Sidewalk and LID Design

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Civil and Environmental Engineering
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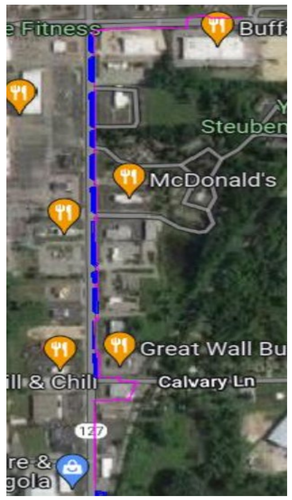
Project Location:

The location for this project is 1.2 miles along N. Wayne Street between the railroad and the bike path entrance across from the Buffalo Wild Wings.



Sidewalk Location

LID Systems

Our Group:

MBR Engineering

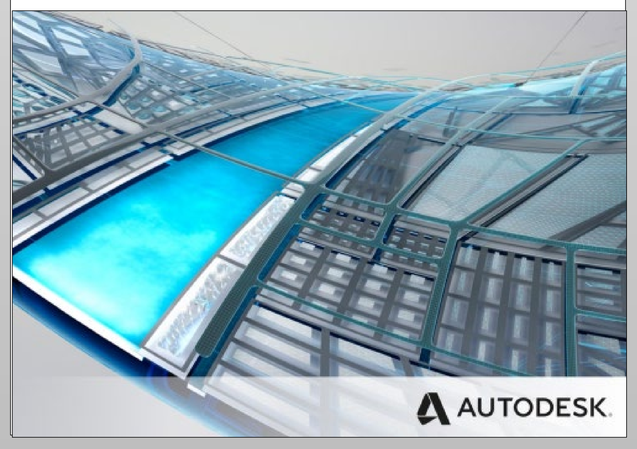
- Mariah Rodriguez
- Braydon Cape
- Ryan Wisman

Background:

The idea behind this design is that there is no safe and convenient way to get from the south side of town to the businesses that are located along N. Wayne Street on the North side of the railroad. There is also a problem with degrading and insufficient stormwater management in the project area so a new stormwater management system will be put in to reduce the amount of flooding in the area.

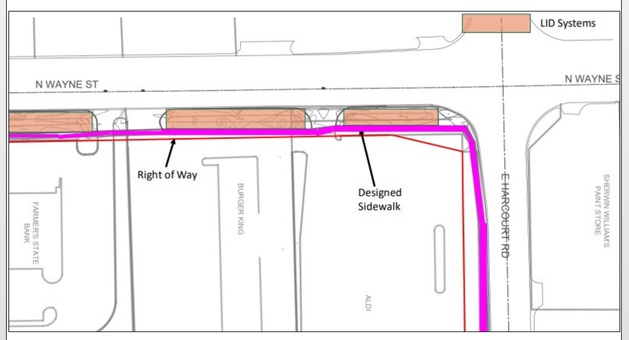
Design Methods:

The sidewalk and Low Impact Development systems were laid out to fit within the project site using AutoCAD Civil 3D. The calculations for stormwater management and traffic signal timing at the crosswalk were done in Excel and checked by hand.



Sidewalk:

ADA compliance was at the forefront of the design for the sidewalk so that it could be used by everyone. This presented some challenges during design about where to position the sidewalk for the safety of pedestrians and accessibility for disabled persons. The final design was able to meet these regulations so that a wheelchair could safely traverse the designed sidewalk while also staying within the Right-Of-Way.



Low Impact Development:

There were three styles of Low Impact Development implemented along the project site to deal with stormwater runoff:

- Green Gutters
- Vegetated Swales
- Rain Gardens

Stormwater Management:

The project area was delineated into two sections. North of Cavalry St. and South of Cavalry street. Angola municipal code states that the required stormwater storage volume is 1.5" X The Impervious Area of a site. The volume of the proposed LID systems was much greater than the volume required storage volume to account for new impervious area that might be added as well as helping to control more major flooding events due to global warming.

Volume Calculations	
N Wayne St.	
Impervious Area	
194583	ft^2
Angola Municipal Code	
0.125	ft
Volume that needs stored	
24,323	ft^3
LID Storage Volume	
68,355	ft^3
Excess Storage Volume	
44,032	ft^3

Design References:

Sidewalk and Crossings:
- Angola Municipal Code
- INDOT Design Manual
- AREMA Design Manual

Low Impact Development:
- San Mateo Guidebook
- Michigan Low Impact Development Manual
- Angola Municipal Code