

DETROIT'S FUTURE GREENWAYS:

Suitability Mapping Bike Infrastructure in America's Motor City

Introduction

In their Green City Index report, Siemens looked at 27 cities in the US and Canada to assess urban planning in terms of environmental factors. Detroit ranked last in overall score, earning the worst or second to worst sub score in eight of nine categories. Detroit ranks dead last in Transport, where 4% of the population travel by public transit, bicycle, or foot, while the index average of the cities studies was 13%. Detroit ranks second to last in Land Use, where 7% of the city is green space, compared with index average of 12%.

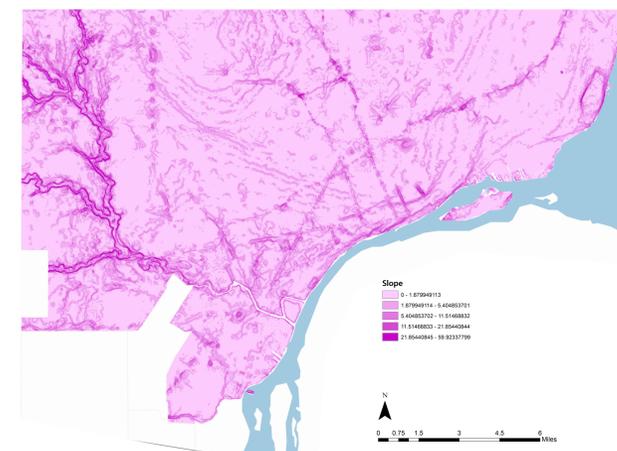
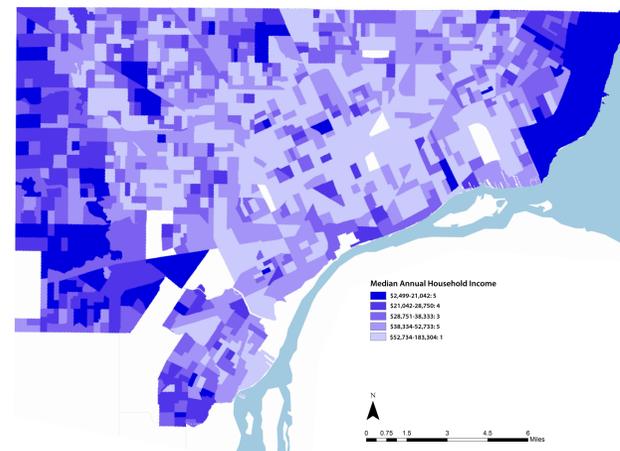
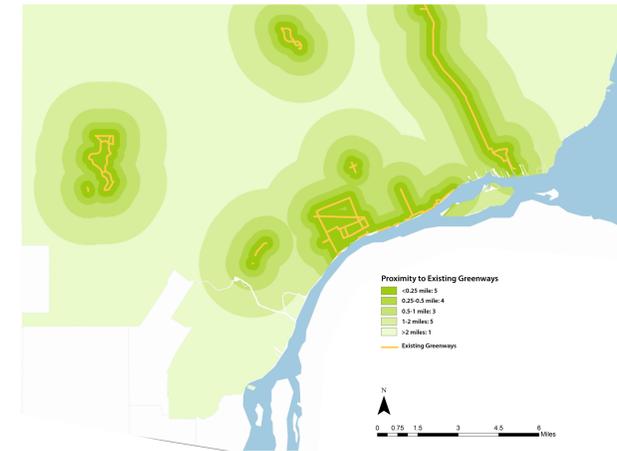
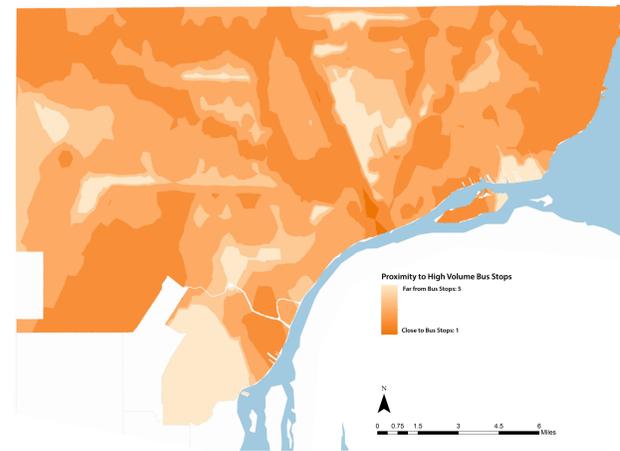
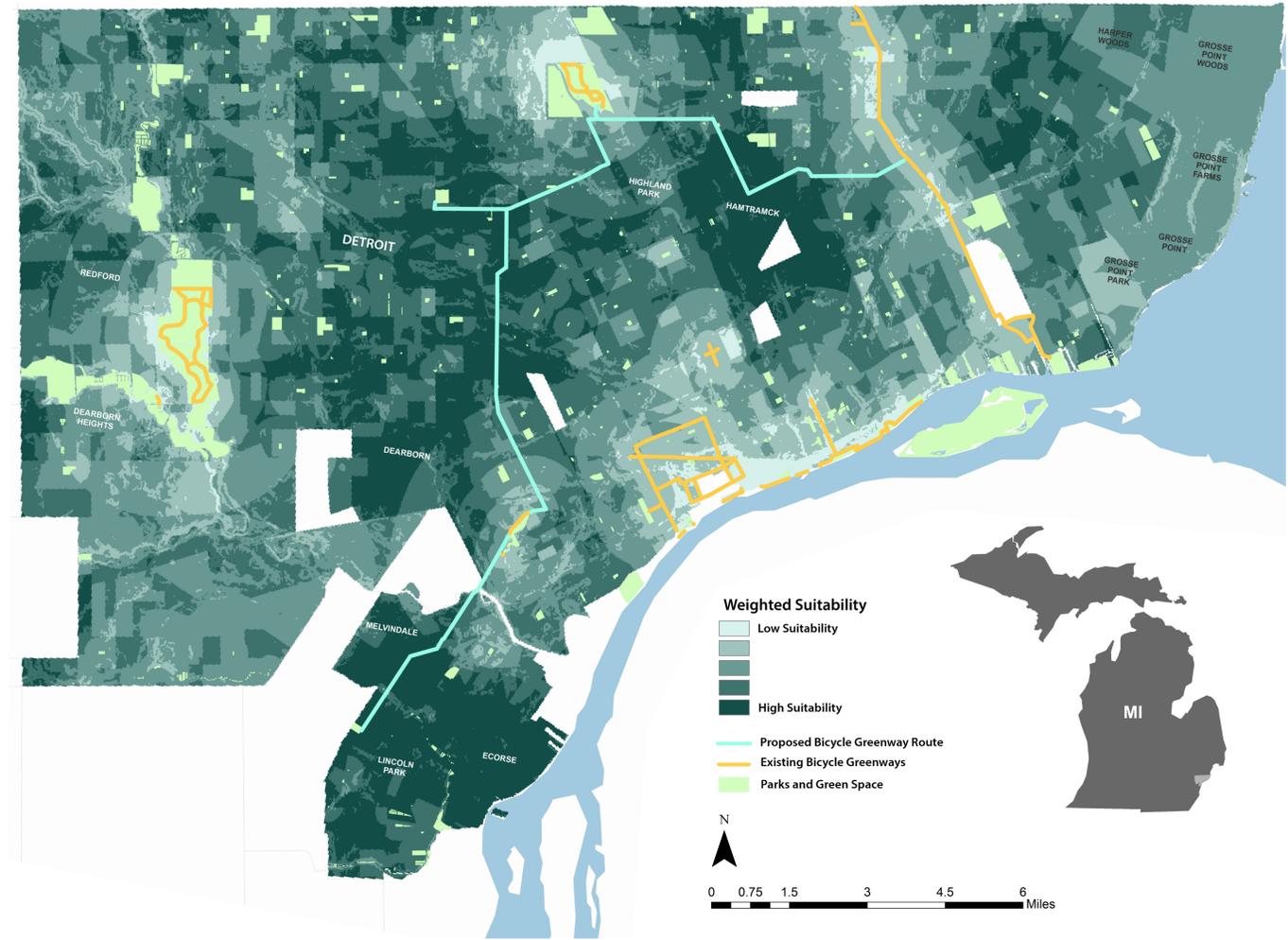
In 2008, Detroit adopted a new master plan, part of which involves implementing new bike lanes. This is a sign that the city has the momentum to implement a bigger project like a bicycle greenway, that will improve transit and add green space. This project sought to identify areas in the city of Detroit and its surrounding towns that are in need of more public green space and alternative transit options, and then looked at existing physical conditions to determine a route most suitable for the development of a bicycle corridor.

This project consisted mainly of a suitability analysis of areas that could benefit from new bicycle infrastructure, based on proximity to existing bike paths, access to high volume bus lines, income, slope, and proximity to public green space. With areas in need established, I developed a conceptual plan for a greenway that would connect some existing paths and parks, establishing a more useful greenway network.

Methods

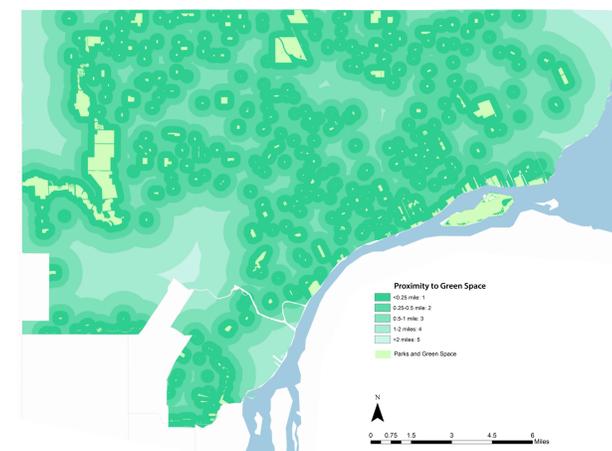
To identify areas in need of new bike infrastructure, this project considered five determining factors: proximity to high volume bus stops, proximity to existing greenways, median household income, slope, and proximity to green space. These factors were mapped for the selected area and classified on a 1-5 scale, 1 indicating least need for greenways and 5 indicating greatest need. The five factors were then combined in a weighted calculation to generate the suitability map on the right. Here's how the factors were broken down and reclassified:

FACTOR	SCALE	WEIGHT
Proximity to existing greenways	1-5	0.3
Proximity to high volume bus stops	1-5	0.2
Median household income	1-5	0.2
Slope	1-5	0.2
Proximity to green space	1-5	0.1
TOTAL		1.0



Results

With the reclassified calculated raster layer generated from these five weighted factors, displayed on the map above, it is apparent that some areas in and around Detroit have a much greater need for improved green bike infrastructure. In particular, Highland Park (a town contained within Detroit) and the Melvindale/Lincoln Park area (south-west of the city) had the highest concentrated suitability scores, with interspersed high-scored areas between them. With this in mind, a conceptual 22 mile route for a bicycle greenway was drawn to connect these areas, as well as some of the existing bike paths and parks. As much of the route as possible was sited alongside existing railroads in the city, many of which are abandoned and ready to be converted into green space.



Discussion

While this analysis was successful in finding areas suitable for bike infrastructure development based on the factors considered, this method is a fairly simplistic approach to a much more complex problem. To get a more complete understanding of the need for greenways and alternative transportation, it is important to also consider levels of traffic congestion, commute time, means of commuting and popular routes from home to work. It would also be necessary to factor in physical and environmental factors, such as land cover, emissions levels and road width. Perhaps most important to the future siting of Detroit's greenways is the identification of abandoned railway corridors that can be repurposed as rail trails for the city. As Detroit works to lift itself from its economically depressed state, improving transit options and land use will be critical, and developing green bike infrastructure may be an important component of that process.

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GIS 101: Introduction to
Geographical Information
Systems

Data Sources: American Community Survey, City of Detroit,
Michigan Department of Technology, Management, and
Budget, Southeast Michigan Council of Governments, ESRI
U.S. National Transportation Atlas- Railroads

