Bike Share Suitability Analysis | Columbus, Indiana

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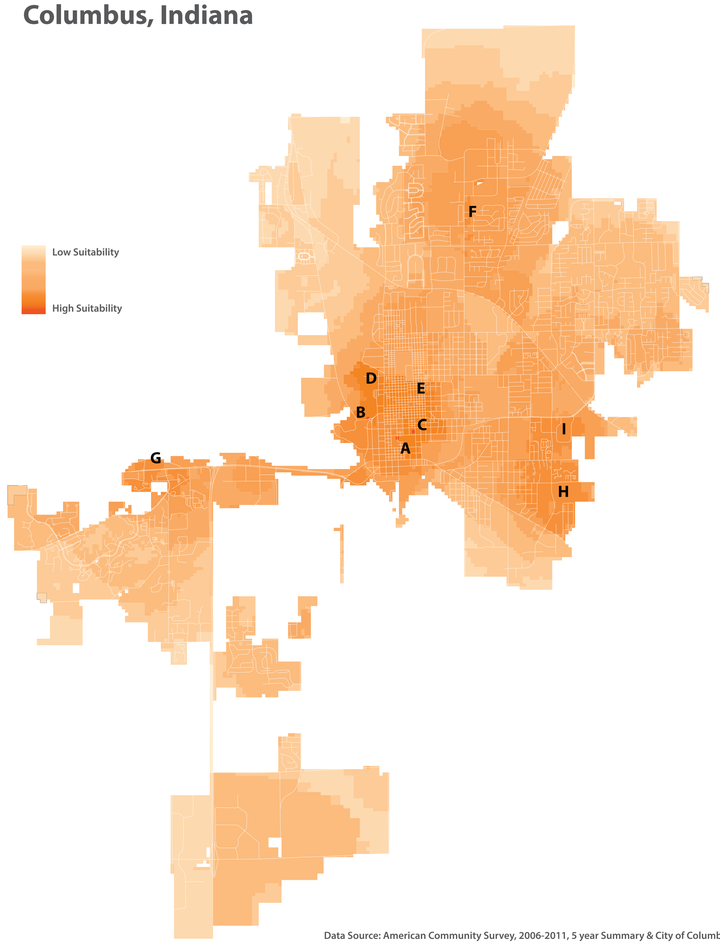
Analysis + Results

Bike Share Station Suitability Analysis & Prioritized Focus Areas

Columbus, Indiana



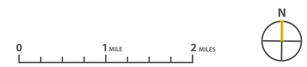
Priority 1 Focus Area
- A. Downtown / Visitor's Center
- B. Mill Race Park / ColumBUS Transit Center
- C. 7th Street / Central Middle School / Cummins

Priority 2 Focus Area
- D. Noblitt Park
- E. Donner Center
- F. Blackwell Park

Priority 3 Focus Area
- G. West Side Commercial Area / People Trail Head
- H. Clifty Park
- I. East Side Commercial Area

Weighted Analysis Factors

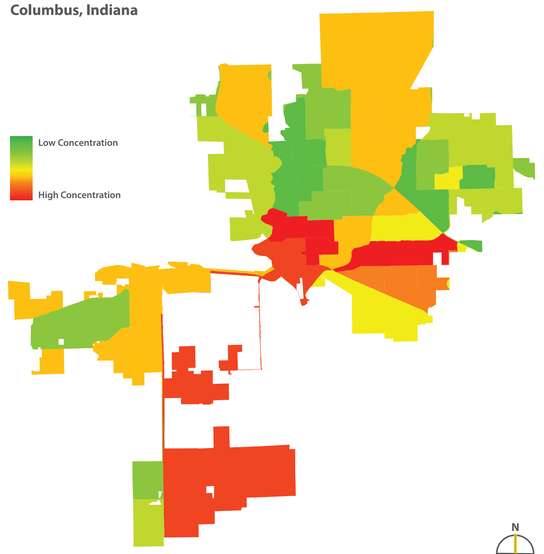
Major Destinations	**Concentrations of People**
Visitor's Center	In Poverty
Parks	Minority
Commercial Centers	Spanish-Speaking
Minor Destinations	**Population Density**
High Schools	**Bike Facilities**
Community Centers	
Employment Density	**ColumBUS Transit Stops**



Data Source: American Community Survey, 2006-2011, 5 year Summary & City of Columbus Office of the City Engineer, Indiana, 2015

Concentrations of People who are Minority, Non-English Speaking, or in Poverty

Columbus, Indiana

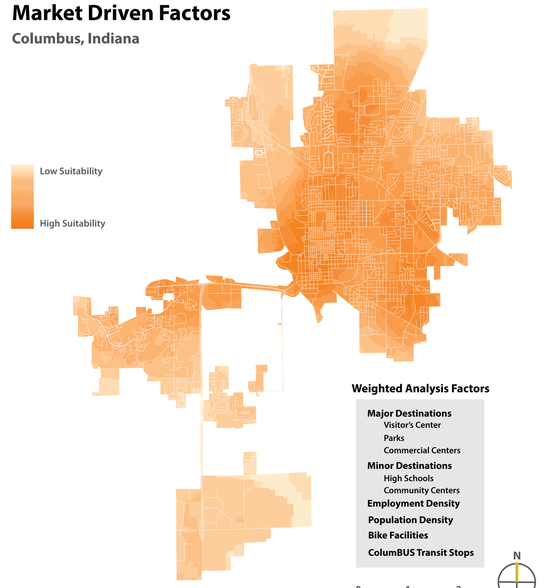


Data Source: American Community Survey, 2006-2011, 5 year Summary

Planning transportation networks that allow all people equal access to meet their daily needs, no matter their race, income, or background is crucial. This map shows where there are high concentrations of low-income, minority, and Spanish speaking residents. First, the percentage of each of these populations per block group were mapped, then classified into four quantiles. In order to combine these factors into one map and determine an overall equity composite, the quantiles were ranked from highest to lowest on a scale of 1 to 4. These scores were then averaged together to create a new feature class that showed where there were high concentrations of these three variables.

Bike Share Suitability Analysis Based on Market Driven Factors

Columbus, Indiana



Data Source: American Community Survey, 2006-2011, 5 year Summary & City of Columbus Office of the City Engineer, Indiana, 2015

Using data from the 2006-2011 5 Year Summary of the American Community Survey and the City of Columbus Office of the City Engineer, this map displays where bike share stations should be located if the only consideration was profitability. This map weights variables that were found in previous studies to be indicative of high bike share usage. The market-driven suitability map is derived from the six market factors.

Table of Relative Weights

Major Destinations	10
Employment Density	10
Minor Destinations	7
Bike Network Density	5
Population Density	3
Proximity to Transit Stops	2

Background

Columbus, Indiana (population approximately 45,000) is located 70 miles south of Indianapolis. Initiatives to develop a bike share system began a couple years ago with support from the city and Cummins Engine Company, a large corporation based in Columbus. Public input has began to garner support for a bike share system and to see where the public envisions future bike share stations. Bike share stations operate best and gain the highest use when placed in effective locations. Those locations are typically based on proximity to transit hubs, key destinations, bike facilities, and population and job densities. This project will determine a prioritized list of the most suitable focus areas for bike share stations.

Data + Sources

City of Columbus Engineering Department
- Streets
- ColumBUS Stops
- Existing Bike Facilities
- Parcels
- Corporate Boundary

2006-2011 American Community Survey
- Employment
- Population
- Income
- Race
- Spanish Speaking

Cincinnati Bike Share Feasibility Study. By Alta Planning+Design. City of Cincinnati, Sept. 2012. Web. June 2015
City of Providence Bike Share Feasibility Study. By Alta Planning+ Design. City of Providence, May 2011. Web. June 2015

Methods

Proximity to destinations and employment density were weighted most heavily because city officials anticipate bike share to be used primarily by tourists and Cummins employees traveling between campuses; the city has a robust tourism industry and a major corporate presence in downtown.

Table of Relative Weights

Major Destinations	10
Employment Density	10
Minor Destinations	7
Percent of Persons in Poverty	7
Bike Network Density	5
Percent of Minority Residents	5
Percent of Spanish Speakers	5
Population Density	3
Proximity to Transit Stops	2

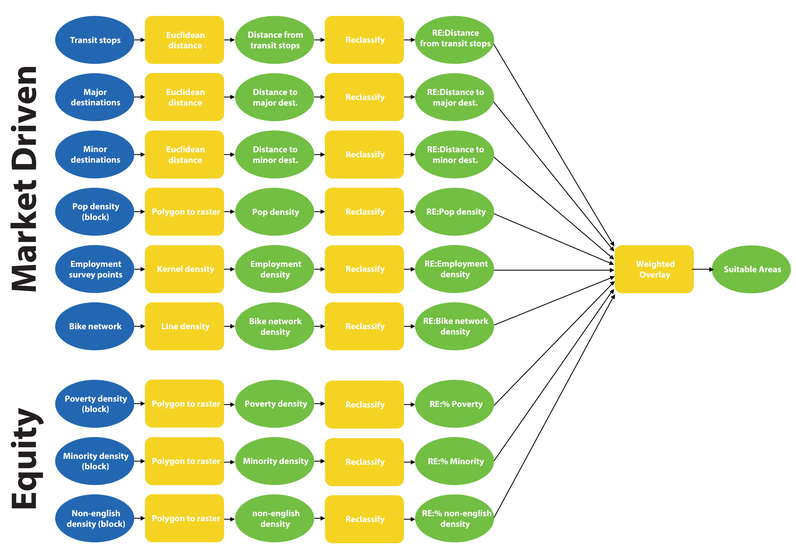
Poverty was rated just below employment and destinations to account for historically underserved and disadvantaged populations. The other two equity elements (percent minority and percent spanish speaking) were weighted just below poverty. The impact of these elements on the original market analysis was to further concentrate suitability in the downtown areas and neighborhoods in the north and east of the city—places already deemed highly suitable in the market analysis.

Bike infrastructure was given a medium weight because currently it is not extensive and it is normal to see cyclists using streets without any designated bike infrastructure on it.

Population and transit were given lower rates because of the anticipated tourist- and employer-oriented nature of patronage and the small, low frequency transit network.

Priority focus areas were chosen that had the three highest suitability rankings (10, 9, and 8). Priotiry area 1 had the highest suitability ranking (10) and areas 2 and 3 scored 9 and 8, respectively.

Market Driven + Equity Suitability Model



ArcGIS Spatial Analyst and model-building function were used for this analysis to determine bike share station focus areas within the City of Columbus, through suitability mapping. Two scenarios were employed for this project. The first scenario incorporated data to determine the most profitable and successful bike share station locations. This analysis weighted major and minor destinations, employment density, population density, existing bicycle network, and ColumBUS transit stops to determine which locations with the highest suitability for a bike share station. The second scenario incorporated an equity approach by mapping high concentrations of low-income, minority, and Spanish speaking residents. The population concentrations were then added to the model, which resulted in suitable bike share station locations that met the market driven demand while considering the needs of the entire community.