

Is Your GIS Smart Grid Ready?

A State-of-the-Industry Report

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Survey Overview

In the fourth quarter of 2009, ESRI conducted a smart-grid-readiness survey of electric utilities. Response was received from 226 participants. The majority of responses were from the United States; however, respondents came from across the globe. About 60 percent of the respondents were from midsize companies, 30 percent from large companies, and 10 percent from very large companies. These proportions accurately mirror company sizes across the industry.

Key findings from respondents include

- Most engineering departments are likely to handle GIS applications and updates; IT departments are likely to handle GIS support.
- Only about 10 percent of the companies update GIS data within 1 day of work completion.
- About 25 percent indicate they have work orders older than six months yet to be added to the GIS database.
- While a vast majority of respondents ranked smart grid readiness as strategic to their plans, none has achieved readiness in all areas.

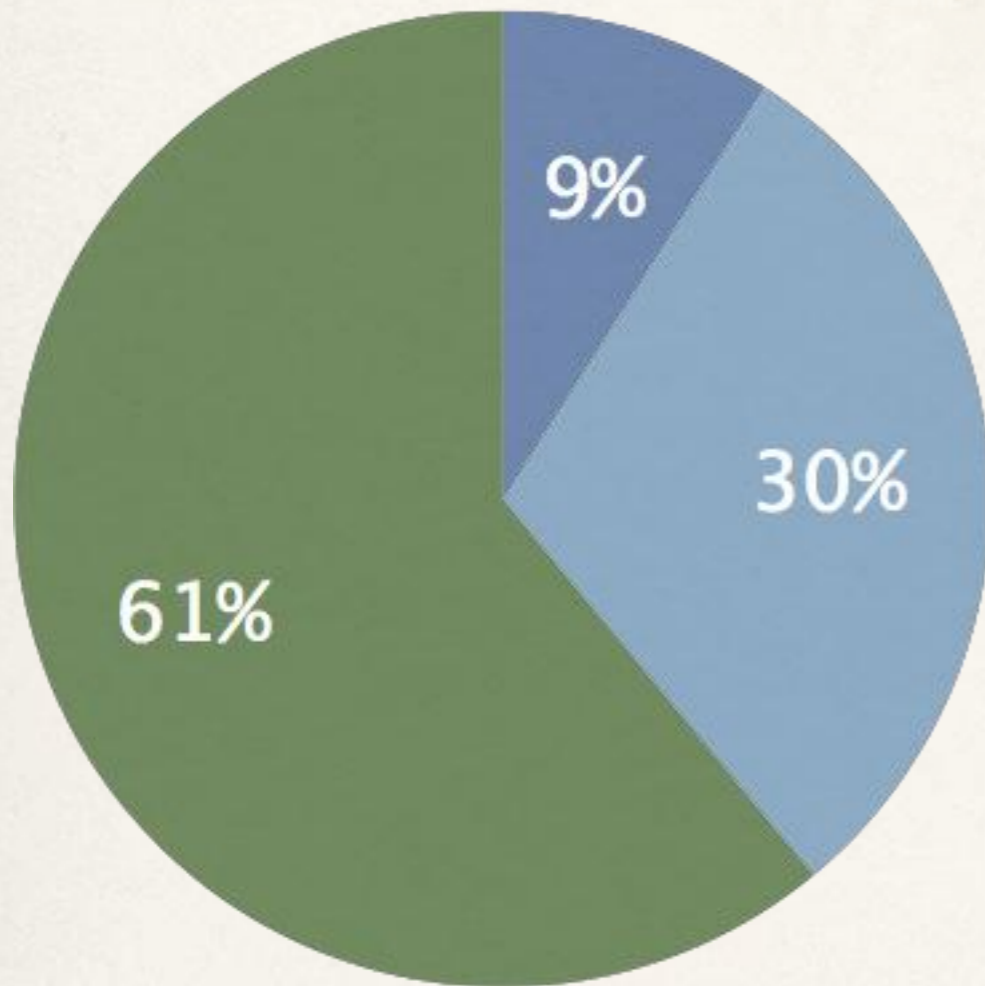
Survey Methodology

Each response was scored based on values for each response choice and the importance to overall smart grid readiness of each question. Total scores for the 226 participants were then grouped into four quartiles.

The Size of Utility Respondents Accurately Reflects the Industry

What best describes your utility company?

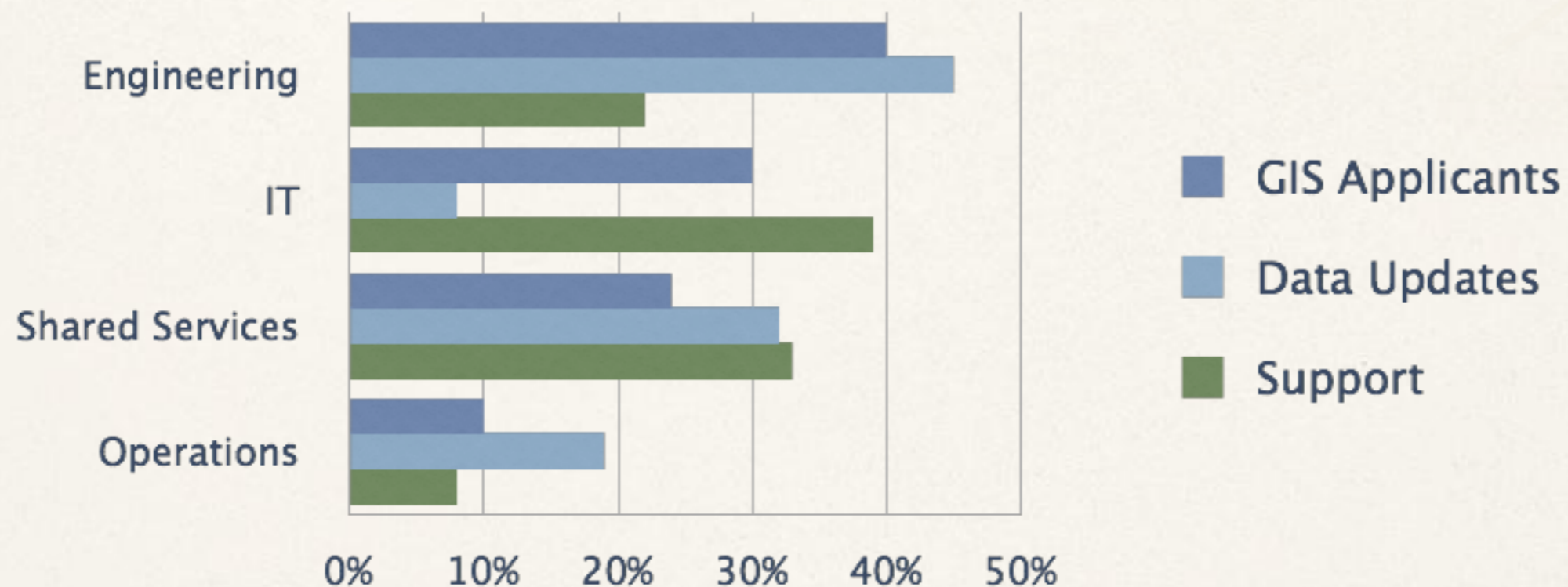
- More than 2 million customers
- 100,000–2 million customers
- Fewer than 100,000 customers



Responses from 226 people in companies large and small contribute to the findings in this smart-grid-readiness study.

Engineering, IT, and Shared Services Shoulder Most GIS Responsibilities

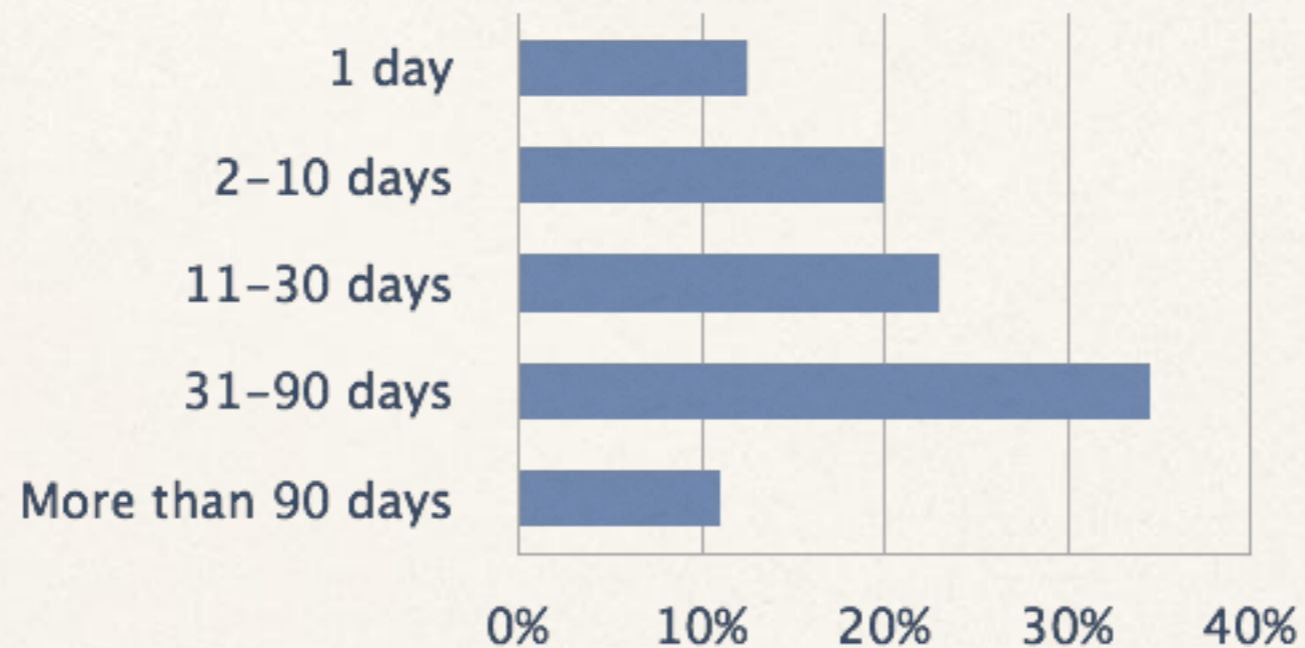
What group within your company is responsible for the following aspects of your GIS?



Respondents report that Engineering is responsible for most GIS applications and data updates, while IT is responsible for most support.

Lag Time to Update Data Places Smart Grid Readiness at Risk

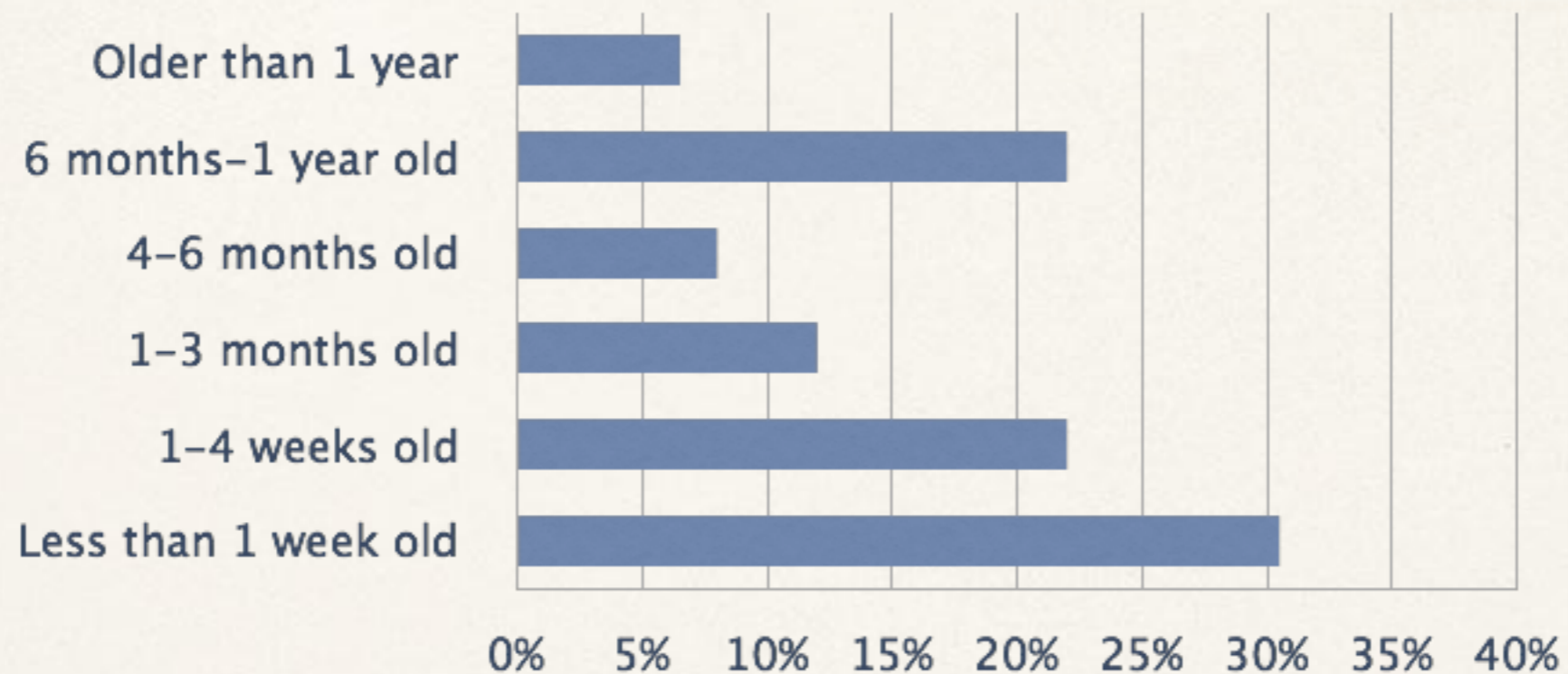
After the completion of construction/maintenance, how long does it usually take before your GIS data reflects the new construction/maintenance information?



Only one-third of utilities say they update their GIS data within 10 days of work completion.

Lack of Data Currency Can Compromise Smart Grid Effectiveness

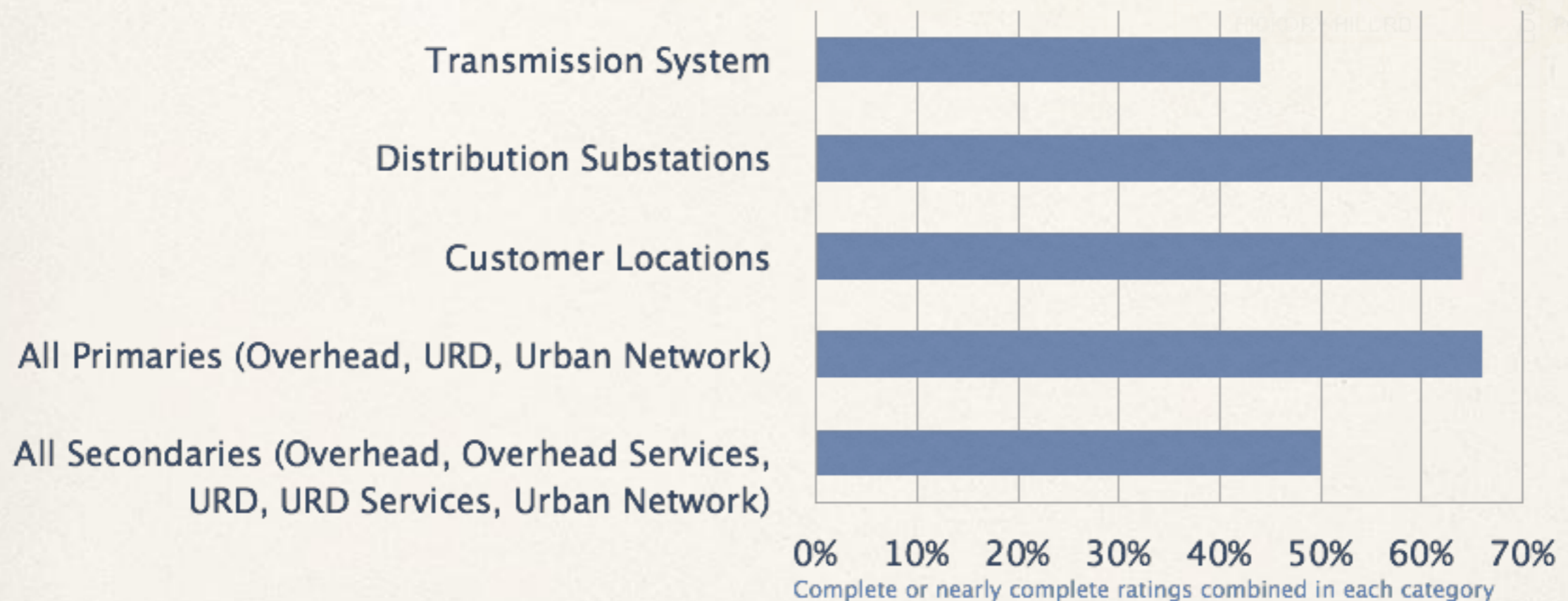
What is the oldest outstanding work order still to add to the GIS?



One in four respondents report there is information older than 6 months that is not reflected in their GIS.

Spotty Completion of Data Conversion Hampers Smart Grid Readiness

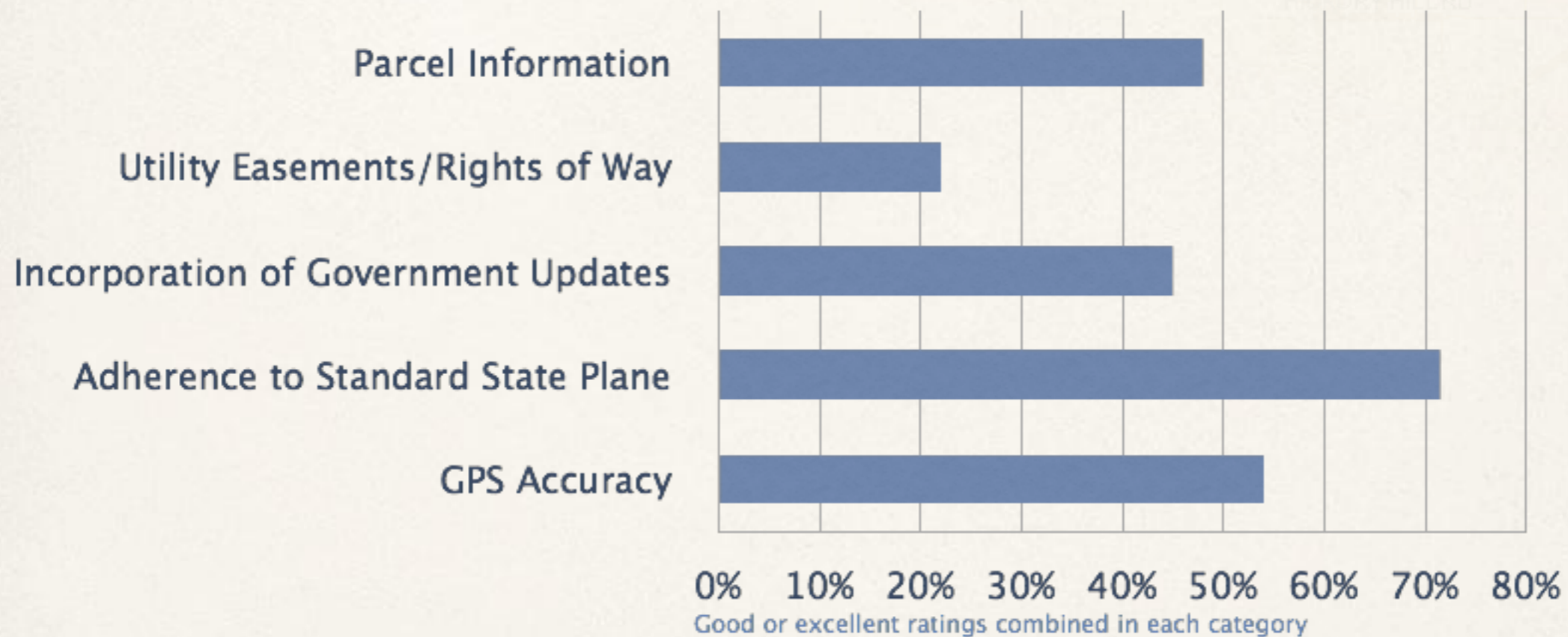
How would you rate the completeness of your GIS data in the following areas?



Less than 70% of respondents report having a complete model of their primary distribution.

Accurate Land Referencing Compromises Smart Grid Device Location

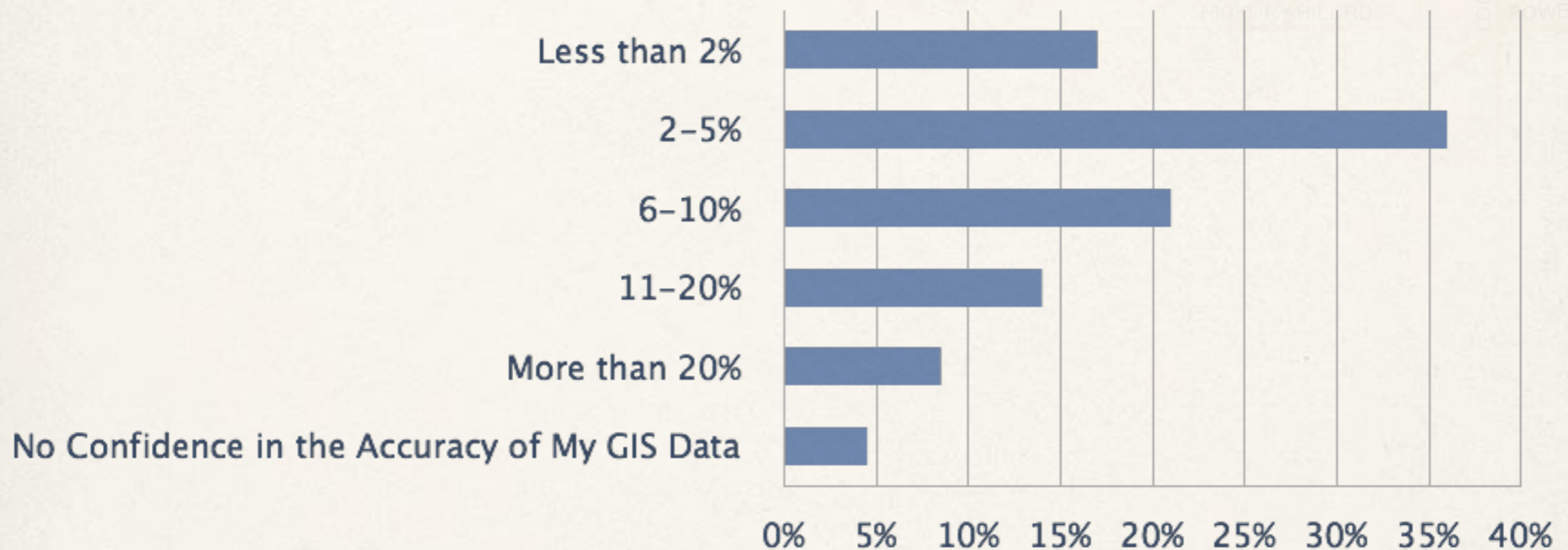
How would you rate the quality of your land/street information in the following areas?



Just over half of respondents report their land and street information is GPS accurate.

High Data Error Rates Hinder Smart Grid Accuracy

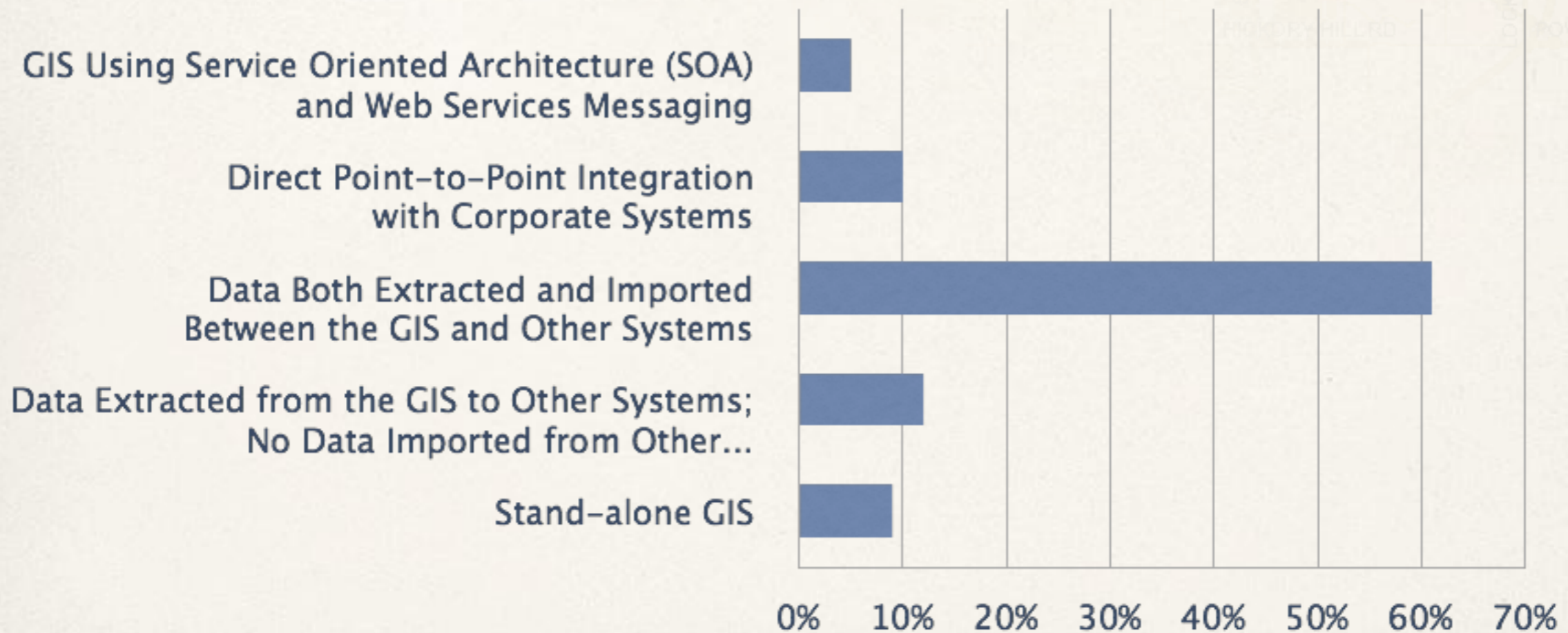
What best describes the percentage of errors you have identified in your GIS data?



Only 15 percent of respondents report high confidence (less than 2% errors) in their GIS data.

Integration of Data Is Key to Leveraging Smart Grid

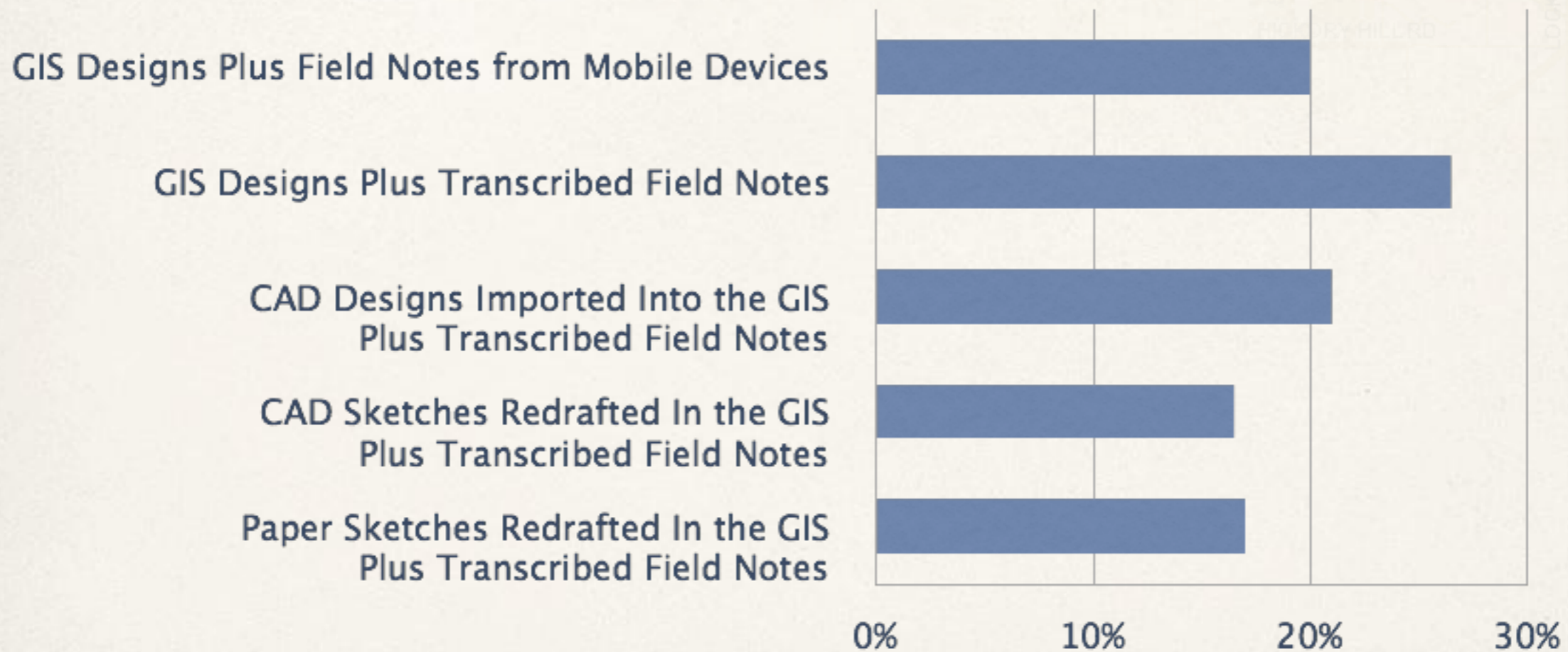
What best describes the integration of your GIS?



Most utilities report batch processing of GIS data into and out of other systems.

Minimal Use of GIS for Design Limits Smart Grid Currency

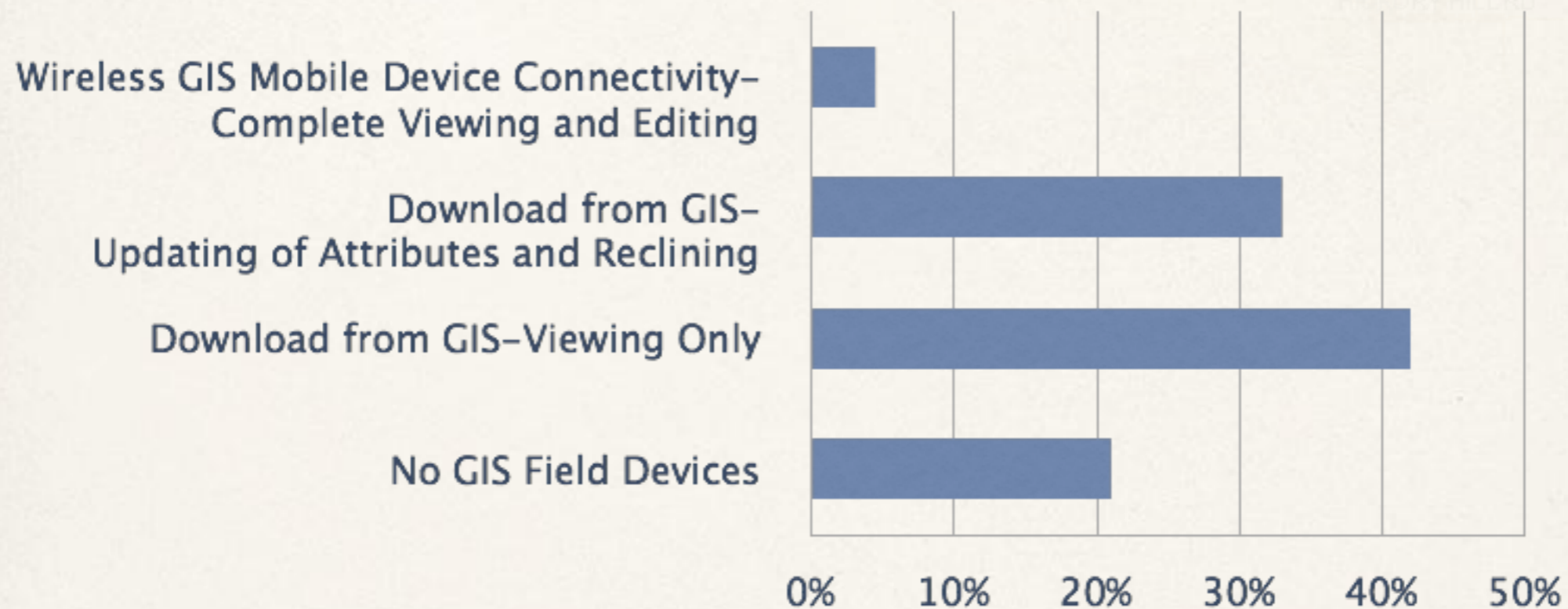
What best describes your data management and design process?



Most utilities report batch processing of GIS data into and out of other systems.

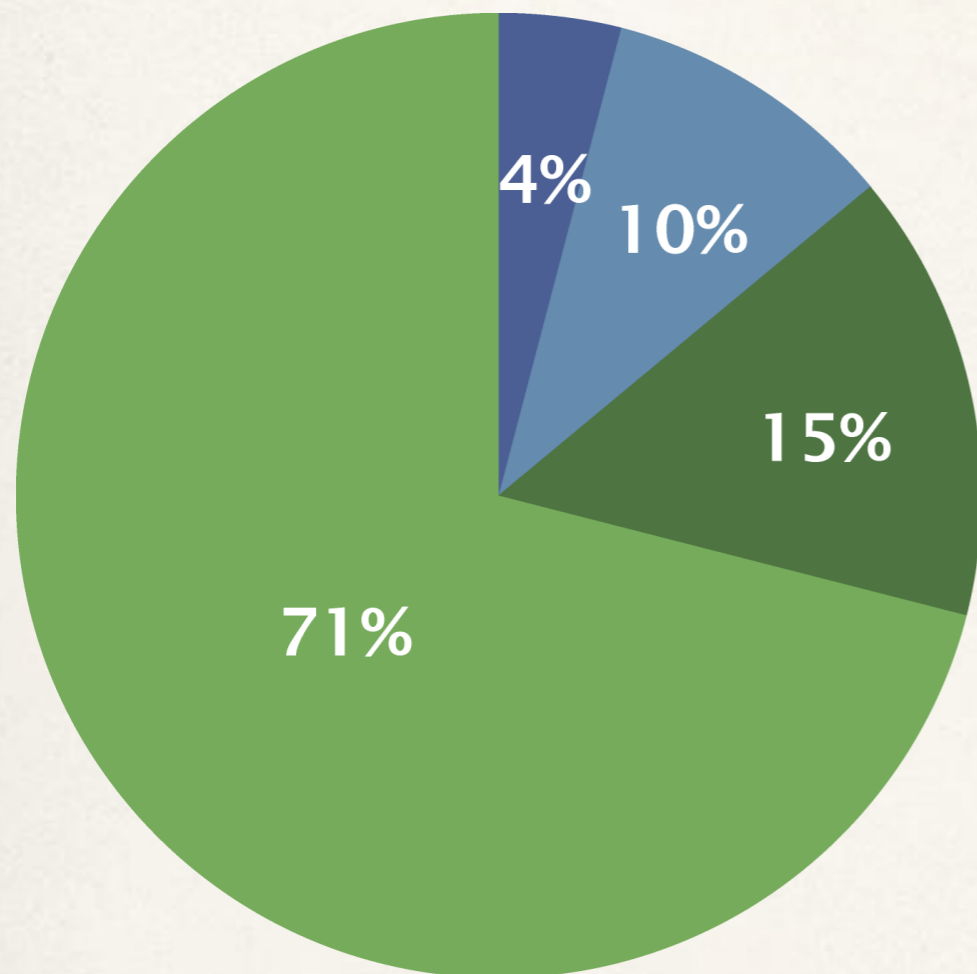
Mobile Devices Used Only for Viewing, or Lack of Mobile Devices Hampers Efforts to Maintain Data Currency

What best describes your GIS field mobility practices?



More than one in five have no GIS field devices. Of those that do, most have only viewing capability.

GIS Is Seen as Critical

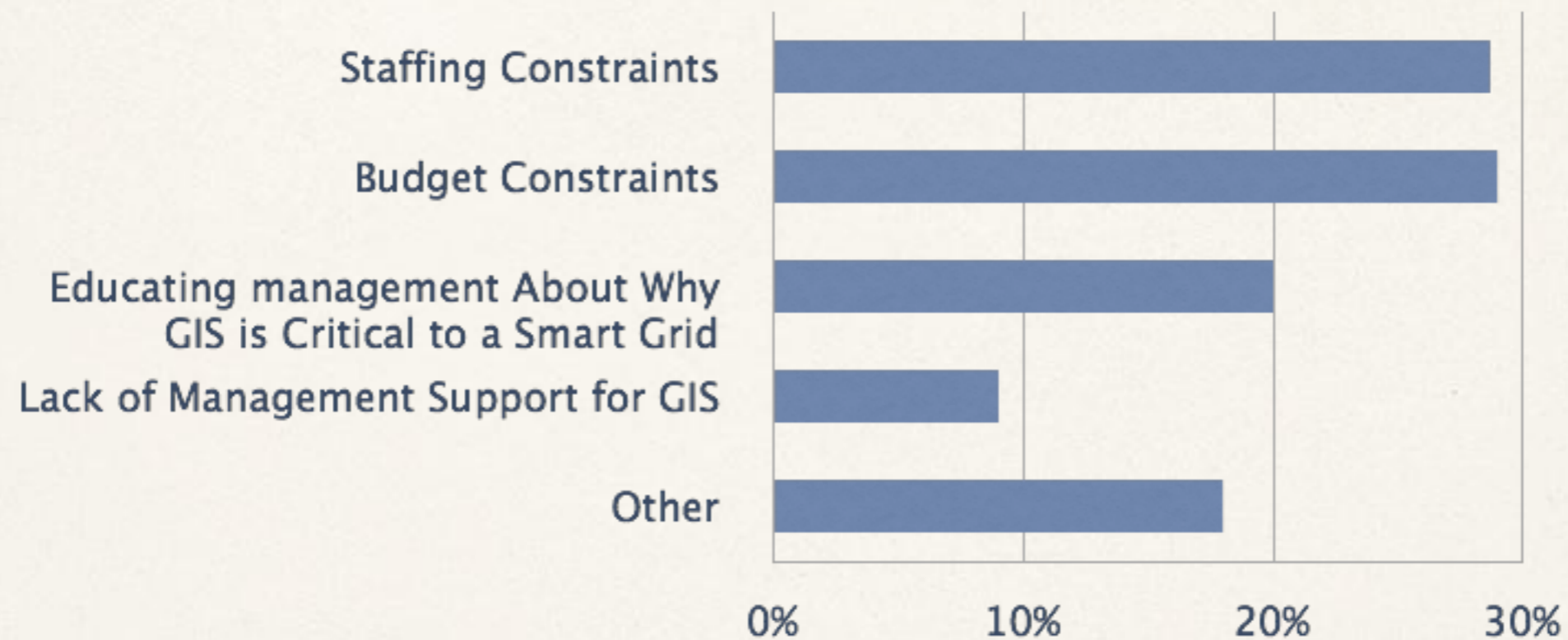


What best describes your GIS vision?

- Departmental system used for mapping
- An Efficient Tool to Produce Operating Maps
- Helpful for Providing Data to Strategic Systems, but Not Strategic Itself
- Strategic Core Platform, Fully Integrated with Foundation IT Systems and Fully Supported by IT
- Not Important—0%

Staffing and Budget Stifle GIS Development

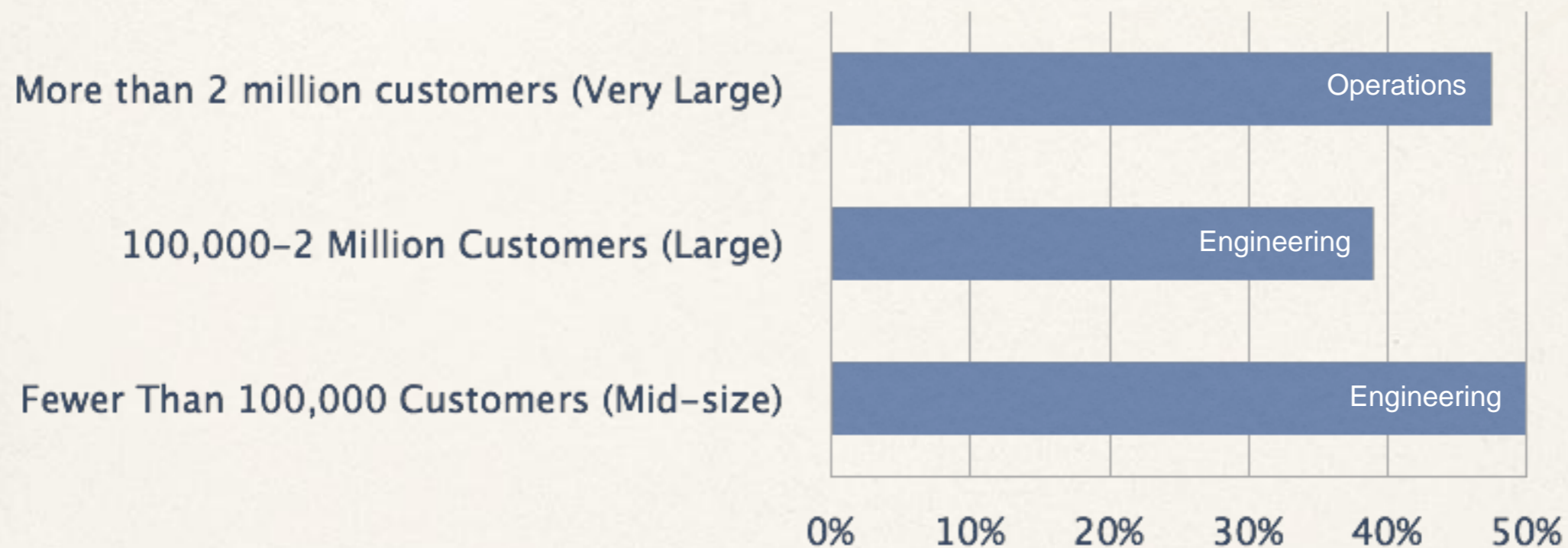
What do you consider the single biggest challenge in your organization to having a smart grid ready GIS?



More than one in five have no GIS field devices. Of those that do, most have only viewing capability.

Data Updates Are Most Likely to Be Handled by Engineering in Large and Midsize Companies

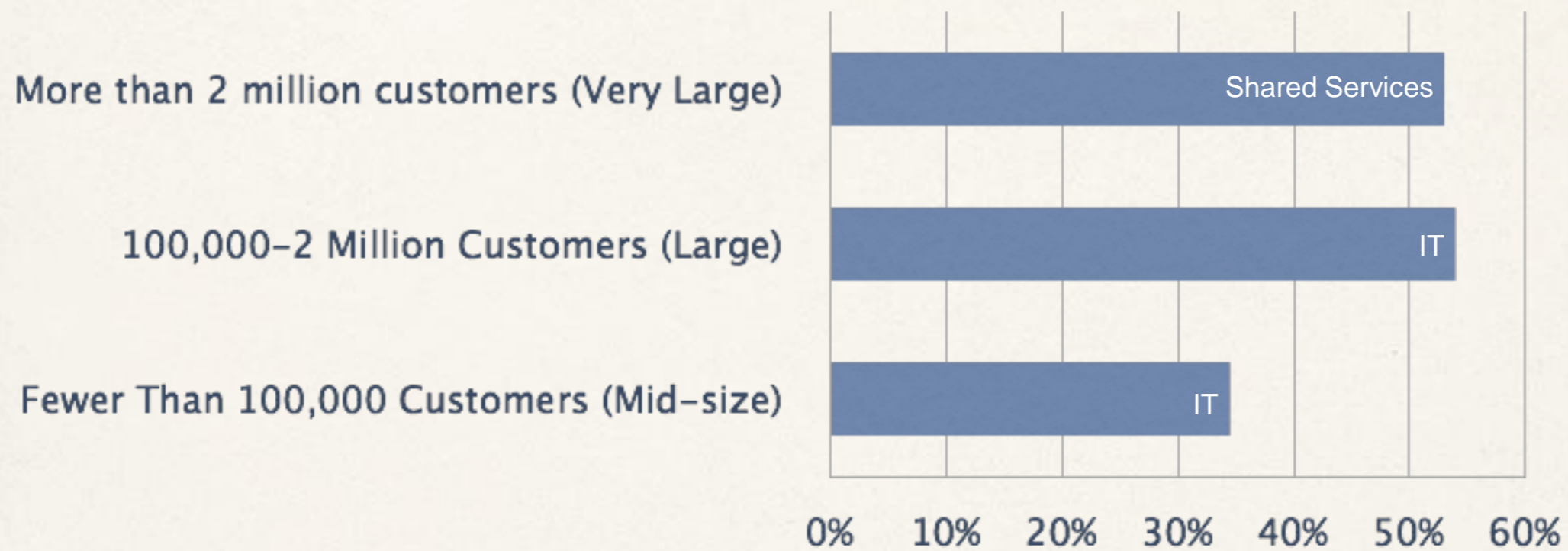
Size of Company and Governance of Data Updates



Very large companies say data updates are handled by Operations.

IT More Likely to Handle GIS Support in Midsize and Large Companies

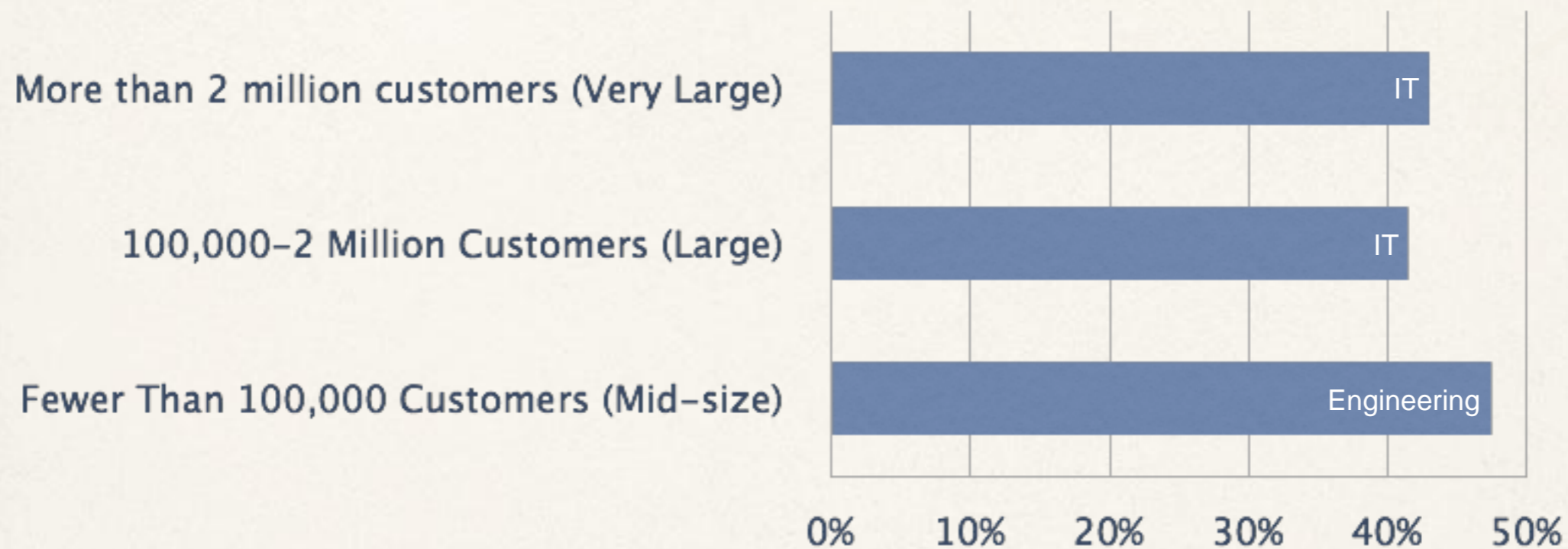
Size of Company and Governance of GIS Support



Shared Services is more likely to handle GIS support in very large companies.

Larger Companies Have Migrated GIS Application Support from Engineering to IT

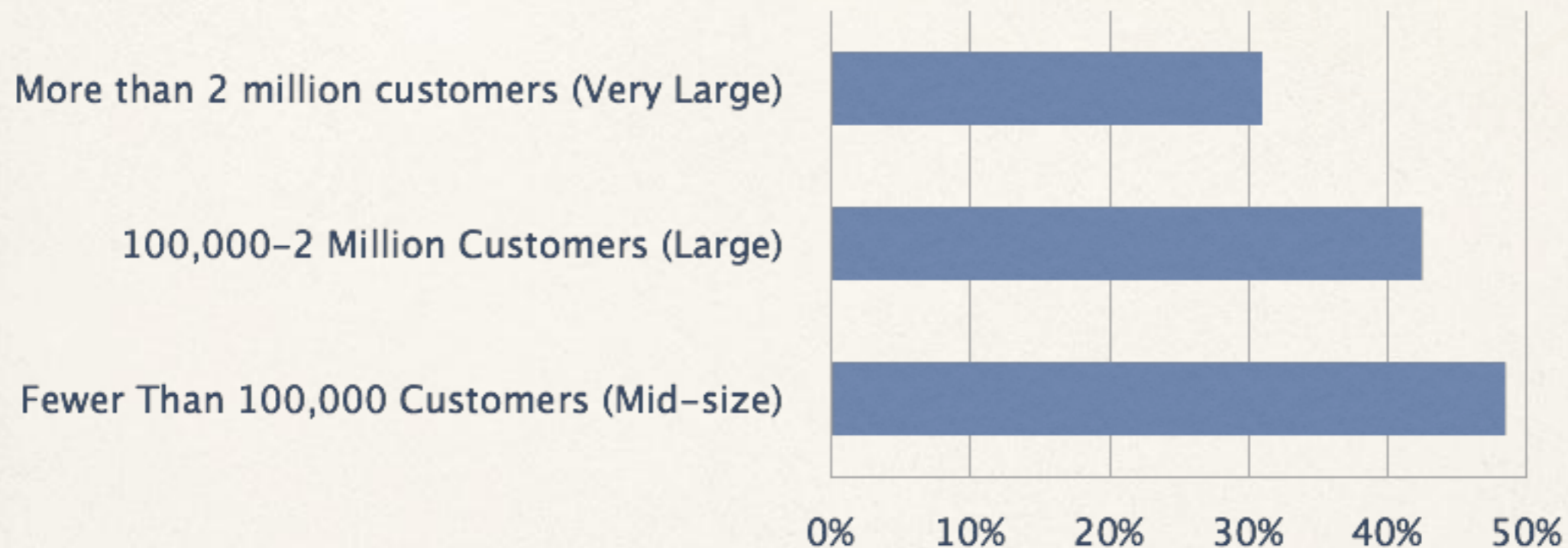
Size of Company and Governance of GIS Applications



Engineering is more likely to govern GIS applications in midsize companies while governance of GIS applications by IT is more likely in large and very large companies.

Larger Companies Take Longer to Update Their GIS

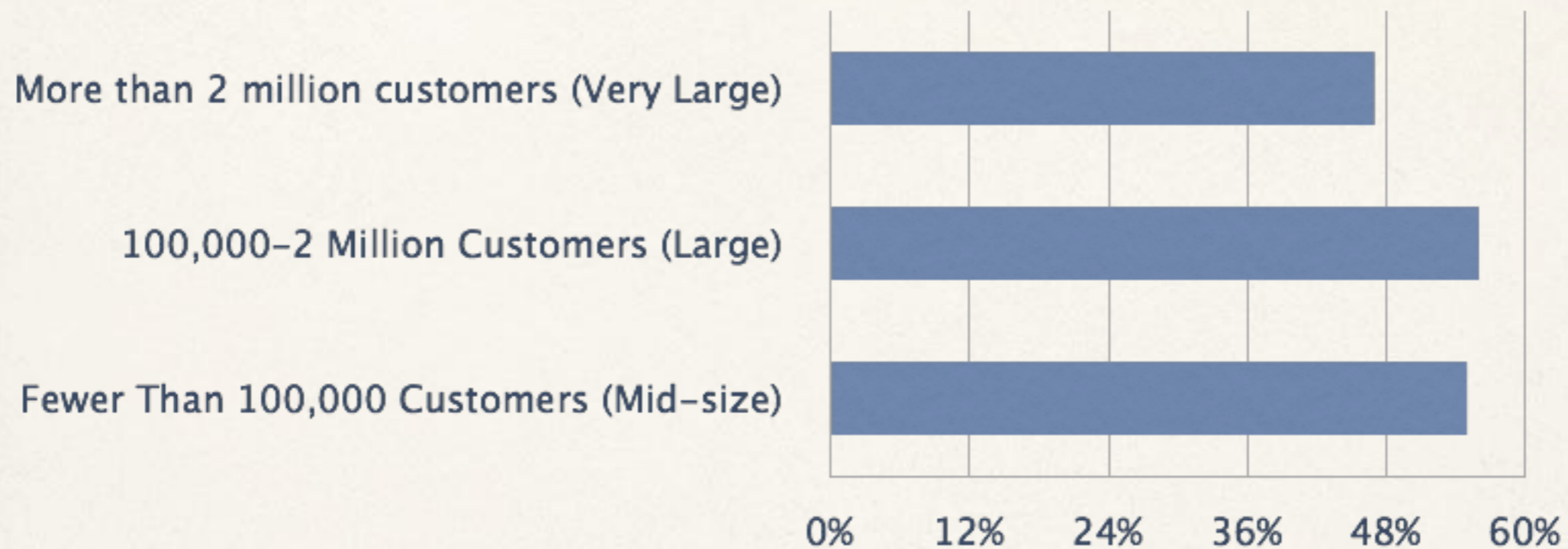
Size of Company and Data Update After Work Completion



There is a strong correlation between the size of a company and how long it takes before completed work is reflected in the GIS database.

Very Large Companies Report the Least GPS Accuracy

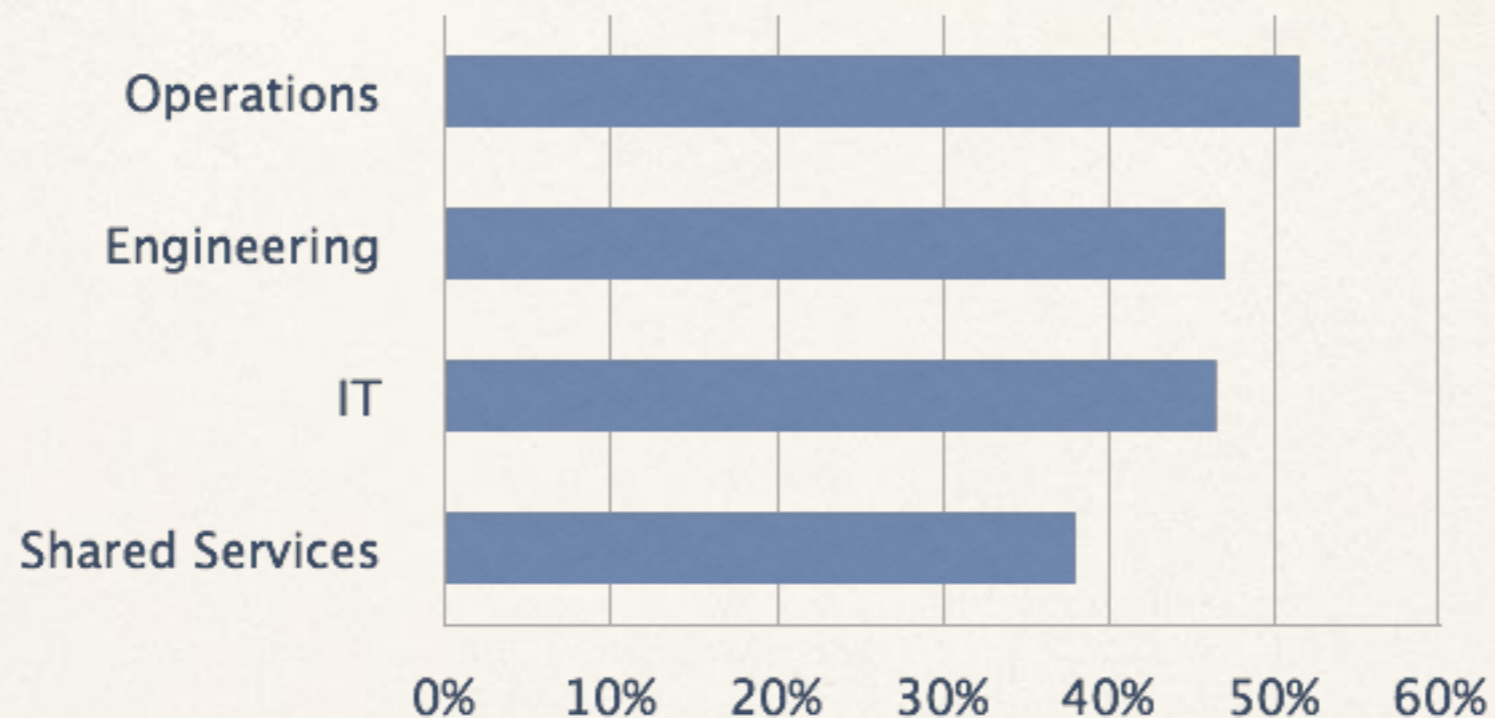
Size of Company and GPS Accuracy



Large and midsize companies report similar levels of GPS accuracy.

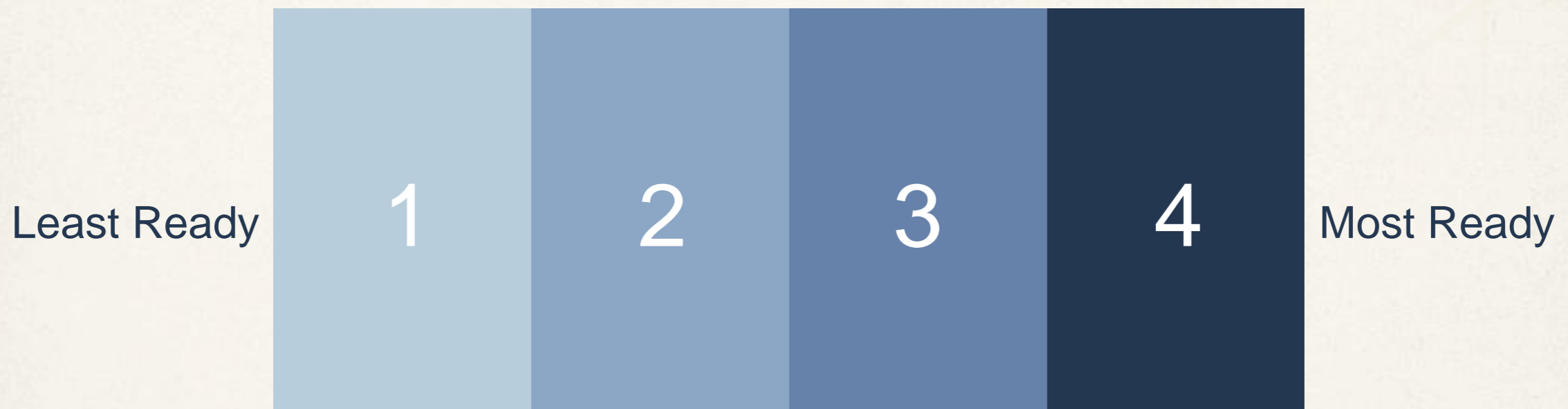
Operations Is Fastest to Update GIS Data

Governance of Data Updates and Length of Time to Update GIS Data After Work Completion



Companies that report GIS updates handled by Shared Services show longer times before completed work is reflected in their GIS database.

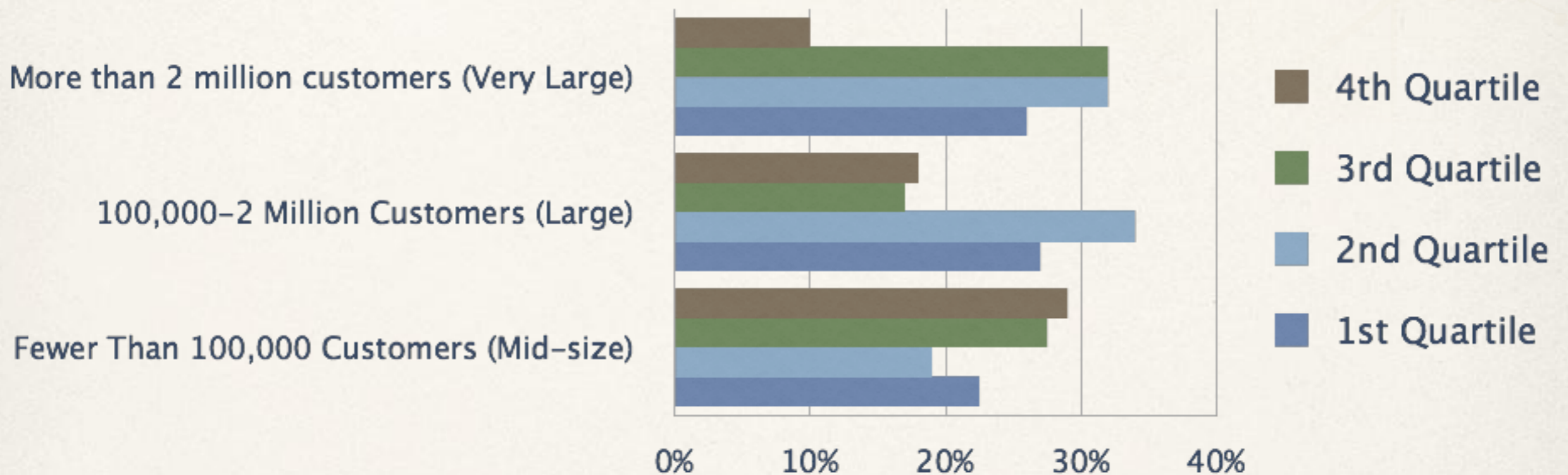
Responses Were Scored and Grouped into Four Quartiles



Scores were calculated based on the value to which each response choice contributed to the smart grid readiness of a respondent's GIS.

Comparing Quartiles to Company Size Revealed an Interesting Trend

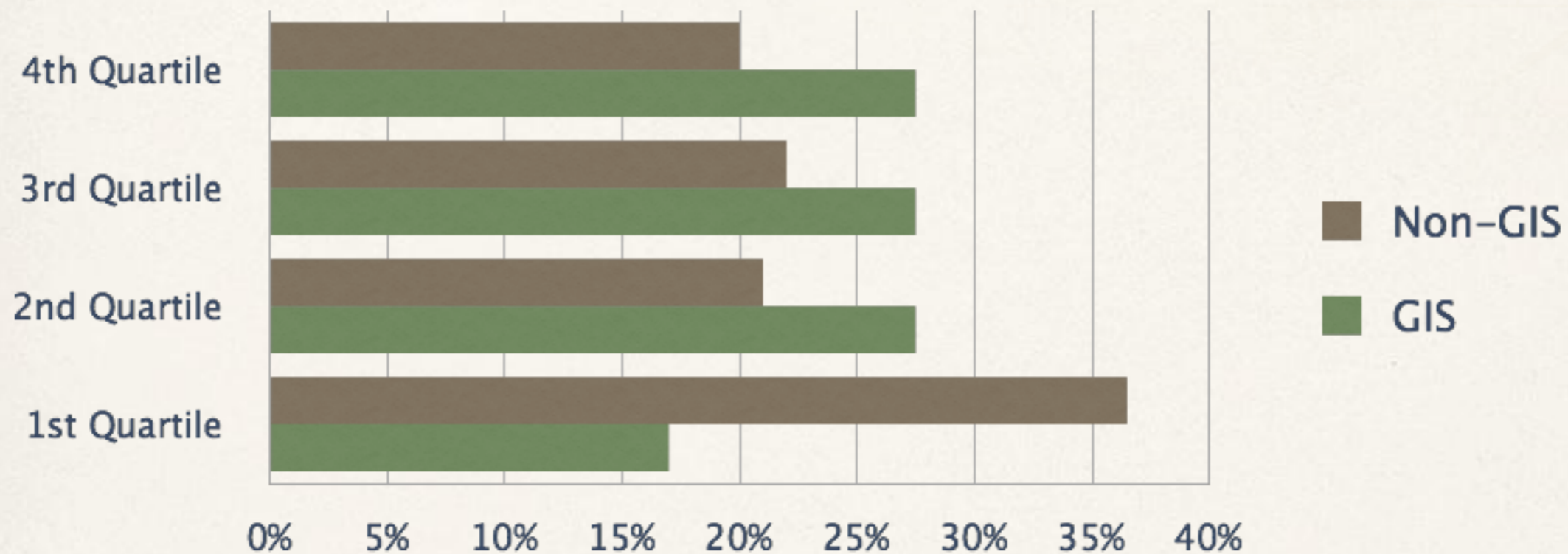
Size of Company and Ratings



The larger the size of the company, the less likely they were to be among the most smart grid ready (Quartile 4).

GIS Analysts Were Most Optimistic in Reporting Smart Grid Readiness of Their GIS

Role and Ratings



Respondents who reported themselves as not working directly with GIS were less likely to be confident of their smart grid readiness.

Common Challenges to Smart-grid Readiness

- Delay in posting field construction data to the GIS
- Some data not posted after 90 days
- Data conversion incomplete for systems including transmission, substation and medium- to low-voltage
- Customer location data incomplete in the GIS
- High error rates
- GIS not integrated by service oriented architecture
- GIS not integrated with SCADA, outage management, advanced metering infrastructure (AMI) and/or distribution management systems
- No use of mobile GIS; or limited capabilities of mobile GIS including editing and updating
- Issues with land base accuracy

Top Recommendations

- Adjust the basemap and associated facilities if you do not have a GPS-accurate basemap and thus cannot locate the facilities exactly using GPS. This can be done incrementally and Esri provides tools to help. [See an example](#) of how a customer adjusted its basemap and facilities.
- Implement a quality-control process to assure all phasing and customer locations are included in the GIS at the time of new construction. Phasing and connectivity must be rigorously maintained.
- Implement GIS-based design so that all designs are recorded at inception in the GIS. This will improve the accuracy and timeliness of data.
- Implement mobile GIS for field reporting of as-built information as well as reporting of corrections to the GIS.
- Complete all electric delivery system-related information into the GIS including all land features such as easements, rights-of-way, and transmission corridors.
- Evaluate the process for getting field information into the GIS. Eliminate unnecessary reconciliation steps, hand-offs, and queuing. The use of mobile and GIS design will help.
- Implement a data cleanup process. This may require some field surveys and benchmarking to see just where data is missing or inaccurate. Use GIS tools to help evaluate where the data is in the most need of improvement. Implement a data quality improvement program.
- Create an integration roadmap for GIS. This should include the integration of GIS with SCADA, DMS, OMS, CIS, real estate systems, and other corporate systems.

Find Out More

Send an e-mail to [Bill Meehan](#) to request a detailed analysis of your smart grid readiness.

[Request a call](#) from an ESRI sales representative to discuss solutions to improve the smart grid readiness of your GIS.

