

neighbourhood design and vehicle travel

recommendations for reduction of energy consumption

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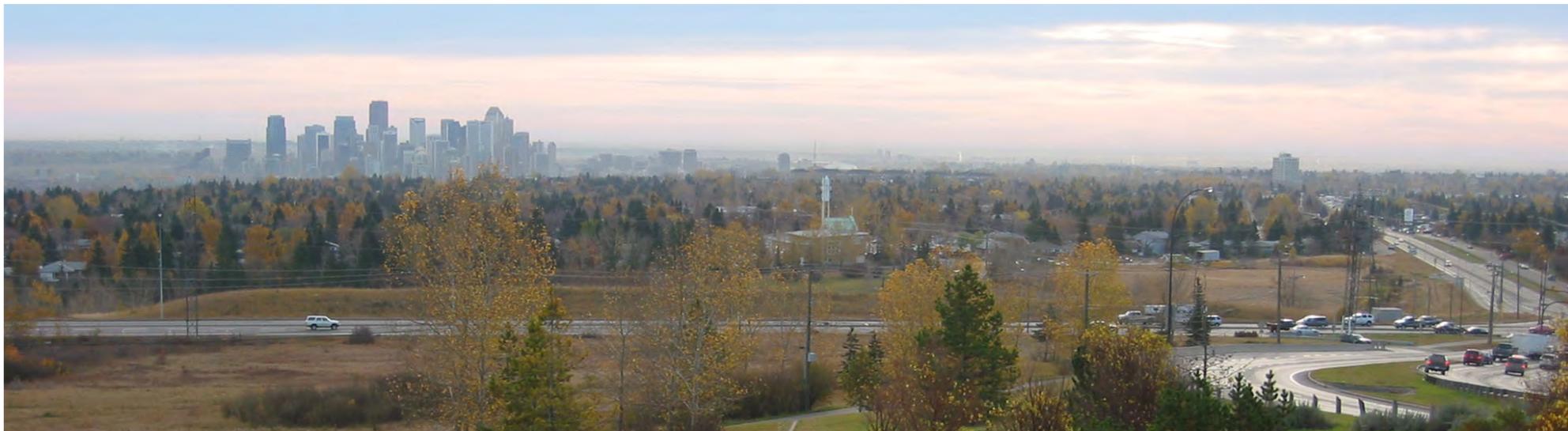
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Research Question

There has been much discussion about block pattern and how that has changed over the years to an auto-oriented design

Does neighbourhood design, block pattern in particular, affect peoples' travel patterns?



Research project:

Economic Evaluation of Urban Form to Increase Activity - EcoEUFORIA

Research team:

Dr. Alan Shiell

Dr. Gavin McCormack

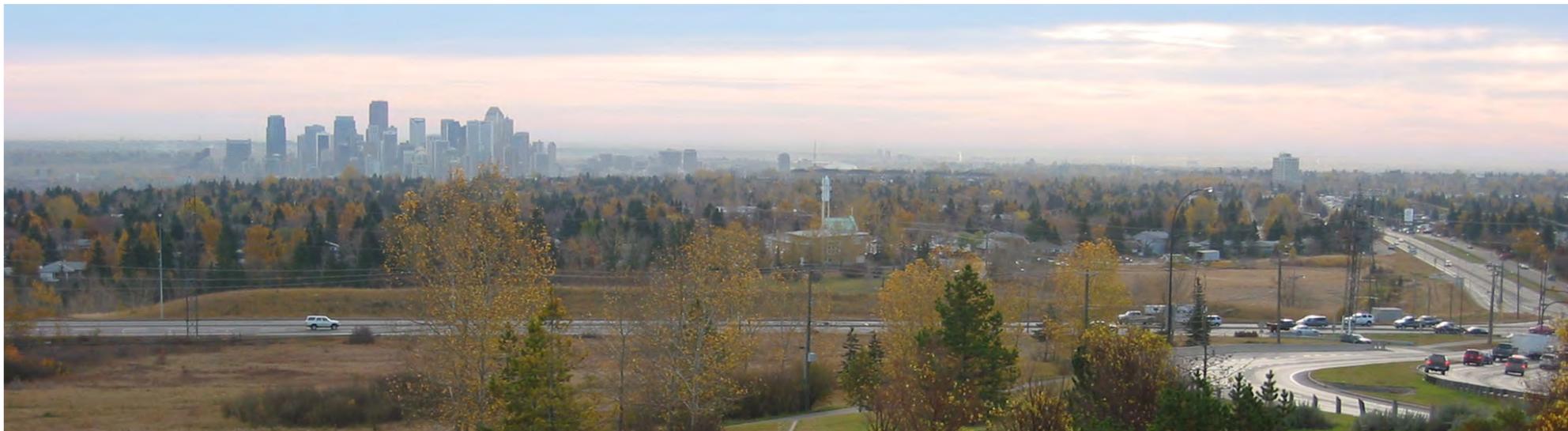
Dr. Tish Doyle-Baker

Dr. Christine Friedenreich

Dr. Beverly A. Sandalack

Francisco Alaniz Uribe

Faculties of Medicine, Kinesiology and Environmental Design



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The city of Calgary as the case study

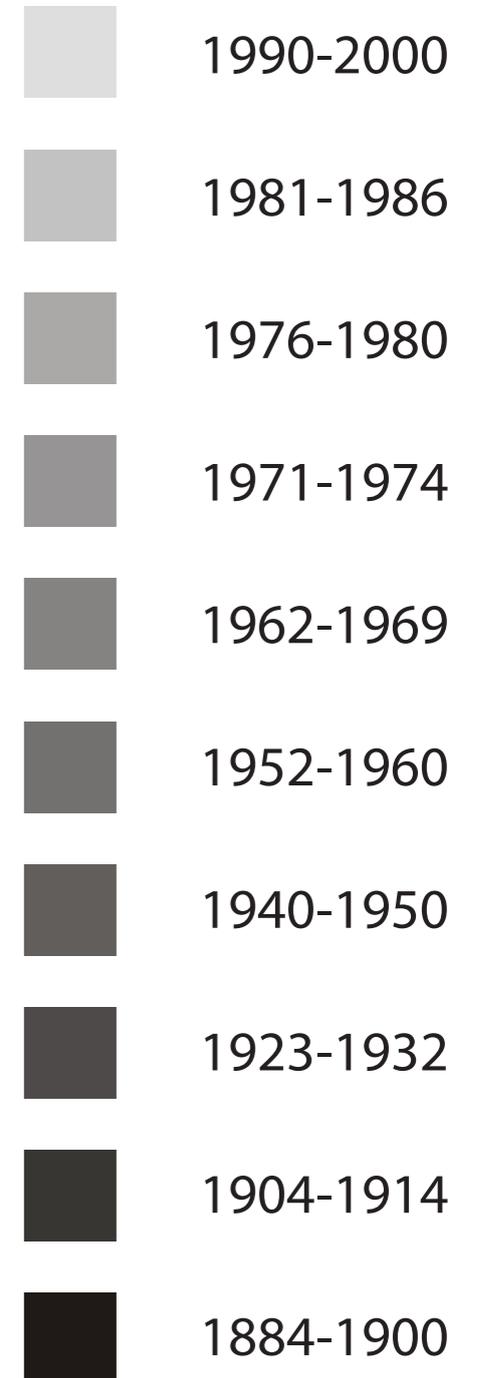
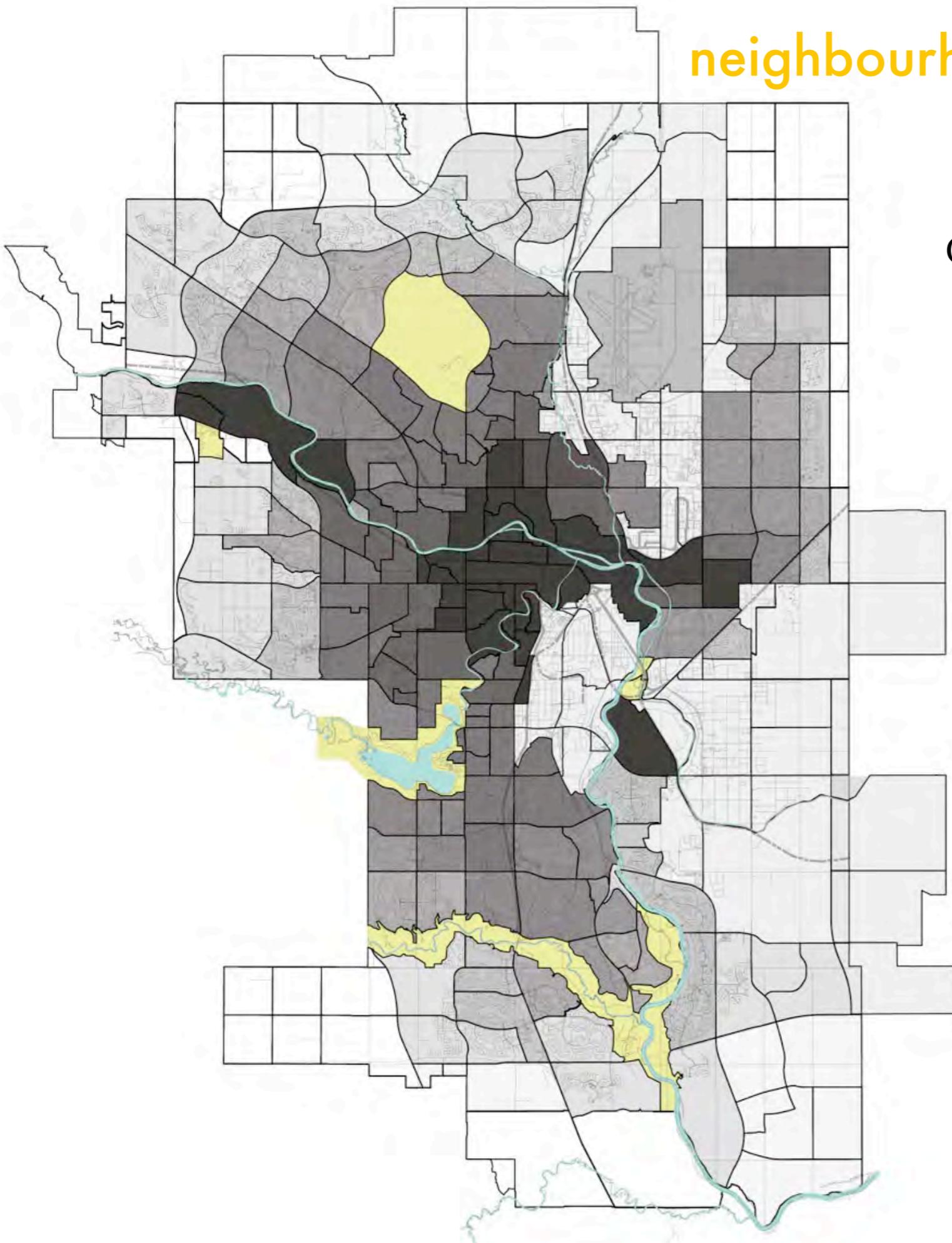
Concentric growth around downtown

Clear neighbourhood boundaries

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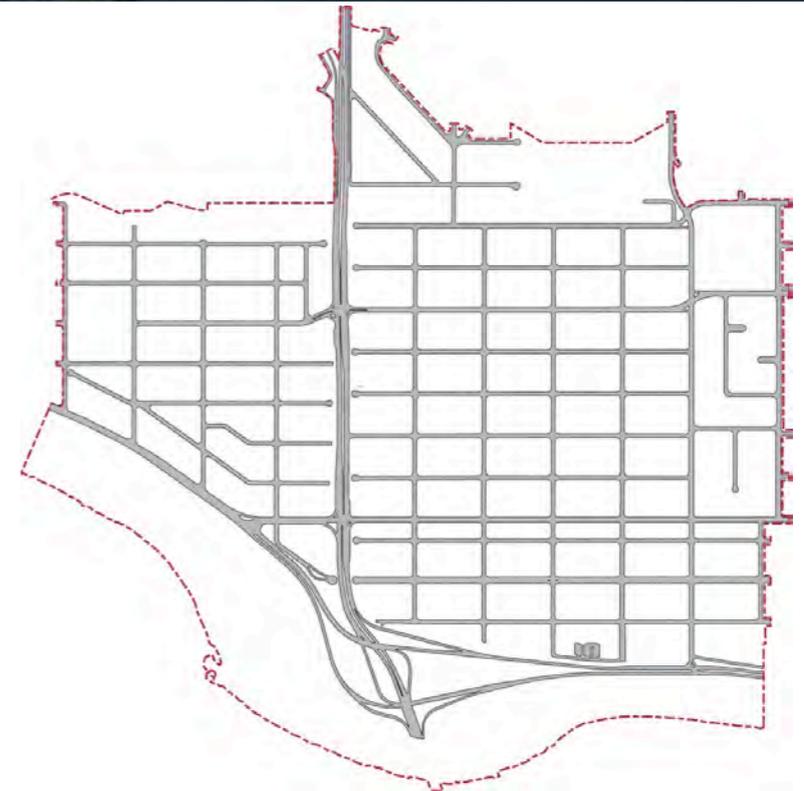
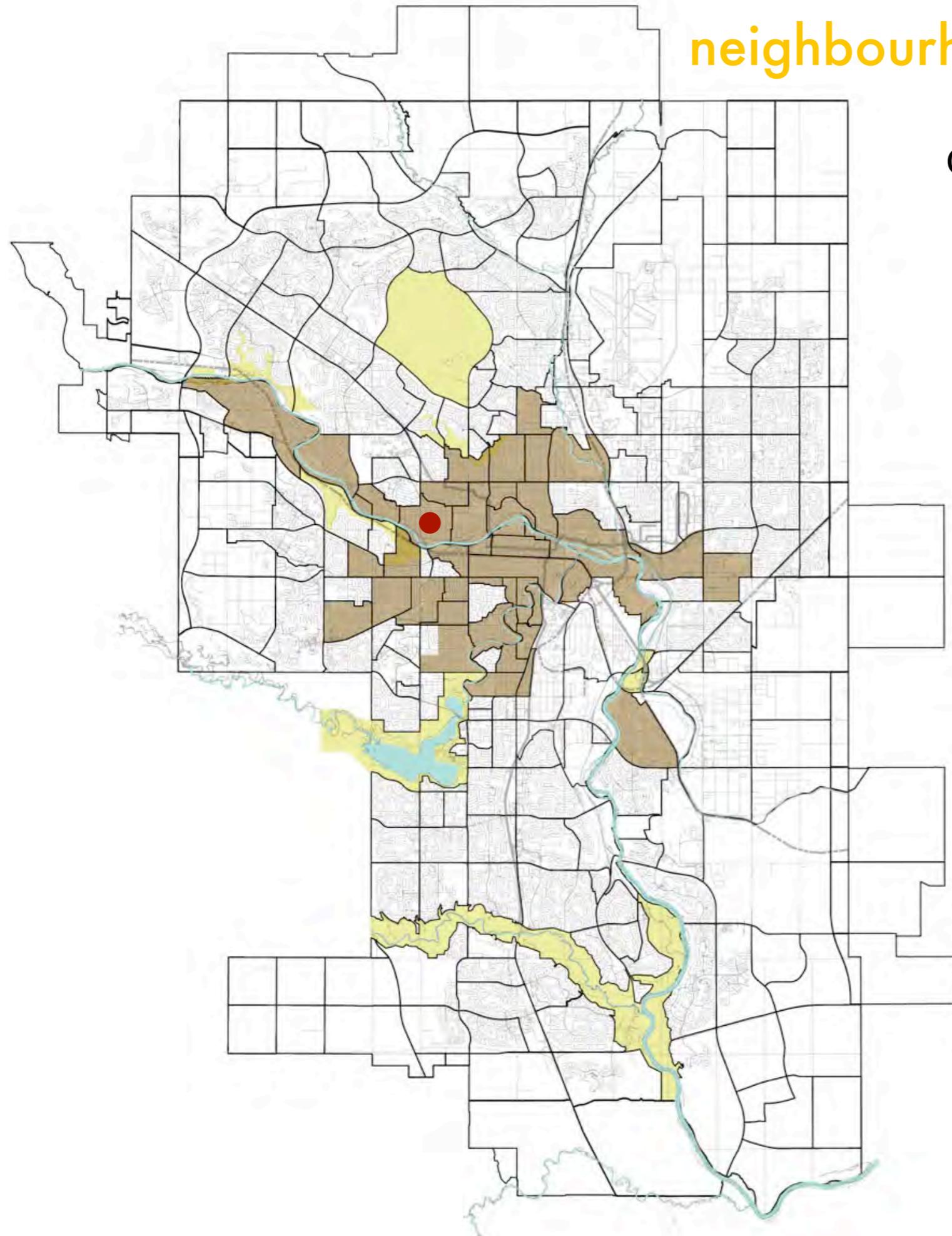
Calgary has developed in concentric rings



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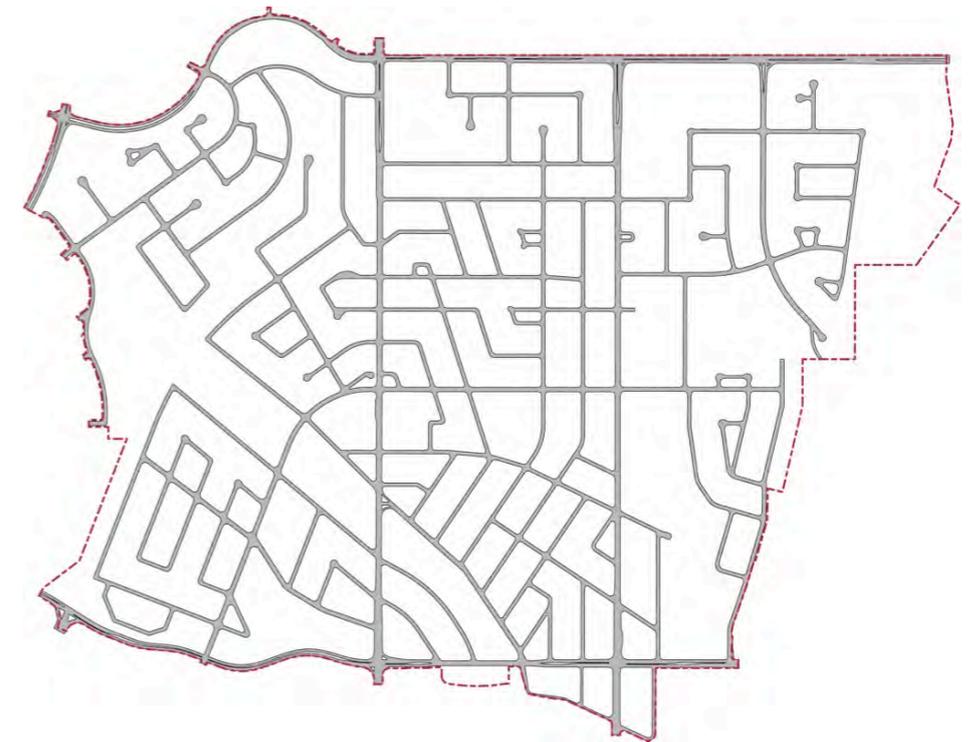
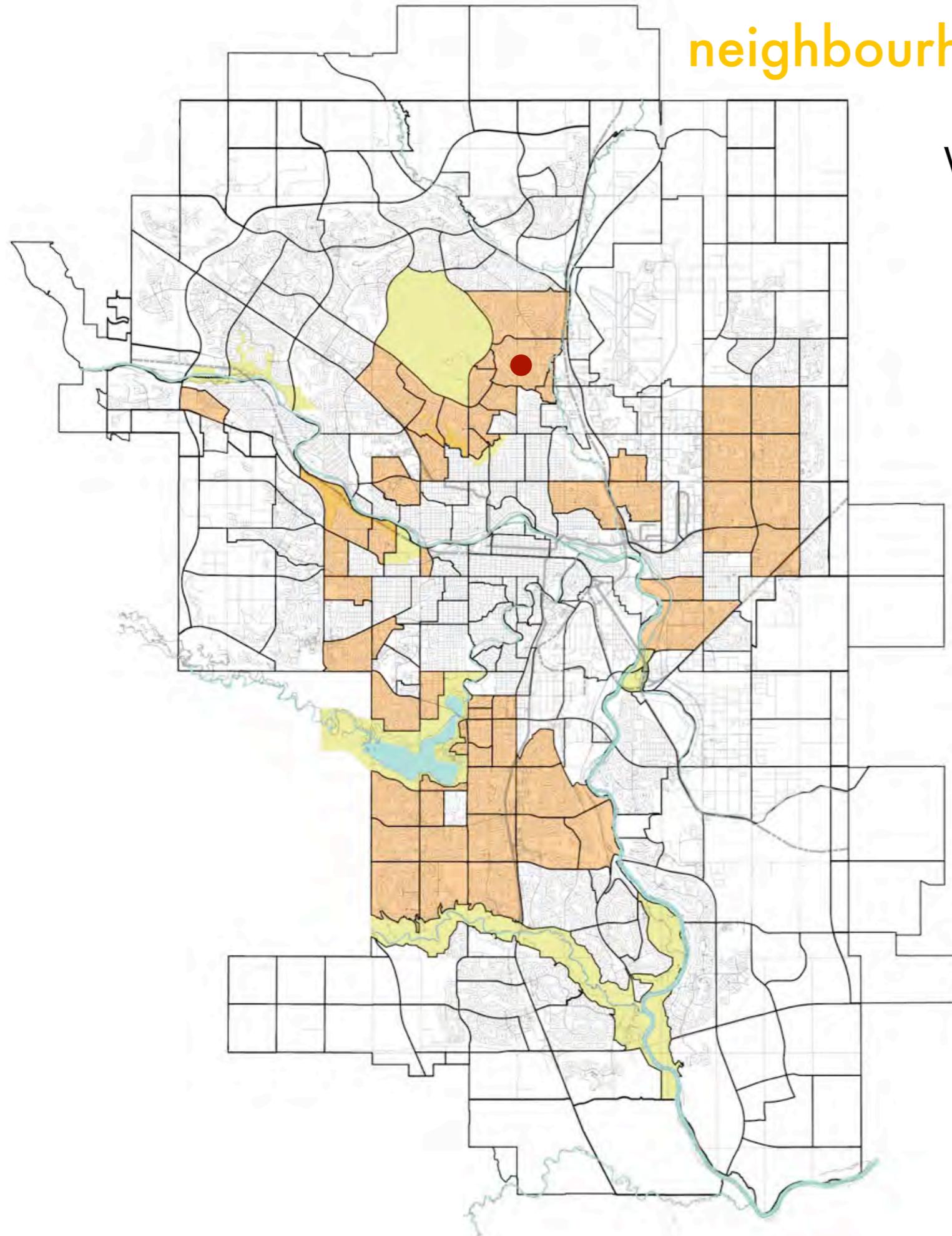
GRID - West Hillhurst



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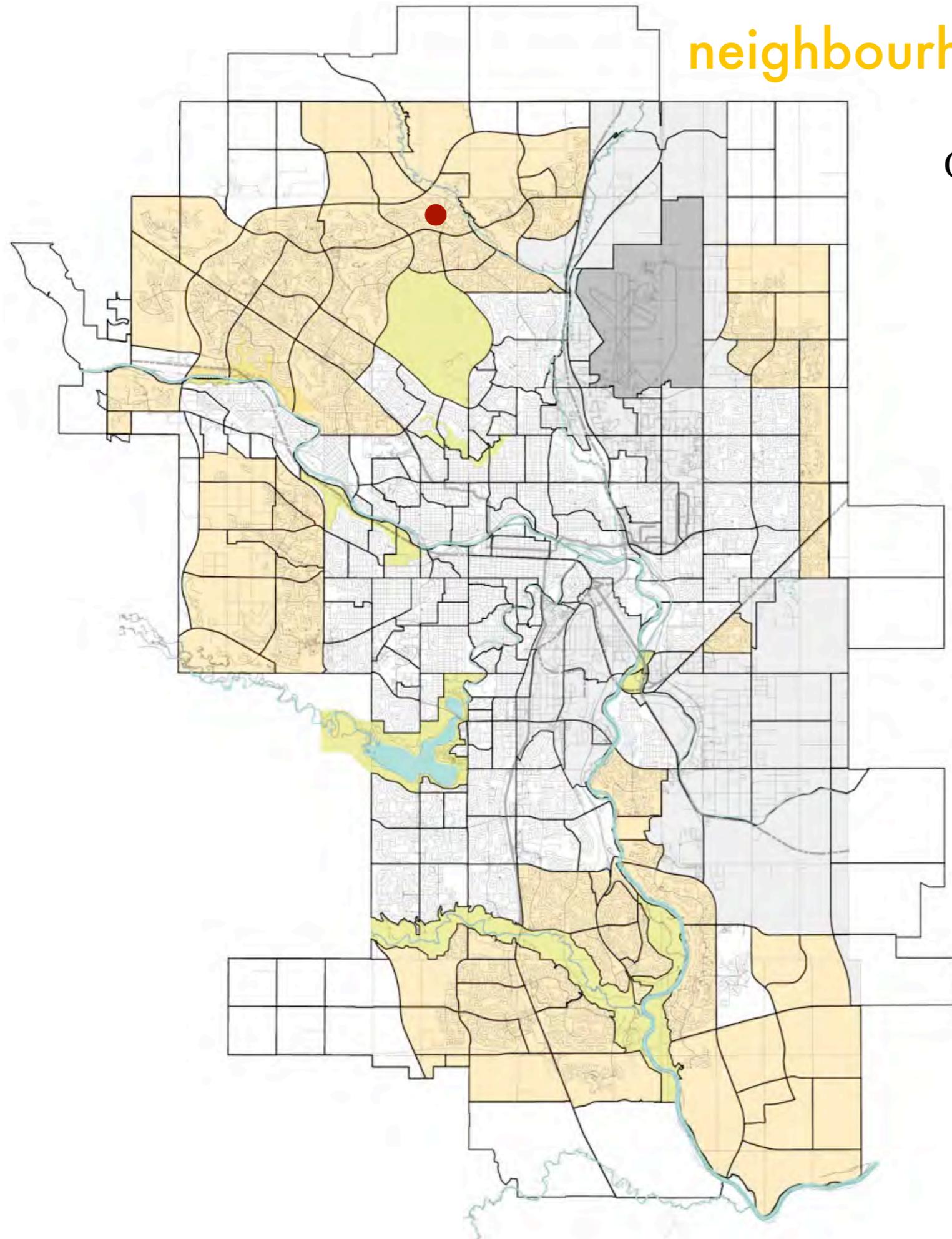
WARPED GRID - Thorncliffe



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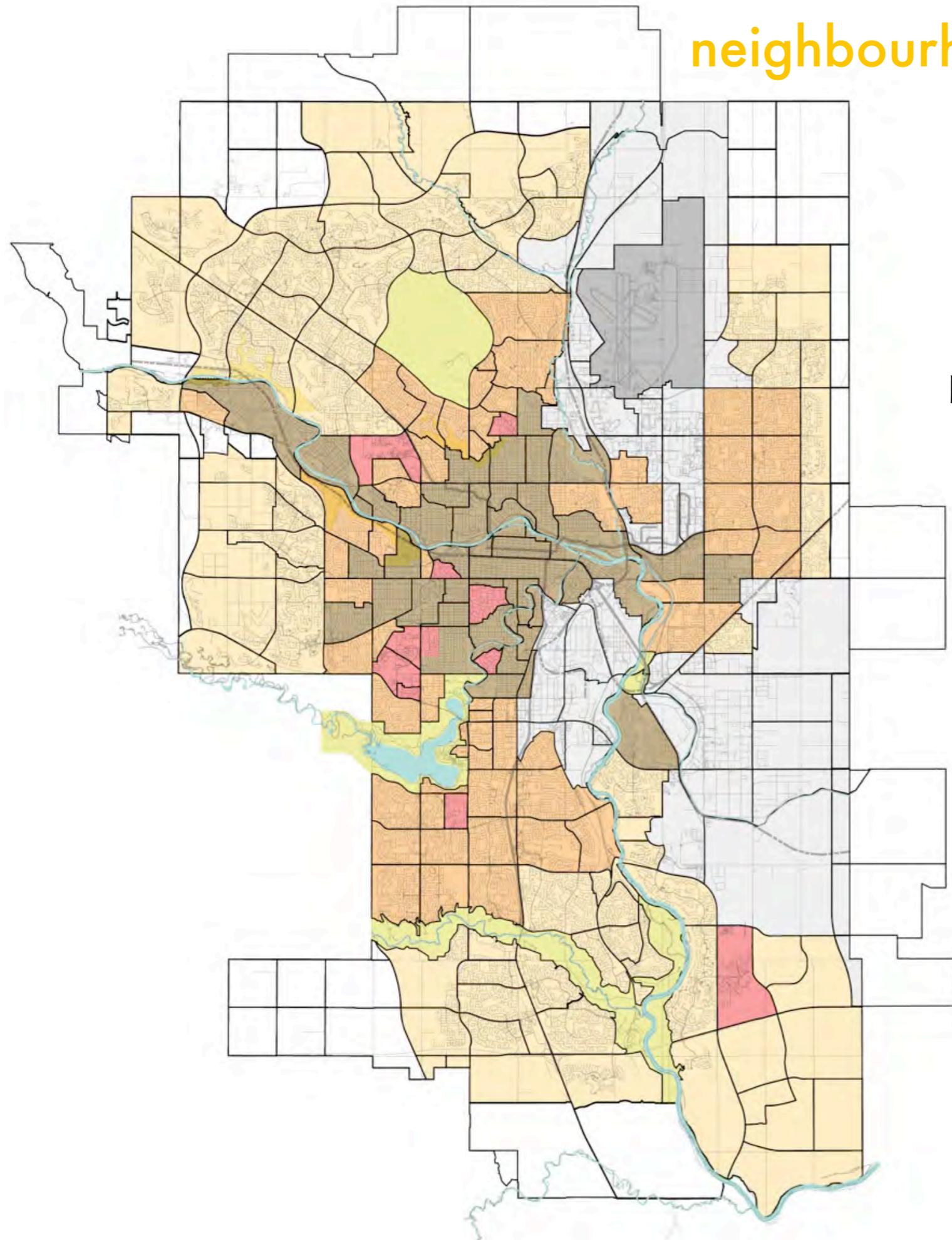
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CURVILINEAR - Hidden Valley



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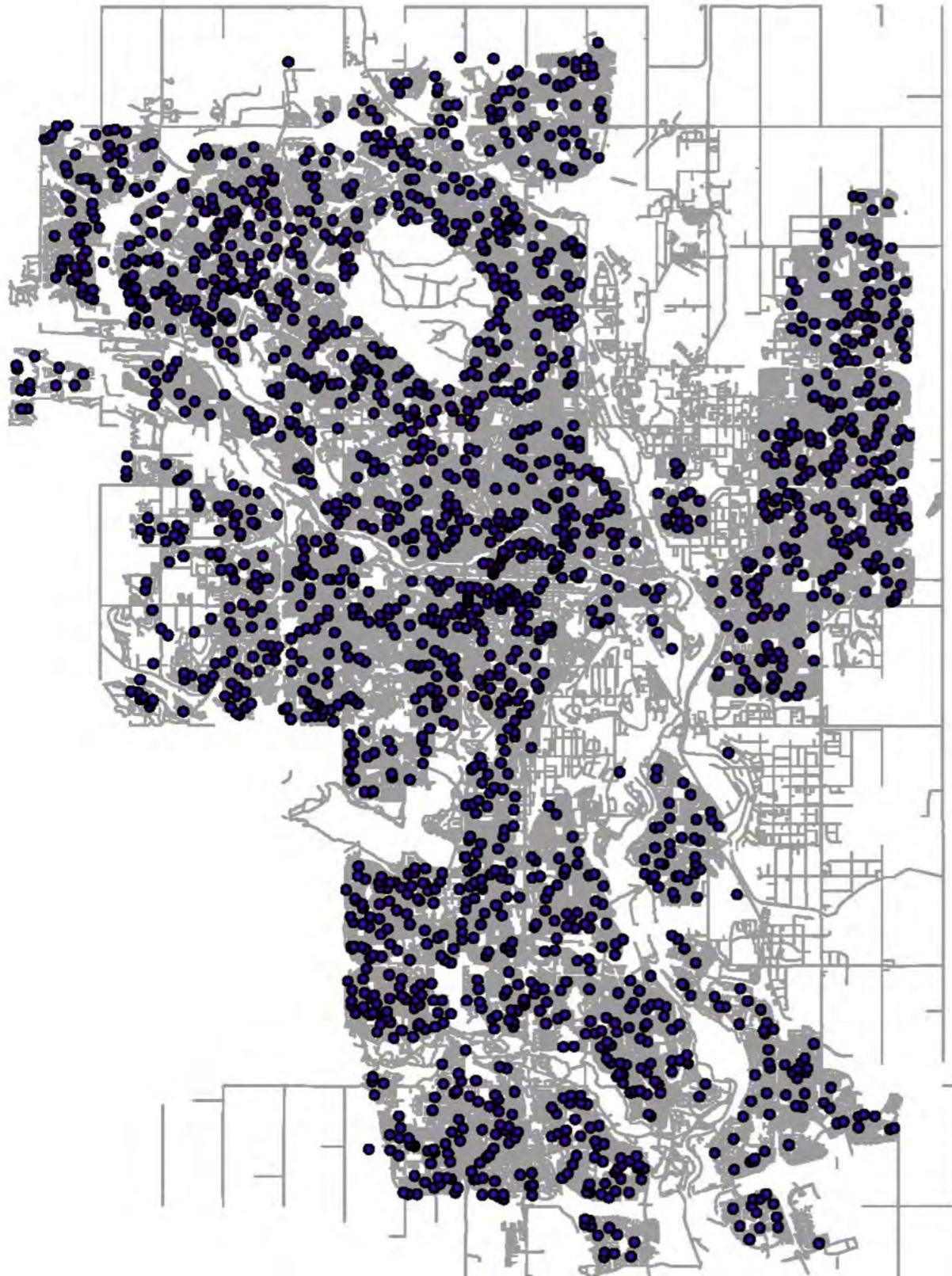


NEIGHBOURHOOD TYPES

- Grid Block
- Warped Grid
- Curvilinear
- Special Cases
- Airport
- Industrial Lands
- Major Parks

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To understand travel patterns a survey was conducted.

A randomized sample from across the city was collected in two mailed surveys (summer and winter) and a follow-up telephone survey.

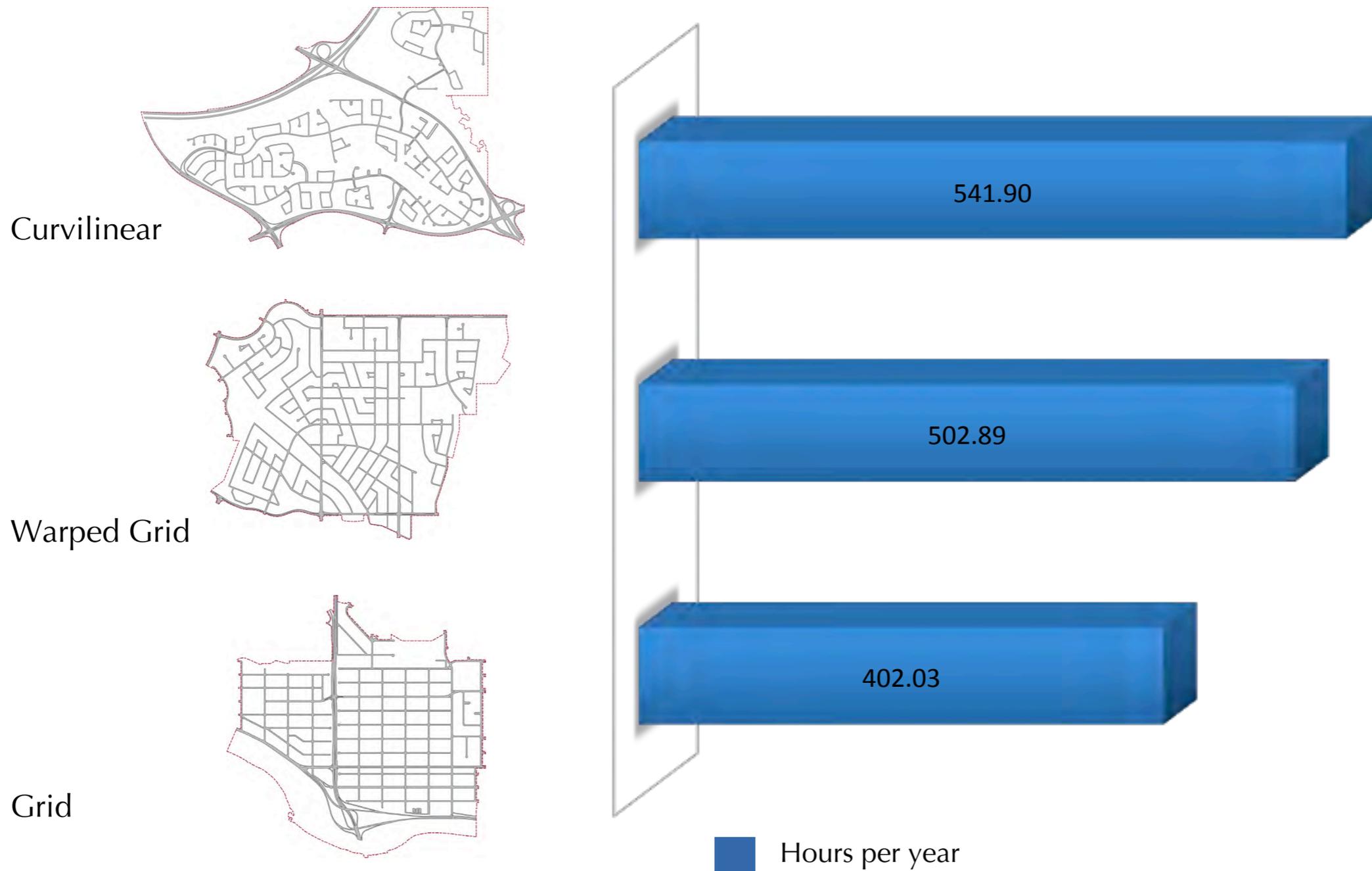
2006 respondents accounted for their vehicle use and travel.

MAP: Respondents' Postal Codes

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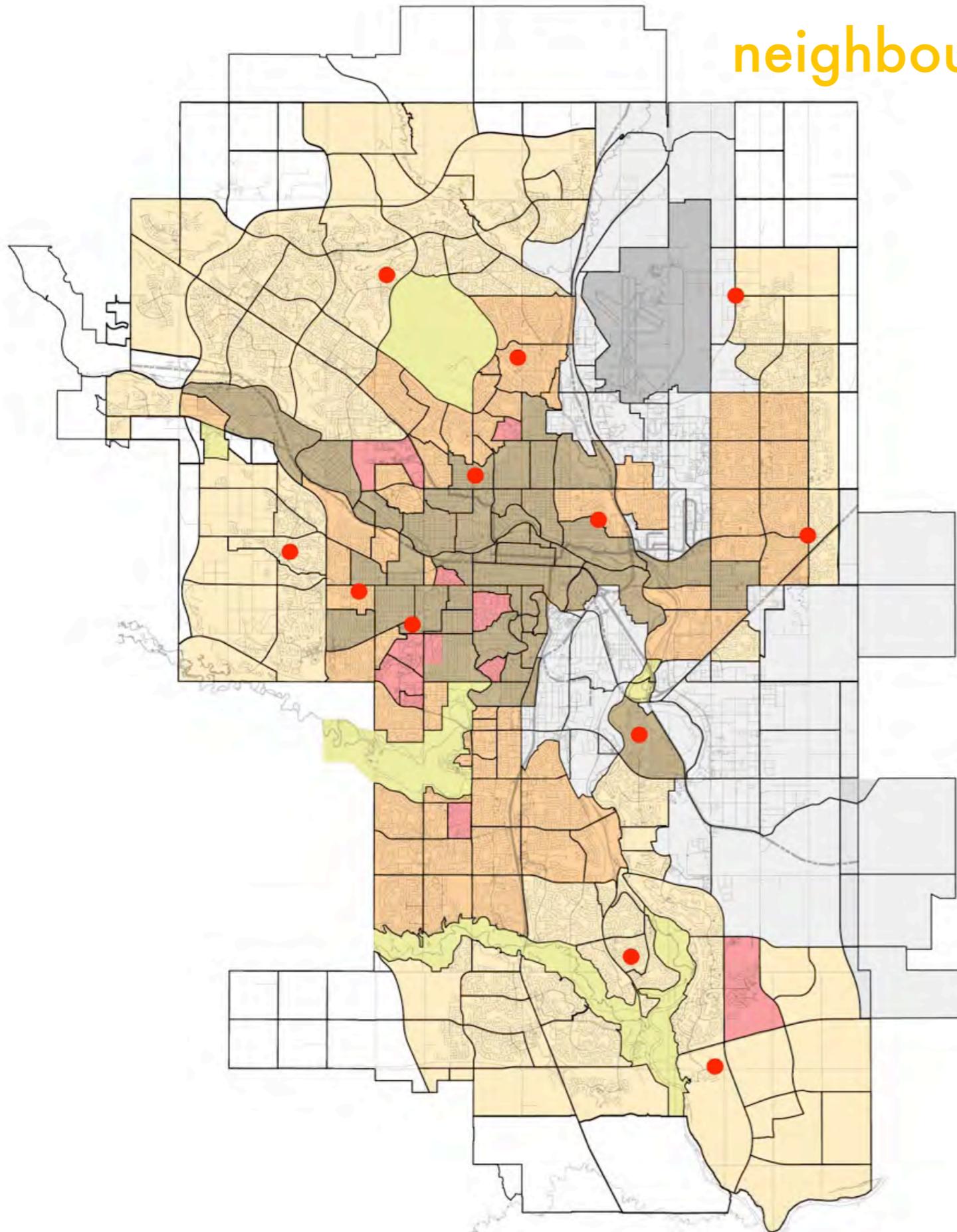
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Self reported vehicle travel (hours)



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To estimate average Vehicle Kilometers Travelled (VKT) an average speed was used

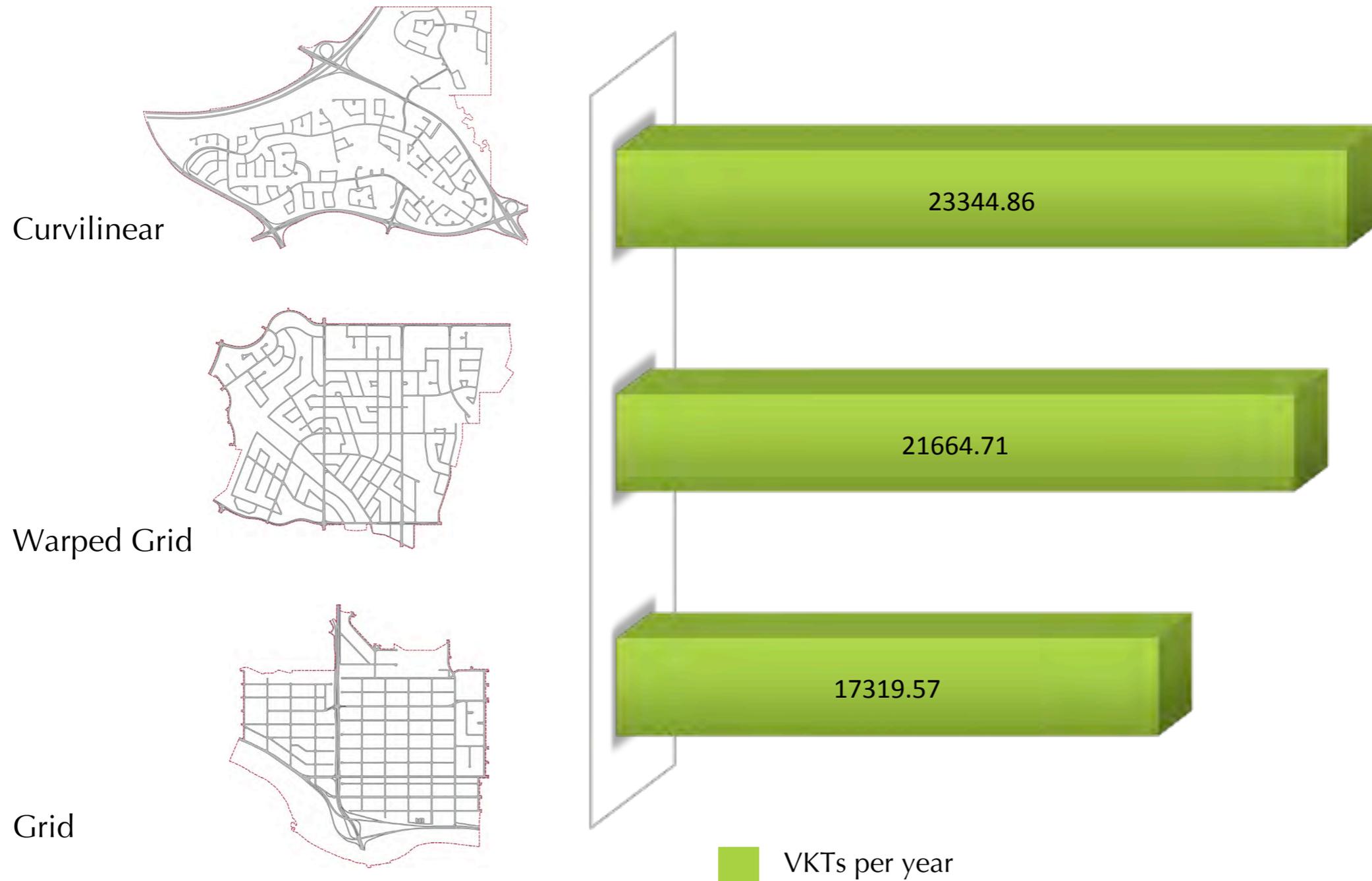
Data from 37 traffic monitoring boxes was available from 12 intersections across the city

The average speed from this data set is 43.08km/hr

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Vehicle Kilometers Travelled based on the average speed in Calgary (43.08km/hr)

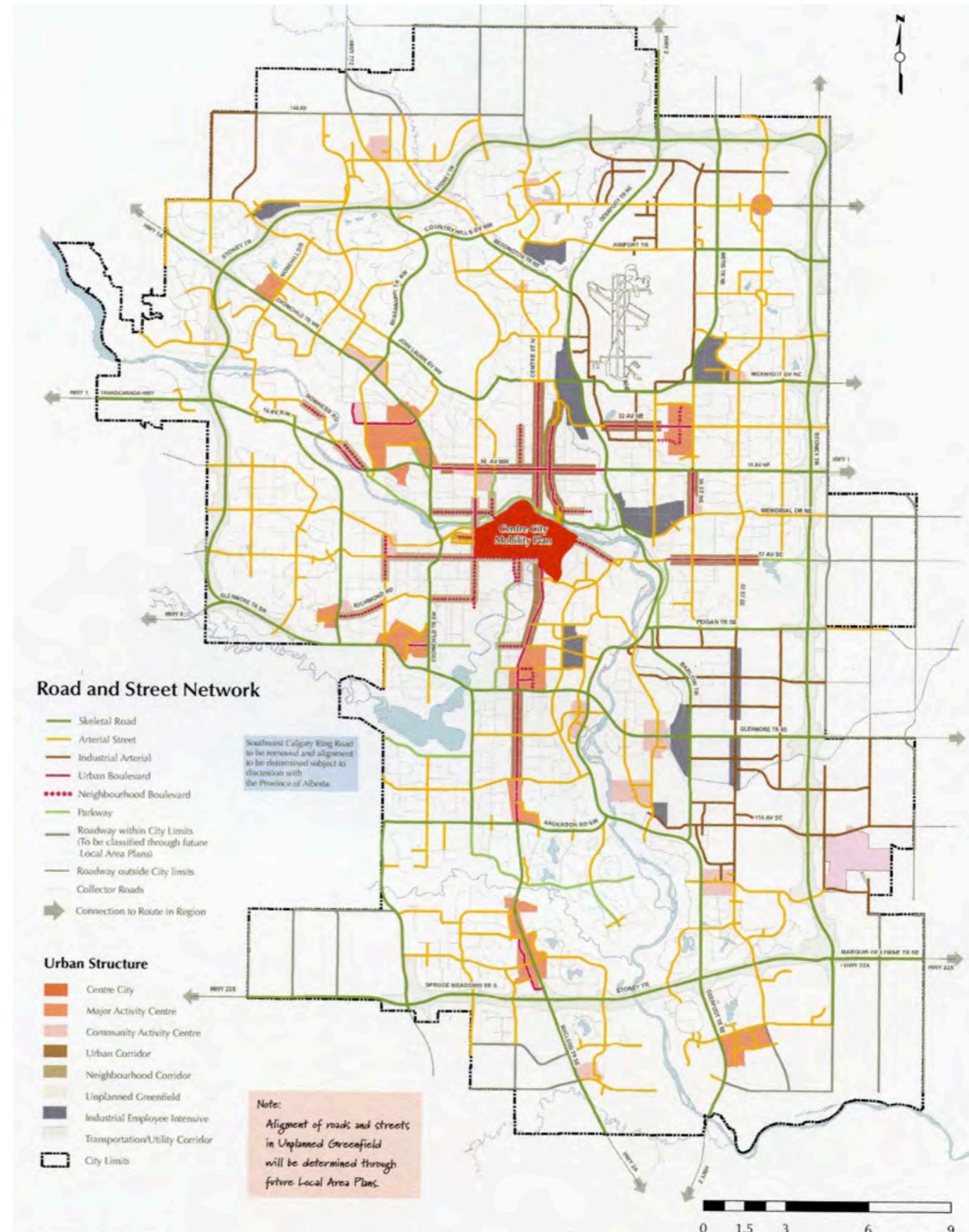


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Research limitations

- Location of the neighbourhood within the city
- Proximity of neighbourhood to employment centres



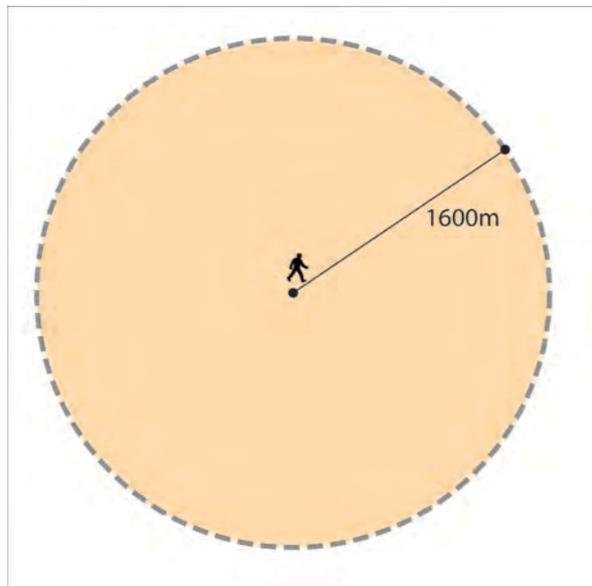
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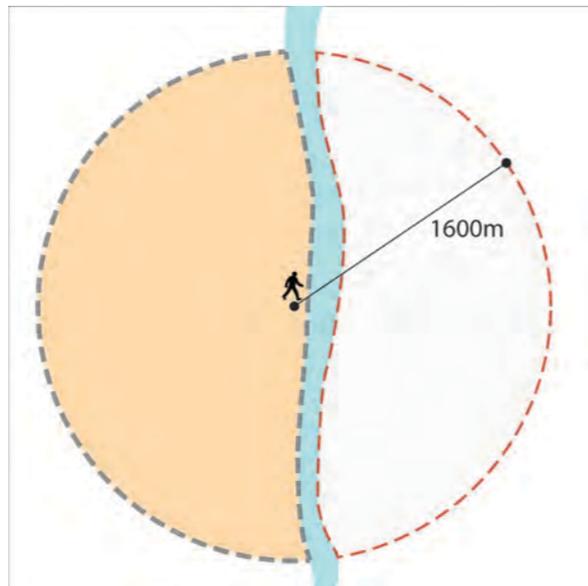
Walkshed mapping of respondents' postal codes

Development of walkshed modeling tool

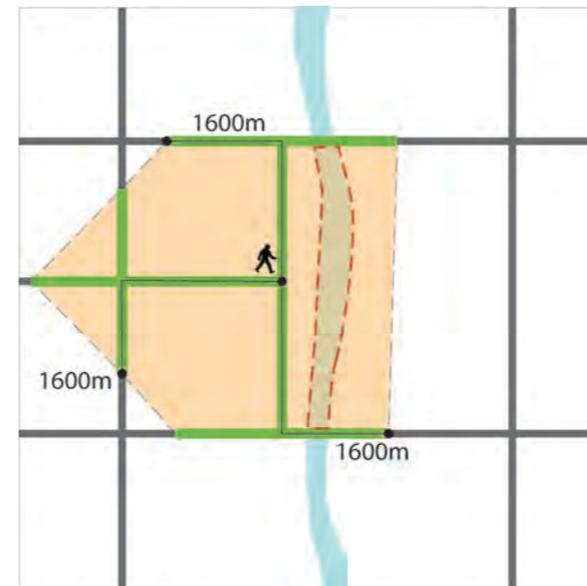
Airline



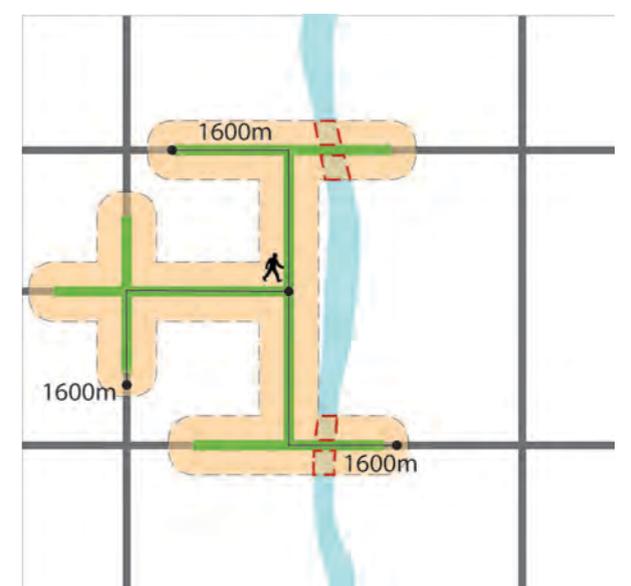
Airline



Road Network



Line-based Network



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Airline Buffer



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Road Network Buffer



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Line-Based Network Buffer



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Comparison



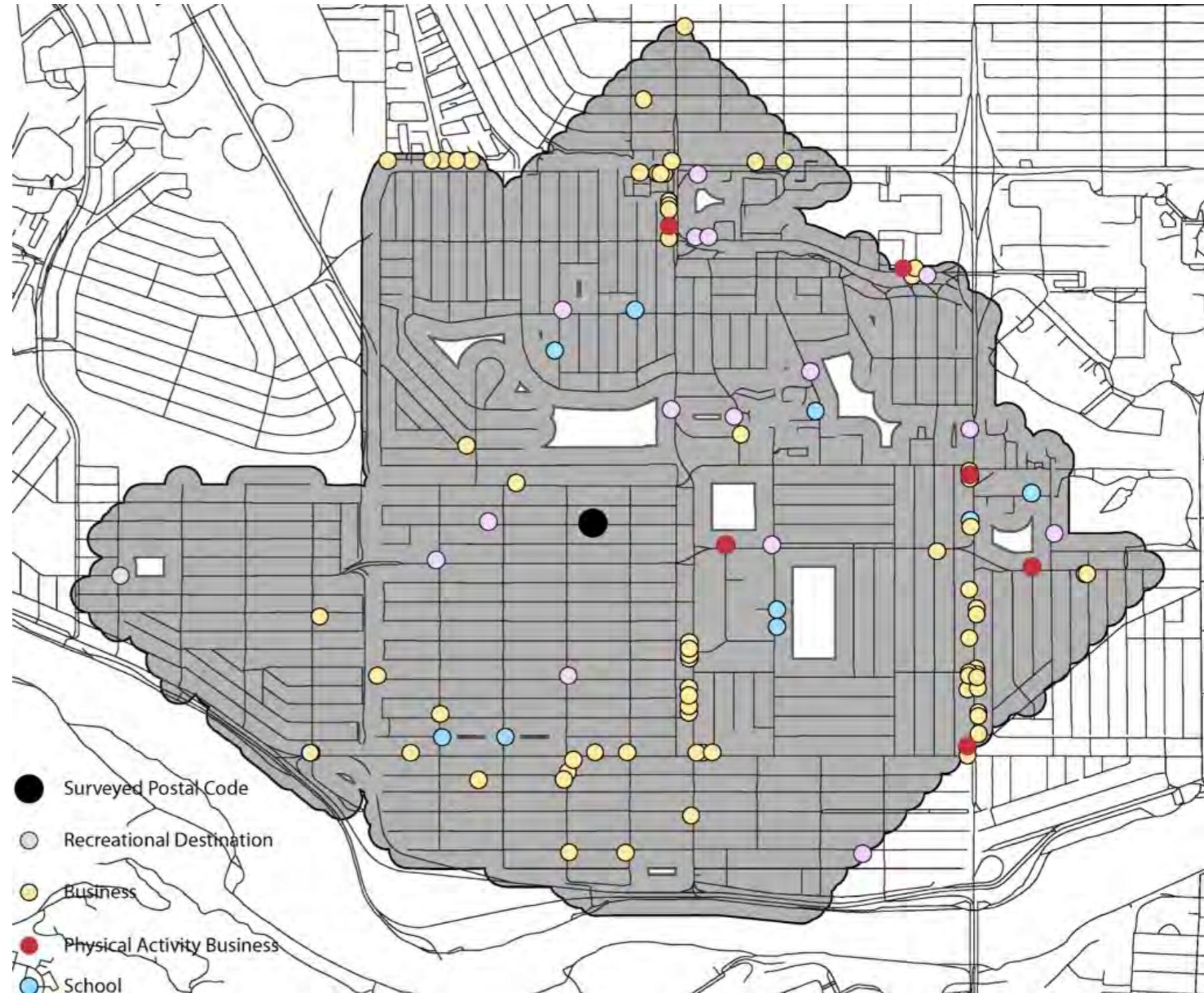
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Walksheds were also mapped for 4473 respondents

GRID

831 responses



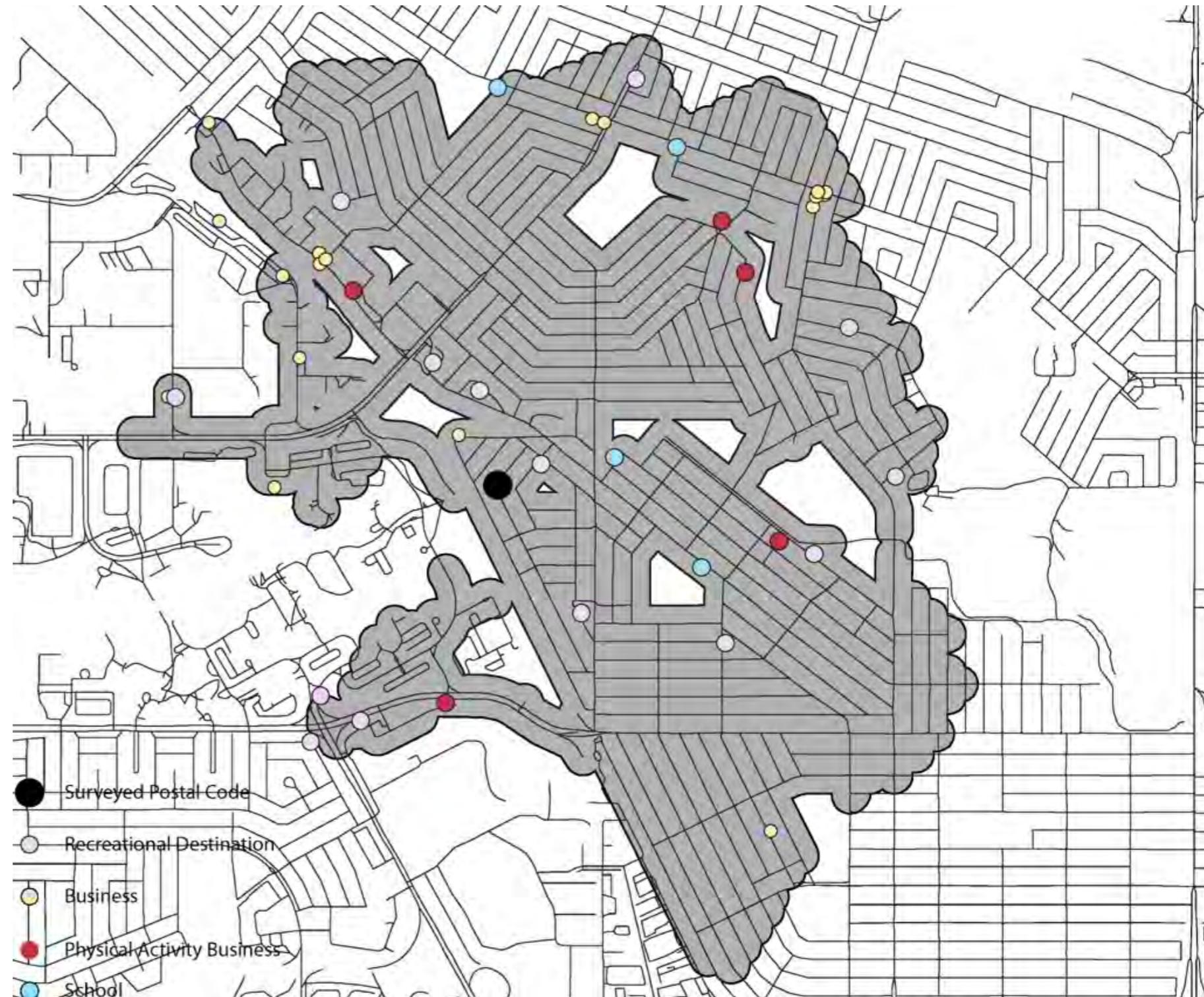
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Walksheds were also mapped for 4473 respondents

WARPED GRID

1342 responses



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Walksheds were also mapped for 4473 respondents

CURVILINEAR

2100 responses

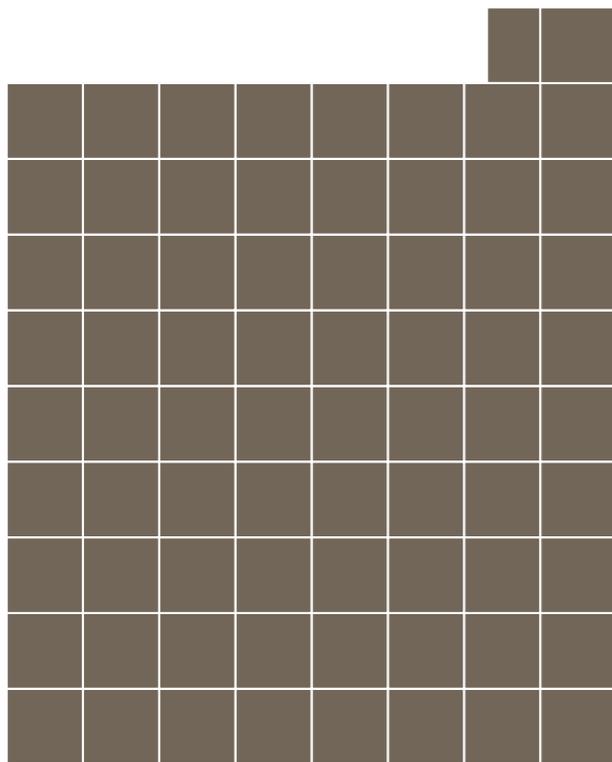


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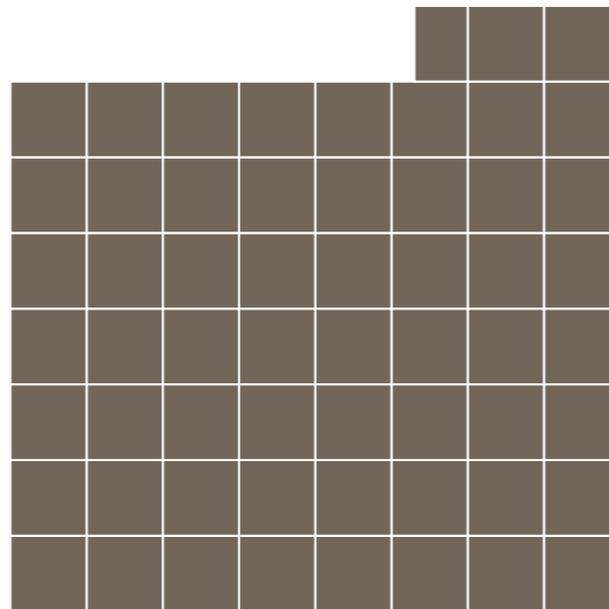
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Average Walkshed vs. Neighbourhood Type

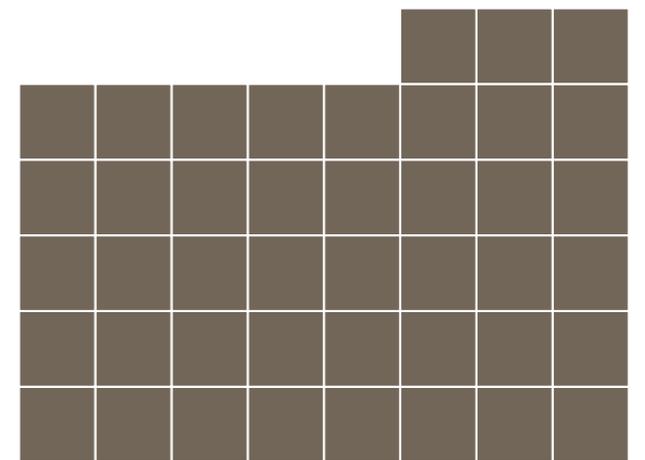
0.05 sq. km 



GRID
3.68 sq. km



WARPED GRID
2.93 sq. km



CURVILINEAR
2.15 sq. km

Conclusions

Older neighbourhoods tend to be more connected to their context while newer curvilinear neighbourhoods have few entry points

Block pattern is an important factor impacting vehicular travel

The more permeable a neighbourhood is, the less amount of vehicle travel is observed

We need to increase vehicular and pedestrian permeability in our neighbourhoods, smaller blocks and more connected streets

We need to change the way we design our roads, modifying the existing classification system, to increase connectivity and shorten trips

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recommendations for reduction of energy consumption

Merci
Thank you



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