NDS Live Conference

Putting the Pieces into Place:

Developing a Tile-Based Approach to Map Updates

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WOVEN PLANET

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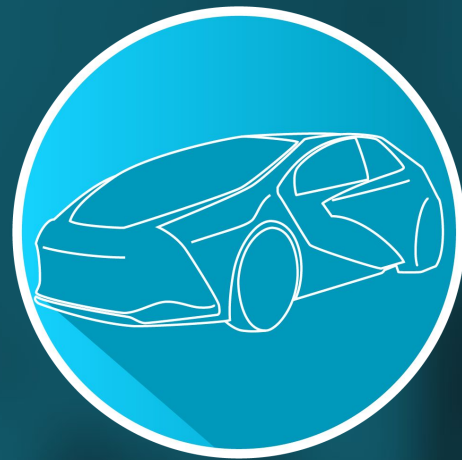## Mobility to Love, Safety to Live

Woven Planet brings together the agility and innovation of Silicon Valley with the attention to detail and operational excellence of Japan.

Automated Mapping

ARENE
Automated OS

Automated Driving

Probe-derived map data with high x-, y-, and z-level accuracy

BASE MAPPING
Developing automotive-grade base maps using scalable modalities like satellite- and aerial-imagery and aggregated probe data.

CHANGE MANAGEMENT AND MAP REGENERATION
Detecting lane-level changes in features and furniture and making corresponding updates, using commodity, consumer-grade sensors.
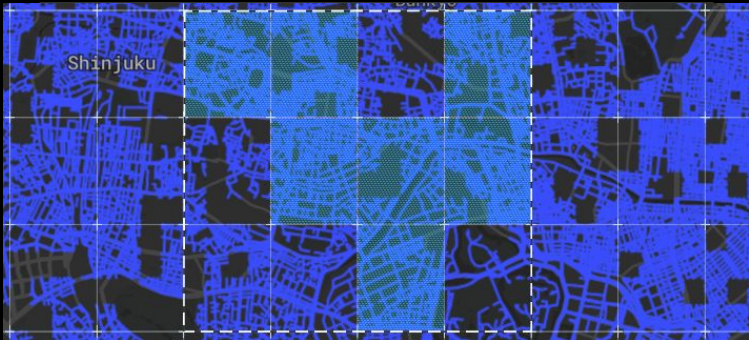
GEOSPATIAL INDEXING
Pioneering the use of lower fidelity maps as a baseline index for developing more powerful training models based on road data from diverse ODDs.

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Tile-based map sourcing

Key to our approach is to be able to update — and ultimately source a map — at a tile-by-tile level.

Dividends now and into the future

NOW
Better map updates
Update only the tiles with the high confident changes.

SOON
Faster development cycles
Working at the tile level will allow developers to be closer to the map and adopt more "agile" processes.

ULTIMATELY
Better procurement models
Real-time evaluation and use of the the best maps at a tile transaction level.

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Working at the tile-level allows discrete updates to the map, where only the high confident, validated changes are sent to the vehicle.

Dividends now and into the future

NOW
Better map updates
Update only the tiles with the high confident changes.

SOON
Better sourcing of map data
Use the best maps available at the individual tile level.

ULTIMATELY
Better procurement models
Real-time evaluation and use of the the best maps at a tile transaction level.

Tile-based map sourcing

When map vendors can be changed in real time, we increase the innovation cycle. Application developers can try new data layer features, and fall back to previous implementations if not perfectly right.   Canary deployments allow safe realtime deployment of innovations that can happen at the tile level.

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Tile-based map sourcing

We will be able to constantly evaluate maps in real time with vehicle probe feedback and test validations. At a transaction level we will decide which vendors map is the best to use at an individual tile location.

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NDS offers an ideal framework

...gives us a framework for adopting

INTEROPERABLE

With the standard data layers and the independent tiling concept to exchange map vendors

COOPERATIVE

The cooperative relation in adjusting and accommodating for AD and ADAS scenarios of ours
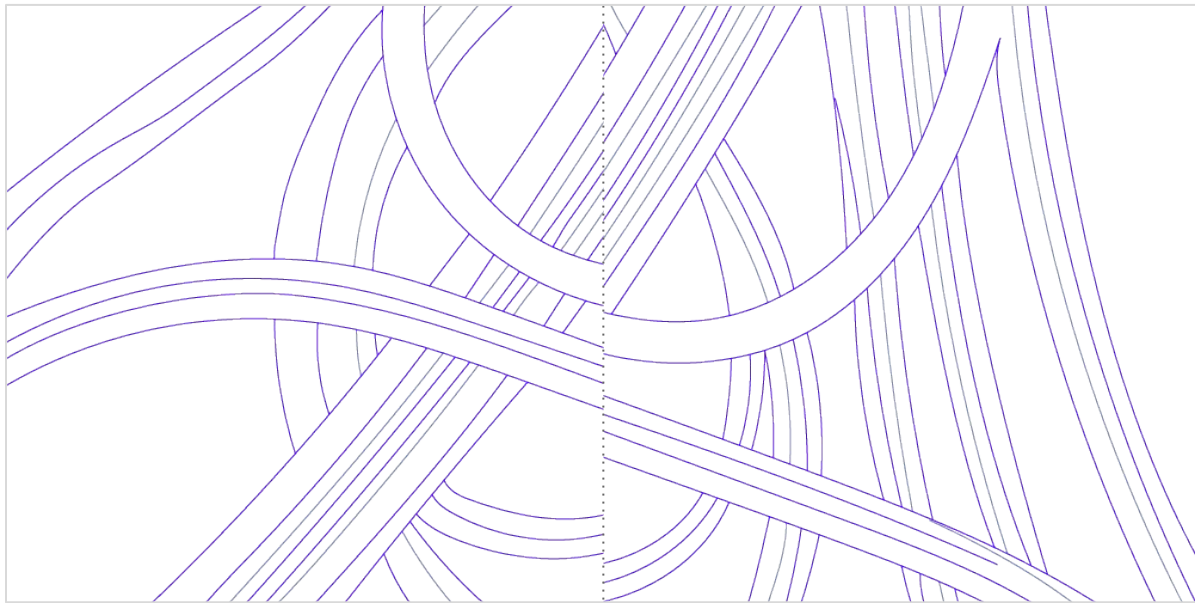
PRODUCTION-READY

For ADAS and AD applications we believe that the latest specification is basically read for production
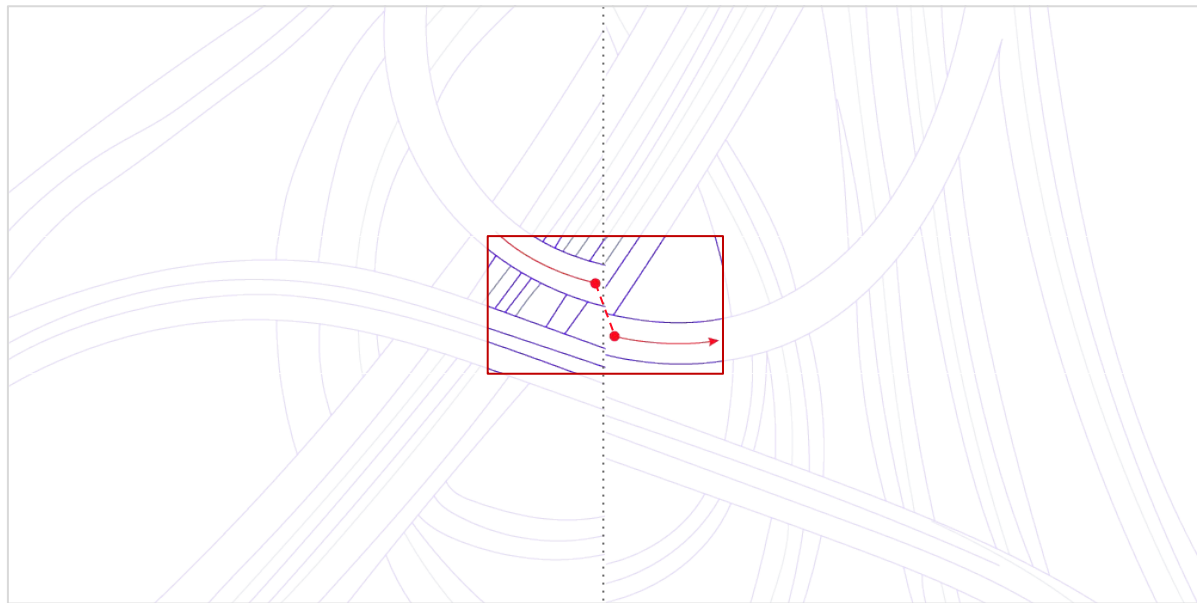
Opportunities for Innovation

Matching at the boundaries

When we update individual tiles the connector points do not always match
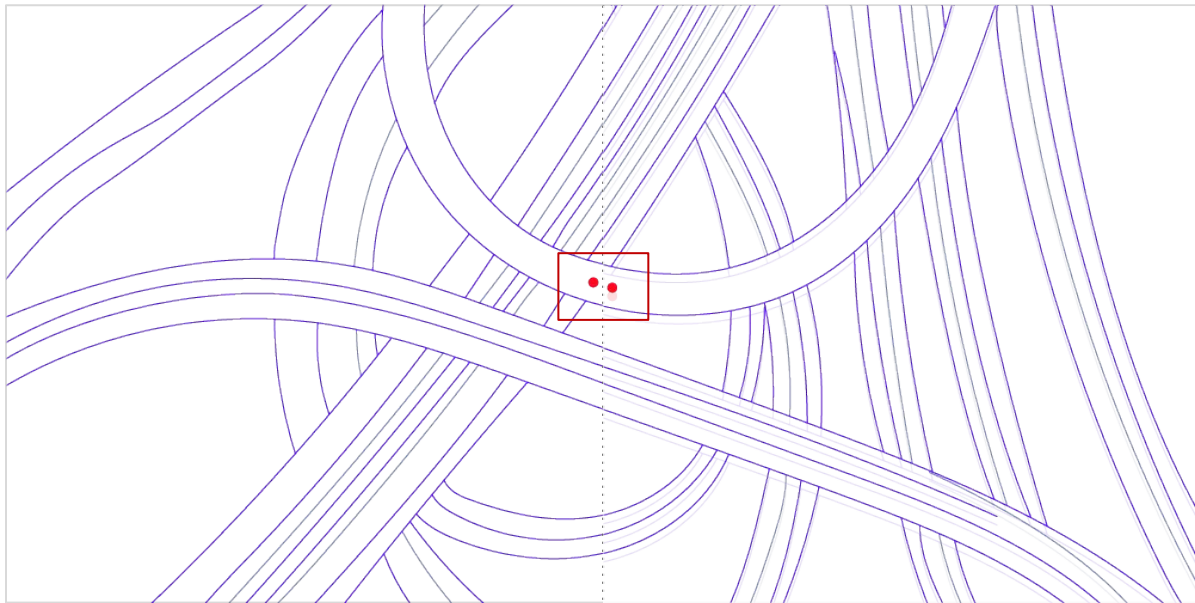
Matching at the boundaries

When we update individual tiles the connector points do not always match

When the connector points are misaligned this will trigger an initial vehicle map matching so that the vehicle re orientates to the new tile map.

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Matching at the boundaries

When we update individual tiles the connector points do not always match

Alternatively, if connector points are close enough, the previous history of lane connectivity can be retained and used, without having to trigger a full vehicle rematching of the vehicle.

Distributing tiles and map vendors

Changing the source of the tiles at every boundary should be avoided

Map Vendor A
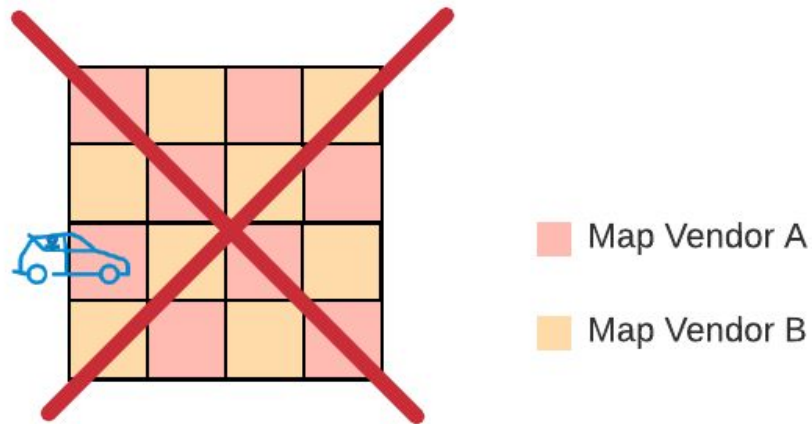
Map Vendor B

- Because it Increases the risk of incorrect map matching
- It adds more burden on the localization part of the application

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Distributing tiles and map vendors

Changing the source of the tiles at every boundary should be avoided

We can apply a cost equation that takes into account multiple variables for the quality and business requirements but also includes a geographical distribution element that prefers similar map vendors across the boundaries.
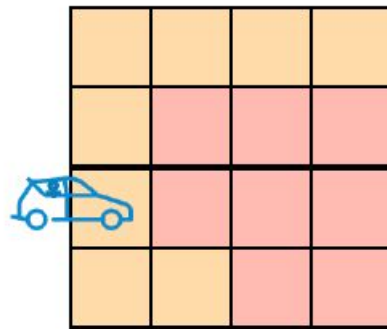
Map Vendor A

Map Vendor B

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Better
Sourcing

Better
Reliability

Better
Innovation

Thank you!

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