Homeland Security
Geospatial Data Model

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For *whom* are we doing this?
- *the homeland security community*

But *why* build a new model?
- *new requirements, new models*

*Where* will the model be used?
- *across the geospatial community…*

*Technical things*
- *standards-based & open*

And perhaps most importantly, *how* will the model be used?
For whom are we doing this?

- The DHS’ component agencies
  - a standards-based geospatial data model to execute on internal programs
    - facilitates collaboration between disparate communities inside the Department

- The DHS’ external partners in Homeland Security
  - Federal allies
  - Tribal, State, Regional & Local governments
  - Commercial entities & NGOs
But why build a new model?

- Standards are great…it’s a good thing we have lots of them.

- The homeland security brings together many communities
  - A standards-based standard is required

- Technical evolution is driving change
  - IT in general is moving toward services-based implementations
    - Services vs Systems
      - Publish protocols for standards-based connections vs write systems-level custom integrations
  - DHS is required to follow certain Federal standards mandates
    - National Information Exchange Model
      - NIEM addressing construct
    - Federal Geographic Data Committee
      - FGDC framework standard

- Common standards reduce friction, speed adoption, and improve sharing
Where & how will the model be used?

- The geospatial standard inside the DHS
  - baseline reference for a geospatial Metadata Registry
  - template for sharing geospatial datasets
  - cost-reduction driver to eliminate duplication
  - standardized acquisitions & outsourcing guidelines
  - template for common operating views & standard reference

- The geospatial standard (?) for DHS’ partners in the homeland security community
  - Federal partners
    - ‘move-to’ baseline for collaborative geospatial programs
      - What you see is what I see + round-trip consistency for data content – disaster & steady ops
  - Tribal, Regional, State & Local governments + NGO’s and commercial entities
    - Extract, Transform & Load template for content aggregation
      - Standard view for services connections to local user communities, Federal allies, DHS
      - Enables “data flow up” and “information sharing down” the pipeline
Where & how will the model be used?

- A model for pre-staging and assembling geospatial data
  - *The utility of pre-assembled geospatial data is widely acknowledged.*
    - National Governor’s Association – “State Strategies for using IT in…homeland security”
    - National Science Foundation – “Successful Response Starts with a Map”
  - A template for aggregating data prior to sharing
    - A common view at first-level collection aids in the Extract, Transform & Load process later
    - Sharing can be physical (via FTP or email, AKA new-age sneakernet)
    - Sharing can (should!) also be direct OGC services published at the aggregation site

- Defines a common operating picture
  - *Two basic ways to build a nationwide COP for homeland security*
    - One, through a common connection
      - Web-based connections to a common core
      - No web, no COP
    - Two, by defining a common view
      - Local connections to a common standard shared across *all* levels
      - Updated when the web is available

- Drives data creation programs to meet validated requirements
  - *The FGDC, DHS geospatial management office, IP resources, and others have all studied geospatial information requirements extensively*
    - The model aggregates these studies and incorporates requirements from across the Federal homeland security community to a single, approachable and useable standard
The geospatial standard for homeland security
v2.0 is released and available now on the FGDC web site


v2.0 is a major rework of the model
- Eliminated overlaps and re-cast model into flattened, more approachable form
- Incorporated hundreds of comments from across the modeling community
  - But almost none from the State/Local geospatial community
    - More on this to follow…

Now developing v2.0 of an Oracle10g Spatial implementation model
- Expect release on FGDC site within 3+ weeks

Developing an implementation model translation tool – ‘GDM-O-Matic’
- To be released for public use through FGDC site.
- Simple tool to construct format-compliant XML files
  - ArcCatalog converts ESRI XML files to geodatabases
  - NIEM solutions will consume and work with appropriately-formatted XML packets

Actively integrating Nat’il Information Exchange Model (NIEM) to model
- Planning for v2.5 of core UML model in September 2008
Why build the GDM-O-Matic?

- With a name like that, it had to be done

- UML models in Enterprise Architect are not useful at the operational level

- To most GIS managers in the homeland security community, a UML data model might as well read like this:
  
  - внутригосударственной безопасности
  - отображение модели данных

- Because it’s the right thing to do
GDM Interactive Model Site
**Approach**

- Make using the model as easy as possible
- Think beta…
  - *Gather input, build something, get feedback, scrub, rinse, repeat…start on EM & Infrastructure Protection*
- Leverage ArcCatalog XML capabilities
- Allow users to choose parts important to *them*
- Produce something an ArcGIS data manager can use immediately…a geodatabase
- Enable NGA-authorized users to load HSIP data directly into a GDM-compliant geodatabase
- Provide “pure” GDM XML extract option for non-GIS application use
- Construct both web and desktop tools
Using the GDM Utility

Select Domains of Interest

Select XML Format

Select Area of Interest
Output: Geodatabase XML Format

ArcGIS 9.2 XML Namespace

GDM Features transformed Into Geodatabase “Feature Classes”

GDM naming conventions maintained, ESRI-compliant types used
Working with the XML: ArcCatalog
The Geodatabase
Mapping the Data: ArcMap
** Features depicted in this map have been substantially altered and do not indicate actual location of infrastructure. Information provided here is for demonstration purposes only.
- The GDM-O-Matic in action
Next Steps

- Complete ESRI functions for v2.0 of the GDM-O-Matic by mid-July, 2008
  - Construct and release a Windows EXE and Web App
  - Post for comment and open download from the FGDC site
  - Demo complete GDM-to-ESRI feature translation tool at ESRI UC in August
  - Brace ourselves for comments from State & Local geospatial community

- Build to a v2.5 UML model that incorporates NIEM by September, 2008
  - Modify the Windows EXE and Web App to incorporate new export format
  - Post for comment and open download from the FGDC site
  - Brace ourselves for comments from the Law Enforcement community
For questions or comments on the model, please contact:

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