[2]. When using multiple performance measures, MPOs are likely to get a more complete and accurate understanding of congestion in the region. For example, a roadway might experience serious delay without the volume of traffic surpassing the road's capacity, but if only traffic volume is measured, the source of congestion at this location may not be detected.

MRMPO's CMP monitors congestion through three data inputs. This approach was judged as robust by the FHWA based on its inclusion in the organization's national Congestion Management Process Guidebook:

> The Mid-Region Council of Governments in Albuquerque, New Mexico, utilizes three measures of congestion: volume to capacity ratio, speed, and crash rate. Together, these three measures are indexed and combined into a corridor score, which is used to rank roadways in terms of congestion priority. The result is that the agency is able to map its CMP network and portray the performance of each network link according to the score in order to prioritize investments[3].

The three data inputs – traffic volume, travel time, and crash rates – measure different aspects of congestion. Traffic volume and travel time measure "recurring" congestion, while crash rates measure "non-recurring" congestion caused by incidents. Recurring congestion is routine congestion that takes place at the same time and location each weekday. Since this type of congestion is predictable, it enables planners to consider the expected impacts of proposed investments. Non-recurring congestion is caused by an unusual traffic disturbance such as a wreck or stalled vehicle. It is possible to identify locations where non-recurring congestion is more likely because of high crash rates, but it is difficult to know when non-recurring congestion will occur. Many instances can be addressed with specific roadway design improvements, however, programmatic strategies such as improved emergency response and coordination are also required to lessen the effect of non-recurring congestion.

The CMP data are assigned numeric point values to develop corridor level rankings and make comparison among corridors possible. Points are awarded to a link when its traffic volume, travel time or crash rate exceed certain thresholds. Points are a measure of the severity of congestion; the more points a link receives, the more congested it is. A corridor's congestion mitigation approach will vary based on its points by data input. For example, a corridor with high crash rates and slow travel times, but a low traffic volume will require a different treatment than a road with a high traffic volume and slow travel times, but low crash rates.

CMP Network

The 31 corridors that comprise the CMP congested network were selected by the CMP committee – a working group of technical experts from agencies in the AMPA – based on a series of qualitative and quantitative criteria. Eight river crossings between Los Lunas and Bernalillo are included in the congested network as well as many arterials that feed the river crossings such as Isleta Blvd. and Arenal Rd. In addition, many regionally significant arterials that carry high volumes of traffic, such as Coors, San

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[2] Federal Highway Administration, "Congestion Management Process: A Guidebook"

[3] Federal Highway Administration, "Congestion Management Process: A Guidebook," 2011 pg. 23

Mateo, and Montgomery Blvds., are also included in the congested network. In 2010 and 2012, the congested network was comprised of only 30 corridors. The congested network received an additional corridor in 2014, because what used to be considered one corridor was split into two. In past analyses, San Mateo Blvd. and Osuna Rd. were considered one corridor. They have been split into two separate corridors for the 2014 Corridor Rankings Table, with I-25 serving as the dividing line. The rationale behind splitting these corridors is that they are separate travel markets with different characteristics and should be analyzed separately.

The interstates are not included in the analysis because traffic volume and crash data are not collected on the interstate in a manner consistent with data collected on arterials. Therefore, any comparison between one of the interstates and an arterial would not be an "apples to apples" comparison. This issue will be revisited in future updates to the CMP.

Volume to Capacity Ratio

Volume to capacity (V/C) is a measure of traffic congestion used to determine whether a roadway's peak hour traffic volume surpasses its design capacity. To determine a V/C ratio, the observed peak hour traffic volume along a certain stretch of roadway is divided by the road's capacity. MRCOG determines roadway capacity in the region with guidance from the Florida Level of Service Capacity Tables (see **Table 10**). Volume data is collected through MRMPO's traffic counts program. Several factors are used to determine a road's capacity, including how many lanes it has, what the speed limit is, and whether access to the road via side streets and driveways is controlled or not. If a V/C ratio surpasses 1.0, the volume is higher than the road's intended capacity.

$$V/C\ (link) = \frac{Observed\ Peak\ Hour\ Volume}{Capacity}$$

$Observed\ Peak\ Hour\ Volume =$ Maximum motorized vehicle volume observed during one-hour in the AM (5-10AM) or PM (3-7PM) time period.

$Capacity =$ Maximum hourly motorized vehicle volume that can reasonably be expected to pass a point under prevailing conditions. Capacity varies based on the roadway's functional class, number of lanes, posted speed and access control.

MRMPO's CMP corridors are comprised of separate "links" per the traffic counts program. This allows a direct relationship of the CMP and the MRMPO's traffic data collection efforts. A link is defined as a segment of road, usually stretching between two signalized intersections. For every link, V/C ratios are determined for each travel direction at both AM and PM peak periods. The AM peak hour is determined for each directional link by the four consecutive 15-minute intervals that represent the highest volume of traffic flow between 5:00AM and 10:00AM. For example, the AM peak hour on an eastbound link in Rio Rancho may be at 6:30AM-7:30AM, while a link in downtown Albuquerque may experience its heaviest hour of traffic volume between 8:00AM-9:00AM. The same goes for the PM peak hour; a link's PM peak hour V/C ratio may be observed anywhere between 3:00PM and 7:00PM and varies link to link.

Table 2: V/C point thresholds

VC Ratio	Points
<.7	0
.7-.85	1
.85-1	2
>1	3

MRMPO conducts traffic counts on every link in the region at least once every three years. MRMPO traffic count data is used by the CMP to determine AM and PM peak hour V/C ratios on all the links being monitored by the CMP. To help analyze the V/C data, a scoring system is used to assign points to segments of roadway that surpass thresholds considered congested. **Table 2** illustrates the point thresholds used for V/C ratios. Any V/C ratio below 0.7 is not considered congested and does not receive any points. If a V/C ratio is above 0.7 and below 0.85, it will receive 1 point. A V/C ratio between 0.85 and 1 will receive 2 points and any V/C ratio above 1.0 receives 3 points. The scoring system awards more points to links with higher V/C ratios, and therefore, more severe congestion.

Table 3 demonstrates how point values are assigned to segments of road based on their V/C ratios. Each of the four links that constitute Arenal Rd. have V/C ratios for both directions at both AM and PM peak periods. V/C ratios for both directions and peak periods are in the four rows to the right of the location row. The headers indicate which direction and peak period the V/C ratio relates to, for example, AM EB refers to the V/C ratio observed during the AM peak period in the eastbound lanes. The corresponding point values are in the final four rows. Points are awarded to a link's V/C ratios based on the point thresholds in **Table 2**. Points are awarded to individual links, but later combined to determine a corridor score.

Table 3: V/C ratios and corresponding point scores on Arenal Rd.

Length (Mi)	Route	Location	AM EB	AM WB	PM EB	PM WB	AM EB Pt.	AM EB Pt.	PM EB Pt.	PM WB Pt.
0.841	ARENAL	E. OF UNSER - W. OF COORS	0.25	0.12	0.32	0.31	0	0	0	0
0.435	ARENAL	E. OF COORS - W. OF ATRISCO	1.04	0.85	0.66	1.02	3	2	0	3
0.65	ARENAL	E. OF ATRISCO - W. OF TAPIA	0.25	0.61	0.26	0.48	0	0	0	0
0.629	ARENAL	E. OF TAPIA - W. OF ISLETA/GOFF	0.76	0.37	0.59	0.78	1	0	0	1

Speed Differential

Speed differential (SpD) is a measure of traffic congestion used to determine locations where traffic is moving slower than intended during the AM and PM peak hours. More specifically, a speed differential is the difference between the observed peak hour traffic speed and the roadway's posted speed, expressed as a percentage. For example, if the average westbound speed was observed to be 30 mph during the PM peak hour on a link where the speed limit was 45 mph, then that link would have a PM SpD of 33.3% in the westbound direction. SpD is an important indicator of congested conditions which, as stated earlier, may be caused by factors other than high traffic volume alone.

$$SpD\ (link) = \frac{Posted\ Speed - Observed\ Speed}{Posted\ Speed}$$

Table 4: SpD point thresholds

SpD	Points
<25%	0
25%-35%	1
35%-45%	2
>45%	3

Like V/C ratios, a link receives point values on segments that exceed certain thresholds. Links that have a SpD value between 25% and 35% receive 1 point, 35%-45% receives 2 points, and anything above 45% receives 3 points (**Table 4**). Below is an example of speed differentials on Wyoming Blvd. between Zuni Rd. and Constitution Ave. (**Table 5**). Each link has 4 cells with directional SpD values with corresponding points per **Table 4** above. Points are awarded to individual links, but later combined to determine an overall corridor score.

Table 5: Speed differentials and corresponding point values of several links on Wyoming Blvd.

Miles	Route	Location	AM NB	AM SB	PM NB	PM SB	AM NB Pt.	AM SB Pt.	PM NB Pt.	PM SB Pt.
0.077	WYOMING	N. OF ZUNI - S. OF CENTRAL	22.73%	39.08%	28.00%	34.00%	0	2	1	1
0.417	WYOMING	N. OF CENTRAL - S. OF COPPER	36.12%	29.19%	44.81%	26.41%	2	1	2	1
0.512	WYOMING	N. OF COPPER - S. OF LOMAS	36.66%	28.83%	45.14%	25.68%	2	1	3	1
0.139	WYOMING	N. OF LOMAS - S. OF I-40 S. RAMPS	40.43%	41.81%	50.94%	30.50%	2	2	3	1
0.107	WYOMING	BETWEEN I-40 RAMPS	40.74%	35.80%	50.62%	32.42%	2	2	3	1
0.253	WYOMING	N. OF I-40 RAMPS - S. OF CONSTITUTION	33.03%	27.71%	40.47%	28.28%	1	1	2	1

Crash Rate

Crash rate is the third data input and is meant to capture one source of non-recurring congestion. Non-recurring congestion is congestion caused by events that may occur at predictable rates but do not occur at predictable moments in time, such as stalled vehicles and crashes. The FHWA estimates that nationally, 25% of all congestion is due to traffic incidents[4]; therefore it is important to monitor crash rates to indicate areas that are susceptible to non-recurring congestion.

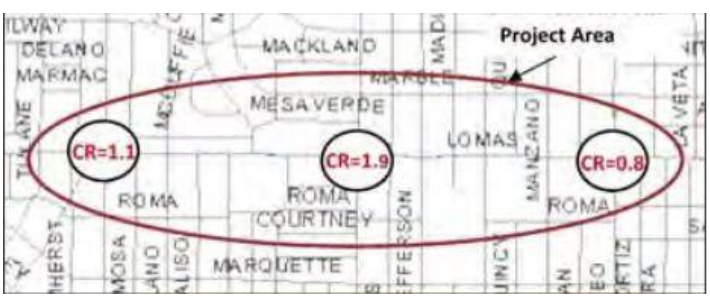
Table 6: Crash rate scoring thresholds

Crash Rate vs. AMPA avg.	Pts
0 - .99	0
1 - 1.49	1
1.5 - 1.99	2
2+	3

The crash rates used in the 2014 Corridor Rankings Table are a composite of data collected over a five-year period, currently 2009-2013. Although crash data exists on both links and at intersections, the current methodology requires crash rates be assigned to intersections only, making it difficult to integrate with link-based SpD and V/C ratios. Crash scores are therefore determined for entire corridors and added to the SpD and V/C ratio corridor scores to create a composite score.

A corridor receives points based on how many times each of its major intersections exceed the AMPA average (**Table 6**). **Figure 2** is an extract from the PPP that demonstrates this process. An important difference between the PPP and CMP approach is that the CMP does not average a corridor's crash rate. Each individual intersection along the corridor is given a score and then the corridor's crash points are added up. The sum of the corridor's crash points are then divided by the number of data points overall. The resulting figure is multiplied by 10, and the result serves as the corridor's crash score. For example, Central Avenue has 40 intersections with crash data with a combined 57 points, and a crash score of 14.25: (57/40)*10=14.25.

Figure 2: Crash rate scoring example from PPP



[4] http://www.ops.fhwa.dot.gov/congestion_report/executive_summary.htm

$$Corridor\ Crash\ Score = 10 \times \frac{\sum_{i=1}^{n} Major\ Intersection\ Crash\ Points}{n}$$

n =Number of $\boldsymbol{major\ intersections}$ $for\ which\ a\ crash\ rate\ is\ caluclated$. The intersection must have three or more legs where traffic counts are performed in order to provide an approach volume.

$$Major\ Intersection\ Crash\ Points_i = \begin{cases} 0 & if\ Crash\ Ratio_i < 1.0 \\ 1 & if\ 1.0 \leq Crash\ Ratio_i < 1.5 \\ 2 & if\ 1.5 \leq Crash\ Ratio_i < 2.0 \\ 3 & if\ Crash\ Ratio_i \geq 2 \end{cases}$$

$$Crash\ Ratio_i = Intersection\ i\ Crash\ Ratio\ compared\ to\ the\ AMPA\ average\ intersetion\ crash\ rate = \frac{Intersection\ Crash\ Rate}{AMPA\ Average\ Intersection\ Crash\ Rate}$$

$$Intersection\ Crash\ Rate = \frac{\sum_{five\ years} Crashes\ occuring\ at\ the\ intersection}{\sum_{five\ years} Average\ daily\ intersection\ approach\ volume \times 365} \times 1{,}000{,}000$$

Corridor Evaluation: Link Score Adjustment by Length

A corridor's V/C ratio and SpD points are awarded to every link and summed together to form a composite score for recurring congestion. Before link scores are added together, each link's V/C and SpD scores are adjusted by the length of the link. The rationale behind adjusting link scores by their length is that congestion experienced over a longer distance should be weighted more heavily as the effects are greater on a regional scale.

Table 7: Examples of point adjustment by length

Miles	Route	Location	Total Points Speed	Total Points V/C	Adjusted Speed	Adjusted V/C	Total Adj. Points
2.16	PASEO DEL NORTE	E. OF COORS E. RAMPS – W. OF 2ND W. RAMPS	1	6	21.61	129.66	151.27
0.26	OSUNA	E. OF JEFFERSON – W. OF PAN AM. .	10	3	26.1	7.83	33.93

Table 7 illustrates MRMPO's approach to adjusting points by a link's length. There are two links in **Table 7**; one long link from Paseo Del Norte and one short link from Osuna. Despite garnering more raw points, the link along Osuna receives fewer points after adjustment because of its shorter length. Both the V/C and SpD points are multiplied by the length of the link*10. For example, the link on Paseo Del Norte received 6 V/C points and has a length of 2.16 miles: 6*(2.16*10) =129.66.

The adjusted V/C points for all links along a corridor are added together, then divided by the length of the corridor in miles. The same is done for SpD. The sum of each corridor's adjusted SpD and V/C points are then divided by their length in miles. The normalization of a corridor's points by its length takes out the matter of scale and allows for a comparable analysis between corridors, some of which may be considerably longer than others. For example, the Paseo del Norte corridor garnered 376.5 adjusted SpD points in total, more than double Osuna's 165.2. However, because Osuna is only 2.6 miles and Paseo is 13.4, Osuna receives 63.6 SpD points and Paseo only 28.1 after dividing the respective point totals by their corridor length. This reflects that average congestion is more intense along the extent of Osuna Rd. than along the extent of Paseo del Norte Blvd.

$$Corridor\ V/C\ \ Score = \frac{1}{TCL}\left(\sum_i 10 * VCP_i * LL_i\right)$$

$$Corridor\ SpD\ Score = \frac{1}{TCL}\left(\sum_i 10 * SpDP_i * LL_i\right)$$

$$TCL = Total\ Corridor\ Length\ (miles)$$

$$VCP_i = Volume\ to\ Capacity\ Points\ \ for\ Link\ i$$

$$SpDP_i = Speed\ Differential\ Points\ for\ Link\ i$$

$$LL_i = Link\ Length\ in\ miles\ for\ Link\ i$$

$$i = index\ for\ corridor\ links$$

Data Input Weighting

The V/C, SpD, and crash scores are added together to form a composite score. However, the three data inputs are not weighted equally. The data inputs are weighted based on the reliability of the data source and how important the source is as a determinant of congestion. After deliberation by the CMP Committee the weighting targets for the 2014 composite corridor scores were set at 40% SpD points, 40% V/C ratio points, and 20% crash points.

Table 8: 2012 and 2014 data input weightings

Data Input	2012 Weighting	2014 weighting
Speed Differential	50%	40%
V/C Ratio	35%	40%
Crash	15%	20%

This differs from 2012, where the data input weighting was as follows: 50% SpD, 35% V/C, 15% Crash. The motivation behind the weighting modification in 2014 was based on the introduction of a new travel time data source used in the speed differential calculations. The importance of the V/C score was elevated in relation to SpD points because the traffic volume data, unlike the travel time data, is consistent with previous years' methodology. The two data inputs now equally impact the composite scores. This adjustment allows for increased importance of the crash score (elevated to 20% from 15%) in the final composite score and better reflects FHWA's estimation that 25% of congestion is a result of traffic incidents.

Achieving 40/40/20 Weighting Targets – Final Adjustment

In order to preserve the intended 40/40/20 weight distribution for V/C, SpD, and Crash factors in the corridor rankings, a final adjustment factor approach is necessary. **Table 11** depicts the point totals for each corridor before and after being adjusted to achieve weighting targets. The row at the bottom of **Table 11** summarizes each data input's portion of points for all 31 corridors. This row makes clear how different the pre-adjusted point totals were from the 40/40/20 weighting targets. For example, the V/C points made up only 23% of all points, while SpD generated 59% and crash points 18%. To reach the 40-40-20 weighting target, every corridor's V/C score had to be adjusted upwards by a factor of 1.5, SpD scores were adjusted down by .6, and the crash scores were unaltered. The adjustment of V/C and speed differential points resulted in a reduction of total points by about 11.5%. After the reduction of total points, crash points constituted 20% of all points without needing adjustment; therefore, the factor used to adjust crash points is 1.0.

$Final\ Corridor\ CMP\ Composite\ Score$ =

$$= 1.5 * Corridor\ \ V/C\ Score + 0.6 * Corridor\ SpD\ Score + 1 * Corridor\ Crash\ Score$$

When the adjustment factor is applied evenly to each corridor's V/C score, the total amount of V/C points is adjusted upward, while maintaining the V/C scores' proportion to one another. The same adjustment factors will be used to create the 2016 Corridor Rankings Table in order to keep as many variables constant with the 2014 analysis.

Changes in Methodology

Introduction of Inrix Travel Time Data

From 2010 to 2012, MRCOG relied on probe vehicle speed data collection. The probe vehicle approach used the floating car technique, whereby a vehicle is equipped with a GPS device to record speed and location data while driven in traffic at peak times. The shortcomings of this approach are that it is resource intensive and limited by small sample size. By contrast, the 2014 Corridor Rankings Table relies on state of the practice commercially available mobile source data to collect travel times on major roadways. Inrix, a private company, collects travel times from GPS-equipped fleets and mobile devices located in vehicles (cell phones or cars with Bluetooth components). The benefit of Inrix data is that it is continuously collected, offering a much larger sample size for the calculation of average travel times. Although the new data collection methodology is superior in many ways to the floating car methodology, the analysis year of 2014 still had gaps in coverage with nearly 20% of the roadways in the congested network lacking coverage. To fill these gaps, speed differentials from 2012, collected via the floating car technique, were used. It is anticipated that future updates of the CMP will not have this issue as Inrix coverage is continually expanded and updated.

Figure 3: SpD observed along Wyoming Blvd. in 2012 using floating car data

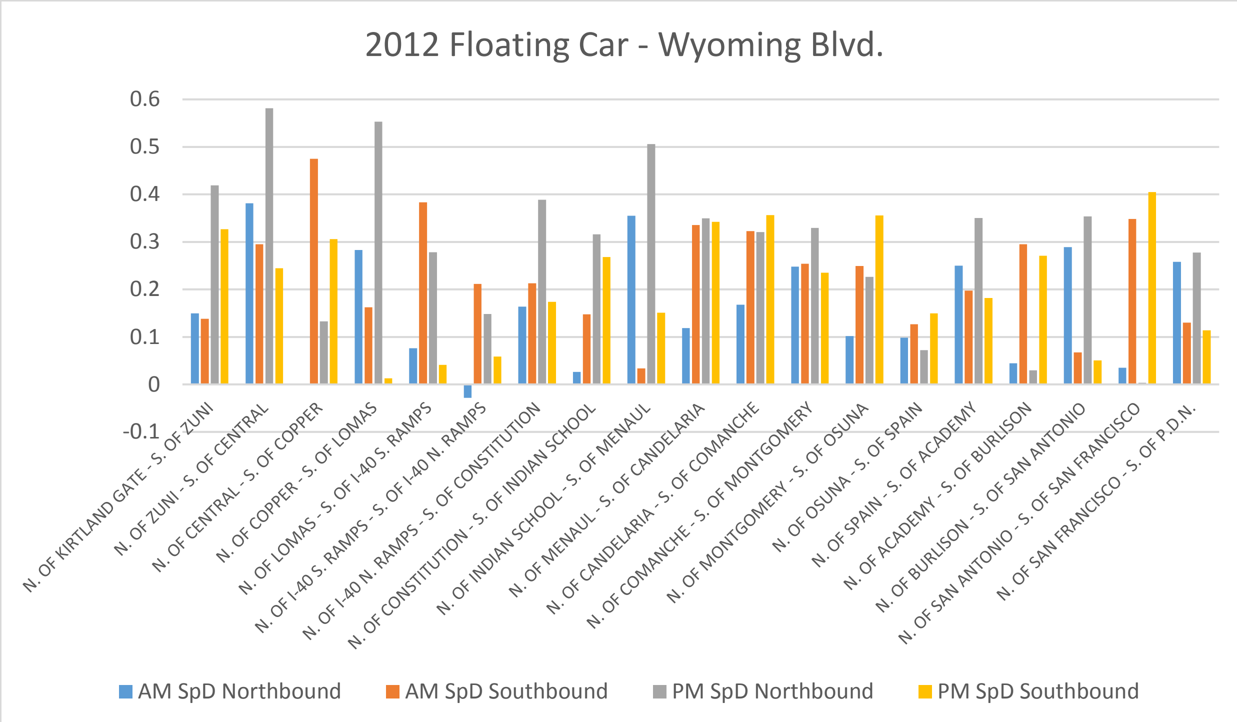
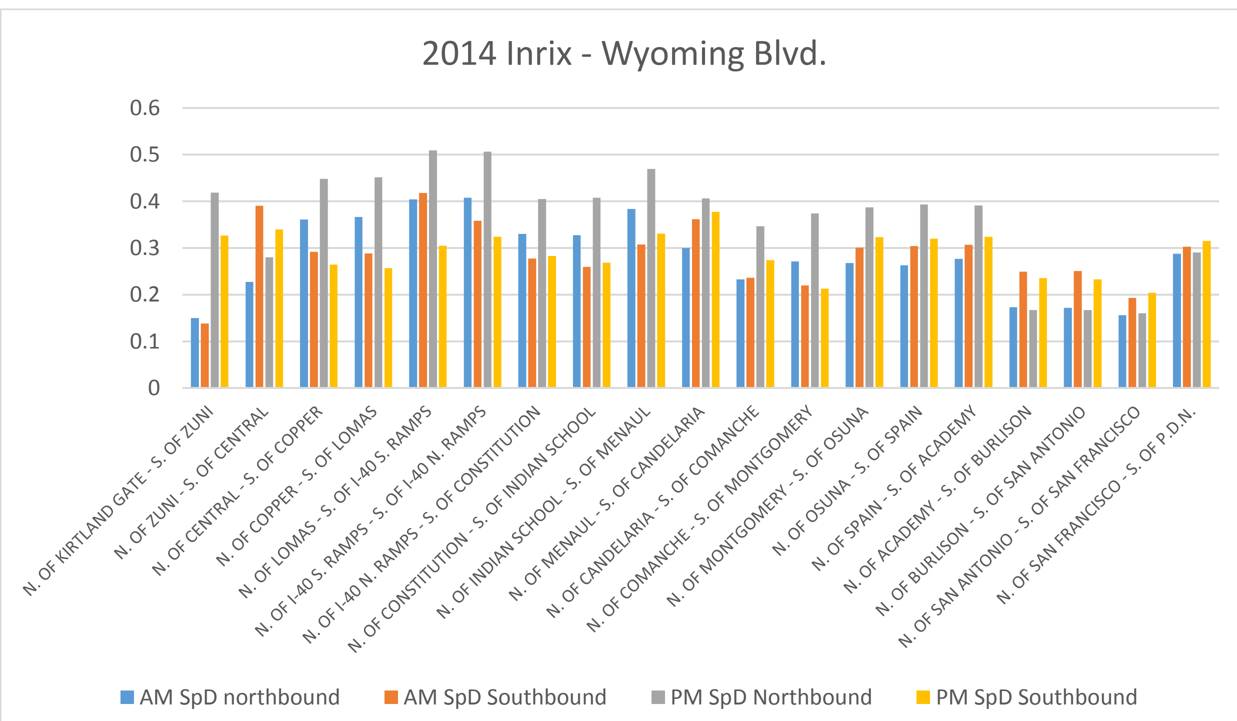


Figure 4: SpD observed along Wyoming Blvd. in 2014 using Inrix data



A comparison was made between the new and previous methodologies to identify any differences that might unexpectedly affect rankings. It was found that the 2014 Inrix data depicted lower variability throughout the congested network than the 2012 Floating Car survey. Above are two graphs depicting speed differentials along Wyoming Blvd., one based on 2012 floating car data (**Figure 3**), the other based on 2014 Inrix data (**Figure 4**). The 2012 floating car data has higher peaks and lower valleys than the 2014 Inrix data, likely due to the fact that the Inrix data represents the average travel time of countless probe runs over a year instead of only a handful of probe runs over the course of several days. In other words, the much larger sample size of Inrix has a smoothing effect. This smoothing effect makes Inrix travel times a useful tool for understanding average conditions over time, but less valuable for evaluating specific traffic incidents.

Changes in Speed Differential Point Thresholds

To garner points, a speed differential has to be above a congestion threshold (See Speed Differential in the Methodology section). In 2014, the point thresholds were shifted upward to account for the fact that the average speed differential from Inrix was higher on average than the 2012 floating car speed differentials. If the 2012 point thresholds were used with the 2014 Inrix data, Wyoming would have garnered 155 points, or about 68% of the 228 available speed points. After shifting the point thresholds up by 10 percentage points, Wyoming received 87 points, or about 38% of available points in 2014. When a high number of link-level data exceeds the minimum point thresholds, the data becomes a less meaningful measure of congestion. This is why the point thresholds were set to higher levels (just above the average 2014 speed differential), ensuring that points are only awarded to links that experience above average levels of congestion. To maintain integrity where 2012 floating car data was used to fill gaps in 2014 Inrix coverage, the 2012 point thresholds were used.

Table 9: 2012 and 2014 SpD point thresholds

2012 Thresholds		2014 Thresholds	
SpD	**Points**	**SpD**	**Points**
<15%	0	<25%	0
15%-25%	1	25%-35%	1
25%-35%	2	35%-45%	2
>35%	3	>45%	3

Updated Capacity Values

Roadway capacity measures the ability of a roadway to carry a level of traffic volume at a determined level of comfort/quality of flow. The capacity values used in analyses have historically been based on a relatively simple function of the roadway's number of lanes and functional class with the average speed or level of operation. In 2015, the roadway capacities were updated based on the latest practice from the 2010 Highway Capacity Manual (HCM) and Florida DOT Level of Service Capacity Tables which consider factors such as medians and side-driveways, providing a more representative capacity value for analysis. A volume to capacity ratio (V/C) is determined by dividing the observed peak hour volume by the road's capacity. Therefore, a change in the capacity value affects the volume to capacity ratio. Most of the capacity values in the congested network went up, resulting in smaller V/C ratios and fewer points. In 2012, using the outdated capacity values, 15.6% of the network's available V/C points were taken compared to only 9.7% in 2014. The drop in V/C points is not due to a reduction in traffic volumes, but the use of higher capacity values to determine 2014 V/C ratios.

Table 10: Change in capacity values used for 2014 CMP analysis

Functional Class	Year	1 Lane	2 Lane	3 Lane
Principal Arterial - 35 MPH or below	2008-2012	800	1600	2400
	2014	750	1630	2520
	Difference	-50	30	120
Principal Arterial - 40 MPH and above	2008-2012	800	1600	2400
	2014	880	2000	3020
	Difference	80	400	620
Principal Arterial - Limited Access - Controlled Access	2008-2012	800	1600	2400
	2014	1035	2215	3335
	Difference	235	615	935
Principal Arterial - Limited Access - Urban Highway	2008-2012	800	1600	2400
	2014	1190	2430	3645
	Difference	390	830	1245
Minor Arterial	2008-2012	750	1500	2250
	2014	750	1630	2520
	Difference	0	130	270
Urban Major Collector	2008-2012	675	1350	2025
	2014	675	1465	2268
	Difference	0	115	243

III. Rankings

The Rankings section explores the results of applying the methodology explained in the previous section to 2014 travel time, traffic volume, and crash data. This section examines the 2014 Corridor Rankings in several different tables and figures. The **Corridor Rankings Table 2014** (**Table 11**) ranks the 31 corridors by their final composite score. Each corridor's speed differential, V/C ratio and crash rate points are included in the table; the sum of these three data inputs constitutes the final score. **Table 11** includes every corridor's score before and after adjustments were made to reach weighting targets. The first four columns in the table depict each corridor's unadjusted point totals. The final four columns depict each corridor's point totals after being adjusted to meet weighting targets. The adjustment factor used to adjust the point totals is included in the column's title. The two rows at the bottom of the table show point totals for each data input and each data input's portion of points. The 2014 Corridor Rankings Table sees a consolidation of river crossings at the top of the table. The top five corridors in the table are river crossings. In 2012, only two of the top five places were occupied by river crossings.

Table 11: Corridor Rankings Table, with points before and after adjustment

		Unadjusted scores				Adjusted scores			
Rank	**Route**	**V/C**	**Speed**	**Crash**	**TOTAL**	**V/C*1.5**	**Speed * .6**	**Crash* 1**	**FINAL SCORE**
1	Alameda Blvd.	45.46	39.95	3.64	89.05	68.19	23.97	3.64	95.80
2	Montano Rd.	27.50	43.14	11.82	82.46	41.25	25.88	11.82	78.95
3	Bridge/Cesar Chavez Blvd.	32.40	25.13	11.33	68.86	48.61	15.08	11.33	75.02
4	U.S. 550	35.25	28.57	3.33	67.15	52.87	17.14	3.33	73.35
5	Paseo Del Norte	22.45	28.15	16.32	66.92	33.68	16.89	16.32	66.89
6	San Mateo Blvd.	6.12	64.64	18.13	88.89	9.19	38.78	18.13	66.10
7	Paradise Blvd.	20.43	31.44	16.00	67.87	30.65	18.86	16.00	65.51
8	Isleta Blvd.	26.77	32.02	4.62	63.40	40.16	19.21	4.62	63.98
9	Osuna Rd.	10.61	63.62	9.33	83.56	15.92	38.17	9.33	63.42
10	Arenal Rd.	18.54	35.89	10.00	64.44	27.82	21.54	10.00	59.35
11	Montgomery Blvd.	4.85	46.30	20.83	71.98	7.27	27.78	20.83	55.88
12	Rio Bravo/Dennis Chavez Blvd.	16.09	24.48	14.29	54.86	24.13	14.69	14.29	53.11
13	Jefferson St.	15.09	36.98	7.78	59.85	22.63	22.19	7.78	52.60
14	Coors Blvd.	10.45	27.55	13.44	51.43	15.68	16.53	13.44	45.64
15	Wyoming Blvd.	3.24	41.65	13.33	58.23	4.86	24.99	13.33	43.18
16	Central Ave.	7.32	28.29	14.25	49.86	10.99	16.97	14.25	42.21
17	N.M. 6	5.66	48.37	4.00	58.04	8.50	29.02	4.00	41.52
18	Eubank Blvd.	5.48	33.75	12.00	51.23	8.22	20.25	12.00	40.47
19	2nd St.	7.38	31.30	9.62	48.30	11.07	18.78	9.62	39.47
20	4th St.	7.65	38.13	5.00	50.78	11.47	22.88	5.00	39.35
21	N.M. 47	19.88	6.09	1.25	27.21	29.82	3.65	1.25	34.72
22	Gibson Blvd.	6.75	28.64	6.67	42.06	10.13	17.18	6.67	33.98
23	N.M. 528	9.24	22.51	6.19	37.94	13.86	13.50	6.19	33.56
24	Lomas Blvd.	1.16	37.26	9.17	47.58	1.73	22.36	9.17	33.26
25	Louisiana Blvd.	2.00	27.23	10.48	39.71	3.00	16.34	10.48	29.82
26	Unser Blvd.	7.58	15.70	8.80	32.08	11.37	9.42	8.80	29.59
27	Menaul Blvd.	2.00	25.01	9.09	36.10	3.00	15.00	9.09	27.10
28	Southern Blvd.	4.97	18.71	5.83	29.52	7.46	11.23	5.83	24.52
29	Irving Blvd.	1.99	18.85	10.00	30.84	2.98	11.31	10.00	24.29
30	Broadway/Edith Blvd.	1.12	26.35	5.91	33.39	1.69	15.81	5.91	23.41
31	Tramway Blvd.	5.83	6.39	6.47	18.69	8.74	3.83	6.47	19.04
Sum of points by data input		391.28	982.10	298.90	1672.28	586.92	589.26	298.90	1475.08
Portion of points by data input		23%	59%	18%	100%	40%	40%	20%	100%

Table 12: Corridor rankings based on speed differential points alone

Rank	Route	Speed Points
1	San Mateo Blvd.	38.78
2	Osuna Rd.	38.17
3	N.M. 6	29.02
4	Montgomery Blvd.	27.78
5	Montano Rd.	25.88
6	Wyoming Blvd.	24.99
7	Alameda Blvd.	23.97
8	4th St.	22.88
9	Lomas Blvd.	22.36
10	Jefferson St.	22.19
11	Arenal Rd.	21.54
12	Eubank Blvd.	20.25
13	Isleta Blvd.	19.21
14	Paradise Blvd.	18.86
15	2nd St.	18.78
16	Gibson Blvd.	17.18
17	U.S. 550	17.14
18	Central Ave.	16.97
19	Paseo Del Norte	16.89
20	Coors Blvd.	16.53
21	Louisiana Blvd.	16.34
22	Broadway/Edith Blvd.	15.81
23	Bridge/Cesar Chavez Blvd.	15.08
24	Menaul Blvd.	15.00
25	Rio Bravo/Dennis Chavez Blvd.	14.69
26	N.M. 528	13.50
27	Irving Blvd.	11.31
28	Southern Blvd.	11.23
29	Unser Blvd.	9.42
30	Tramway Blvd.	3.83
31	N.M. 47	3.65

Table 13: Corridor rankings based on V/C points alone

Rank	Route	V/C Points
1	Alameda Blvd.	68.19
2	U.S. 550	52.87
3	Bridge/Cesar Chavez Blvd.	48.61
4	Montano Rd.	41.25
5	Isleta Blvd.	40.16
6	Paseo Del Norte	33.68
7	Paradise Blvd.	30.65
8	N.M. 47	29.82
9	Arenal Rd.	27.82
10	Rio Bravo/Dennis Chavez Blvd.	24.13
11	Jefferson St.	22.63
12	Osuna Rd.	15.92
13	Coors Blvd.	15.68
14	N.M. 528	13.86
15	4th St.	11.47
16	Unser Blvd.	11.37
17	2nd St.	11.07
18	Central Ave.	10.99
19	Gibson Blvd.	10.13
20	San Mateo Blvd.	9.19
21	Tramway Blvd.	8.74
22	N.M. 6	8.50
23	Eubank Blvd.	8.22
24	Southern Blvd.	7.46
25	Montgomery Blvd.	7.27
26	Wyoming Blvd.	4.86
27	Louisiana Blvd.	3.00
28	Menaul Blvd.	3.00
29	Irving Blvd.	2.98
30	Lomas Blvd.	1.73
31	Broadway/Edith Blvd.	1.69

The **Speed Differential Table** (Table 12) ranks the 31 corridors by most speed differential points to least. In 2014, six of the top 10 corridors in terms of SpD are on Albuquerque’s Eastside. The most congested

Table 14: Corridor rankings based on crash points alone

Rank	Route	Crash Points
1	Montgomery Blvd.	20.83
2	San Mateo Blvd.	18.13
3	Paseo Del Norte	16.32
4	Paradise Blvd.	16.00
5	Rio Bravo/Dennis Chavez Blvd.	14.29
6	Central Ave.	14.25
7	Coors Blvd.	13.44
8	Wyoming Blvd.	13.33
9	Eubank Blvd.	12.00
10	Montano Rd.	11.82
11	Bridge/Cesar Chavez Blvd.	11.33
12	Louisiana Blvd.	10.48
13	Arenal Rd.	10.00
14	Irving Blvd.	10.00
15	2nd St.	9.62
16	Osuna Rd.	9.33
17	Lomas Blvd.	9.17
18	Menaul Blvd.	9.09
19	Unser Blvd.	8.80
20	Jefferson St.	7.78
21	Gibson Blvd.	6.67
22	Tramway Blvd.	6.47
23	N.M. 528	6.19
24	Broadway/Edith Blvd.	5.91
25	Southern Blvd.	5.83
26	4th St.	5.00
27	Isleta Blvd.	4.62
28	N.M. 6	4.00
29	Alameda Blvd.	3.64
30	U.S. 550	3.33
31	N.M. 47	1.25

corridor in terms of speed differential, San Mateo Blvd., occupies sixth place on the Corridor Rankings Table 2014. The **V/C Table** (Table 13) ranks the 31 corridors by most V/C points to fewest. The top four corridors, in terms of V/C points, are river crossings and also occupy the top four places in the composite corridor rankings table (**Table 11**), albeit in a different order. The most congested corridor in terms of volume to capacity ratio points, Alameda Blvd., is also the most congested corridor in the Corridor Rankings Table 2014. Volume to capacity points appear to be the most important data input in determining which corridors make it to the top of the composite score table. Although the sum of the 31 corridors' speed differential and V/C points are roughly the same, they are distributed differently. The speed differential points are spread more equitably to all corridors, while the V/C points are more concentrated in a handful of corridors, mostly river crossings.

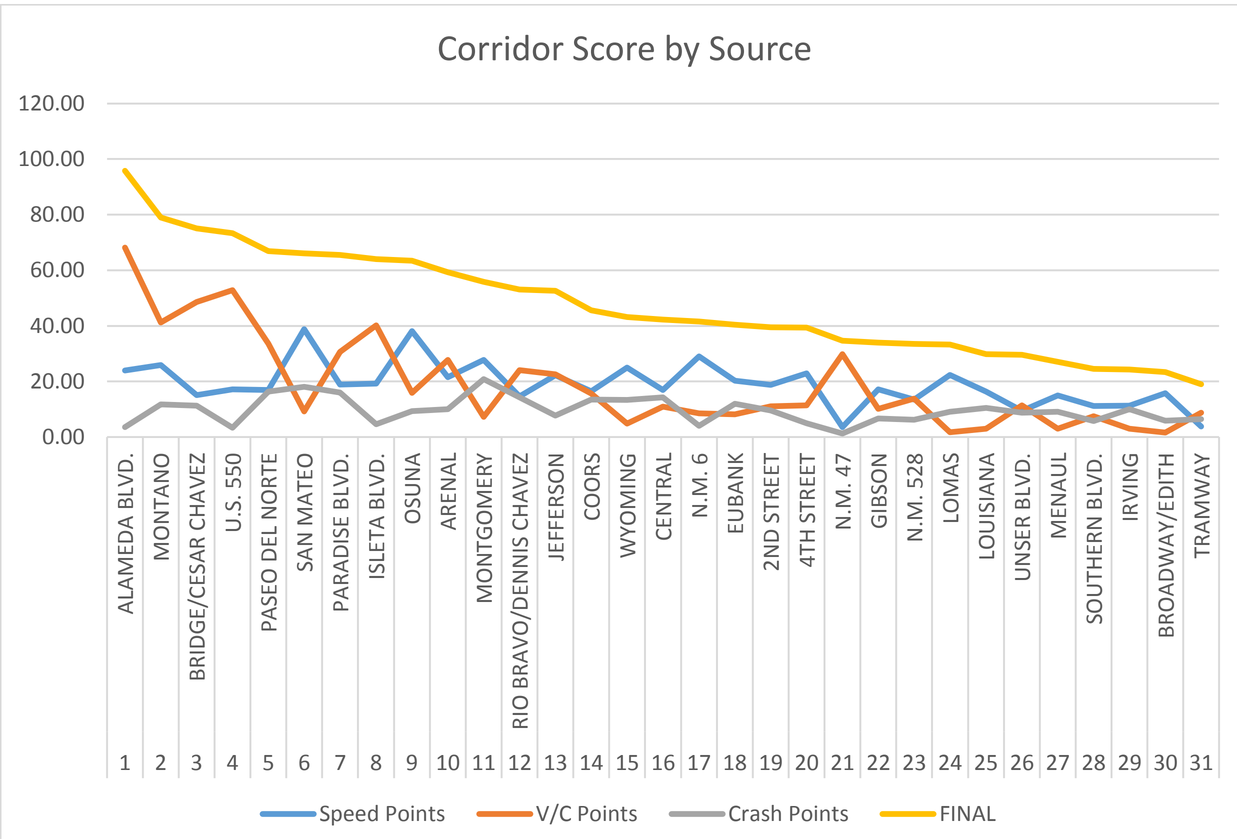
The **Crash Table** (Table 14) ranks the 31 corridors by highest crash rates to lowest. There are half as many crash points as SpD or V/C points overall, reflecting the FHWA's estimation that non-recurring congestion is a less important determinant of congestion than recurring congestion. Despite the lower weighting, crash rate is still an important data input that shapes the Corridor Rankings Table. The two corridors with the most crash points – Montgomery Blvd. and San Mateo Blvd. –are both major boulevards on the eastside of Albuquerque. Both arterials host high levels of commercial activity and neither have extensive access control. Some corridors receive a disproportionate amount of their congestion score from crash rates. This means that addressing safety concerns is an important means of ensuring smoother travel flow on these corridors. Examples include San Mateo Blvd., Paradise Blvd., and Montgomery Blvd.

IV Discussion

Changes in the methodology and data input used to create the 2014 Corridor Rankings Table result in significant changes in the corridor rankings from 2012. This section explores the 2014 Corridor Rankings Table's major departures from the 2012 rankings. First, a macro analysis of the overall change in trends will be given before delving into noteworthy changes in particular corridors. Corridors that changed in rank by 10 or more places since 2012 will be individually scrutinized to uncover what factors are responsible for their shift.

Perhaps the most significant methodological change was the decision to alter the data input weighting targets. In previous years' corridor rankings methodology, speed differential was weighted more heavily than volume or crash data. As a result, only one of the top ten corridors had more V/C points than SpD points. Changing the weighting targets to 40/40/20 resulted in a rise in the importance of volume to capacity points in shaping the rankings. In the 2014 Corridor Rankings Table, the top five corridors all have more V/C points than SpD.

Figure 5: Source of points by corridor



Only a small number of corridors are overcapacity at peak periods, but nearly all corridors experience intersection-related delay. Therefore, there is a broader distribution of SpD points than V/C points. Reflecting the fact that a small number of corridors carry a disproportionate amount of traffic, two thirds of all V/C points are generated by ten corridors. By contrast, delay is experienced more widely, as evidenced by the fact that speed differential points are more evenly distributed across the 31 corridors. Because more V/C points are concentrated in fewer corridors, it makes sense that traffic volumes have a greater impact over which corridors are at the top of the 2014 Corridor Rankings Table. **Figure 5** is a chart that visualizes which data inputs went into every corridor's final score. The top line of **Figure 5** represents each corridor's final score and is the sum of the three lines below it, which each represent one of the three data sources used. The chart makes clear that the most congested corridors are the select locations where V/C ratios are highest.

Lowering the weighting target for speed differential points leads to significant drops in the composite scores of corridors whose points are mostly derived from speed-related delays. For example, the primary source of congestion on Gibson, Wyoming, Lomas, and Louisiana are low travel speeds. Consequently, the ranking for each of these corridors fell in 2014 compared to 2012. As explained in Section II, the 2014 SpD is weighted less heavily than in 2012. Lowering the weighting target of SpD between the 2012 and 2014 corridor rankings reduced the amount of SpD points for all corridors. This decision resulted in a drop in ranking for corridors whose composite score was primarily made up of speed differential points.

The change of weighting targets is not solely responsible for the ranking changes from 2012. Many of the corridors that experienced extreme shifts in rank since 2012 were affected by a combination of factors. The next section will scrutinize the corridors that shifted ten or more places in rank from 2012.

Noteworthy Changes in Rankings

Table 15 organizes the corridors in the congested network by greatest difference in rank between 2012 and 2014. At the top of table are the corridors that experienced the greatest positive shift, the corridors in the middle did not change and the corridors at the bottom experienced the greatest negative shift since 2012. This section examines the four corridors that shifted 10 places or more in rank since 2012.

Table 15: Change in Rankings 2012 to 2014

Route	2012 Rank	2014 Rank	Change
U.S. 550	19	4	15
Paseo Del Norte	13	5	8
N.M. 47	28	21	7
Arenal Rd.	15	10	5
Rio Bravo/Dennis Chavez Blvd.	17	12	5
N.M. 6	22	17	5
Montano Rd.	6	2	4
Paradise Blvd.	11	7	4
Unser Blvd.	29	26	3
San Mateo Blvd.	7	6	1
2nd St.	20	19	1
4th St.	21	20	1
Irving Blvd.	30	29	1
Alameda Blvd.	1	1	0
Bridge/Cesar Chavez Blvd.	3	3	0
N.M. 528	23	23	0
Osuna Rd.	7	9	-2
Southern Blvd.	26	28	-2
Montgomery Blvd.	8	11	-3
Menaul Blvd.	24	27	-3
Broadway/Edith Blvd.	27	30	-3
Isleta Blvd.	4	8	-4
Jefferson St.	9	13	-4
Central Ave.	12	16	-4
Eubank Blvd.	14	18	-4
Tramway Blvd.	25	31	-6
Louisiana Blvd.	18	25	-7
Lomas Blvd.	16	24	-8
Wyoming Blvd.	5	15	-10
Coors Blvd.	2	14	-12
Gibson Blvd.	10	22	-12

U.S. 550

U.S. 550 is the northernmost river crossing in the AMPA. U.S. 550 is becoming an increasingly attractive river crossing to Rio Rancho residents wishing to access jobs in Albuquerque via I-25. In response to increasing traffic volumes along the corridor in recent years, the New Mexico Department of Transportation (NMDOT) reconstructed the U.S. 550 and I-25 interchange into a single point urban interchange and added capacity through an additional driving lane on U.S. 550 between I-25 and NM 313. Construction on this project was completed in July of 2014.

During construction of the U.S. 550/I-25 interchange, motorists on the corridor reported significant delays in traffic[5]. Construction during the first half of 2014 may have skewed the average annual travel time along segments of this corridor, which may partially explain the increase in speed differential points in 2014 from 2012. However, it is difficult to ascertain whether the slower travel times are a result of construction or the introduction of a new travel time data source.

U.S. 550 moved from 19th place in 2012 to 4th place in the 2014 Corridor Rankings Table. This movement appears to be the result of the removal of several segments of the corridor that were not congested and an increase in overall SpD points. In previous CMP analyses, NM 165, which lies to the east of I-25 and provides access to the community of Placitas, was considered part of U.S. 550. After recent deliberation, it was decided that these two corridors should be considered different travel markets and not combined. U.S. 550 and N.M. 165 were split and N.M. 165 was taken out of the congested network as its congestion levels are negligible. Cutting out the three links that constitute N.M. 165 heightened U.S. 550's score because few congestion points were generated from N.M. 165. In other words, U.S. 550's congestion score was slightly diluted by the inclusion of N.M. 165.

Table 16: Capacity values along U.S. 550, 2012 and 2014

		2012 Capacity		2014 Capacity		Difference	
Route	**Location**	**EB Capacity**	**WB Capacity**	**EB Capacity**	**WB Capacity**	**EB Change**	**WB Change**
U.S. 550	**EAST OF DON TOMAS - WEST OF NM 313**	**1600**	**1600**	**2000**	**2000**	**400**	**400**
U.S. 550	**RIO GRANDE CROSSING - WEST OF SANTA ANA RD**	**1600**	**1600**	**2000**	**2000**	**400**	**400**
U.S. 550	**EAST OF SANTA ANA RD - WEST OF DON TOMAS**	**1600**	**1600**	**2000**	**2000**	**400**	**400**
U.S. 550	**EAST OF JEMEZ DAM RD - RIO GRANDE CROSSING**	**1600**	**1600**	**2000**	**2000**	**400**	**400**

In the 2012 Congested Corridor Rankings, U.S. 550 received 51 V/C points and 19 SpD points. In 2014, the corridor garnered 39 V/C points and 40 SpD points. The corridor received roughly the same amount of crash points in both years. Traffic volumes along U.S. 550 increased in most locations between 2012 and 2014. The corridor has seen a marked increase in traffic volumes since the completion of the U.S. 550/I-25 interchange project as **Table 17** illustrates. However, the adjustment of capacity values upward (**Table 16**) resulted in smaller V/C ratios and fewer points despite higher average traffic volumes along the corridor.

[5] https://www.abqjournal.com/289121/traffic-project-running-late.html?utm_source=abqjournal.com&utm_medium=related+posts+-+default&utm_campaign=related+posts

Nevertheless, U.S. 550 garnered the second highest amount of volume to capacity points of any corridor in 2014, indicating that there is far more demand to use the road than there is roadway supply. Therefore, it is no surprise that in February 2016, NMDOT announced plans to increase capacity through an additional lane in each direction on U.S. 550 between N.M. 313 and N.M. 528.

Table 17: Increase in traffic volume at U.S. 550 river crossing over time

Date	Route	Location	Volume	AM Pk Hr Vol	PM Pk Hr Vol
3/21/2016	U.S. 550	W. of Santa Ana Rd.	52,582	3,755	4,238
3/26/2012	U.S. 550	W. of Santa Ana Rd.	42,850	3,186	3,660
3/1/2009	U.S. 550	W. of Santa Ana Rd.	39,498	2,640	3,338

Gibson Blvd.

Gibson is an important east-west principal arterial on Albuquerque's southeast side that provides access to the Sunport International Airport and Kirtland Air Force Base. In 2012, the corridor ranked 10th but dropped to 22nd in 2014. Traffic volumes along Gibson Blvd. rarely exceed the road's capacity, and the corridor received few V/C points in both 2012 and 2014. The corridor also experienced a similar crash rate in 2014 as it did in 2012. The major difference between Gibson's 2012 and 2014 ranking is the reduction in points generated by speed related delay.

Figure 6: 2012 Gibson Blvd. speed differentials derived from floating car data

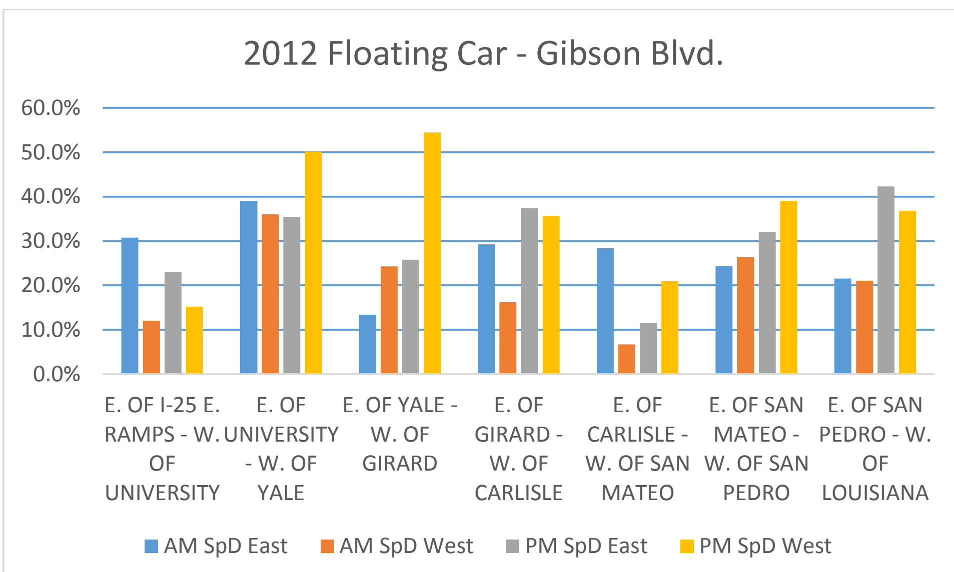
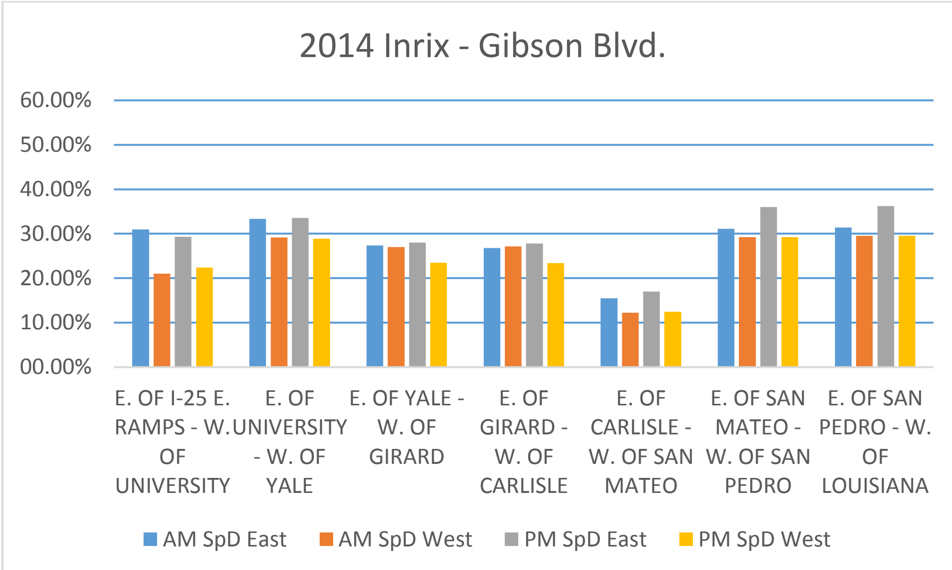


Figure 7: 2014 Gibson Blvd. speed differentials derived from Inrix data



Gibson Blvd. produced nearly half the amount of speed differential points in 2014 as it did in 2012 before weighting factors were applied. This shift appears to be due, at least in part, to the change in travel time data methodology. **Figure 6** illustrates the speed differentials observed along Gibson Blvd. during the peak periods using the floating car technique in 2012. **Figure 7** depicts the average 2014 peak hour speed differentials along Gibson Blvd. as detected by Inrix. Remember that the point thresholds were shifted 10 percentage points above 2012 levels in 2014 (**Table 9**). So a speed differential in 2012 only needed be above 15% to receive a point, but 2014 speed differentials must exceed 25% to receive a point. Not only were speed differentials higher on Gibson in 2012, but also point thresholds were lower. There were 10 speed differentials that exceeded the top point threshold in 2012 and none in 2014.

Coors Blvd.

Coors is the primary north-south facility in the AMPA west of the Rio Grande. MRMPO's CMP monitors 16 miles of Coors Blvd., from Don Felipe Rd. in the South Valley to N.M. 528 at the Rio Rancho city limits. Coors ranked second overall in 2012, but fell 12 places to 14th in 2014. Before adjustment factors were applied to achieve weighting targets, Coors took 65% fewer volume to capacity points, 37% fewer speed differential points and about half as many crash points as it did in 2012.

The lower number of V/C points in 2014 is a result of the shift in capacity values that occurred between the 2012 and 2014 corridor ranking analyses. The change in capacity values was pronounced on Coors Blvd. because the majority of the corridor, from Rio Bravo to the Coors Bypass, is an access controlled facility. After capacities for the AMPA road network were recalculated, the capacity values on Coors shifted upwards, on average, by 765 vehicles per hour in both directions (see Table 18). Such a large shift in capacity values meant that the peak hour volumes were being divided by a much larger number, resulting in more links with V/C values below the point-generating threshold of 0.7.

Table 18: Capacity value along Coors Blvd., 2012 and 2014

Route	Location	2012 Capacity		2014 Capacity		Difference	
		NB Capacity	SB Capacity	NB Capacity	SB Capacity	NB Change	SB Change
COORS	NORTH OF MONTANO - SOUTH OF LA ORILLA	2400	2400	3335	3335	935	935
COORS	NORTH OF EAGLE RANCH RD - SOUTH OF S.I.P.I. ENTRANCE	2400	2400	3335	3335	935	935
COORS	NORTH OF S.I.P.I. ENTRANCE - SOUTH OF P.D.N. S. RAMPS	2400	2400	3335	4460	935	2060
COORS	NORTH OF LA ORILLA - SOUTH OF EAGLE RANCH RD	2400	2400	3335	3335	935	935

Table 18: Note that a lane was added between the Southwestern Indian Polytechnic Institute entrance and the Paseo Del Norte on ramps.

The average Inrix generated speed differential in 2014 was 5% higher than the corridor's average 2012 floating car speed differential. However, the 5 percentage point increase in average speed differential was offset by the 10 percentage point increase in speed differential point thresholds in 2014. As a result, Coors Blvd. generated fewer SpD points in 2014 than in 2012.

Coors Blvd. has historically experienced a high crash rate. In 2014, the corridor exhibited the seventh highest crash rate in the network. The high number of automobile crashes makes Coors Blvd. particularly vulnerable to non-recurring congestion. Coors Blvd. is the primary north-south arterial west of the river and there are few alternative options for north south travel. When there is an accident on Coors Blvd., the limited Westside network cannot absorb diverting traffic as easily as the Eastside grid can. Montgomery Blvd., for example, carries similar traffic volumes as Coors Blvd., but if a traffic accident impedes traffic on Montgomery Blvd., traffic can more easily divert to parallel routes.

Wyoming Blvd.

Wyoming Blvd. is an important north-south principal arterial in east Albuquerque. The CMP monitors congestion on Wyoming from Kirtland Air Force Base in the south to Paseo Del Norte in the north. Wyoming Blvd. was ranked 5th overall in 2012, but dropped to 15th place in 2014. Wyoming's drop in rank can be attributed to a reduction in V/C points as well the decreased influence of speed differential on composite scores in 2014.

Table 19: Capacity values along Wyoming Blvd., 2012 and 2014

Route	Location	2012		2014		Difference	
		SB Capacity	NB Capacity	SB Capacity	NB Capacity	SB Change	NB Change
WYOMING	N. OF I-40 W. RAMPS - S. OF CONSTITUTION	2400	2400	3020	3020	620	620
WYOMING	N. OF CONSTITUTION-S. OF INDIAN SCHOOL	2400	2400	3020	3020	620	620
WYOMING	N. OF INDIAN SCHOOL - S. OF MENAUL	2400	2400	3020	3020	620	620
WYOMING	N. OF MENAUL - S. OF CANDELARIA	2400	2400	3020	3020	620	620
WYOMING	N. OF CANDELARIA - S. OF COMANCHE	2400	2400	3020	3020	620	620
WYOMING	N. OF COMANCHE - S. OF MONTGOMERY	2400	2400	3020	3020	620	620
WYOMING	N. OF MONTGOMERY - S. OF OSUNA	2400	2400	3020	3020	620	620
WYOMING	N. OF OSUNA - S. OF SPAIN	2400	2400	3020	3020	620	620
WYOMING	N. OF SPAIN - S. OF ACADEMY	2400	2400	3020	3020	620	620

Increased capacity values along Wyoming Boulevard led to a reduction in volume to capacity points. In 2012, Wyoming generated 41 V/C points, but only 8 V/C points in 2014. In 2012, a six lane principal arterial with turn lanes and no access control was thought to have a capacity of 2,400 vehicles per hour per direction. After updating the Albuquerque Metropolitan Planning Area's road network according to the Florida Department of Transportation's suggested capacity values, a six lane principal arterial's capacity was set to 3,020 vehicles per hour per direction. Much of Wyoming Blvd.'s link capacity values grew by 620 vehicles per hour per direction, nearly a 25% increase over 2012 capacity values (**Table 19**).

VMT Table

Vehicle Miles Traveled (VMT) is a measure of miles traveled by vehicles in a specified region during a specified time. VMT is calculated by multiplying the volume of traffic by the length of the roadway. Daily VMT was calculated for all links in the congested network and then added together to form composite VMT corridor value. Each corridor's VMT value was divided by its length in miles, resulting in each corridor's average VMT per mile of roadway. Understanding each corridor's daily VMT and VMT per mile helps determine which corridors carry the most traffic overall and which are the most heavily used on a per mile basis.

$$VMT_{link} = link\ traffic\ volume \times link\ length\ (miles)$$

$$VMT_{Corridor} = \sum_{All\ corridot\ links} VMT_{link}$$

The current methodology used by MRMPO to assess congestion does not give more weight to congestion on corridors with higher traffic volumes. Rather, congestion scores are normalized to allow for evaluation of different corridor types using consistent methodology. As a result, congested conditions on Irving Blvd. will garner the same amount of points as congestion of the same intensity on Coors Blvd., despite the congestion on Coors Blvd. being experienced by far more people.

The VMT table is a way of evaluating the relative importance of corridors in the congested network. The corridors with the highest Daily VMT carry the most traffic overall, while the corridors with the highest VMT per mile carry the most traffic on a per mile basis. The VMT table should be thought of as a tool to accompany the corridor rankings. Where the corridor rankings measure the intensity of congested conditions on facilities, the VMT table considers the role the facility plays in the region in terms of people movement. When viewed together the tables provide insight into the corridors where roadway improvements might have the greatest impact.

Table 20: VMT by corridor

Rank	Route	Corridor Length (mi)	Daily VMT	VMT per Mile	VMT Score
1	Coors Blvd.	15.6	617,430.9	39,505.5	39.5
2	Montgomery Blvd.	6.4	230,200.2	36,036.4	36.0
3	Alameda Blvd.	4.1	146,663.5	35,815.3	35.8
4	N.M. 528	11.1	390,288.5	35,047.5	35.0
5	Paseo Del Norte	11.0	380,669.8	34,574.9	34.6
6	U.S. 550	2.8	96,113.3	34,424.5	34.4
7	Wyoming Blvd.	7.2	248,189.0	34,308.7	34.3
8	San Mateo Blvd.	6.1	206,792.5	33,740.0	33.7
9	Gibson Blvd.	4.2	133,050.7	31,769.5	31.8
10	Eubank Blvd.	8.1	238,974.3	29,386.9	29.4
11	Montano Rd.	6.1	173,495.2	28,521.3	28.5
12	Tramway Blvd.	7.2	189,066.7	26,358.1	26.4
13	Central Ave.	14.5	371,919.7	25,612.5	25.6
14	Bridge/Cesar Chavez Blvd.	5.3	132,175.1	24,812.3	24.8
15	Osuna Rd.	2.6	63,462.7	24,655.3	24.7
16	N.M. 6	3.9	96,555.5	24,550.1	24.6
17	Rio Bravo/Dennis Chavez	3.7	86,763.5	23,155.4	23.2
18	Menaul Blvd.	10.0	223,070.2	22,333.8	22.3
19	Unser Blvd.	21.0	467,513.0	22,294.4	22.3
20	Lomas Blvd.	9.6	213,995.7	22,235.6	22.2
21	Louisiana	4.9	107,435.0	21,930.0	21.9
22	N.M. 47	10.3	224,391.2	21,711.8	21.7
23	Southern Blvd.	4.4	90,096.3	20,546.5	20.5
24	2nd St.	7.0	136,054.0	19,472.4	19.5
25	Jefferson St.	3.1	55,279.0	17,694.9	17.7
26	Isleta Blvd.	3.3	55,807.5	16,855.2	16.9
27	Paradise Blvd.	3.4	52,414.1	15,452.3	15.5
28	4th St.	7.2	110,053.1	15,336.3	15.3
29	Broadway/Edith Blvd.	14.1	182,489.2	12,957.2	13.0
30	Arenal Rd.	2.6	28,038.5	10,974.0	11.0
31	Irving Blvd.	2.1	20,808.8	9,932.6	9.9

Final Note

The 2014 Corridor Rankings depart from previous iterations in both data input and methodology. Because 2014 is the first year to use Inrix data and the altered weighting targets, it will serve as the new baseline to which future corridor rankings will be compared.