

Appendix B
Albuquerque Cycle Zones



Albuquerque Cycle Zones

The Cycle Zone Analysis (CZA) tool allows the City to better understand which parts of the City are best suited for capturing large numbers of cycling trips, which have greater potential to do so than they are currently, which areas are best suited for strategic investments, and which areas may need innovative bikeway treatments to maximize cycling potential. Breaking the City into zones which share similar characteristics, allows a comparison and analysis that provides information that can be used to guide future facility investments.

Cycle Zone Definition

A cycle zone is defined as an area of the City that possesses similar characteristics for cycling. Cycle Zones are not Transportation Analysis Zones (TAZ) and TAZs cannot be used for cyclezone analysis. Generally, a cycle zone is defined by features that represent significant barriers or crossing difficulties, like I-25, I-40 and the Rio Grande River. They are also defined by neighborhoods and areas that contain places that are desirable destinations for cyclists like parks or neighborhood centers. In addition, cycle zone boundaries reflect a change in the character of a neighborhood (e.g. block size or street connectivity).

The cycle zones and their boundaries were delineated by City and consultant staff familiar with cycling conditions, neighborhoods, and features that represent crossing difficulties for cyclists. The City's political limits also served as a boundary for this analysis.

Data Gathering and Synthesis

The analysis was based on existing data from the City of Albuquerque and Bernalillo County.

The measures that were chosen and the reasoning for their inclusion in the cycle zone analysis equation are discussed in more detail below. In many cases, the selected measures were translated into density units – square acre or linear feet - to account for size variations between zones. The following measures were used for cycle zone analysis:

Road Network Density: (ft/square acre)

Definition

The density in linear feet per square acre of all roads in the cycling zone. This includes roads of all types, including local streets, arterials, highways and freeways.

Example



Reasoning

A zone with a greater density of roads will facilitate a better cycling experience. Riders will be able to go more places and have greater route choice.



Basic Methodology

GIS tools were used to determine the overall length of roads falling within each cycle zone. This was divided by the zone's acreage to obtain an average road network density.

Bike Network Density: (ft/square acre)

Definition

The density in linear feet per square acre of all the City of Albuquerque's bicycle facilities within a specific cycling zone. The facilities used for this analysis include only existing facilities.

Example



Reasoning

The presence of facilities designed for cyclists increases their comfort and safety. A greater presence of cycle facilities will improve the cycling experience.

Basic Methodology

The bicycle network layer was intersected with the cycle zone boundary, and then the lengths of each segment or partial segment that fell within a specific zone were summed. The resulting number was divided by acreage to obtain the average density

Road Network Connectivity

Definition

A measure of road network connectivity, this number ranging from 0 – 1 represents the ratio of cul-de-sacs and three-way intersections to four- or more way intersections. The closer to one, the more grid-like the street pattern. An overall average score was calculated for each zone.

**Example****Reasoning**

A zone with greater roadway connectivity will facilitate a better cycling experience. Riders will be able to easily go more places and have greater route choice.

General Methodology

GIS was used to determine all points in the City where one road was intersected by at least one other road. The location and number of roads at each intersection point were recorded. For each cycle zone, the overall number of intersections was summed up as well as the number of intersections that were at least four ways. These numbers were used to determine the percentage of intersections that were four-ways or more.

Bike Network Connectivity

Same measure and use as road network connectivity, but applied specifically to the existing on-street bicycle and trail network

Slope: (% greater than 5%)**Definition**

The percentage of roads and bikeways with slope greater than 5% for each cyclezone.

Reasoning

Topography can decrease the ease of cycling. A great cycle zone will be relatively flat. Topography is an issue that is difficult or impossible to change and is very important to consider when evaluating the bikability of a zone.

General Methodology

Elevation data from the United States Geologic Service was used to determine the elevation at all starting and ending points of the road segments in the City. The elevations were used to calculate the overall slope for each road segment.

Land Use Mix**Definition**

This factor combines the degree of concentration of cycling generating land uses in a Cycle Zone with the residential and employment density in a Cycle Zone.

Reasoning

Areas with a high population and employment density as well as a good use of bicycle trip generating land uses create a significant number of potential cycling trips.



Calculation

The methodology involves calculating both the overall level of land use mix and combined residential and employment density in each Cycle Zone. The scores from the land use mix and residential and employment datasets were then integrated as shown in Table 1.

Table 1. Employment Density and Land Use Integration

Residential & Employment Density <i>(residents and employees per acre)</i>	1G	2G	3G	4G	5G	6G	7G
18.1 - 20.9	1G	2G	3G	4G	5G	6G	7G
15.3 - 18.1	1F	2F	3F	4F	5F	6F	7F
12.5 - 15.3	1E	2E	3E	4E	5E	6E	7E
9.7 - 12.5	1D	2D	3D	4D	5D	6D	7D
7.0 - 9.7	1C	2C	3C	4C	5C	6C	7C
4.2 - 7.0	1B	2B	3B	4B	5B	6B	7B
1.3 - 4.2	1A	2A	3A	4A	5A	6A	7A
Land Use Mix <i>(% Commercial, Institutional, or Mixed Commercial-Residential)</i>	19 - 25	28 - 31	31 - 36	36 - 42	42 - 47	47 - 51	51 - 56

Ratings Scale	
Violet	Highest (8)
Indigo	(7)
Dark Blue	(6)
Light Blue	(5)
Green	(4)
Yellow	(3)
Orange	(2)
Red	Lowest (1)

Model and Zone Scores

Once the cycle zone analysis is complete, the scoring, normalization and weighting of the data occurs. Positive Z-Scores are calculated for each major metric of the Cycle Zone Analysis and then weighting is applied. Score weighing is shown in Table 2.

Table 2. Composite CZA Factor Weights

Factor	Weight (Percent)
Road Network Connectivity	10
Road Network Density	10
Topography	10
Land Use	20
Existing Bikeway Connectivity	25
Existing Bikeway Density	25

Composite scores showing the relative quality of the cycling experience in each zone are displayed on Map B-1. Higher scores represent areas that have the best existing cycling conditions, these are zones 19, 20, 23 and 24. Zone 4 is the highest scoring Zone on the west side of the river due to a dense and well-connected network of bicycle facilities. Zones 8 and 25 generally scored the lowest for most factors including land use, existing roadway network density and connectivity, and existing bikeway network connectivity.

Table 3 shows the scores for each zone by from low to high. This table can be used to understand the existing conditions in each zone, understand the factors that can be changed, and develop a strategy to develop each zone to its maximum cycling potential. For example, zone 4 scores poorly for roadway density but well for connectivity. The factors that contribute the highest percentage of the overall score for bikeway density and bikeway connectivity are some of the high-

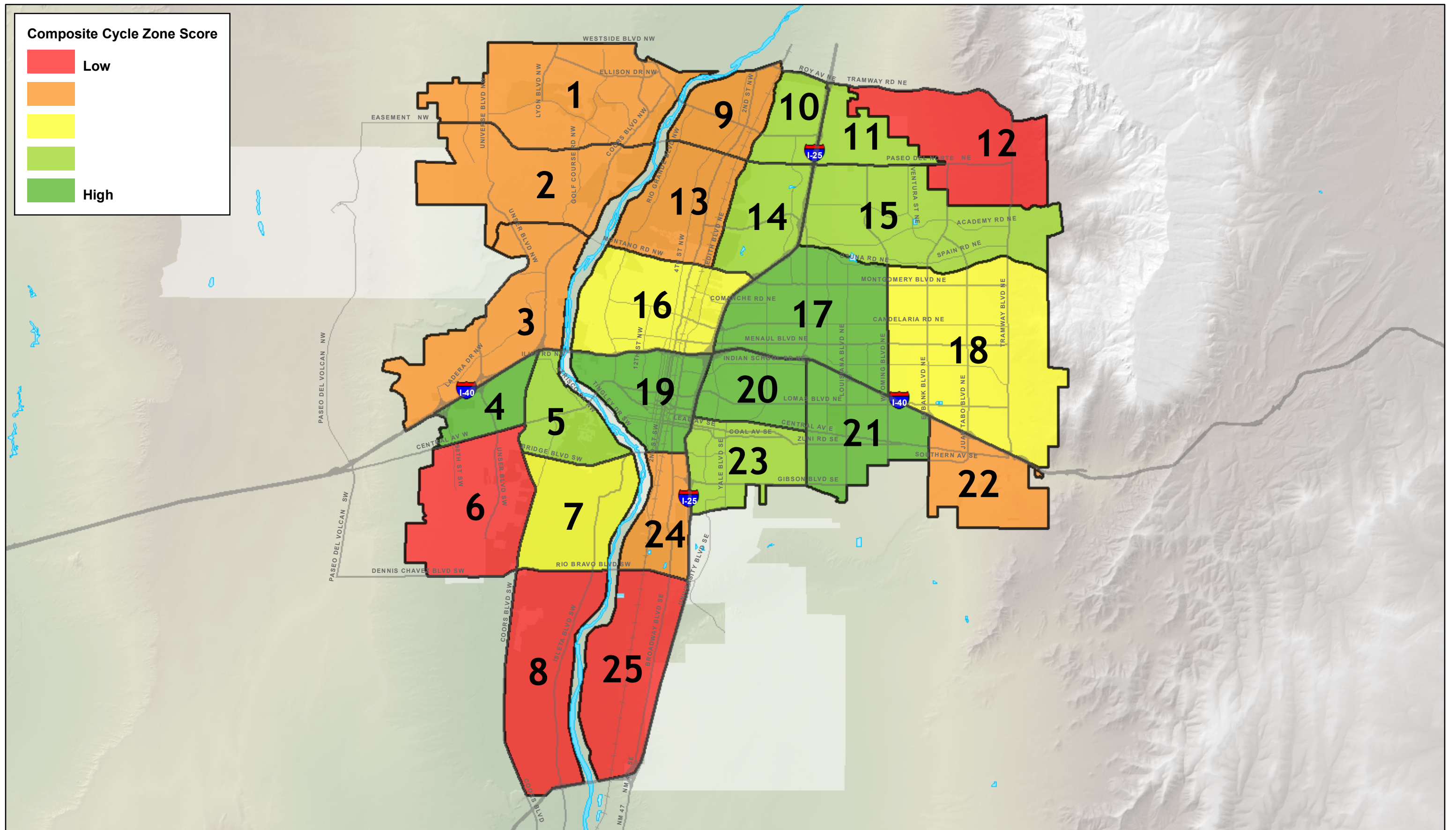


est in the city. This contributes to a high overall score, but cyclists still may face challenges traversing this zone on roadways that are not part of the designated bikeway network due to lower roadway density and connectivity. These findings indicate that as the roadway network in this zone increases, the relative quality of the cycling network will increase. Any new construction in this zone should include accessways to facilitate bicycle and pedestrian connectivity. These accessways should be signed to increase user’s awareness of these facilities. A summary of existing conditions along with suggested strategies to improve the relative Cycle Zone Analysis Scores is included in Appendix A. Maps showing the relative score for each factor are included in Appendix B.

Table 3. Summary of CZA Factor Scores

Zone Number	Bikeway Connectivity	Roadway Connectivity	Bikeway Density	Roadway Density	Topography	Land Use	Composite CZA
1	Low	Low	Low	Low	Low	Low	Low
2	Low	Low	Low	Low	Low	Low	Low
3	Low	Low	Low	Low	Low	Low	Low
4	Low	Low	Low	Low	Low	Low	Low
5	Low	Low	Low	Low	Low	Low	Low
6	Low	Low	Low	Low	Low	Low	Low
7	Low	Low	Low	Low	Low	Low	Low
8	Low	Low	Low	Low	Low	Low	Low
9	Low	Low	Low	Low	Low	Low	Low
10	Low	Low	Low	Low	Low	Low	Low
11	Low	Low	Low	Low	Low	Low	Low
12	Low	Low	Low	Low	Low	Low	Low
13	Low	Low	Low	Low	Low	Low	Low
14	Low	Low	Low	Low	Low	Low	Low
15	Low	Low	Low	Low	Low	Low	Low
16	Low	Low	Low	Low	Low	Low	Low
17	Low	Low	Low	Low	Low	Low	Low
18	Low	Low	Low	Low	Low	Low	Low
19	Low	Low	Low	Low	Low	Low	Low
20	Low	Low	Low	Low	Low	Low	Low
21	Low	Low	Low	Low	Low	Low	Low
22	Low	Low	Low	Low	Low	Low	Low
23	Low	Low	Low	Low	Low	Low	Low
24	Low	Low	Low	Low	Low	Low	Low
25	Low	Low	Low	Low	Low	Low	Low

Value Key	
Low	Lightest Blue
	Light Blue
	Medium Blue
High	Darkest Blue



Appendix B - Map 1. Cycle Zone Analysis Composite Existing Conditions

Albuquerque Bikeways and Trails Master Plan Update

Source: City of Albuquerque, MRCOG, Gannett Fleming
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