Transportation Emissions with the East-West Gateway Council of Governments

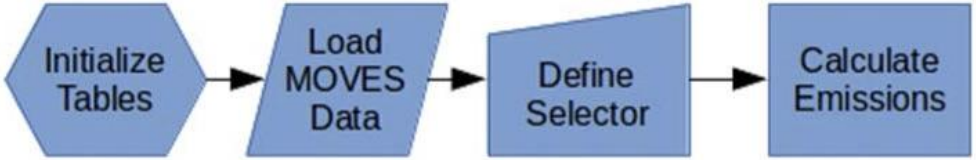
Modeling vehicle traffic patterns to improve air quality in St. Louis

Who We Are

- WashU students in the Sustainability Exchange
  - Jenny Zhang -Senior majoring in Environmental Earth Sciences
  - Laura Barber - Junior majoring in Mechanical Engineering
  - Liyu Liu - Graduate student majoring in Environmental Engineering
  - Zhou Liu - Master student majoring in Energy, Environmental, and Chemical Engineering
- Goals:
  - Examine I-64 corridor using SAGGET
  - Compare emissions with demographic data
  - Create report detailing findings for EWG

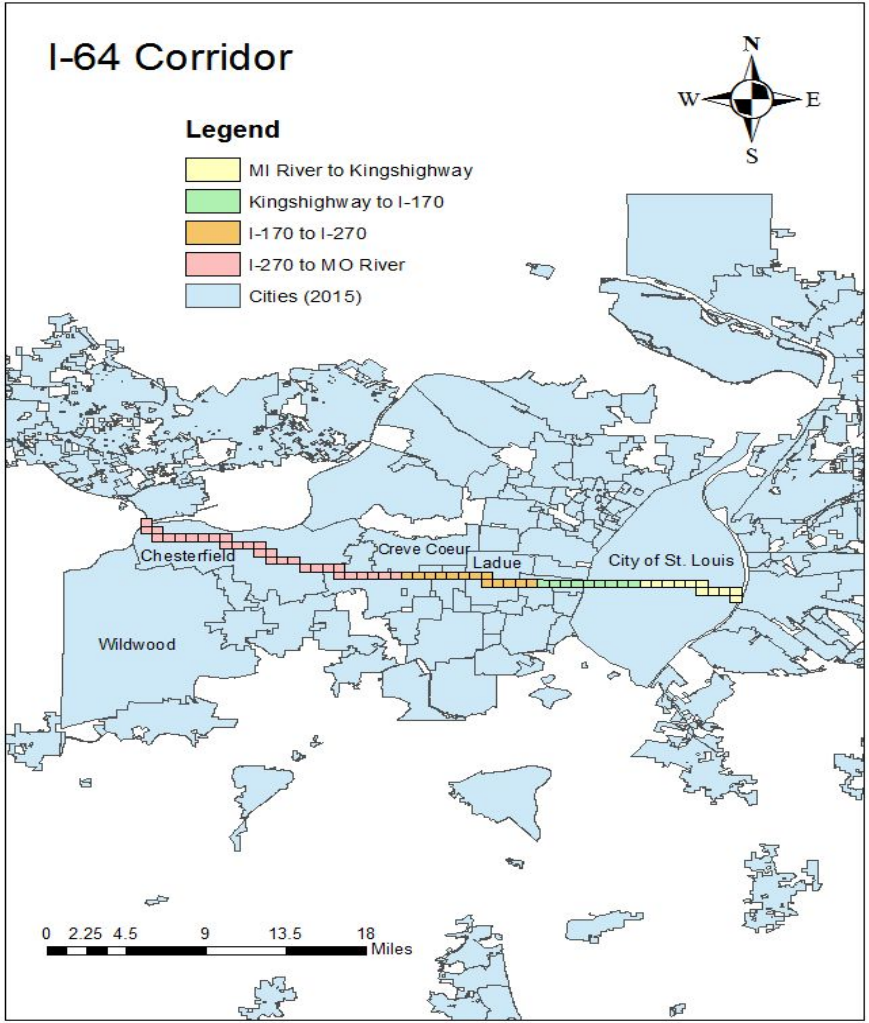
What is SAGGET?

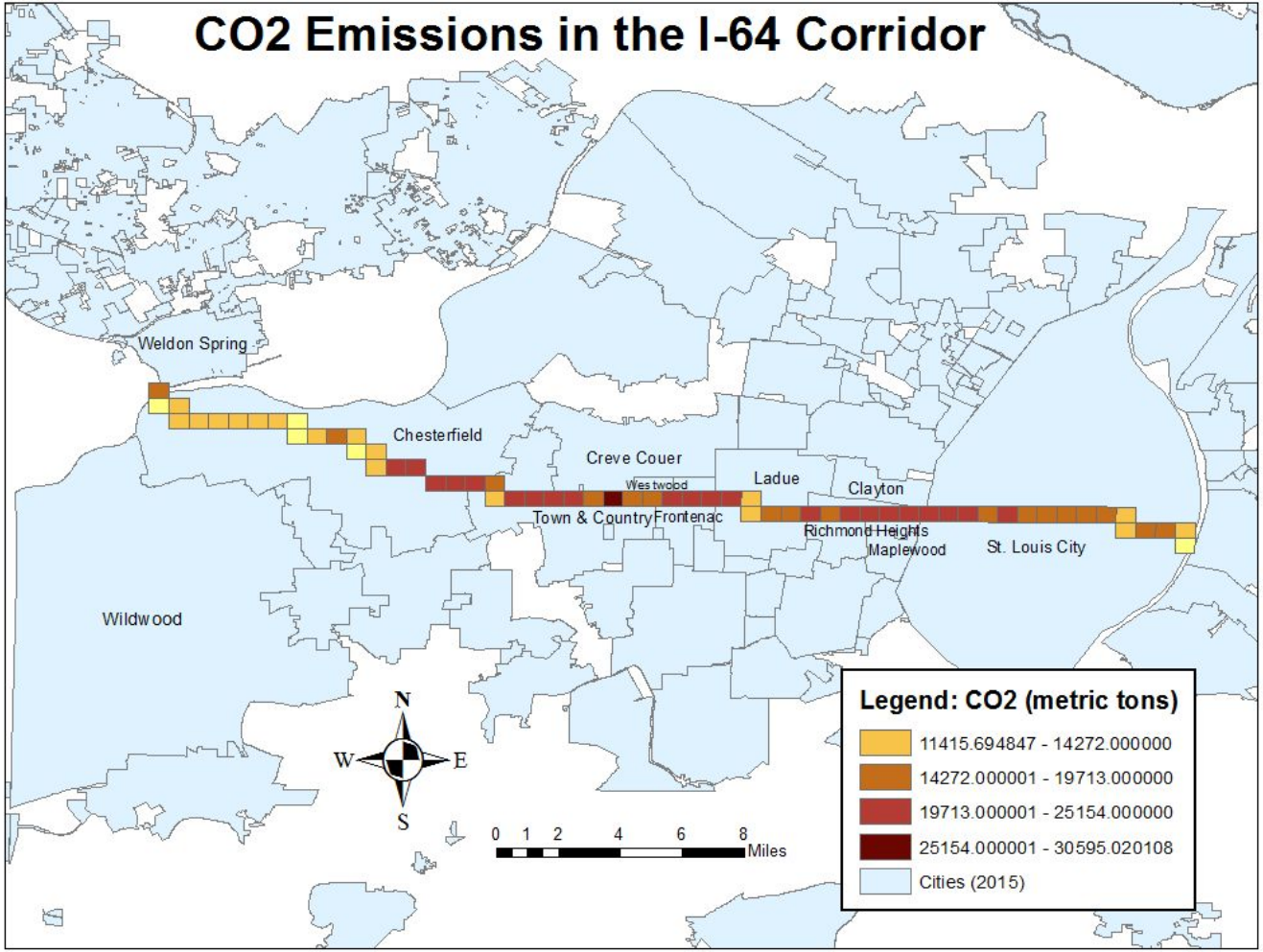
- Small Area Greenhouse Gas Estimation Tool
- Combines MOVES data with road volumes from EWG
- Faster
- Provides method for analyzing small geographic scales across the region
  - Can analyze using zip code, look at specific corridors, user defined geography
- Allows analysis of multiple years
  - Base year and forecast year



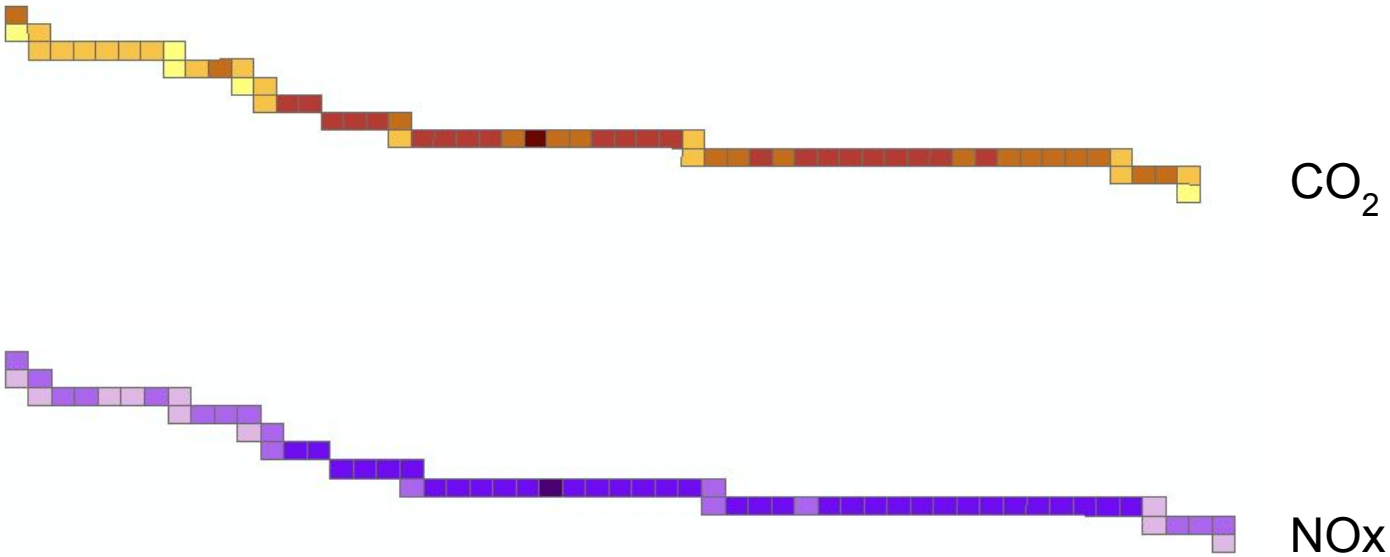
Our Area of Interest

The I-64 Corridor




CO2 Emissions in the I-64 Corridor
Weldon Spring
Chesterfield
Creve Couer
Westwood
Ladue
Clayton
Town & Country
Frontenac
Richmond Heights
Maplewood
St. Louis City
Wildwood
N
W
E
S
0 1 2 4 6 8
Miles
Legend: CO2 (metric tons)
11415.694847 - 14272.000000
14272.000001 - 19713.000000
19713.000001 - 25154.000000
25154.000001 - 30595.020108
Cities (2015)

CO_2 vs. NOX

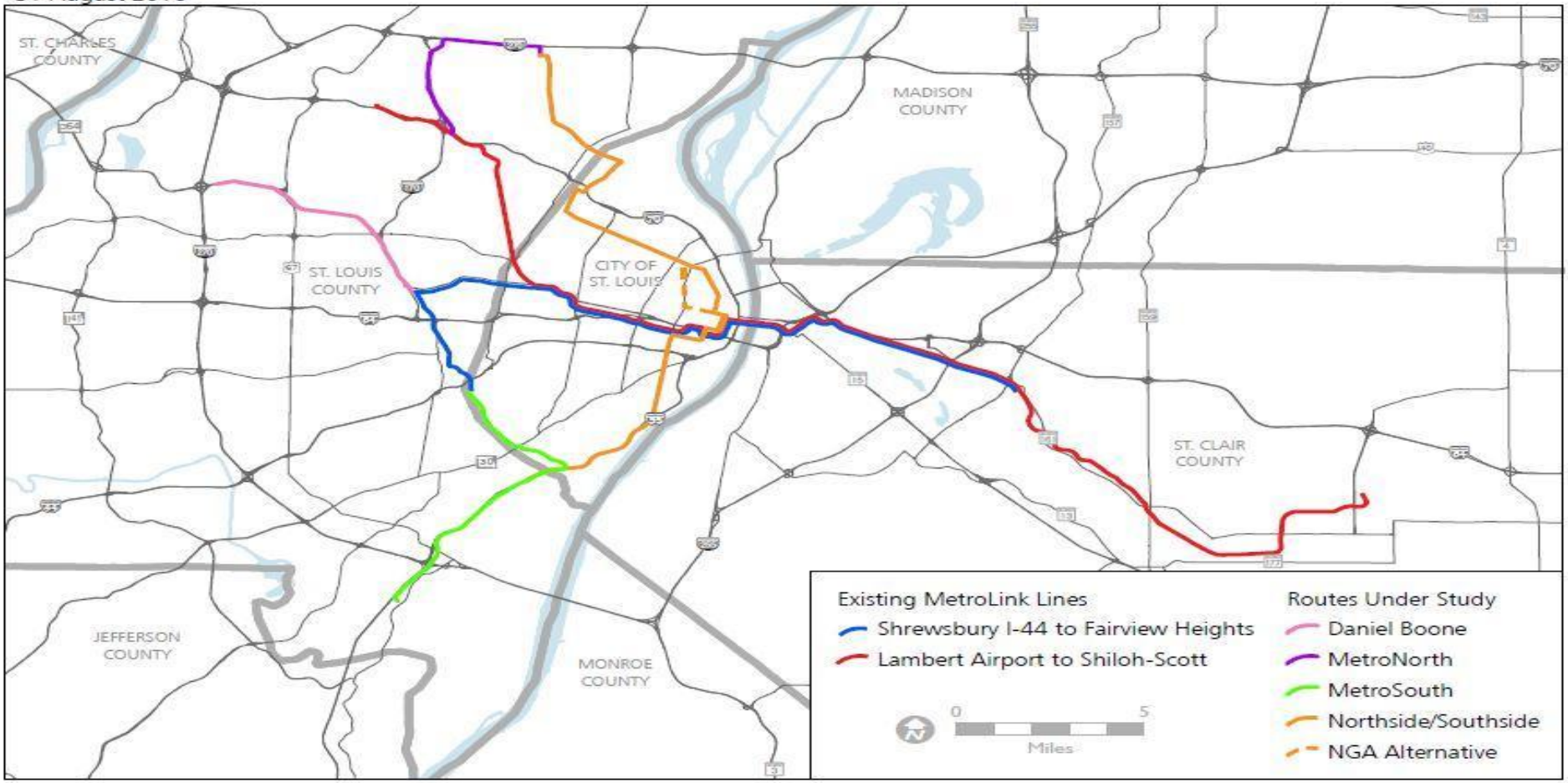


MetroLink: Existing Routes and Routes Under Study

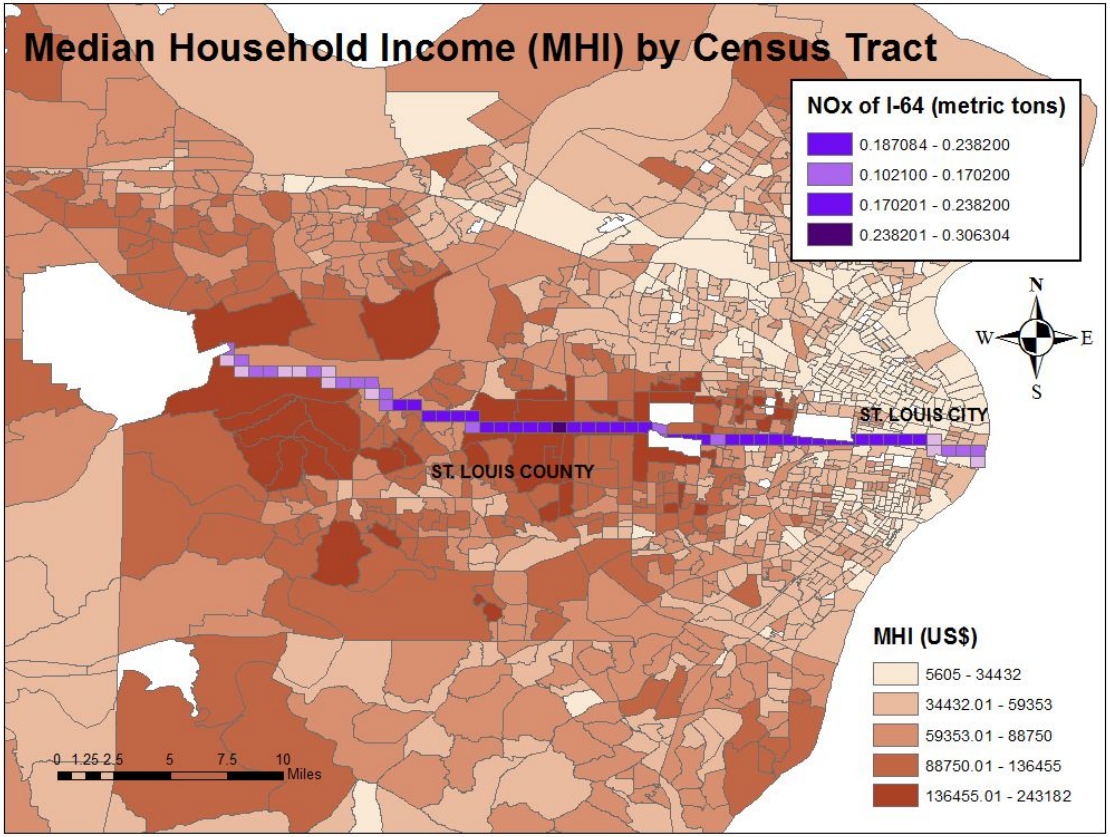
St. Louis Metropolitan Area

31 August 2016

EAST-WEST GATEWAY
Council of Governments



NOx and MHI


Median Household Income (MHI) by Census Tract
NOx of I-64 (metric tons)
0.187084 - 0.238200
0.102100 - 0.170200
0.170201 - 0.238200
0.238201 - 0.306304
N
W
E
S
ST. LOUIS CITY
ST. LOUIS COUNTY
MHI (US$)
5605 - 34432
34432.01 - 59353
59353.01 - 88750
88750.01 - 136455
136455.01 - 243182
0 1.25 2.5 5 7.5 10
Miles

Next Steps and Possibilities

- Run SAGGET on arterial roads
- Overlay emission maps with more demographic maps
- Look at other pollutants
- Look at other corridors or areas
- Examine health effects and emissions, like asthma
- Find methods to reduce the emissions along corridors
    - Encourage carpooling
    - Expand Metrolink routes