



Geo-referenced Construction Information Management System (GCIMS)

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Content

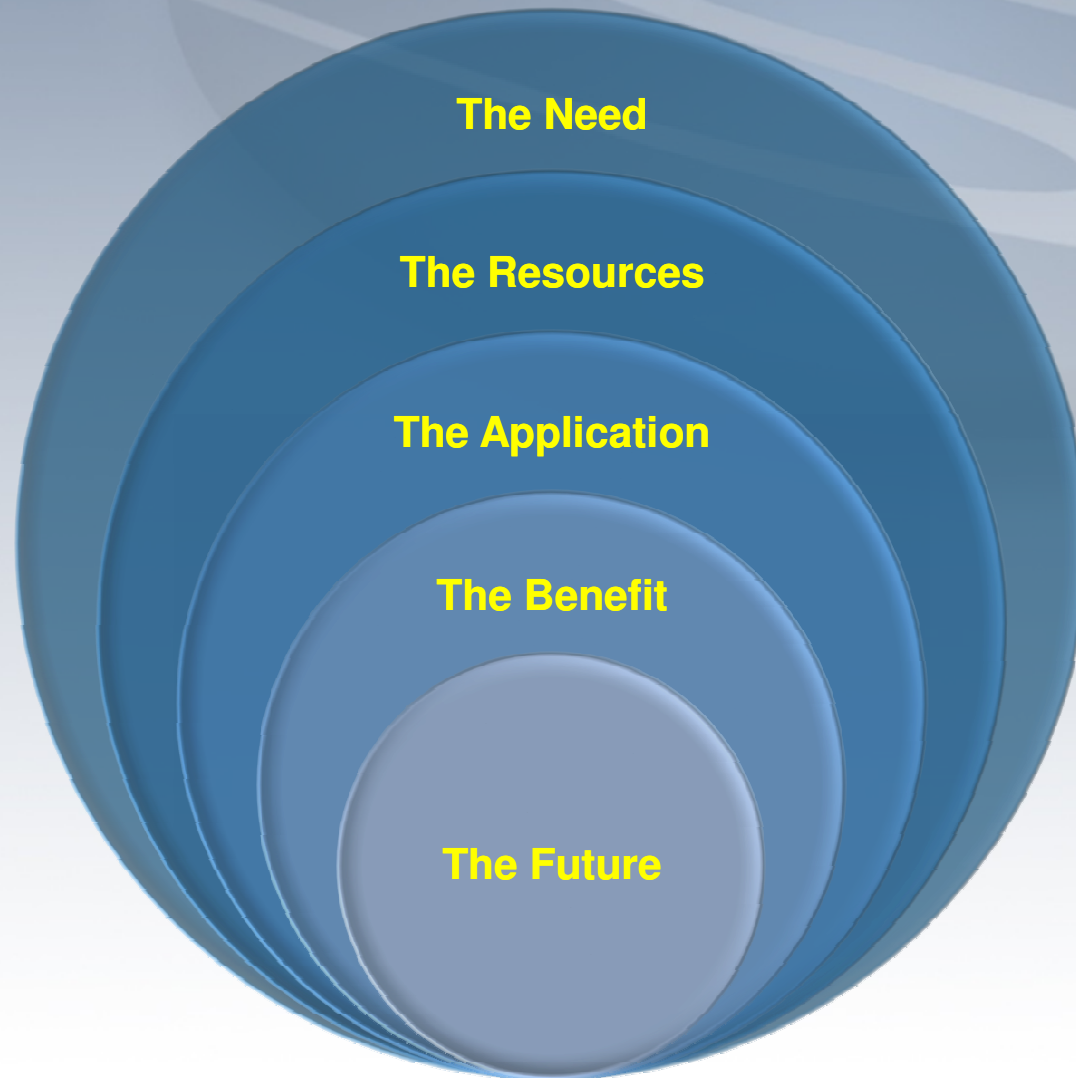
Introduction

Features

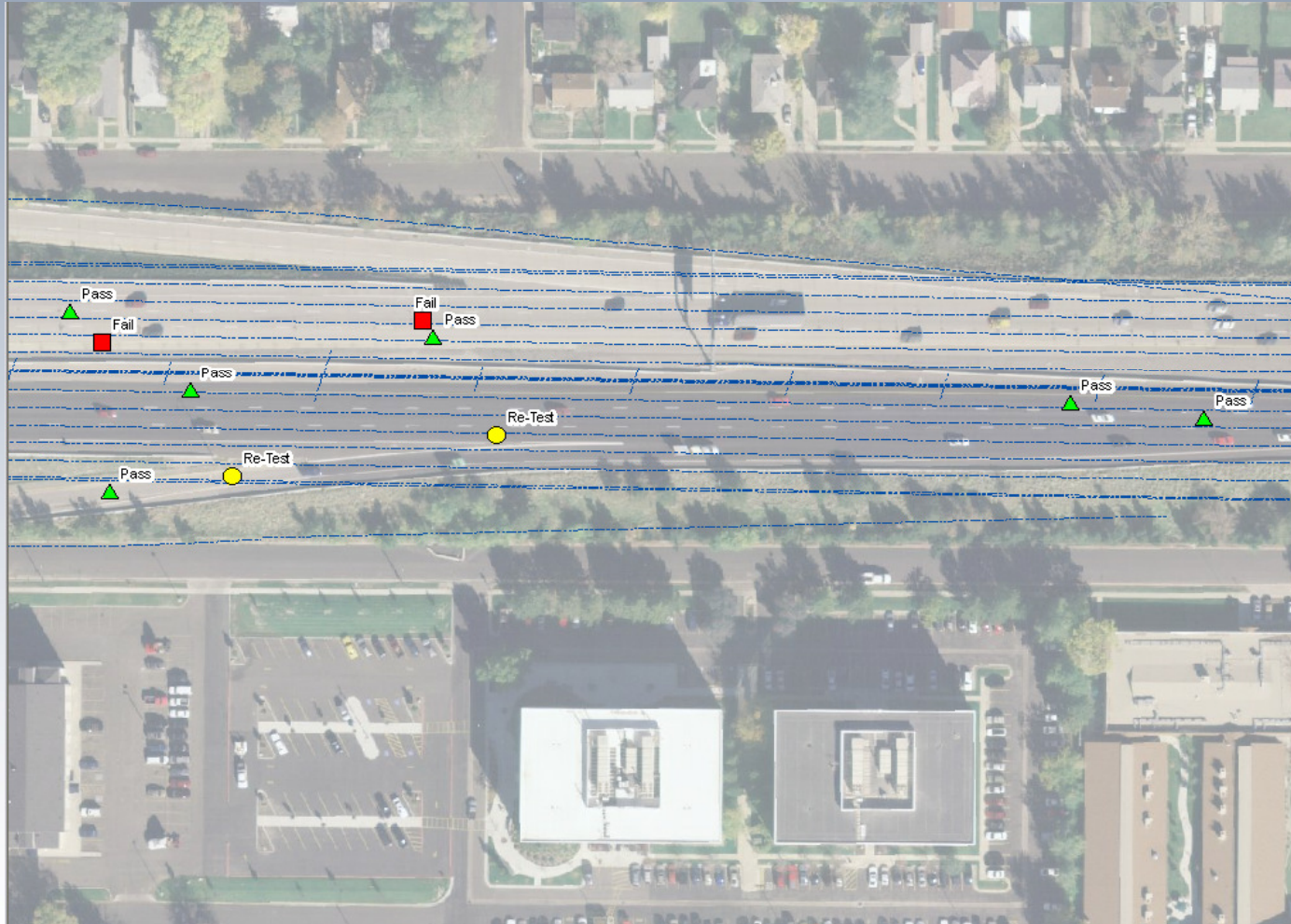
**System
Description**

Benefits

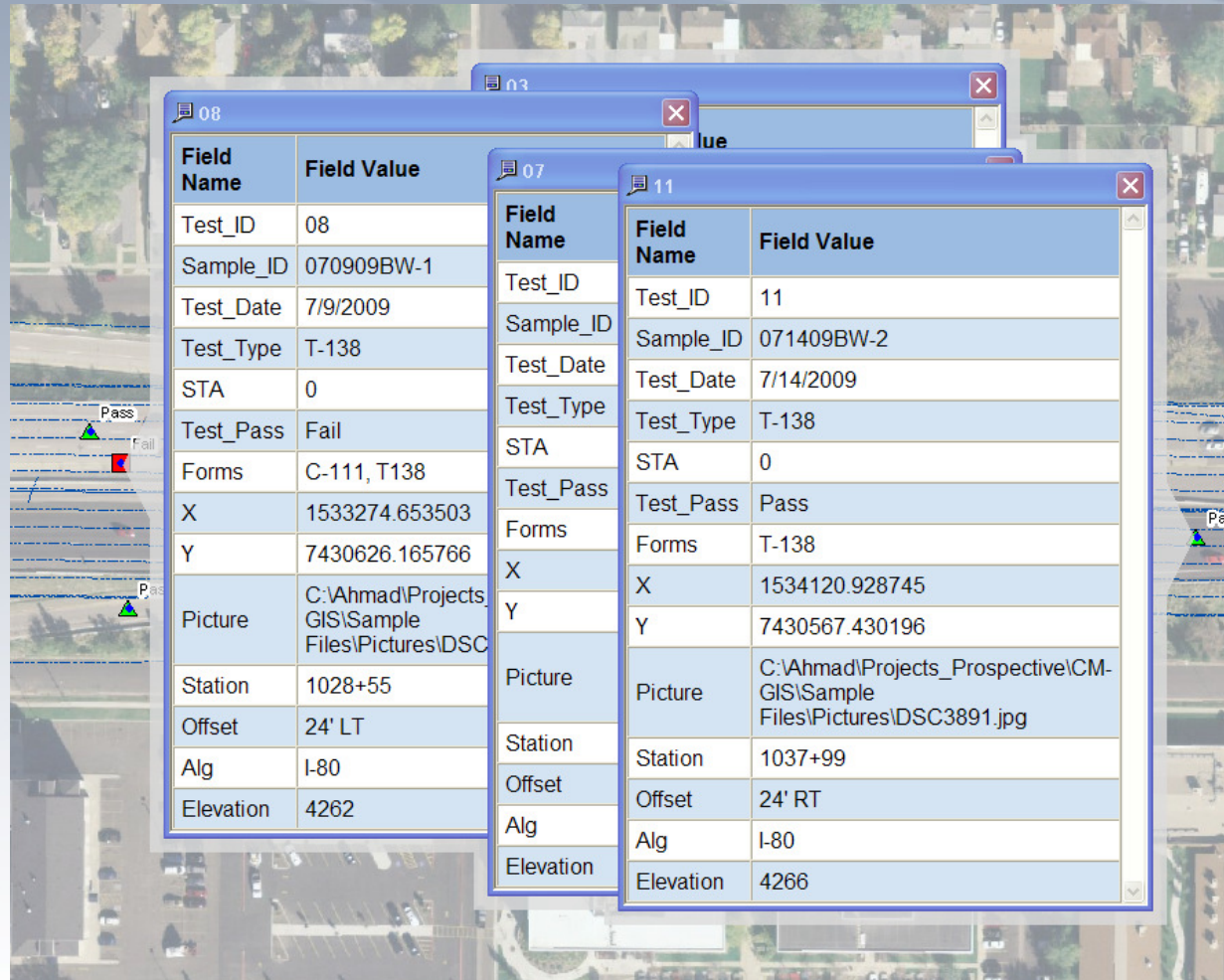
Introduction



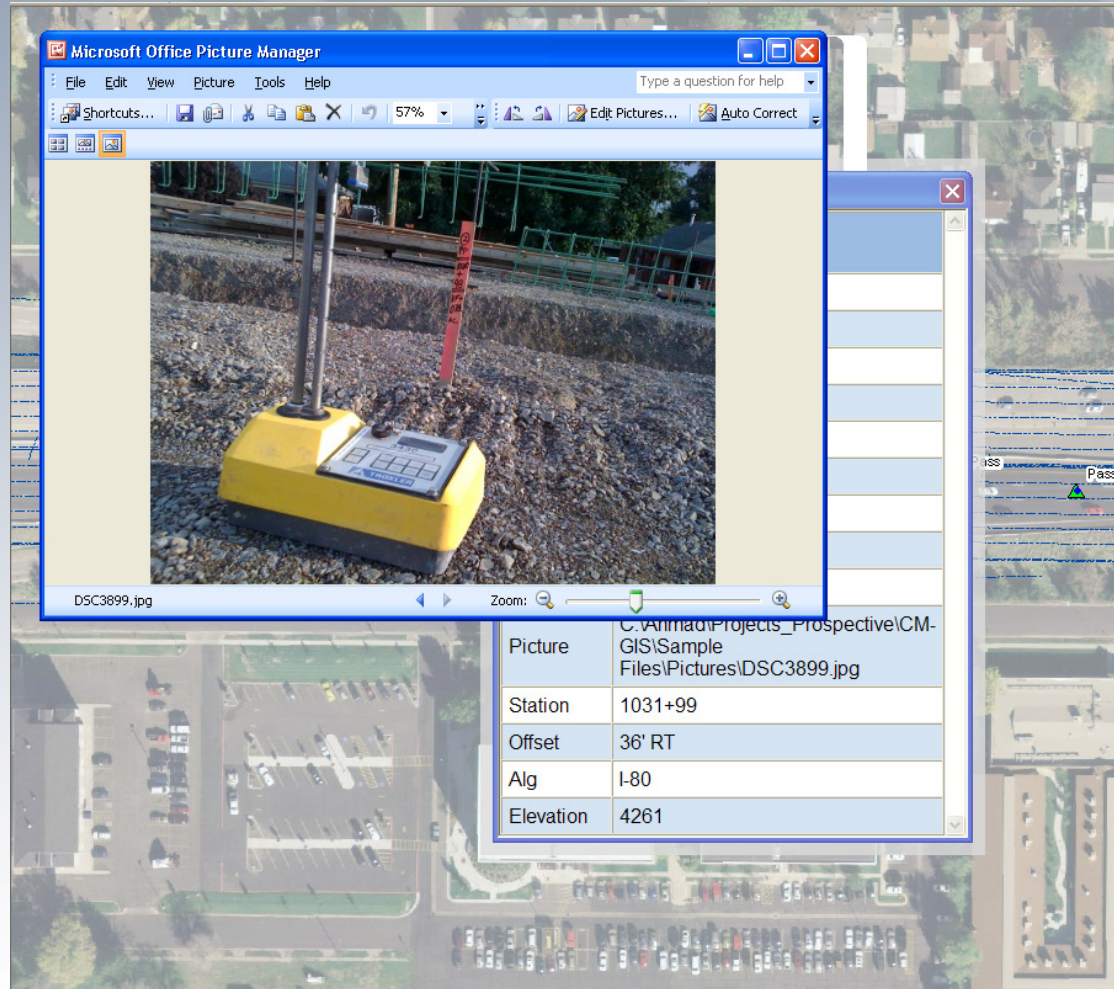
Observation Points



Attributes



Field Pictures



Inspection Forms

Adobe Reader - [C-111 070909 BW.pdf]

Inspector's Daily Report Form C11 (198) (Resident Engineer)

PAGE 1 of 2

Date: 9th July 2009 DAY: SU M Tu W Th F Sa WEATHER: Partly Cloudy

PROJECT NO: S-80-3(152)121 CHARGE ID: 7091203C Items Paid: 17, 19, & 102

CONTRACTOR: RALPH L. WADSWORTH

PRIME CONTRACTOR'S WORK FORCE:

(Total Number of) SUPERVISION: SKILLED: UNSKILLED:

PRIME CONTRACTOR'S HOURS WORKED: From: AM/PM To: AM/PM

SUBCONTRACTORS:

	Hrs:	Super	Skilled	Unskilled
Harper Contracting (State-300)	10	Super	Skilled	3
Harper Contracting (Ramp G)		Super	Skilled	3

EQUIPMENT USED THIS DAY:

SEE IPAQ

REMARKS: (Description of work performed by contractor, location by station, materials used, where placed)
(Record conversations, verbal agreements, and instructions - exchanged with the contractor)

Item # 17 Soft Spot Repair

a) Location Ramp G, 707+39 (21' LT to 11' LT) to 708+01 (21' LT to 2' LT). AND 708+31 (21' LT to CL) to 708+77 (22' LT to 4' RT). AND 708+77 (22' LT to 4' RT) to 709+09 (20' LT to 6' RT).

b) Harper over excavated two feet, placed concrete rubble from on site PCCP, then filled with granular borrow.

c) This area will be proof rolled again when grade is achieved.

Item # 19 Geotextiles - Separation

a) Location Ramp G, 708+77 (22' LT to 4' RT) to 709+09 (20' LT to 6' RT).


b) Harper placed fabric in this area, then covered with granular borrow.

Item # 102 Untreated Base Course

a) Location I-80 Eastbound, 1028+00 to 1031+50, CL to 71' RT.

b) Harper placed UTBC in this area, samples were taken at the following locations

070909BW-1 1028+74, 55' RT
070909BW-2 1029+46, 24' RT
070909BW-3 1031+03, 43' RT



C:\Animad\Projects_Pro prospective\GIS\Sample Files\Pictures\DSC3899.jpg

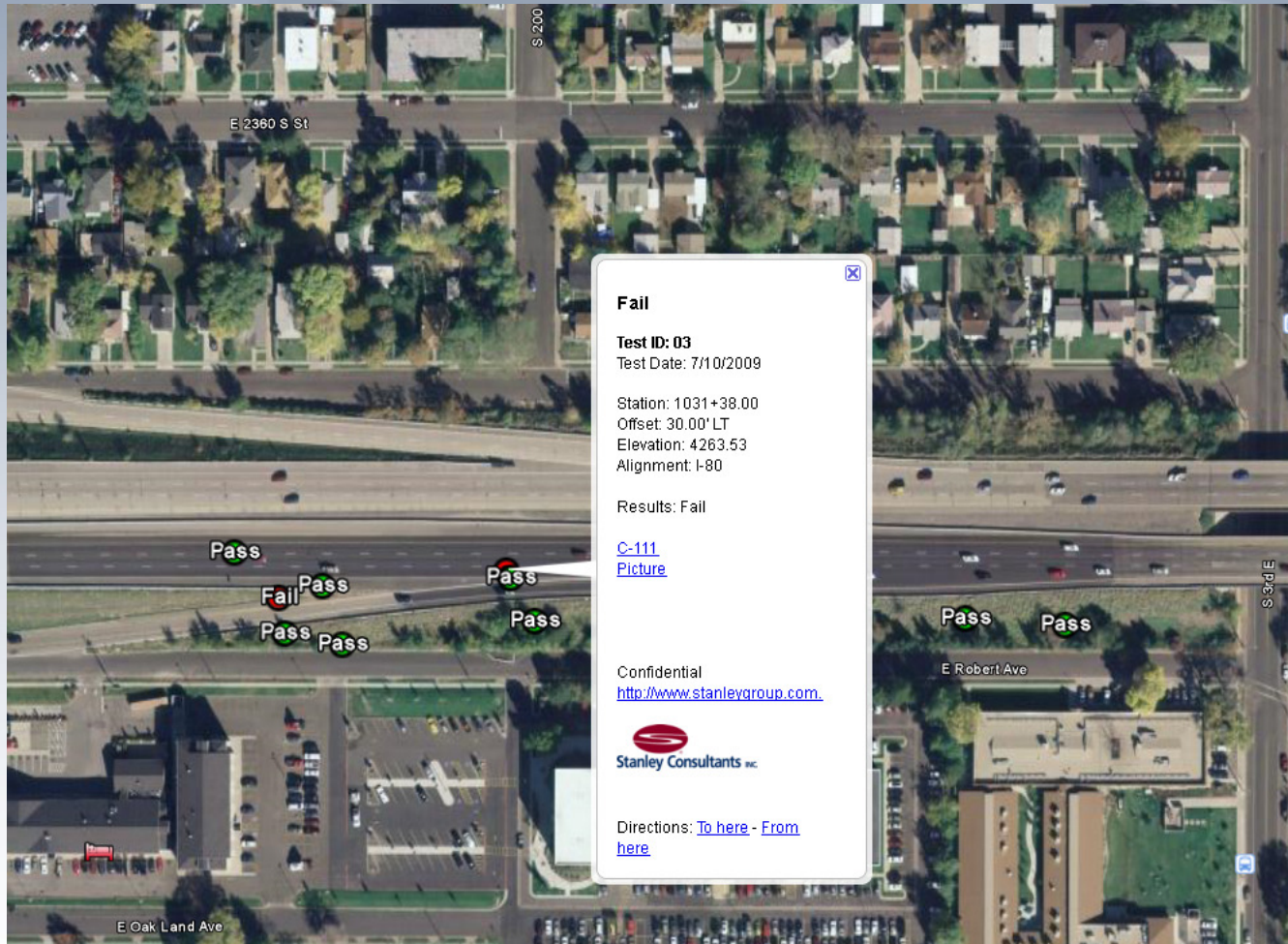
1031+99

36' RT

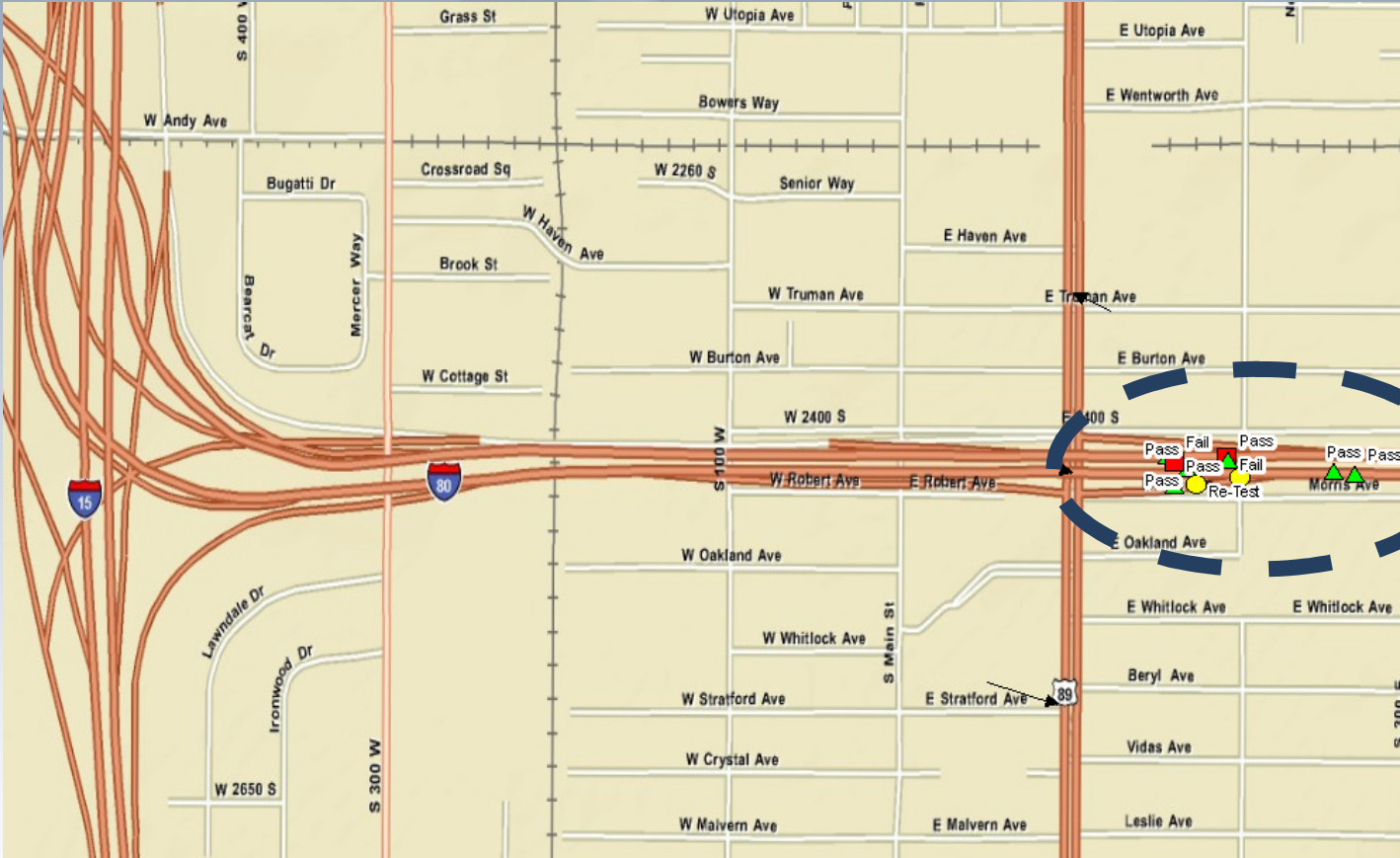
I-80

4261

Easy Reporting



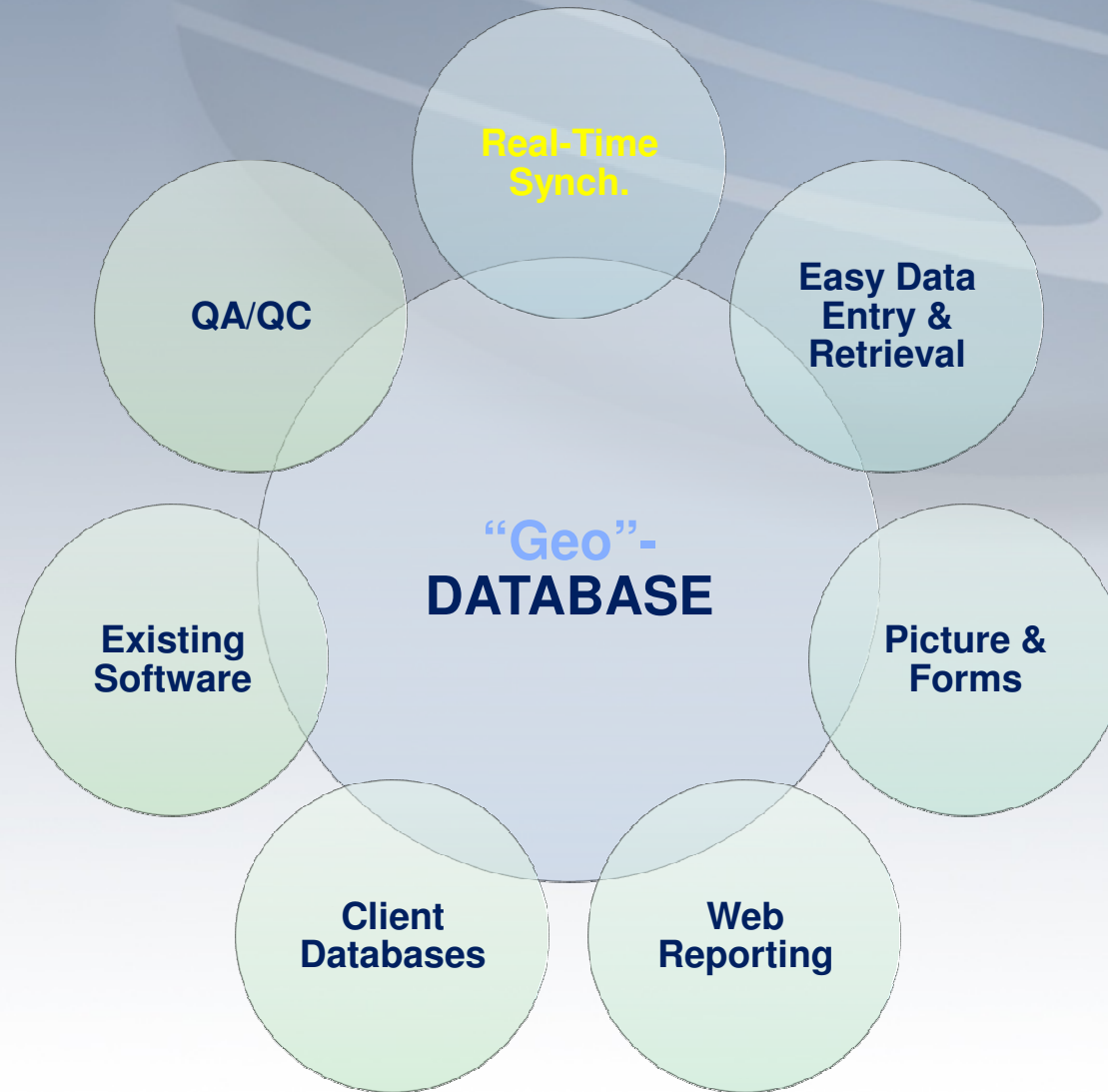
Base Maps



Inspection Area

Pass Fail Pass
Pass Pass Fail Pass
Pass Re-Test Pass Pass

Key Features



GCIMS in a Nut Shell

- GIS for construction management data.
- It is a “data model”
- Transparent to field technician
- Automated navigation to previous sites
- Nodes, lines and polygons are auto-symbolized
- Four tiers:
 - ▶ Data Collection
 - ▶ Desktop Application
 - ▶ Integration
 - ▶ Reporting
- GCIMS may be referenced as an electronic construction management “eCM” system.

System Description



Data Collection

- Hardware:
 - ▶ Rugged hand-held GPS receivers.
 - ▶ GPS assisted point reference and collection.
 - ▶ GPS accuracy: 1-3 meter, upgradable to sub foot accuracy.
 - ▶ Built-in camera (3.0 MP)
 - ▶ MiFi Connectivity – real-time synchronization
- Software:
 - ▶ ArcPad 8.0 (very soon 10.0)
 - ▶ ArcPad StreetMap
 - ▶ Customized forms for easy data collection.
 - ▶ Drop-down menus for selected attributes.
 - ▶ Pre-defined selections.

Desktop Application

- Geo-Database
 - ▶ Includes various CM.
 - ▶ Each layer has unique set of attributes stored.
 - ▶ Attributes have domains attached.
 - ▶ Scalable: can include additional layers as needed.
- Base maps
 - ▶ Aerial: 25 cm resolution.
 - ▶ Street map.
 - ▶ Project-specific layers from CAD (eg. ROW, striping, ..etc).
- QA/QC: Field data are synchronized, real-time, to a replica geo-database.
- Management and update of the main geo-database including required layers, tables, forms and pictures.

Integration

- Custom user friendly forms for easy data entry.
- Automatic extraction of CM field data from geo-database.
- Automatic generation of client-required inspection forms in Microsoft Excel and PDF formats.
- Minimizes office time for report generation and eliminated typos.

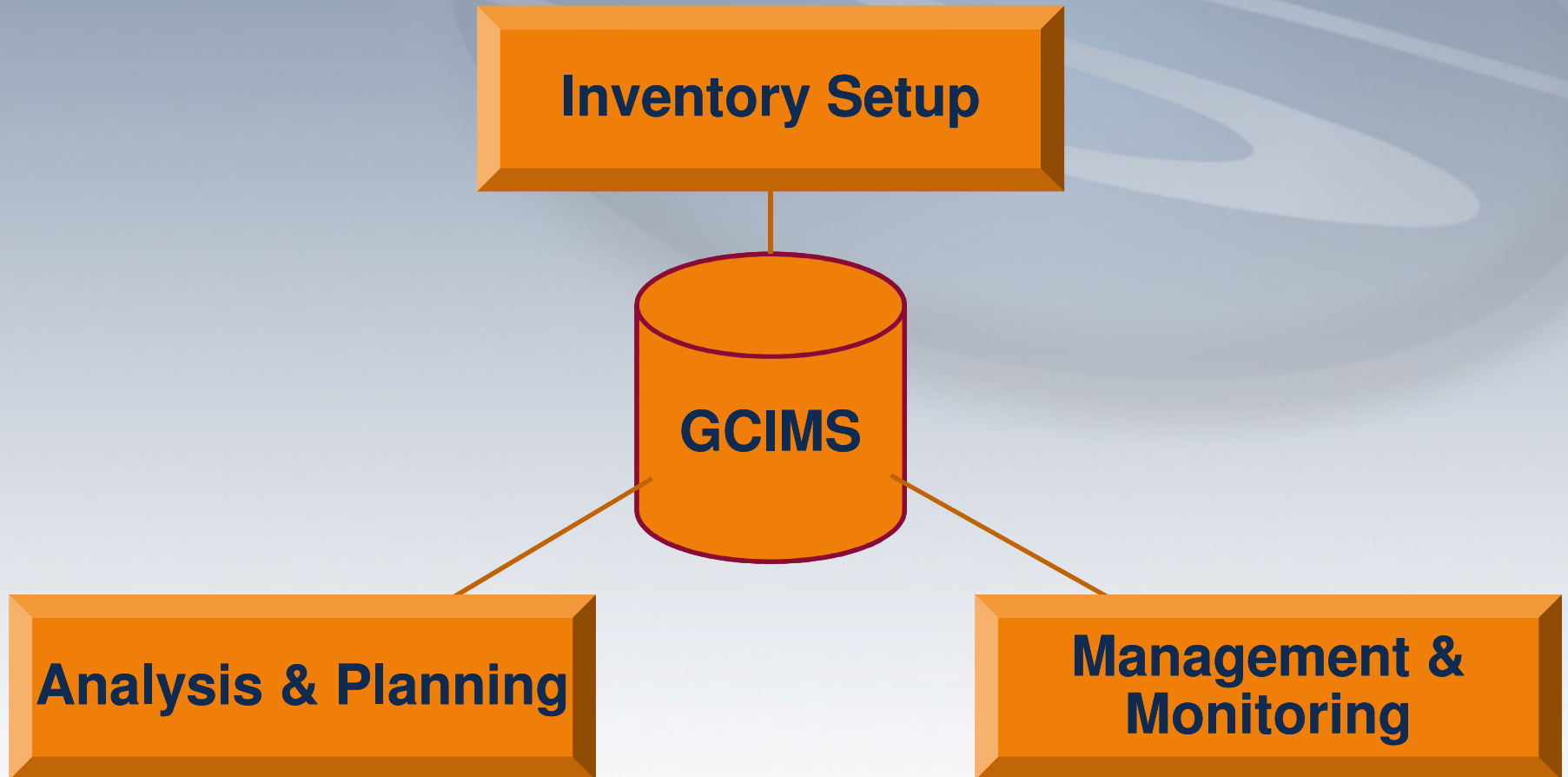
Reporting

- Replace conventional reporting system (weekly/monthly CD /paper)
- Timely, electronic and convenient reporting
- GCIMS reporting includes:
 - ▶ Forms
 - No need for data re-entry.
 - Client forms are easily exported from the system.
 - Automated client-required form generation
 - ▶ KML clients
 - Balloon popup
 - Pictures & PDF'ed forms – hyperlinked
 - ▶ Web portal
 - Real-time for up-to-date field inspections
 - Web security

Cost - 2009

- Initial Cost:
 - ▶ Hard Costs:
 - GPS Units: \$1,000-\$3,000/each
 - ArcGIS Server: \$8,500 (one time)
 - Training & References: \$2,500
 - ▶ Labor Cost: including system design, implementation and initial feedback.
- Operating Costs
 - ▶ Labor:
 - GIS system analyst
 - Web portal administration

GCIMS Components



GCIMS Benefits

- User friendly, reliable and cost effective
- Customizable & scalable to **client needs**
- Increase safety & maximize performance
- Can be survey-accurate

- Using **existing** client software/platform
- Change detection maps – track construction progress
- Interactive and real-time maps, queries, reports.
- **Integrated with client databases**
- Web-based interface

- Return on investment
- Inspection time to be cut, Go Green
- Reduces the chance of error
- Accelerate delivery (data collection, processing), Innovation, Minimize MOT and get a good price