An Innovative Footpath Pavement Management System for Auckland Transport

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Limitations of Current Footpath Inspection Methods

Asset Condition Rating

- Physically demanding
- Inconsistent
- Slow data entry
- No individual fault data
- Little use to maintenance contractors

Limitations of Current Footpath Inspection Methods

Maintenance Inspections

- Inaccurate- from vehicle
- Slow data entry
- Incomplete

System Design Brief

- Single Inspector for consistency
- Minimal physical effort
- Efficient and Accurate data entry
- Data must have multiple uses

Data Collection Tool-50cc Scooter

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Data Entry- Voice Recognition (VR)

- Hands Free data entry
- Custom Grammar
- Fields Automated or Defaulted
- Challenges- Outdoor Noise
- Accuracy- Over 98%

Data Entry- GPS Auto Tracking (GAT)

- Automated location data
- Pre-Inspection database verification
- Footpaths manually re-mapped

Data Entry- GPS Auto Tracking (GAT)

The Field Data Collected

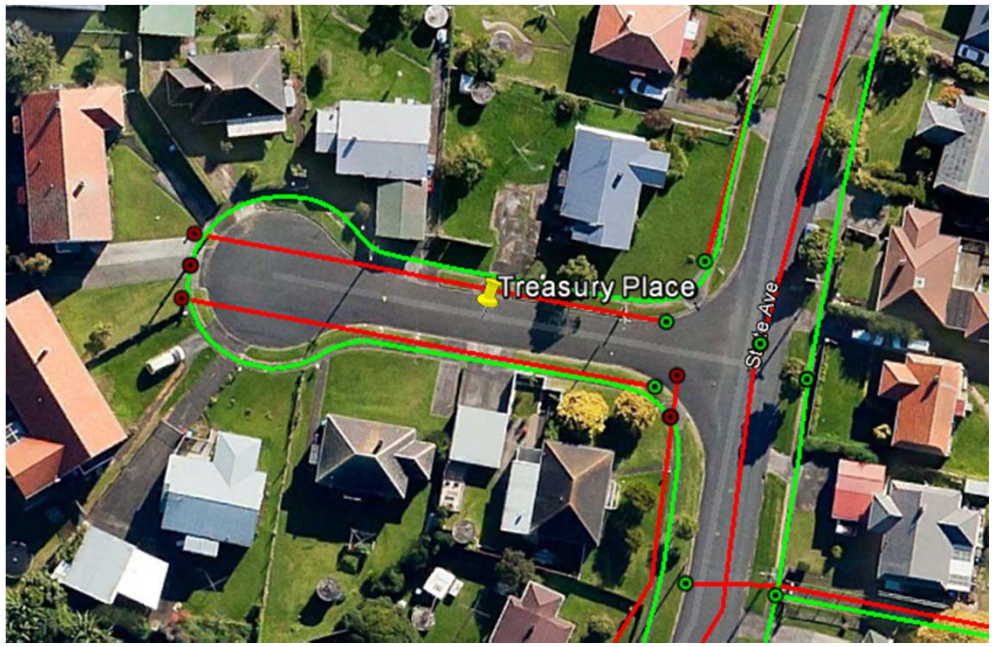
Individual Fault Attributes

- Asset
- Zone
- Surface Material
- Fault Type
- Fault Cause
- Fault Severity

The Reports Generated Post Inspection

Case Study- Treasury Pl

- Footpath Centrelines remapped
- Video of Field Work



The Reports Generated Post Inspection

Case Study: Treasury Place

Spread sheets:

- All Individual Faults
- Sections by Grade
- Faults as a percentage of each section

The Reports Generated Post Inspection

	A	B	T	U	V	W	X	Y	Z	AA
1	Footpath ID	Road Name	G1-Excellant	G2-Good	G3-Fair	G4-Poor	G5-Bad	G6-PlantObstruction	Footpath Grade	Overall Grade
2	28347	Treasury Pl	74	5	4	17			4	
3	36226	Treasury Pl	86	4	10				3	3
4										
5										
6	38752	Market Rd (Remuera)	6	14	28	52			4	

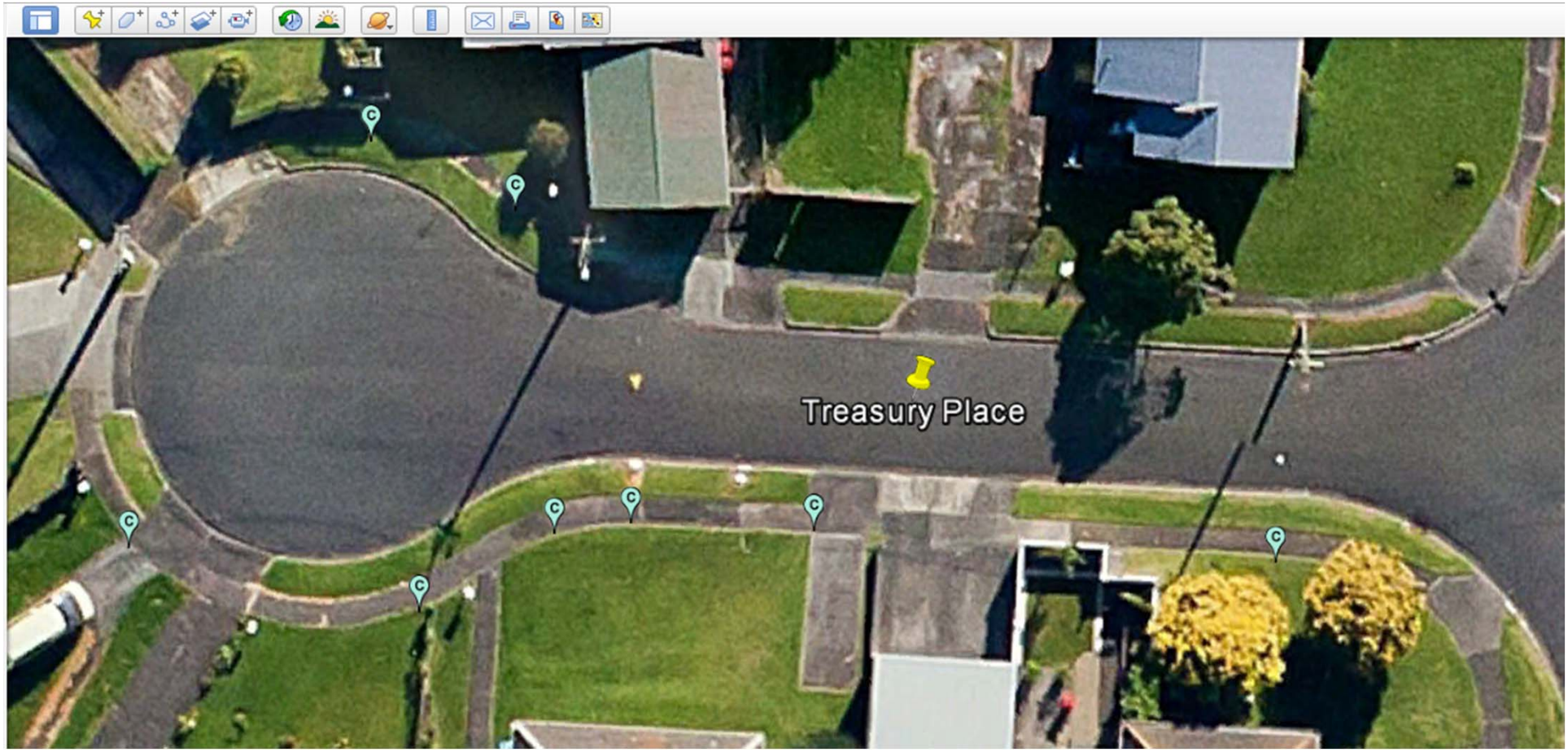
The Reports Generated Post Inspection

Case Study: Treasury Place

Google Earth Files:

- Faults by Type
- Faults by Cause
- Faults by Grade
- Sections by Grade

The Reports Generated Post Inspection



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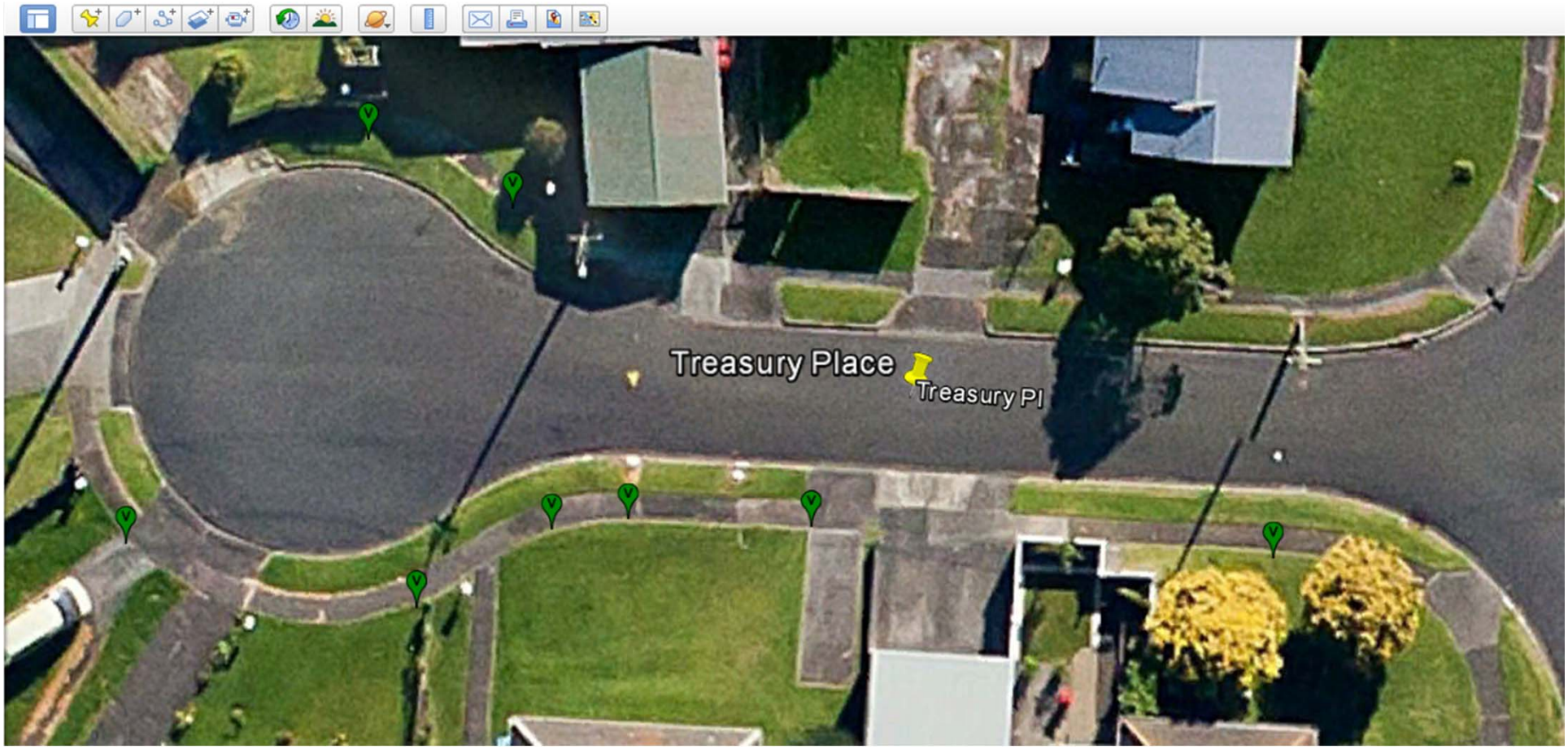

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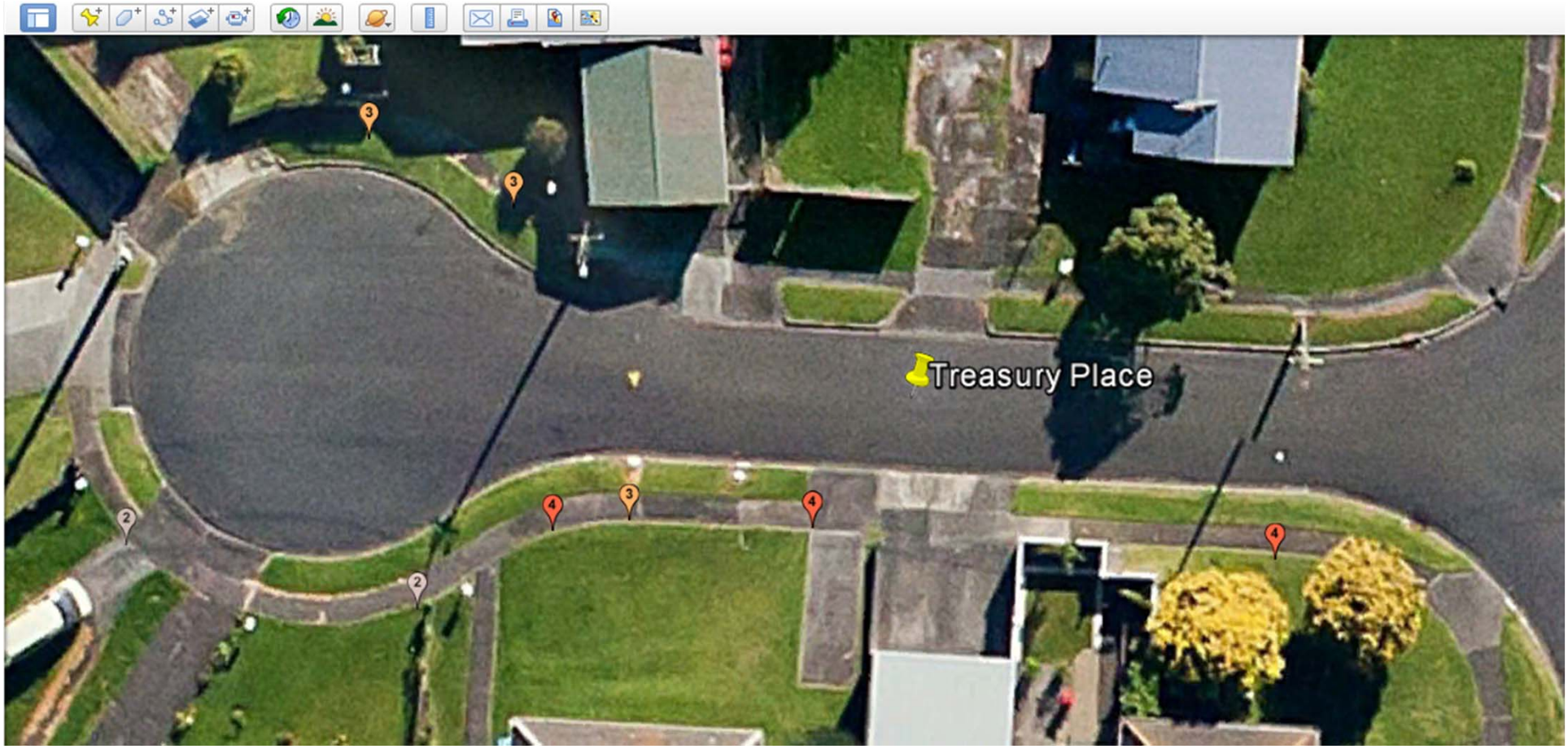

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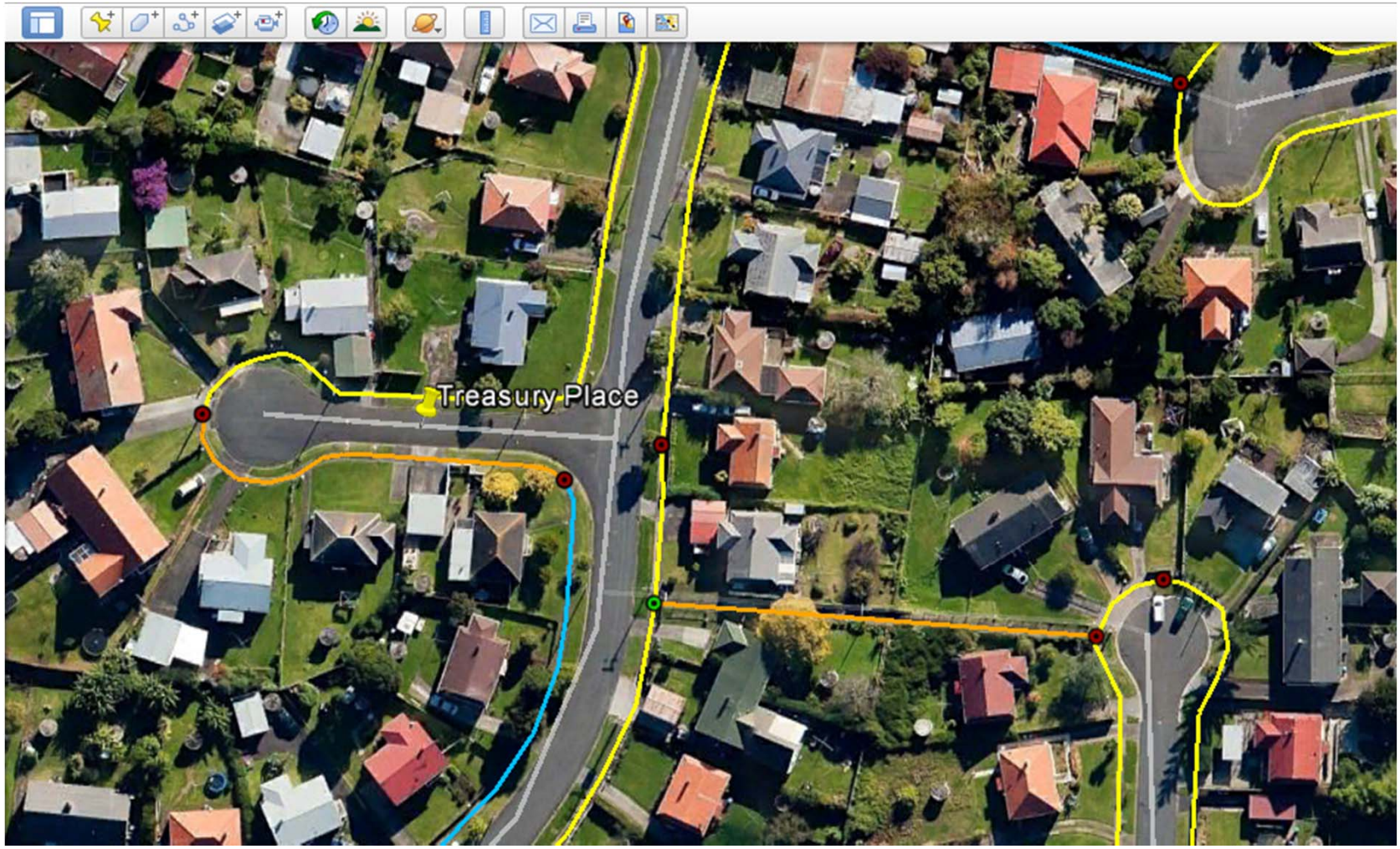
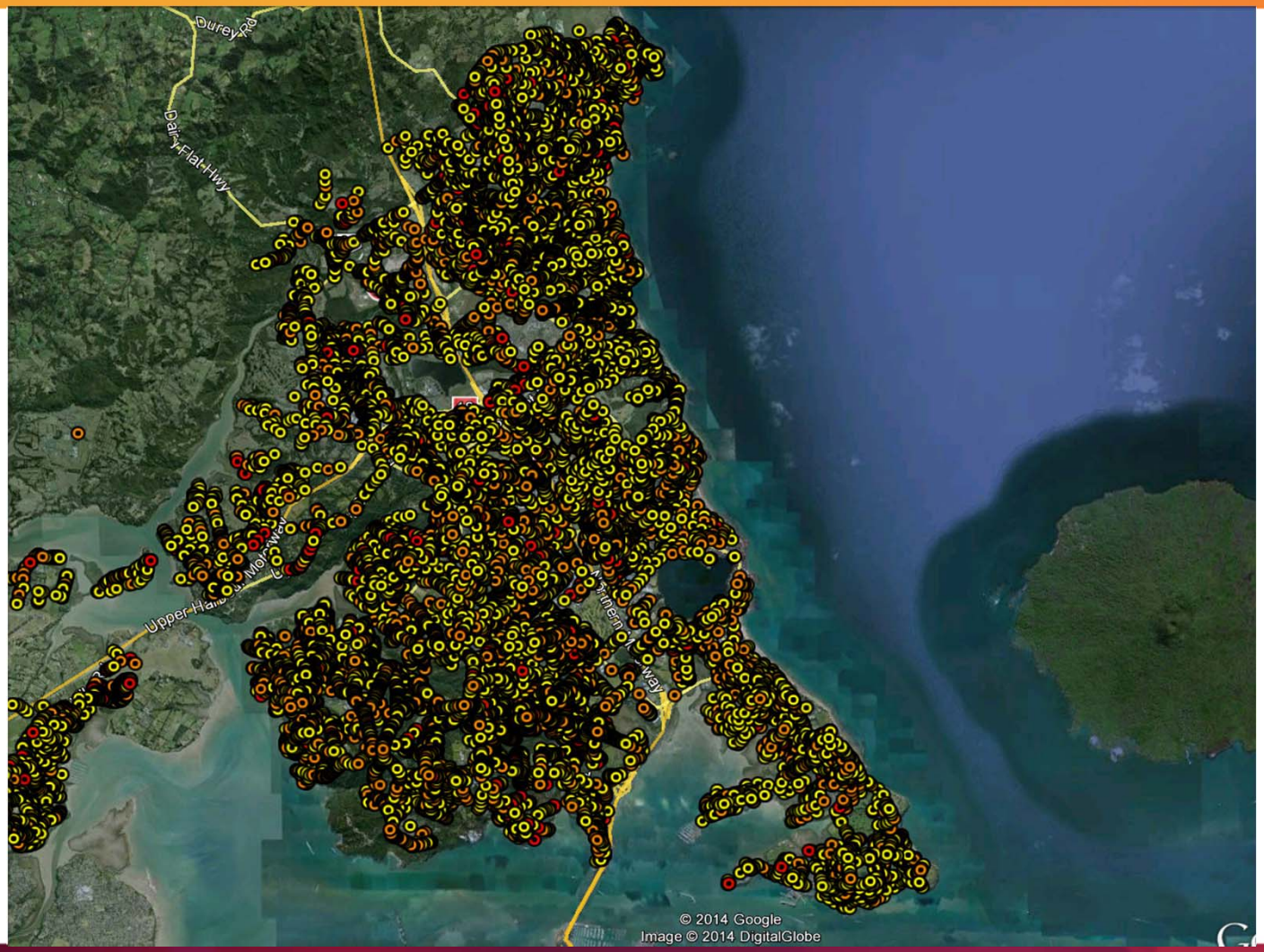


Footpath Renewal Programme Development

- Detailed and accurate footpath fault data has been collected and available for developing footpath renewal programme
- Vast amount of faults identified by severity and category
- Limited funding for footpath renewal work
- A more advanced methodology is need for programming of forward footpath renewal work in order to:
  - Prioritize the renewal work
  - Balance between immediate needs and long-term improvements
  - Increase footpath condition in the network level

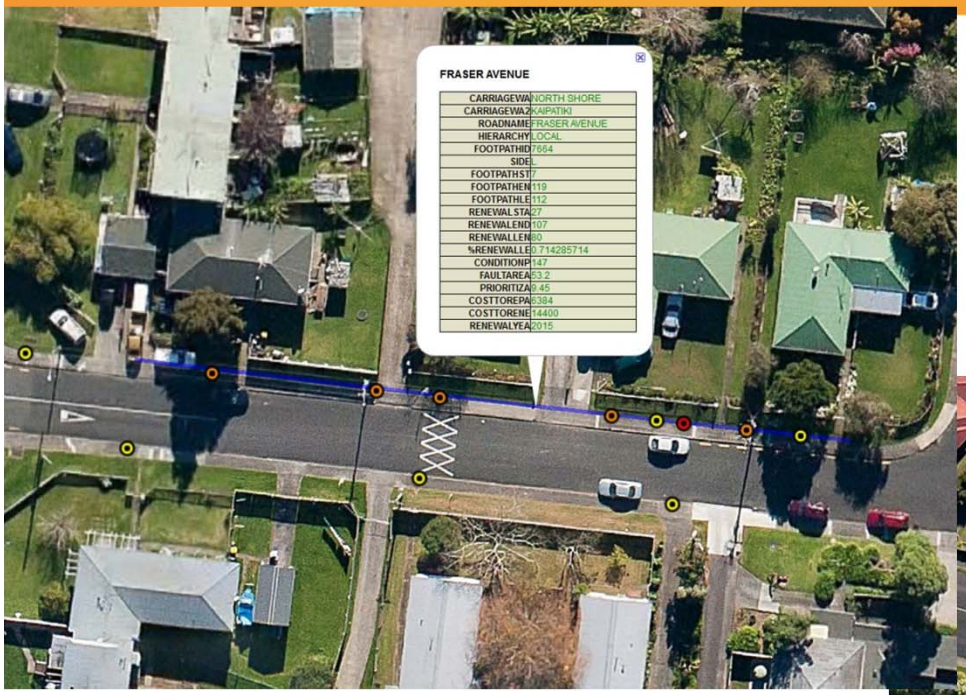
Footpath Renewal Programme Development



Footpath Renewal Programme Development

- Methodology
  - Filter the fault data for condition grade greater than 2 (excluding excellent and good, including fair, poor, and bad)
  - Integrate fault GPS data with RAMM footpath data to determine the location of fault in LRS.
  - Convert individual footpath fault records into fault profile values and prioritization value (density of poor and bad faults) at every 10m along the whole length of footpath section for each footpath
  - Determine the thresholds for fault profile values and identify renewal segments for each footpath
  - Determine the renewal section by combining the renewal segments identified with consideration of connection adjacent renewal sections (distance within 10m)
  - Prioritize renewal sections by prioritization value (density of poor and bad faults)
  - Field validation and updates

Footpath Renewal Programme Development



Conclusion

Technical Challenges

- VR Accuracy in high noise environments
- GPS Accuracy in adverse conditions

System adapted to other tasks

- Currently used for road maintenance inspections
- Asset recording/verification
- Private industry data collection

Questions?

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