• Tools
  • Trimble GPS
    • Survey grade (S6)
    • Mapping grade (6000)
  • Trimble V10 imaging rover
  • Trimble Business Center
  • AutoDesk Civil 3D/Raster Design
  • GeoExpress

• GIS
  • ArcGIS Enterprise
  • SDE on a SQLServer platform
  • nearmap imagery
  • Parcel Fabric
What is Inception Through Completion?

- Initial concept basemap
- Survey
- Engineering Design
- Construction Documents
- Construction
- As-built Documents
Proposed Road Diet
Basemap

- Base Tables
  - Parcel Ownership Table
  - Research Table (GIS, Book/Page, Ownership, Care-of, Address, etc)
- Title
  - Parcels/Ownership—Accuracy; Currency
  - ROW/Ownership—Agreements; Historic; Takes
  - Gaps and overlaps
    - Seniority of title--RR, EBID vs private parcels
Basemap, cont.

• Aerial Imagery
  • Registration to local projection—Low Distortion Projection
• Topography—2 ft contours—possible 3D surface
• Utilities
  • City-owned—Gas, Water, Sewer, Storm, Fiber Optics
  • Private—Electricity, Telephone, Cable/FO, Water, Gas
• Basemap becomes basis for survey planning
• Early transfer to design engineers for Conceptual or Preliminary Design
Single Data Source

• SDE → Civil 3D
  • Surveys for engineering design start by creating a basemap by importing Nearmap tiles and bringing in water, sewer, gas, stormsewer, parcel data from SDE
  • Informational only currently; need a workflow that informs the GIS data
• Issues
  • Need 3D; right now, very little elevation data
  • All GIS data still needs to be verified during design
  • Works well from GIS into Civil 3D, TBC, KML/KMZ, but not the other direction
Survey

• “Field to Finish” workflows
• GIS = “Get It Surveyed”
  • Accuracy
  • Apparent; Approximate (up to 1 foot); Fixed (authoritative)
• GIS provides more global look that can point out missing field data
• Data needs to flow both ways
• What constitutes survey-grade authoritative data?
  • Pins/Property Corners
  • Property/ROW lines
Problems with Existing Workflow

• As-builts
  • Typically, marked-up set of construction documents
  • Reliable?

• Silos of information
  • 5,000 survey control and parcel boundary points shot each year, none used to inform cadastral mapping yet
    • CSV files, project folders, CAD files
  • Final project data does not currently inform GIS data
Imagery Issues

- Imagery not survey grade throughout city
- Up to two foot variation in precision
  - If you are two feet off on 3 inch resolution, you notice
- WGS84 v NAD83 transformations
- Transformation issues: Autodesk, ESRI, Trimble, Google Earth
  - 3mo working with Autodesk → C3D currently does not have complete transformation tools to create survey grade registration (ESRI does)
- Ground control for next flight
Issues

• Can’t have data transfer be a burden on the design process
• “GIS-centric” v. “CAD-centric” thinking (e.g., layers, projections, points, attributes)
• Very complex system—software and workflow—and easily broken
• Software updates disrupt our processes—test before upgrading
What have we learned?

• Leverage staff
  • Limited resources
  • Surveyors, GIS Technicians, Engineering Techs in all departments all contribute
  • Standardize processes/Training

• Develop data
  • Understand each others data/QAQC

• Leadership
  • Different departments have different priorities
  • Buy-in from Directors?
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The City of Las Cruces is developing a true and cost-effective survey-grade GIS database. We have developed an iterative process to leverage both mapping grade and survey grade data collection within various City department workflows. The GIS database is used to share the geospatial data across software platforms. This allows us to use the same data in land master planning, conceptual/preliminary design, and final engineering by increasing accuracy at each stage of project development.