Spatial and Transport Impacts of Automated Driving

NETWORK DESIGN AND IMPACTS OF AUTOMATED DRIVING

STAD OPEN EVENT WP3 WORKSHOP: 10-05-2019

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WHERE CAN WE FACILITATE AUTOMATED DRIVING DURING THE TRANSITION PERIOD?

omated_Driving

Source: https://www.mercedes-benz.com/en/mercedes-benz/innovation/research-vehicle-f-015-luxury-in-motion/

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ARE THESE PLACES SUITABLE WITHOUT ADJUSTMENTS?

Source: https://commons.wikimedia.org/wiki/File:Fietsstraat.jpg


Source: https://decorrespondent.nl/7196/over-de-frietzak-de-banaan-en-andere-nieuwe-smaken-fietspad/756638331700-f291c16d


Source: https://www.youtube.com/watch?v=fn4s-3eWP


Source: https://www.youtube.com/watch?v=NzAVvpenGz8

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VISIONS FOR AUTOMATED FUTURE

- A network of dedicated lanes
  - (Chen et al., 2016)
- A network of dedicated links (AV links and none-AV links)
  - (Ye and Wang, 2018)
- Dedicated zones
  - (Chen et al., 2017)
- Automated Driving subnetworks
  - (Madadi et al., 2019)

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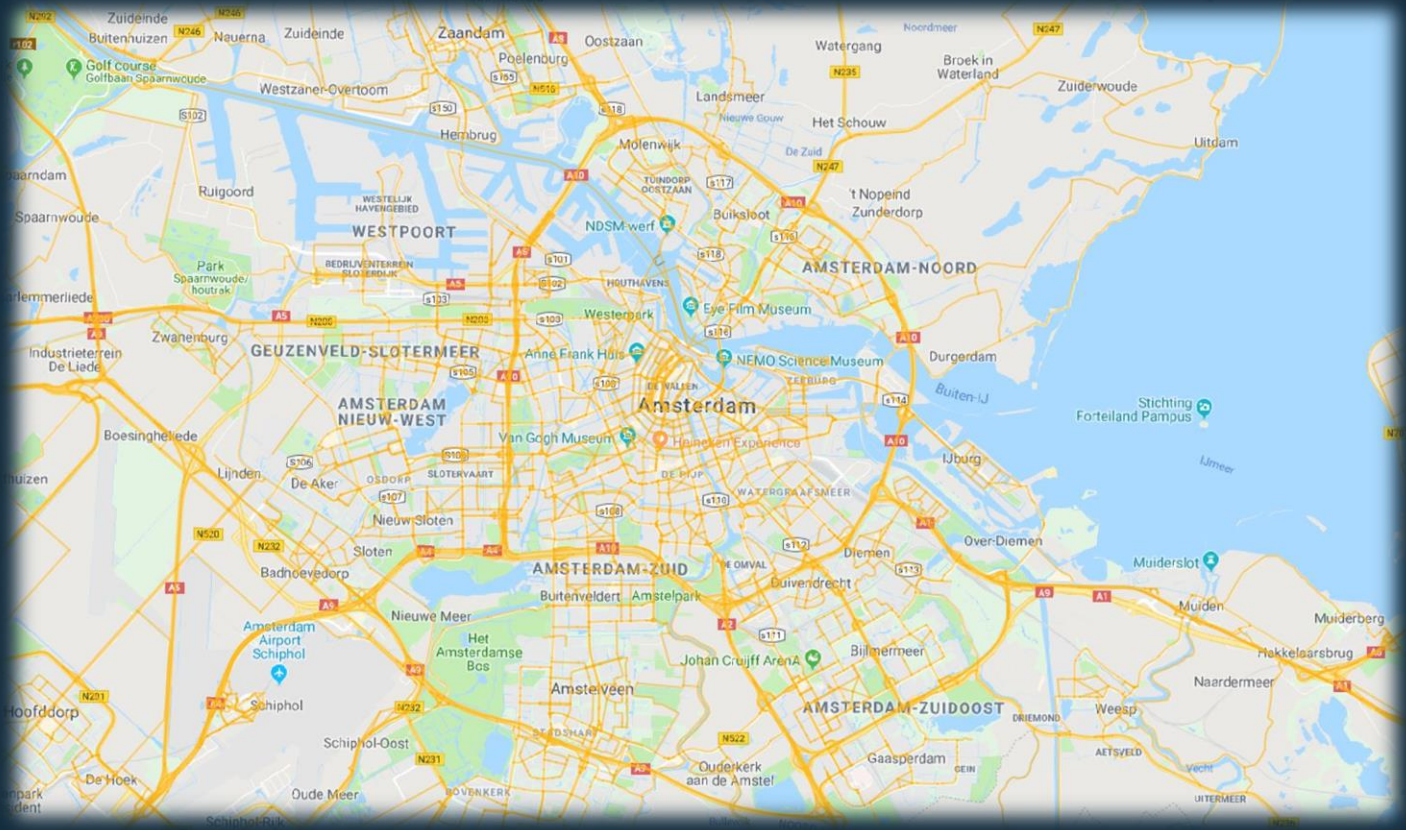
A NETWORK OF DEDICATED LANES
(CHEN ET AL., 2016)



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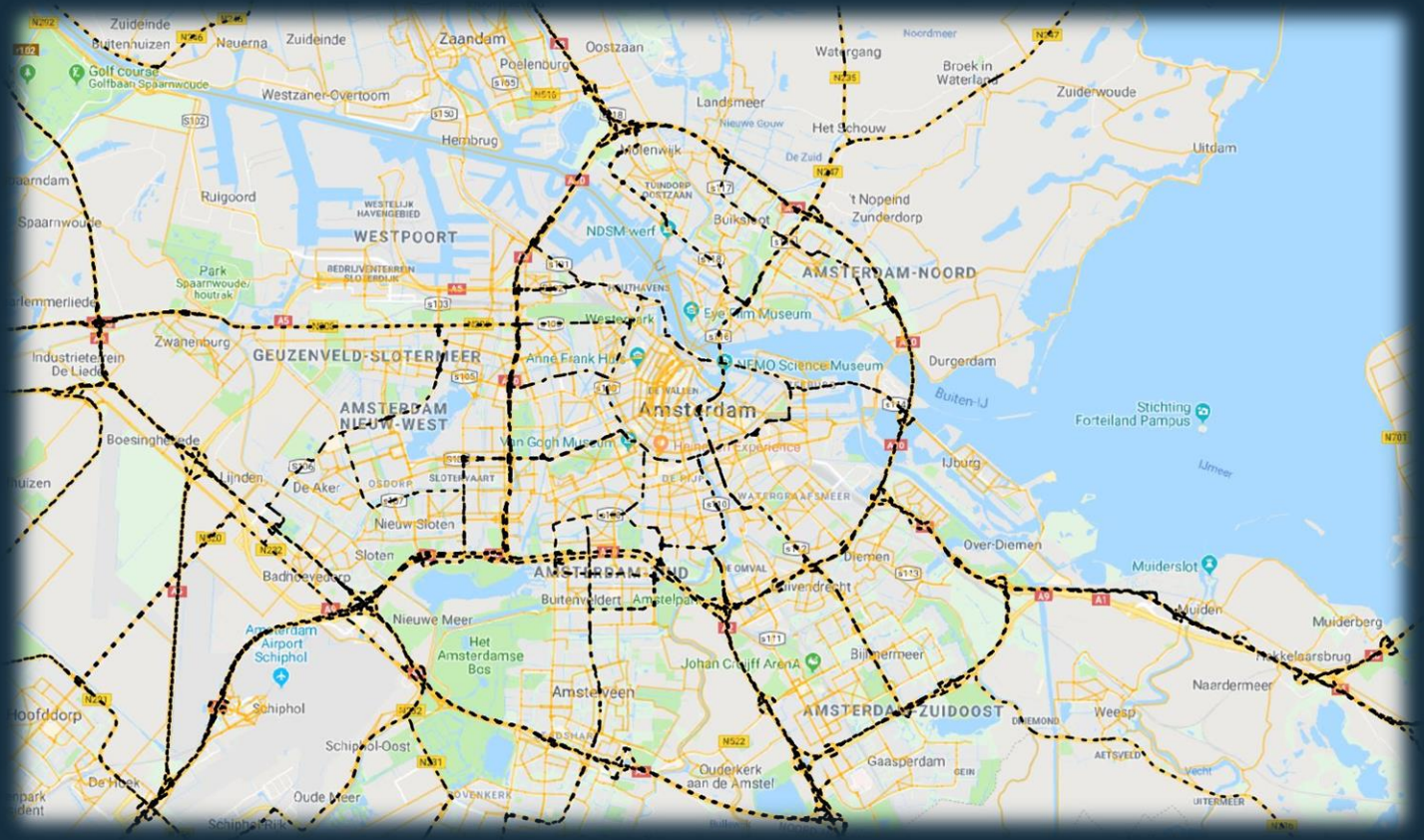
A NETWORK OF DEDICATED LANES

(CHEN ET AL., 2016)



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A NETWORK OF DEDICATED LANES
(CHEN ET AL., 2016)

Advantages:

- Safe
- Easy to implement?

Disadvantages:

- Space
- Costly
- Inefficient

Accessibility?

Pollution?

Noise?

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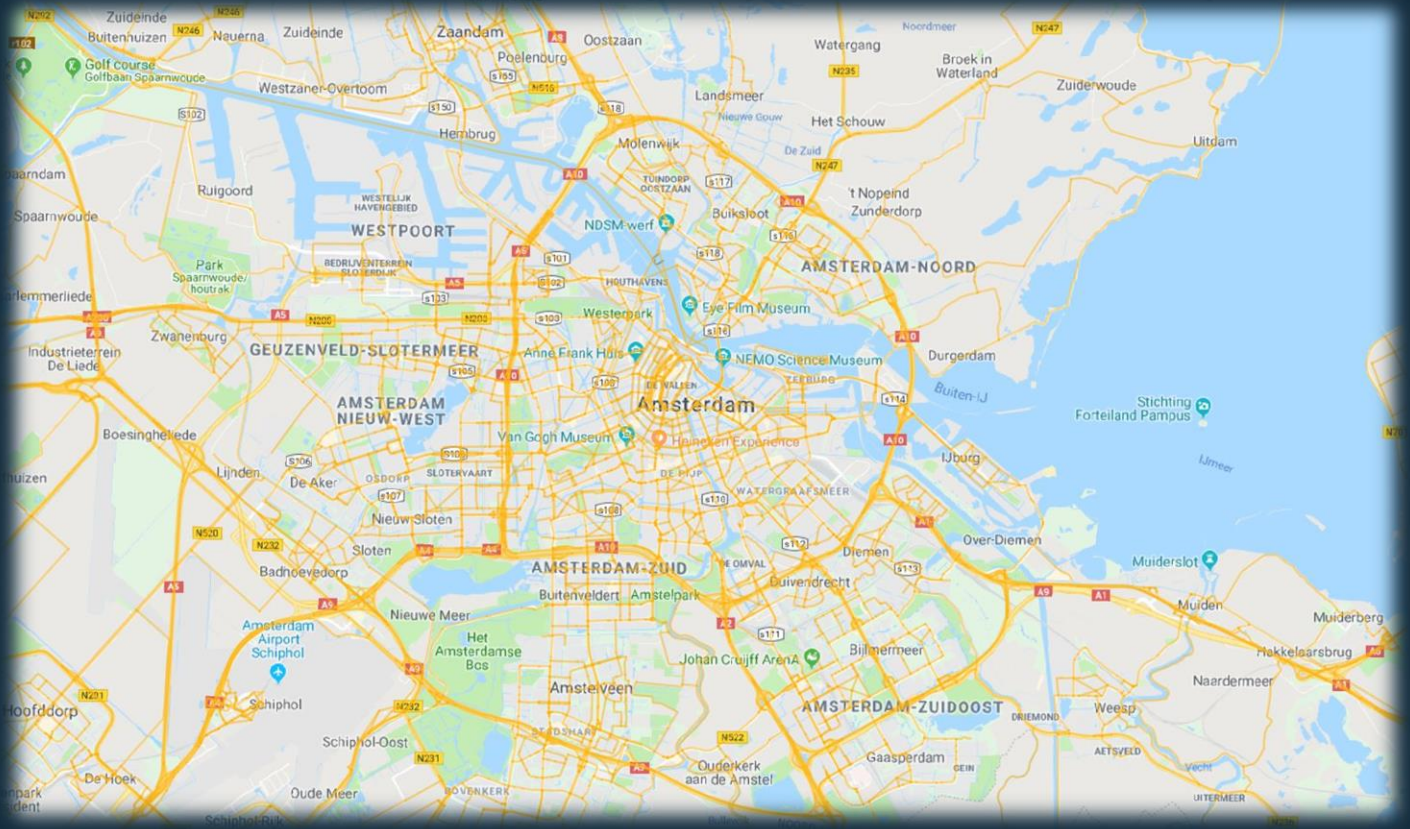
A NETWORK OF DEDICATED LINKS

(YE AND WANG, 2018)



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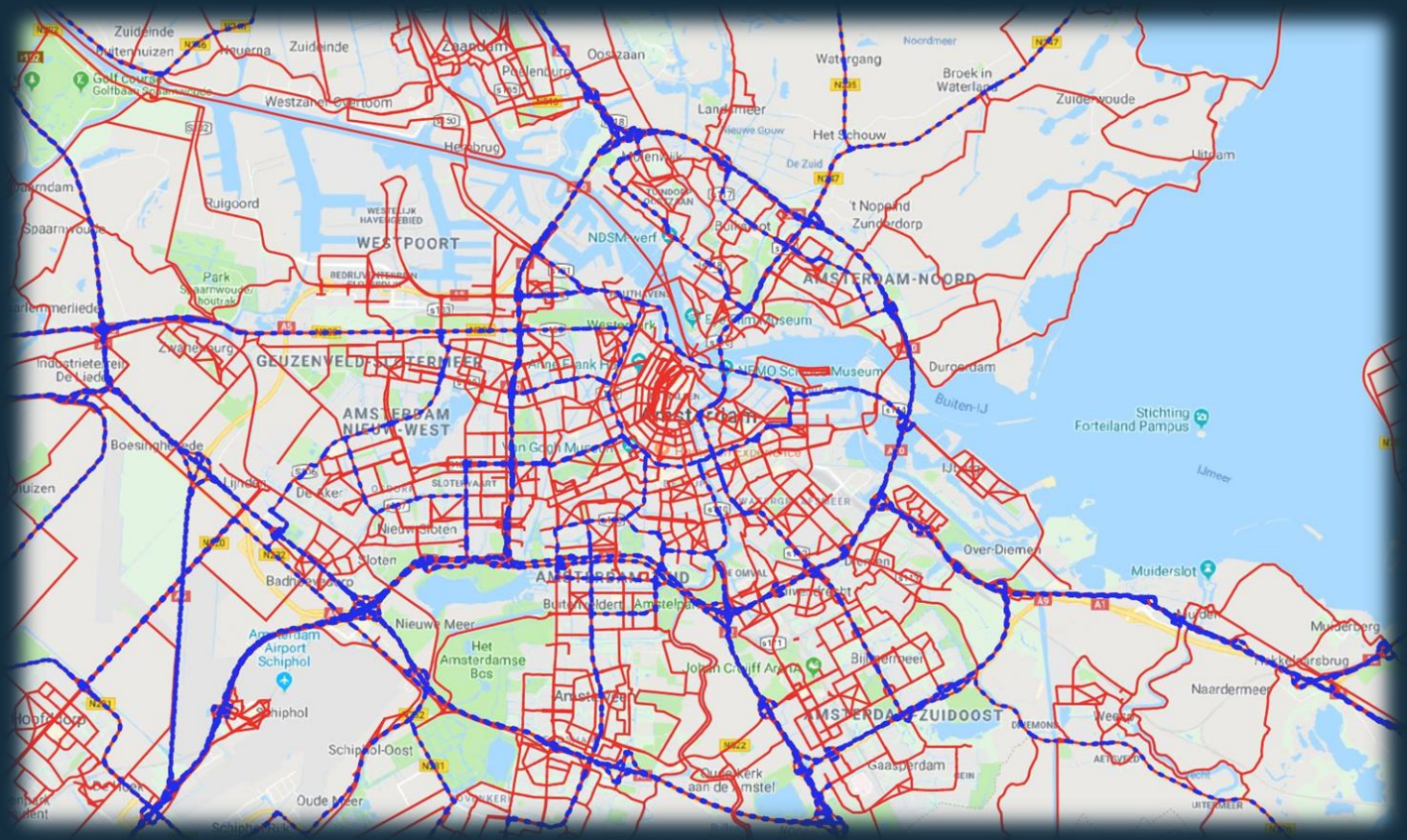
A NETWORK OF DEDICATED LINKS

(YE AND WANG, 2018)



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A NETWORK OF DEDICATED LINKS
(YE AND WANG, 2018)

Advantages:

- Safe (potentially)
- Could be efficient and cheap

Disadvantages:

- Requires serious planning
- Can compromise accessibility

Pollution?

Noise?

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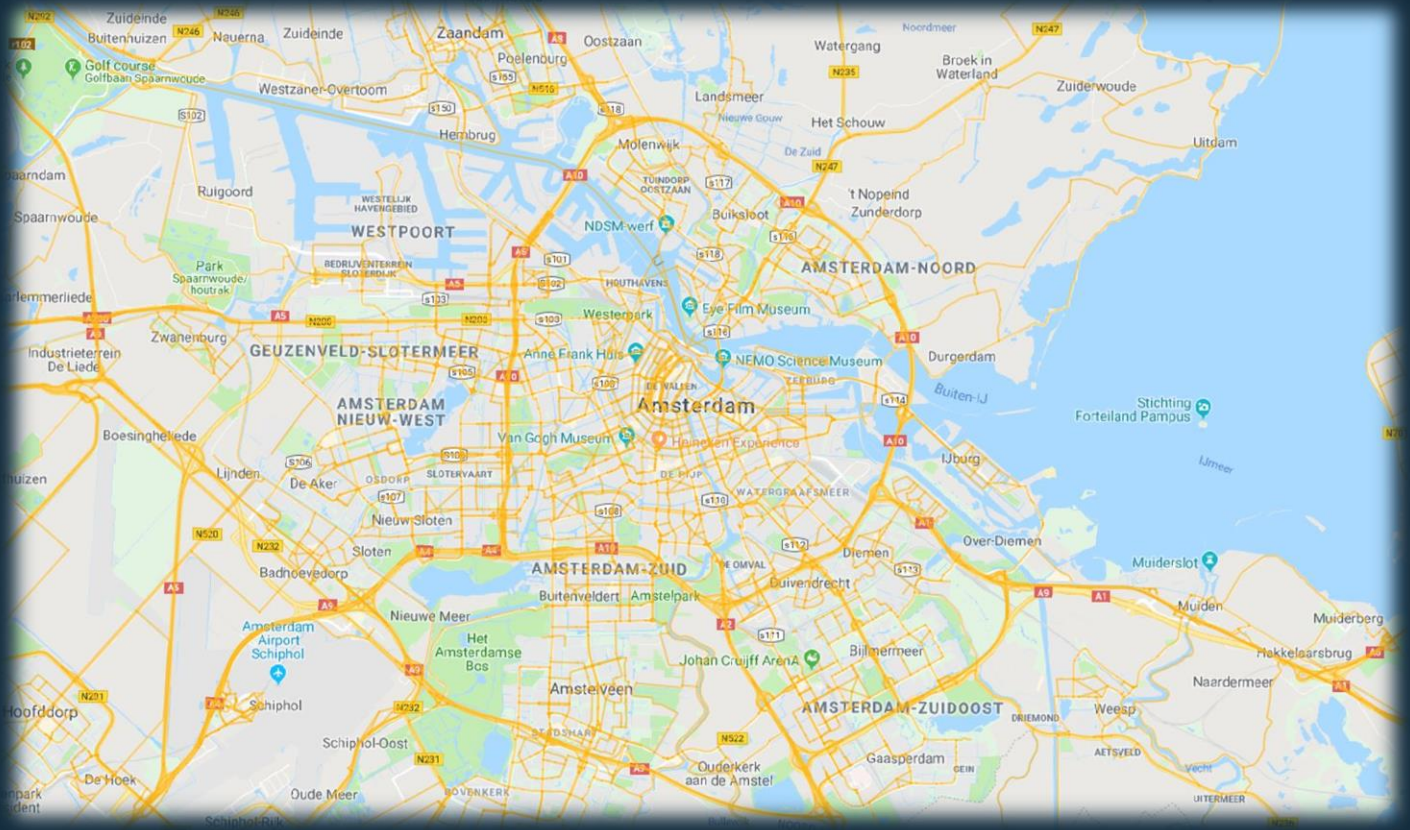
DEDICATED ZONES
(CHEN ET AL., 2017)



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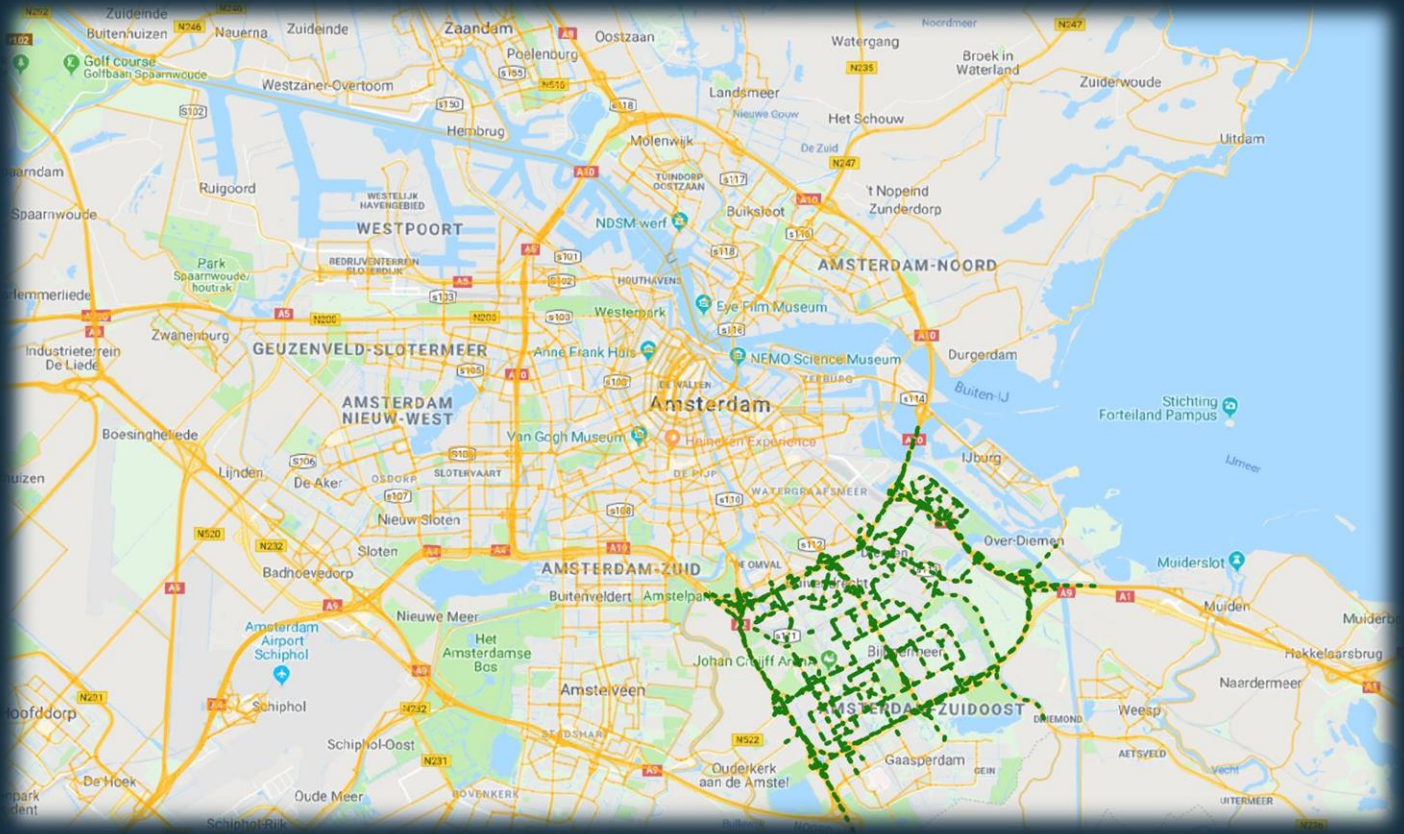
DEDICATED ZONES
(CHEN ET AL., 2017)



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DEDICATED ZONES
(CHEN ET AL., 2017)

Advantages:

- Safe (potentially)
- Efficient **only** in AV zone

Disadvantages:

- Requires serious planning
- Accessibility
- Inefficient
- Costly

Pollution?

Noise?

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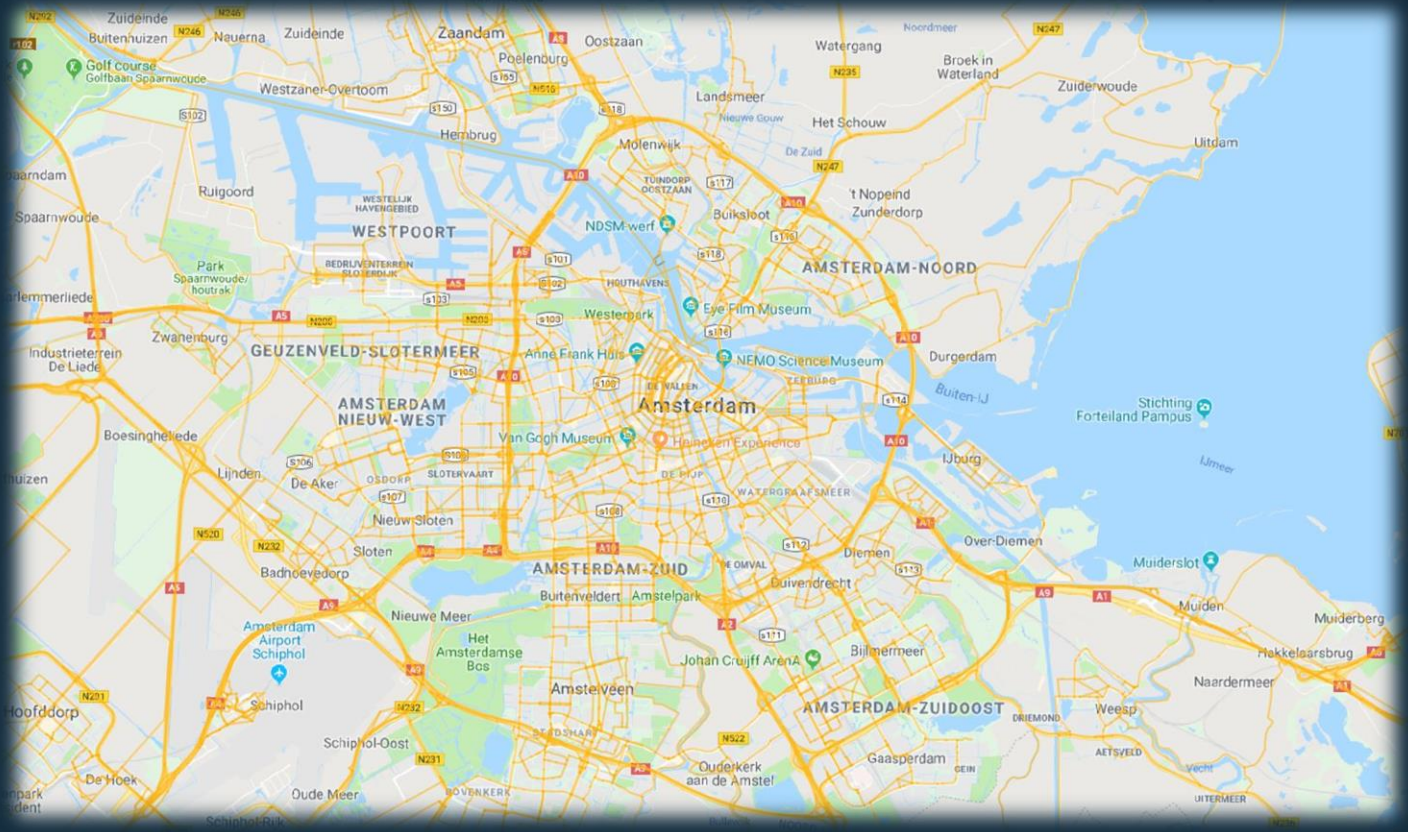
AUTOMATED DRIVING SUBNETWORKS
(MADADI ET AL., 2019)



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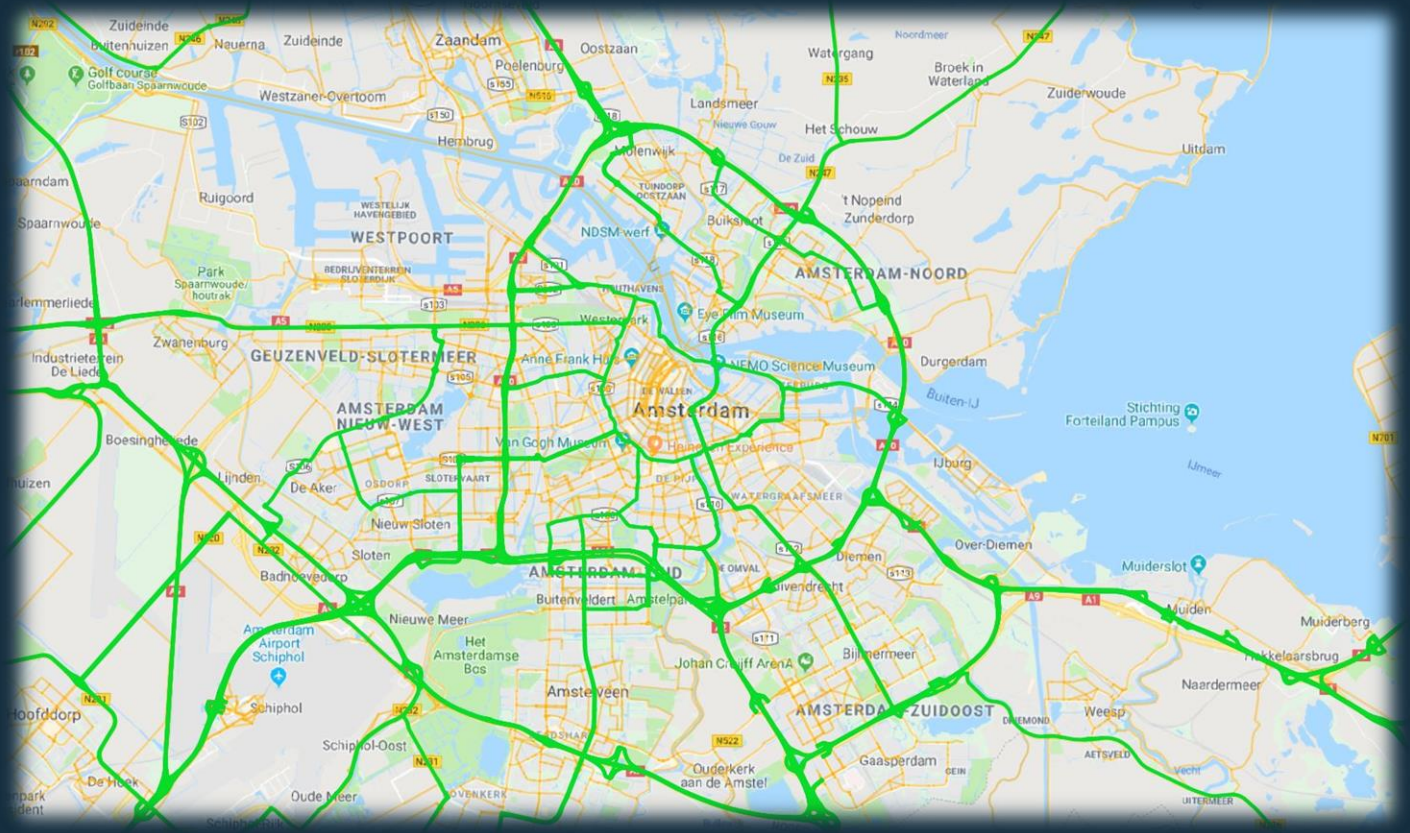
AUTOMATED DRIVING SUBNETWORKS
(MADADI ET AL., 2019)



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AUTOMATED DRIVING SUBNETWORKS
(MADADI ET AL., 2019)

Advantages:

- Safe
- Can benefit all road users
- Efficient (potentially)
- Can improve accessibility

Disadvantages:

- Costly

Pollution?

Noise?

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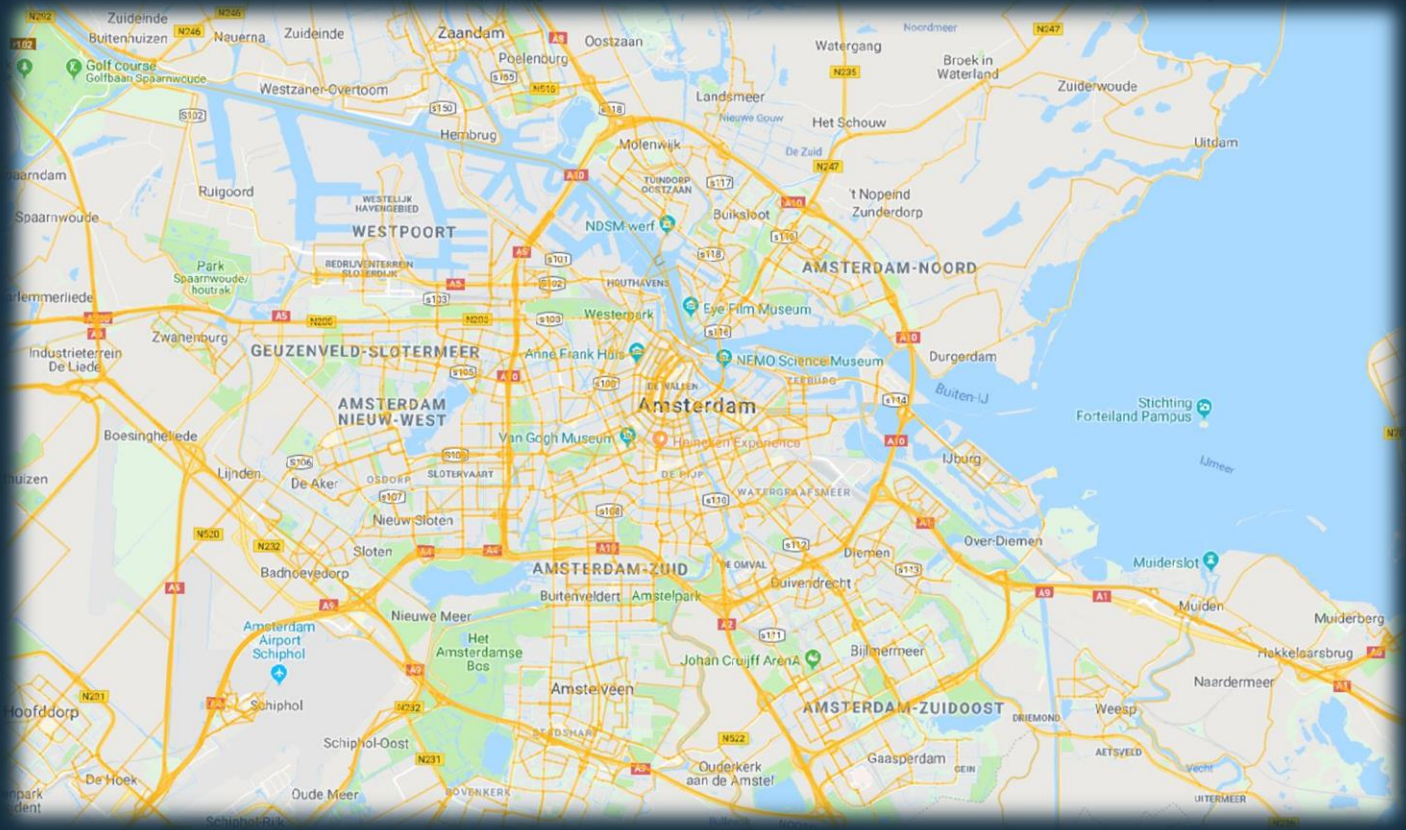
NOW YOU ARE IN CHARGE!



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Criteria:

Safety

Accessibility

Efficiency

Investment cost

Equity

(distribution of impacts)

Legend:

Dedicated lanes

Dedicated zones

Dedicated links

AD subnetwork

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THANK YOU!

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