CAD\GIS Interoperability at KYTC

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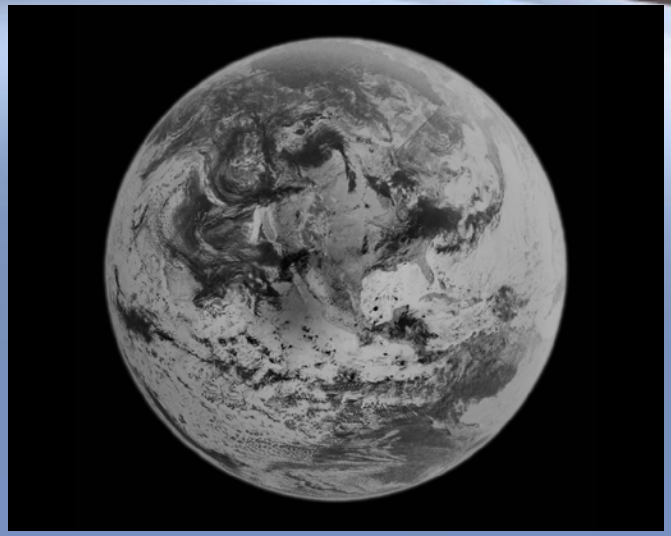
CAD vs. GIS

VS



CAD

Engineering software, usually used to develop detailed drawings of how a civil service should be constructed
(DESIGN ROADS)

GIS

Software used to manage this civil service and answer questions about its attributed data
(MANAGE ROAD DATA)

CAD vs. GIS

- Common Ground
  - Both systems contain spatial information (whether it be graphic elements or spatial attribute data)
  - Both systems are used to solve problems about the earths land and resources

Interoperability Issues

- Microstation's ability to read GIS data has been very limited or non-existent over the years
  - Could have GIS data exported to DXF format
    - However, all graphical data was on the same level and symbolized the same way
    - No Attribute data
  - Most spatial data within the Transportation Cabinet and Kentucky State government is/or has moved to ArcSDE Geodatabases
    - No method to connect to ArcSDE Geodatabases
- Bentley MAP has brought more functionality
    - Fairly new product itself
    - Can now read Shapefiles
    - Can now read ArcGIS Map Files (MXD)
      - However, very slow performance
      - Also required ArcGIS Desktop on each machine and a license

A Product Solution

- In 2002 Bentley Systems Incorporated teamed up with Environmental Systems Research Institute, Inc. (ESRI) to produce an interoperability paradigm that would leverage both the GIS and CAD world
- Bentley and ESRI posed their enterprise connector that would allow the exchange of Bentley Microstation data directly with ESRI ArcSDE Geodatabases
- The connector is called the **Bentley ProjectWise ArcGIS Connector**
- It allows the extraction of GIS data stored in ESRI ArcSDE Geodatabases to Microstation Geographics DGN files. This data can be read and/or manipulated by Microstation Geographics users, with an option to post back changes to the ArcSDE Geodatabase.

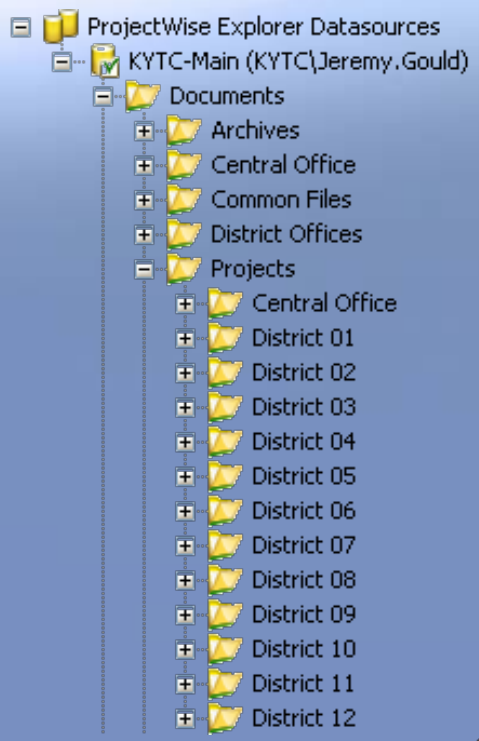
ProjectWise

- Document Management
  - It is used to electronically manage, find, and share CAD and geospatial content, project data, and office documents

  - 1000+ Users
  - 750,000+ Documents
  - Over 1 Terabyte of data

ProjectWise Diagram

- One location for all Project documents



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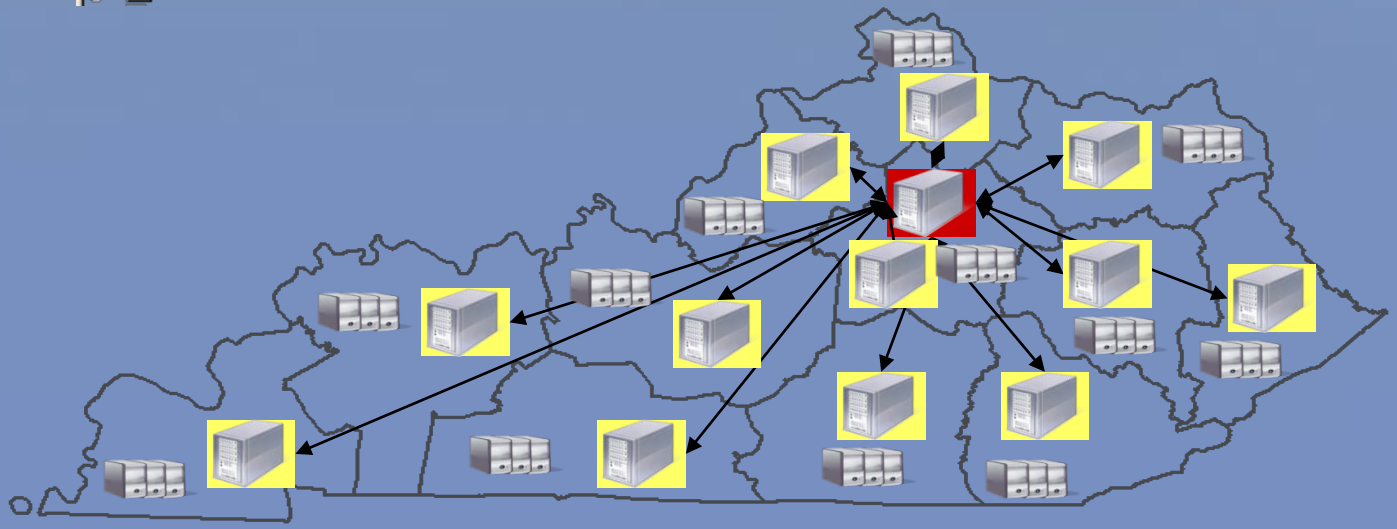
Special Utility Coordination Require...	Special Utility Coordina...	Special Utility C...		30208	Word
R00100LS.dgn	R00100LS	R00100LS.dgn		140288	MicroStation 2004
Outer Loop & US 31E Traffic Signal ...	Outer Loop & US 31E ...	Outer Loop & U...	jeremy.gould	42496	Excel
NOI19210.pdf	NOI19210	NOI19210.pdf		30458	Acrobat Reader
NOI19210.doc	NOI19210	NOI19210.doc		387072	Word

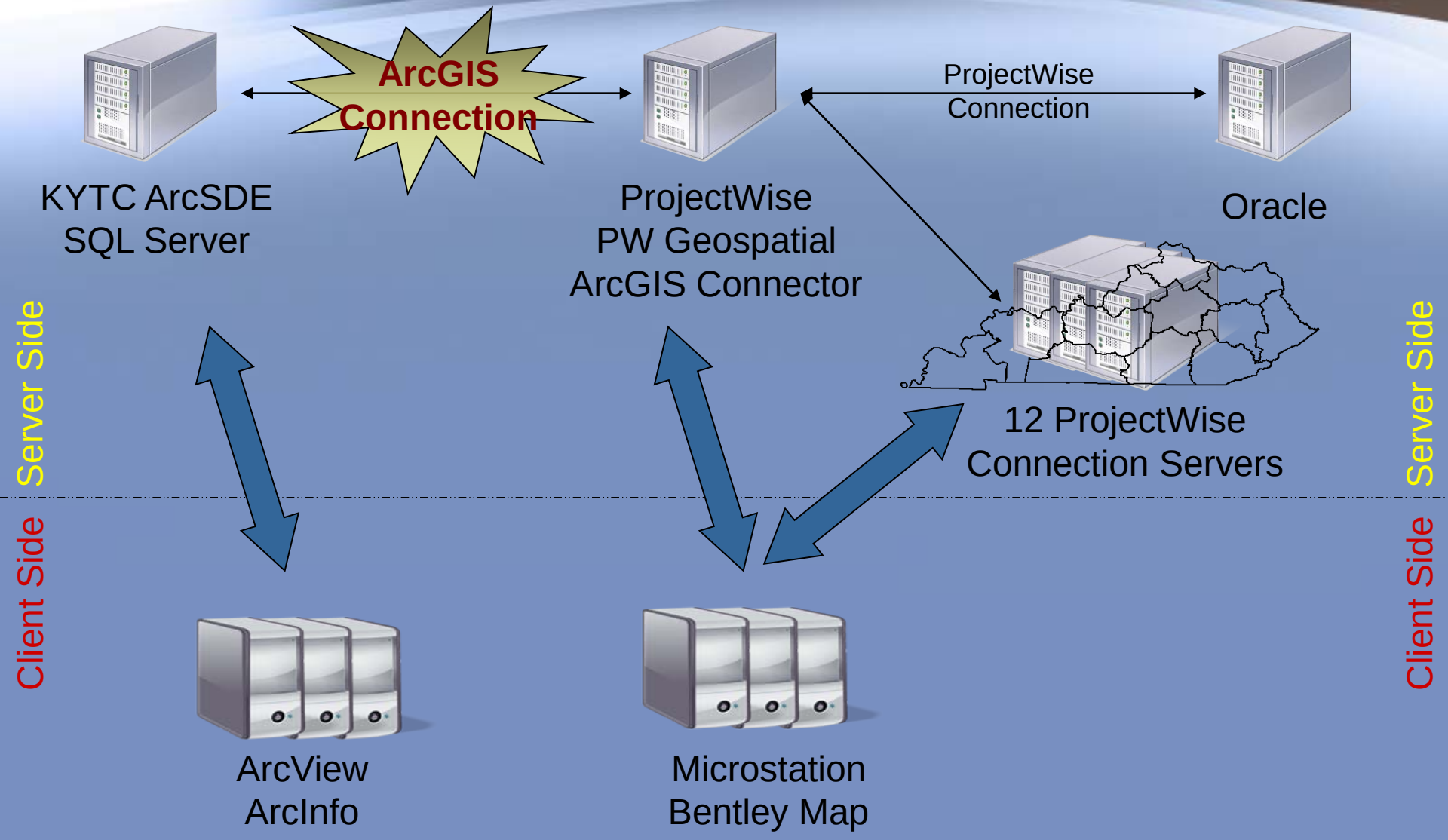


ProjectWise Integration Server

ProjectWise Gateway Servers

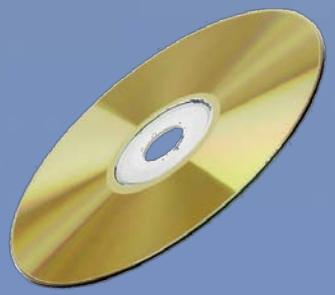
Dozens of ProjectWise Client users

ArcGIS Connector Diagram



Client Software

Client Software



Bentley Microstation V8i SS1

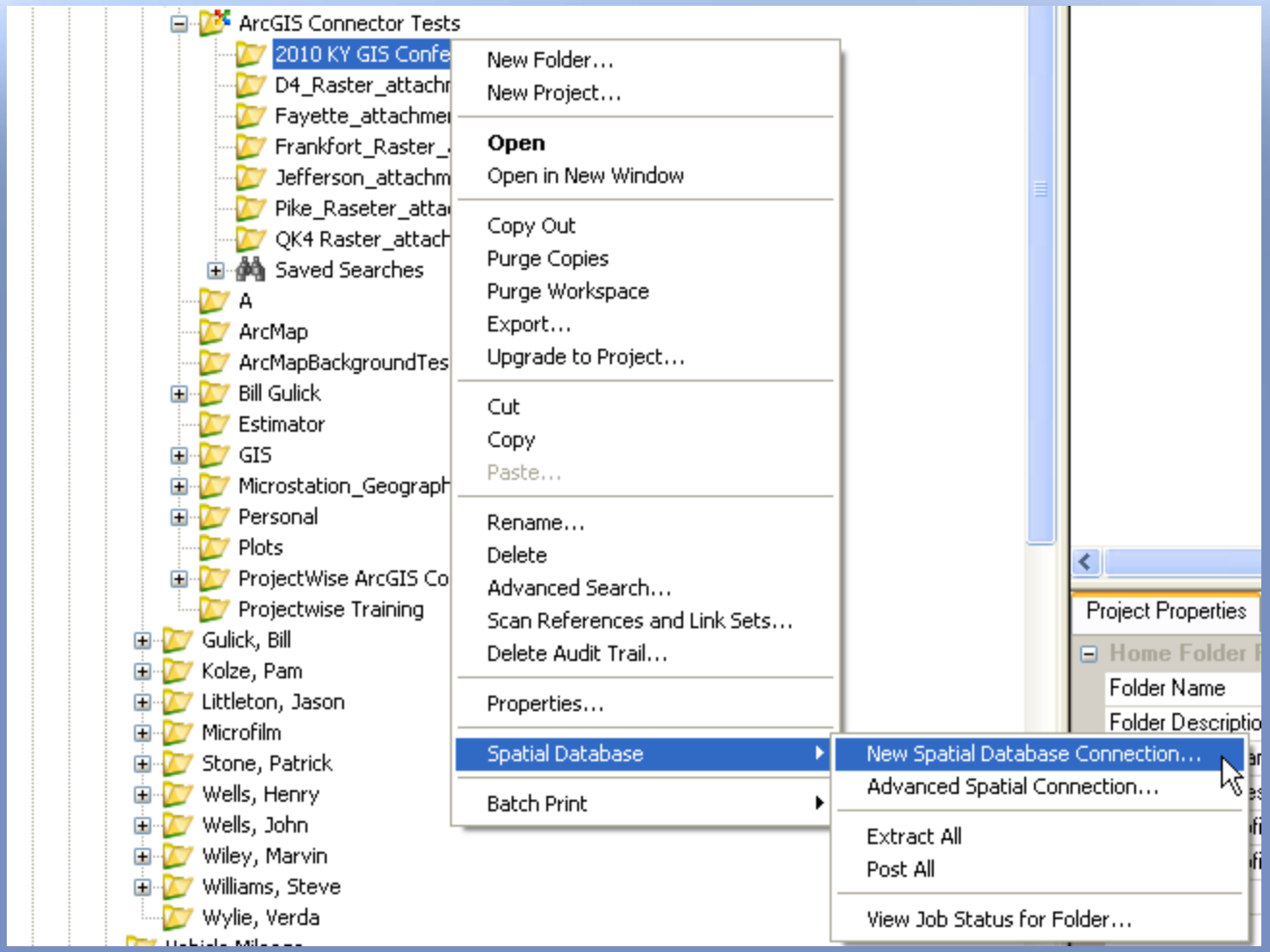
Bentley InRoads/Map V8i SS1

Bentley ProjectWise Explorer V8i SS1

Bentley ProjectWise Geospatial Explorer V8i SS1

Bentley ProjectWise Explorer Extension for the ArcGIS Connector V8i SS1

Extraction Process



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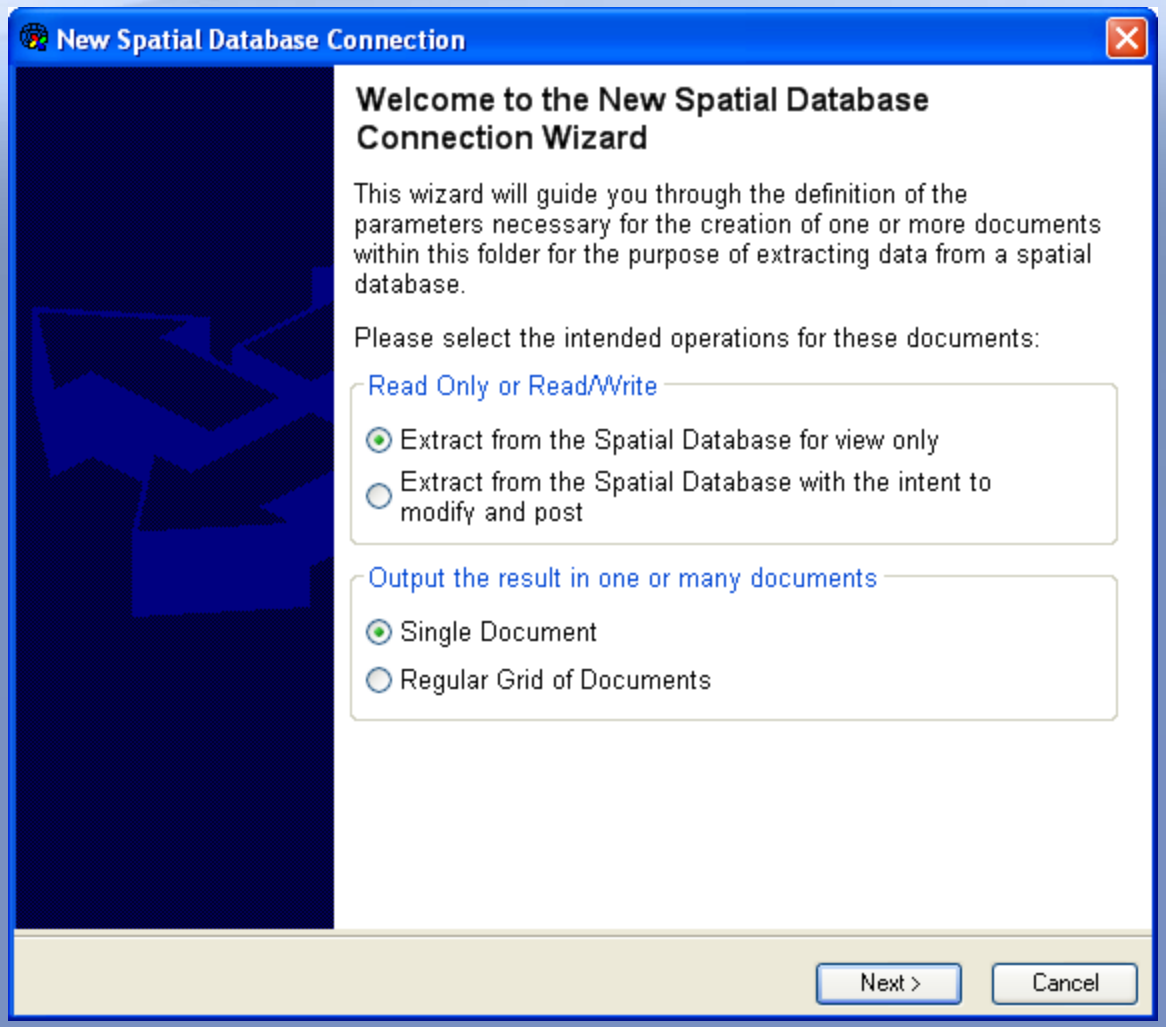
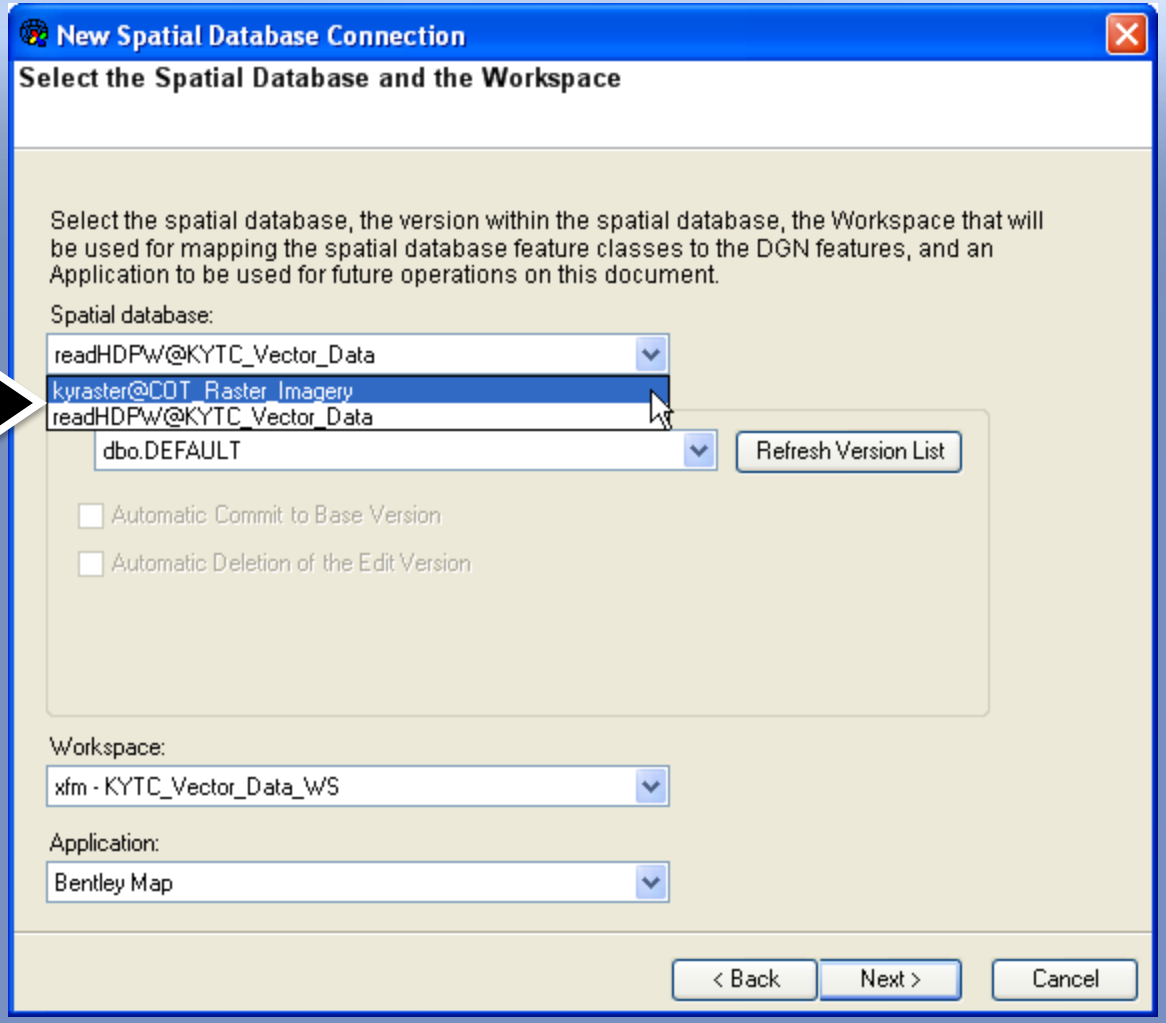


Extraction Process

RASTER
OR
VECTOR
EXTRACTION



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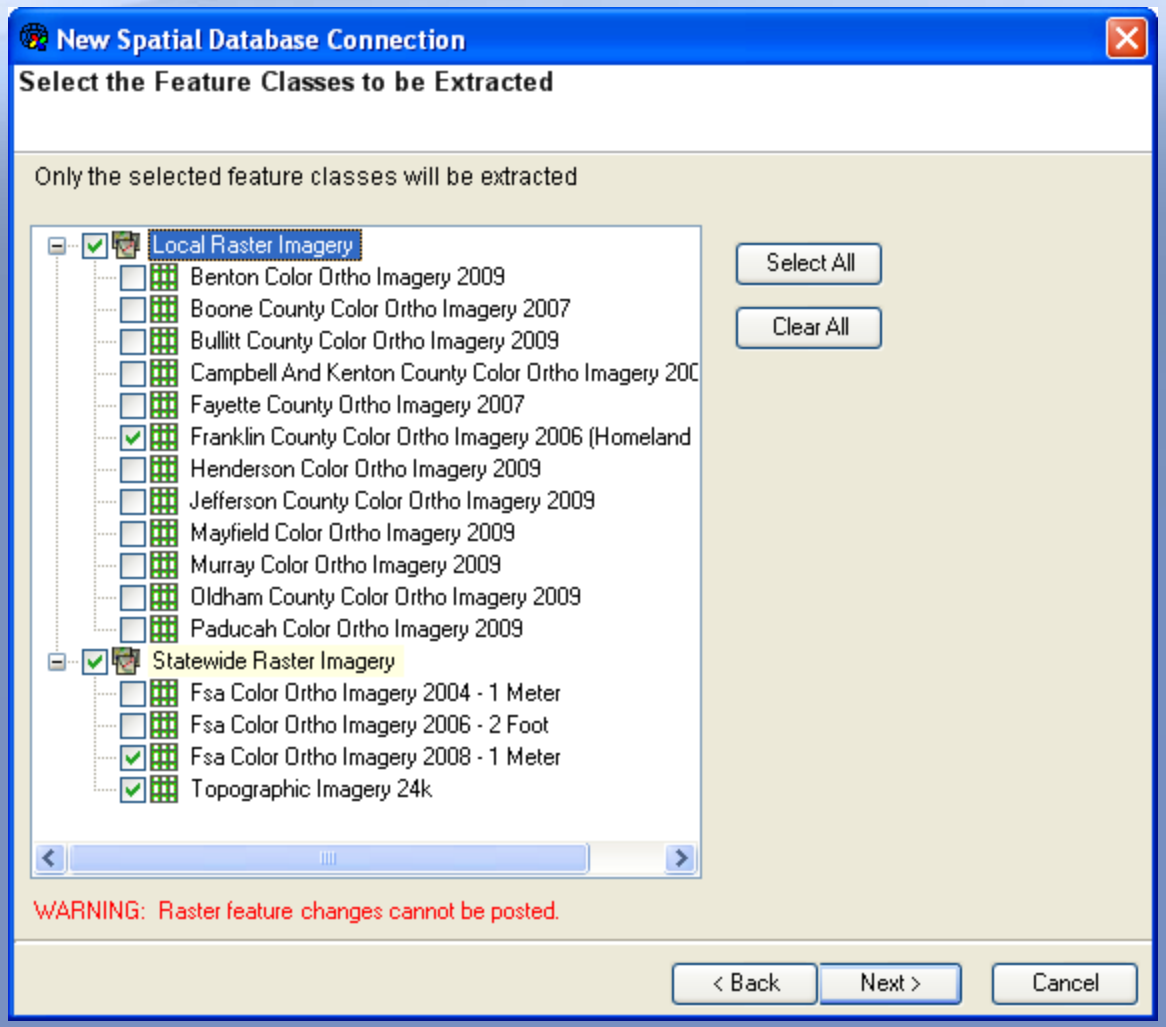

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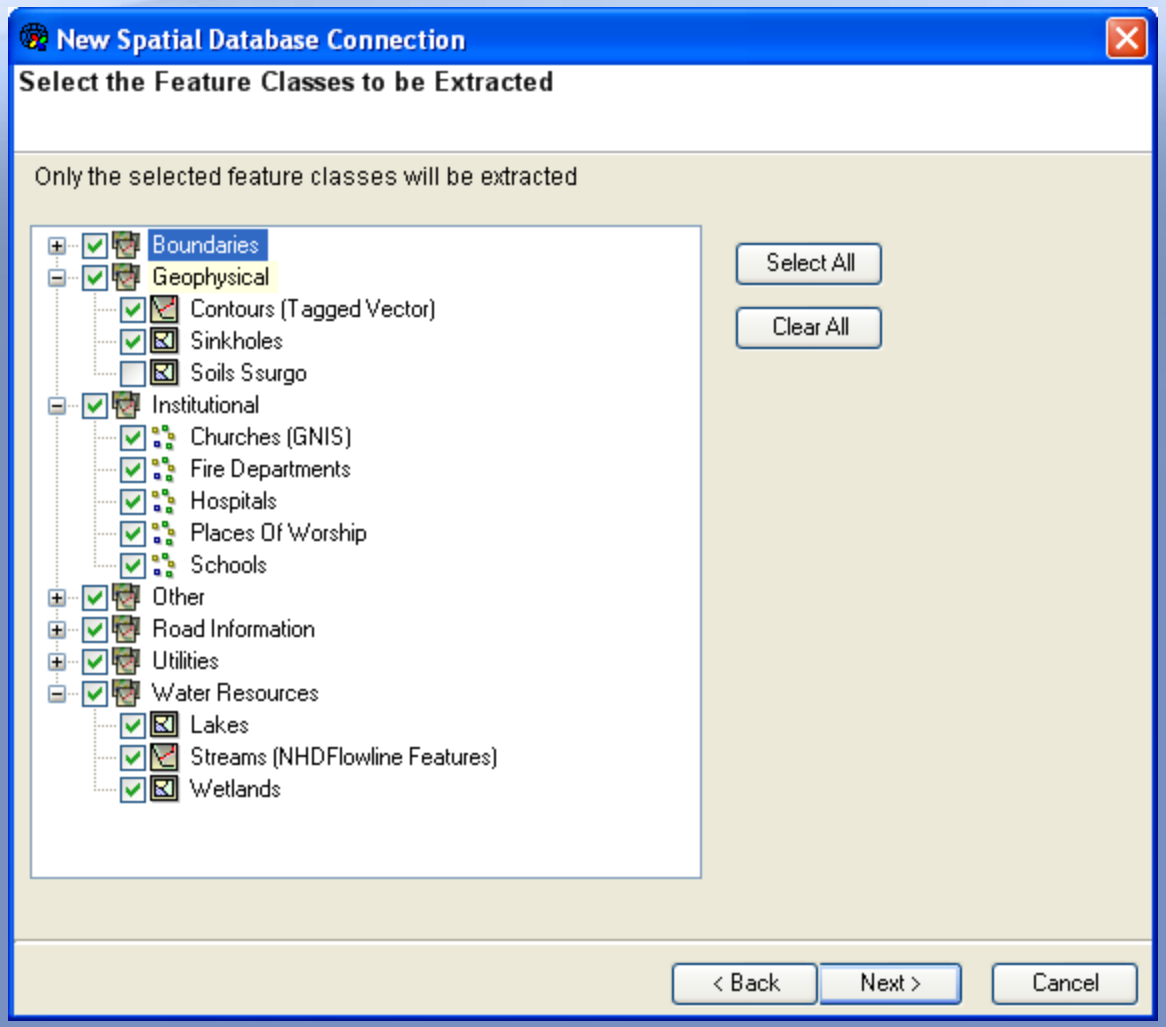

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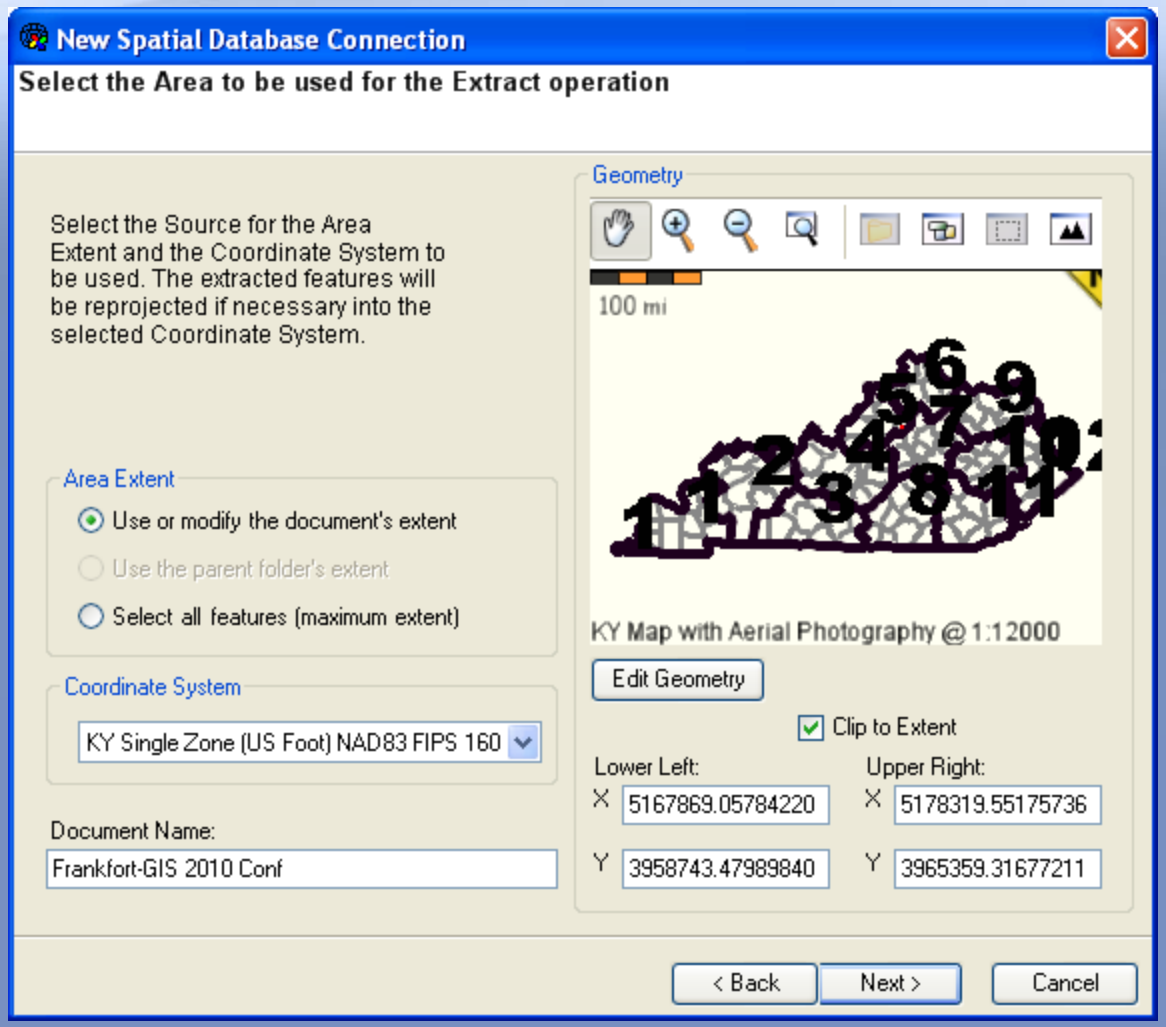

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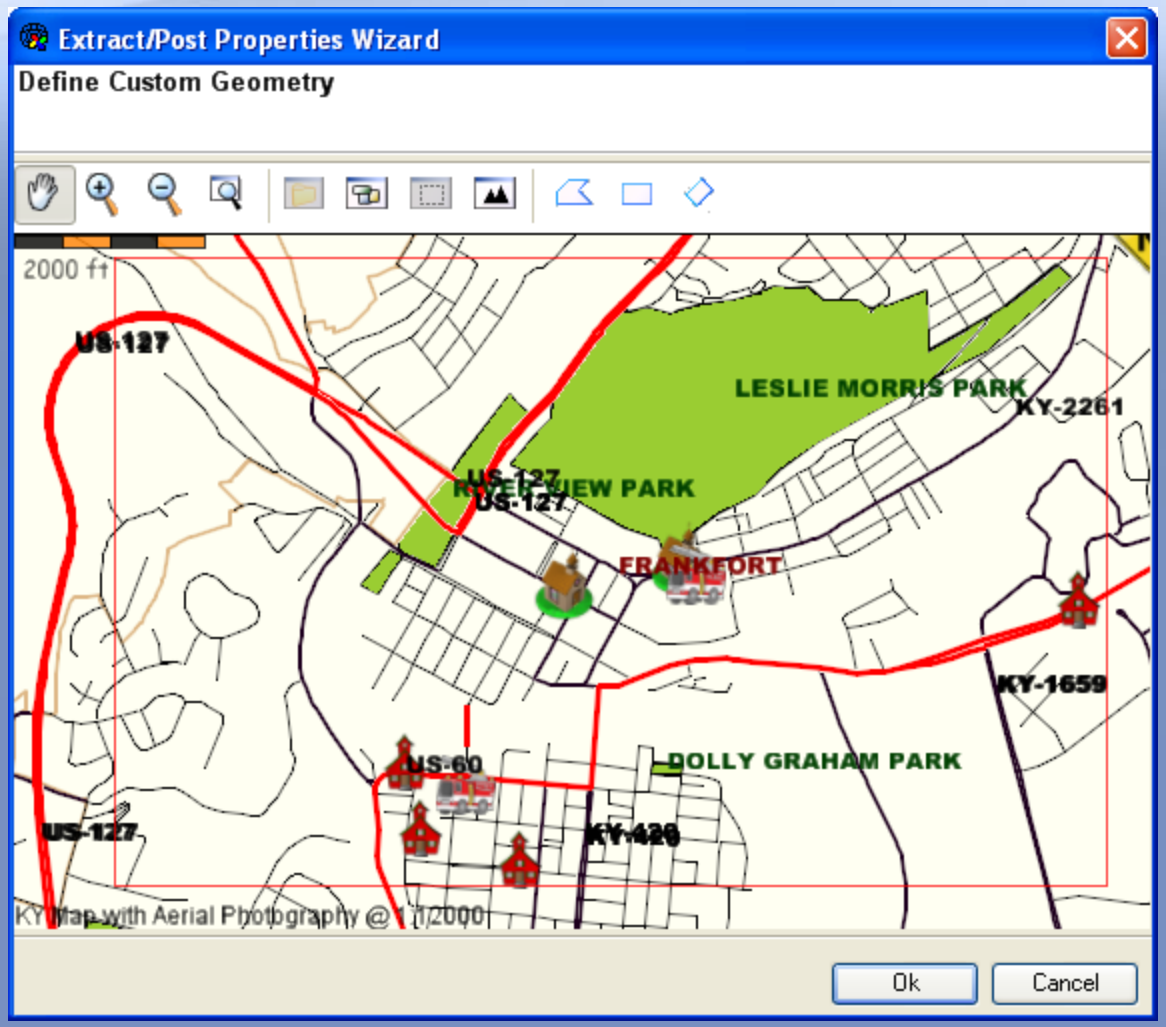

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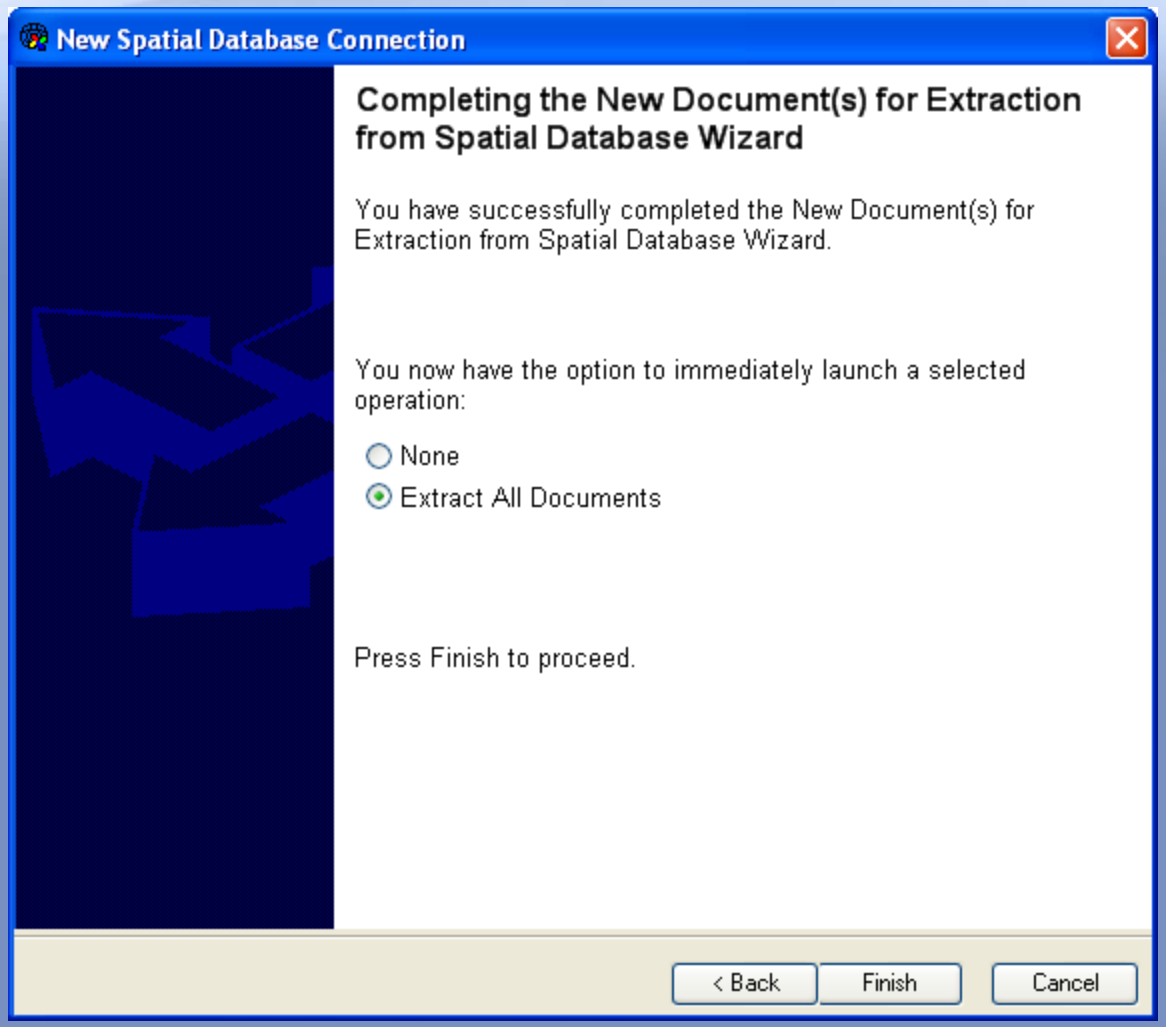
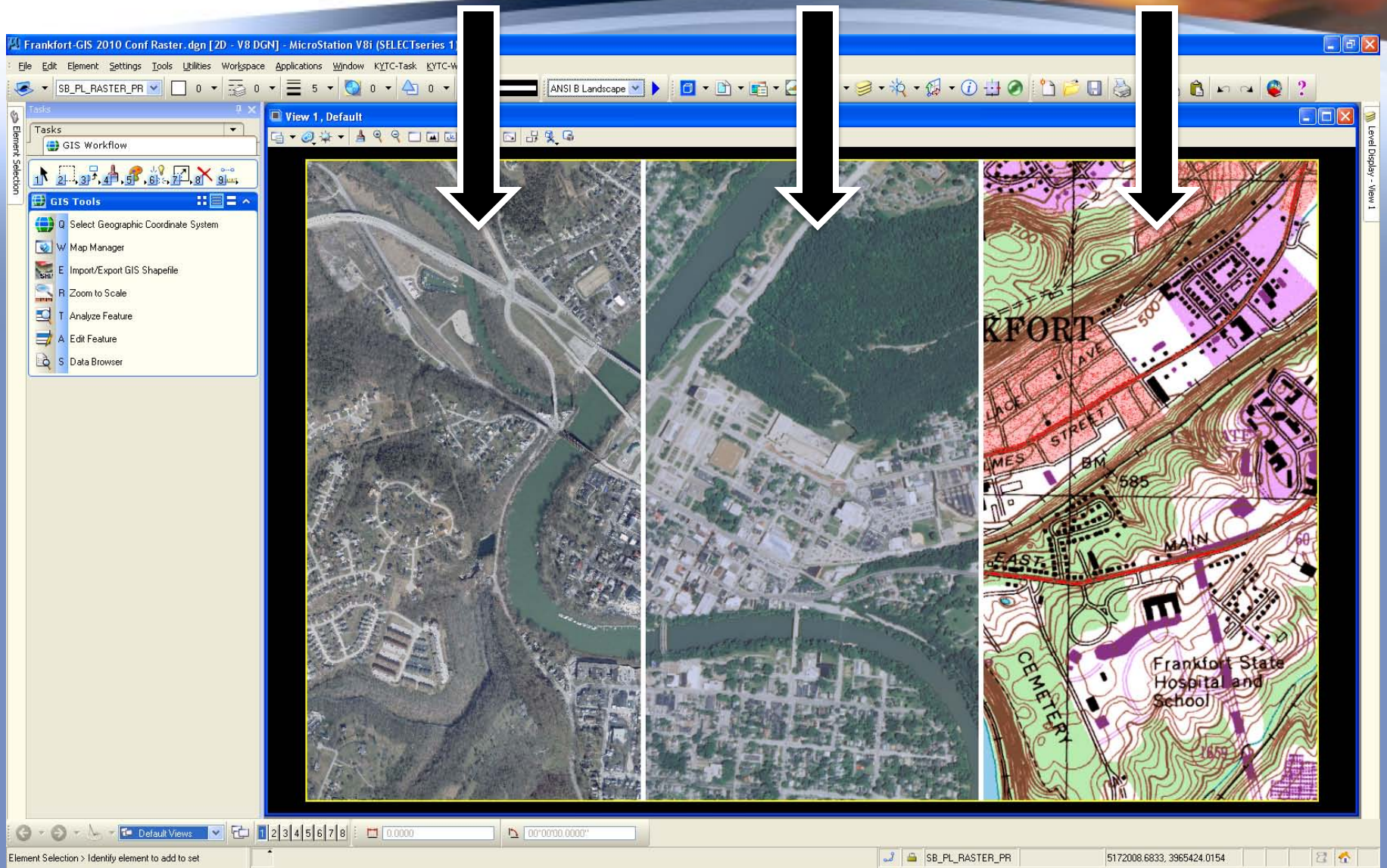
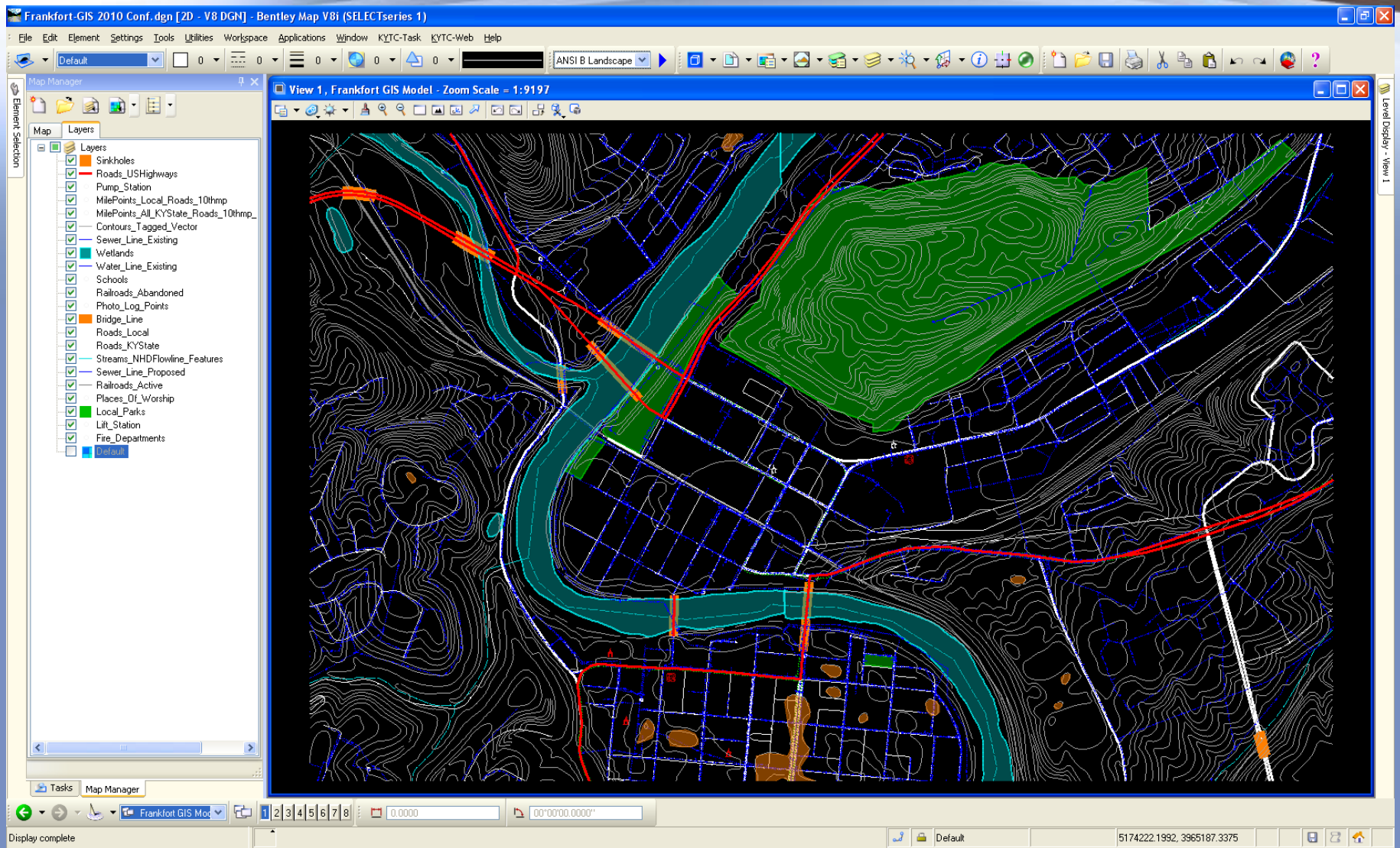


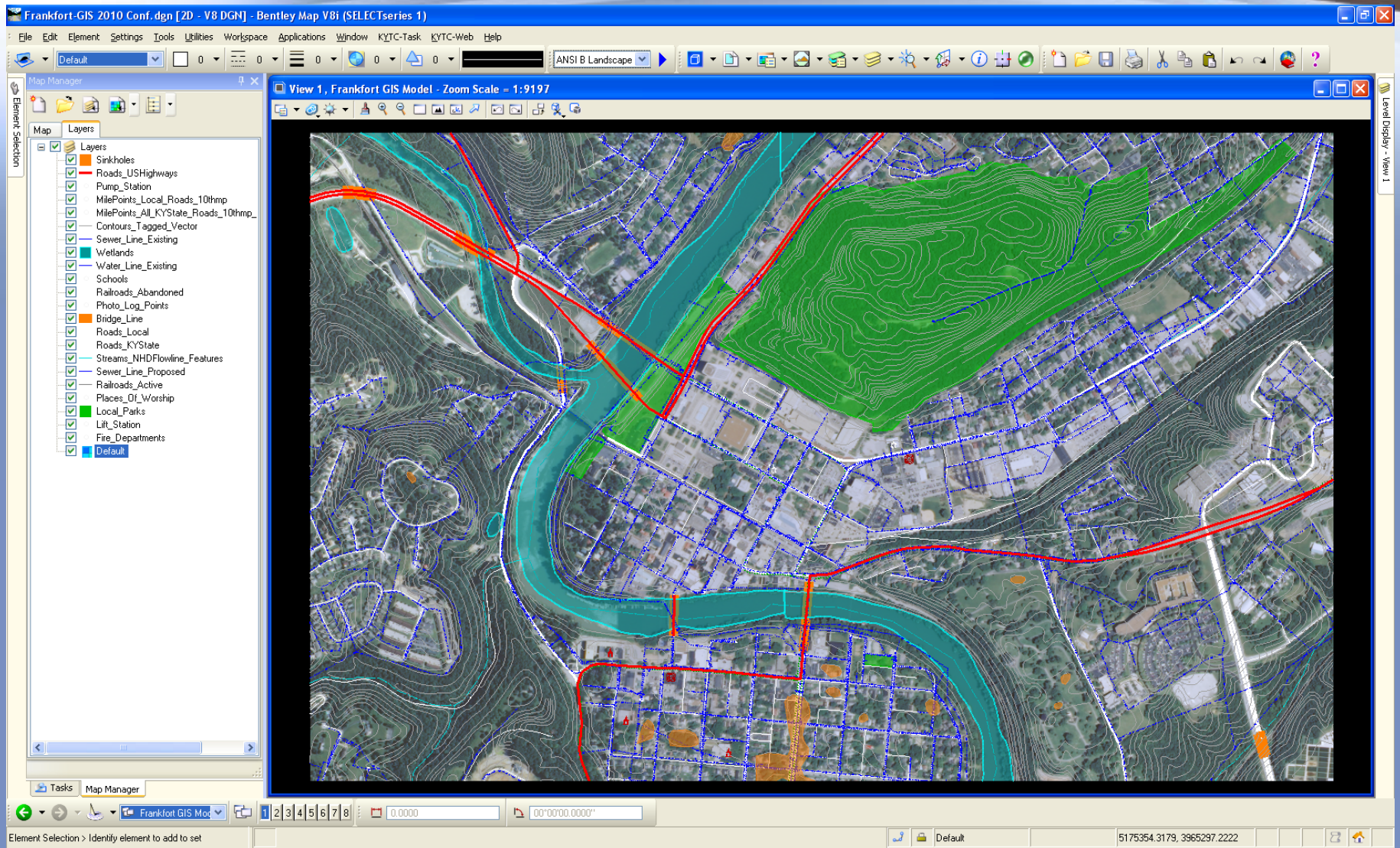
Results: Extracted Raster Data



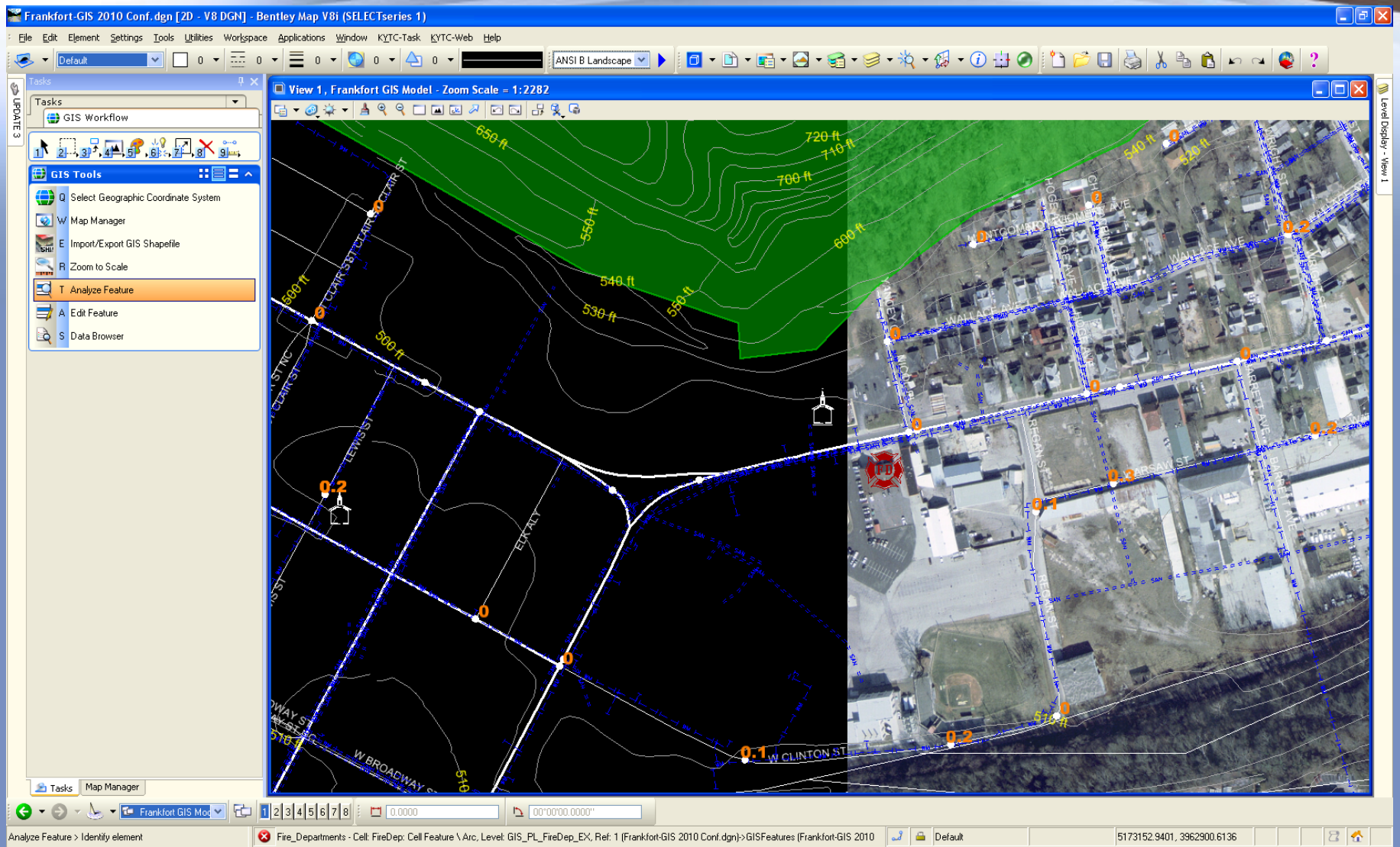
Results: Extracted Vector Data



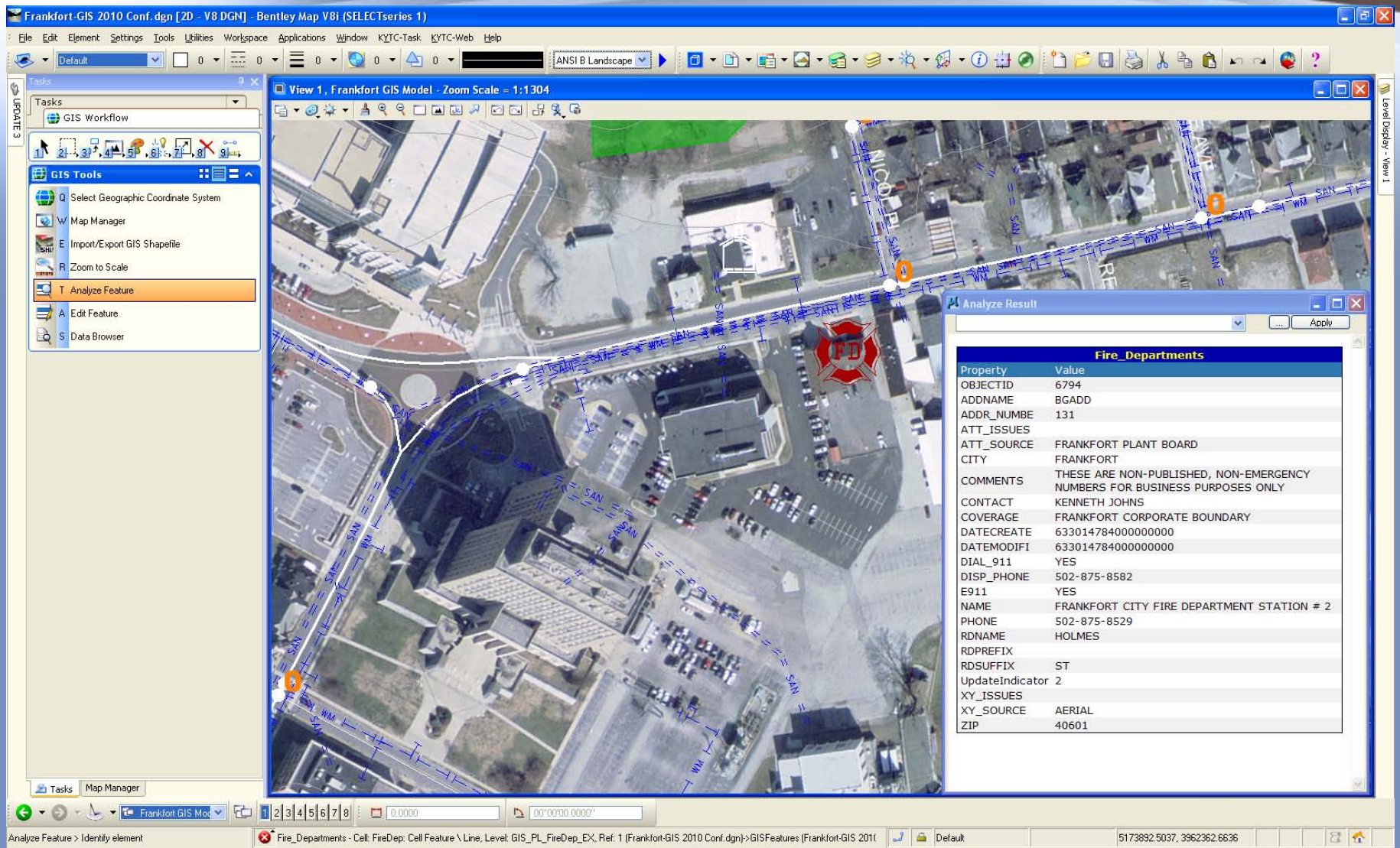
Results: Extracted Vector-Raster Data Combined



Results: Labeling Features based on feature attributes



Results: Analyzing Feature Attributes



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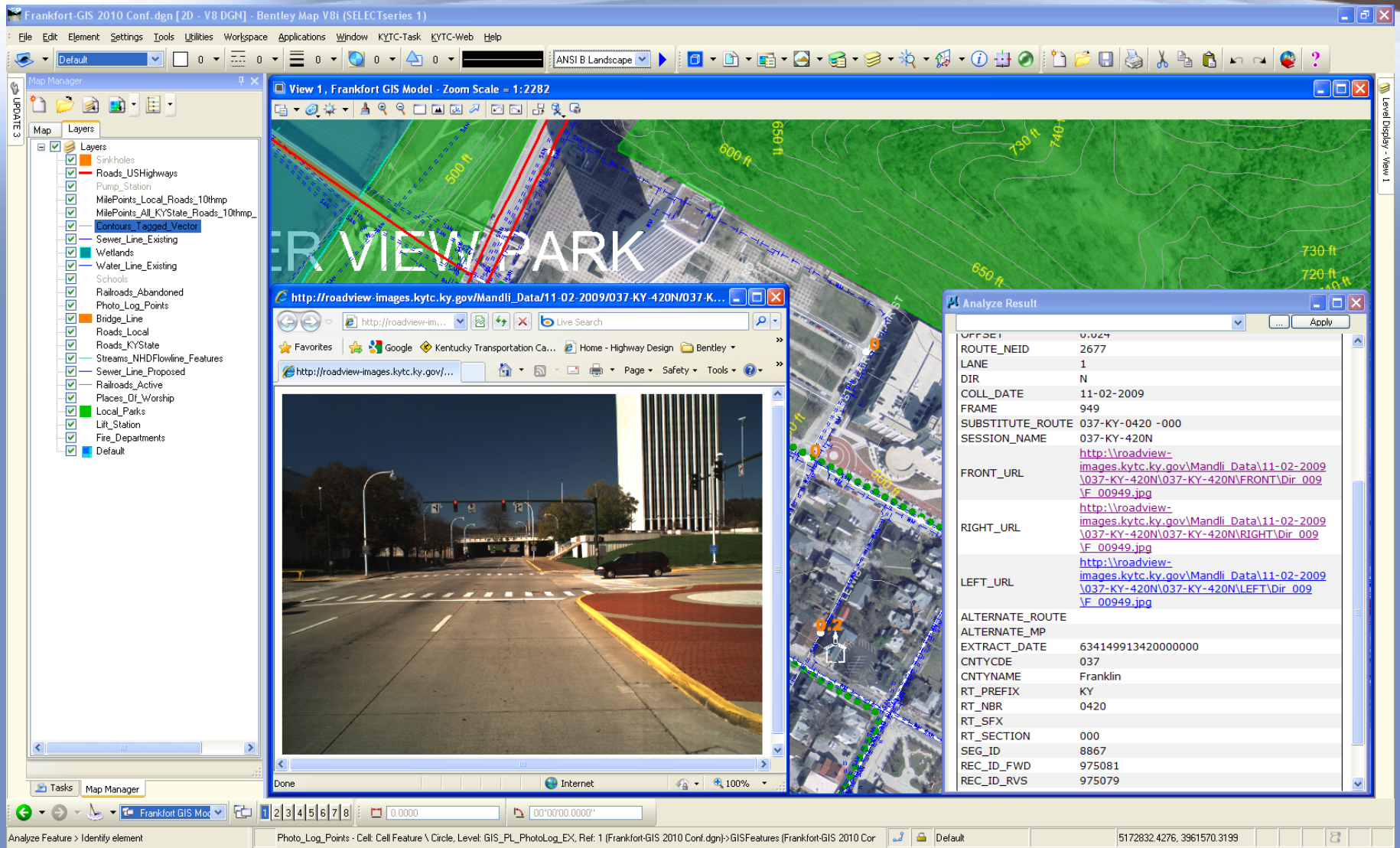
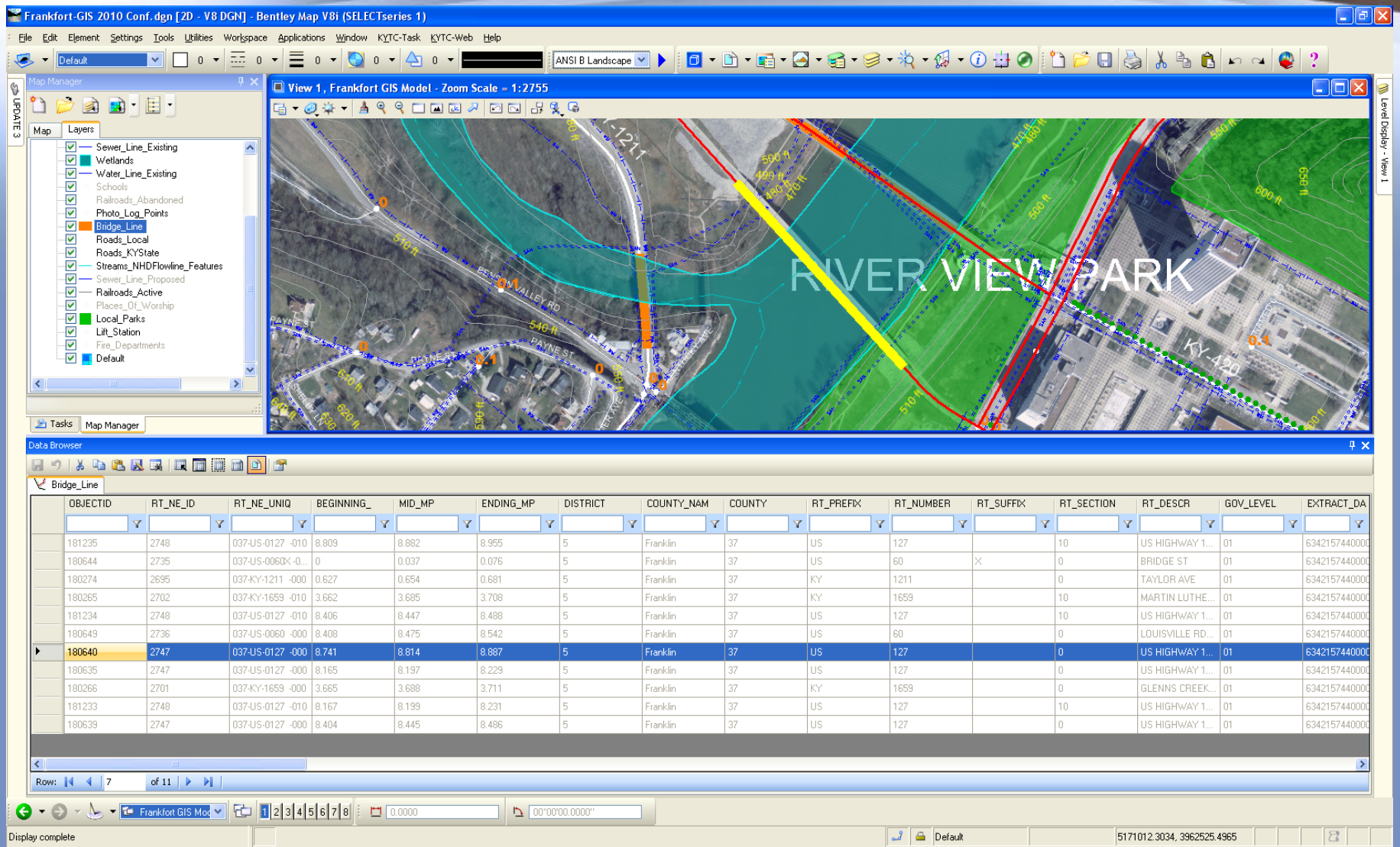
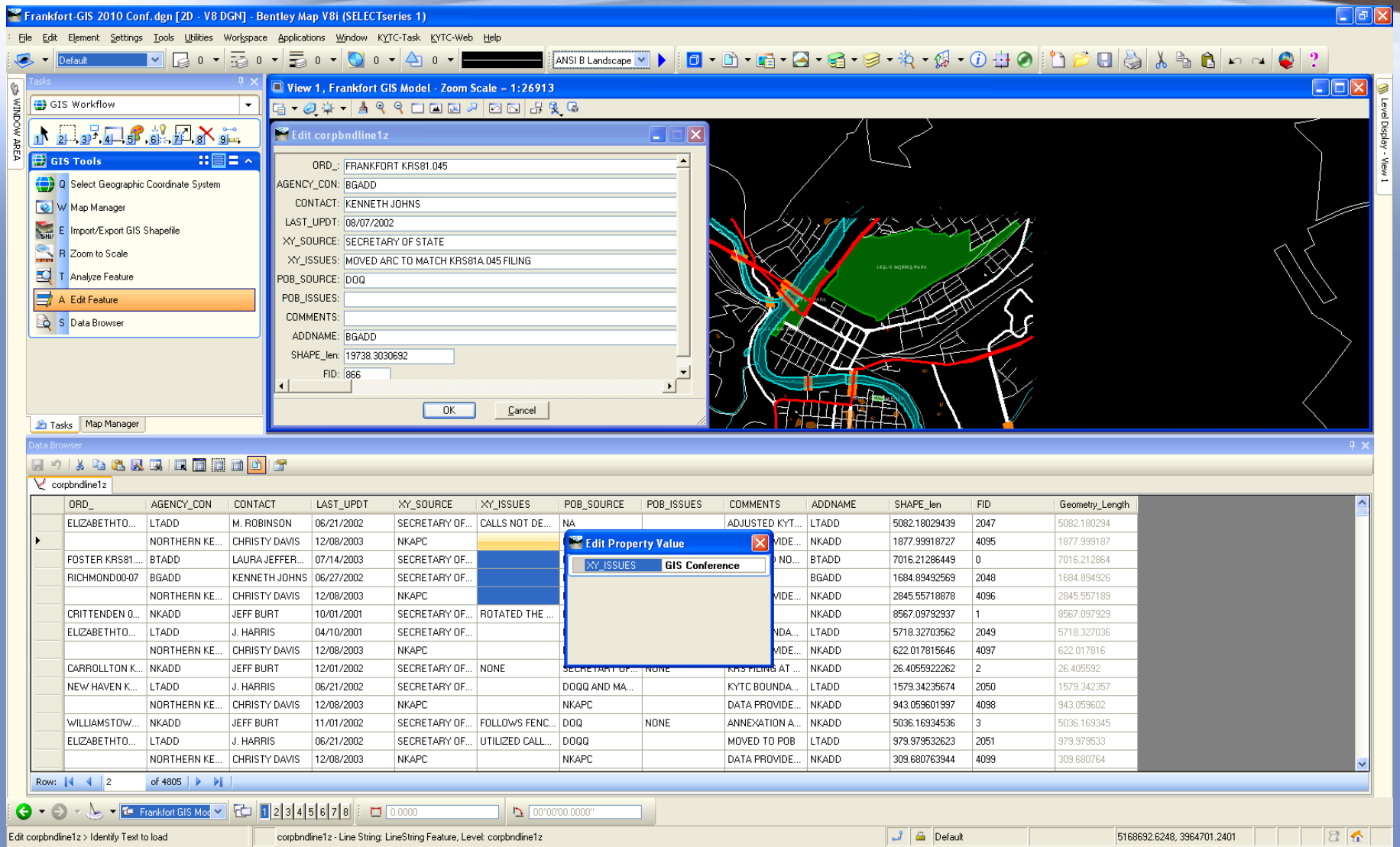


Results: Browsing Data



Editing Feature Data



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FOSTER KRS81....	BTADD	LAURA JEFFER...	07/14/2003	SECRETARY OF...				NO...	BTADD	7016.21286449	0	7016.212864
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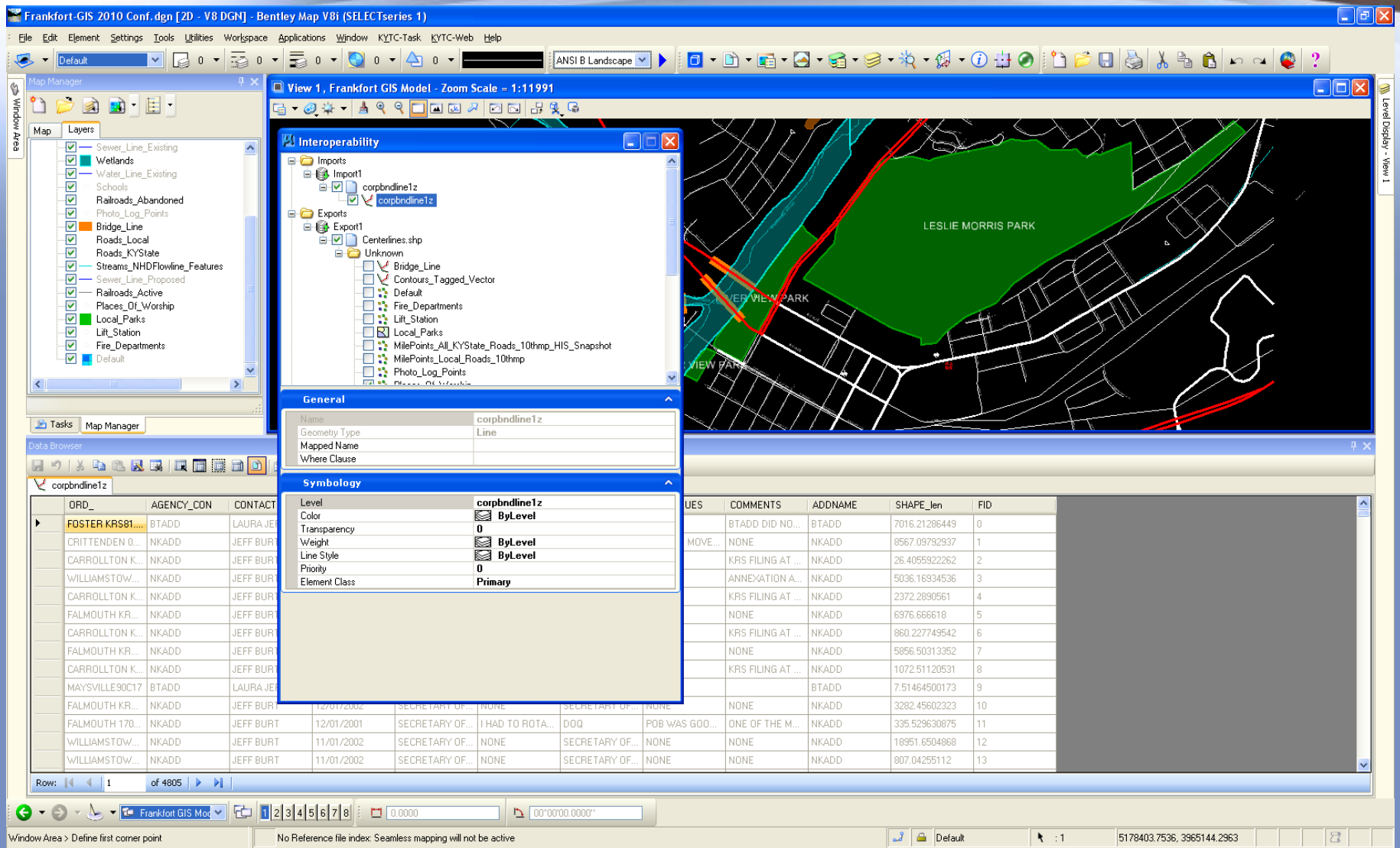
Importing/Exporting Shapefiles



Benefits

- Data accessibility/openness
  - Have access to data that once was not easily accessible
  - Minimum Learning Curve: This data will also be in a format familiar to the users (DGN)
- Time savings
  - Will not have to wait for spatial data
- Improved decision making
  - Better alignments
- Cost avoidance
  - Better Estimates

Future Uses

- Implement processes to post CAD data (centerlines, shoulders..etc) into ArcSDE
- Possible extraction of City/County government ArcSDE data

Questions