

A Wheelee Good Time: Safe Biking in Denver

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Motivation

- **Department of Transportation and Infrastructure's Denver Moves: Bicycles Program**
 - Adding 125 miles of bike lanes by 2024
 - Extending current bike paths
 - 60% of Denver residents are “interested but concerned” in bike commuting
- **Promoting Eco-friendly Transportation**
 - Denver announced e-bike grants
- **45% of Crashes Occur From Cars Veering into Rider**

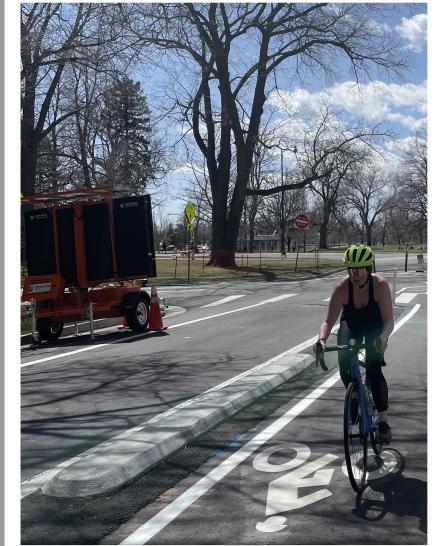
Types of Paths



Shared Use Path
(Shown: Cherry Creek Trail)

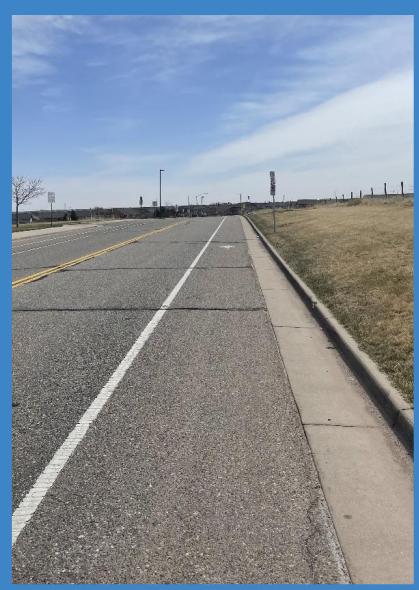


Neighborhood Byway
(Shown: Harvard Gulch)



Protected Bike Lane
(Shown: Marion St Pkwy)

Types of Paths



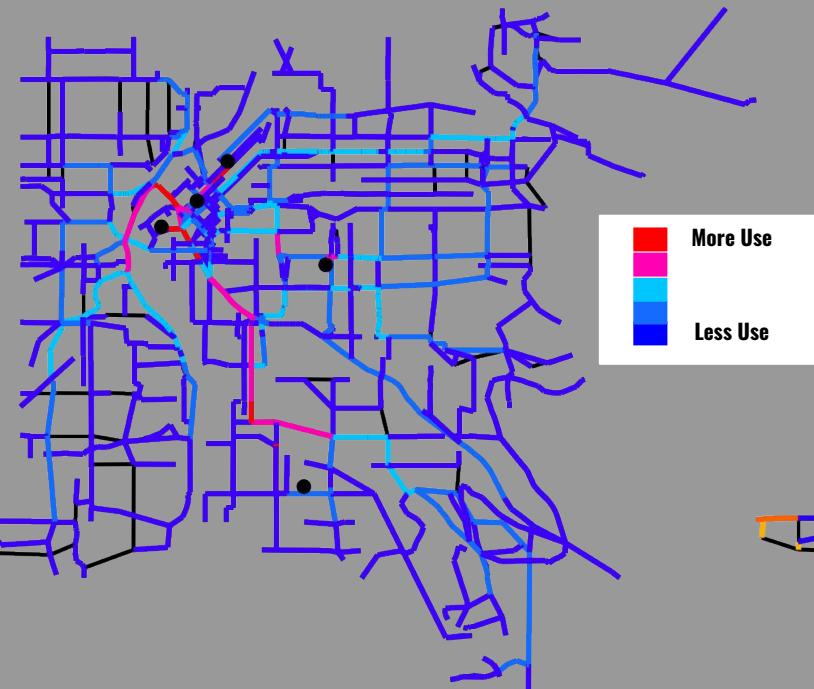
Unprotected Bike Lane (UBL)



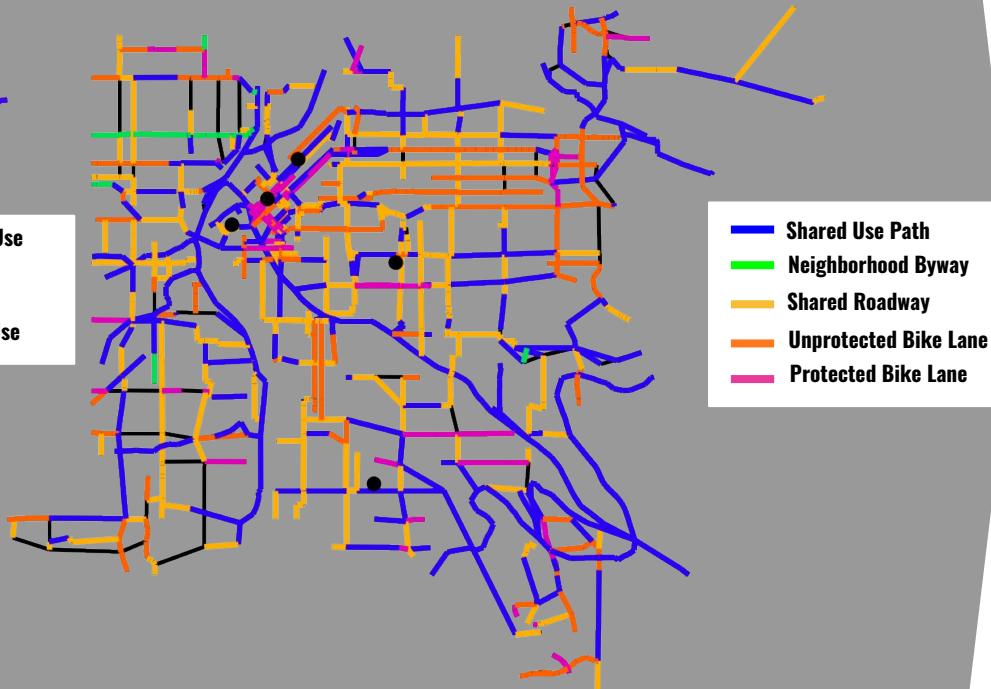
Shared Road (SR)

Shortest Paths

Frequency of Edges in Regular Shortest Paths



Types of Edges in Regular Shortest Paths



Cautious vs Adventurous Cyclist

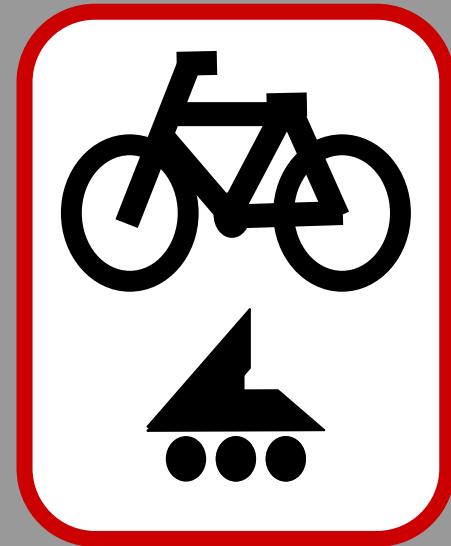
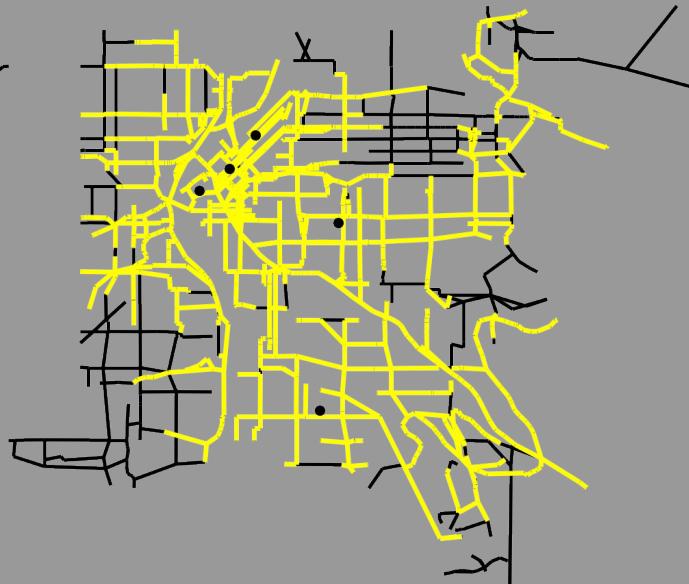
Cautious - little time on SR and UBL

Adventurous - more tolerance of SR and UBL

Cautious Tau Shortest Paths



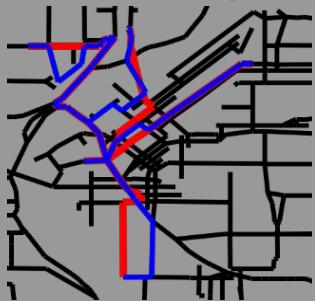
Adventurous Tau Shortest Paths



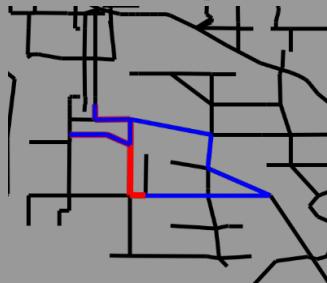
Cautious vs Regular Shortest Path

Most Significant Path Changes

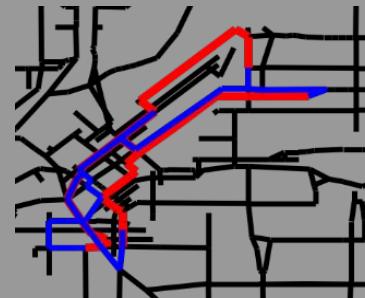
Auraria Campus



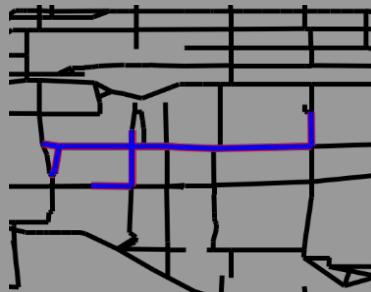
DU Campus



5 Points



City Park



Union Station



Regular Shortest Path
Cautious Shortest Path





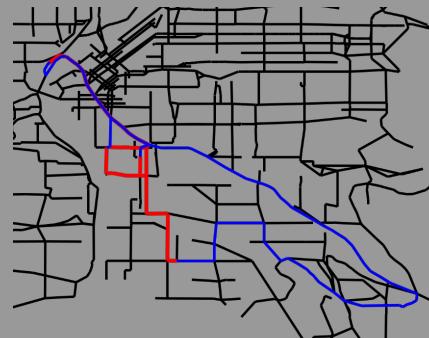
Adventurous vs Regular Shortest Path

- Regular Shortest Path
- Adventurous Shortest Path

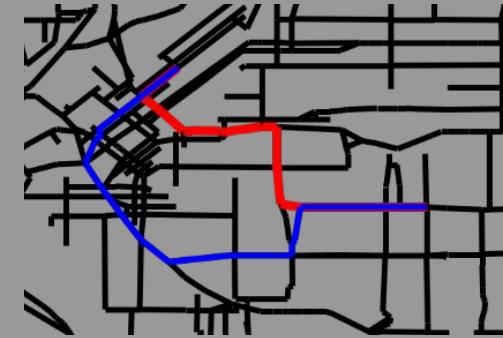
Auraria Campus



DU Campus



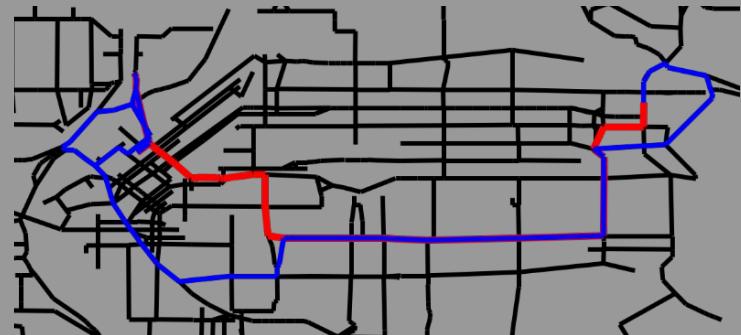
5 Points



Union Station



City Park

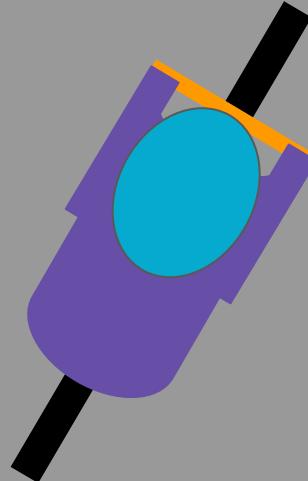


Analysis

- 8 of the top 20 most used paths for the shortest paths are Shared Roadways or Unprotected Bike Lanes
- Safety greatly affects the path choice with current bike route infrastructure
- May see large increases in path length (5.1 miles vs 6.25 miles)
- Current infrastructure insufficient for the cautious rider
- Cherry Creek Trail is essential for rider comfort

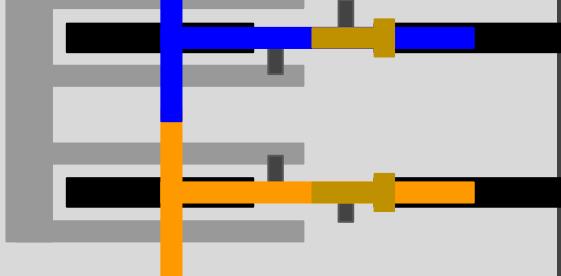
Recommendations

- **Frequency:**
 - Protected bike lanes should be built on Downing from Wash Park to Buchtel Blvd
- **Safe Routes vs Shortest Routes:**
 - Protected bike lanes should be built throughout downtown to allow more direct rides
- **Accessibility:**
 - Park Hill and Central Park neighborhoods need more biking infrastructure



Future Work

- Better data sources
 - Account for neighborhood streets
 - Account for low traffic shared roads
- How do Denver's planned upgrades affect our analysis
 - Shapefile for the proposed streets in the Denver Moves: Bicycle Program
- Can we improve our analysis by identifying neighborhoods that are more willing to commute via bike



References

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4. Denver Public Works Transportation and Mobility (2016) Bicycle Crash Analysis: Understanding and Reducing Bicycle and Motor Vehicle Crashes.
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5. Teschke, Kay, et al. "Bicycling: Health risk or benefit." *UBC Med J* 3.2 (2012): 6-11.

Questions

