

Oracle Network Data Model and the Victorian Public Transport Network

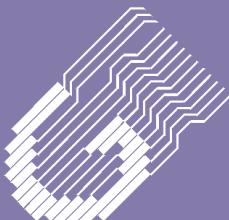
**Presentation to Victoria Oracle
Spatial User Forum**

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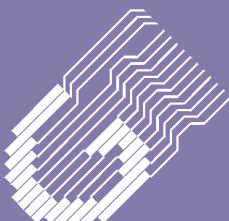
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 **Geomatic** Technologies

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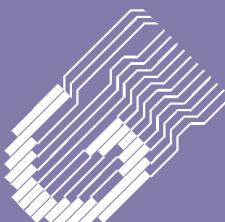
Geometric Technologies

- Southbank headquartered company, 70 staff, Brisbane office, Est. 1994
- Leader in the provision of spatially based business solutions to government, road, rail & power utilities:
 - Field based asset mapping and inspections,
 - Spatial data distribution and value added reselling,
 - Digital aerial imagery and terrain models,
 - Enterprise GIS solutions including web & mobile technology,
 - Development, implementation and support of hosted and Application Service Provider (ASP) based solutions.



Background

- Routing a requirement for Victorian Government Initiative
- Datasets include:
 - Tourism Victoria attractions, accommodation, restaurants
 - Vicmap

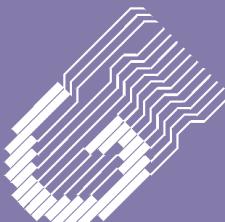


Objectives

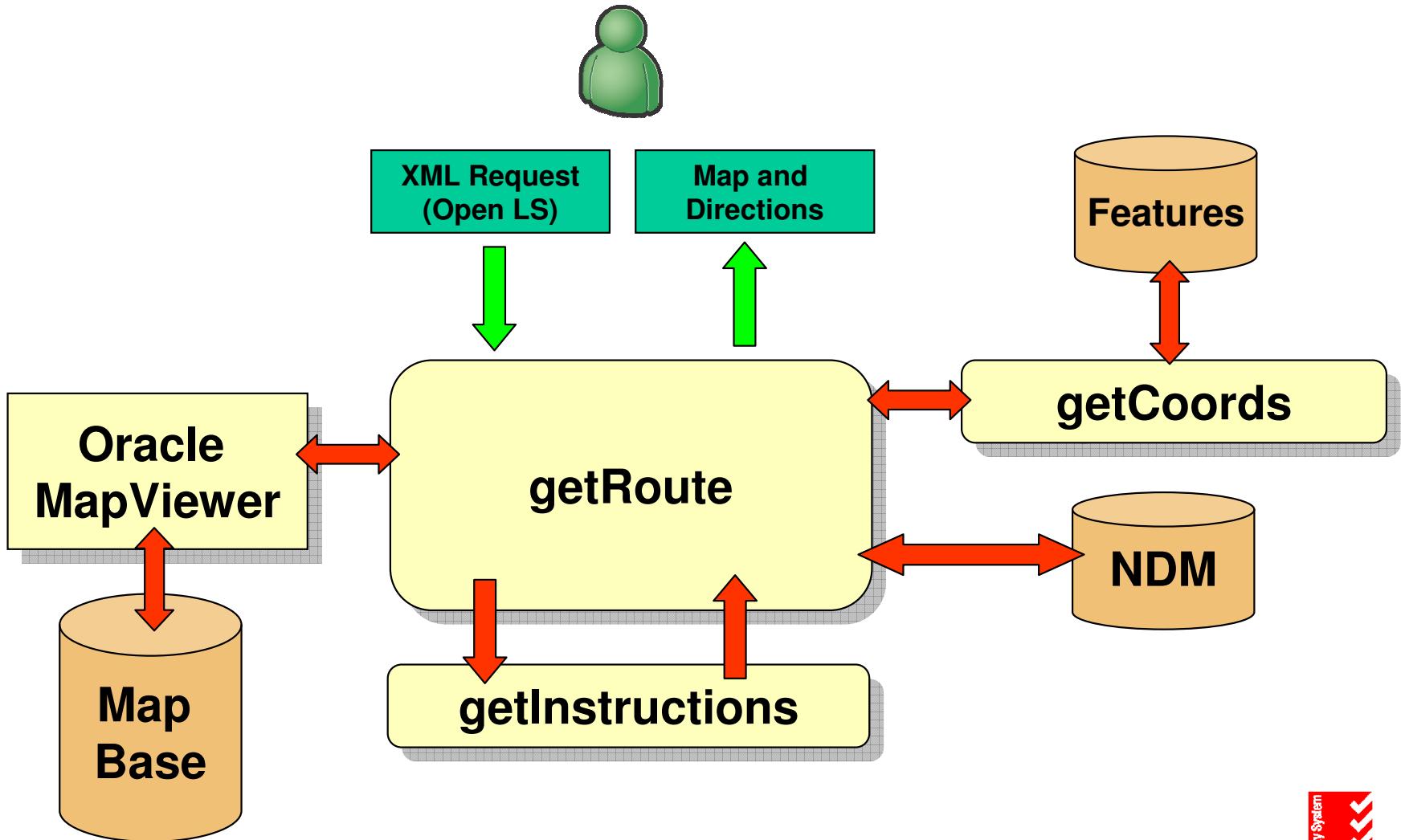
- To provide shortest route from selected locations using Melbourne's public transport network
- To generate meaningful travel directions and maps
- To deliver information as a web service
- To build a routable data set
- Note: timetables/schedules were not to be included

Technologies

- Oracle10g R2 and Oracle 10g AS Java Edition
- Oracle RouteServer
 - Road focused
 - Single transport mode
- Oracle Network Data Model
 - Java API
 - Network Data Editor tool
- Oracle MapViewer
 - MapBuilder
- Microsoft .NET



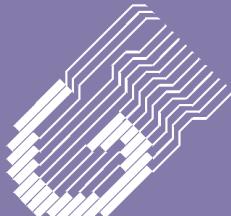
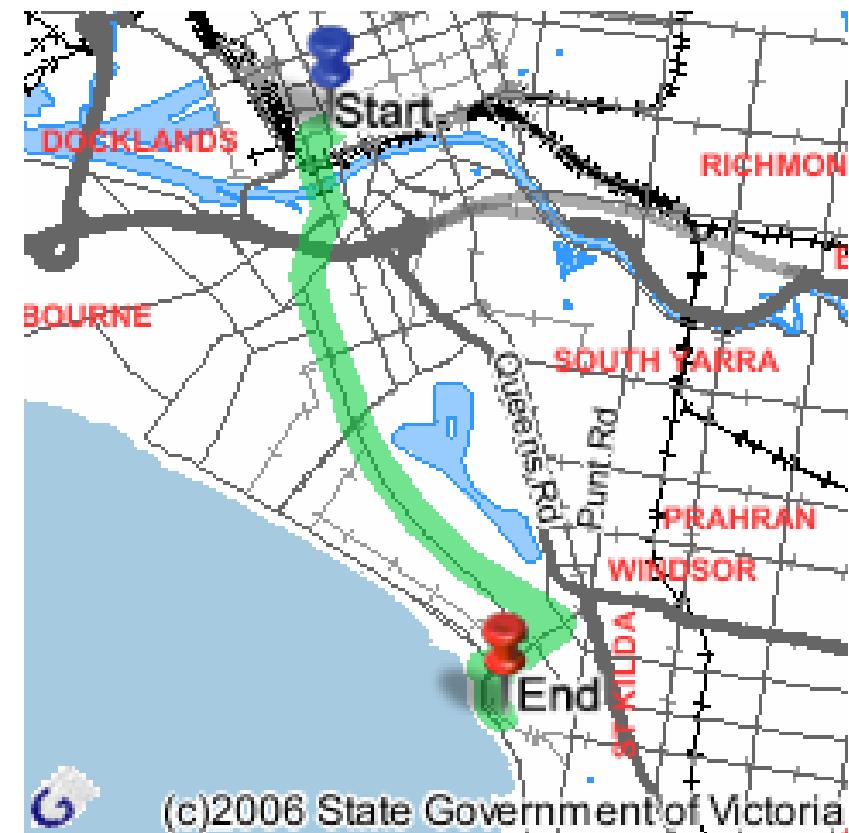
Solution Architecture



Sample output

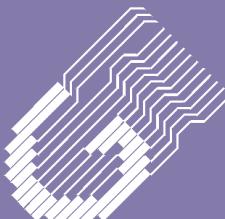
From : Melbourne Observation Deck
To : Novotel Hotel, St Kilda

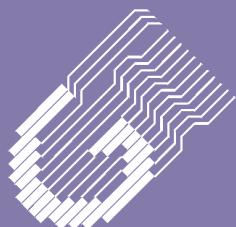
- **WALK** to Stop 2 King St/Collins St (Melbourne City) (0.1km)
- **TRAM** No. 109 Port Melbourne from Stop 2 King St/Collins St (Melbourne City) to Stop 125 Port Junction/79 Whiteman St (Southbank)
- **TRAM** No. 96 St Kilda Beach from Stop 125 Port Junction/79 Whiteman St (Southbank) to Stop 137 Alfred Pl/The Esplanade (St Kilda)
- **WALK** to Novotel St Kilda (16 The Esplanade St Kilda) (0.3km)



Transport data in Victoria

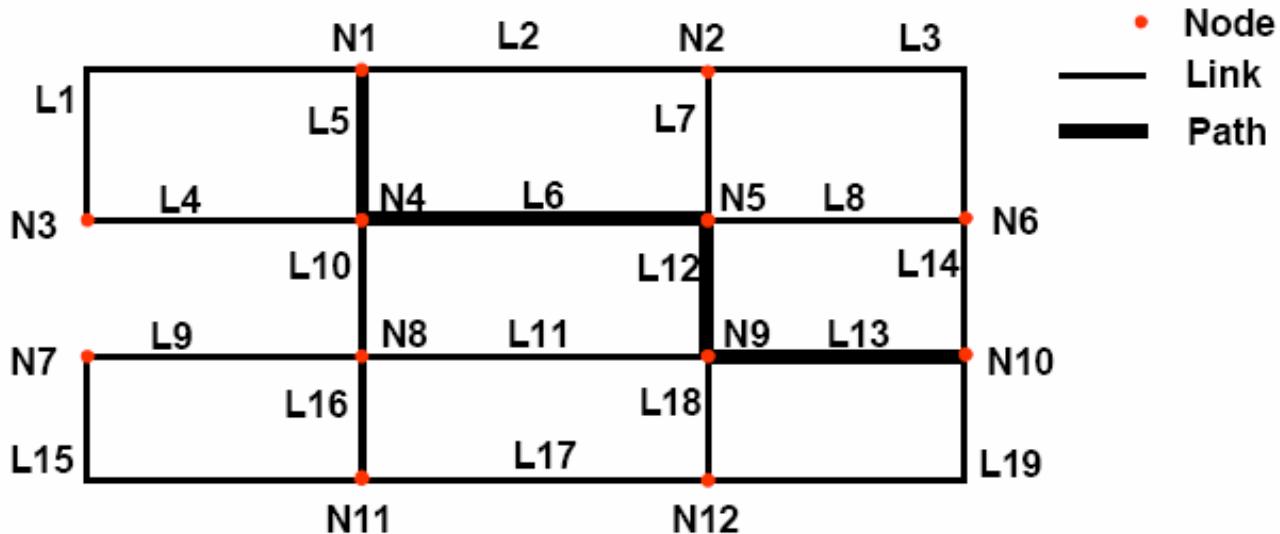
- Vicmap Transport
 - Roads (node/links)
 - Rail (Trams, Trains)
- Metlink/ Dept of Infrastructure
 - Tram – 29 routes,
 - Bus – 289 routes, over 23,000 stops
- Custom built during project
 - Node/links
 - Route metadata





Oracle NDM Concepts

A Simple Network

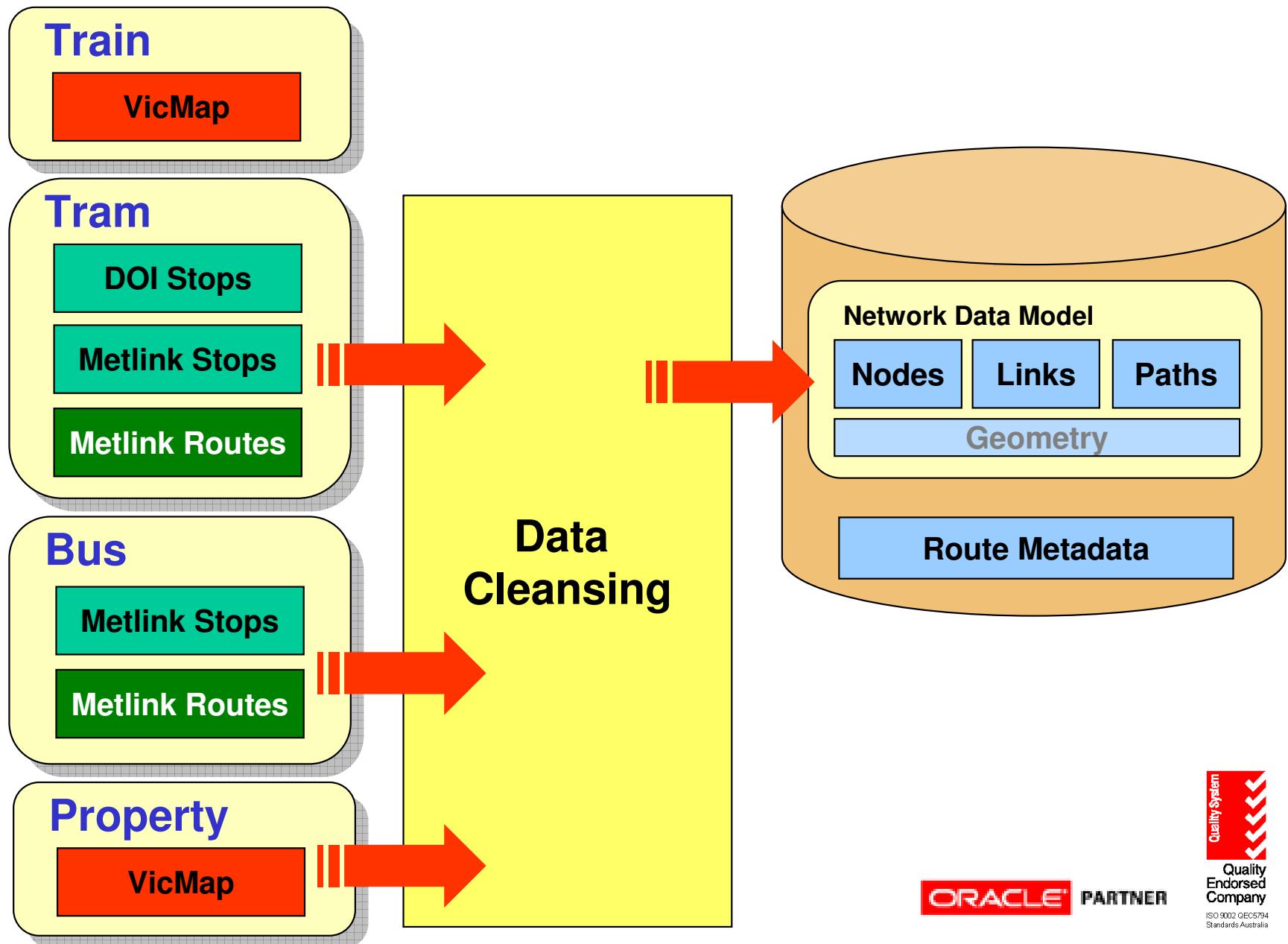


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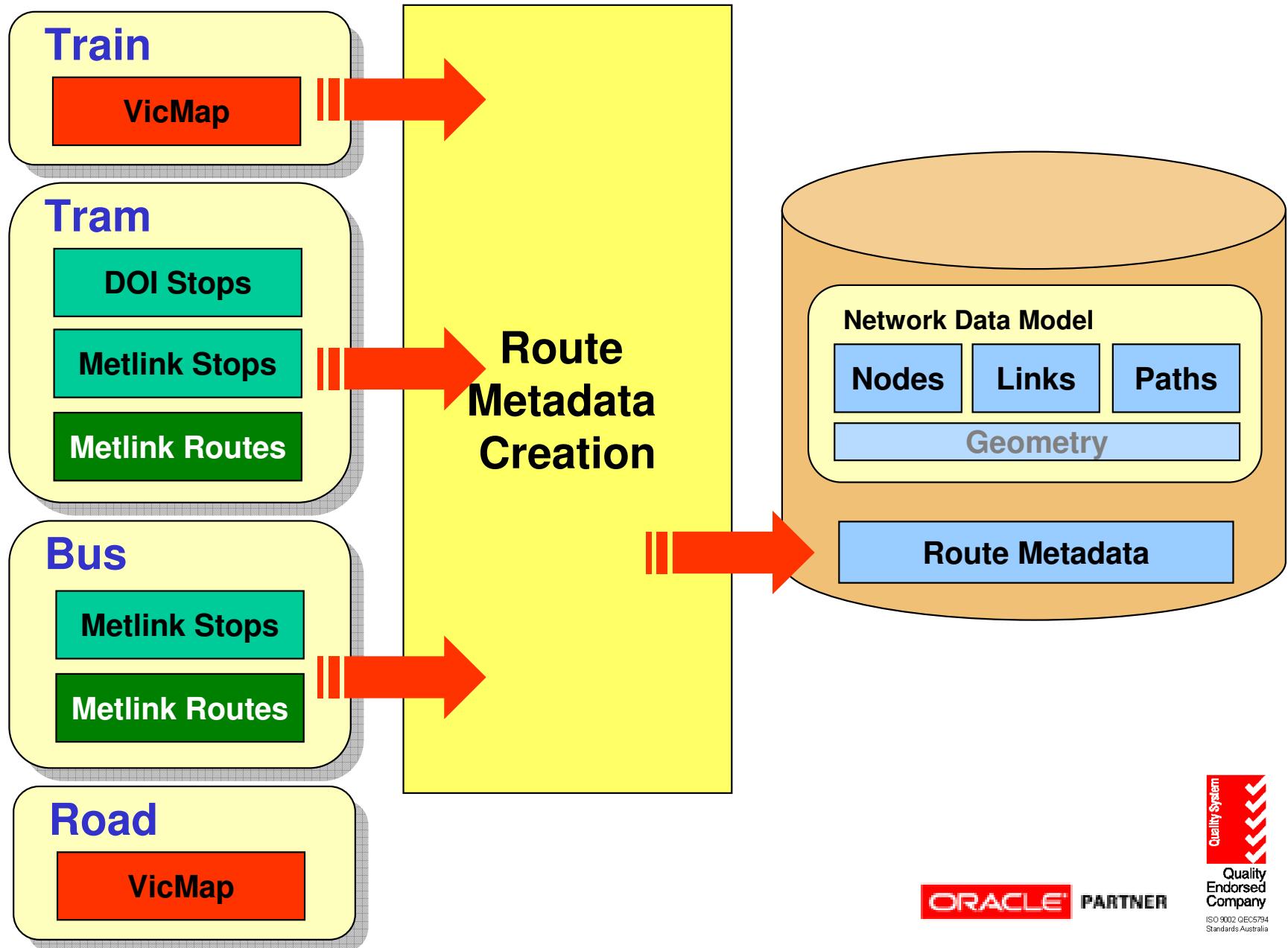
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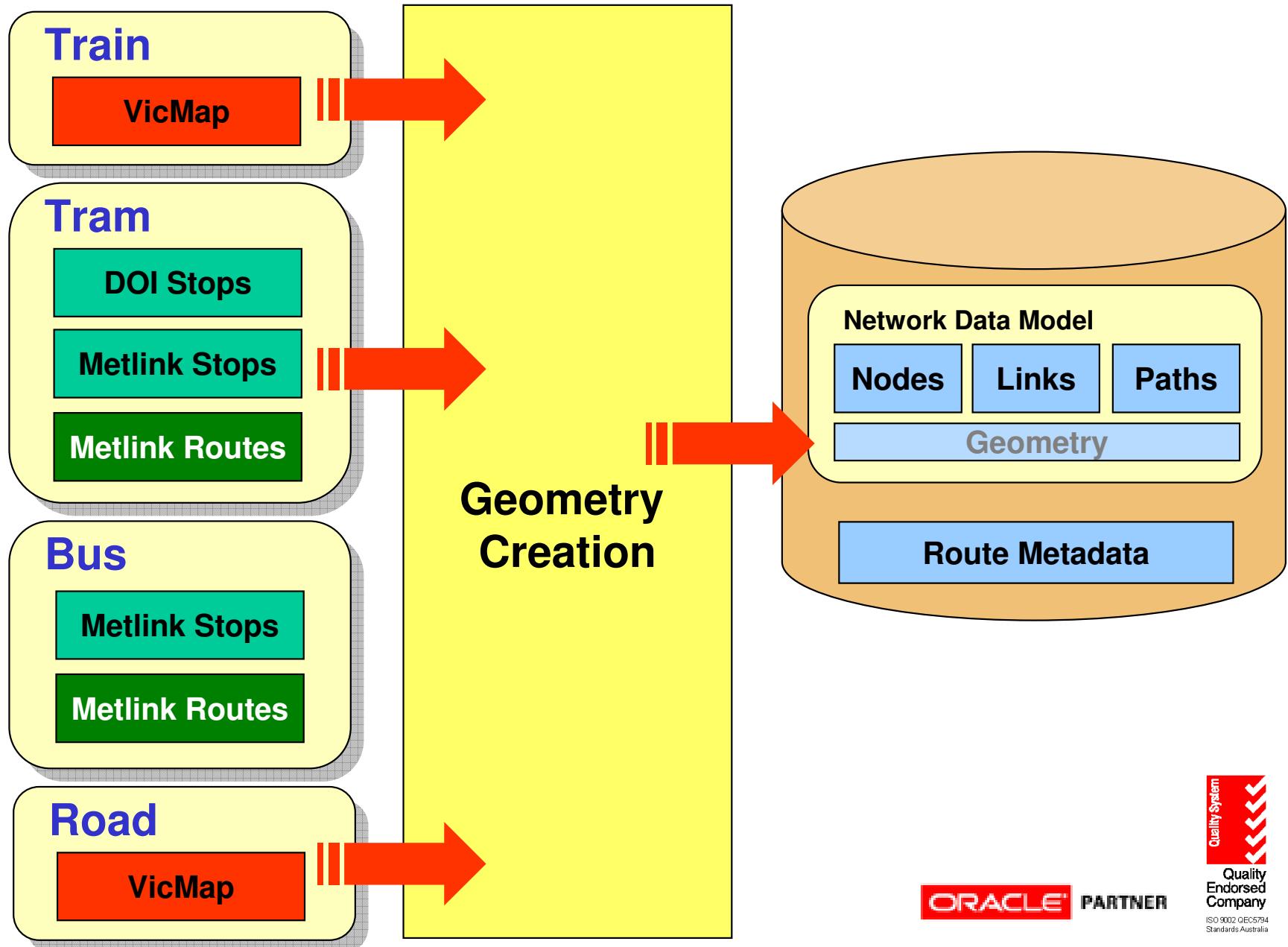
Building the route data



Building the route data



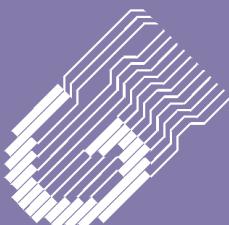
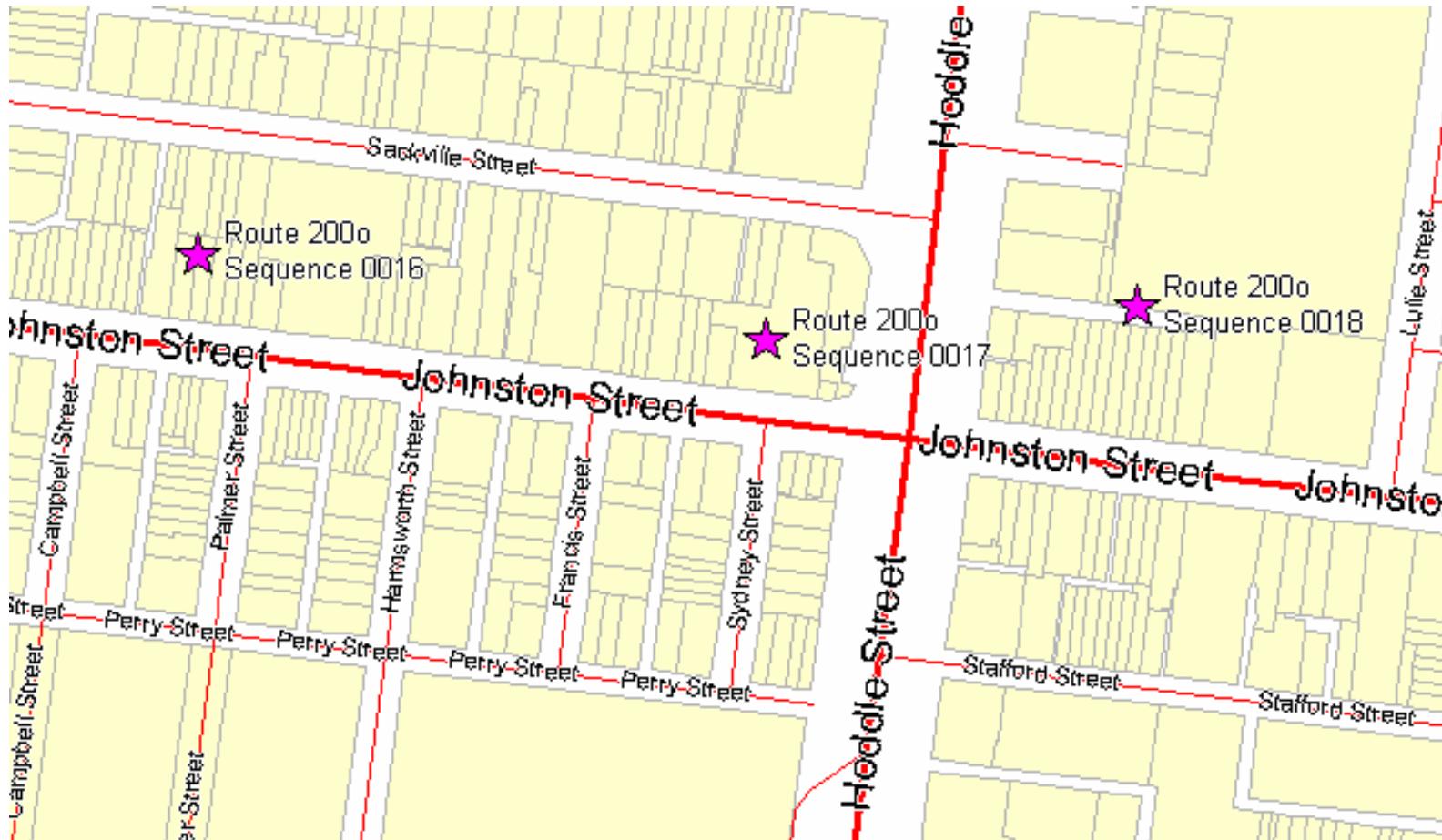
Building the route data

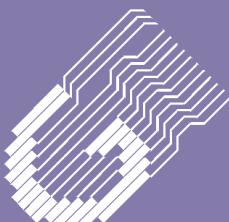


Data issues

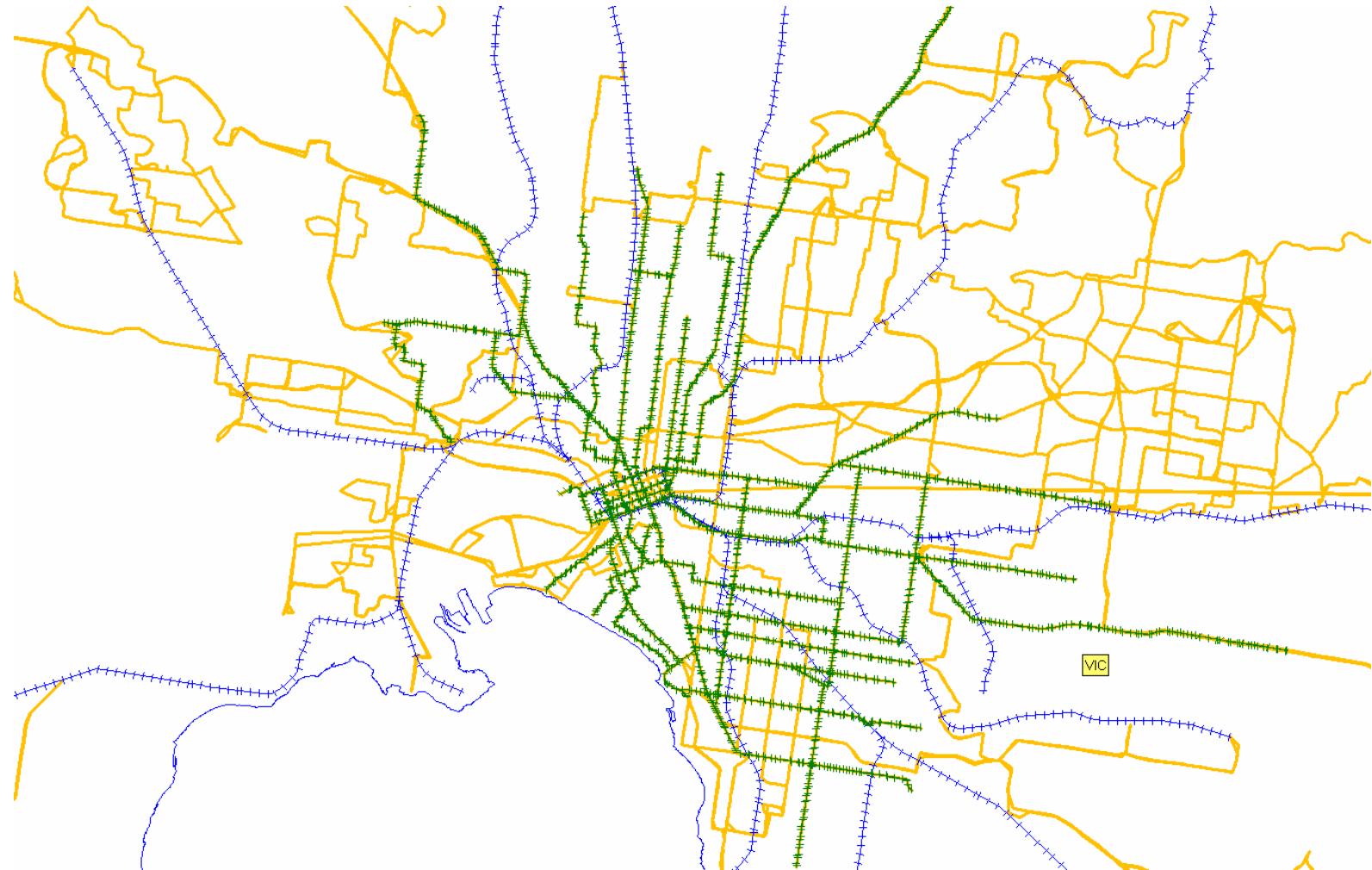
- Data Cleansing
 - Reconciliation of stops with map base
 - Sequencing of stops
 - Duplicate removal within routes
 - Duplicate nodes between routes
- Geometry
 - Union of road network for route
 - Splitting road segments based on stop positions
 - Fixing directions of both links and geometry

Data issues





Transport Network – Physical



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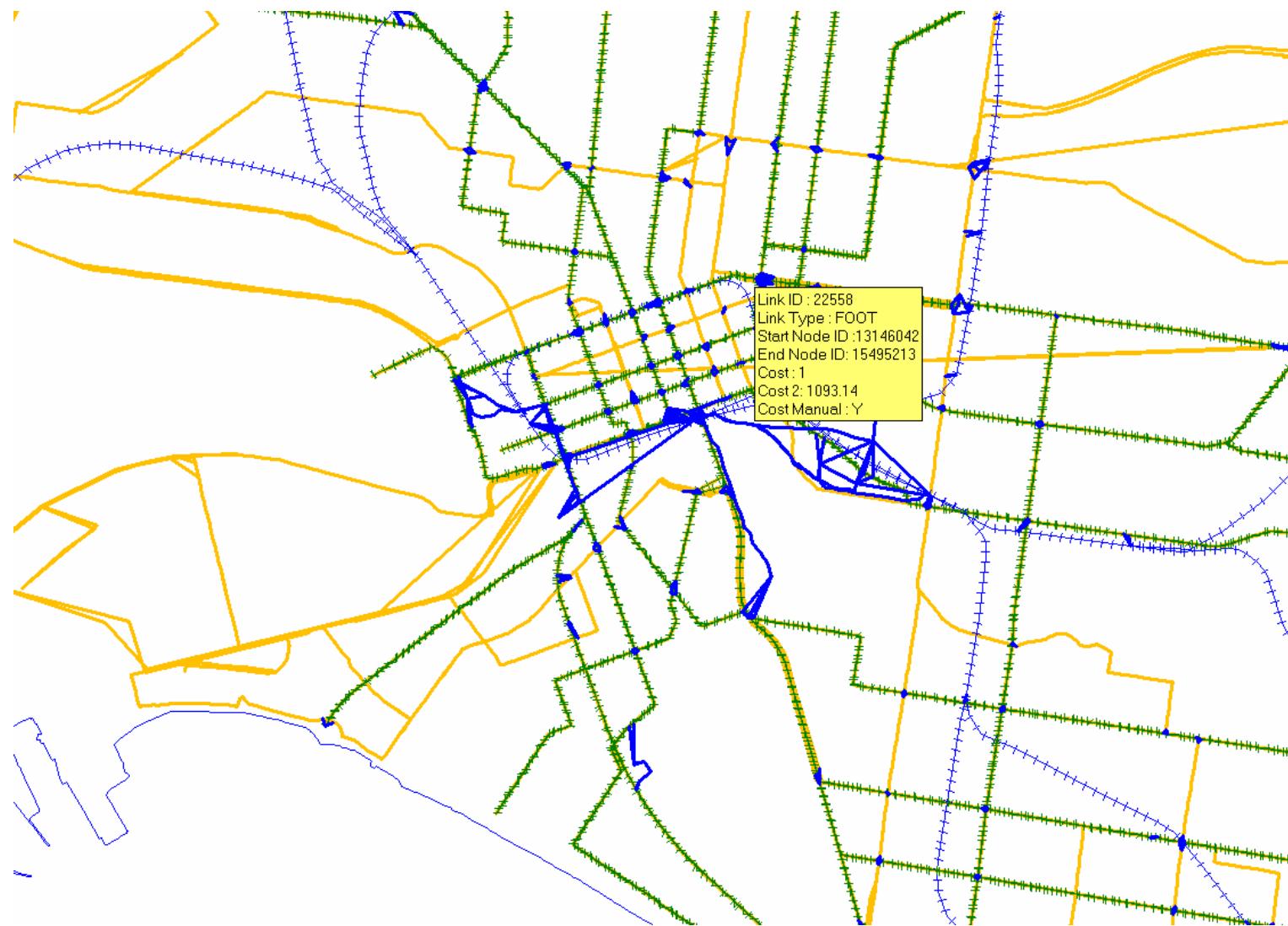


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Putting it all together

- Connections between modes
 - Foot links
- Determining the 'least cost'
 - Multiple costs on links
 - Travel time
 - Distance
- Network Management with SQL and Oracle Network Data Editor
- Directions to include:
 - Route Name, Destination, Stop Name, Walking distance (in kms)

Transport Network – Multi-mode

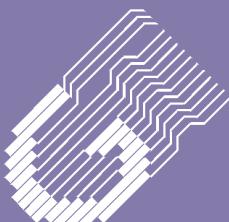


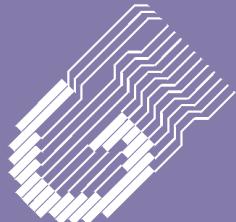
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Route display with MapViewer

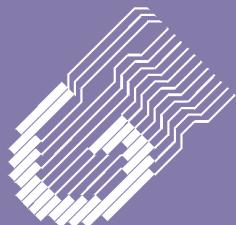
- JDBC Themes for non-base data
 - Route Start/End
 - Route geometry
- PNG output
- Web service builds directions and map into single response
- Map authoring with Oracle MapBuilder



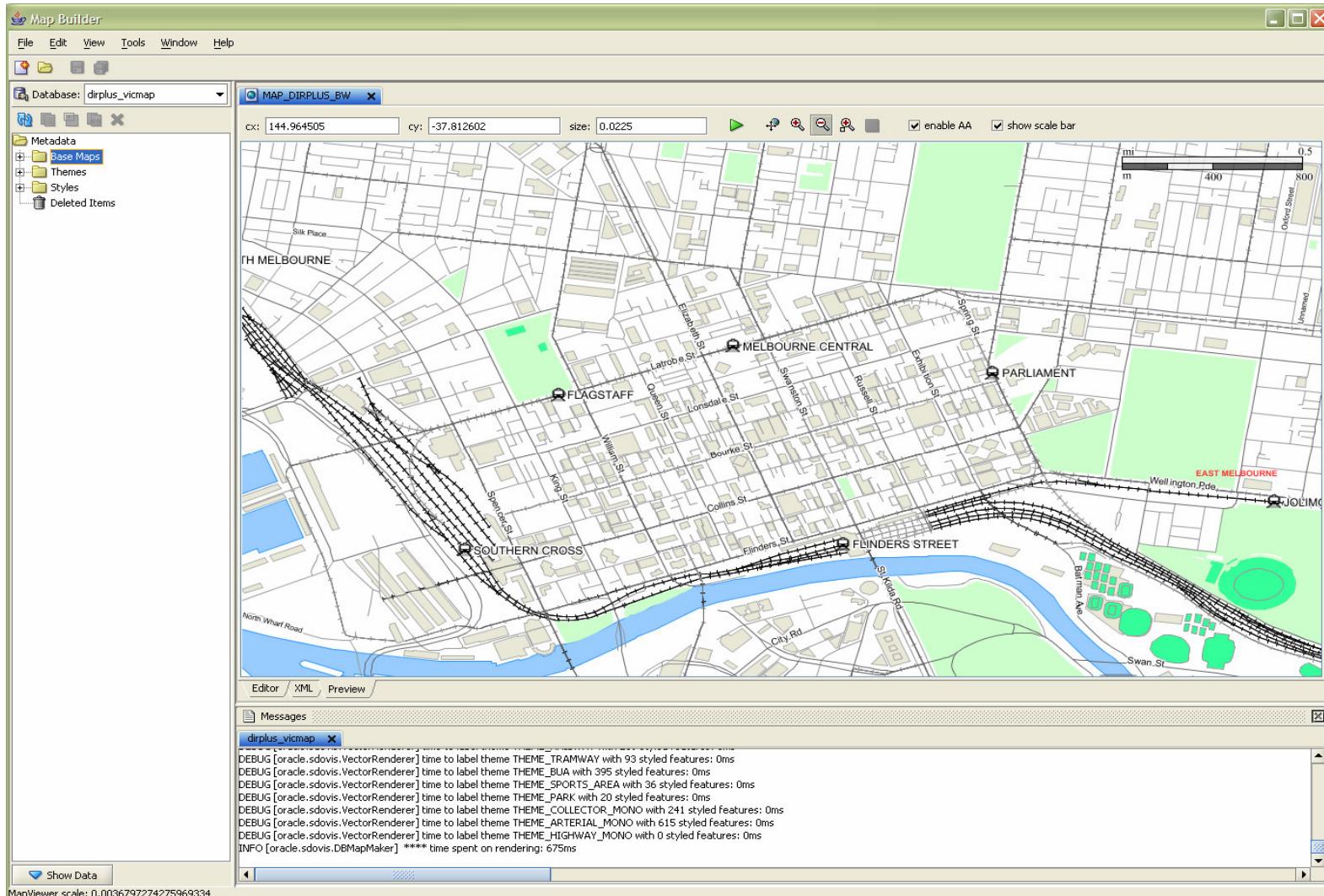


Routing with MapViewer





Oracle MapBuilder



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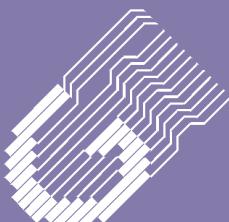


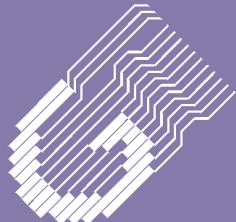
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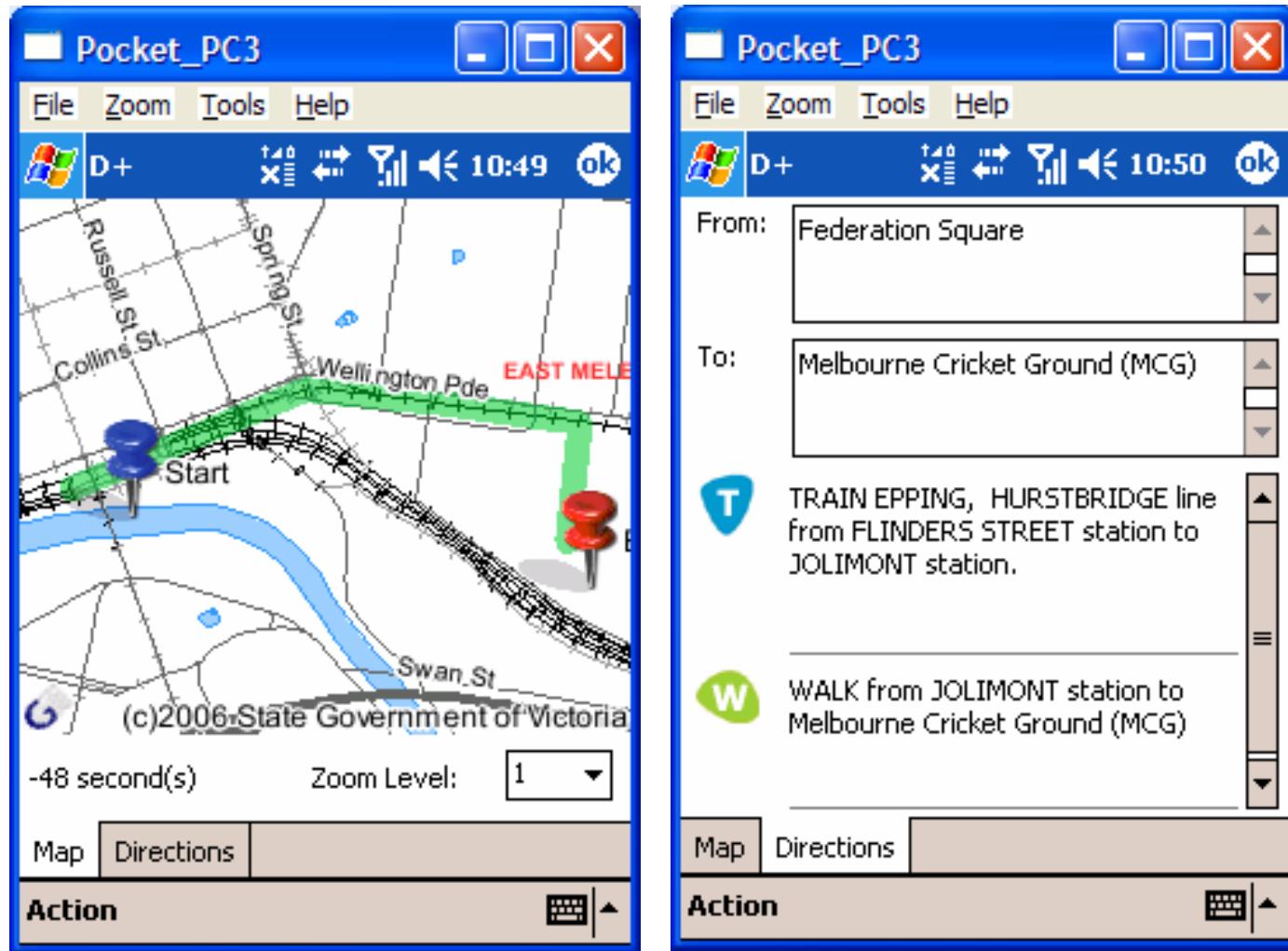
Outcomes and planned Deployments

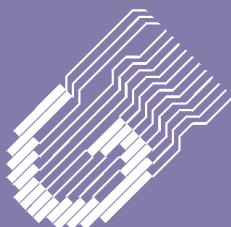
- First deployment scheduled for March 2006
 - Mobile device
- Web based deployments to follow in April 2006
- Bus and tram data returned to government custodians





Mobile deployment





Questions?