Agenda

• Broadband Mapping Goals
• Methodology
• ProField™ Demo
Broadband Mapping Goals

• Mapping Database Software (Intelligent Map)
• Accurate Data
• Consistent Nationwide Model and Data
• Support Economic Stimulus
Mapping Database Software

• Data Model for Dynamic Query and Reporting
• Broadband Coverage needed at the Street-level
• Costing Tool for Evaluating Grant Applications
• Software Tools for All Stakeholders
  – Federal & State Governments
  – Providers
  – Affected Parties
  – Public
Data Model
To Support Dynamic Query & Reporting

Tip: Verify the underlying data model
Block Groups
Charlotte County, VA
Broadband Data
Dynamic Query & Roll-up

Block Level

Block Level Data

Aggregated to Tract Level

Census Tract Level Data
Accurate Data

- Nationwide Field-Survey is Required to Assure Accuracy of Coverage Data
  - Provider Data is not Accurate
  - FCC Data is at Census Tract Level
  - State Mapping Programs Data is Not at Street-Level
    - Consumer-Supplied Data Points Added in Some Cases

- Data Accuracy is Critical (99%)
  - Will support $7b in Grants
  - President’s Open Government Pledge
  - Sensitive data visible to public
Pennsylvania Broadband Program

• Pennsylvania requires Verizon to provide broadband service to 100% of its customers by 2015 (≥ 1.544 mbps)

• Verizon PA’s Network Modernization Plan requires Verizon to file interim reports tracking Verizon’s progress towards its 2015 goal.

• The Pennsylvania PUC retained the Liberty Consulting Group to audit the Verizon’s most recent interim report
Pennsylvania Broadband Program

• Verizon’s Methodology:
  – Uses electronic test equipment to conduct a high frequency loss test (21% of records)
  – Uses median terminal loop length of all pairs working at the same terminal (37%)
  – Unknown – Uses this specification when it cannot determine the source of the data (18%)
Pennsylvania Broadband Program

• Audit Findings:
  – Verizon’s method for determining broadband availability (≥1.544 Mbps) does not accurately reflect actual availability
  – Verizon’s data includes lines not readily available for broadband service
  – Information provided by Verizon’s Golden Source database is not consistent with information provided by Verizon’s online website
  – Liberty was unable to replicate Verizon’s reported results for broadband and rural DSL availability
Results of Recent Field Audit

- 60,000+ Remote Terminals Inventoried
- Of which,
  - 6,484 Locations were wrong
  - 2,237 Did not exist
Tract Level FCC Data Masks
Un-served Areas
State Mapping Programs

- State broadband mapping programs were tailored for each state – not consistent from State to State
- Primary reliance on Provider-supplied Data, not known for its accuracy
- No data model; maps are static “views”
- The requirements of the current broadband mapping initiative are fundamentally different
A Standard National Methodology and Data Model

• A scientific, defensible methodology including field-validation of provider-supplied data is essential
  – Apex offers to develop and license a complete ProField solution for use nationwide – at a substantial discount or free

• A consistent, rich data model is essential for the current national mapping initiative
  – Apex offers to develop and share its data model for national use
Supporting Economic Stimulus

- Apex’s methodology involves hiring, training and deploying an estimated 2,000 college students from across the country
- Field Survey work to be completed in the Summer of 2009 – Managed with ProField™
- Project Completion Targeted for Dec 2009
Questions?
• **Step 1:** Develop Base Map
  - Street Data
  - Census Data
  - Political Boundaries
  - Public Buildings
    - Schools (82,000; 28,000-rural)
    - Higher Education (5,000)
    - Churches (400,000)
    - Libraries (9,000)
    - Fire Stations (25,000)
    - Police Stations (17,000)
    - Hospitals (7,569)
Apex’s Methodology

• **Step 2:** Build Costing Model
  – By Census Block

• **Step 3:** Collect Provider Data
  – Locations of broadband-enabled terminating equipment
  – Customer addresses
  – Service level and type
Apex’s Methodology

- **Step 4:** Geo-Code Provider Data on Base Map
- **Step 5:** Compute Served Area Boundaries using Provider Data:
  - Terrain models for wireless broadband
  - *Along streets* for telecom/cable broadband
Apex’s Methodology

• **Step 6: Define Field-Study Area**
  – Categorize Census Blocks by population density
  – Conflate computed Service Boundaries
  – Include all schools, colleges, hospitals, libraries, churches, police stations and other public buildings
  – Identify Census Blocks to be surveyed
Apex’s Methodology

• **Step 7: Develop Survey Instruments**
  
  – Questionnaire
  
  – Script and procedure for requesting speed readings
  
  – Leave-behind educational literature
    (for un-served and underserved households)
Apex’s Methodology

- **Step 8:** Customize ProField
- **Step 9:** Conduct Field Data Collection
  - GPS Reading
  - Spectrum analysis for wireless connectivity speeds
  - If telephone/cable service is available, perform speed tests (or request customer)
Step 10: Update Broadband Map
» Correct Service Area Boundaries based on Field Data

Step 11: Deliver (or Host) National Website and Mapping Database:
» Dashboard progress reporting with drill-down
» On-line Construction Grant Application
» Grant Tracker and Evaluator
» Public Portals and Tools
Summary

• **Intelligent Maps**
  - Supports real time information updates
  - Allows the NTIA to efficiently use and maintain the broadband maps
  - Compares multiple provider information in a single layer
  - Integrates the mapping project with grant evaluation

• **99+% Accurate Data**
Summary

- Dynamic, Interactive Tool for all Stakeholders
  - Federal & State Governments
  - Provider Community
  - General Public

- Consistent Nation-wide Data

- The Field Survey is used to educate customers

- Supports the President’s economic stimulus