

Integrating Traffic Management Data via an Enterprise LRS

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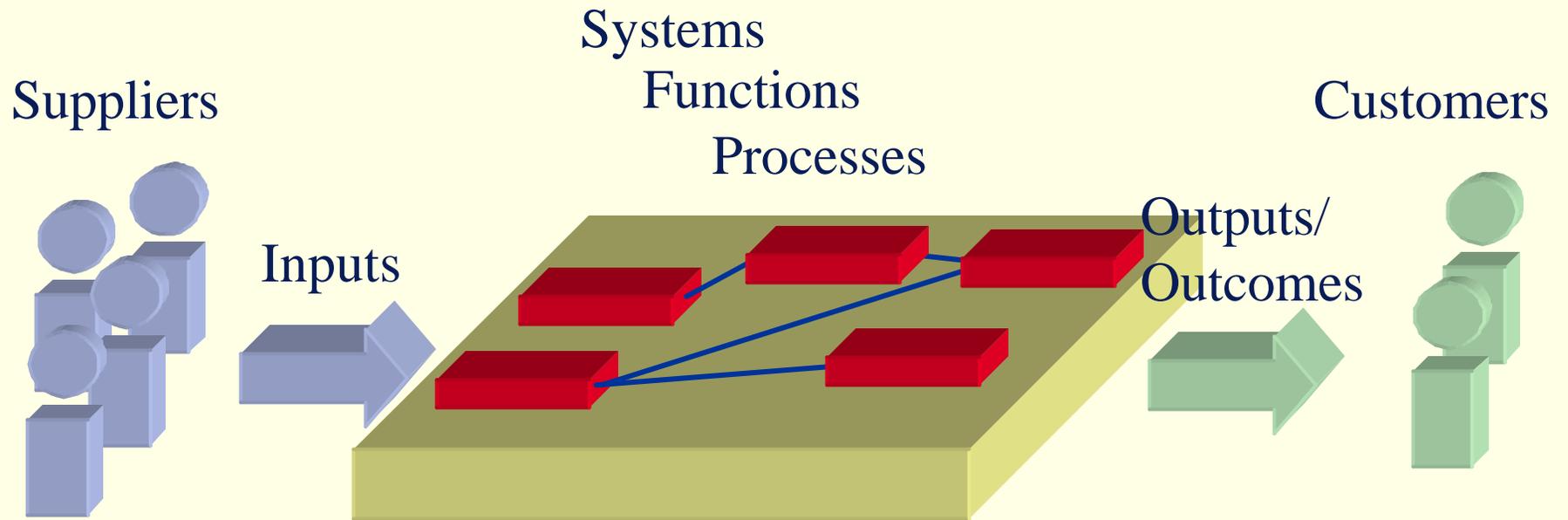
Presentation Agenda

- ◆ The Enterprise
- ◆ The Business Process
- ◆ Fundamental Location Requirements
- ◆ LRS: Meeting Requirements
- ◆ Conclusions

The Presentation focus is on understanding what constitutes an Enterprise Location Reference System, and why.

The Enterprise

The Enterprise System



What are Enterprise Systems?

- ◆ The enterprise is those entities and agents with a common mission or objective
- ◆ It is not limited by physical organization
- ◆ The only limitation is common interest driven by inputs and outcomes/outputs
- ◆ An enterprise may be broadly defined
- ◆ An enterprise may take many forms

The Business Process

FRANK AND ERNEST

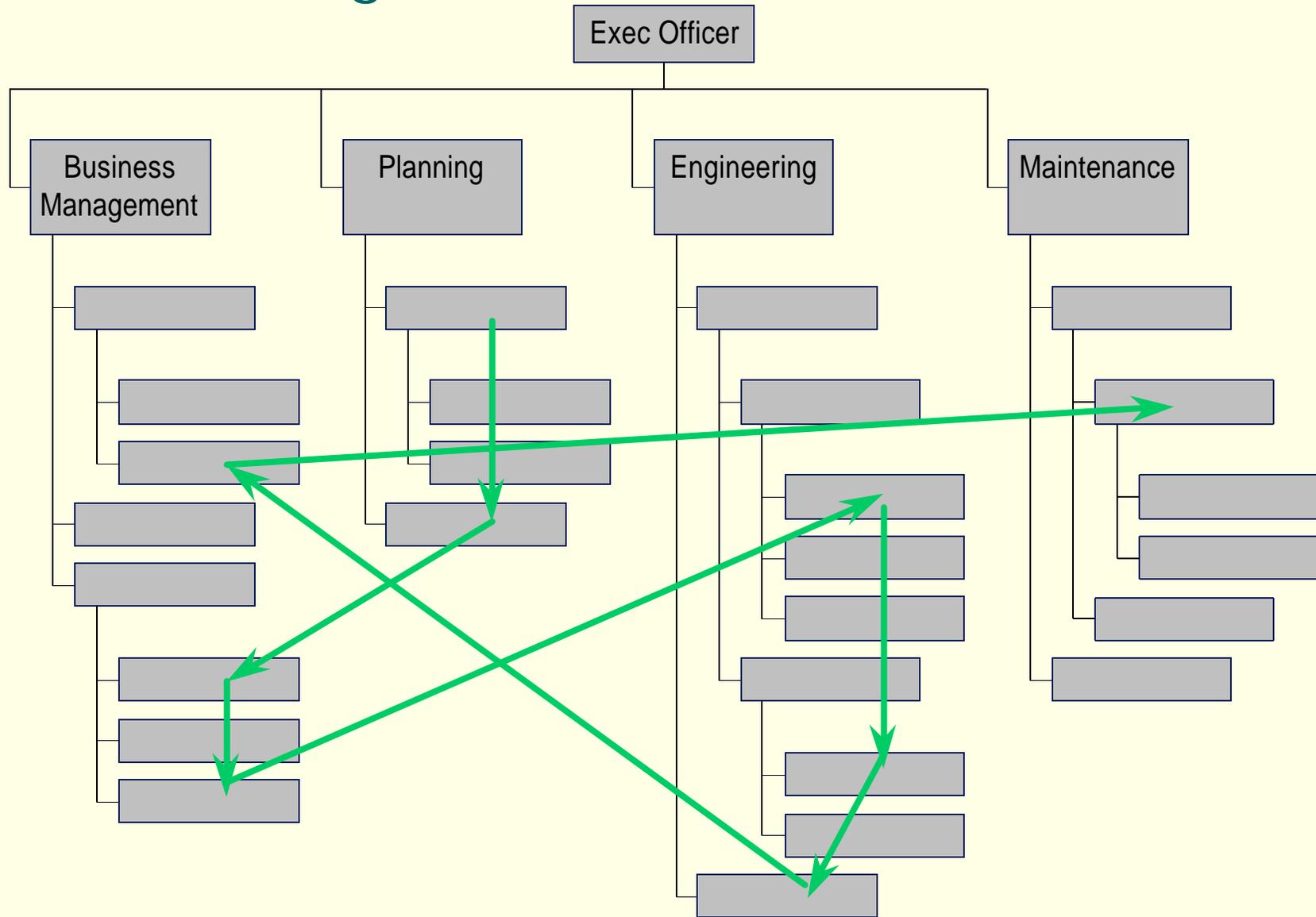
By Bob Thaves



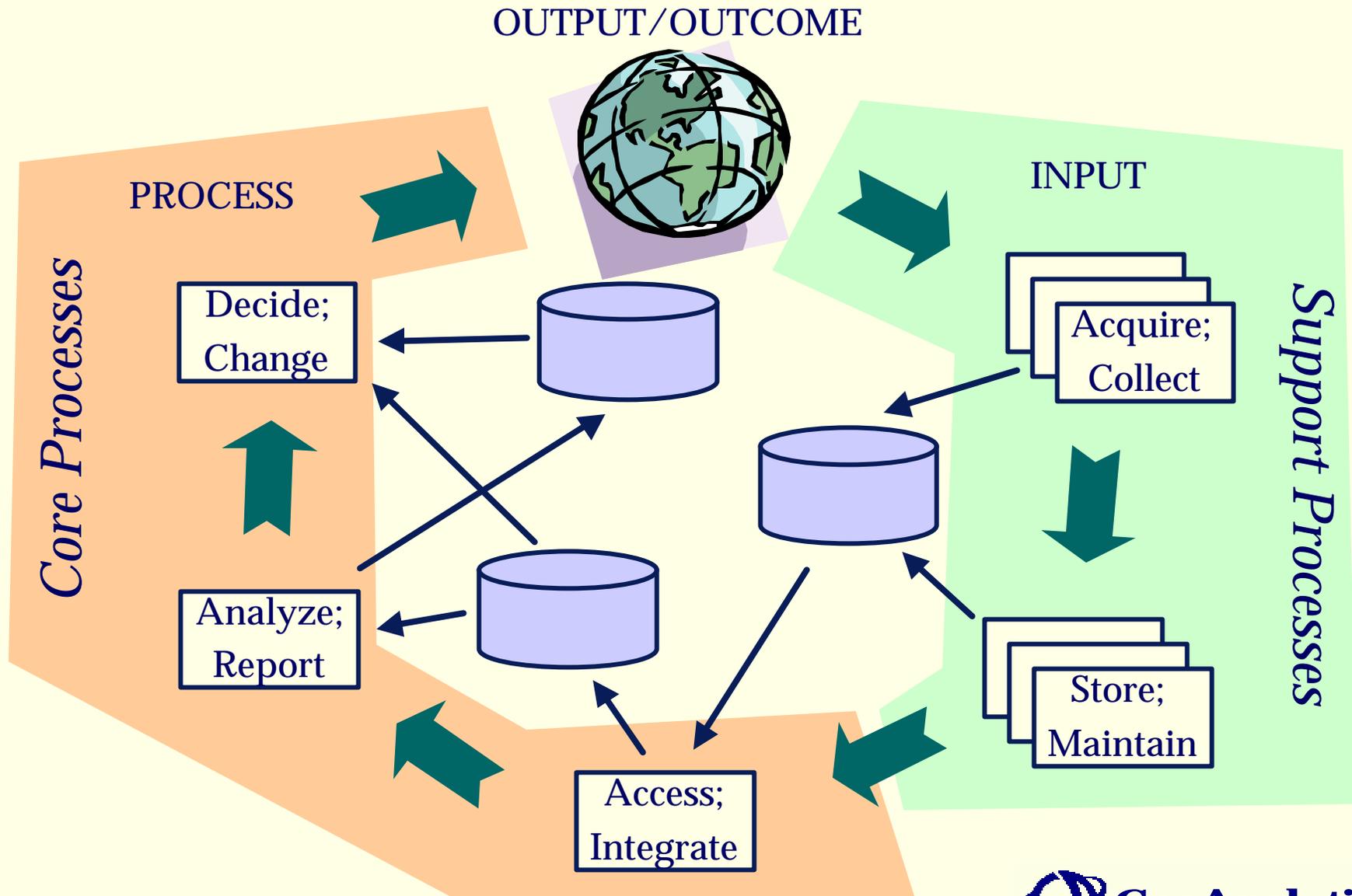
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Process vs Organization



Typical Business Processes



How Do You Fit In?

- ◆ What do you do - support, core, both? If both, other customers make collect/use fundamentally different.
- ◆ Everyone has primary and secondary customers and suppliers. Do you explicitly know; do they agree?
- ◆ How is location recorded throughout the process; does it change form?
- ◆ Do you actually collect and maintain location reference information (light poles, mileposts, routes, etc)? You may be doing this implicitly.

How Do You Fit In?

- ◆ Are you part of a process or do you promote silos?



Winner of the
“It’s Not My Job”
Award

Fundamental Location Requirements

Traffic Monitoring / Management

◆ A. Real-Time Operations

- location-derivations on-the-fly (*easy-to-use*)
- meters (roadway lanes) (*high accuracy*)

◆ B. Planning

- locations over time (years) (*temporal stability*)
- tens of meters (*summarized*)

◆ Data Archiving

- How can location generalization help take A to B?

Acquire / Collect

- ◆ Valid location is critical (effective), but effort should be minimal (efficient)
 - *Accuracy and Speed*
- ◆ Two approaches to acquiring location:
 - explicit (cross-streets, milepost, features, sections)
 - implicit (GPS, cellular, remote-sensing)
 - *Flexibility*

Store (Initially input and then maintain)

- ◆ Enter Once (*from-to versus multiple sections*)
- ◆ Quality Control (*location domains, referential integrity*)
- ◆ Storage (*collected or neutral location form*)
- ◆ Stability Over Time (*section vs route-independence*)
- ◆ Quality Assurance (*row level quality means location quality at “feature level”*)

Access and Integrate

- ◆ Operational versus Decision-Support Forms
 - data mart and warehouse strategies (*location versus pre-defined linkages*)
- ◆ Access - easy to find and read access
 - external org sources (*compatible location*)
- ◆ Extract, Transform, Load (*discovery*)
- ◆ Integrate/Combine (*similar location forms*)

Analysis and Report

- ◆ Complex analytics (*spatial proximity, aggregation; includes linear*)
- ◆ Multi-variable analyses (*graphic interface*)
- ◆ Reporting
 - Tabular (*human-friendly linear reference - e.g. cross-streets*)
 - Map (*various scales imply various resolutions*)

Decide and Implement

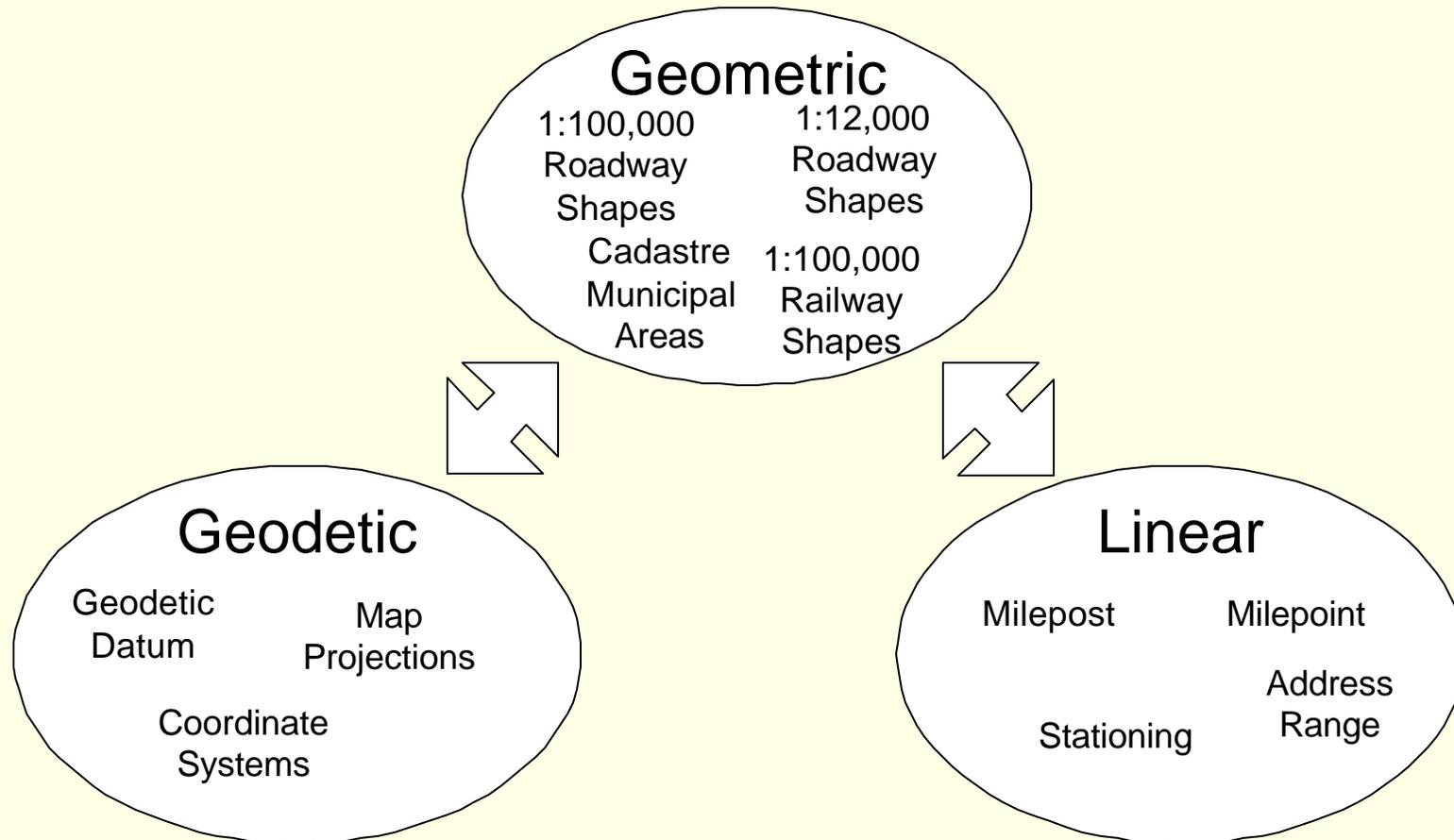
- ◆ Multiple Audiences (*multiple levels of detail*)
- ◆ Easy-to-see impacts (*graphic interface*)
- ◆ Confidence (*location feature level quality*)
- ◆ Implementation detail (*increased location accuracy*)

Location Reference System: Meeting Requirements

Key Underlying Location Requirements

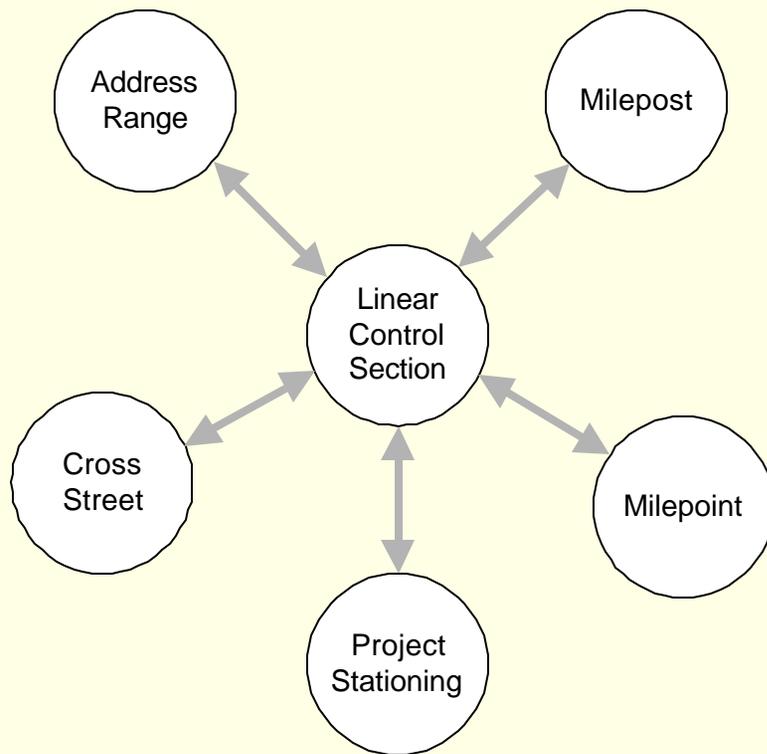
- ◆ Must support numerous location methods
- ◆ Must be able to transform between methods
- ◆ Must allow for analytical discovery
- ◆ Must allow simple presentation of information

Location Reference Groups and Their Relationships

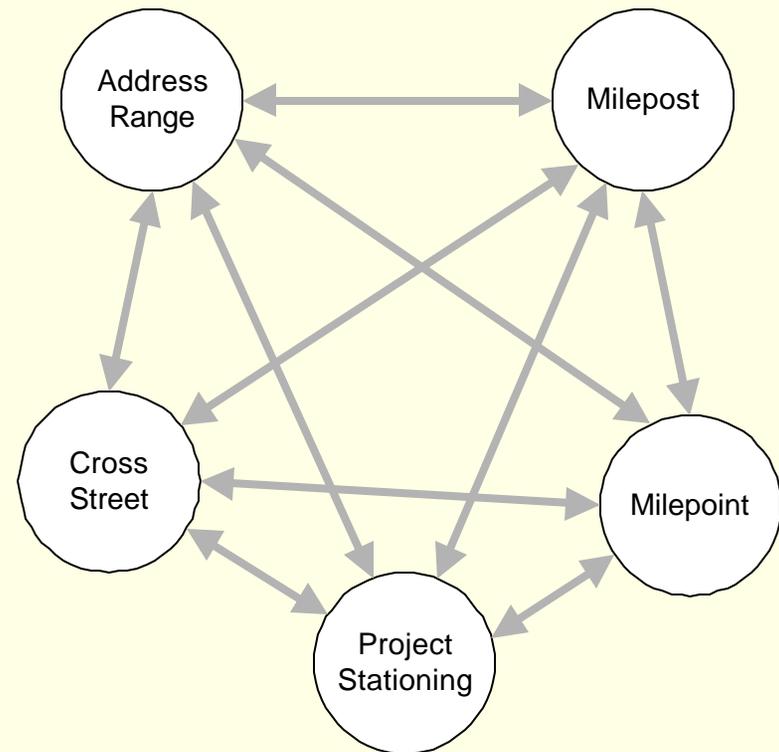


Transform Approach

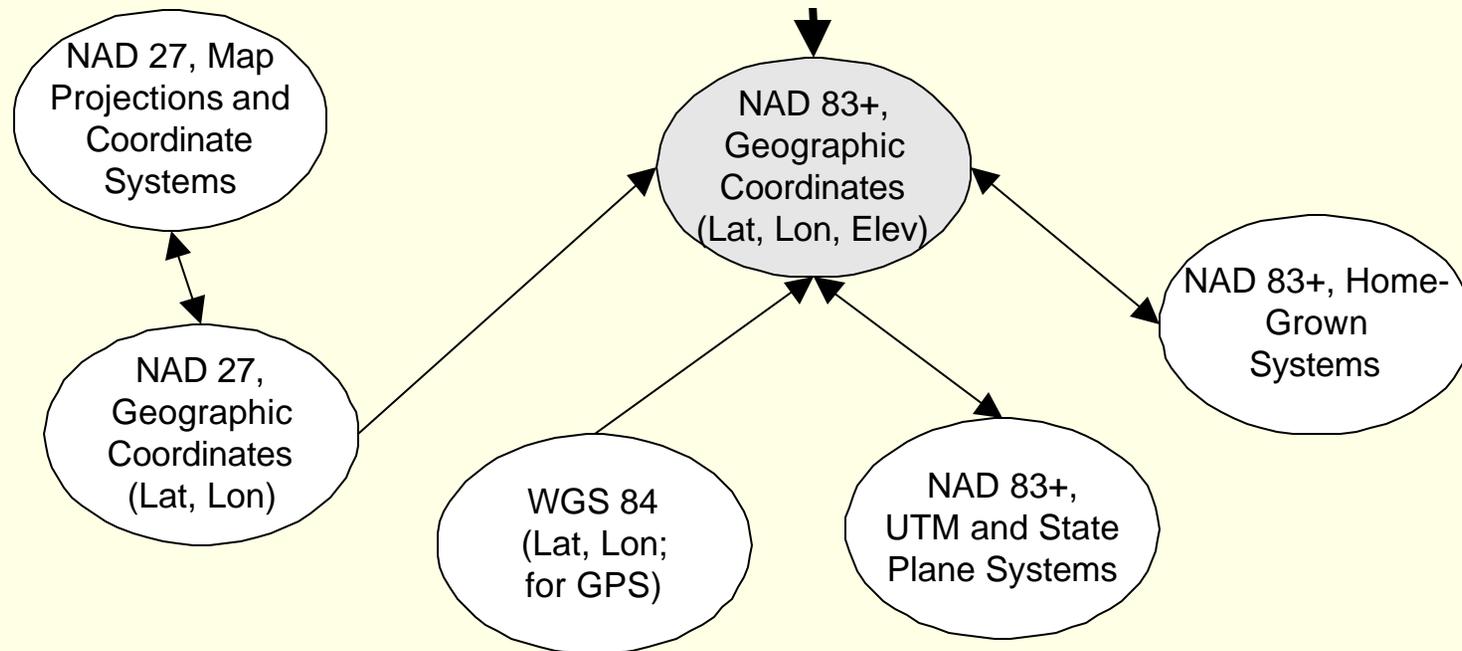
Indirect



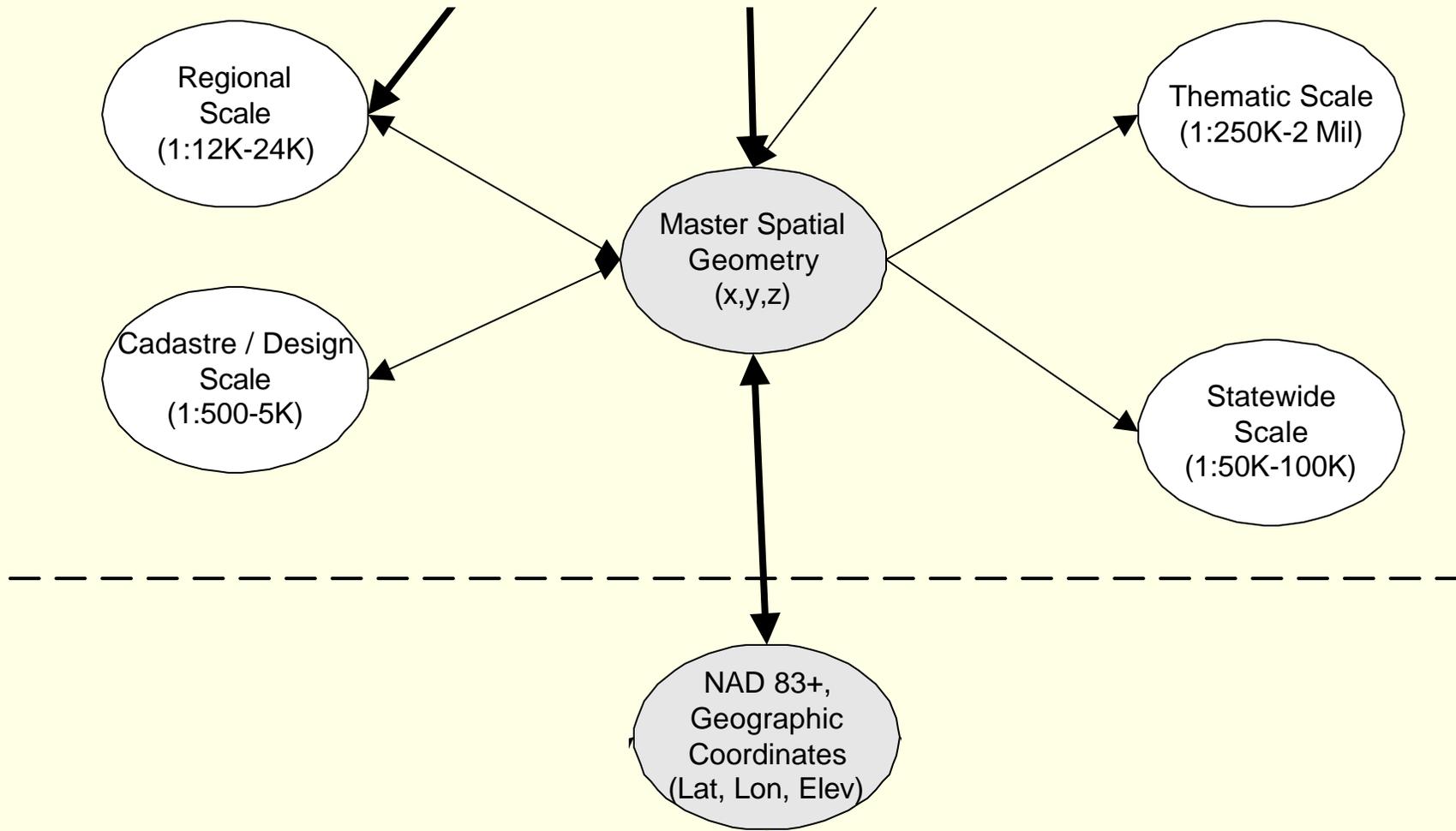
Direct



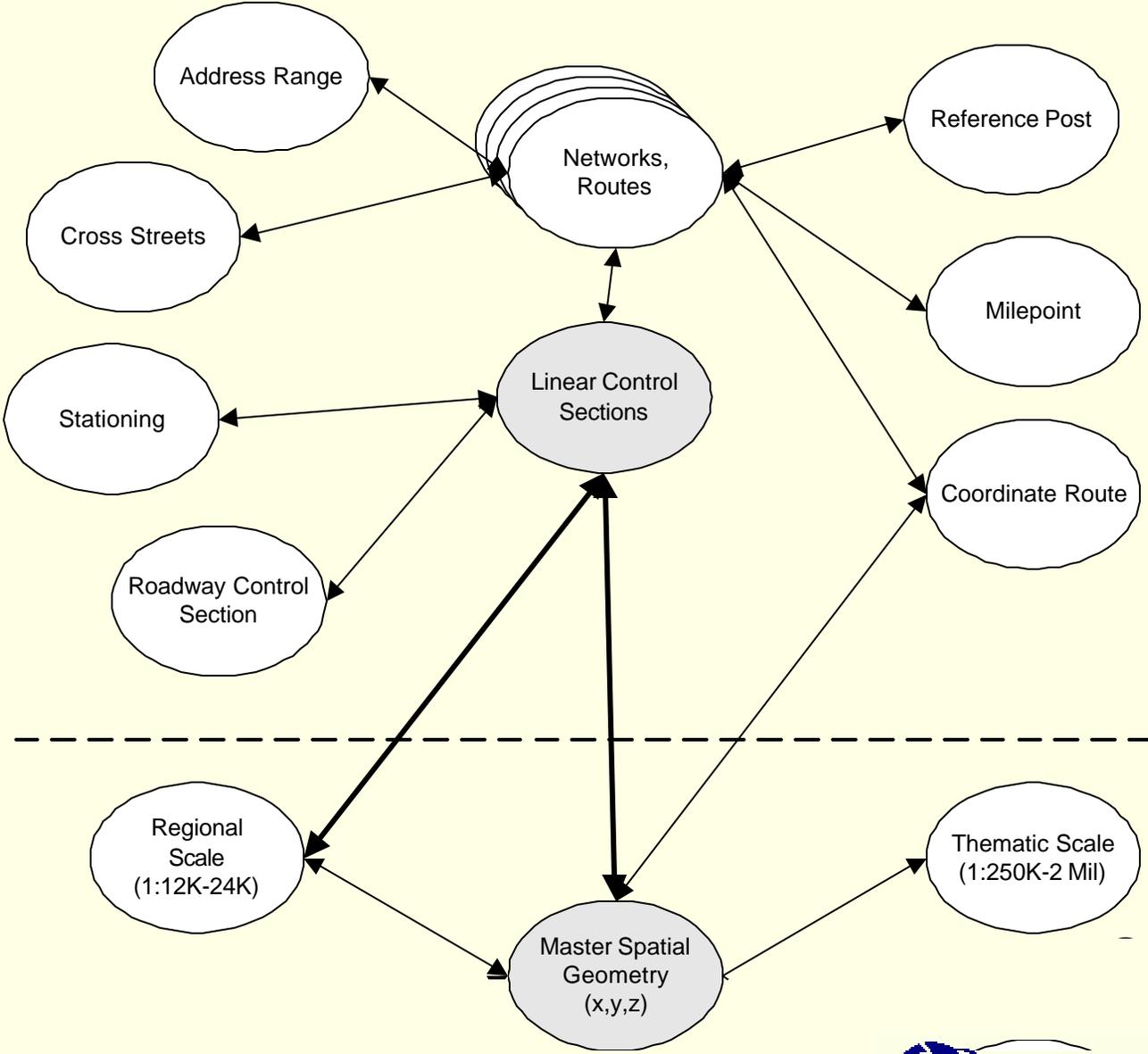
Geodetic Location Reference



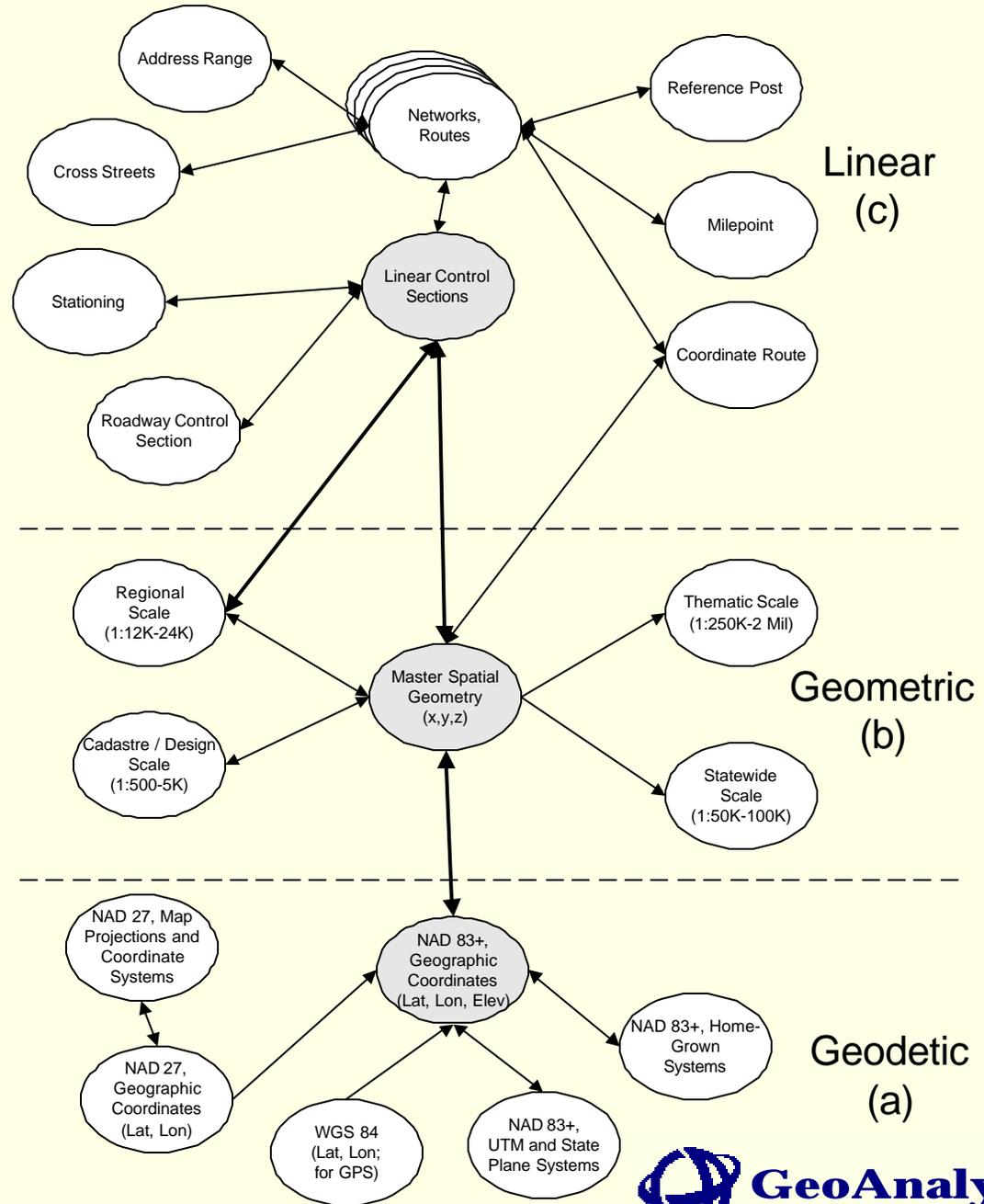
Geographic (Cartographic) Location Reference



Linear Location Reference



Transportation Location Reference System (Asset Management)



Key Underlying Location Requirements

- ◆ Must support numerous location methods
- ◆ Must be able to transform between methods
- ◆ Must allow for analytical discovery
- ◆ Must allow simple presentation of information

How Do You Fit In?

Location Reference Management

- ◆ Which location forms do you use (supplied by someone else)?
- ◆ Which location forms do you create or maintain for yourself or others (you are the supplier)?
- ◆ Do all your enterprise's location forms interoperate (similar to the diagrams)?
- ◆ Are you part of your enterprise's location management group/committee? If you don't have one, should you?

How Do You Fit In?

Maintaining Quality Information

- ◆ Do you help provide data to your consumer in a form conducive to their needs (GPS vs link/node)?
- ◆ Does your location reference supplier explicitly know your quality goals (completeness, positional, temporal, etc)?
- ◆ Do you provide constructive feedback to your location reference suppliers on a regular basis, and do you help your suppliers try to attain your quality goals?

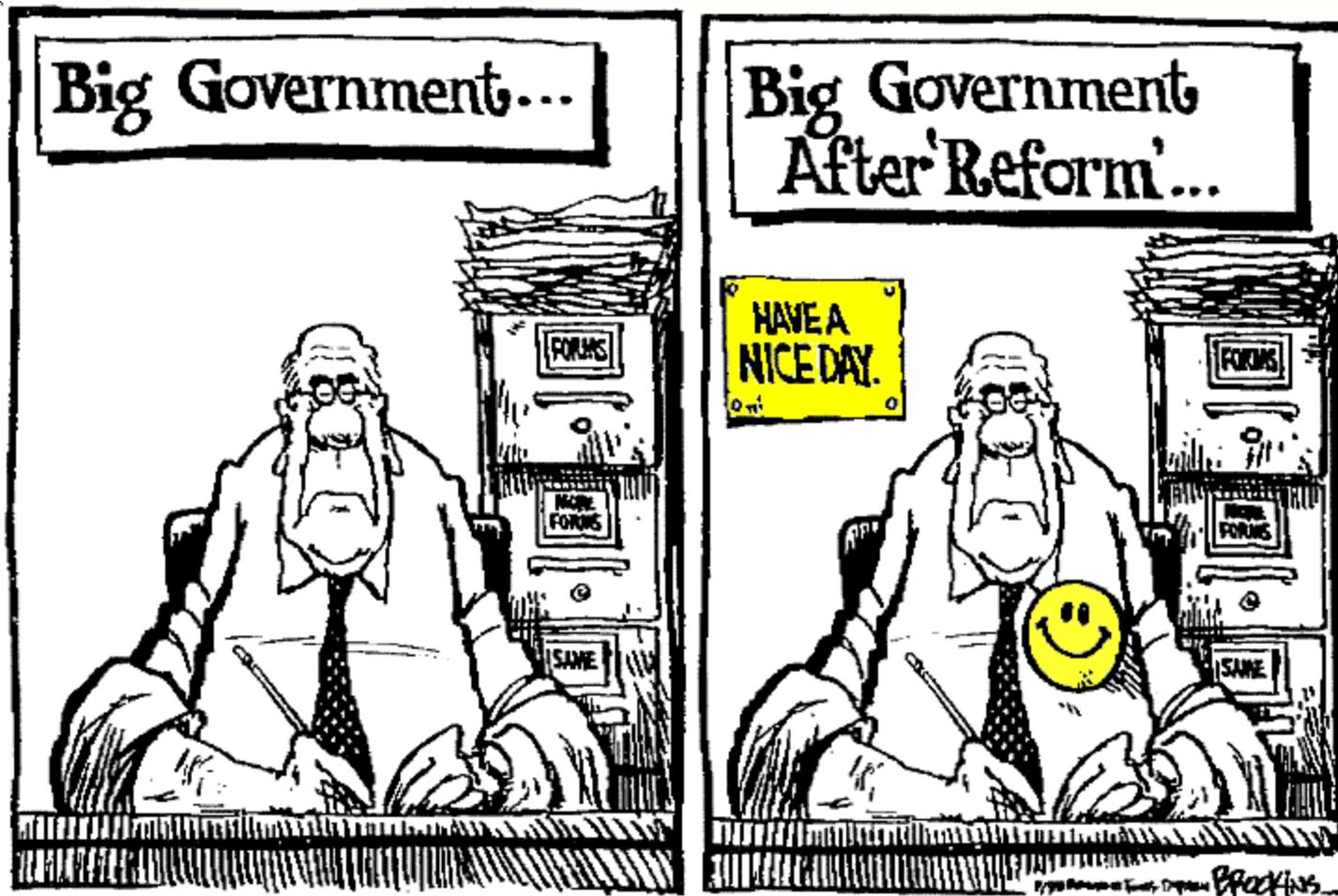
Conclusions

Key Points Today

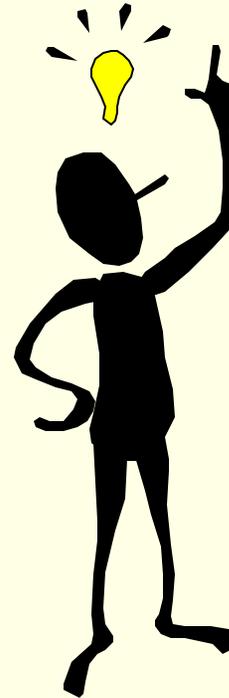
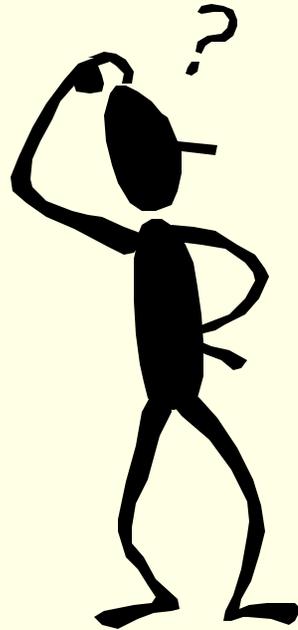
- ◆ Enterprise is not Organization
- ◆ You are part of key processes (COPIS-SIPOC)
- ◆ GIS-T is all forms of location reference
- ◆ For large enterprises, multiple location references are expected
- ◆ For location to be successful, these location references must be managed and at least be interoperable.
- ◆ Making your LRM (use or maintain) part of the LRS makes your data part of the Enterprise.

Key Points Today

- ◆ Becoming Effective/Efficient Requires Change...



Questions or Comments



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