



Mapping Vehicle Emissions

An Update



December 6, 2018

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Agenda

1. National Vehicle Emission Dataset (NVED)

- Overview
- The latest updates

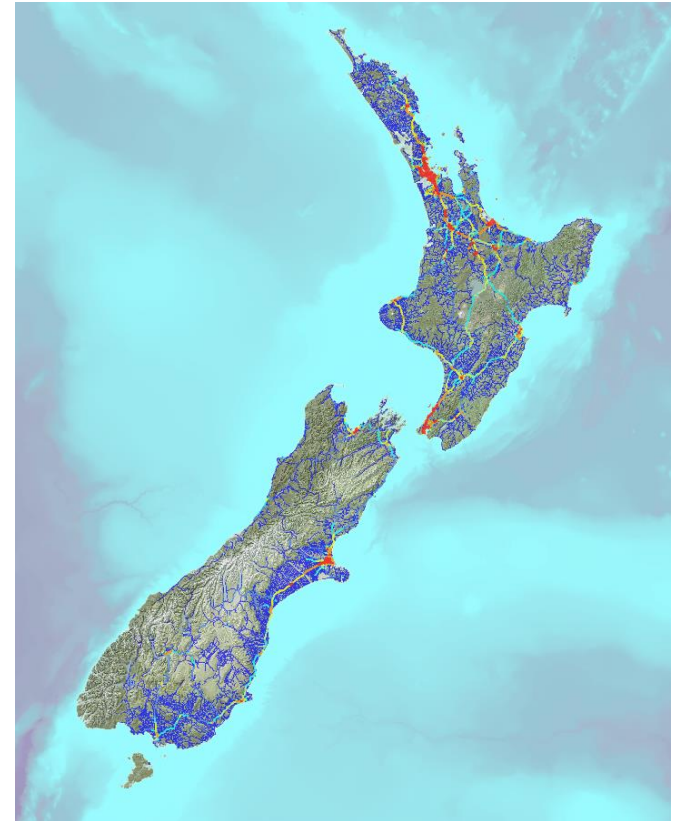
2. Vehicle Emission Concentrations

- Overview
- How it's done
- Outputs
- Future steps

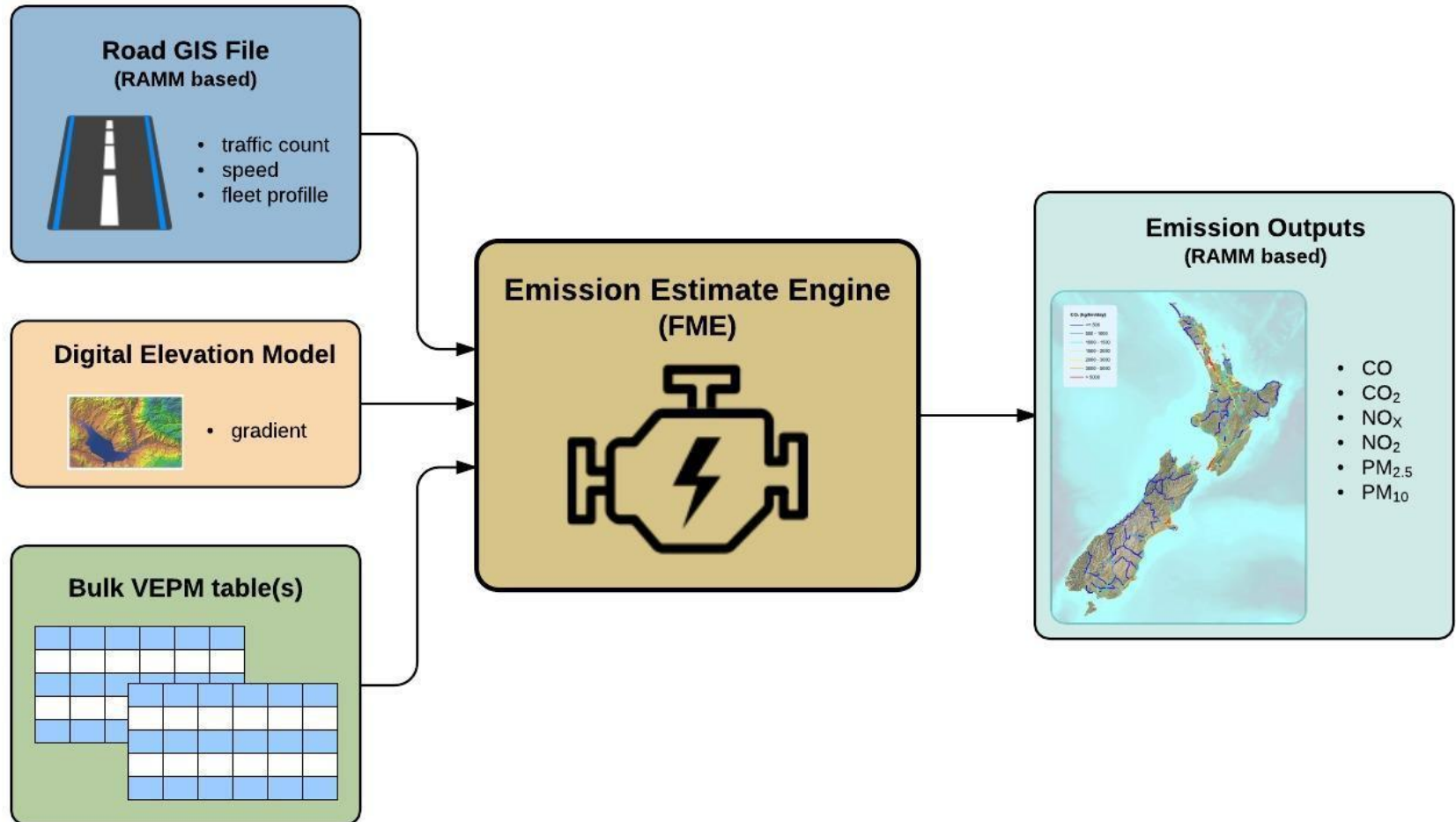
NVED Overview

- Vehicle emissions for all roads*
- Annual average daily emission
- Each road has emissions for:
CO, CO₂, NO₂, NO_x, PM_{2.5} & PM₁₀
in both ***g/km/day*** and ***g/day***

* available from input data



NVED Overview



NVED updates

- Separate emission values for:

Light vehicles	Heavy vehicles	Petrol	Diesel	Electric / hybrid
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- Roads identifiable by:

Territorial Authority	Regional Council	ONRC	Road Asset ID
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- Updated with 2017 data

NVED update benefits

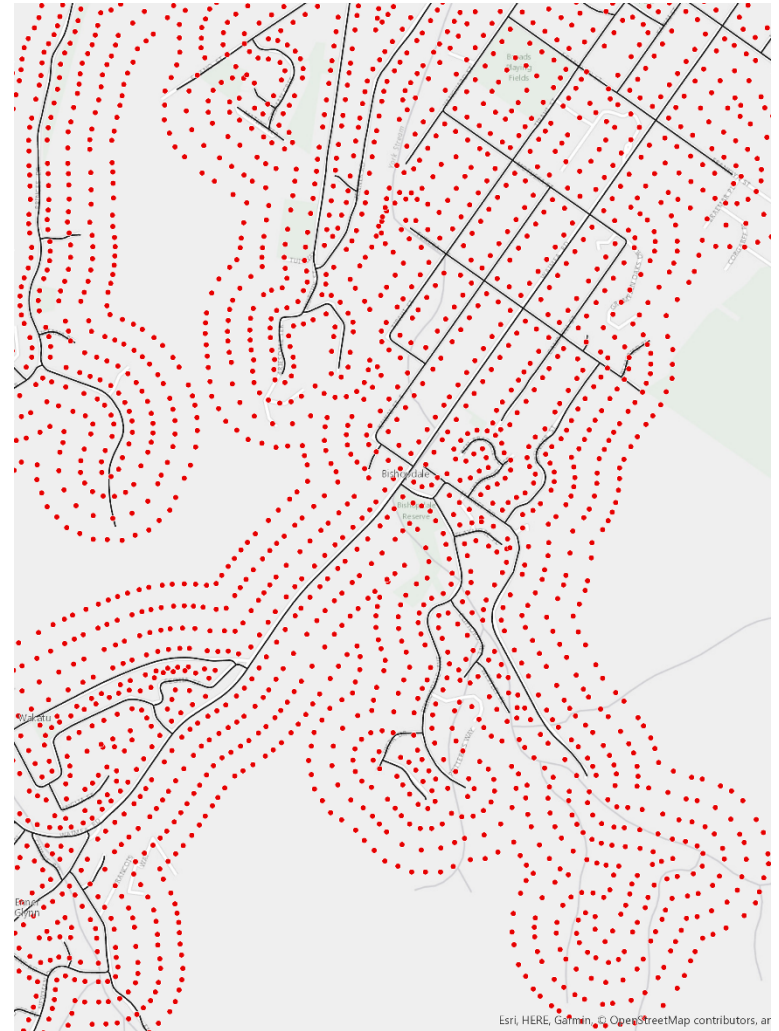
- More information available
- Simple GIS based selections and summaries
e.g. find total CO₂ emissions for petrol vehicles in Christchurch City Council
- Set up well for potential online use in the future
- Yearly update process

Emission Concentration Overview

- At early development stage
- Emission concentration contours for NO₂, PM_{2.5} & PM₁₀
- Created directly from NVED data.
- Automated process
- Easily updated whenever NVED is updated

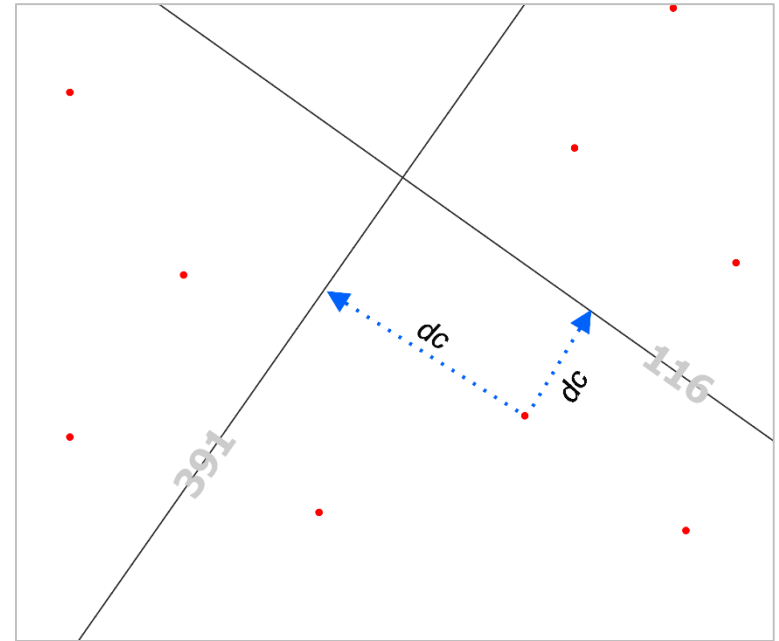
Emission Concentration Methodology

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- Calculate concentrations for each point using DMRB screening method



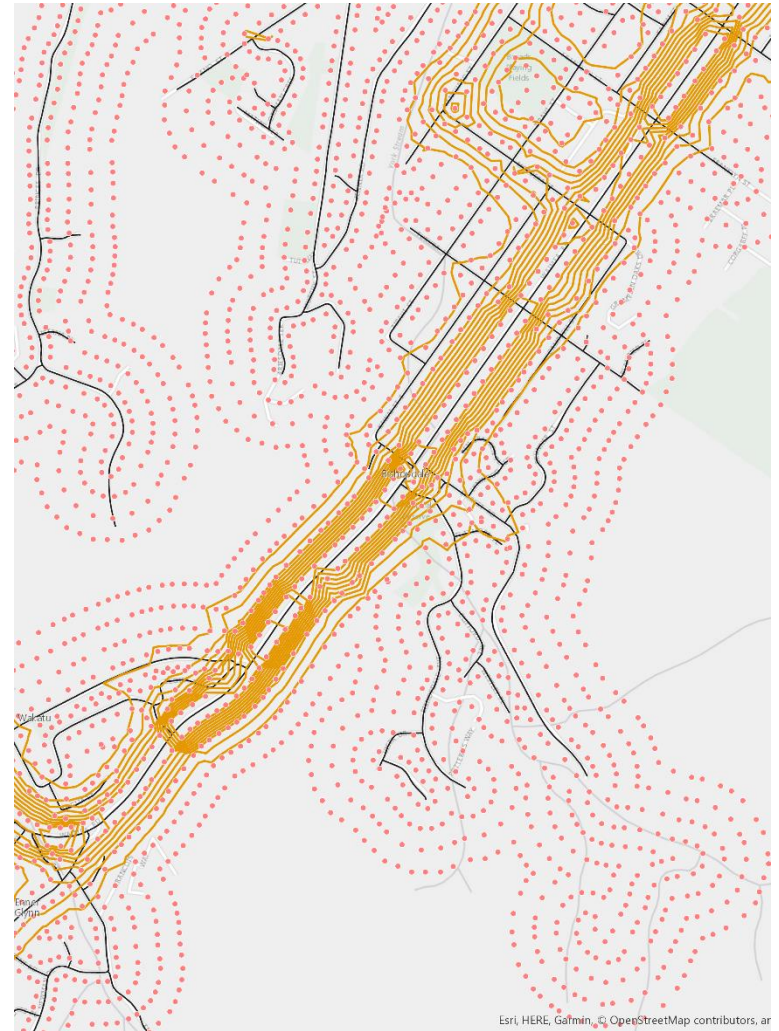
$$[0.17887 + (0.00024 * dc) - (0.295776 / dc) + (0.2596 / dc^2) - 0.0421 * \ln(dc)] * EFd$$

dc = distance from road

EFd = road emission from NVED

Emission Concentration Methodology

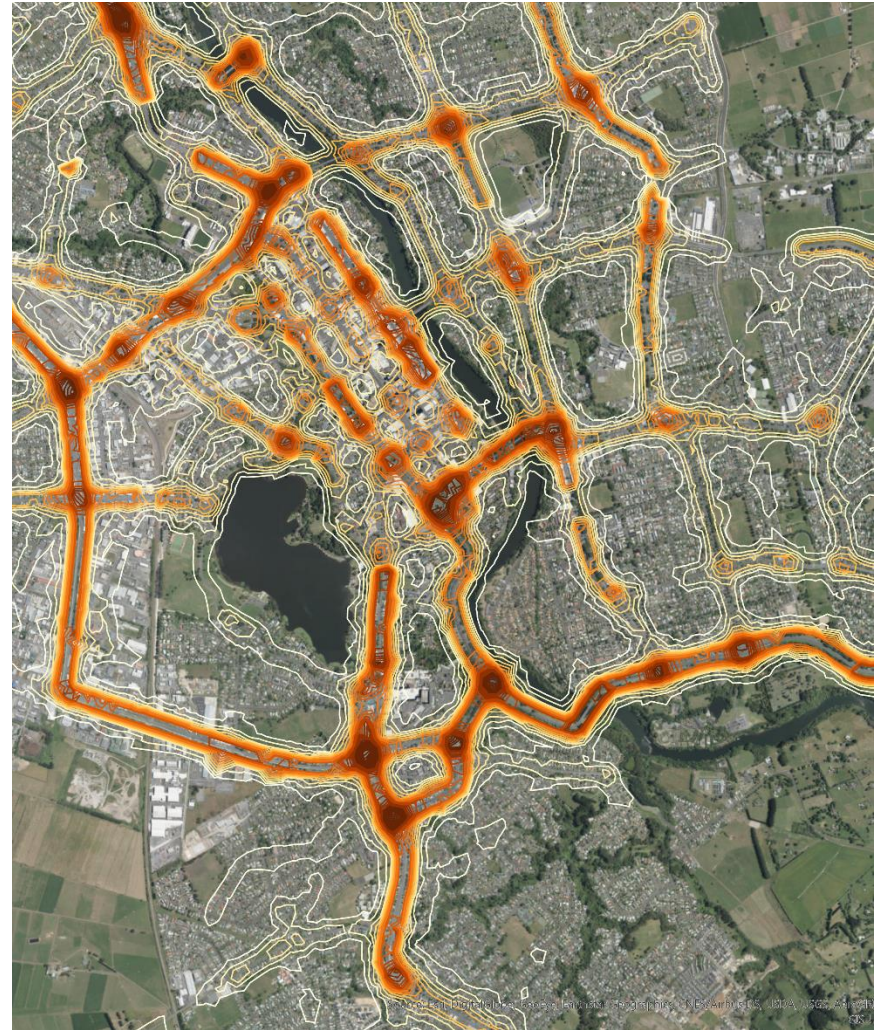
- Simulate receptor points around NVED roads (there are loads!)
- Calculate concentrations for each point using DMRB screening method
- Interpolate contours from receptor point emission values



Emission Concentration Outputs

- Concentration contours

Contaminant	Contour Interval (mg/m ³)
NO ₂	10
PM ₁₀	2
PM _{2.5}	1

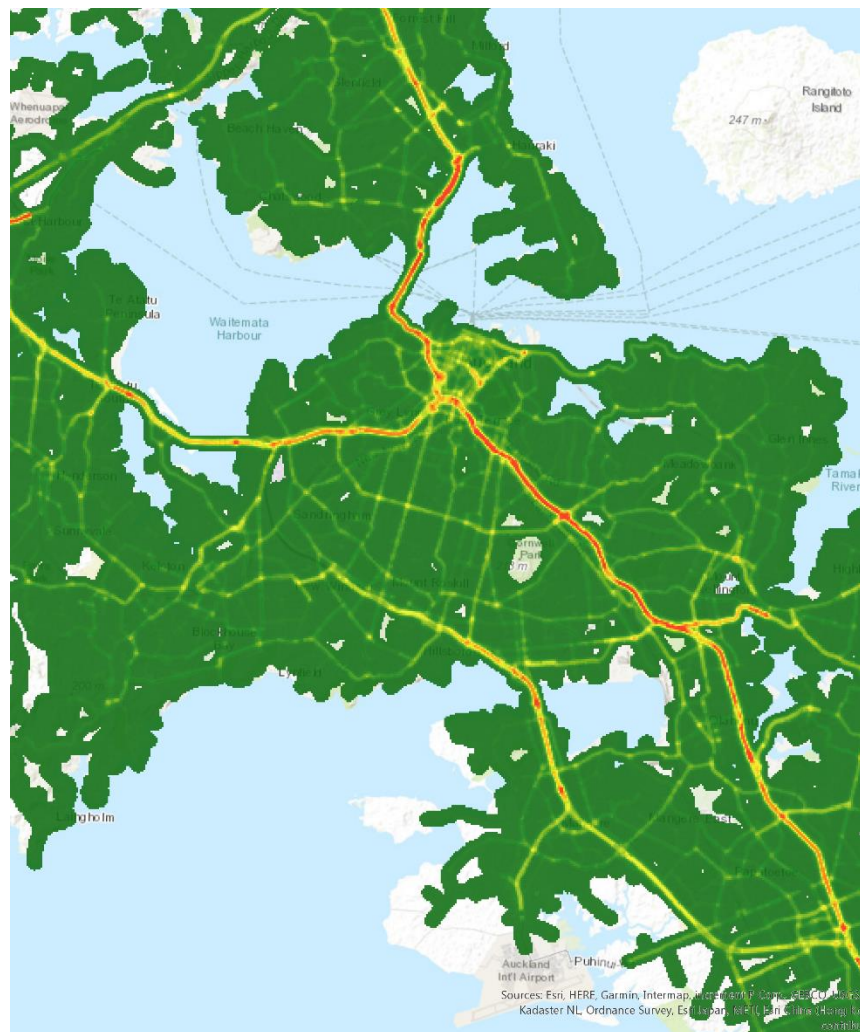


Emission Concentration Outputs

- Concentration contours

Contaminant	Contour Interval (mg/m ³)
NO ₂	10
PM ₁₀	2
PM _{2.5}	1

- Easily converted to raster outputs



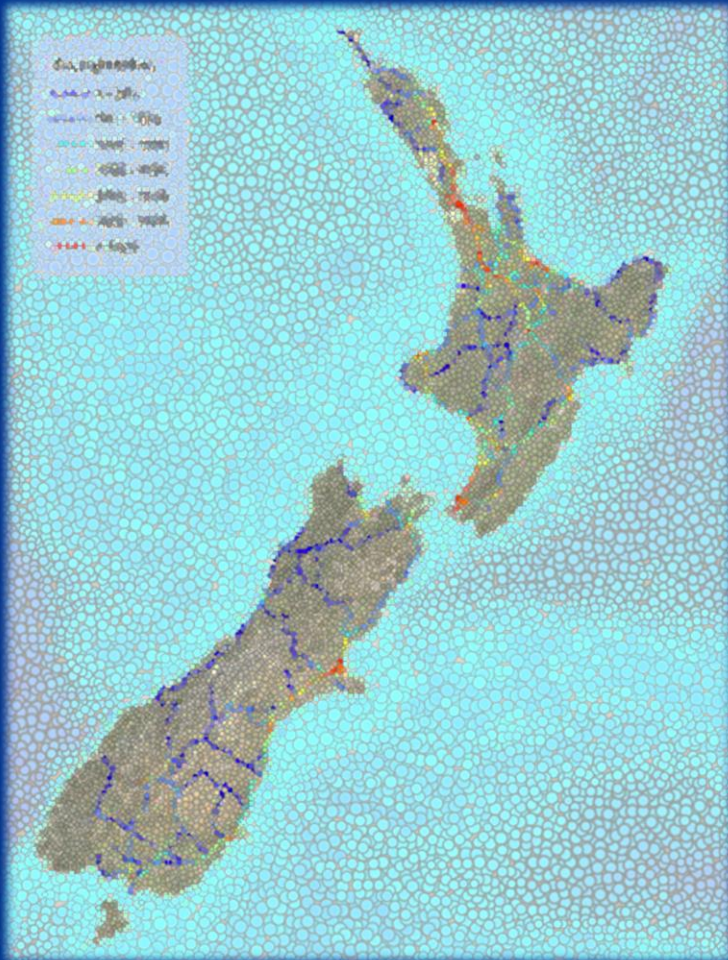
Emission Concentration Future Steps

- Incorporate background emissions

Emission Concentration Future Steps

- Incorporate background emissions
- Incorporate building footprints for effect assessment





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