Road Asset Management

A Tolling Experience

July 2011

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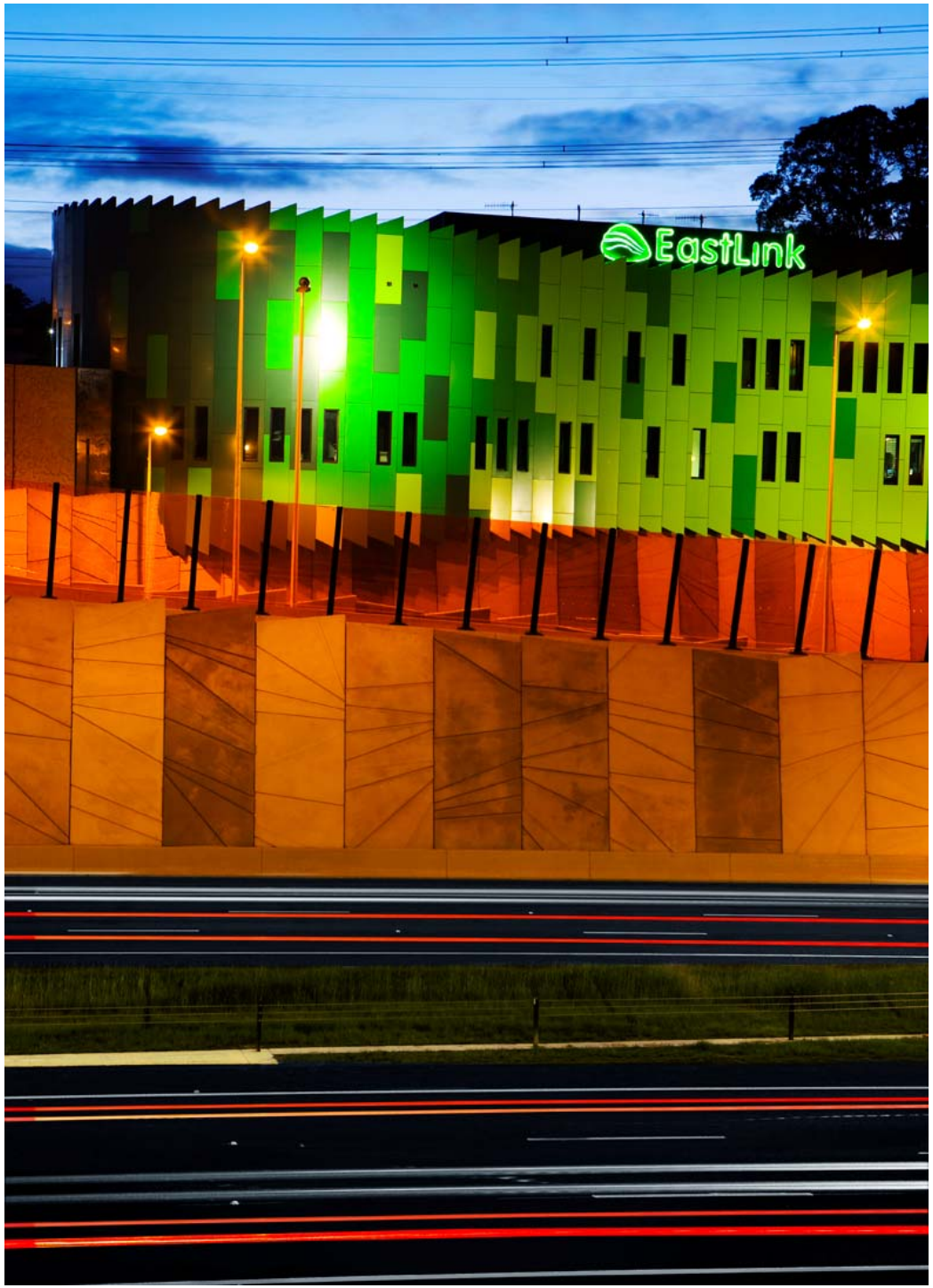
Construction & Asset Engineer
ConnectEast Group

Australia’s largest road project

ConnectEast

- EastLink is owned and operated by ConnectEast.
- Under its Concession Deed with the State ConnectEast will operate EastLink as a toll road until 2043.
- At the conclusion of the Concession Period EastLink shall be handed back to the State.


Melbourne Metropolitan Road Network
HUME FWY
CALDER FWY
TULLAMARINE FWY
Melbourne Airport
METROPOLITAN RING RD
Essendon Airport
WESTERN FWY
WESTERN RING RD
SYDNEY RD
CITY LINK
EASTERN FWY
DONCASTER
RINGWOOD
MAROONDAH HWY
DEER PARK BYPASS
FOOTSCRAY
MELBOURNE CBD
CITY LINK
WEST GATE FWY
PRINCES HWY
PORT OF MELBOURNE
GLEN WAVERLEY
EASTLINK
PRINCES HWY
NEPEAN HWY
MONASH FWY
Moorabbin Airport
DANDENONG
M.P. FREEWAY
STH. GIPPSLAND FWY
PRINCES HWY
PAKENHAM BYPASS
SOUTH GIPPSLAND HWY
FRANKSTON FWY
FRANKSTON
WESTERN PORT HWY
MOORODDUC HWY
M.P. FREEWAY
PORT OF HASTINGS
KEY
Under construction



EastLink Facts

- 39km electronic tollway between Mitcham and Frankston
- $2.5b construction cost
- Two three-lane 1.6 km tunnels
- 17 interchanges
- 88 bridges
- 310 km traffic lanes
- 35km shared user path
- 60 wetlands

Construction, Operation & Maintenance

- Design and Construction provided by Thiess John Holland.
- EastLink construction commenced early 2005.
- Opened to traffic 29 June 2008.
- Operation and Maintenance contracted to Transfield Services

Residual Asset Life at 2043 Handover

- Road pavements and tunnel secondary linings – 20 years
- Pavement Surfaces – 5 years
- All other assets – at least 50% design life

Asset Management System

- Form acceptable to the State, and must be available for independent interrogation by the State through online, real time, access;
- Maintain a record of the current, historical and projected future condition of each Asset ……. including detailed records of the repair or replacement of Asset Items or Asset Sub-Items to assist in establishing the Residual Design Life of the Asset Items and Asset Sub-Items;
- Maintain a record of the nature, extent, quantity, location, time and type of any maintenance works performed by, or programmed to be performed;

Asset Management System cont.

- include a method of reporting to the State …..on the performance of any Asset by analysis of the specific condition and defect information recorded for individual Asset Items and Asset Sub-Items; and
- provide for the development and maintenance of pavement performance models for monitoring the performance of the pavements.

Asset Management System cont.

- must document the regular inspection of the Asset Items and Asset Sub-Items
- document any failure to meet performance standards and/or condition indicators
- must initiate an appropriate maintenance response.
- location referencing system must be based on a linear system

Maximo

- Maximo Enterprise Suite 6.2

- Customisations:
  - Linear functionality;
  - Residual life;
  - Activity management.

Concession Deed Asset Inventory Requirements?

- The Asset Inventory is to be structured in layers comprising Asset Elements, Asset Types, Asset Items and where appropriate, Asset Sub-Items.

Asset Elements

- Asset Elements are the broader categorisations of the Asset Types, such as pavement, bridges, signs, line-marking and ventilation systems.

Asset Types

- Asset Types are the distinct class of Asset, such as flexible pavements, concrete bridges, fans, pumps, switchboards, warning signs or barrier lines.

Asset Items

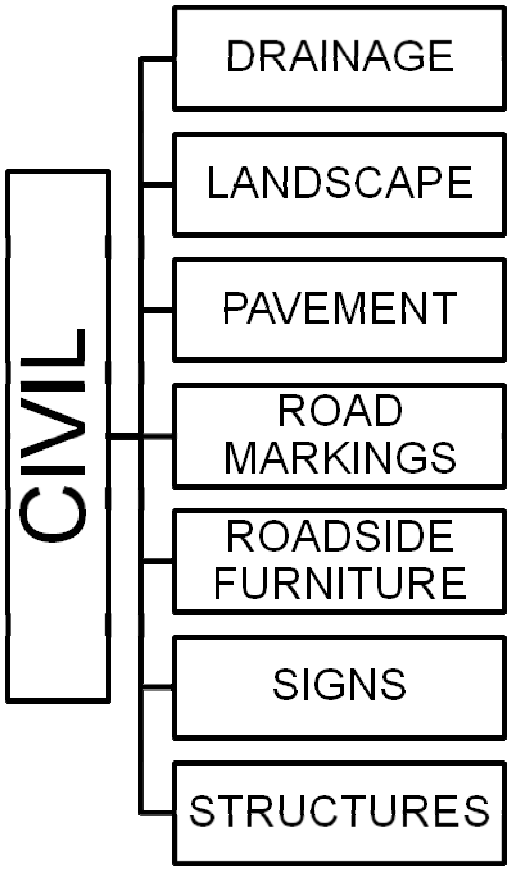
- Asset Items are single occurrences of any Asset, such as a pavement section, a bridge bearing, specific items of plant or equipment, a warning sign or a length of barrier line.

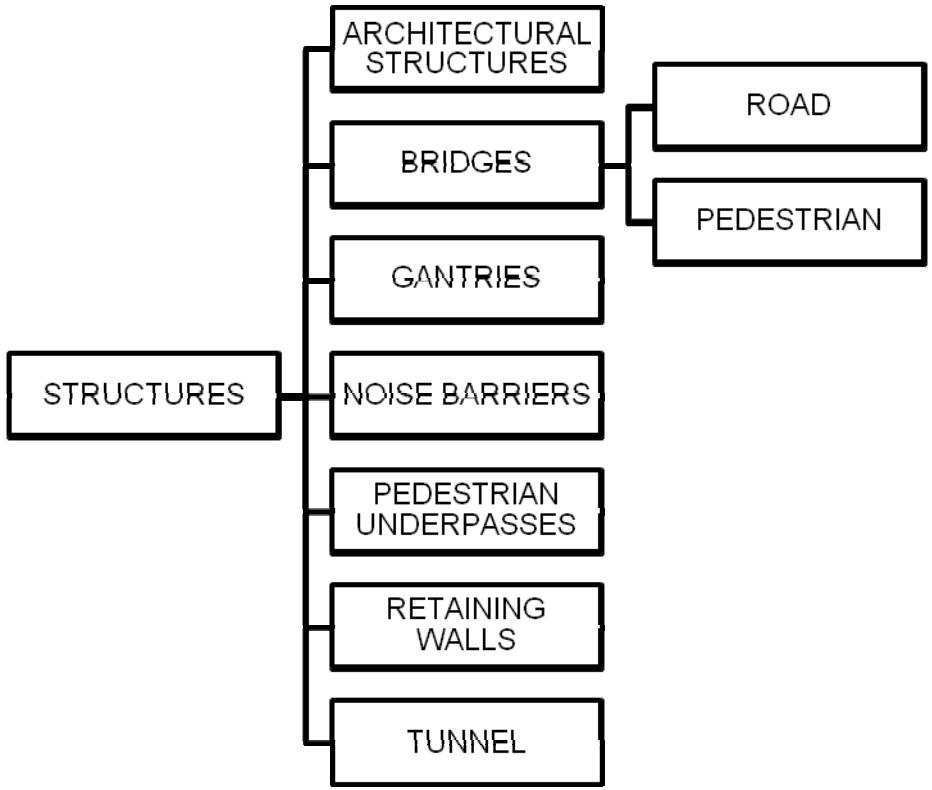
Asset Sub-items

- Asset Sub-Items are components of Asset Items which have a Design Life or maintenance requirements which vary from that established for the Asset Item, of which it forms a part such as light lamps, or fan bearings.

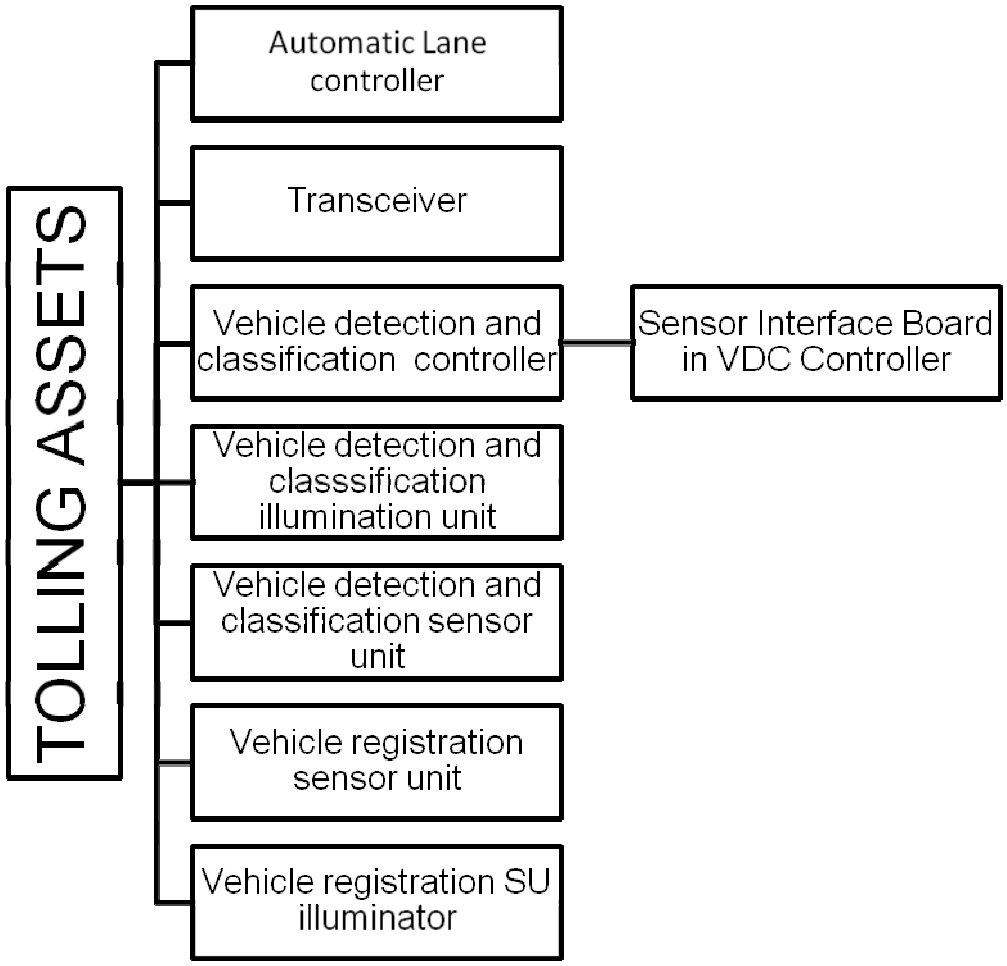
Assets

Civil Asset Classifications

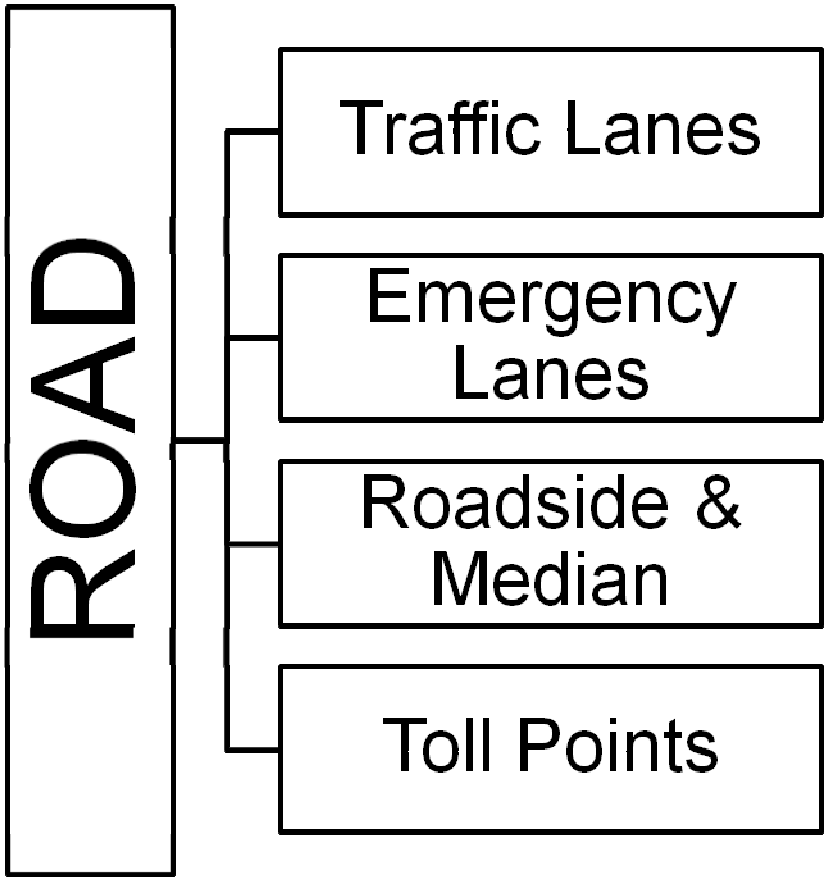




Tolling Asset Classifications



Location Classifications



EastLink KPI’s

- 40% of the EastLink Concession KPI’s are related to Road Operation and Maintenance and are reported using Maximo data.
- KPI’s include Incident management, Lane Availability, Cyclic Maintenance, Routine Pavement and Landscape Maintenance and Pavement Condition.

Incident Management

- KPI 16, 17, 18 – Incidents in a Traffic Lane, an Emergency Stopping Lane and other locations.
- Response times, 10, 15 and 25 minutes.

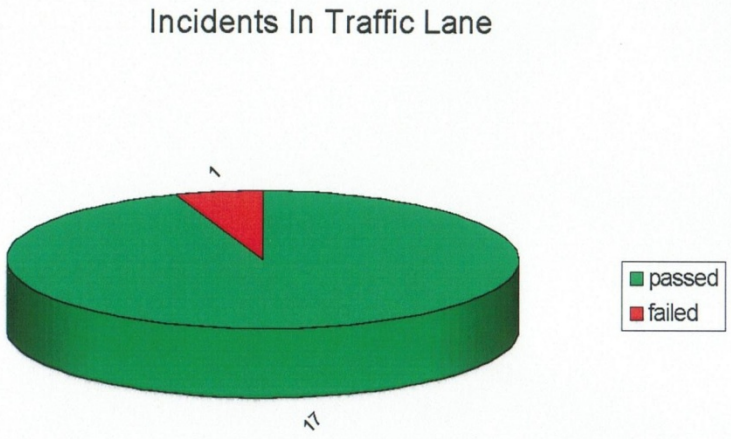
INCIDENT MANAGEMENT REPORT FOR TRAFFIC LANES - KPI CD16 (M1.1)

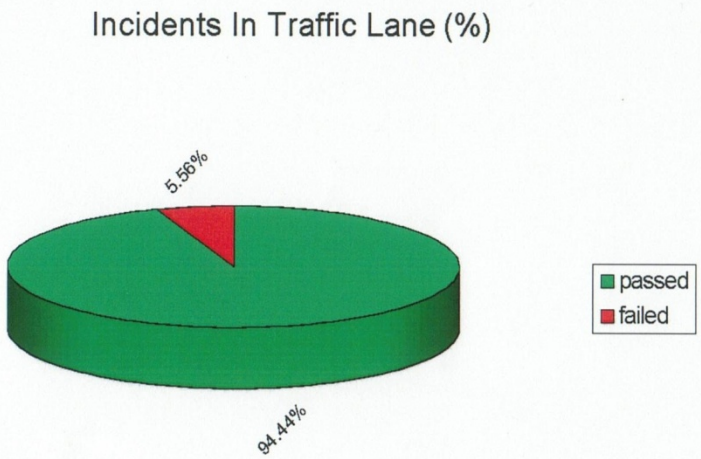
CONNECTEAST

Number of incident response events in a Traffic lane in which the response time (10 minutes) was achieved. The pass/fail measure is if the work order arrived on site time is within 10 minutes of the reported date/time.

Traffic Lane Criteria:- FAILURE CLASS = TLANE or CWY
Incident Response Criteria:- ACTIVITY = EM000 or IM01
Pass/Fail Criteria:- WORK ORDER STATUS ARRIVED ON SITE DATE/TIME is within 10 minutes of REPORTED DATE/TIME

Only work orders with a reported date/time between 6/06/11 and 12/06/11 (inclusive) have been included in this report.





Scheduled Maintenance KPI

- KPI 19 – Perform Planned Inspection & Maintenance at scheduled intervals < 6 months

WORK ORDER REPORT FOR PLANNED MAINTENANCE WITH FREQUENCY LESS THAN 6 MONTHS - KPI CD19 (M1.4)

CONNECTEAST

This report lists work orders generated from PM's with a frequency less than six months, 26 weeks or 180 days. The work orders are grouped by discipline based on activity. Refer to Page 2 for the list of activities under each discipline.

Refer to Report "KPI 19 Part 1 of 2" for listing of scheduled PM's.

Where there is a Deed requirement and/or it is practical to schedule the work on a cyclic basis, activities are grouped under a specific heading.

For completeness activities not grouped under specific headings, will appear in the 'Miscellaneous' group on the report. Any work orders appearing in the miscellaneous group should be reviewed for the correct activity.

PASS/FAIL CRITERIA

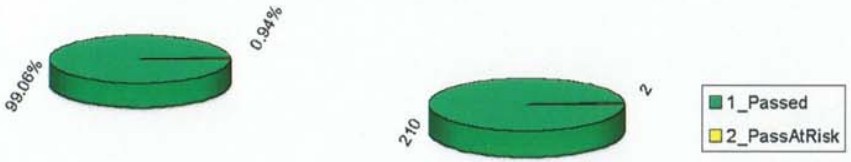
Passed
- Work Order ACTUAL FINISH date is less than or equal to TARGET FINISH date.

Passed (At Risk)
- Work Order Actual Finish date is greater than the Target Finish date and less than the Target Finish date plus 1/4 frequency period.

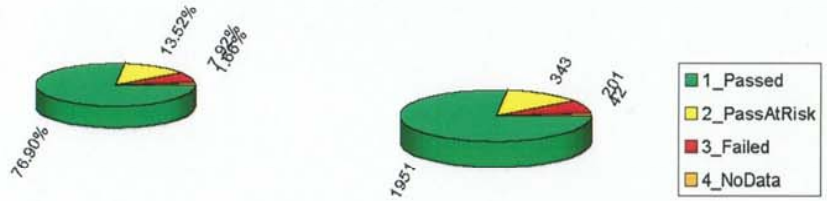
Failed
- Work Order ACTUAL FINISH date is greater than the TARGET FINISH date plus 1/4 frequency period.
- Work Order ACTUAL FINISH date is not Entered.

Work orders with a target finish date between 1/01/10 and 31/01/10 (inclusive) are included in this report.

PART A SUMMARY REPORT
Parent and non child work orders



PART B DETAILREPORT: (Total Occurences)
List all child work orders & work orders without parents

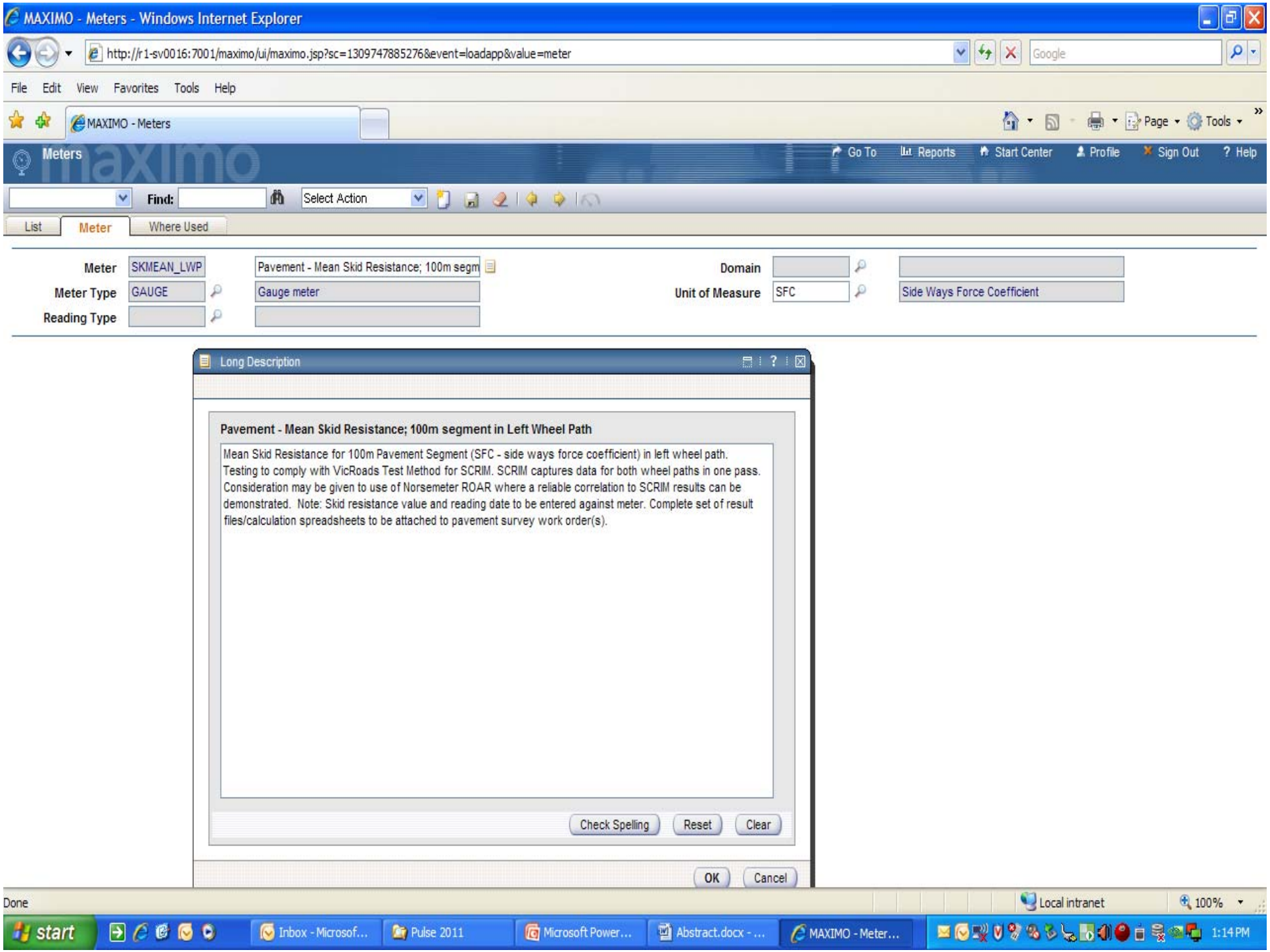


Pavement Condition KPI

- Pavement Condition – Maintain road pavement condition as measured by roughness, rutting, cracking, skid resistance, texture, deflection and curvature through correction of areas outside intervention levels within the periods provided in the Code of Maintenance Standards.

Skid Resistance

Road Element	Investigatory Mean SFC Level	Action
Approaches to signalised intersections	0.55	**Within 1 week - Inspect site** **Within 3 months - Produce report and recommendations** **Within 6 months - Consider recommendations and complete work as necessary.**
Entry and Exit ramps Left lane of the freeway covering the merge area for a distance of at least 300m before the ramp entry and exit points. The asphalt surfacing within the Mitcham tunnels.	0.50	**Within 1 week - Inspect site** **Within 3 months - Produce report and recommendations** **Within 6 months - Consider recommendations and complete work as necessary.**
Approaches to unsignalised intersections	0.45	**Within 1 week - Inspect site and produce report.** **Within 6 months – Produce report and recommendations** **Within 12 months - Consider recommendations and complete work as necessary.**
Freeway carriageways outside the exit and entry ramp merge areas	0.35	**Within 4 weeks - Inspect site and produce report.** **Within 6 months – Produce report** **Within 12 months - Consider recommendations and complete work as necessary.**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File Edit View Favorites Tools Help
MAXIMO - Meters
Meters
Go To Reports Start Center Profile Sign Out Help
Find:
Select Action
List Meter Where Used
Meter SKMEAN_LWP
Pavement - Mean Skid Resistance; 100m segm
Meter Type GAUGE
Gauge meter
Reading Type
Domain
Unit of Measure SFC
Side Ways Force Coefficient
Long Description
Pavement - Mean Skid Resistance; 100m segment in Left Wheel Path
Mean Skid Resistance for 100m Pavement Segment (SFC - side ways force coefficient) in left wheel path. Testing to comply with VicRoads Test Method for SCRIM. SCRIM captures data for both wheel paths in one pass. Consideration may be given to use of Norsemeter ROAR where a reliable correlation to SCRIM results can be demonstrated. Note: Skid resistance value and reading date to be entered against meter. Complete set of result files/calculation spreadsheets to be attached to pavement survey work order(s).
Check Spelling
Reset
Clear
OK
Cancel
Done
Local intranet
100%
start
Inbox - Microsof...
Pulse 2011
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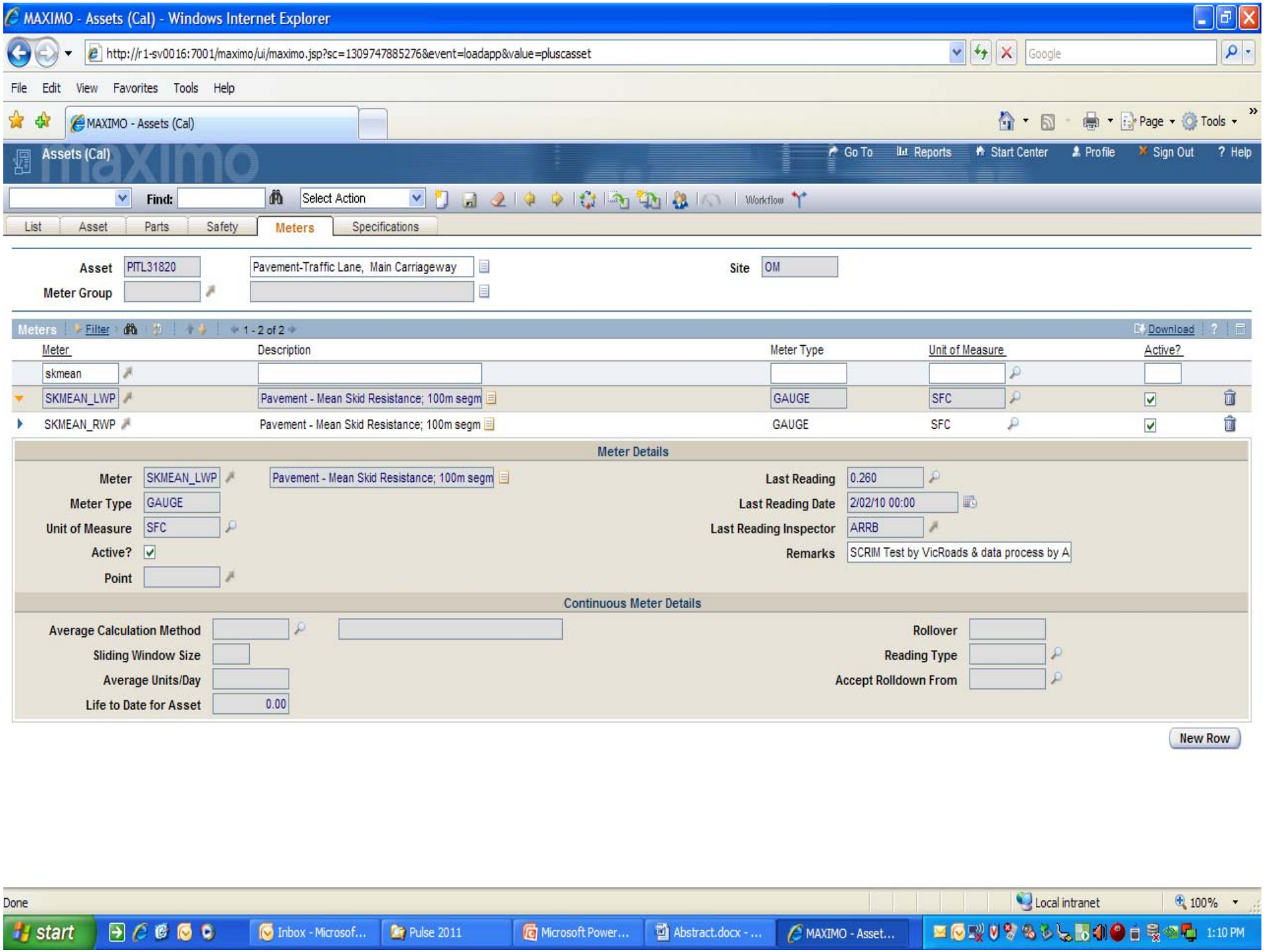
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MAXIMO - Assets (Cal)
Assets (Cal)
Go To Reports Start Center Profile Sign Out Help
Find: Select Action Workflow
List Asset Parts Safety Meters Specifications
Asset PITL31820 Pavement-Traffic Lane, Main Carriageway Site OM
Meter Group
Meters Filter 1 - 2 of 2 Download
Meter Description Meter Type Unit of Measure Active?
skmean
SKMEAN_LWP Pavement - Mean Skid Resistance; 100m segm GAUGE SFC
SKMEAN_RWP Pavement - Mean Skid Resistance; 100m segm GAUGE SFC
Meter Details
Meter SKMEAN_LWP Pavement - Mean Skid Resistance; 100m segm
Meter Type GAUGE
Unit of Measure SFC
Active?
Point
Last Reading 0.260
Last Reading Date 2/02/10 00:00
Last Reading Inspector ARRB
Remarks SCRIM Test by VicRoads & data process by A
Continuous Meter Details
Average Calculation Method
Sliding Window Size
Average Units/Day
Life to Date for Asset 0.00
Rollover
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New Row
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Skid Resistance Report

Asset Description	Asset Location	Asset Classification	Eastlink Start Chainage	Eastlink End Chainage	Seg Av Length (m)	Mean Skid Resistance 100m Segment, LWP	Mean Skid Resistance 100m Segment, RWP	Minimum Skid Resistance 100m Segment, LWP	Minimum Skid Resistance 100m Segment, RWP	Short Term Action Required	Short Term Action Required By (date)	Long Term Action Required	Long Term Action Required By (date)
Pavement-Traffic Lane, Main Carriageway	Inbound Traffic Lane 3: Springvale Road I/C	DEEPSTRGO	18200	18300	100	**0.260**	**0.660**	0.180	0.610	LWP: Inspect within 4 weeks. Produce report within 6 months, include review of accident data.	20/06/2011 3:58:42 PM	LWP: Within 12 months - Consider report and complete actions as necessary.	22/12/2011 3:58:42 PM
Pavement-Traffic Lane, Main Carriageway	Inbound Traffic Lane 3: Springvale Road I/C	DEEPSTRGO	18300	18400	100	**0.260**	**0.660**	0.180	0.610	LWP: Inspect within 4 weeks. Produce report within 6 months, include review of accident data.	20/06/2011 3:58:42 PM	LWP: Within 12 months - Consider report and complete actions as necessary.	22/12/2011 3:58:42 PM

Asset Condition - Meters

- Pavement condition – 23 parameters, recorded using 23 meters as previously described for skid resistance.
- Structures – condition recorded by rating each component (sub-assets) 1 to 4 (%). Ratings determined through Level 2 Bridge Inspection process. An overall rating is applied to the parent asset – good, fair, poor.

General Approach using to Meters

- Condition recorded via measured values and/or assessed through an objective inspection process.

Lessons Learnt 1

- Scope and functionality
  - What output information is required?
  - How much effort is the organisation prepared to expend capturing maintenance and/or condition data?
  - Develop an Asset Management Strategy

Lessons Learnt 2

- Modelling Assets
  - What asset/sub-assets are required to capture and track maintenance, condition, asset life or other specified parameters?
- Locations
  - Preference for areas or spaces that can be visualised (physical locations).

Lessons Learnt 3

- Capturing Maintenance and Condition Data at the ‘coal face’.
  - Organisational culture
  - Contracted maintenance commercial arrangements
  - Industrial relations

Questions?

EastLink
Time better spent.

Follow Up Questions?

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