Developing Architecture for a Routing System using Bridge Data and Adversary Avoidance

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Goal

Traditional Routing

- Traditional routing ignores bridge integrity

Bridge-observant Routing

- Our routing will avoid unsafe and damaged bridges

Architecture + Big Data

End-User Applications

- Any Valhalla-based use case
- Live simulations
- Web-based routing application

Merged Dataset (NBI + OSM)

- Merge data using a custom program
- Resulting data format is in OSM (XML)
- Can be used in any bridge-oriented routing solutions

Valhalla

- Open-source routing system
- Use our custom NBI data
- Editable components
- Sif – Dynamic costing algorithm for bridge safety
- Thor – Custom routing algorithm for adversary avoidance

National Bridge Inventory (NBI)

- Government-managed data
- Publicly available
- Bridges are inspected once every two years
- Data is highly accurate and detailed
- Bridge health, location, max load, recommended load...

Open Street Map (OSM)

- Open-source GIS data
- Worldwide data
- Inconsistent in rural areas
- Widely supported
- Roads, buildings, lakes, bridges

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