GPS World
The Business and Technology of Global Navigation and Positioning

Geospatial solutions
APPLYING THE POWER OF PLACE

What's Going to Happen When High Precision GPS is Cheap?

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Outline

1. High-precision GNSS technology in the next 10 years is going to advance significantly faster than the past 10 years.
2. Crowd-sourced data is scaling up and becoming more accurate.

High-precision GNSS technology in the next 10 years is going to advance significantly faster than the past 10 years.

High-Precision GNSS Technology

The Last 10 Years

The Last 10 Years
High-Precision GNSS Technology

Significant developments

- SBAS became operational.
- GLONASS matured.
- RTK Network proliferation.
- OPUS and OPUS-like online post-processing introduced.
- L2C introduced.

High-Precision GNSS Technology

The Next 10 Years

The Next 10 Years

High-Precision GNSS Technology

- Complete L5 constellation (2018).
- Deployment of Europe's Galileo.
- Deployment of Russia's CDMA GLONASS
- Continued proliferation of RTK Networks.
- Continued proliferation of wireless networks.
- Complete L2C constellation (currently 8).

The Next 10 Years

High-Precision GNSS Technology

- May 2010 marked a new era of GPS with the launch of the first GPS satellite equipped to broadcast L5.
- According to the USAF, a full constellation of 24 GPS satellites broadcasting L5 (and all legacy signals) will be in orbit by 2018.
- The “semicodeless sunset” date of Dec. 31, 2020 doesn’t give the USAF much “wiggle” room on the 2018 schedule.

The Next 10 Years

High-Precision GNSS Technology

- The new GPS L5 signal will result in very low-cost L1/L5 receivers capable of cm-level horizontal/vertical precision.
- High-precision GPS receivers will be available at a very low cost.
- Europe's Galileo could accelerate a full L5 constellation.

The Next 10 Years

High-Precision GNSS Technology – Eng./Const./GIS service sector

- The value of high-precision data (horizontal and vertical) will reduce substantially.
- The skill and time required to collect high-accuracy data will fall substantially.
- Manpower requirements will shrink as productivity increases. Spending less on people and more on equipment
- Projects will be completed more quickly.

The Evolution of GPS Mapping
Cost of recording a utility pole at sub-meter precision

- Year 2000 – $10,000 GPS receiver. $2,000 post-processing software. Days of training.
- Year 2010 - $2,000 GPS receiver. Hours of training.
- Year 2020 - $100 GPS receiver. Minutes of training.

The Next 10 Years

High-Precision GNSS Technology - Implemented

- GIS - a data-hungry technology (infrastructure mapping, 3D mapping).
- Machine control. 23% CAGR over the next five years.
- Crowd-sourced data using mobile devices.
- Crowd-sourcing…

The Next 10 Years

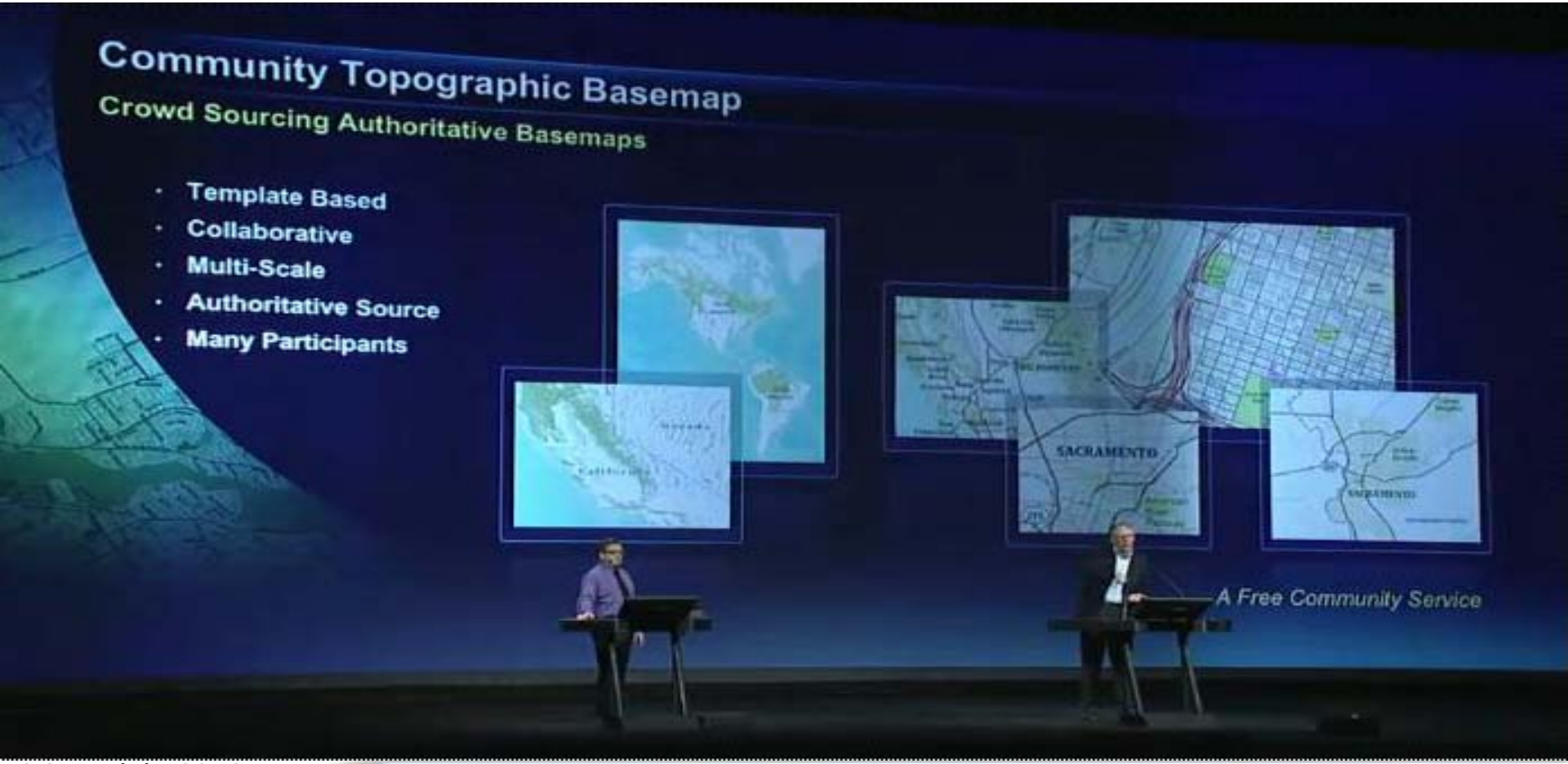
High-Precision GNSS Technology - Implemented

Crowd-sourced data

The Next 10 Years

High-Precision GNSS Technology - Implemented

Crowd-sourced data



The Next 10 Years

High-Precision GNSS Technology - Implemented

Crowd-sourced data

The Next 10 Years

High-Precision GNSS Technology - Implemented

Crowd-sourced data

- TomTom Travel Times
- Road usage and speed pattern reports.
- Based on two trillion pieces representing 15 million miles of road data collected world-wide from TomTom users.

Trends

- Trending from measurement skills to data management and data analysis skills.
- Trending from relying solely on one's own geographic data to incorporating geographic data from external sources (eg. crowd-sourced data).
- Trending towards huge volumes of more precise and rich geographic data.

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