

Coordinating National Park Management with GIS:

Facilities Management GIS



66174

N 18.46633° W 066.13625° NAD 83

SAJU

01/14/2005 12:08:30 PM

The Situation:

Over 60,000 National Park Service assets in 389 units!



The Situation:

Over 425,000 Equipment/Features associated with those assets!

- Every asset has its own unique Location ID # (aka. FMSS #).
- An equipment/feature is something that is associated with a larger asset or system. equipment/feature has its own unique # as well.

* This 1,000,000 gallon water tank is an example of a feature of the water system at Mesa Verde National Park.



Current Management Methods: Facilities Management Software System or FMSS

Location/Asset

Location: 52230 B - (HS)1154 WHITE GRASS Cabin

Specification Template: Building

Components:

Classification: 4000 Buildings

Subclassification: 4100 Building

Attribute	Description	Type	Value	Measure Unit
HEADER1	GENERAL INFO	ALN		
PARKALPH	Park Alpha Code	ALN	GRTE	
BLDGTYPE	Building Type	ALN		
ASSETOWN	Asset Ownership	ALN		
OCCUPANT	Occupant/Assigned To	ALN	NPS	
FADPRESP	Facility Operation Responsible	ALN		
FAMARESP	Facility Maintenance Responsib	ALN		
HISTIND	Historic	ALN	N	
FOOTPRAR	Foot Print Area	NUMERIC		
GRBASARE	Basement Area	NUMERIC		
GRSQFOOT	Gross Sq Footage	NUMERIC	384.00	
NUMBASE	Basement Levels	NUMERIC		
NUMFLRS	Number of Floors	NUMERIC		
RIDGEHT	Approximate Ridge Height	NUMERIC		
COMPCAC	Complex Asset, Contract CAC	ALN		
CONSTYPE	Construction Time	ALN		

Location Asset
Specification template.
Each asset has a unique
FMSS location ID #.

PRO'S

- Powerful!
- Detailed!

Equipment/Feature

Equipment/Feature: 131028 Exterior Door, Wood, Standard, DOR68645

Belongs To: [Dropdown]

Location/Asset: 52230 B - (HS)1154 WHITE GRASS Cabin

Item: [Dropdown]

Vendor: [Dropdown]

Manufacturer: [Dropdown]

Park Alpha Code: GRTE LCS #: [Dropdown] CLI #: [Dropdown] Park Concession: [Dropdown]

Park Description: [Text]

Details:

Calendar: [Dropdown] Property: [Dropdown]

Work Category: 4000 License #: [Dropdown]

Asset: [Dropdown] Serial: [Dropdown]

Model: [Dropdown] Brand: [Dropdown]

Costs:

Total: \$0.00

YTD: \$0.00

Budgeted: \$0.00

Inventory: \$0.00

Purchase Information:

Installation Date: [Dropdown]

Warranty Date: [Dropdown]

Purchase Price: \$0.00

Equipment/Feature
page

Work Order

Work Order: 244078 B - (HS) 1154 WHITE Grass Dining REPAIR Roof

Location/Asset: 52230 B - (HS)1154 WHITE GRASS Cabin

Equipment/Feature: [Dropdown]

Reported By: [Dropdown]

Reported By Date: 4/14/2003 10:56

Work Phone: [Text]

W/O Status: COSTED

W/O Status Date: 6/15/2004 11:37

Charge to Store? [N] Work Type: FM

GL Account: [Dropdown]

Warranty Date: [Dropdown]

WBS Component: B30

Quantity: 1

Sub Component: B3010

Measurement Unit: EA

Job Details:

Plan Type: AD

Job Plan: [Dropdown]

Safety Plan: [Dropdown]

PM: 33585

Service Contract: [Dropdown]

Park Planning:

PMIS # / Component: [Dropdown]

Cost Source: [Dropdown]

Work Prg/Budget: [Dropdown]

Park GPRA Goal #: [Dropdown]

GPRA Goal #: [Dropdown]

GPRA Goal IV: [Dropdown]

Problems / Follow-up Work:

Work Category: 4000

Work Activity: [Dropdown]

Incident Name: [Text]

Problem Code: [Text]

Originating W/O: 244051

Has Follow-up Work? [N]

Scheduling Information:

Start: 10/12/2002 12:00 AM

Completion: 9/30/2003 12:00 AM

Scheduled: [Text]

Actual: [Text]

Responsibility / Modify:

Supervisor: 13572

Labor Group: [Text]

Lead Craft/Person: [Text]

Work Order

CON'S

- Complex!
- Difficult!

Enhancing Management Software:

How Could FMSS be improved?

- Move away from just a tabular database and increase the visualization of the assets both individually and as a whole making it more intuitive.
- This is done by merging the capabilities of GIS with the value of a picture (1000 words!).
- GPS-PhotoLink and ArcGIS!

Facilities Management GIS:

Getting Started with Data Collection Procedures!

- Considering the amount of data to be collected and the varying levels of GIS expertise among the personnel collecting the data, correct procedures need to be documented. Each one provides proper GPS collection techniques and how to use GPS-PhotoLink.



Garmin GPS Camera Equipment for Facilities Management GIS

Setup and Operations



July 19, 2006

Garmin camera equipment pack are most commonly used with 60 pack provided by the Park Service for use nationwide.



ArcPad 7 Data Collection for Facilities Management GIS

Setup and Operations



July 19, 2006

With a custom forms application ArcPad is an easy and robust data collector. GPL uses a shapefile in processing.



Facilities Management GPS Data Collection With Trimble Geo XT and Geo XM Units



November 3, 2005

Waypoint Collection Positions for each Park Asset

Roads	Record the GPS coordinates at the beginning and end of each route.
Parking Areas	Record GPS coordinates at the approximate center.
Bridges	Record the GPS coordinates at the beginning and end of the Bridge.
Tunnels	Record the GPS coordinates at the beginning and end of each Tunnel
Trails	Record the GPS coordinates at the beginning and end of each Trail.
Maintained Landscapes	Record GPS coordinates at the approximate center.
Campground	Record GPS coordinates at the approximate center.
Picnic Area	Record GPS coordinates at the approximate center.
Buildings	Record GPS coordinates near the primary entrance.
Water / Waste Water Systems	Record GPS coordinates at the approximate center.
Heating & Cooling Plants	Record GPS coordinates at the approximate center.
Electrical, Radio, Phone, Computer Systems	Record GPS coordinates near the primary entrance.
Fuel Systems	Record GPS coordinates at the approximate center.
Dams	Record GPS coordinates at the approximate center.
Constructed Waterways	Record the GPS coordinates at the beginning and end of each.
Marina/Waterfront System	Record GPS coordinates near the primary entrance.
Tower/Missile Silo	Record GPS coordinates near the primary entrance.
Outdoor Sculptures/Monuments/Plaques	Record GPS coordinates near the approximate center of this unique asset.
Ruins	Record GPS coordinates near the primary entrance.
Fortification	Record GPS coordinates near the primary entrance
Lighthouse	Record GPS coordinates near the primary entrance
Railroad System	Record the GPS coordinates at the beginning and end of each track.
Aviation System	Record the GPS coordinates at the approximate center.
Amphitheater	Record GPS coordinates near the primary entrance

Facilities Management GIS:

How GPS-PhotoLink Works!



* Important:
Take a picture of
the GPS unit.
Make sure that
your camera
time and you
GPS time are as
close as possible.

Take an averaged
GPS waypoint.
Name the
waypoint the
FMSS location
ID#.

Following the
waypoint, take a
photograph.
You can take as
many
photographs as
you need to.

Facilities Management GIS:

How GPS-PhotoLink Works!

Within the GPS-PhotoLink software select the photo of the GPS receiver.

Check the Use this Photo for time entry option and enter in the GPS time that is on the GPS receiver.

The software will calculate the time offset between the camera and the GPS receiver.

GPS-Photo Link NPS Edition - Time Offset Entry

☒ **Use this photo for time entry**

GPS Time : 7/26/2006 10:56:17 AM


Photo Time : 7/26/2006 10:56:12 AM

☒ **Fit image to screen** **Calculated Offset : 5 sec**

Note : Be sure to enter exactly how the time appears on the picture of the GPS screen, including the date, time and am/pm.

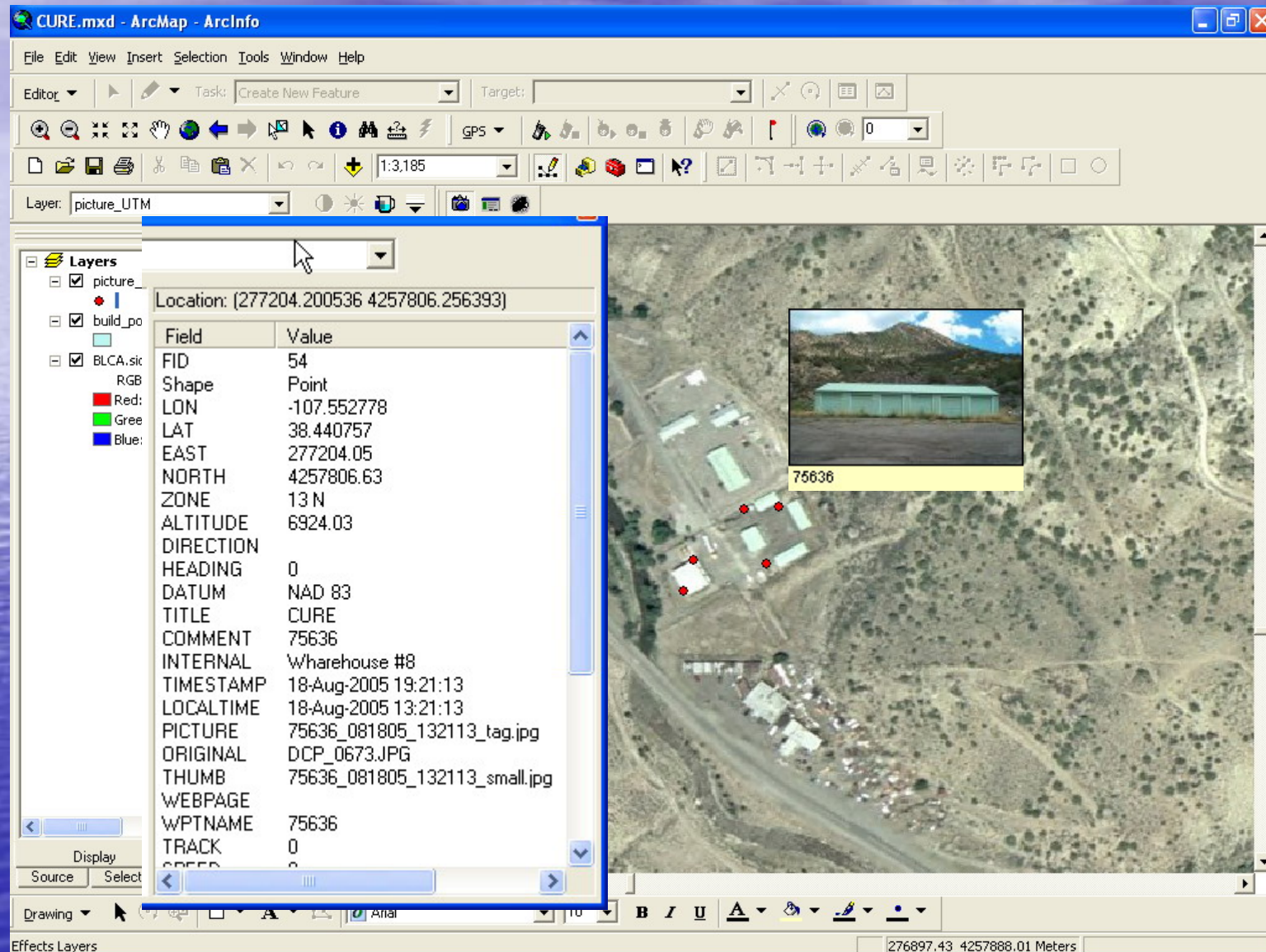
Select Photo | Picture from Camera : PENTAX Corporation PENTAX Optio WPI Optio WPI Ver 1.00

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072606_085250.JF
072606_105617.JF
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59361_072606_11



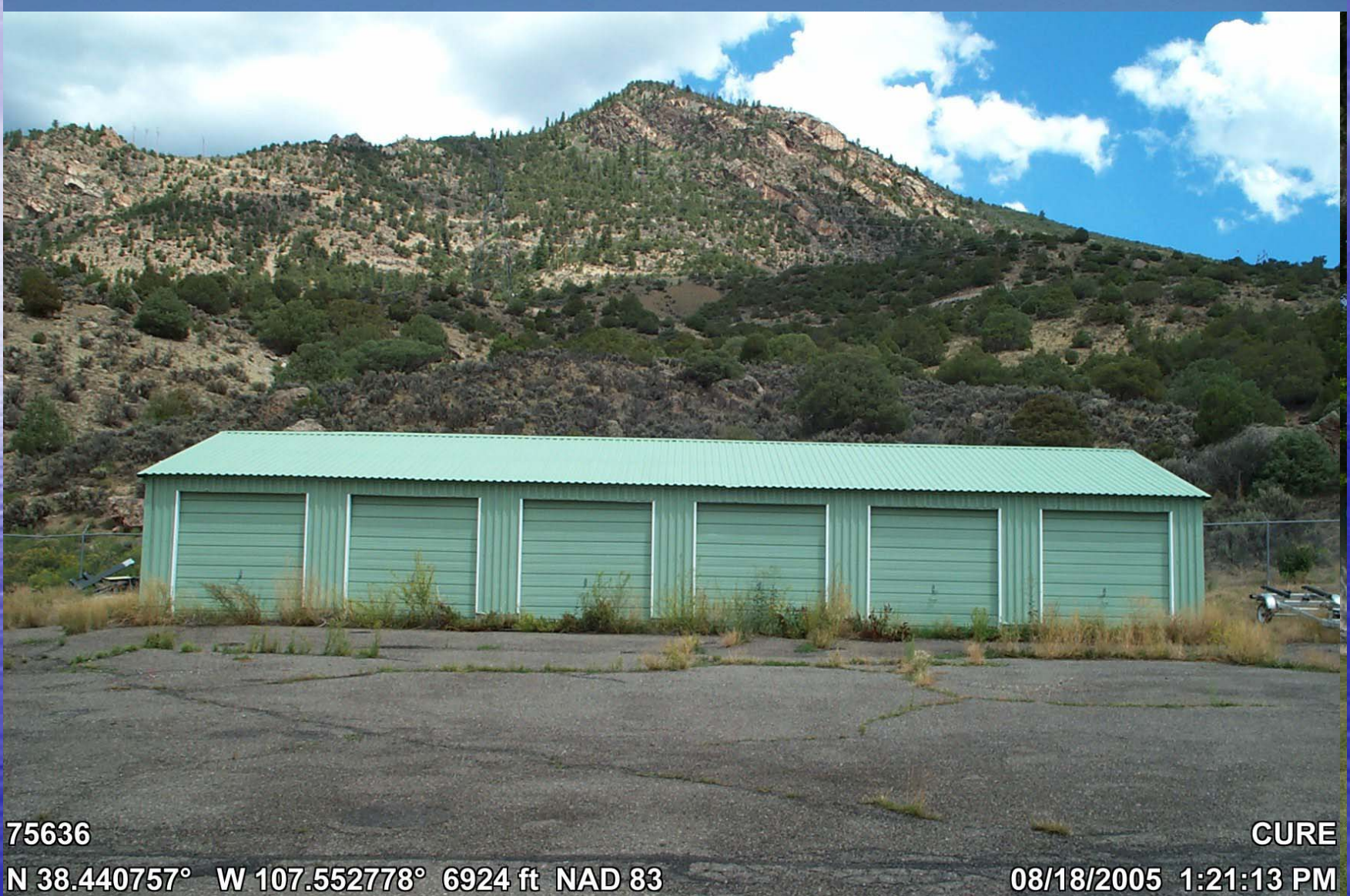
Facilities Management GIS:

GPS-PhotoLink Spatial Data



Facilities Management GIS:

GPS-PhotoLink Watermarked Photos



75636

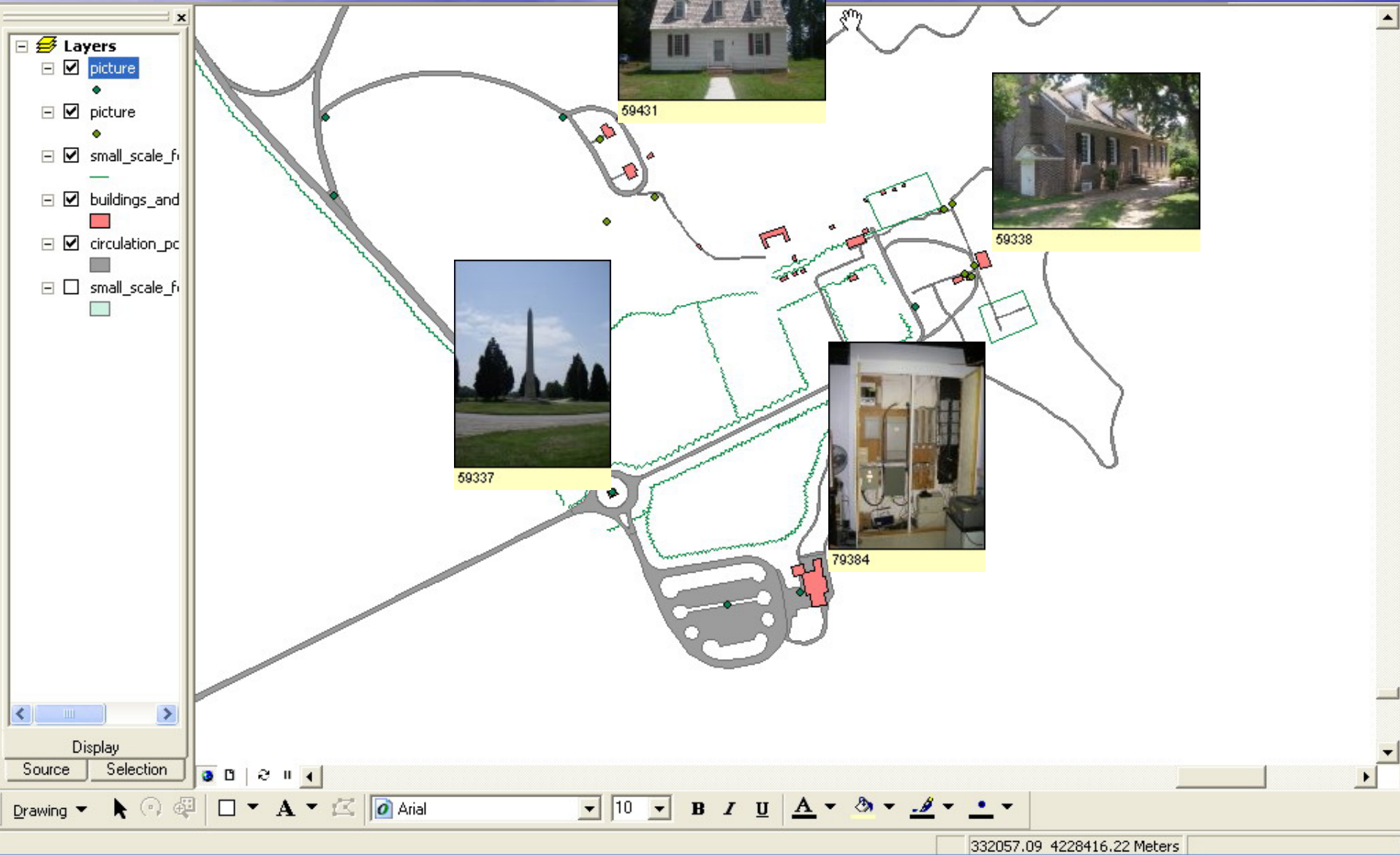
CURE

N 38.440757° W 107.552778° 6924 ft NAD 83

08/18/2005 1:21:13 PM

Facilities Management GIS:

Asset Visualization and Data Creation



Facilities Management GIS:

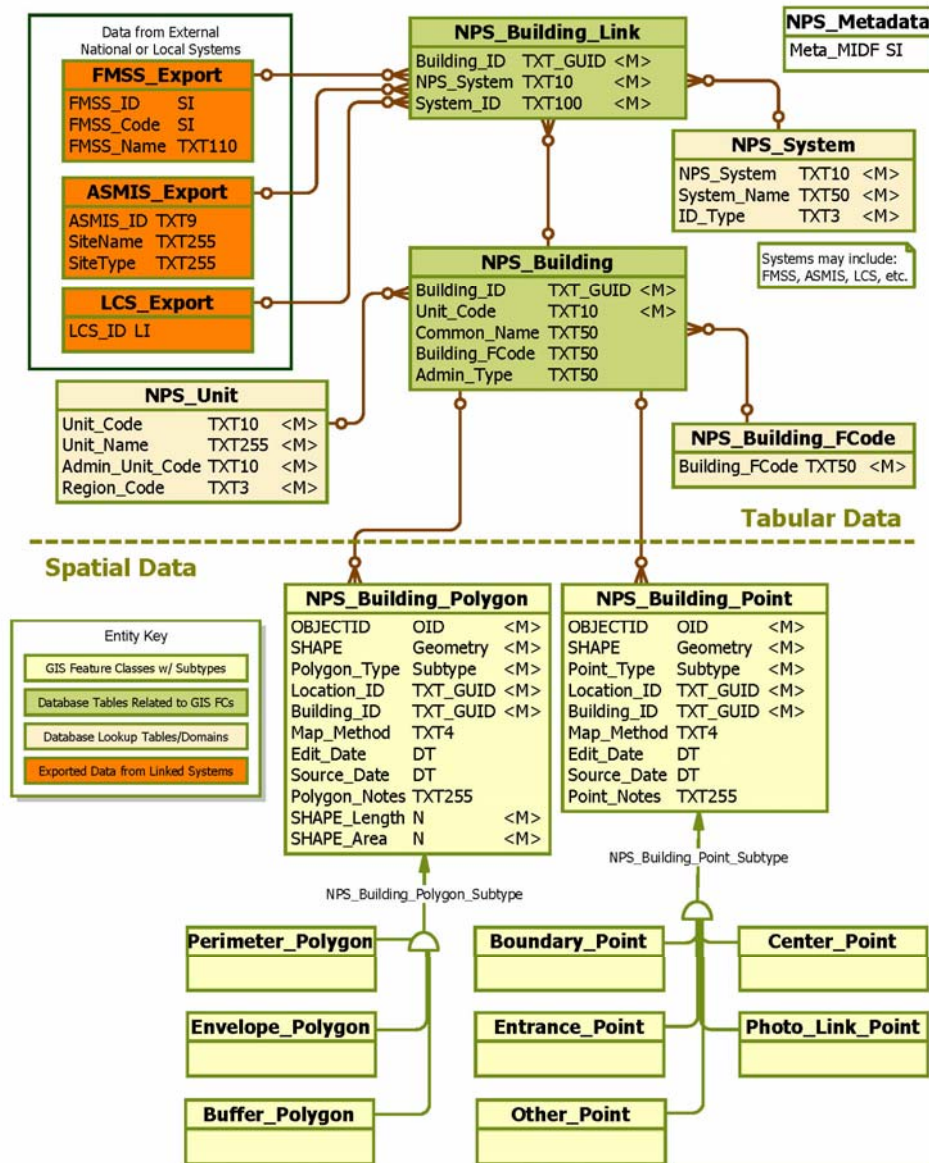
Image File Management

View Favorites Tools Help

Search Folders

\\FMSS\SER\BISC\brian\021606

Name	Size	Type	Date Modified	Date Picture Taken	Dimensions
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93331_021606_133733_small.jpg	8 KB	ACDSee 7.0 JPEG Image	7/19/2006 1:27 PM	2/16/2006 1:37 PM	140 x 93
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picture.shx	1 KB	AutoCAD Compiled Shape	7/19/2006 1:28 PM		
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track.shp	3 KB	AutoCAD Shape Source	7/19/2006 1:28 PM		
track.shx	1 KB	AutoCAD Compiled Shape	7/19/2006 1:28 PM		



Proposed Data Model for NPS Building GIS Layers
Created By: A. Southwold, G. Daniels (AKSO GIS)
Updated: September 22, 2005

Facilities Management GIS: Implementation

Maximo Work Order Tracking

CAGR
39361

Assignments
Attached Doc's
Maps



N 32.99414° W 111.53653° 07/17/2002 10:59:44 AM



Layers
Results

Work Orders		
Work Order	Description	Status
587557	Inspect Roof - 40365	WAPPR
587540	Renovate VIP/Maintenance Yard	WAPPR
587987	CAA Inspect B-15 Parking Garage	WAPPR
587898	Inspect Equipment Shed	WAPPR
587921	Assess condition of Architectural Remains at Campo	WAPPR
587684	Inspect B-4 Seasonal Employee Housing	WAPPR

Active Layer
GI

Work Order T
ALL







Location ID: 70365
 Description: MD TB Campground Restroom #2 3-35
 Asset Code: 4100

Facilities Management GIS:

Contact Information

Brian Diethorn

Facilities Management GIS Data
Manager

WASO-GISD

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