INTRODUCTION – WHY ST MARYS BAY?

- Crash rate is on average 33% higher than the Auckland motorway network.
- Three of the top five black spots on Auckland state highways
- Complex geometry – four small radii curves
- 368 reported crashes from 2005-2009
- No major changes during study period

INTRODUCTION – SCOPE OF STUDY

- 1.2 km section of Auckland motorway
- Five years of crash data (2005-2009)
- Northbound and Southbound analysed separately

OBJECTIVES

- Identify crash rates on a lane by lane and movement type basis
- Investigate road and environment factors contributing to these crashes
- Investigate the potential for using a geographical information system to analyse crashes on multilane roads
**METHODOLOGY**

- Crash Data
- Traffic Flow Data
- Road Geometry Data
- Road Surface Data
- Aerial Photo Base layer
- Combined in Excel
- Plotted in GIS
- Analysis of Results

**DATA ANALYSIS - NORTHBOUND**

- Crash rate by lane and type (2005-2009)

**CONCLUSIONS – NORTHBOUND**

- Crash rate in lane 3 was significantly higher than other lanes
- Nose to tail crashes are most common, driver inattention and congestion are the major contributing factors
- Crash type was dependant on location:
  - More lane change crashes near ramps,
  - More loss of control crashes on curves,
  - Loss of control crashes more common in faster lanes
- Data did not suggest any relationship between crashes and skid resistance
**DATA ANALYSIS - SOUTHBOUND**

**SH1N St Marys Bay - Crash Rate by Lane and Type (2005-2009)**

![Graph showing crash rates by lane and type](image1)

**SOUTHBOUND GIS SCREENSHOT**

![GIS screenshot](image2)

**DATA ANALYSIS - SOUTHBOUND**

Differential ESC
Loss of control crashes

<table>
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<tr>
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<td>0.06 - 0.08</td>
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<tr>
<td>5</td>
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**CONCLUSIONS - SOUTHBOUND**

- Crash rate in lane 3 significantly higher than other lanes
- Crash rate in lane 1 is extrapolated due to lane under utilisation
- Mainly nose to tail type crashes
- There is a possible trend between loss of control type crashes and skid resistance
- Nose to tail and lane change type are usually caused by driver inattention/error
LINEAR GIS VS SPATIAL GIS

- **Existing CAS system (Vector)** GIS lane by lane system (Raster)

FEASIBILITY OF A SPATIAL GIS

**Positive**
- Aids visualisation of crash patterns
- Aids visualisation of RAMM data such as skid resistance
- Excellent for multilane roads and intersections

**Negative**
- Implementation can be costly and time consuming
- Accuracy of input data is crucial
- Does not offer any additional benefits for single lane roads

RECOMMENDATIONS

- Accuracy and completeness of data is important.
- Traffic crash reports and CAS data entry
- RAMM skid resistance data
- RAMM geometry data
- Traffic flow data
- All data collected must be accurately referenced to coordinates.
- This is better suited to raster GIS system rather than vector a system like CAS
- Greater accuracy from police is required to locate crash origin
ANY QUESTIONS?