



**Development and  
Implementation of an  
Oracle Spatial Based  
Asset Management  
System for Australian  
Urban Services.  
(Barbecue Manager by Exor)**



The Global Leader  
in Infrastructure Asset  
Management Solutions



# Acknowledgements

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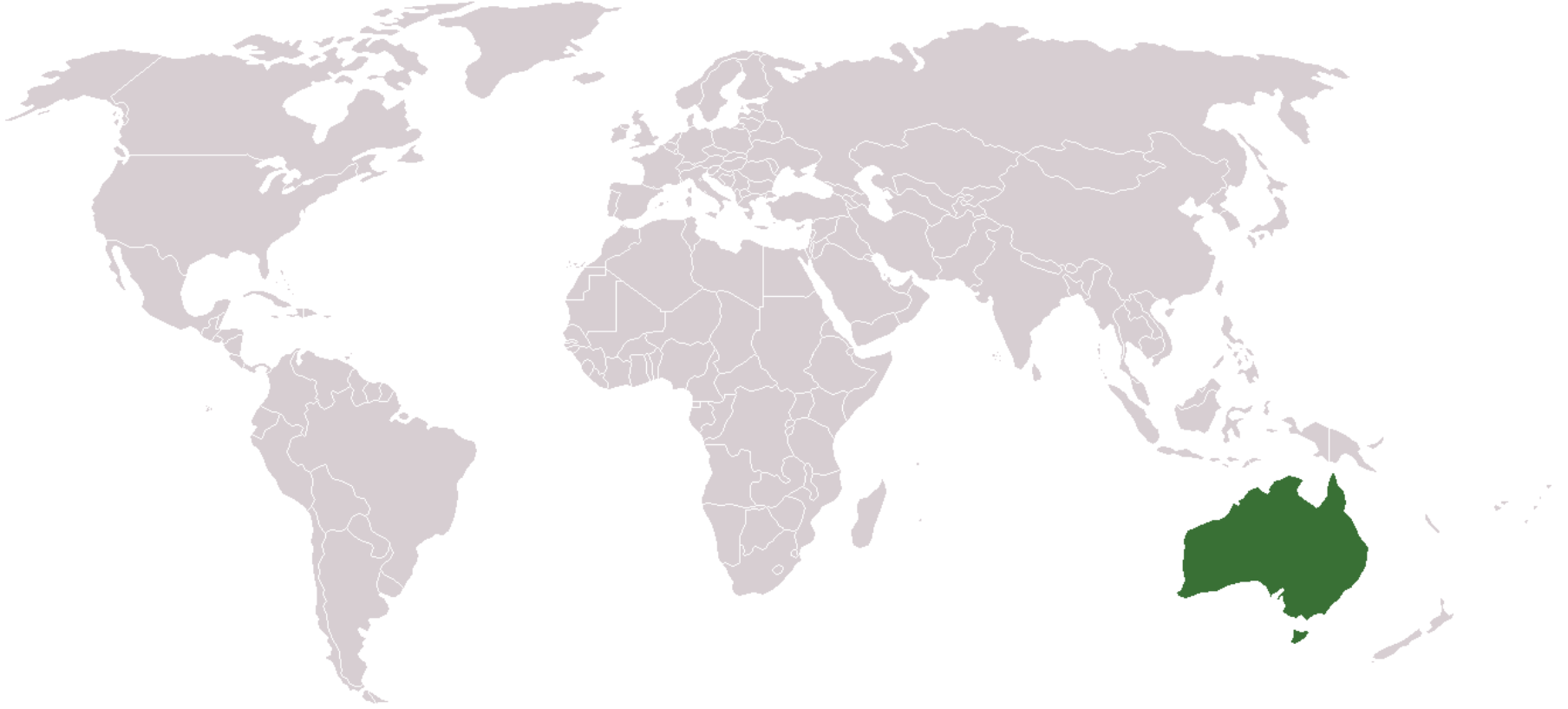
- ◆ *Robert Twin, ACT*
- ◆ *Rob Coupe, Exor*
- ◆ *Andy Rowlinson, Exor*
- ◆ *Graham Stickler, Exor*

- ◆ *Introduction to ACT project*
- ◆ *Introduction to Exor spatial strategy*
- ◆ *Description of the happy confluence of the two*

- ◆ *Integrated Asset Management System*
- ◆ *One system to manage assets maintained by the Australian Capital Territory*
- ◆ *Department of Urban Services*
  - ◆ *Canberra Urban Parks and Places*
  - ◆ *ACTRoads*
  - ◆ *ACTNoWaste*
  - ◆ *Environment ACT*
- ◆ *Designed to share information and improve processes*

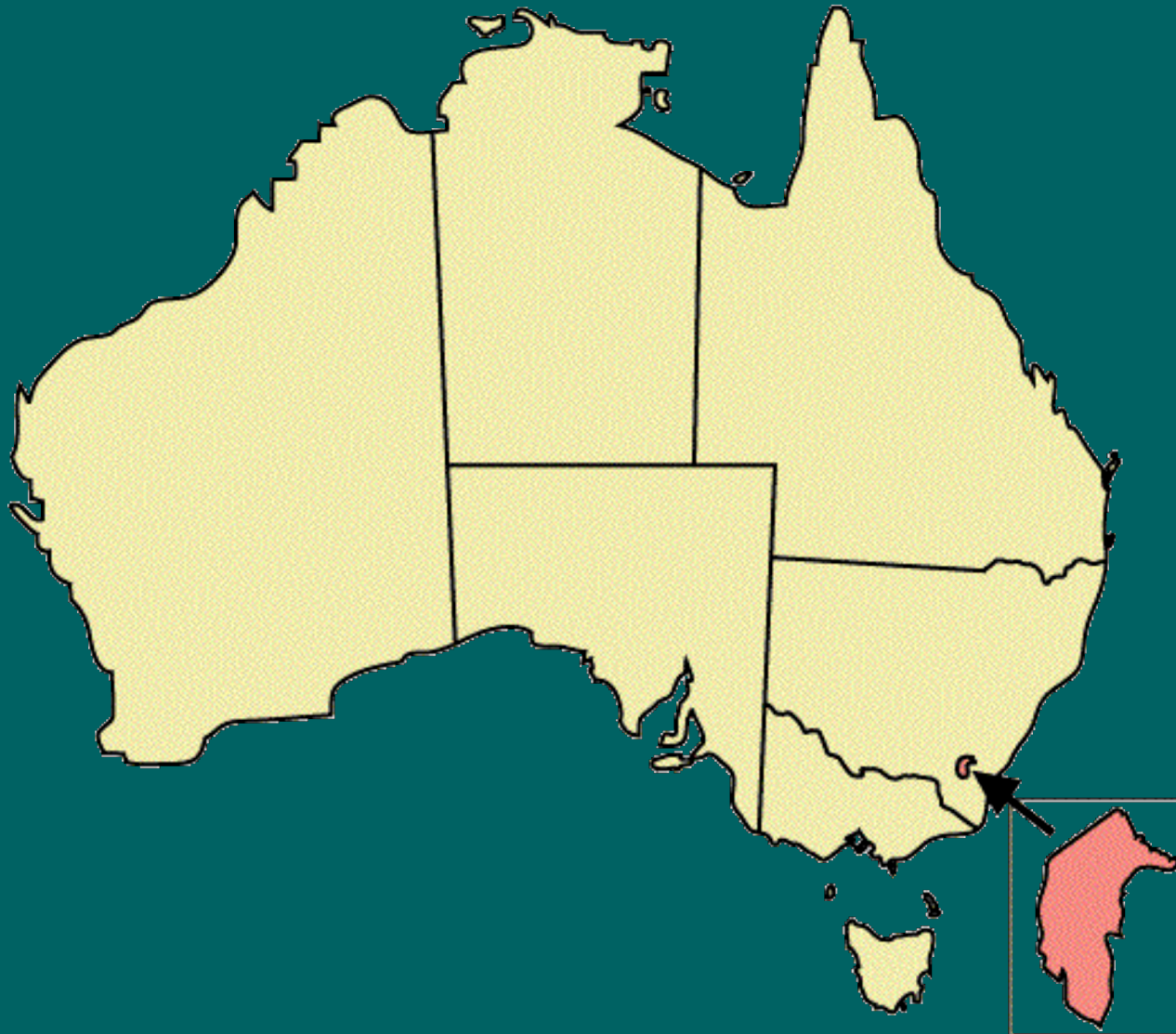


# Australian Capital Territory



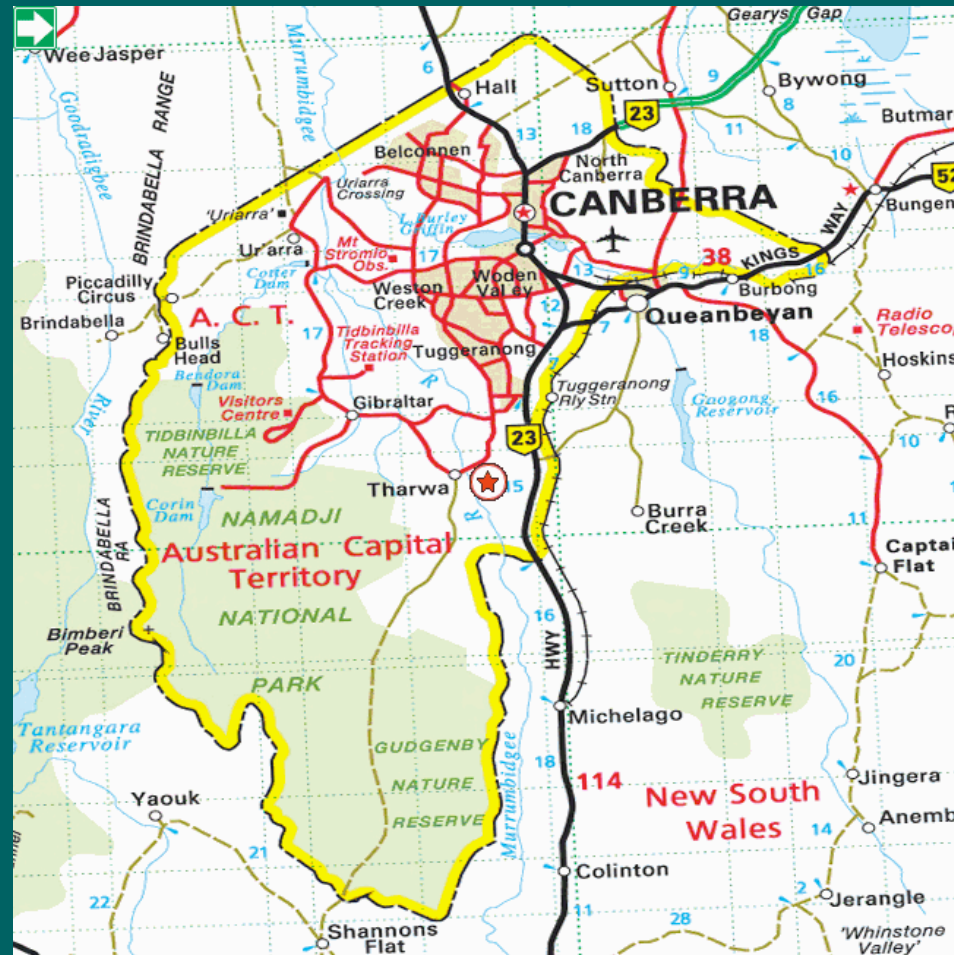


# Australian Capital Territory





# Australian Capital Territory





# DUS Asset Management

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- ◆ *Reviewed business processes in late 1990s*
  - ◆ *Found seven incompatible systems*
- ◆ *Went shopping in early 2000s*
  - ◆ *For one integrated COTS system*
- ◆ *Objectives*
  - ◆ *Save Money*
  - ◆ *Improve Services*
  - ◆ *Executive Information*

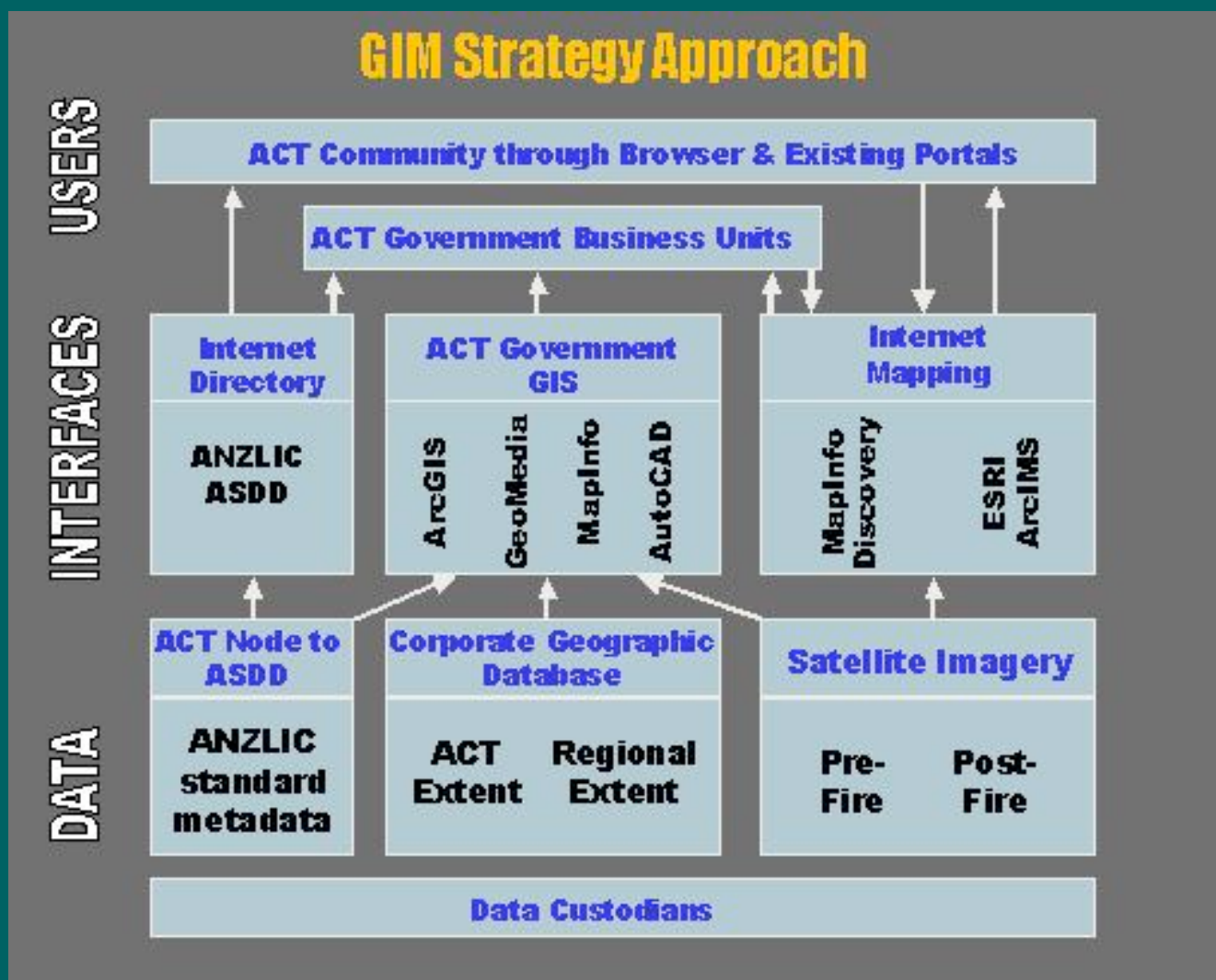
# Varied IAMS Functions

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- ◆ *Asset management for all business units*
- ◆ *Asset Valuations for all business units*
- ◆ *Traffic and Accidents*
- ◆ *City Management's Customer Service Enquiries Centre and FAQs*
- ◆ *Bins*
- ◆ *Road Network including some condition data but not Pavement Management*
- ◆ *Reporting functionality for Bins, Road Network, Accidents / Traffic flow, Customer Service, Asset Valuation through the use of Information Manager.*

- ◆ ***ACTRoads***
  - ◆ *Roads, Stormwater*
- ◆ ***ACTNoWaste***
  - ◆ *Bins, Landfills*
- ◆ ***CUPP***
  - ◆ *Parks, Trees, Sports fields, Barbecues*
- ◆ ***Environment ACT***
  - ◆ *Parks, Trails, Monuments*

# ACT GIM Strategy





# Core Spatial Data

<i>Reference</i>	<i>Cadastral Administrative</i>	<i>Built Environment</i>	<i>Land Use</i>	<i>Natural Environment</i>
<i>Survey Control</i>	<i>State and Territory</i>	<i>Road</i>	<i>Land Use Policy Area</i>	<i>Inland water</i>
<i>Geographic Names</i>	<i>District</i>	<i>Road Network Centerline</i>	<i>Overlay Provision</i>	
<i>Map Sheet Index</i>	<i>Division (Suburb)</i>	<i>Kerb</i>	<i>National Capital Plan</i>	
<i>Contour</i>	<i>Section</i>	<i>Trail</i>	<i>Heritage</i>	
<i>Orthoimagery</i>	<i>Block (Parcel)</i>	<i>Community Path</i>	<i>Sports Field</i>	
	<i>Block Address</i>	<i>Building Footprint</i>	<i>Urban Parks</i>	
	<i>Road Reserve</i>	<i>Airport</i>	<i>Shopping Centre</i>	
	<i>Tenure</i>	<i>Airport Tarmac</i>	<i>Waste</i>	
	<i>Lessee</i>	<i>Railway Line</i>	<i>Forest</i>	
	<i>National Land</i>		<i>Forest Block</i>	
	<i>Postcode</i>		<i>Community Facility</i>	
	<i>Electoral</i>		<i>Contaminated Site</i>	
			<i>Development</i>	

- ◆ *Support Business Applications*
- ◆ *Maintain Core Data*



# Exor Corporation

- ◆ *Management buy-out from Oracle UK in 1994*
- ◆ *Focus on network modelling and linear asset management software solutions*
- ◆ *Background in Highways*
- ◆ *Recognized leader in this field*
- ◆ *Clients grown from 30 to 150+ customers world-wide*
- ◆ *Manages over 1,000,000 km of linear assets, with an estimated value exceeding £750 billion worldwide*
- ◆ *Oracle's chosen solution partner for transportation and linear asset management*
- ◆ *Leading supplier of Street Works Systems to Highway Authorities and Utilities*
- ◆ *Offices in UK, USA, Australia and New Zealand*





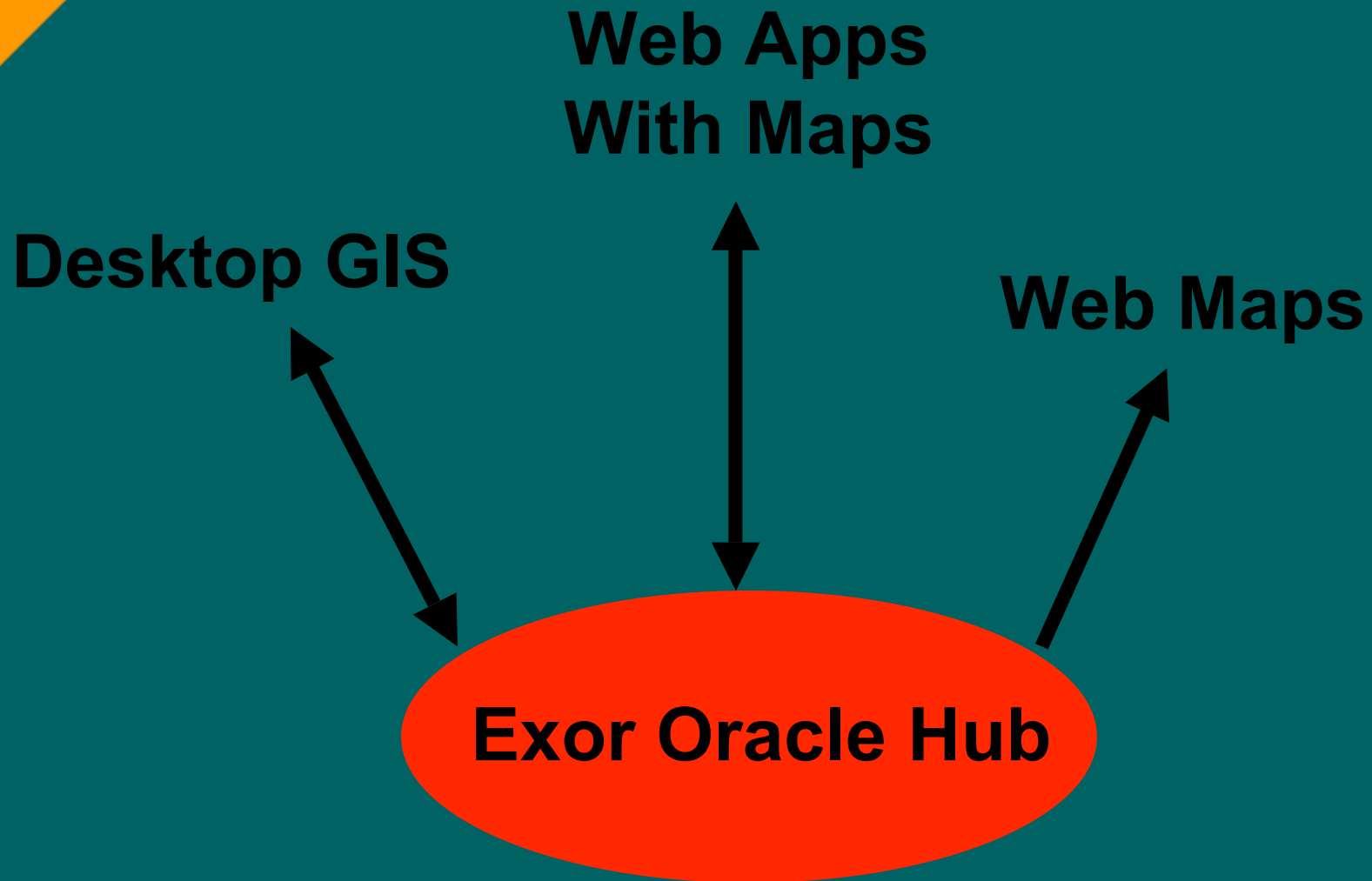
# Software evolution

1995	2001	2004	2005	2006
2.x	3.0	3.1	3.2	4.0
Integrated Highway Asset Management System	Multiple Linear Referencing	Integrated Spatial Database	Web services	New Applications Improved look and feel





# Exor Spatial Strategy







# Exor Spatial Services

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- ◆ *A set of Oracle server APIs to support Exor clients.*
- ◆ *A set of Oracle tables to support integration of Linear Referencing and other network and asset data.*
- ◆ *A set of triggers to support spatial integrity.*
- ◆ *A set of utilities for registration.*



# Spatial Services Highlights

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- ◆ *Multiple Linear Referencing*
- ◆ *Server Side Dynamic Segmentation*
- ◆ *Map External Assets*
- ◆ *Off Network Asset support*
- ◆ *Historic Database of Business Records and Spatial Features*



# IAMS Highlights

ENQUIRY MANAGER (0 Actions Outstanding)

Id: 42187    Status: RE    Received    Source: T    Telephone:    Admin Unit: ACT

Recorded By: SYS    SYSTEM ADMINISTRATOR

Name: MR    JED    FISHER    Type: ENQUIRER    Ref:    Organisation:    locator - NM0572 - IAMS@iamsdev.IAMSDEV.AST v3.2.1.0

Postcode:    Street: GOOREN ST    Dependant Street:    Town:    County:    Category: REQS    Reque:    Enquiry Type: DEFH    Defec:    Location:    Description:    Action/Remarks:    Date Recorded: 15-AUG-2005    Follow Up 1:    Priority:    Find Asset:    Road Type:    History:    Summary:

Found 31 STREET\_ADDRESS

BLOCK_ID	ST...	ROAD_NAME	SUB	Select
75943	1	GOOREEN STREET	REID	<input type="checkbox"/>
75945	10	GOOREEN STREET	REID	<input checked="" type="checkbox"/>
75616	11	GOOREEN STREET	REID	<input type="checkbox"/>
74848	12	GOOREEN STREET	REID	<input type="checkbox"/>
74465	13	GOOREEN STREET	REID	<input type="checkbox"/>
74849	14	GOOREEN STREET	REID	<input type="checkbox"/>
74463	15	GOOREEN STREET	REID	<input type="checkbox"/>
74706	16	GOOREEN STREET	REID	<input type="checkbox"/>
74319	17	GOOREEN STREET	REID	<input type="checkbox"/>
72722	19 - 21	GOOREEN STREET	REID	<input type="checkbox"/>
76224	2	GOOREEN STREET	REID	<input type="checkbox"/>
72724	20 - 24	GOOREEN STREET	REID	<input type="checkbox"/>
5547	29 - 31	GOOREEN STREET	BRADDOON	<input type="checkbox"/>

New Search    Export Results

Route    Datum    Groups

Unique	Descr	Start	End

NW Type:    Grp Type:    Unit:



- ◆ ***Search***
- ◆ ***Create Enquiry Records from Map***
- ◆ ***Log Defects from Map***



# Create Enquiry Record

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- ◆ *Search for Street Address for enquiry*
- ◆ *Create enquiry record*
- ◆ *Enter enquiry details*



IAMS Test

File Edit Block Field Record Query Help Window

Exit NORMAL 08-SEP-2005

Exor Locator - NM0572 - IAMS@eam.EXORDEMO AST v3.2.1.0

Found 55 STREET\_ADDRESS

Show Map

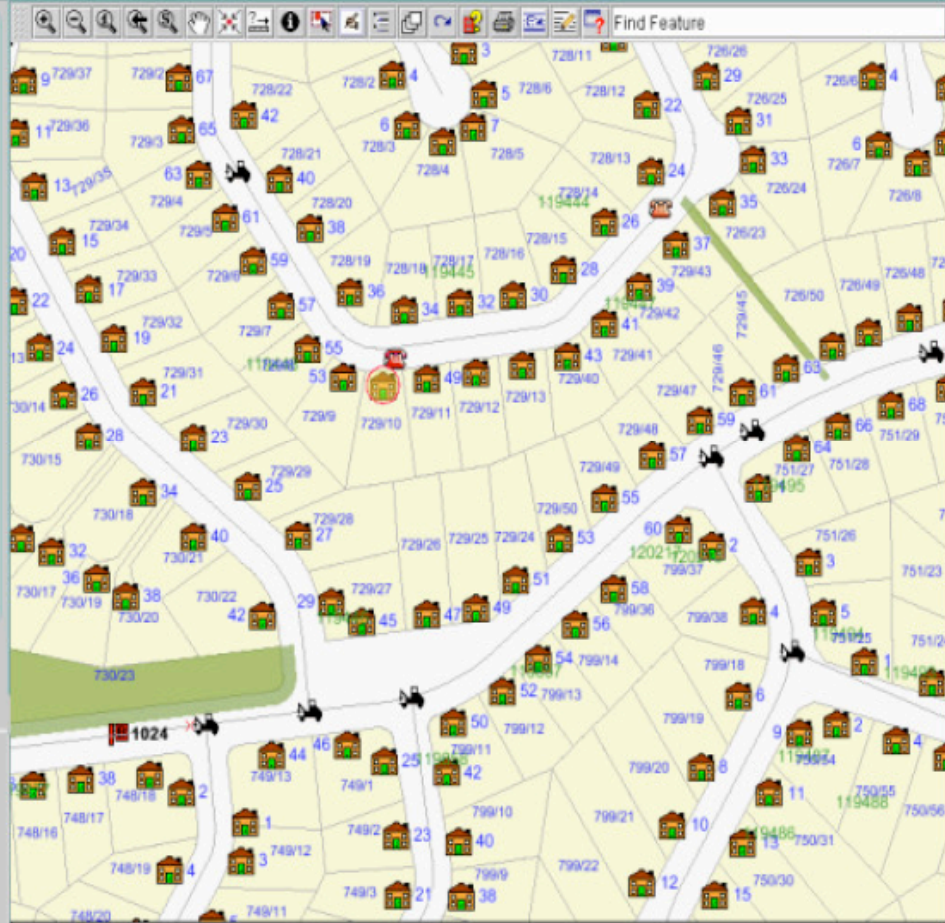
- Select
- 9 ZOXCIRCUIT
  - ZOXCIRCUIT
  - 28 ZOXCIRCUIT
  - 51 ZOXCIRCUIT
  - 67 ZOXCIRCUIT
  - 43 ZOXCIRCUIT
  - 61 ZOXCIRCUIT
  - 31 ZOXCIRCUIT
  - 21 ZOXCIRCUIT
  - 15 ZOXCIRCUIT
  - 26 ZOXCIRCUIT
  - 42 ZOXCIRCUIT
  - 41 ZOXCIRCUIT

New Search Export Results

Route Datum Groups

Unique	Descr	Start	End
BARAK CT 3-6	BARAK COURT / HOUSE NO 3 - H 0	0	0

NW Type ROAD ACT ROAD  
Grp Type ROAD ACT ROADS GROUP  
Unit KILOMETERS



Scale: 52.8 M/inch 208954.01, 586440.1

Active Layer: STREET ADDRESS Attribute: Not Set

Select To

IAMS Test

File Edit Block Field Record Query Help Window

Exit NORMAL 08-SEP-2005

Exor Locator - NM0572 - IAMS@eam.EXORDEMO AST v3.2.1.0

Found 55 STREET\_ADDRESS

Show Map

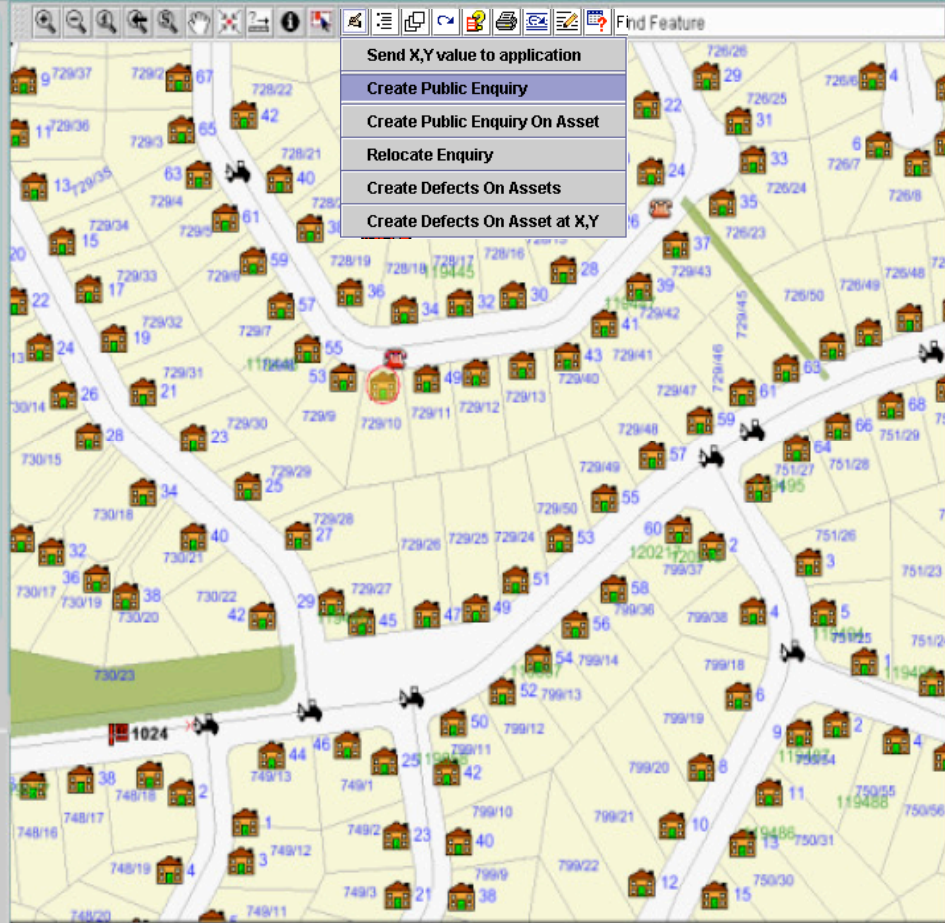
- Select
- 9 ZOX CIRCUIT
  - ZOX CIRCUIT
  - 28 ZOX CIRCUIT
  - 51 ZOX CIRCUIT
  - 67 ZOX CIRCUIT
  - 43 ZOX CIRCUIT
  - 61 ZOX CIRCUIT
  - 31 ZOX CIRCUIT
  - 21 ZOX CIRCUIT
  - 15 ZOX CIRCUIT
  - 26 ZOX CIRCUIT
  - 42 ZOX CIRCUIT
  - 41 ZOX CIRCUIT

New Search Export Results

Route Datum Groups

Unique	Descr	Start	End
BARAK CT.3-6	BARAK COURT / HOUSE NO 3 - H	0	0

NW Type ROAD ACT ROAD  
Grp Type ROAD ACT ROADS GROUP  
Unit KILOMETERS



Scale: 52.8 M/inch 208554.01, 586440.1  
Active Layer: STREET ADDRESS Attribute: Not Set

Select To

IAMS Test

File Edit Block Field Record Query Help Window

Exit NORMAL 08-SEP-2005

Exor Locator - NM0572 - IAMS@eam.EXORDEMO AST v3.2.1.0

Found 55 STREET\_ADDRESS

Show Map

- Select
- 9 ZOXCIRCUIT
  - ZOXCIRCUIT
  - 28 ZOXCIRCUIT
  - 51 ZOXCIRCUIT
  - 67 ZOXCIRCUIT
  - 43 ZOXCIRCUIT
  - 61 ZOXCIRCUIT
  - 31 ZOXCIRCUIT
  - 21 ZOXCIRCUIT
  - 15 ZOXCIRCUIT
  - 26 ZOXCIRCUIT
  - 42 ZOXCIRCUIT
  - 41 ZOXCIRCUIT

New Search Export Results

Route Datum Groups

Unique	Descr	Start	End
BARAK CT 3-6	BARAK COURT / HOUSE NO 3 - HI 0	0	

NW Type ROAD ACT ROAD  
Grp Type ROAD ACT ROADS GROUP  
Unit KILOMETERS

Find Feature

Scale: 52.8 M/Inch 208591.26, 506436.8

Active Layer: STREET ADDRESS Attribute: Not Set

Select To

**Confirm New Feature Creation**

Network Ty...	Route	Theme	Distance	Measure	Units	Select
LINK/	ZOXCCT...	LINKS	39478851...	310.35096...	Metres	<input checked="" type="checkbox"/>
ROAD/RO...	ZOXCCT.	ACT ROA...	39478851...	457	Kilometers	<input type="checkbox"/>

OK Cancel

IAMS Test

File Edit Block Field Record Query Help Window

Exit NORMAL 08-SEP-2005

Exor Locator - NM0572 - IAMS@eam EXORDEMO AST v3.2.1.0

Found 55 STREET\_ADDRESS Show Map

Select

- 9 ZOX CIRCUIT
- ZOX CIRCUIT
- 28 ZOX CIRCUIT
- 51 ZOX CIRCUIT
- 67 ZOX CIRCUIT
- 43 ZOX CIRCUIT
- 61 ZOX CIRCUIT
- 31 ZOX CIRCUIT
- 21 ZOX CIRCUIT
- 15 ZOX CIRCUIT
- 26 ZOX CIRCUIT
- 42 ZOX CIRCUIT
- 41 ZOX CIRCUIT

New Search Export Results

Route Datum Groups

Unique	Descr	Start	End
BARAK CT 3-6	BARAK COURT / HOUSE NO 3 - HI 0	0	0

NW Type ROAD ACT ROAD  
Grp Type ROAD ACT ROADS GROUP  
Unit KILOMETERS

Find Feature

Message  
PEM 42254 successfully created.  
OK

Scale: 52.8 M/inch 208591.26, 586436.8  
Active Layer: STREET ADDRESS Attribute: Not Set  
Select To

Id	42254	Status	RE	Received	Source	T	Telephone
Recorded By	SYS SYSTEM ADMINISTRATOR			Admin Unit	ACT		
Name				Type	ENQUIRER	Ref	
Organisation				Email			
Postcode	Number	Building	Sub.	Home	Flag		
Street				Work			
Dependant Street	Locality			Mobile			
Town				Fax	Primary Contact		
County				Property Type			
				Search	Contacts Summary	View Contact Details	

Category	REQS Request for Services	Class	RPAV Road Pavement
Enquiry Type	DEFH Defective - Pothole	Responsibility Of	
Location			
Description	Asset unable to be matched		
Action/Remarks			

Date Recorded	08-SEP-2005 17:53	Incident Date & Time	08-SEP-2005 17:53	Correspondence Date		Corr Received Date	
Follow Up 1		Acknowledgment		Follow Up 2		Follow Up 3	
Priority		Target Date		Complete Date		Reference No	
Find Asset			Start		End		XSP
Road Type	SECT	Road	ZOX CCT_010592	ZOX CIRCUIT (MCCAW -> ZOX)			

# Create Defect Record

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- ◆ *Search for defective asset*
- ◆ *Create defect associated with asset record*
- ◆ *Enter defect records*



**IAMS Test**  
File Edit Block Field Record Query Help Window

08-SEP-2005

Exor Locator - NM0572 - IAMS@eam.EXORDEMO AST v3 2.1.0

Found 991 **Bus Stop** Show Map

Bus Stop Number	X Coordinate (Ea...	Y Coordinate (No...	Shelter Ty	Select
1001				<input type="checkbox"/>
1002				<input type="checkbox"/>
1003				<input type="checkbox"/>
1004				<input type="checkbox"/>
1005				<input type="checkbox"/>
1008				<input type="checkbox"/>
1011			CONCRETE	<input checked="" type="checkbox"/>
1012				<input type="checkbox"/>
1015			CONCRETE	<input type="checkbox"/>
1016				<input type="checkbox"/>
1018				<input type="checkbox"/>
1025				<input type="checkbox"/>
1026				<input type="checkbox"/>

New Search Export Results

Route **Datum** Groups

Unique	Descr	Start	End
ELLERSTON AV	ELLERSTON AVENUE	2,094	2,094

NW Type ROAD ACT ROAD  
Grp Type ROAD ACT ROADS GROUP  
Unit KILOMETERS

Scale: 52.8 M/inch 208027.99, 597692.27  
Active Layer: BUSSTOP\_DT Attribute: Not Set

Select To Upgrade Bus Stop



IAMS Test  
File Edit Block Field Record Query Help Window  
08-SEP-2005  
Exor Locator - NM0572 - IAMS@eam EXORDEMO AST v3 2.1.0

Found 991 **Bus Stop** Show Map

Bus Stop Number	X Coordinate (Ea...	Y Coordinate (No...	Shelter Ty	Select
1001				<input type="checkbox"/>
1002				<input type="checkbox"/>
1003				<input type="checkbox"/>
1004				<input type="checkbox"/>
1005				<input type="checkbox"/>
1008				<input type="checkbox"/>
1011			CONCRETE	<input checked="" type="checkbox"/>
1012				<input type="checkbox"/>
1015			CONCRETE	<input type="checkbox"/>
1016				<input type="checkbox"/>
1018				<input type="checkbox"/>
1025				<input type="checkbox"/>
1026				<input type="checkbox"/>

New Search Export Results

Route Datum Groups

Unique	Descr	Start	End
ELLERSTON AV	ELLERSTON AVENUE	2.094	2.094

NW Type ROAD ACT ROAD  
Grp Type ROAD ACT ROADS GROUP  
Unit KILOMETERS

Find Feature

- Create Public Enquiry
- Create Public Enquiry On Asset
- Create Defects On Assets
- Create Defects On Asset at X,Y
- Relocate Point Feature

Scale: 52.8 M/Inch 207948.24, 587800.52  
Active Layer: BUSSTOP\_DT Attribute: Not Set

Select To Upgrade Bus Stop





IAMS Test

File Edit Block Field Record Query Help Window

Exor Locator - NM0572 - IAMS@eam.EXORDEMO AST v3.2.1.0

Found 991 Bus Stop

Bus Stop Number	X Coordinate (Ea...	Y Coordinate (No...	Shelter Ty	Select
1001				
1002				
1003				
1004				
1005				
1008				
1011				
1012				
1015				
1016				
1018				
1025				
1026				

Defect Details

Date / Time Created: 08-SEP-2005 17 : 58

Activity\*: BS Bus Shelters Defect Type\*: BS02 Vandalised

Defect Description: damaged shelters

Priority\*: 301 1 Day Action: [ ]

Action Description: [ ]

Asset Modification: [ ] Decommission Target Date: 09-SEP-2005 17:58

Cancel < Back Next >

Route: Datum Group

Unique: ELLERSTON AV EL

NW Type: RC

Grp Type: ROAD ACT ROADS GROUP

Unit: KILOMETERS

Active Layer: BUSSTOP\_DT Attribute: Not Set

Select To: Upgrade Bus Stop



# Conclusions

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- ◆ *You need spatial data to do asset management properly*
- ◆ *The system must be driven first by asset management requirements*
- ◆ *Oracle Spatial provides a convenient foundation for providing spatially enabled asset management systems*

# Request for Oracle

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- ◆ *Cannot perform a spatial query that uses a spatial index via a database link*
- ◆ *Prevents us from performing spatial queries against other Oracle Spatial databases*
- ◆ *Required some data replication*



# Thank you



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