Apex CoVantage

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National Broadband Mapping

Presentation to NTIA

March 12, 2009

Agenda

- **Broadband Mapping Goals**

- **Methodology**

- **ProField™ Demo**

Broadband Mapping Goals

- **Mapping Database Software (Intelligent Map)**

- **Accurate Data**

- **Consistent Nationwide Model and Data**

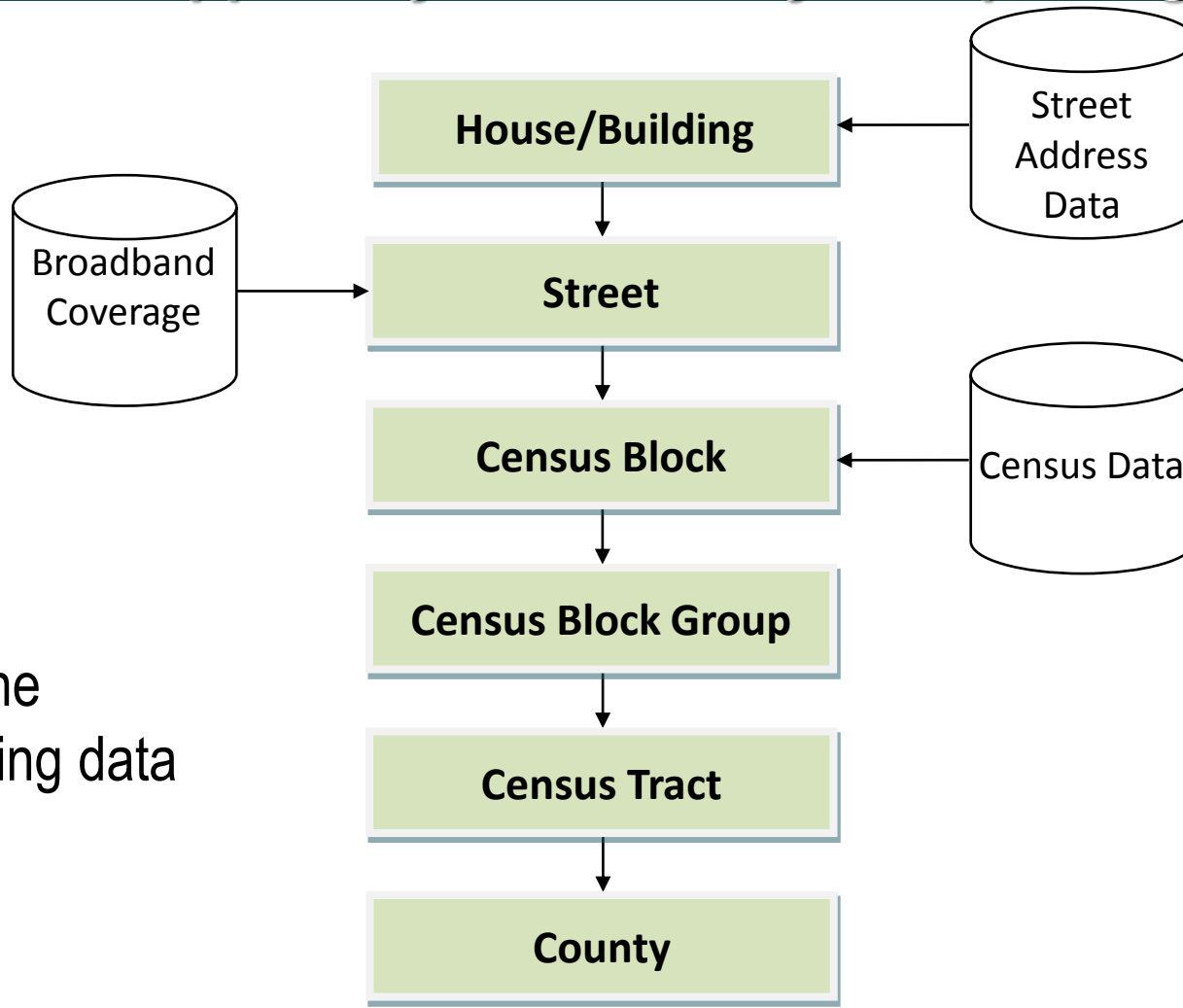- **Support Economic Stimulus**

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
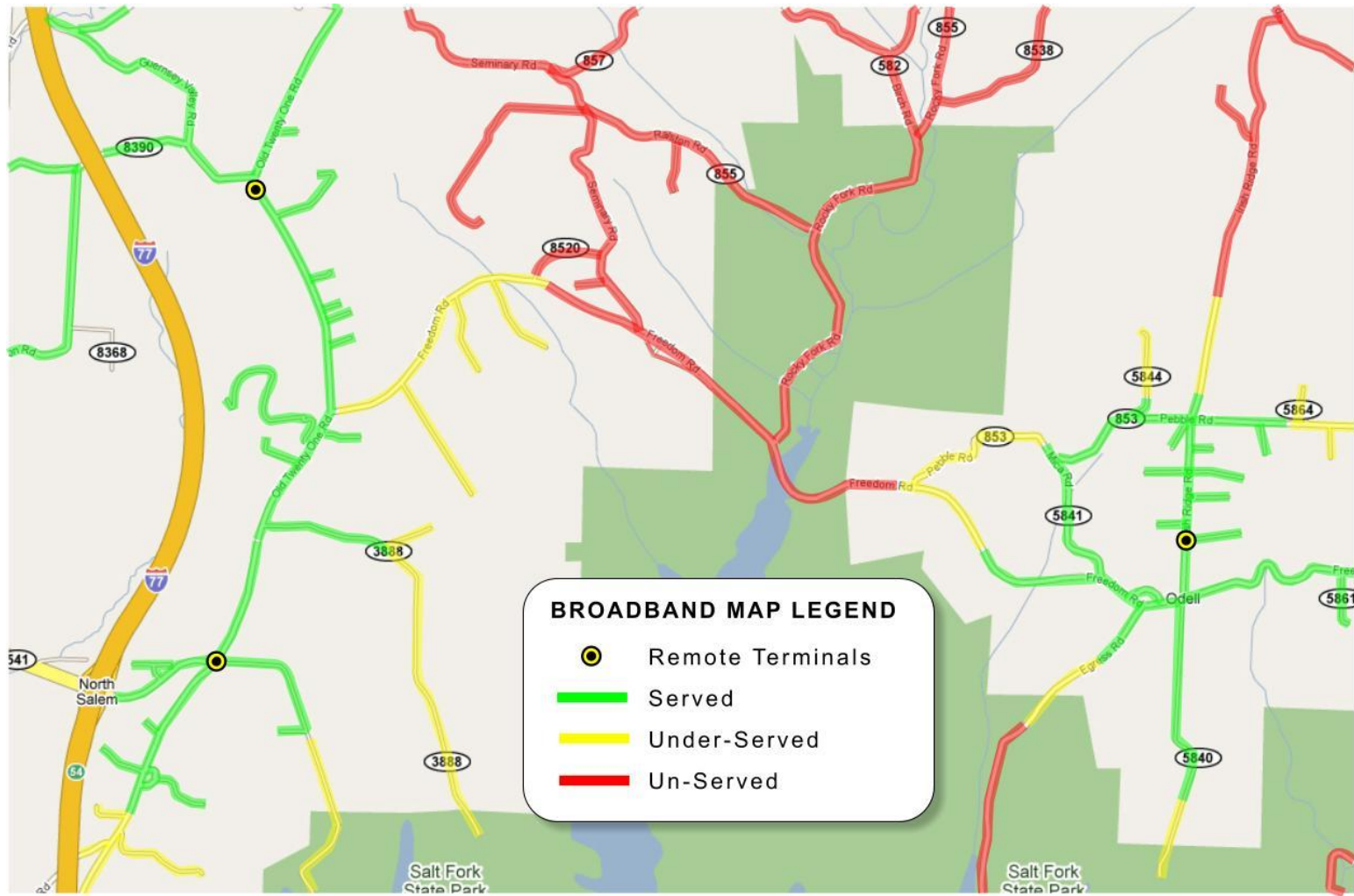## To Support Dynamic Query & Reporting

House/Building ← Street Address Data

Broadband Coverage → **Street**

Census Block ← Census Data

Census Block Group

Census Tract

County

<u>Tip:</u>
Verify the underlying data model

Street Level Broadband Coverage

BROADBAND MAP LEGEND
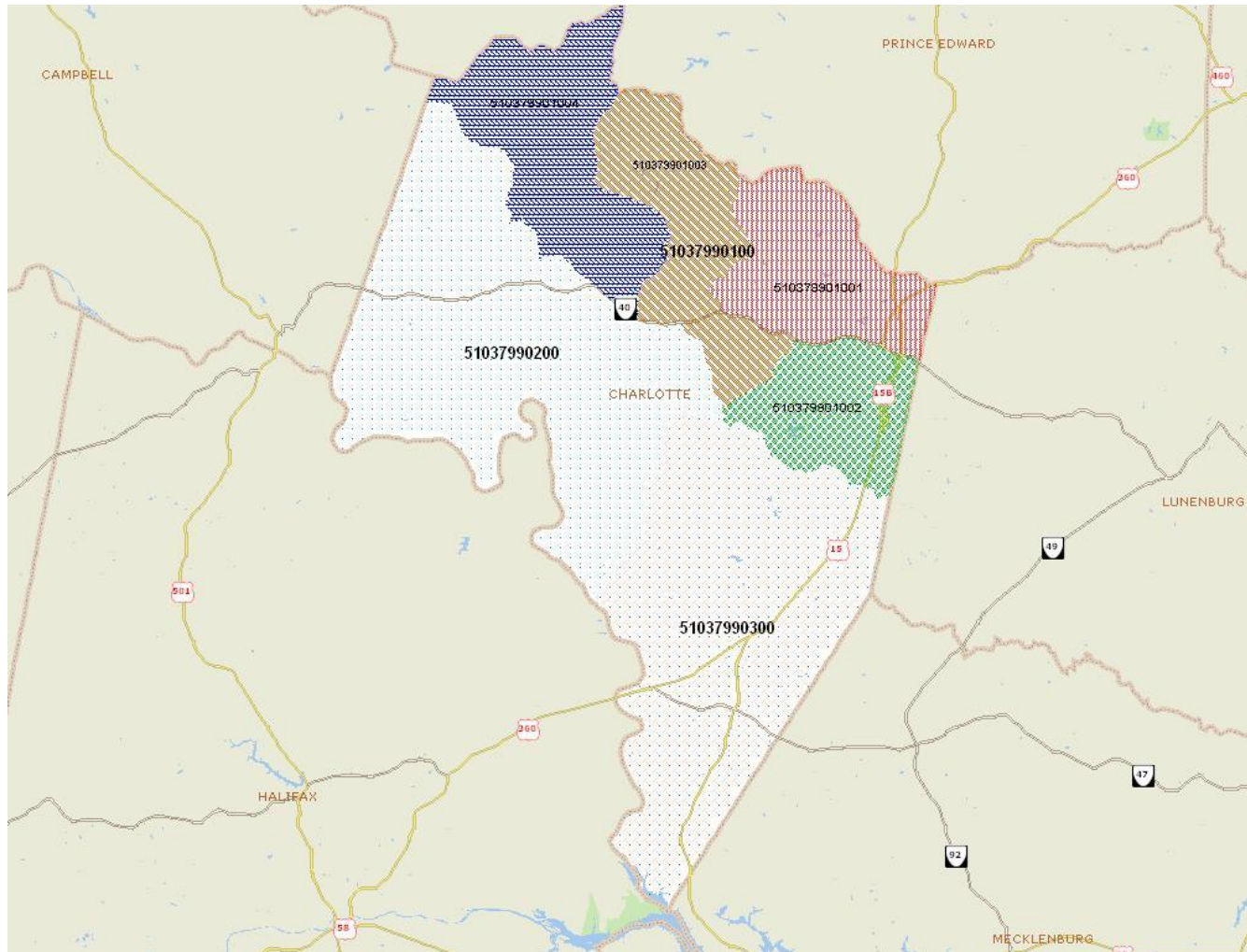
- ⊙ Remote Terminals
- ▬ Served
- ▬ Under-Served
- ▬ Un-Served
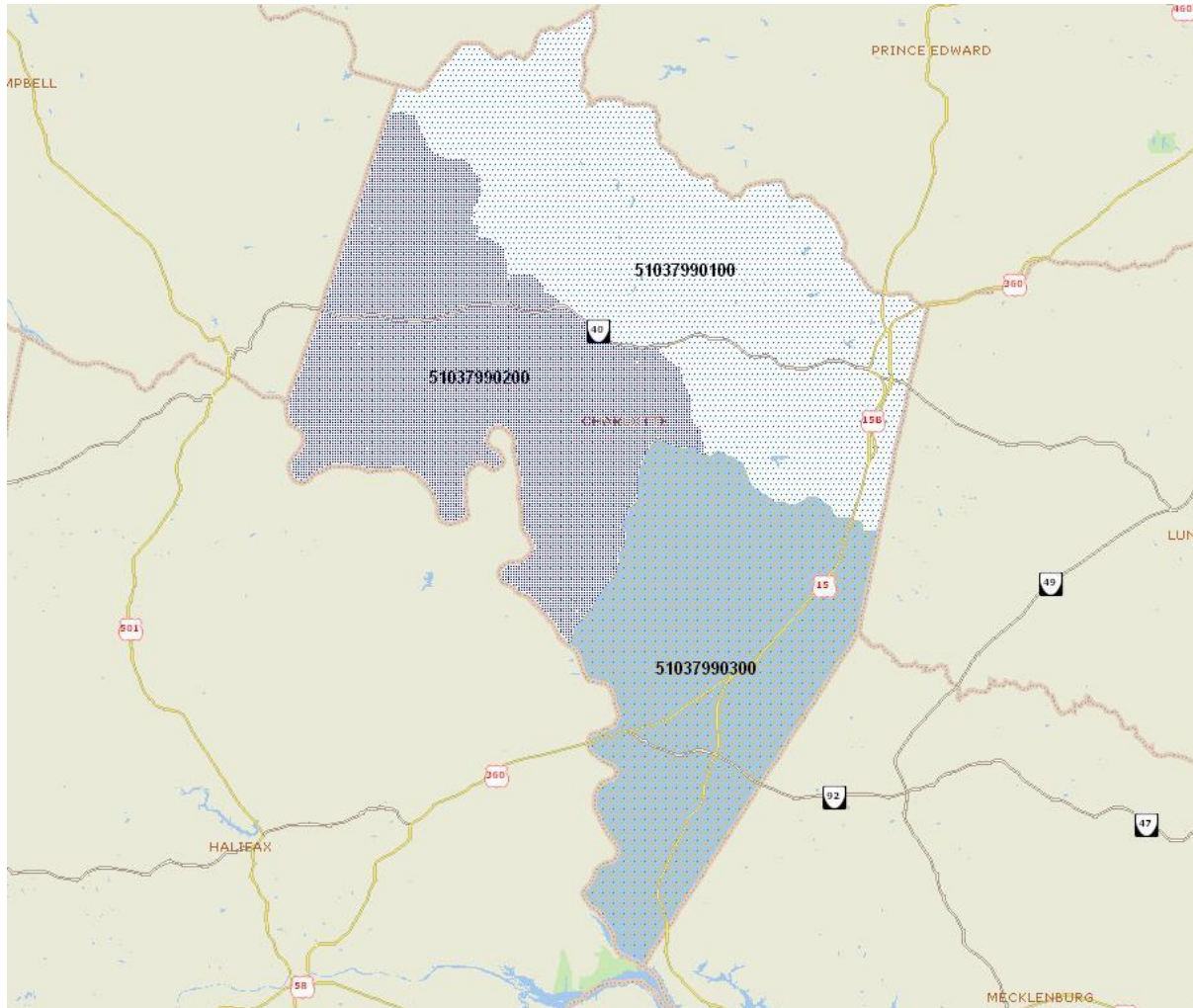
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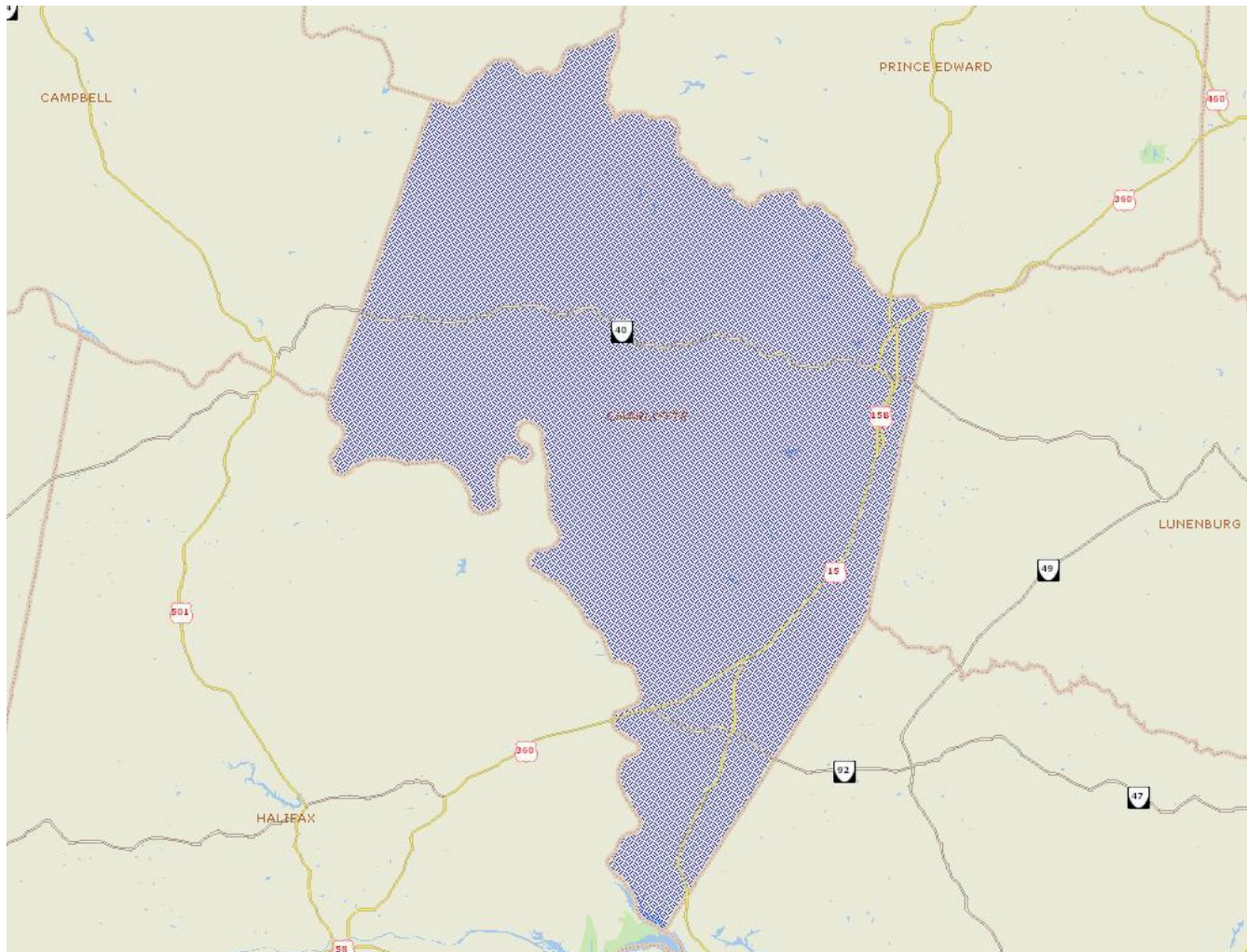# Census Blocks
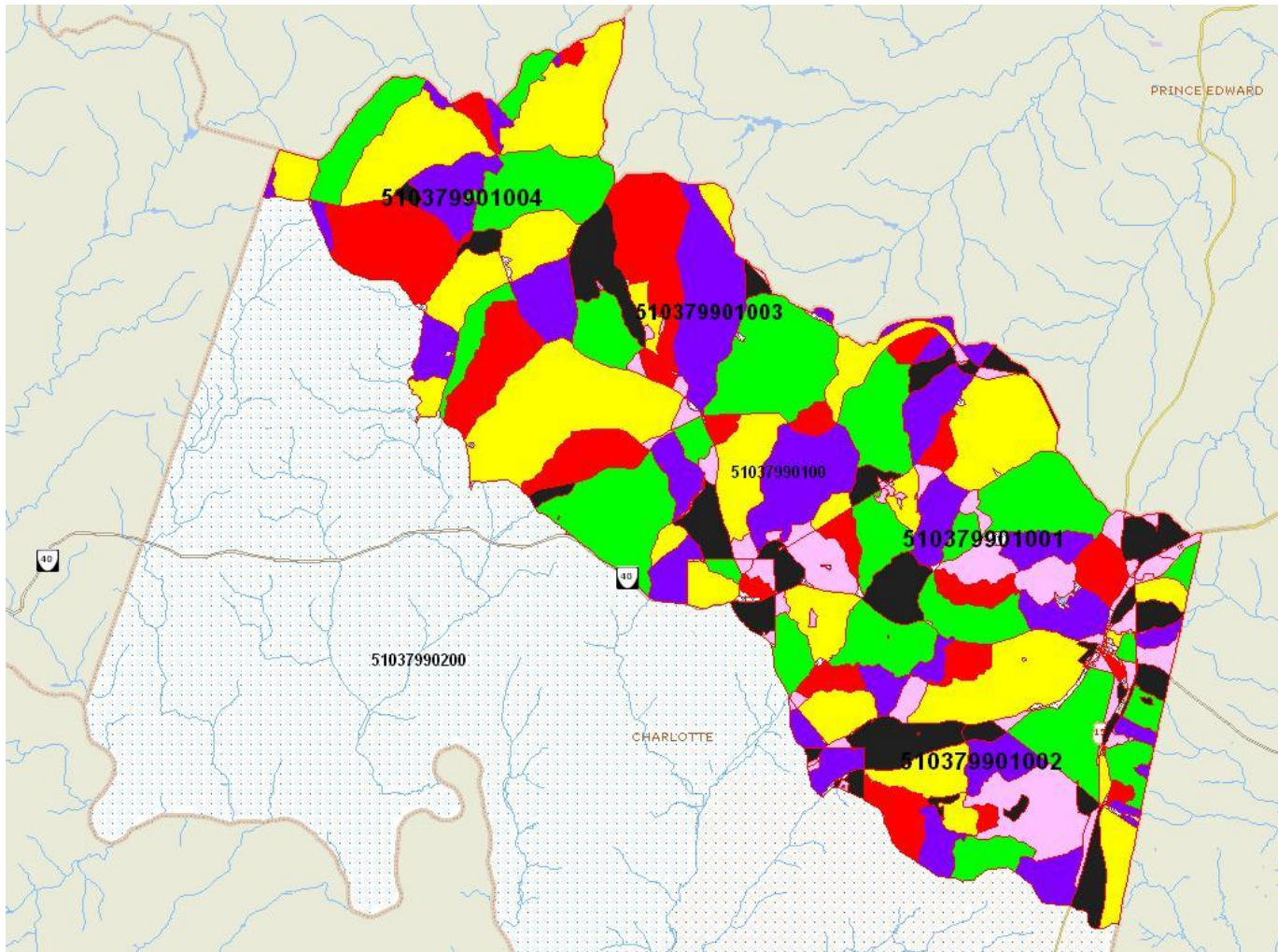
Block Groups

Tracts in Charlotte County

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 <u>Critical</u> (99%)**
  - **Will support $7b in Grants**
  - **President's Open Government Pledge**
  - **Sensitive data visible to public**

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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
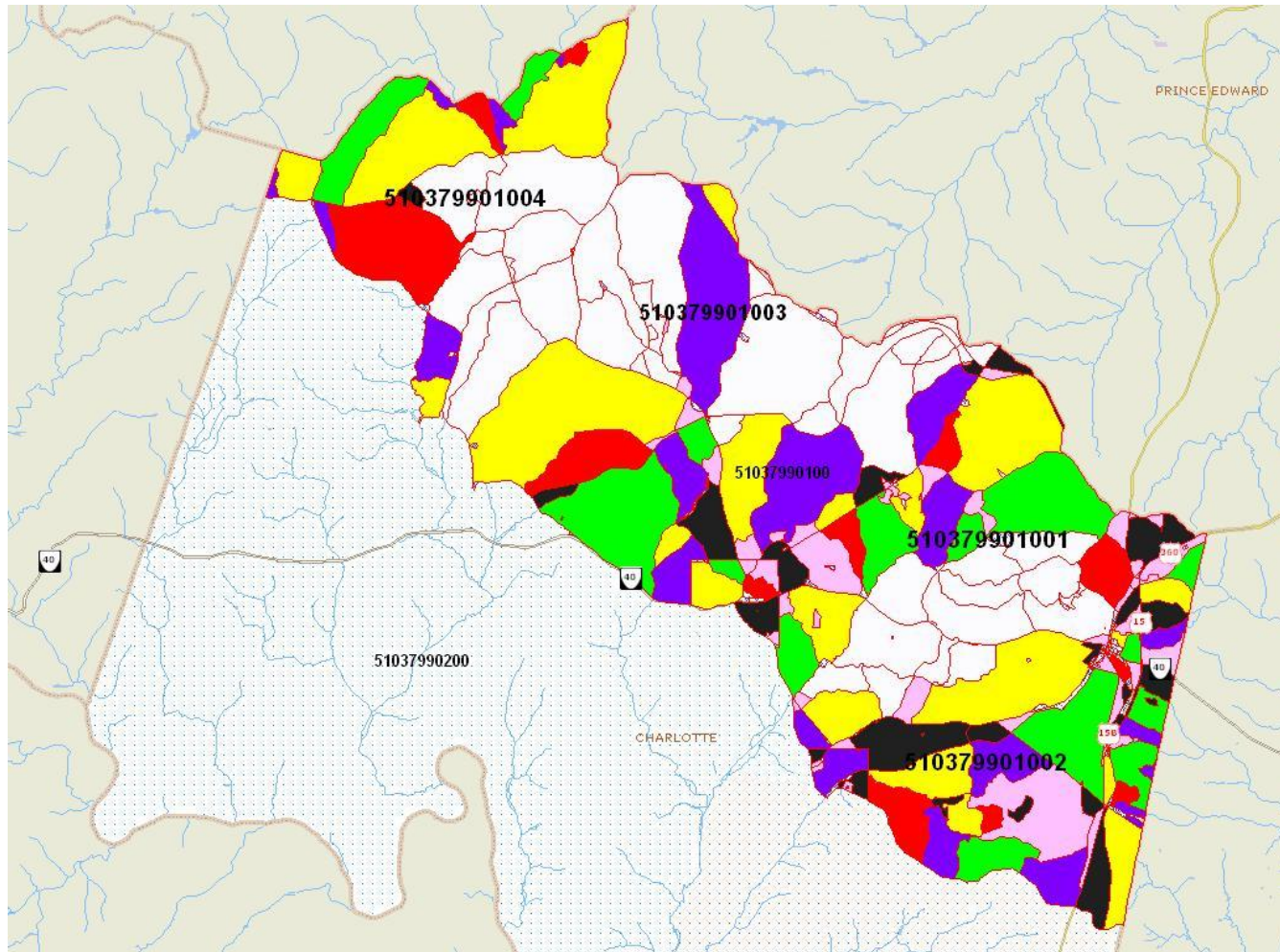
Results of Recent Field Audit

- **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**

APEX

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?

Apex's Methodology

- **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

- **<u>Step 4:</u> Geo-Code Provider Data on Base Map**

- **<u>Step 5:</u> Compute Served Area Boundaries using Provider Data:**

  - **Terrain models for wireless broadband**

  - **<u>Along streets</u> 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)

Apex's Methodology

- **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**

How can Apex help?