## Implementing a Spatially Integrated AMS DPTI - PTS

Speaker:

– Liam Nicholls

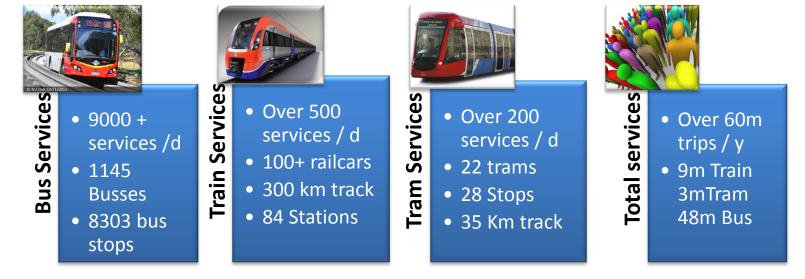
**AMS** Analyst



**Government of South Australia** 

#### **Public Transport Services**

A Division of SA Government's Department of Planning, Transport and Infrastructure (DPTI). Manages Adelaide's public transport network





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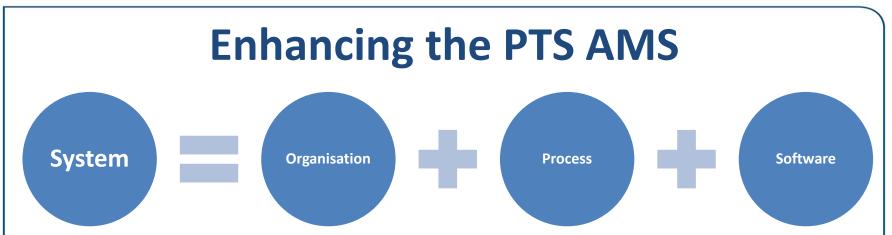
#### **Rail Revitalisation Projects**

- 30 years of little investment
- SA Government's \$3 billion ten year commitment was the biggest single investment ever in public transport in SA.
- The majority of the investment was to revitalise Adelaide's passenger rail network.
- Upgrades include:
  - Track upgrade
  - Extending Noarlunga line to Seaford
  - Electrification of Seaford line
  - New electric Trains & Trams (larger fleet)

- Overhaul of several train stations
- Increased services
- Tramline extension (to Entertainment Centre)



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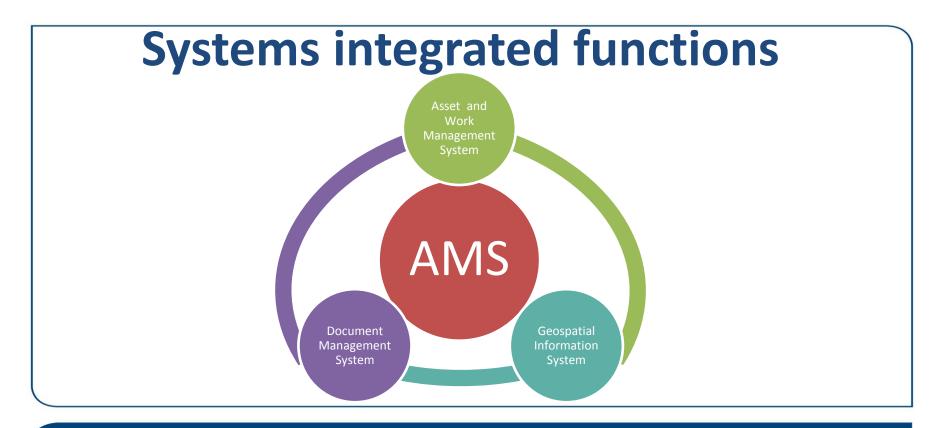


**80% of all your** potential (AMS) improvements could and are most likely related to **Process and Organisation**.

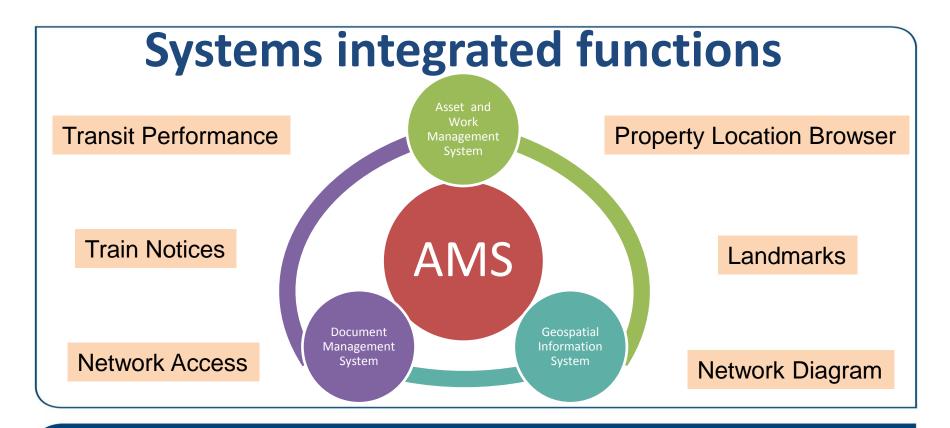
Q: How can an organisation and it's processes be enhanced through increased system functionality?



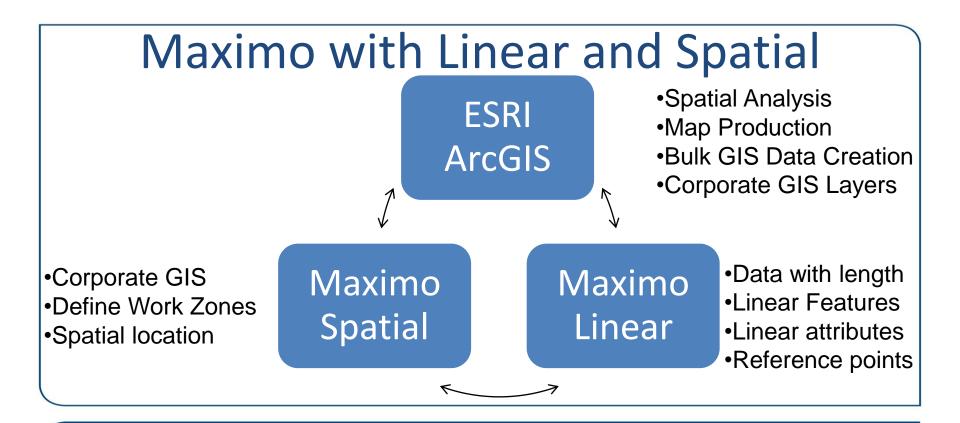
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#### What Maximo Linear does?

• Discrete assets/work orders/service requests

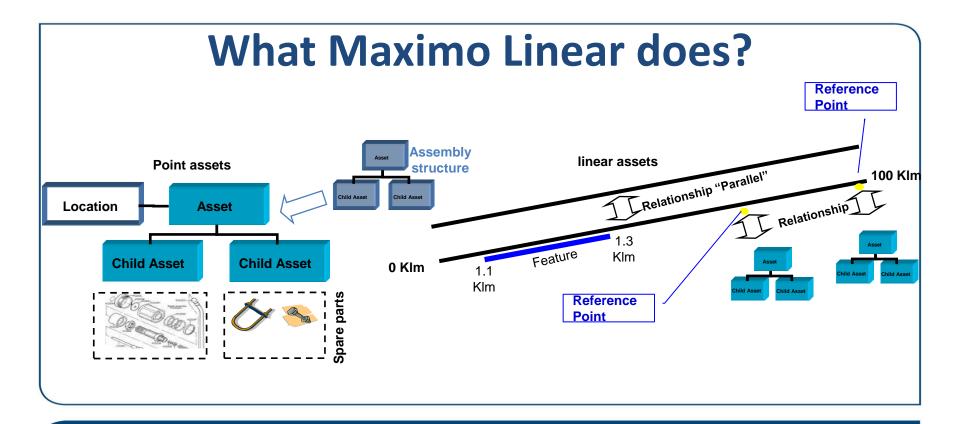
@ a location, can have (or can be) child assets

#### • Linear assets/work orders/service requests

Has length (or exists along a line). Assets can be segmented using features, and can have attributes, reference points and relationships.



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		40011	Track -	Main - North D	Down Main	13.397	13.	397 BE	LONGS TO				>>	40485	>>	Turnout : DC1264	4	13.39	7	13.397
		40011	Track -	Main - North D	Down Main	13.388	13.	388 BE	LONGS TO				>>	40480	>>	Turnout : DC125		13.38	8	13.388
		40011	Track -	Main - North D	Down Main	1.329	1.	329 BE	LONGS TO				>>	40451	>>	Turnout : AD83		1.32	9	1.329
		40011	Track -	Main - North D	Down Main	0.687	0.	687 BE	LONGS TO				>>	40410	>>	Turnout : AD69A		0.68	7	0.687
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				OUTH			>5	<10	
226288	Platform Inspection - West Croyden	West Croydon Platform 1	22/11/12 11:00 AM	OUTH	20	СОМР	5.000	5.151	-
403372	Insulation Pads	Outer Harbor Corridor	9/04/14 1:30 PM	OUTH	20	COMP	5.050	5.200	0
417357	11799 Piece of rail on running face missing	Outer Harbor Up Line		OUTH	20	APPR	5.050	5.048	-
201870	14316 Tight gauge 12mm	Outer Harbor Up Line	18/11/13 3:00 PM	OUTH	20	INPRG	5.093	5.093	4
352735	Call Out	Croydon West Subway		OUTH	1	COMP	5.099	5.099	-
364159	loose rubber mats under rail loose on rossetta street bridge down o/h line	Rosetta Street Bridge		оитн	20	APPR	5.106	5.106	-
347681	(Re-insulate Rossetta street Bridge)	Rosetta Street Bridge	11/10/13 11:10 AM	оитн		COMP	5.106	5.106	34
200022	7457 Vertical misalignment (Defect work order signals )	Outer Harbor Up Line		оитн	20	APPR	5.120	5.050	-
330406	11267 Damage " I J " head of rail signal 551	Outer Harbor Down Line		оитн	20	APPR	5.180	5.181	٥.
318980	Mudhole forming on the up track tamping required	Outer Harbor Up Line	13/10/13 8:30 AM	OUTH	20	INPRG	5.260	5.260	-
393628	Fill in walk in holes - ref- Mark Hetherington	Outer Harbor Corridor	22/01/14 7:30 AM	оитн		СОМР	5.280	5.280	3
318983	Bitumen breaking up in walkway, tripping hazard, bitumen required to fil in hole.Require tamping.	Outer Harbor Up Line	16/08/13 1:00 PM	оитн	20	СОМР	5.280	5.280	•
201311	13653 17mm twist ( t.r.c report )	Outer Harbor Up Line	21/02/13 12:10 PM	оитн	20	СОМР	5.280	5.250	٥.
330402	Bitumen raised in walkway on up track	Outer Harbor Up Line	3/10/13 8:00 AM	OUTH	20	COMP	5.329	5.330	2
393580	Bitumen in walk way breaking, Up track	Outer Harbor Up Line		OUTH	2C	COMP	5.330	5.332	-
200626	11882 Insufficient ballast	Outer Harbor Down Line		OUTH	20	APPR	5.970	8.002	-
201868	14315 Tight gauge 11mm	Outer Harbor Up Line	18/11/13 3:00 PM	OUTH	20	INPRG	6.000	6.000	4
270944	12298 redundant I.j.s adelaide side of kilkenny road xing	Outer Harbor Up Line		оитн	20	APPR	6.040	6.040	4
200300	10166 Raised bitumen surface on roadway update 3/11/ 2011 k.maslin 2D hole in bitumen rest of r-xing	Kilkenny Road Level Crossing		оитн	20	COMP	6.049	6.049	8
240371	Square rails check rail Killkenny rd Xing	Outer Harbor Corridor		OUTH	20	INPRG	6.050	6.050	-
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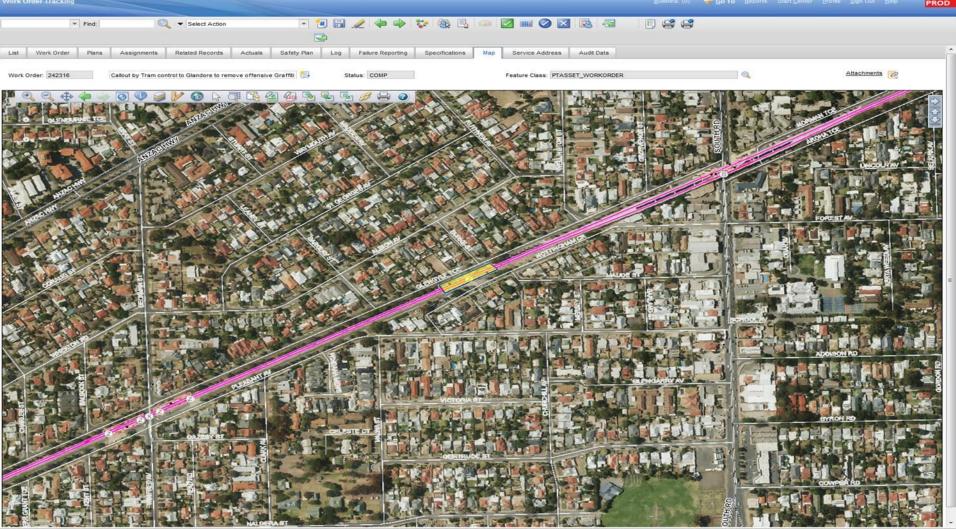
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#### What Maximo Spatial does?

- Ties an asset, work order or service request to a spatial location (point, line or polygon feature).
- Terminology difference between a Maximo Feature and a Spatial Feature.
  - A spatial dataset within ArcGIS is referred to as a Feature Class. A Feature Class contains features
  - Features can be Points, Lines or Polygon



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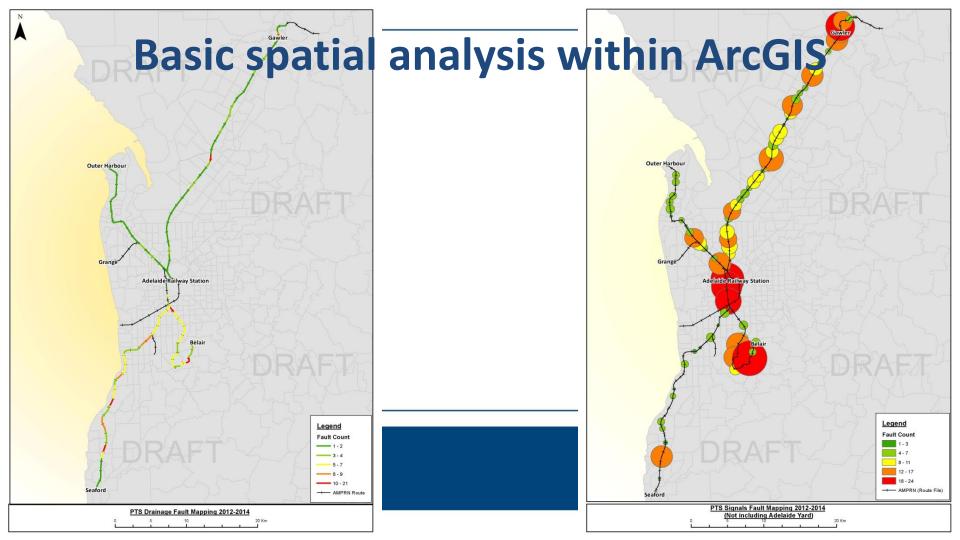


### A priority 1 work order comes in through Maximo.

- Planner organises immediate dispatch of crew to fix fault. Planner then interrogates the system for surrounding faults
- Planner uses the spatial select tool to drag a 500m radius around the work site and identifies 20 jobs.
- He pushes the selected work orders into the list screen, and filters by owner group, picking up 3 additional work orders that can be completed by the dispatched crew.
- He then assigns additional work to the crew, to be completed after rectifying the high priority fault.
- The crews view and complete assigned work orders using toughbooks.



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#### **Expanding Linear and Spatial functionality**

- ArcGIS is capable of converting linear information (i.e chainage) into point or line features.
- This allows for linear work orders to be displayed spatially.
- Although Maximo Spatial is capable of linking to the asset at fault, it can not spatially identify the linear section of an asset at fault.



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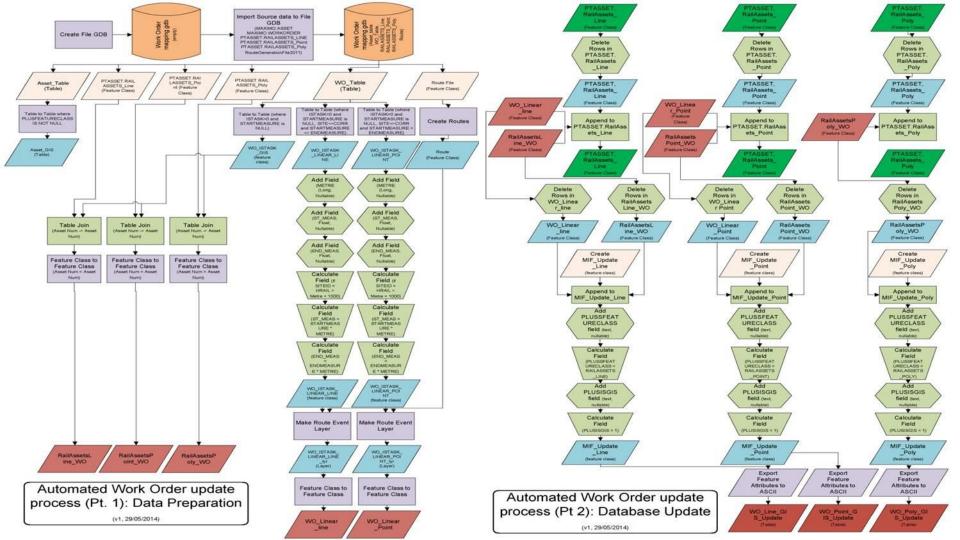
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#### Generation of Spatial features from Linear Information

- References the Maximo WORKORDER table
- Prepares data within ArcGIS for linear referencing
- Creates GIS Features from linear information
- Pushes updated features into the Work Order Feature Class
- Updates Maximo Work Order table via MIF



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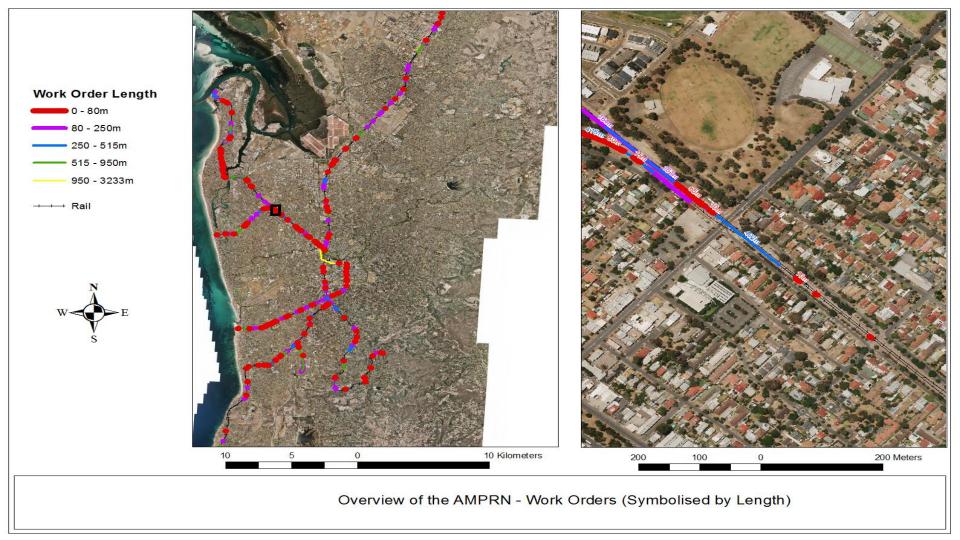
# A basic example of the work order output

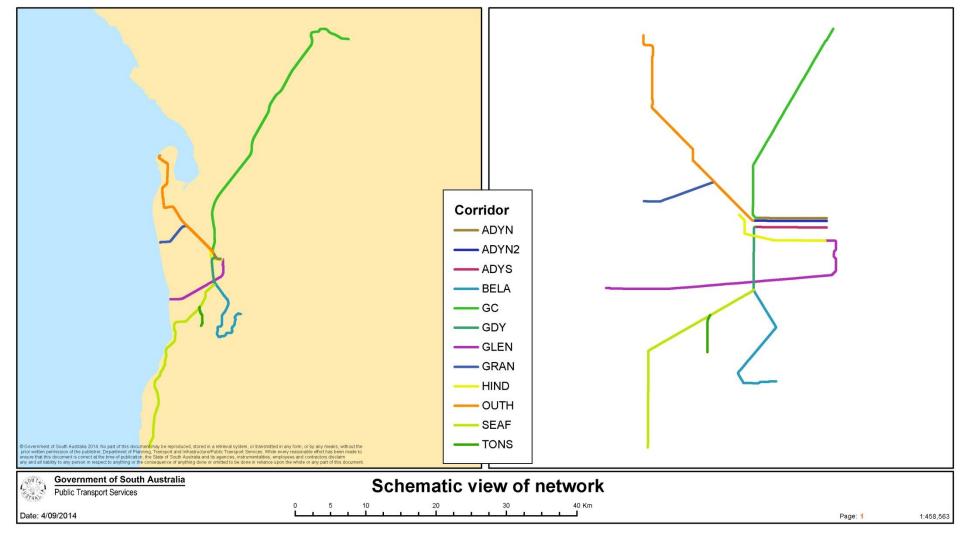
With the availability of Maximo tables through the SDE, the potential for analysis and interrogation is virtually endless.

Example: Work orders displayed by length.



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### SDE schema with access to Maximo tables



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Database Connection selected

# Spatial analysis

#### and statistics

- Nearest Neighbour Analysis
- •Density Analysis
- Weighted Density Analysis

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