

MEETING DATE: 06/25/07

AGENDA ITEM: Authorization to Contract with Nobel Systems (San Bernardino, CA) to Obtain a Digital Asset Inventory of Street Lights.

ATTACHMENTS

	<u>Pages</u>
1. Client List and Previous Pertinent Experience	1 - 7
2. Quote from Nobel Systems	8 - 10

PREVIOUS PERTINENT EXPERIENCE

Nobel Systems has performed hundreds of data development and conversion projects (large and small) for over 100 utilities and municipal clients nationwide, but primarily in California. Many of these projects involved GPS collection for verification or data development." Our Mission Statement along with our outstanding record of performance strongly demonstrates:

- *Nobel Systems' technical expertise and focus on utility GIS Data Development and GPS Collection*
- *Nobel Systems' high customer satisfaction: repeat business with the same customer*
- *Nobel Systems' ability to organize and manage large GIS conversion projects*

1. Client: Los Angeles County Sanitation Districts, CA

GIS Conversion of City Sewers and Storm Drain and on-site support

Contact: Mr. Craig Norrbom – Senior Designer, Sewer Design Section, County Sanitation Districts of Los Angeles County, 1955 Workman Mill Rd, Whittier, CA 90601 (562) 699-7411

Mr. Sean Christian – Project Manager, 562.699.7411 ext 2707

Start Date: 2000
End date: Ongoing
Project Manager: Michael Samuel

County Sanitation Districts of Los Angeles County contracted with Nobel Systems in 2000 to perform GIS Conversion of City Sewers connecting District's Trunk Lines. Nobel Systems subsequently placed 3 of its employees at District's office to provide onsite support for various GIS conversion and mapping projects. Nobel Systems recently won a second major contract to convert Storm Drains for all 88 Cities of Los Angeles County. The project made the team very familiar with all Cities in the Los Angeles county.

2. Client: County of San Bernardino

Project: GIS Conversion of Basemap (parcels, street centerlines)

Contact: Ms. Cindy Prescher – San Bernardino County, (909) 388-0766

Start Date: 2002
End date: 2005
Project Manager: Srinivas Suryanarayanaiah

The County of San Bernardino (County) awarded the team of ESRI and Nobel Systems a large parcel data conversion project to create a parcel basemap database to include all of the County's parcels and related attributes. The goal of the project is to convert land documents such as parcel/tract maps and deeds into an electronic data format to produce Assessor maps. The basemap was created using COGO techniques and further adjusting the data to GPS control points.

3. Client: Hamilton Township Municipal Utilities Authority

Projects: GIS Water and Sewer Conversion; GPS Verification

Client Contact: Mr. Stephen R. Blankenship – Executive Director, Hamilton Township Municipal Utilities Authority, 6024 Ken Scull Avenue, Mays Landing, NJ 08330-1854, Tel: 609- 625 - 1872
Fax: 609 -625 - 0855

City of Culver City - GPS Proposal

Start: October, 2004
End: Ongoing

The Hamilton Township Municipal Utilities Authority of New Jersey, Atlantic County contracted with Nobel Systems in 2004 to perform GIS conversion and Updates of Municipality Sewer and Water facilities. Nobel Systems has presently placed one of its consultants on site to provide support for HTMUA's GIS conversions and mapping projects. This exemplifies the continuous and sustained work carried out by Nobel team on all the requirements of its Client. Nobel is also working on field verification of field structures using Trimble's GeoXT and their automatic synchronization with the MUA GIS System. HTMUA maintains the facility features and also a part of Trunk sewers in alliance with ACUA. The data sources that was used for data conversion and updates were the Asbuilts, 2002 Aerials, GPS points, City Sewer and Water Atlas maps. The Asbuilt drawings were the primary source used to capture/locate features spatially with assistance of Aerials and the GPS points. The data capture was performed by well defined Standards and Procedures developed for both Sewer and Water GIS system. In locations where there was a conflict between Asbuilts and Atlas maps, the Asbuilt took priority. There were two Geodatabases representing the potable water distribution system (with its service connections) and the Sewer collection system.

4. Client: California Water Service Company, CA (CalWater)

Project: GIS Conversion of the Water facilities

Contact: Mr. Ed Harr – GIS Coordinator, California Water Service Company, 1720 North First Street, San Jose, CA 95112. 408-367-8328

Start Date: 2002
End date: Updates Ongoing

California Water Service Company contracted with Nobel to perform GIS Conversion of 23 statewide Water Districts. Nobel converted the hard-copy plat sheets to ArcGIS geodatabase containing various feature-linked annotations. Nobel also developed data maintenance tools in AutoCAD Map and ArcGIS that allows CalWater to perform updates and produce Atlas Books. Currently, Calwater maintains its GIS on ArcSDE and is helped by Nobel with GIS Updates.

5. Client: Park Water Company, CA

Project: GIS Conversion of the Water facilities; GPS Points Collection

Contact: Mr. Aaron Gutierrez – GIS Coordinator, Park Water Company, 9750 Washburn Road, Downey, CA 90241; (562) 923-0711

Start Date: 2006
End date: Ongoing

Park Water Company contracted with Nobel to perform GIS Conversion of Central Basin Water System from the existing format to a new geodatabase format with Geometric Network Functionality and hyper-linking water features with various documents. The scope also included a GPS Point collection Task to enable PWC to gather Valve and Hydrant locations.

6. Client: Township of Green Brook, NJ

Project: GIS Conversion of the Stormdrain facilities; GPS Points Collection

Contact: Mr. Ken Koenig – GIS Coordinator, Township of Green Brook Engineering, 111 Greenbrook Road, Green Brook, NJ 08812; (732) 968-1023 x 6610

Start Date: 2006
End date: Ongoing

Township of Green Brook contracted with Nobel to assist it in GPS locating, mapping and photographing of all catch basins, outfalls, and storm sewers within the municipal boundaries of the Township. NJ Municipalities are required to develop Stormwater Management Plans under the EPA Phase II Rules and the rules proposed by NJDEP. The Stormwater Plan Objectives are to: eliminate, reduce, or minimize stormwater quantity and/or quality impacts associated with new and existing land uses, and balance environmental, social, and economic benefits and costs of implementing the stormwater management plan. The planning needs assessment of the drainage area and so a Geographic Information System became essential. In order to develop the GIS, the township selected Nobel to develop the map using GPS Locations (sub foot accuracy) of outfalls, catch basins and storm sewers.

7. Client: Western Municipal Water District, CA

Project: Water, Reclaimed Water & Sewer GIS Conversion

Contact: Ms. Patty Diaz – GIS Analyst, Western Municipal Water District, 450 Alessandro Blvd., Riverside, CA 92508, (951) 789-5025

Start: 2003

Complete: On-going

In 2001, WMWD contracted with Nobel to provide data maintenance services to update its AutoCAD based Sectional Maps. In 2003, WMWD contracted with Nobel to provide GIS data conversion, application development and data hosting services. A district-wide GIS needs assessment meeting was conducted to understand the roles of various departments and better design the Data Model. A new Grid system was created to better manage map production. Copies of the source maps were used as the primary data source for this project. Nobel reviewed these maps and all source materials for unclear or ambiguous features. Using Nobel' AutoCAD-based proprietary data capture methodology and system, water facilities data was captured. Unique ID numbers were assigned to each arc and node feature at the completion of data capture for a given tile. Easements were captured using COGO. The attribute data was exported into a text file, and linked to the AutoCAD graphics using a LISP program and the arc and node ID's that are in both the graphics and attribute files. The data was then converted to the final ArcInfo format specified by District. All asbuilts were scanned and linked to the GIS using a bar code numbering system. ArcMap layout was designed with symbology as desired by WMWD and Atlas books were created using PrintWorks (custom application that was developed by Nobel to create PDF files of selected or all atlas page or pages). Using ArcCatalog and FGDC's metadata templates, metadata was created for all the feature classes in the geodatabase. The SDE geodatabase with SQL Server data is currently being made available through out WMWD using GeoViewer Online, an ArcIMS based application developed by Nobel. The application also has a tool that helps the Development Services team to calculate Meter Fees.

8. Client: Rancho California Water District, Temecula, CA

Project: Water, Sewer & Reclaimed Water GIS Conversion Project

Contact: Mr. Pete Muserelli, Rancho California Water District, 42135 Winchester Road, Temecula, CA 92589. Telephone 909-296-6900.

Start Date: 1997

End Date: 1999

The Rancho California Water District awarded multiple contracts to Nobel to provide GIS data conversion services for their water, sewer and reclaimed water network. The projects included modifications to the existing database design, correction on an existing GIS database, conversion of the existing VMS/Oracle database Microsoft Access database, and update of the GIS database by converting new as-built construction plans. As a follow on to the initial contract, Nobel received another contract in 1999 to further enhance the District's GIS database for the water system.

The existing ArcInfo coverages and database structures were analyzed. Since they did not totally conform to the District's requirements, Nobel recommended the best-suited architecture of the systems. Microsoft Access was

used as the DBMS of choice in the District. Nobel reviewed and implemented the database design after conducting a user-needs assessment, to determine the GIS requirements and standards for the project.

Prior to Nobel's work, the District contracted with an engineering firm to create a GIS database. 1189 water as-builts and 70 reclaimed as-builts were used during this conversion work.

This work was also done before the District standardized on ArcInfo software. The original water database lacked node topology and did not have pipeline connectivity or continuity. Nobel completed the edits so that the District would have a provisional database to use for ongoing projects, but the original database lacked critical attribute data as well. Nobel was then contracted to rebuild the water and reclaimed water systems using construction as-built maps. The existing water database was used as a reference during the conversion.

9. Client: City of Ontario, Ontario, CA

Project: GIS Conversion of Water and Sewer Facilities (Performed by Nobel Systems)

Contact: Mr. Ivan Sanchez, City of Ontario, 303 East B Street, Ontario, CA 91764; (909) 395-2694

Start Date: 2002

End Date: 2003

Project 1: Conversion of Asbuilt Plans and Atlas Sheets into a GIS

Through a competitive bidding process, the City of Ontario awarded a contract to Nobel Systems to convert their asbuilts and atlas sheets to a GIS system. The data conversion was in AutoCAD and the final deliverable was ArcInfo coverages.

Nobel examined the land base for completeness. Any missing or incomplete data was reported to Ontario.

Nobel then established a mutually acceptable service area grid system that was compatible to generate custom 11"x17" at 200 scale plots. A unique process to capture data as accurately as shown in the source was followed, wherein a controlled placement technique in which features were actually constructed the locations, based on their distances and offsets shown on the source. Attributes were entered through a menu driven system, with defaults set up to the maximum extent possible, virtually eliminating any chance of error. As part of our approach to data capture, we constructed the water and sewer graphics to the landbase, generate scrub plots with unique Ids, and use that as the source to add attributes. This was based on a tried and true process and resulted in a far more accurate database. Data after construction and attribution was exported to ArcInfo coverage format. ArcPlot's map publishing capabilities were used to pull out key attributes thru' over-posting techniques and each of the attributed values were checked against the information available on the source. LaurelHillGIS's DogCreek, a software application used to check consistency in attribute data was applied on the coverage data and verified for consistency, before the data was delivered to the Client.

Deliverables

Sewer System data in coverage format

Water System data in coverage format

ArcInfo Plots

Project 2: Conversion of Data from Coverages to Geodatabase and Atlas Map creation

The City contracted with Nobel to convert the coverages to geodatabase for the sewer and water network.

The geodatabase data was used to generate grid-based atlas maps for both water and sewer facilities. Nobel System's printing application, PrintWorks, was used to generate maps on a continuous mode (batch-mode).

Finally 11"x17" size atlas was created for both water and sewer system on scale 1"=200' and delivered to the Client.

Deliverables

Sewer System Geodatabase

Water System Geodatabase

Water System Atlas

City of Culver City - GPS Proposal

Sewer System Atlas
PrintWorks configuration files

10. Client: Cucamonga Valley Water District, CA

Project: GIS Conversion of Water and Sewer Facilities

Contact: Mr. Dan Meeker, GIS Coordinator, 10440 Ashford Street, Rancho Cucamonga, CA 91729. (909) 483-7312.

Start: 2000

End: 2002

The Cucamonga Valley Water District awarded a Contract to ESRI and Nobel (as a sub-consultant) to convert their paper as-builts and atlas sheets pertaining to water and sewer systems into a GIS system. Copies of the source maps were used as the primary data source for this project. Nobel reviewed these maps and all source materials for unclear or ambiguous features. Using Nobel Systems' AutoCAD-based data capture methodology and system, water and sewer facility data were captured. Unique ID numbers were assigned to each arc and node feature at the completion of data capture for a given tile. Easements were captured using COGO. The attribute data was exported into a text file, and then linked to the AutoCAD graphics using a LISP program and the arc and node ID's that are in both the graphics and attribute files. The data was then converted to the final ArcInfo format specified by District. All as-builts were scanned and linked to the GIS using a barcode numbering system.

11. Client: City of La Verne, CA

Project: GIS Conversion of Water and Sewer Facilities

Contact: Mr. Jerry Mesa, City of La Verne, 2620 1st Street, La Verne, CA 91750; (909) 596-8741

Start Date: 02/04

End date: 01/05

The primary task of this project was to convert City's Water and Sewer asbuilt plans and Atlas maps into GIS. Nobel used the Los Angeles County landbase as reference to construct features pertaining to Water and Sewer facilities shown on the asbuilt plans. The conversion process was performed by well defined standards and procedures developed and approved by the City for both facilities. Gaps where asbuilt plans did not exist were identified, and constructions of features at the gap locations were done using the atlas maps. Rigid quality checks were performed after data was converted, and verification plots were generated using ArcInfo's ArcPlot capabilities. A one-to-one check of features was done on the newly constructed data, against the original source documents. Annotations were generated and placed per cartographic standards. Nobel supplied City of La Verne a geodatabase, along with copies of atlas books.

12. Client: Olivenhain Municipal Water District (OMWD), CA

Project: Project: GIS Data Conversion, Application Development and Data Hosting

Contact: Ms. Karen Ogawa, 1966 Olivenhain Road, Encinitas, CA 92024, (760) 753-6466;
kogawa@olivenhain.com

Start: 2001

End: 2003 and ongoing Data Maintenance

In 2001, Nobel was contracted by OMWD to provide GIS data conversion services to convert their paper atlas maps to GIS. The data was created in ArcInfo coverage format.

Various Shapefiles were created from the AAT and NAT of coverages and served through GeoViewer.

GeoViewer was developed using Visual Basic and ESRI's Map Objects technology.

OMWD's Customer and Work Order data in an old UNIX based system with very little capability for sharing. Working with the small programming team from the application's vendor, Nobel developed a way to extract information from this non-standard system, import it into a more modern data format, and then link it to the GIS. Data updates are performed on a regular basis and are automated. This process has been ongoing
City of Culver City - GPS Proposal

since 2001 on a weekly basis. Nobel worked with different departments and focus groups and found that there is always a way of integrating legacy data from legacy systems, no matter how archaic the system is. Nobel recently created an ArcGIS geodatabase using ESRI's industry standard water-wastewater Data Model. All the Shapefiles were loaded into appropriate geodatabase feature classes. The SDE geodatabase is now served through the web using GeoViewer Online. Nobel designed an XML Web Service which runs on the remote server located at OMWD. Nobel's Web

Application GeoViewer Online communicates with this service and downloads the current data.

OMWD also had all of its "Field Trucks" fitted with GPS Units. These GPS Units were logging the data at a remote server owned by "Network Car". Nobel's Web Application GeoViewer Online was modified to communicate with this remote server periodically and fetch the geographical positions of each truck.

13. Client: City of Oxnard, Oxnard, CA

Project 1: Sewer System GIS Update Conversion (Performed by Nobel Systems)

Contact: Mr. David Endelman- GIS Coordinator, City of Oxnard, 305 West Third St, 2nd Floor, Oxnard, CA 93030, (805) 385-8205

Start Date: 10/03

End Date: 04/04

City of Oxnard had its Sewer data in shapefiles format. Understanding the need to have data per industry standards, City contracted with Nobel Systems in 2003 to accomplish this task.

Nobel's project team reviewed the sources for clarity and unambiguous understanding of the source contents. The conversion process was performed by well defined standards and procedures developed and approved by the City. To accomplish the above mentioned objective of the project, approximately 99 as-built plans and 285 atlas maps were used for conversion. Quality checks were done after spatially adjusting the data and capturing new features using the as-built plans and atlas maps. This was done by generating verification plots ArcInfo's ArcPlot capabilities. A one-to-one QC of features was done on the newly constructed data, against the original source documents. Annotations were then generated and placed per the cartographic standards for a better representation of the features on screen and atlas Maps.

The final data at the end of the project was delivered in ESRI's GeoDatabase format. Along with the GeoDatabase files, 2 sets of atlas books - 11"x17" and 18"x24" paper sizes, were provided to the City.

14. Client: City of Long Beach, CA

Project 1: GIS Updates of Water facilities (Performed by Nobel Systems)

Contact: Mr. Albert Lin – GIS Officer, Long Beach Water Department, 1800 E. Wardlow Road, Long Beach, CA 90807 (562) 570-2356

Start Date: 2002

End date: Ongoing

Rate of Conversion – 120 asbuilts/week

The Long Beach Water Department (Department) contracted with Nobel Systems to perform GIS updates of their water & sewer system atlas maps. Also included in the project was development of true type fonts for their existing symbols. Nobel Systems converted the graphics with associated attributes from hard-copy drawings and/or digital files into the ArcGIS Geodatabase, performed thorough quality-control checking on accuracy of all related data, and we created an ArcGIS-based tool that allowed LBWD GIS Personnel to update the unique User ID for each junction. This tool utilized an AUTOID table that already resides within the Oracle GIS Database. User IDs are utilized by LBWD GIS to identify all features in the system as well as generate User IDs for pipe features. We provided a hardcopy list of all valves and tie-in information for updating of LBWD's Valve Database. This database is a separate data source from LBWD's GIS Database.

City of Culver City - GPS Proposal

We then posted and reconciled all versioned data to LBWD's GIS Database and resolved any and all conflicts that arose during the post and reconcile process.

15. Client: City of Simi Valley, CA

Project 1: Sewer System GIS Conversion (Performed by Nobel Systems)

Contact: Mr. Steve Seiberlich- Senior Engineering Technician, City of Simi Valley, 2929 Tapo Canyon Rd., Simi Valley, CA 93063, (805) 583-6893

Start Date: Feb2004

End date: Jan2005

The City of Simi Valley contracted with Nobel Systems on Various Projects (Water Atlas Books, Sewer Atlas Books, Scanning and Linking of As-Builts to GIS, Viewing Application, Printing Application) City of Simi Valley (City) awarded Nobel Systems various contracts to improve the content and functionality of the City's GIS. Nobel Systems was awarded 3 separate projects to 1) create water system atlas books and provide Nobel Systems PrintWorks application to manage the changes to the atlas books, 2) create sewer system atlas books, and 3) scan and link water as-builts to the GIS and provide Nobel Systems' GeoViewer application to view the GIS data and scanned documents. These GIS projects have allowed the City to further benefit from the City's GIS by adding new beneficial functions.

Deliverables

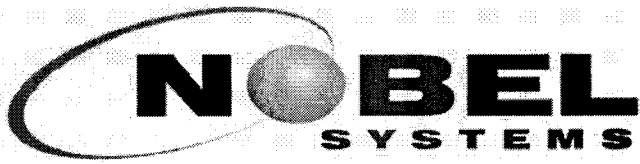
- Sewer System Atlas Books

- Water System Atlas Books

- GeoViewer Application

- Printing Application

- Scanning (tiff. images) and Linking of As-Builts (Access database)



1845 Business Center Drive, #130
San Bernardino, CA 92408
Phone: 866-NOBEL-SYS
FAX: 909-890-5612
sniyogi@nobel-systems.com
www.nobel-systems.com

June 11, 2007

Johnnie Griffing,
GIS Project Manager
The City of Culver City - IT Department
9770 Culver Blvd.
Culver City, CA. 90232

Re: Proposal for GPS point collection for the Street Light Poles

Dear Mr. Griffing,

Nobel Systems ("Nobel") is pleased to submit our quote to the City of Culver City ("City") for providing GPS Data Collection Services for the street light poles within the city. The City is seeking the services of an experienced GPS solution provider for collecting positions of all the City Street Poles. Nobel proposes to provide consulting Services for the City's GPS project for \$5 per street light pole. The City would provide direction on different pole types that the survey crew could select from a data dictionary on the GPS units to establish feature type identification.

The entire project team is very enthusiastic about this project and about the opportunity to work with you to further your information management goals. Please feel free to contact me directly should you require any further information.

Thanks,

Best Regards,

Shil Niyogi,
Regional Manager, Nobel Systems, Inc

UNDERSTANDING, METHODOLOGY AND SCOPE

Culver City seeking the services of an experienced GPS solution provider for collecting positions of all the City Street Poles. The City has between 3000- 4000 poles, whose GPS position it needs to gather. Nobel Systems utilizes state-of-the-art Trimble Global Positioning System (GPS) equipment to capture data in the field. Among units used, the Trimble GeoXH handheld receiver with H-Star technology demonstrates accuracy to within 1-foot of real-world coordinates, under ideal situations. Trimble defines H-Star technology as a combination of advanced GPS receivers, field software with sophisticated logging capabilities, and office software with innovative post-processing capabilities. This allows highly-accurate data points to be collected with minimal cost and time.

One benefit of using Trimble equipment with H-Star technology is the Predicted Post-processed Accuracy (PPA) indicator, which shows the accuracy that is likely to be achieved when the data is post-processed. Additionally, multiple reference stations are used during differential corrections; which reduces error caused by reference station bias and distance. Further, the integrated antenna on the GeoXH employs Trimble's Everest multi-path rejection technology to ensure reflected signals are rejected by the receiver. Nobel recommends adding the external Hurricane antenna for additional multi-path rejection during data collection. According to Trimble, the three essentials of the H-Star systems are:

- Quality GPS data
- PPA-driven workflow
- H-Star post-processing

All electrical equipment is susceptible to an inherent flaw; Electromagnetic interference. GPS receivers are affected by internal as well as external electromagnetic noise. To combat this, Trimble's GeoXH utilizes advanced noise-reduction techniques by shielding both the receiver and the antenna from interference due to nearby electromagnetic sources. This can be extremely useful when collecting data near electric utility features to guarantee quality GPS data.

One benefit to using a PPA-driven workflow is that the user will have confidence that their post-processed data will be within the accuracy determined for a specific project. On the GeoXH handheld, a PPA indicator is constantly updated based on the antenna type, satellite geometry, and carrier lock (duration of lock on a minimal number of satellites), and the assumption that the user will determine the best reference stations that support H-Star processing requirements. It should be noted that PPA values do not factor in ionospheric delay and multi-path signals; it only models them.

The degree of post-processed accuracy depends on several factors. First, the quality of each of the reference stations used must be above 80 on the 'integrity index' scale. This value is provided in the post-processing software, and should be highly considered before choosing a set of base stations for differential corrections. Second, the distance from the area where data was collected is also a highly important consideration. Typically, it is best to use base stations within 200-km of the area where data collection occurred. Last, the physical geography make-up of the locations of the surrounding base stations with regard to the point where data was collected plays an immense role as well. According to Trimble: Using an averaged result from evenly-distributed reference stations lessens the effect of atmospheric error from any one reference station, and provides a truer picture of what was actually happening at the point where data was collected. In other words, a cluster of reference stations all lying in the same direction from the collection area, are not likely to improve accuracy.

Overall, by utilizing Trimble equipment with H-Star technology it is possible to spend a minimal occupation time at data collection points, and still achieve excellent sub-foot post-processed results. By way of technologically advanced receivers, and well-thought-out post-processing procedures, it is simple to create a work-flow which will result in highly-accurate GPS data. It is Nobel's belief that using these methods will increase the overall productivity of data collection immensely.

Data collection by way of accepted methods generally results in approximately one hundred points being collected per 8-hour day. During this project, it is estimated that three thousand to four thousand features will need to be recorded. To facilitate the data collection process, it is recommended that a data dictionary be created ahead of time. This will make it more efficient to collect data points, by displaying a list of attributed features from which to pick from.

Given the parameters set forth in the project's scope, Nobel Systems will be able to accurately capture all features within a period of six to eight weeks from notice to proceed. Further, it is estimated that post-processing will take an additional week to ensure the accuracy requirements set forth in the scope. A final Geodatabase deliverable can be compiled, if required, in a period of approximately three weeks. The total time to develop all requirements and deliverables for this project is estimated to be between ten and twelve weeks.