Using IT smarts to collect, process and visualise road asset data

Lloyd Hasson
Roading Network Management

- Deals with a lot of data.
- A 100m stretch of road can have thousands of records.
- E.g. Maintenance costs, roughness data, crashes.
Using IT smarts to collect, process and visualise road asset data - Lloyd Hasson

### RAMM

<table>
<thead>
<tr>
<th>Set ID</th>
<th>Road Name</th>
<th>Start</th>
<th>Locality Name</th>
<th>Locality ID</th>
<th>Displacement</th>
<th>End</th>
<th>HSD Texture ID</th>
<th>Survey Lane</th>
<th>Survey Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>S10</td>
<td>069-0100</td>
<td>0</td>
<td>008-0009</td>
<td>510</td>
<td>6.10m</td>
<td>10</td>
<td>001-0051</td>
<td>Left lane 1</td>
<td>02/02/2015</td>
</tr>
<tr>
<td>S10</td>
<td>069-0100</td>
<td>20</td>
<td>008-0009</td>
<td>510</td>
<td>6.05m</td>
<td>10</td>
<td>001-0051</td>
<td>Left lane 1</td>
<td>02/02/2015</td>
</tr>
<tr>
<td>S10</td>
<td>069-0100</td>
<td>30</td>
<td>008-0009</td>
<td>510</td>
<td>6.00m</td>
<td>10</td>
<td>001-0051</td>
<td>Left lane 1</td>
<td>02/02/2015</td>
</tr>
<tr>
<td>S10</td>
<td>069-0100</td>
<td>40</td>
<td>008-0009</td>
<td>510</td>
<td>5.95m</td>
<td>10</td>
<td>001-0051</td>
<td>Left lane 1</td>
<td>02/02/2015</td>
</tr>
<tr>
<td>S10</td>
<td>069-0100</td>
<td>50</td>
<td>008-0009</td>
<td>510</td>
<td>5.90m</td>
<td>10</td>
<td>001-0051</td>
<td>Left lane 1</td>
<td>02/02/2015</td>
</tr>
</tbody>
</table>
Information Management

= 

Data into information and knowledge
Using IT smarts to collect, process and visualise road asset data

• Data Collection (Smartphones and Tablets)

• Data Analysis (Computer Programming)

• Data Visualisation (GIS Systems)
Data Collection (Smartphones and Tablets)

- Pen and paper has its place.
- Many Android / Apple apps can be used to set up forms for more efficient data collection.
Data Collection (Smartphones and Tablets)

- Sign up and create a form on the desktop
Data Collection (Smartphones and Tablets)

- Deploy to multiple devices for simple data collection
Data Collection (Smartphones and Tablets)

- Data syncs to cloud.

- Export from cloud to Excel for further analysis or direct import to databases like RAMM.
Data Analysis (Computer Programming)

- True power of Excel is in the back end.
- VBA (Visual Basic for Applications).
- Number of wet and dry crashes sorted into carriageway rows.
- Manually – could take hours.
Data Analysis (Computer Programming)

- Write an algorithm.
- Reproduce algorithm in VBA code.
- Hit RUN
- The process usually takes seconds.
Private Sub MatchCrashesToCarriageway()
    'For all carriageway rows
    For a = 2 To 264
        'Get carriageway data
        carSHRS = Sheets("Carriageway").Range("C" & a).Value
        carRPs = Sheets("Carriageway").Range("D" & a).Value
        carRPe = Sheets("Carriageway").Range("E" & a).Value

        For b = 2 To 2412
            'Get crash data
            accSHRS = Sheets("Crash").Range("B" & b).Value
            accRPs = Sheets("Crash").Range("C" & b).Value

            'If the SHRS values match
            If (carSHRS = accSHRS) Then
                'If the crash is inside the RPs of the carriageway
                If (accRPs >= carRPs And accRP <= carRPe) Then
                    'Add 1 to the crash count for this carriageway
                    Sheets("Carriageway").Range("F" & a).Value = Sheets("Carriageway").Range("F" & a).Value + 1
                End If
            End If
        Next b 'next crash
    Next a 'next carriageway
End Sub
Data Visualisation (GIS Systems)

- Roading data is usually easily mapped spatially.
- Mapping is a good way to visualise data.
- Simply plotting positions of assets gives minimal information.
- Adding other data uncovers more information.
Roadworks Map

NELSON / TASMAN REGION PLANNED ROADWORKS:

SH 6
Nelson - Blenheim
Refuelling Nelson to Hira, single lane.
Refuelling Blenheim to Rumson, single lane.
Expect maintenance crews between Nelson and Blenheim.

SH 6
Nelson - Westport
Refuelling various sites Nelson to Murchison, single lane.
Expect maintenance crews between Nelson and Westport.

SH 6 - SH 65
Murchison - Springs Junction
Road repairs and resurfacing O’Sullivan Bridge to Station Creek, single lane.
Expect maintenance crews between Murchison and Springs junction.

SH 60
Nelson - Collingwood
Bank widening Onohau, single lane.
Expect maintenance crews between Nelson and Collingwood.

SH 63
Blenheim - Kawatiri
Refuelling various sites Blenheim to St Arnaud.
Expect maintenance crews between Blenheim and Kawatiri.

EXPECTED DELAYS UP TO:

5-10min 5-10min 5-10min 5min 5min

For more information please visit: www.nzta.govt.nz or phone 0800 4HIGHWAYS
NZTA's State Highway Location Reference Management System (LRMS)

Every kilometre on the state highway has a corresponding marker post beside the highway indicating the exact location. The markers are generally on the left hand side when travelling away from the origin of the road.

Further information on LRMS can be found at [http://www.nzta.govt.nz/resources/location-reference-management-system-manual/]
Questions?