



# Advanced Topics

## ArcGIS API for Javascript

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# Outline

- Dojo and AMD
- Working with 3<sup>rd</sup> Party Data
- Custom Dijits
- Working with 3<sup>rd</sup> Party Libraries
- Targeting Mobile

# Dojo and AMD

# Dojo and Asynchronous Module Definition(AMD)

## Legacy:

```
dojo.require("esri.layers.FeatureLayer");  
...  
var featureLayer = new esri.layers.FeatureLayer("
```

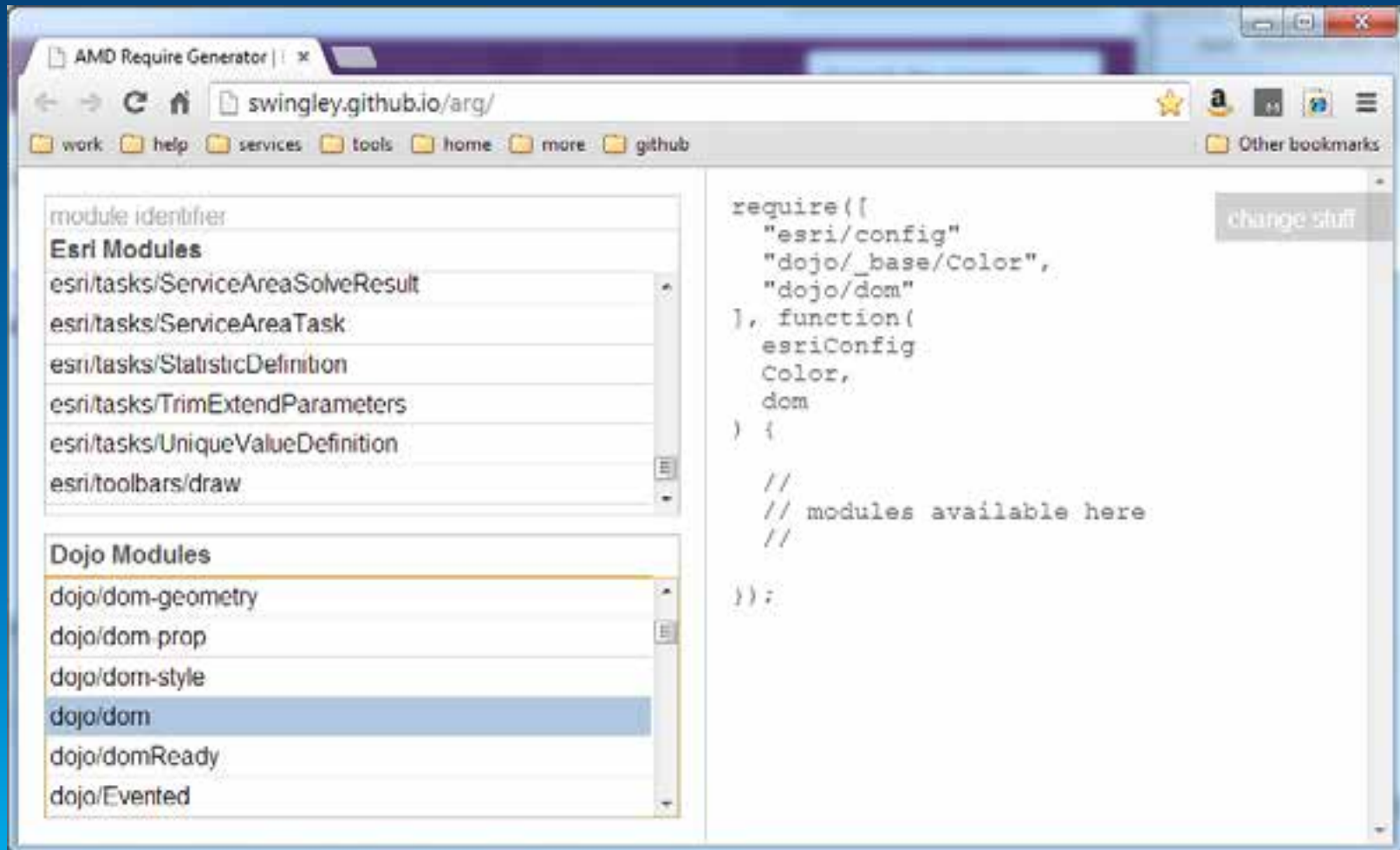
## AMD:

```
require([  
    "esri/map", ... "esri/layers/FeatureLayer"  
], function(  
    Map, ..., FeatureLayer,  
    ...  
var featureLayer = new FeatureLayer("
```

# AMD Example

```
require([
    /*ordered list of modules to load*/
    "esri/map", "esri/InfoTemplate", "esri/layers/FeatureLayer",
    "dojo/parser", "dojo/domReady!"
/*Beginning of anonymous callback function which fires once all modules have loaded*/
], function(
    /*Variable names to refer to each loaded module*/
    Map, InfoTemplate, FeatureLayer, parser
) {
    /*Beginning of actual callback code*/
    parser.parse();
    map = new Map("mapDiv", {
        basemap: "national-geographic",
        center: [-2.97, 53.41],
        zoom: 9
    });
    ...
}) /*Close the callback curly brace and require's parenthesis*/
```

# AMD require generator application



The screenshot shows a web browser window titled "AMD Require Generator" at the URL `swingley.github.io/arg/`. The interface is split into two main sections. On the left, there are two lists of module identifiers. The first list, "Esri Modules", includes `esri/tasks/ServiceAreaSolveResult`, `esri/tasks/ServiceAreaTask`, `esri/tasks/StatisticDefinition`, `esri/tasks/TrimExtendParameters`, `esri/tasks/UniqueValueDefinition`, and `esri/toolbars/draw`. The second list, "Dojo Modules", includes `dojo/dom-geometry`, `dojo/dom-prop`, `dojo/dom-style`, `dojo/dom` (which is highlighted), `dojo/domReady`, and `dojo/Evented`. On the right, a text area displays the generated AMD require configuration code:

```
require([
  "esri/config",
  "dojo/_base/Color",
  "dojo/dom"
], function(
  esriConfig,
  Color,
  dom
) {
  //
  // modules available here
  //
});
```

A "change stuff" button is visible in the top right corner of the code area.

# Object-Oriented JavaScript

- OOJS == Modules
- One class per module
- Avoid single-file, spaghetti code apps
- Re-usable, portable code
- Application maintenance
- Tutorials:
  - Write a class
  - Build a custom widget

# Create a Class

- **AMD: `define()` creates the module and loads dependencies**
- **Legacy: `dojo.provide()` and `dojo.require()`**
- **`dojo/_base/declare()` or `dojo.declare()`**
- **Map widget home button**



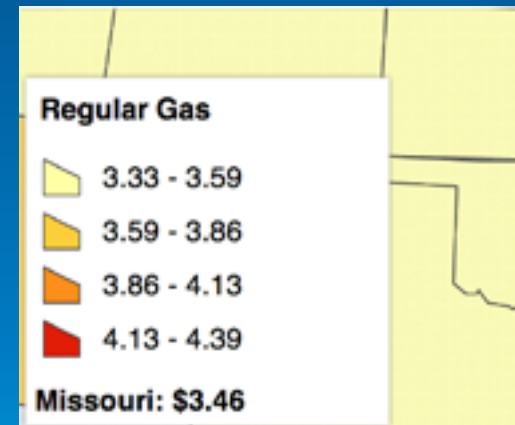
# Working With 3rd Party Data

# Access external data

- esri.request
- Formats
  - Plain Text
  - XML
  - JSON
  - JSONP



```
Field: objectid
Field: emp_id
Field: sample_id
Field: sample_type
Field: lithotype
Field: metafacies
Field: alterations
Field: comments
```



# Under the hood

- **XMLHttpRequest**
- **Dojo methods**
  - **xhrGet , xhrPost, Script get via JSONP**
- **esri.request**
- **WebSockets**

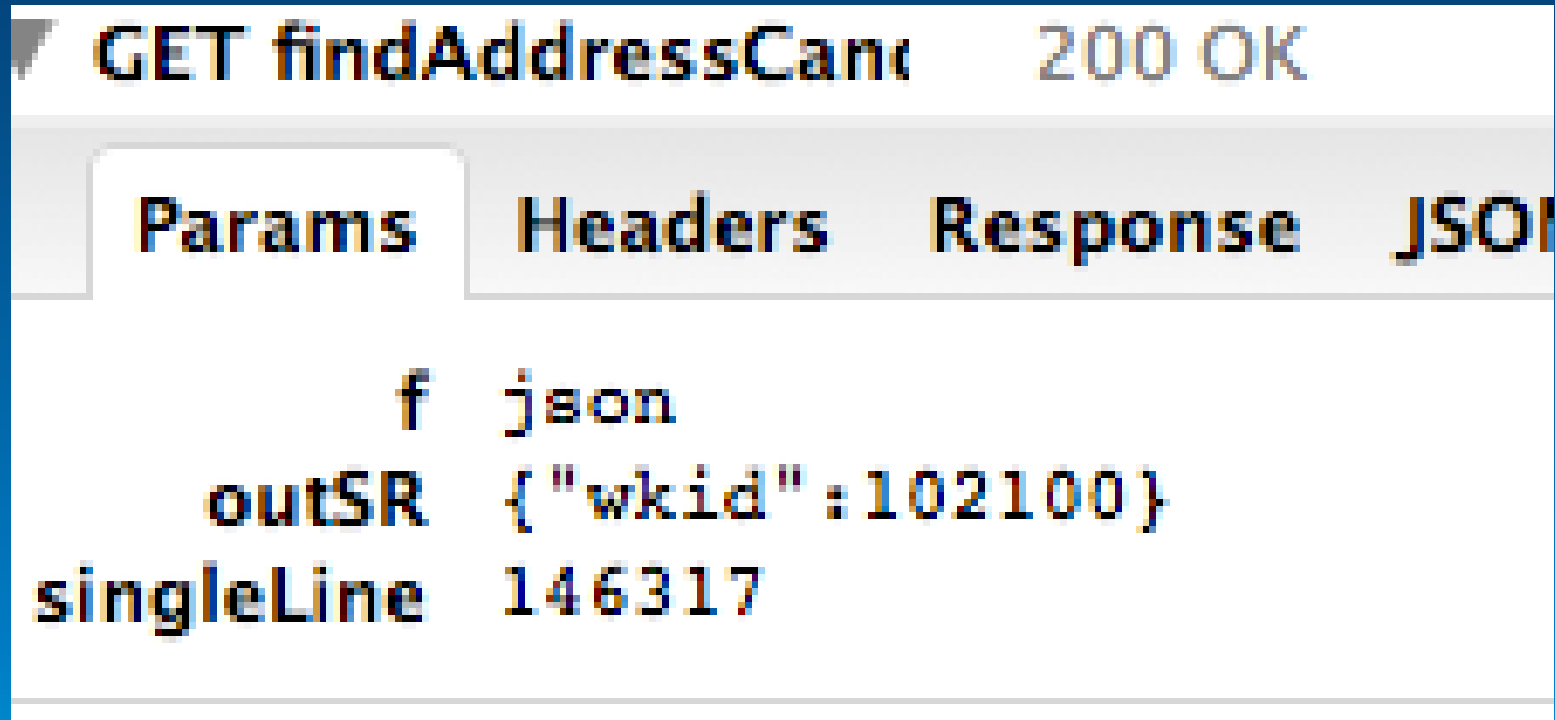
# Using esri.request

```
var request = esri.request({
  // Location of the data
  url: "<String>",
  // Service parameters if required, sent with URL as key/value pairs
  content: {
    parameter1: <value>,
    parameter2: <value>
  },
  // Data format
  handleAs: "<String>"
});
```

# Callback functions

```
function requestSucceeded(data) {  
  console.log("Data: ", data); // print the data to browser's console  
}  
  
function requestFailed(error) {  
  console.log("Error: ", error.message);  
}  
  
request.then(requestSucceeded, requestFailed);
```

## Esri.setRequestPreCallback



GET findAddressCandidates		200 OK	
Params	Headers	Response	JSON
f	json		
outSR	{\"wkid\":102100}		
singleLine	146317		

# Deferreds: Making Async Easy

- Handle async requests in response to a value that is not yet available.

<code>getScale()</code>	Number
<code>getZoom()</code>	Number
<code>hidePanArrows()</code>	None
<code>hideZoomSlider()</code>	None
<code>panDown()</code>	Deferred
<code>panLeft()</code>	Deferred
<code>panLowerLeft()</code>	Deferred
<code>panLowerRight()</code>	Deferred
<code>panRight()</code>	Deferred

# Deferred Lists

```
dParcels = app.qtParcels.execute(app.qParcels);
dBuildings = app.qtBuildings.execute(app.qBuildings);
console.log("deferreds: ", dParcels, dBuildings);
dList = new dojo.DeferredList([dParcels, dBuildings]);
dList.then(handleQueryResults);
```



# Popups - Customize Appearance

**2800 GEARY BLVD** ☐ ✕

---

**2800 GEARY BLVD**

Type Graffiti Complaint – Private Property

Date 08/19/2009

Attachments:  
No attachments found

[Zoom to](#)




(1 of 3) ▶ ☐ ✕

**Idaho**

The estimated unemployment rate here was 8.70% in summer 2010, affecting an estimated 67,766 people age 16 and over.

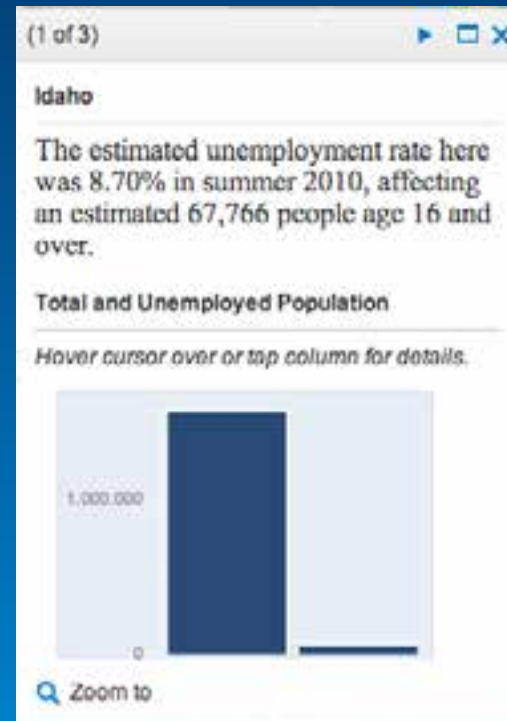
**Total and Unemployed Population**

*Hover cursor over or tap column for details.*

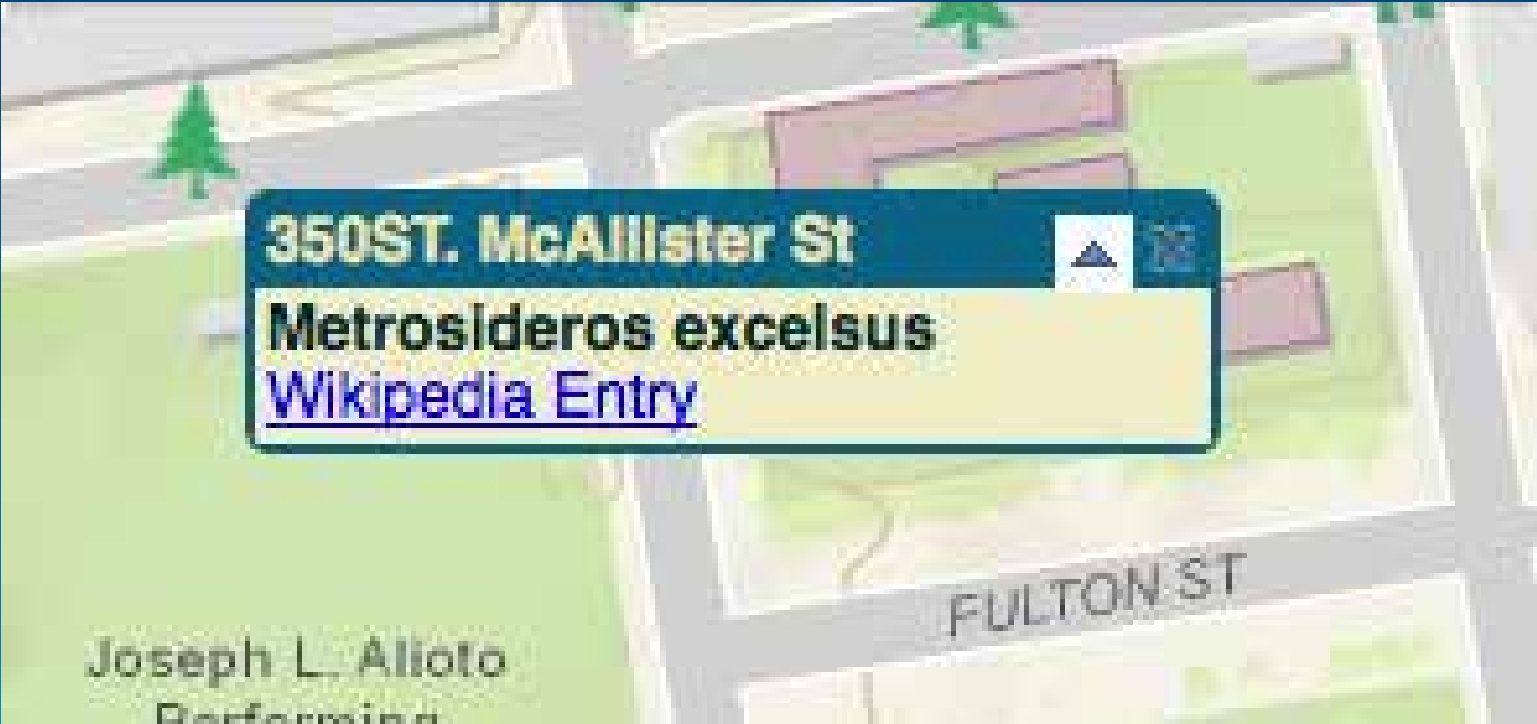


Category	Value
Total Population	~1,000,000
Unemployed Population	67,766

[Zoom to](#)



# Custom Behavior



# WebSockets

- **Push model rather than pull**
- **Subscribe to a feed rather than polling**
- **An emerging pattern in JavaScript**
  - **Instagr.am**
- **Live data feeds**
  - **GeoEvent Processor**

Demo

# Using Esri.Request()

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# Custom Widgets

- **Dijit**
- **Standard file structure**
- **JavaScript for custom methods and properties**
- **HTML template for layout elements**
- **CSS for style**
- **Uses the underlying Dojo extensibility**

# Working With 3rd Party Frameworks

# Compact build

- 32 modules – size 53 kbytes

```
<script src="http://js.arcgis.com/3.7compact/">
```

- Loading additional modules:

```
require(["esri/tasks/Geoprocessor", ... ],
```

```
function(Geoprocessor, ... ){ ... });
```

# Frameworks

Bootstrap

The Boiler

Less+



Wirefy

Zurb Foundation 3

Titan

Skeleton

Ingrid

Susy

jQuery





# Mobile webapps – Dojo Mobile

- Mobile friendly Responsive template
- Touch gestures, smooth scrolling
- Phonegap ready

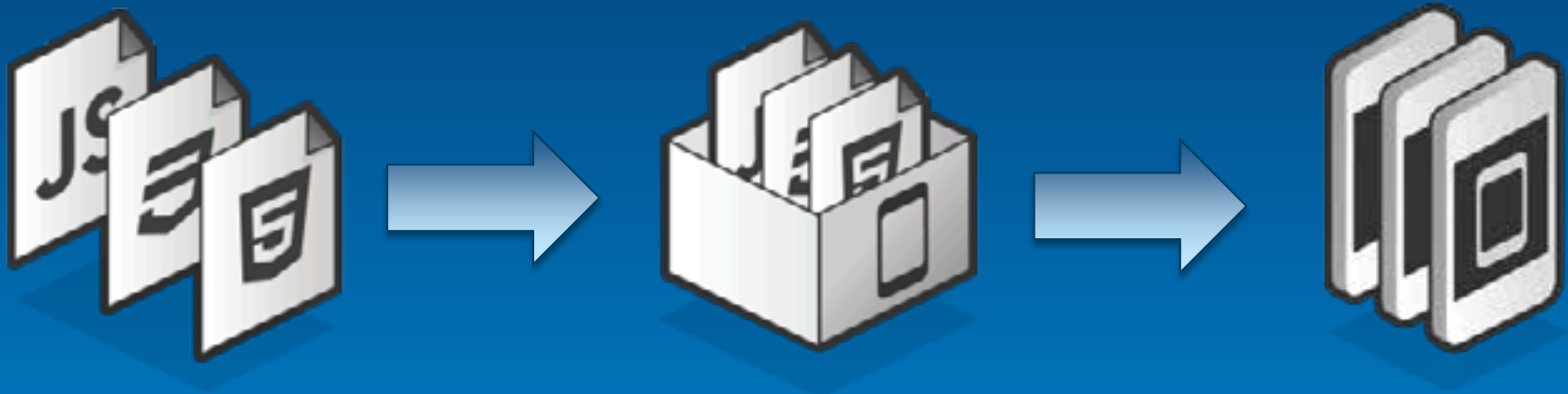


# Views : Easy

```
<div id="mapView" dojoType="dojox.mobile.View"
    style="width:100%;height:100%;">
  <h1 dojoType="dojox.mobile.Heading"
    back="Back" moveTo="mainView">
    5 + 10 minute Drive Times
  </h1>
  <div id="map" style="width:100%; height:100%;"/>
</div>
```



# Hybrid Web Apps



Wrap your app with native framework.

Deploy to multiple platforms!

Native capabilities: GPS, Camera Storage Notification, ....

# Hybrid WebApp Platforms



# Android 4.4 KitKat – WebView Apps



- Chromium-based WebView
- Android Builder

*take advantage of Chrome DevTools*

Demo

# ARGIS & Android Builder

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# ArcGIS Marketplace

- **Make your app available to the community**
- **Make some money**
- **JavaScript**
  - Our library or not
    - Leaflet, etc.
- **iOS**
- **Android**



Understanding our world.