Stakeholder Survey on Digital Infrastructure and Dynamic Maps – Initial Results

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Stakeholder Survey on Digital Infrastructure and Dynamic Maps – Initial Results

- What is needed to support connected and automated vehicles?

- What is the role of government in this work?

- Next steps

The survey was developed and results reviewed by Mike McGurrin and James Moore of Noblis.

Background

- Trilateral Working Group (WG) on Automation in Road Transport:
  - European Commission DG-Connect
  - Japan Ministry of Land, Infrastructure, Transport, and Tourism
  - United States Department of Transportation

- Topic of interest: coordinate research concerning **geospatial infrastructure needs for vehicle automation**

- USDOT also investigating needs for **connected vehicles** and potential for **public/private cooperation**
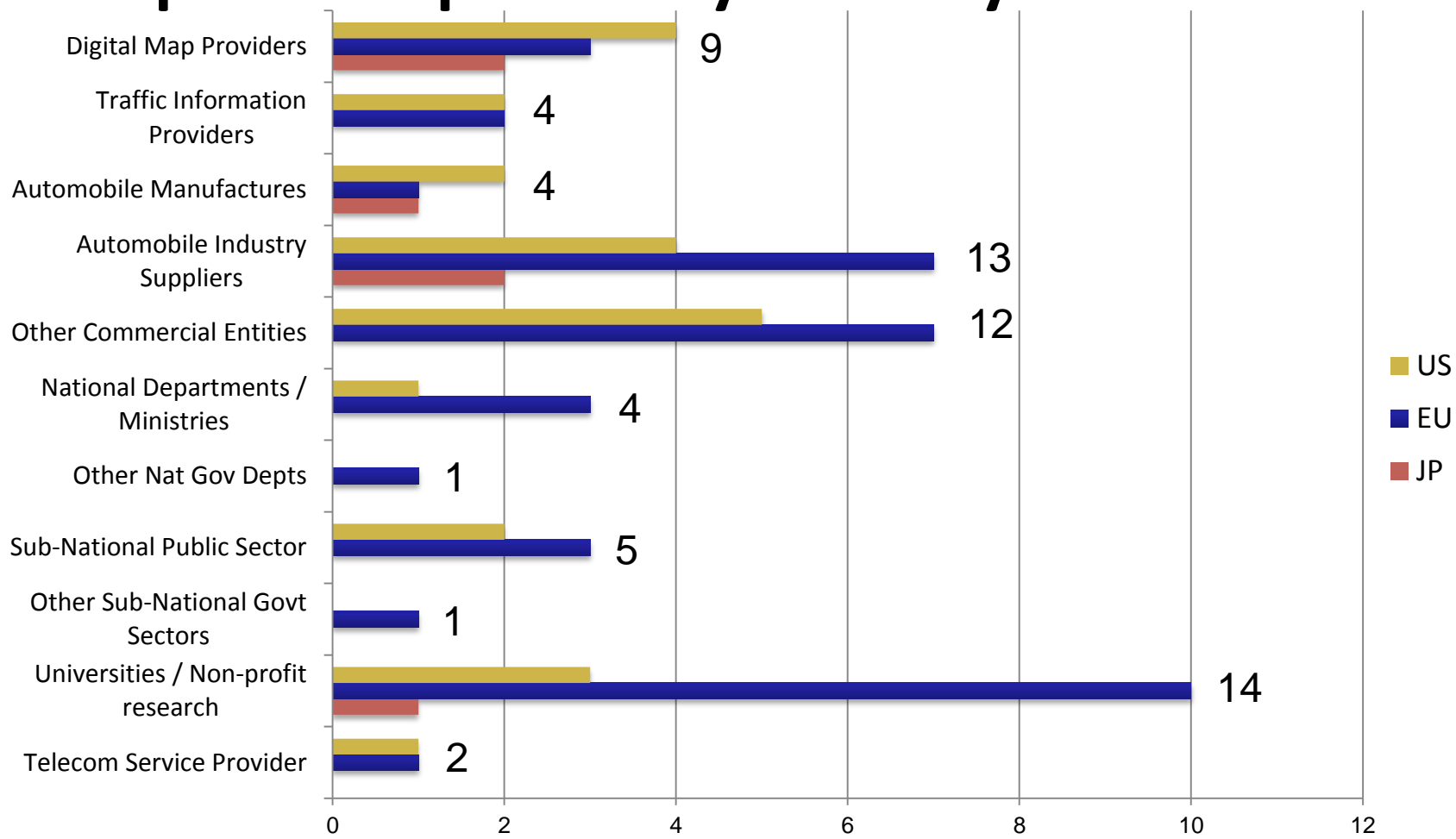
Purpose of the Survey

- Develop initial input on needs and issues of geospatial and geospatial related data for cooperative (connected) and automated vehicle applications.

- Assess opinions concerning appropriate roles of the national and regional public agencies and the private sector

- Identify possible opportunities for cooperation/collaboration between public and private sectors

Approach

- Utilized SurveyMonkey to conduct a web-based survey
- Included broad range of stakeholders
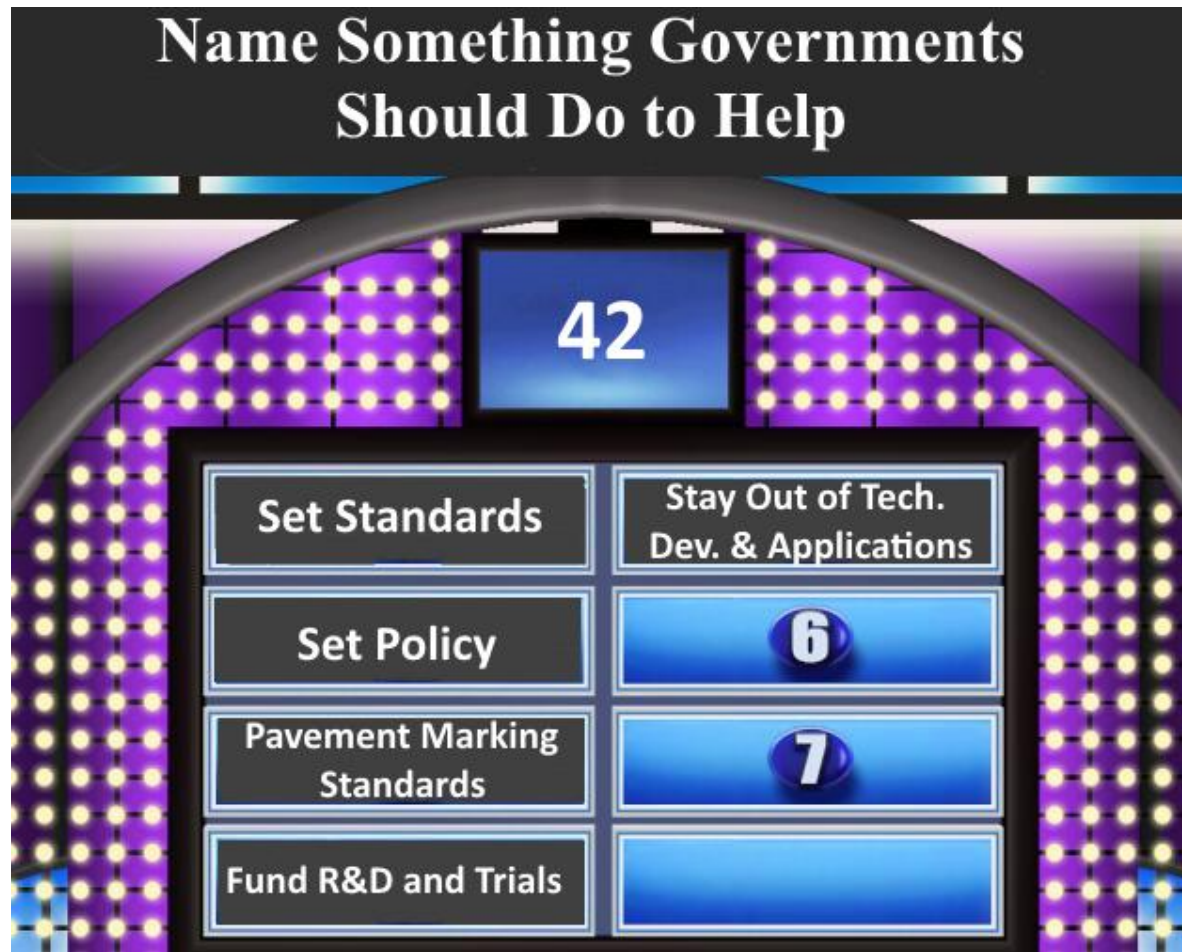- Individual survey responses are confidential

Complete Responses by Industry*

Categories (with EU/US/JP bar values):

- Digital Map Providers — 9
- Traffic Information Providers — 4
- Automobile Manufactures — 4
- Automobile Industry Suppliers — 13
- Other Commercial Entities — 12
- National Departments / Ministries — 4
- Other Nat Gov Depts — 1
- Sub-National Public Sector — 5
- Other Sub-National Govt Sectors — 1
- Universities / Non-profit research — 14
- Telecom Service Provider — 2

Legend: US, EU, JP

X-axis: 0, 2, 4, 6, 8, 10, 12

* 57 Respondents, but only 40 "complete." Numbers add up to more than 40 since a respondent's organization may align with multiple categories.

Survey Results

Cross-Sector Familiarity

	Digital map providers	Traffic information providers	Automobile manufacturers	Automobile industry suppliers	Other commercial entities	National departments or ministries of transport	Other national level government departments	Sub-national public sector transportation entities	Other sub-national governemnt entities	Universities and other non-profit research centers	Telecommunications service providers
Digital map providers	high	high	high	medium	high	medium	medium	medium	medium	medium	medium
Traffic information providers	medium	high	medium	medium	medium	medium	medium	medium	medium	medium	medium
Automobile manufacturers	medium	medium	high	high	high	medium	medium	medium	medium	medium	medium
Automobile industry suppliers	high	medium	high	high	medium	medium	medium	medium	medium	medium	medium
Other commercial entities	high	high	high	high	high	high	medium	medium	medium	medium	medium
National departments or ministries of transportation	medium	high	high	medium	high	high	high	medium	medium	high	medium
Other national level government departments	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sub-national public sector transportation entities	medium	high	medium	medium	medium	high	medium	high	medium	medium	medium
Other sub-national government entities	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Universities and other non-profit research centers	medium	high	medium	medium	high	medium	medium	medium	medium	high	medium
Telecommunications service providers	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Infrastructure to Vehicle Information Needs

What types of geospatial related information needs to be sent from *infrastructure to vehicles*?

Road Conditions Static Speed Traffic Light Status

Map Road Network Lane GPS Location Survey

Vehicle Work Zone

Vehicle to Infrastructure Geospatial Needs

What types of geospatial related information needs to be sent from *vehicles to infrastructure*?

Roles for National Governments

Is there a role for national governments in promoting or facilitating the development of the necessary static and dynamic geospatial infrastructure for *cooperative or connected vehicles*? (31 responses)
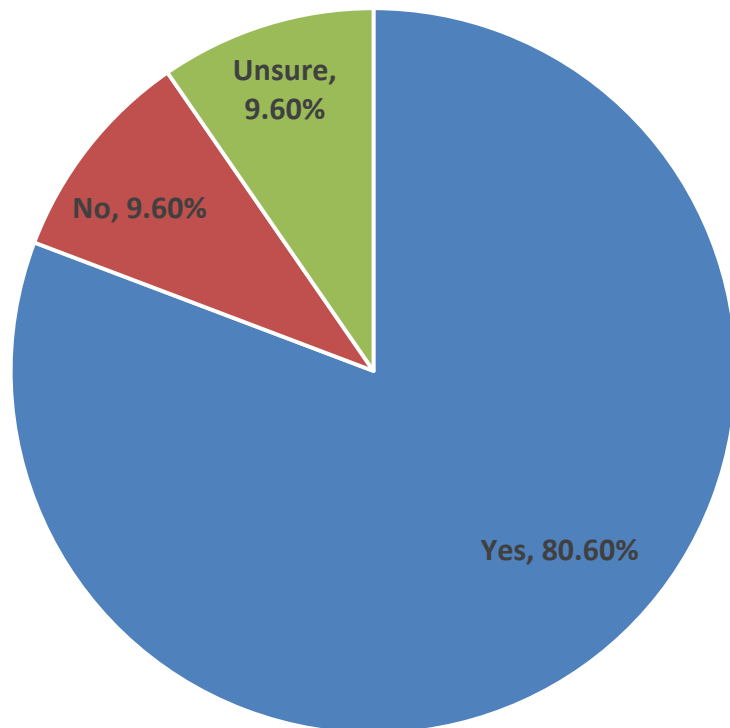
- Yes – 80.6%
- No – 9.6%
  - ➤ Digital map provider (1), Auto industry (1), University(1)
  - ➤ EU (2), Japan (1)
- Unsure – 9.6%

Roles for National Governments

Is there a role for national governments to play in promoting of facilitating the development of the necessary static and dynamic geospatial infrastructure for *automated* vehicles? (31 responses)
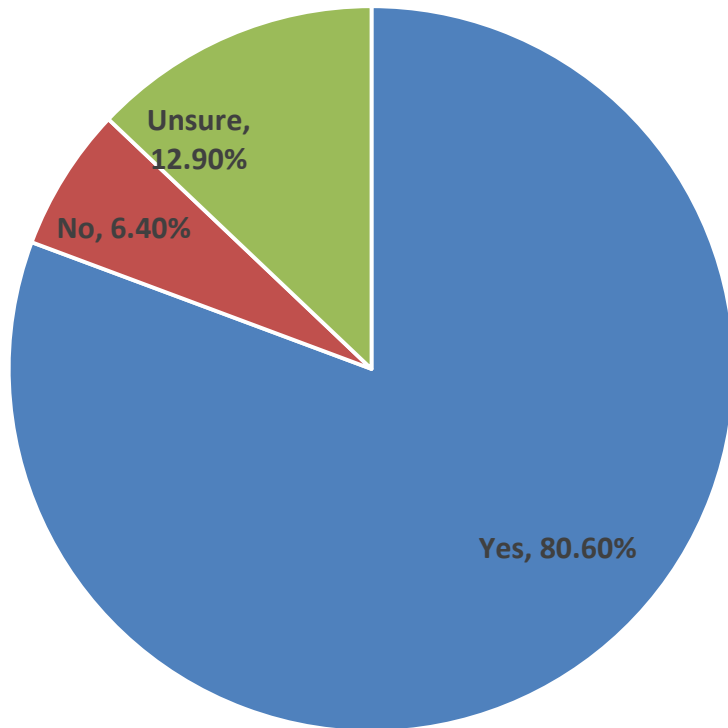
- Yes – 80.6%
- No – 6.4%
  - ➢ Automobile industry supplier (1), University (1)
  - ➢ EU (2)
  - ➢ Two of the 3 that answered "No" to the previous question
- Unsure – 12.9%

Roles for National Government

- National governments *should*:
  - Set policy
  - Establish standards
    - Almost every response that listed standards had a unique list of standards
  - Support funding & testing
  - Work cooperatively with industry
- National governments *should not*:
  - Over define or stifle innovation
  - Design / build the applications

Need for Common "Core" or "Base" Data

Is some level of common, openly-shared geospatial data set needed to safely and efficiently support *cooperative or connected vehicle* applications, or can data sets used by different vehicles, and by the infrastructure be fully independent from one another? "Openly-shared" means available to all, either at no charge or for a charge set only to recover costs. "Infrastructure" refers to systems and services both at the roadside and anywhere else.
(29 responses)

- ➤ Yes – 82.7%
- ➤ No Opinion / further research needed to answer – 17.2%

Need for Common "Core" or "Base" Data

In your professional opinion, is some level of common, openly-shared geospatial data set needed to safely and efficiently support *level 2 or higher automated vehicles*, or can data used by different vehicles, and by the infrastructure, differ from one another? (30 responses)
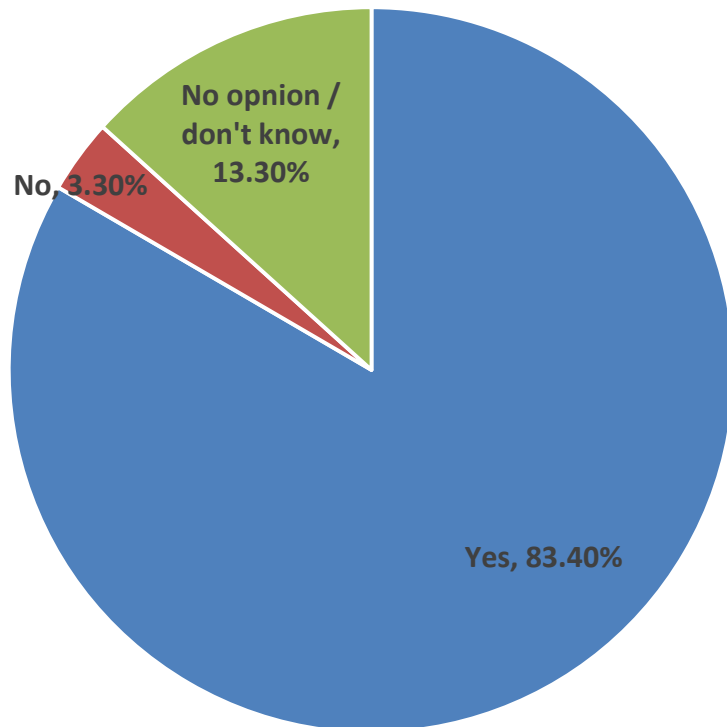
- Yes – 83.4%
- No – 3.3%
  - ➢ 1 representing auto industry supplier / digital map provider
  - ➢ 1 representing auto industry supplier / traffic information provider
- No opinion/ further research needed to answer – 13.3%

Open Data and Data Sharing

- Open data
  - Government data was more open / freely available than commercial systems (all government respondents replied either open or did not know).
  - Private sector generally does not provide open data: only commercial respondent sharing data stated it was limited to "Road section identification data set."

- Data sharing
  - Limited sharing of data between public and private sector

Private Sector Use of Public Sector Data

Do you utilize any geospatial related data obtained from public agencies? (13 responses)
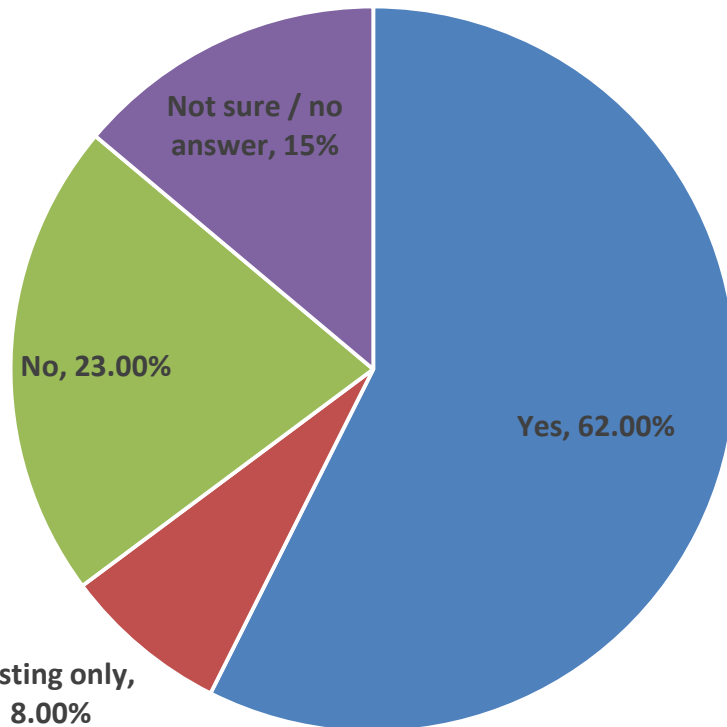
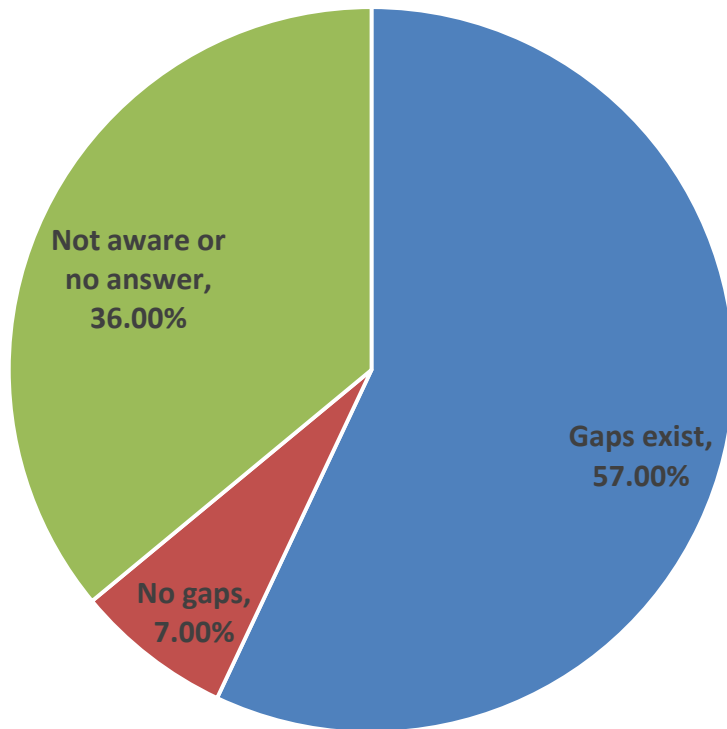
- Yes – 62%
- For testing only – 8%
- No – 23%
- Not sure or no answer – 15%

Standards Gaps

Are you aware of gaps where standards are needed for the exchange of geospatial related information, but such standards don't exist? If so, what are these gaps? (28 responses)

- Gaps exist – 57%
  - ➢ Very large gaps
  - ➢ Current standards or quasi-standards not sufficient
- No gaps – 7%
  - ➢ No gaps
  - ➢ "If any, industry solutions will emerge"
- Not aware or no answer – 36%

"Crowdsourcing" Geospatial Data

For automated vehicle applications, what role, if any, do you see in obtaining data updates from the **general vehicle population**? Through an automated process or other methods? (12 responses)

- 100% saw a role, and
- All responded system should be at least partially automated

Summary

- Stakeholder survey provides useful insights on general needs and direction; *however*:
  - Survey was not in any way a scientific representative sample
  - The more detailed the question, the fewer responses

- Consensus among respondents:
  - There are roles for national governments
  - Significant work is needed on standards
  - Some sort of common, shared basemap / data set is desirable

Next Steps

- Next steps:
  - Provide survey and responses to participants
  - Develop comprehensive telephone survey for subset of respondents
  - Monitor industry activity
  - Coordinate U.S. activities with [Federal Geographic Data Committee](#)
    - Monitor development of Digital Transportation Infrastructure (DTI) Asset Collection Standard