Mapping, charting and custom graphics with D3.js

James Moughon
What is D3.js?
Data Visualization: Tell a story
A graph showing the economic data from Portugal, Italy, Ireland, Greece, Spain (PIIGS), the United Kingdom, Germany, the EU and the Eurozone for 2009.
Make it Understandable

(Soure: Washington Post)
Make it Accessible

Urban speed laws by country/area

(Source: WHO Report on Road Safety, p. 14)
Note: Dashboards
What is D3.js?

Data-Driven Documents
What can D3 do?

- Selections
- Transitions
- Arrays
- Math
- Color
- Scales
- SVG
- Time
- Layouts
- Geography
- Geometry
- Behaviors
## Comparison of JavaScript Charting Frameworks

<table>
<thead>
<tr>
<th>Framework Name</th>
<th>Supported Line Types</th>
<th>Supported Scatter Types</th>
<th>Area</th>
<th>Pie</th>
<th>Bar</th>
<th>Radial Bar</th>
<th>Bullet</th>
<th>Waterfall</th>
<th>Range</th>
<th>Horizonal</th>
<th>3D</th>
<th>License</th>
<th>Other Features</th>
<th>Interactivity</th>
<th>Rendering Technologies</th>
<th>Data Binding</th>
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<tbody>
<tr>
<td>jQuery.sparklines</td>
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D3 Charts

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<th>Box Plots</th>
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<th>Calendar View</th>
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D3 Chart Types
Filtering and Data

Answer some of the questions!

- What size is your area?
  - Extra Large 500,000
- How fast is your area growing?
  - Not or Low
- What does your area look like?
  - Click on area(s) that resemble your area.
  - RURAL, SUBURBAN, URBAN AND URBAN CENTER, URBAN CORE, SPECIAL DISTRICT

What is your goal?
- Select Goal

What can you or others do to help congestion?
(Optional)
- Which problem are you addressing?

START OVER
Multiple Levels & Relationships
Classes & CSS
Successful Collaboration: Methods & Best Practices

2 day, hands-on course. Provides interactive training in collaborative decision making.

Click here for more information
Data & HTML

{  "name": "Attributes",  "children": [    {      "name": "Congestion",      "id": 1,      "children": [        {          "name": "Adding New Lanes or Roads",          "small": 1,          "mid": 1,          "large": 1,          "xlarge": 0,          "negative": 0,          "not-low": 0,          "steady": 1,          "high": 1,          "rural": 1,          "suburban": 1,          "urban-urban-center": 0,          "urban-core": 0,          "special-district": 0,          "more-travel-options": 0,          "adding-new-capacity": 1,          "adding-improving-transit": 0,          "doing-more-with-ops-efficiency": 0,          "active-transport-health": 0,          "embracing-tech": 0,          "improving-connectivity-borders-and-ports": 1,          "improving-connectivity-freight": 1,          "improving-connectivity-business-links": 1,          "aging-population": 0,          "air-quality": 0,          "safety": 0,          "home-to-work-employers": 0,          "what-can-be-done-for-freight-agencies": 0,          "what-can-be-done-for-deliveries-agencies": 0,          "what-can-shippers-do": 0        }      ]    }  ]}
Map Projections

Shapes, GeoJSON & TopoJSON

Options for adjusting the dimensions of your map, and the cartographic projection used.

Width: 534 px  Height: 350 px  Projection: Albers USA (for whole US, insets AK and HI)

(Source: mapstarter.com)
Custom SVGs

Sporting events attract a lot of people. TTI has come up with strategies to relieve congestion ow.ly/oiD7301wSLL
Shapes, shapes & shapes

Signal Operations & Management

Cost

$ $ $ $ $ $ $ $ $ $ 

Time

Short

Impact

Corridor, Spot

Who

- City
- County
- State

Hurdles

- Manpower
Interactive data

INTERSECTION IMPROVEMENTS

While handling left turns is crucial at intersections, other improvements can be made to make intersections more efficient and safer for all users.

Who

CITY
STATE

Hurdles

RIGHT OF WAY

Cost

$ $ $ $ $ 

Time

Short, Moderate 

Impact

Spot

Intersection Improvements

Pedestrian Connections

Managed (HOV/HOT) Lanes

Loop Ramps Reducing Left Turns

Texas A&M Transportation Institute
Tell Stories with Data
Starter Repo

- [https://github.tamu.edu/TTI-KAC/grunt-starter](https://github.tamu.edu/TTI-KAC/grunt-starter)

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**Grunt Starter (with D3 app)**

Starter kit for Grunt tooling.

**Dependencies**

- Node.js
- Bower (npm install --save-dev)

**Build**

Grunt is used to build the assets and place the created file name in the Index.html

- `npm install`
- `grunt prod` or `dev` or `watch`
Viz References

• Data Visualization:
  – 39 studies about human perception in 30 minutes
  – Data Visualization: Modern Approaches
  – The Do’s And Don’ts Of Infographic Design
  – Imagine A Pie Chart Stomping On An Infographic Forever
Projects referenced

• Custom SVG: https://tti.tamu.edu/policy/congestion/how-to-fix-congestion/

• Circle Pack and Radial Tree: https://tti.tamu.edu/policy/congestion/what-strategies-are-best-for-you/

• Map: https://www.swtwc.org/resource-center/education-and-training/workforce-training-map/
Thanks! Questions?

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