

MBDH Transportation Spoke Workshop

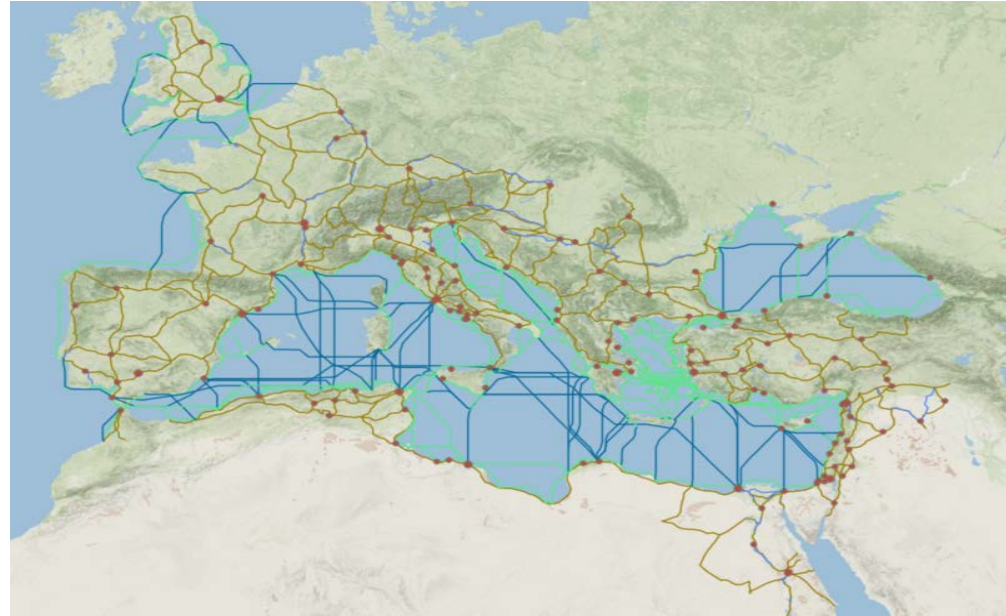
June 22, 2017

Alfred O. Hero; Co-Director
Brian D. Athey; Co-Director

Transportation system in 180 CE

TRAFFIC AND
CONGESTION IN THE
ROMAN EMPIRE

Cornelis van Tilburg



Transportation infrastructure at height of Roman empire

Data on transportation in antiquity

Van Tillburg used data to draw inferences on

- Roads, road-users, traffic congestion, traffic policy

Data came from large variety of sources

- Written legal and construction records (Domitian, Nero)
- Written travel logs (Theophanes)
- Frozen-in-time physical evidence (Pompei)
- Archeological evidence for flows of trade
- Remote sensing and hyperspectral imaging

Transportation system today

The screenshot shows the Data.gov website interface. At the top, there is a navigation bar with 'DATA', 'TOPICS', 'IMPACT', 'APPLICATIONS', 'DEVELOPERS', and 'CONTACT'. Below this is a 'DATA CATALOG' section with a search bar containing 'Department of Transportation' and a dropdown menu for 'Order by:' set to 'Relevance'. A message states '78,340 datasets found for "Department of Transportation"'. Below the search results, there are filters for location and a list of datasets, including 'Department of Transportation Traffic Information' and 'Department of Transportation Quick Map'. At the bottom, there is a navigation bar for the 'United States Department of Transportation' and 'Bureau of Transportation Statistics'.

DATA.GOV DATA TOPICS IMPACT APPLICATIONS DEVELOPERS CONTACT

DATA CATALOG / Datasets Organizations

Department of Transportation

Order by: Relevance

Datasets ordered by Relevance

You are searching in the list of datasets. Show results in entire Data.gov site.

Filter by location Clear

Enter location...

78,340 datasets found for "Department of Transportation"

Department of Transportation Traffic Information
State of North Dakota — Displays DOT traffic count and current traffic information.

Department of Transportation Quick Map

United States Department of Transportation About DOT | Briefing Room | Our Activities

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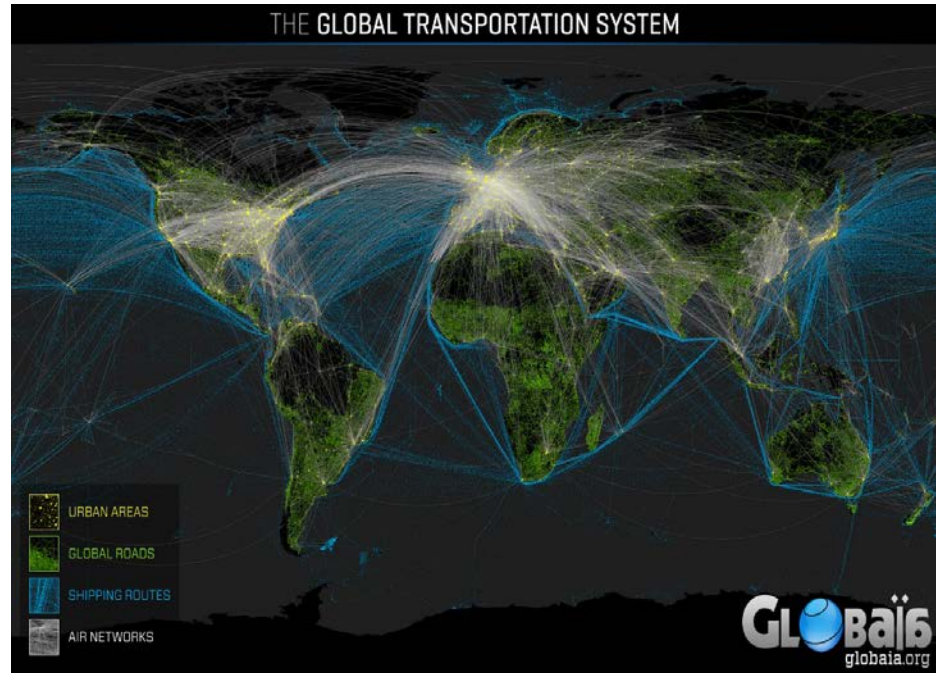
Bureau of Transportation Statistics

Data and Statistics Subject Areas Library News Policies and Methods About BTS Contact Us

Home » Data and Statistics

Databases

- National Transportation Statistics
- TransStats
- Access BTS airline data and other products through analysis tools, downloads and prepared tables
- Intermodal Passenger Connectivity Database
- Data on the availability of connections among the various scheduled public transportation modes at each passenger terminal
- National Census of Ferry Operators
- Includes information on routes, terminals and facilities, vessels, etc. 2010 data is available in a new interface
- Border Crossing/Entry Data
- Persons, vehicles and containers entering the US from Canada and Mexico (monthly)
- North American Transborder Freight Data (BTS)
- Freight imports and exports by mode and origin/destination for trade with Canada and Mexico (monthly)
- Search Public Datasets and Data Tools
- Search datasets for various modes of transportation, both US DOT and outside source
- National Household Travel Survey 2009 - Transferability Statistics
- Transferability statistics by Census tract and data dictionary

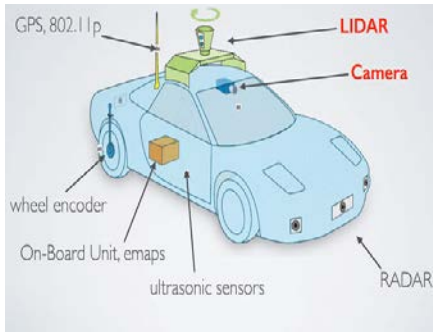


Transportation system in 2017

<http://www.computerworld.com/article/3005436/>

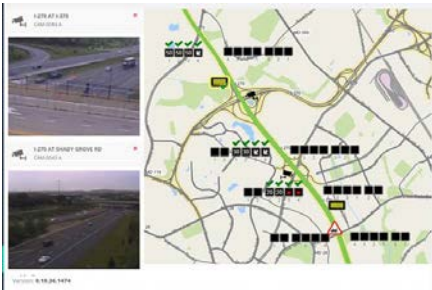
Big Data for modern transportation

Autonomous sensing systems



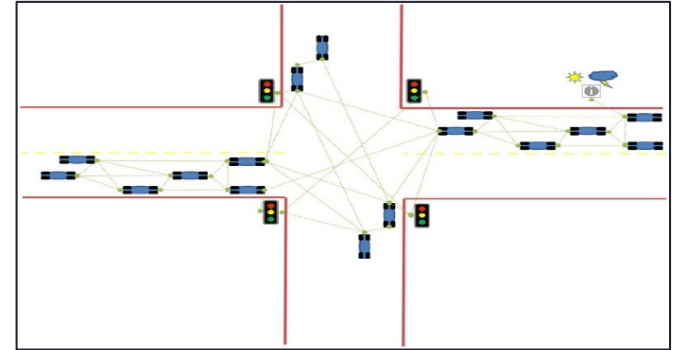
<http://www.computerworld.com/article/3005436/>

Cloud data services



<http://www.traffictechnologytoday.com/news.php?NewsID=79828>

Ad Hoc Vehicle and Road Networks



<http://www.rtcmagazine.com/articles/view/103169>

Clients and users



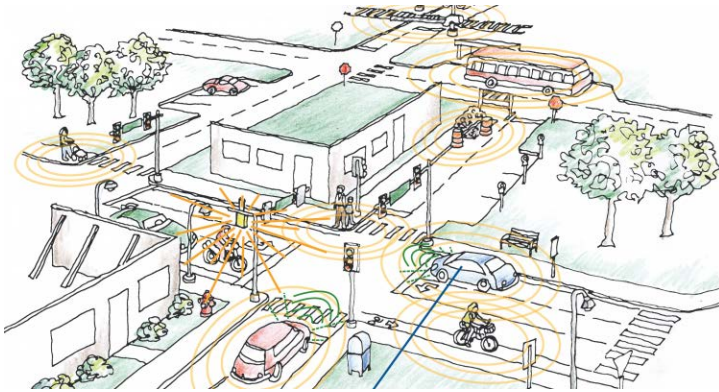
<http://www.coolclip.com>

Data/sensor integration
Telematics
Automated routing
Mobility-on-demand

Big Data impact on transportation

- Data for improved transportation accessibility
 - Access to federated and standardized databases and datastreams
- Data for improved transportation safety
 - Prediction and early warning of traffic/weather conditions
- Data for improved energy efficiency
 - Efficient routing, load balancing, and traffic flow control
- Data for improved public service
 - Optimization of essential and emergency services

MIDAS transportation research thrust



Mcity: A 32-Acre Outdoor Lab

Mobility-on-demand systems

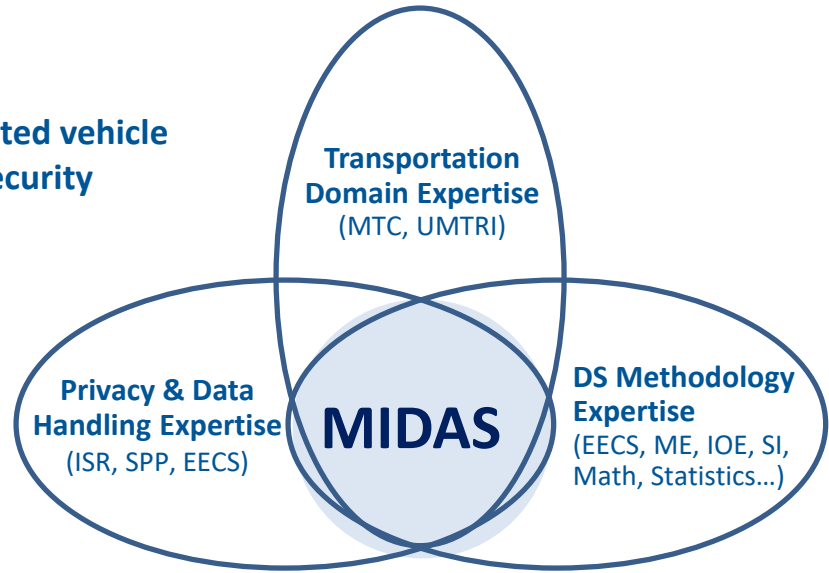
Visual analytics and data fusion

Accident and safety data analytics

Smart cities and infrastructures

Connected vehicle cybersecurity

Transportation data ecosystems for connected vehicles



MIDAS funded research in transportation



Building a Transportation Data Ecosystem: creating a system for data on driver behavior, traffic, weather, accidents, vehicle messages, traffic signals and road characteristics, with a parallel and distributed computing platform.

Flannagan (PI), UMITRI;
Jin, CoE;
Rupp, UMITRI;

Elliott, ISR;
Mars, CoE;
Shedden, LS&A;

Hampshire, UMITRI;
Murphey, UM-Dearborn;
Tang, CoE;

Jagadish, CoE
Nair, LS&A, CoE
Witkowski, ISR



Reinventing Public Urban Transportation and Mobility: using predictive models for travel demand, accessibility, driver behavior, and transportation networks to design an on-demand public transportation system for urban areas.

Van Hentenryck (PI), CoE;
Dillahunt, SI;
Merlin, Taubman Coll.;

Budak, SI;
Hampshire, UMITRI;
Ortiz, UM-Dearborn;

Cohn, CoE;
Lynch, CoE;
Sayer, UMITRI;

Cunningham, Med, SPH
Levine, Taubman
Wellman, COE