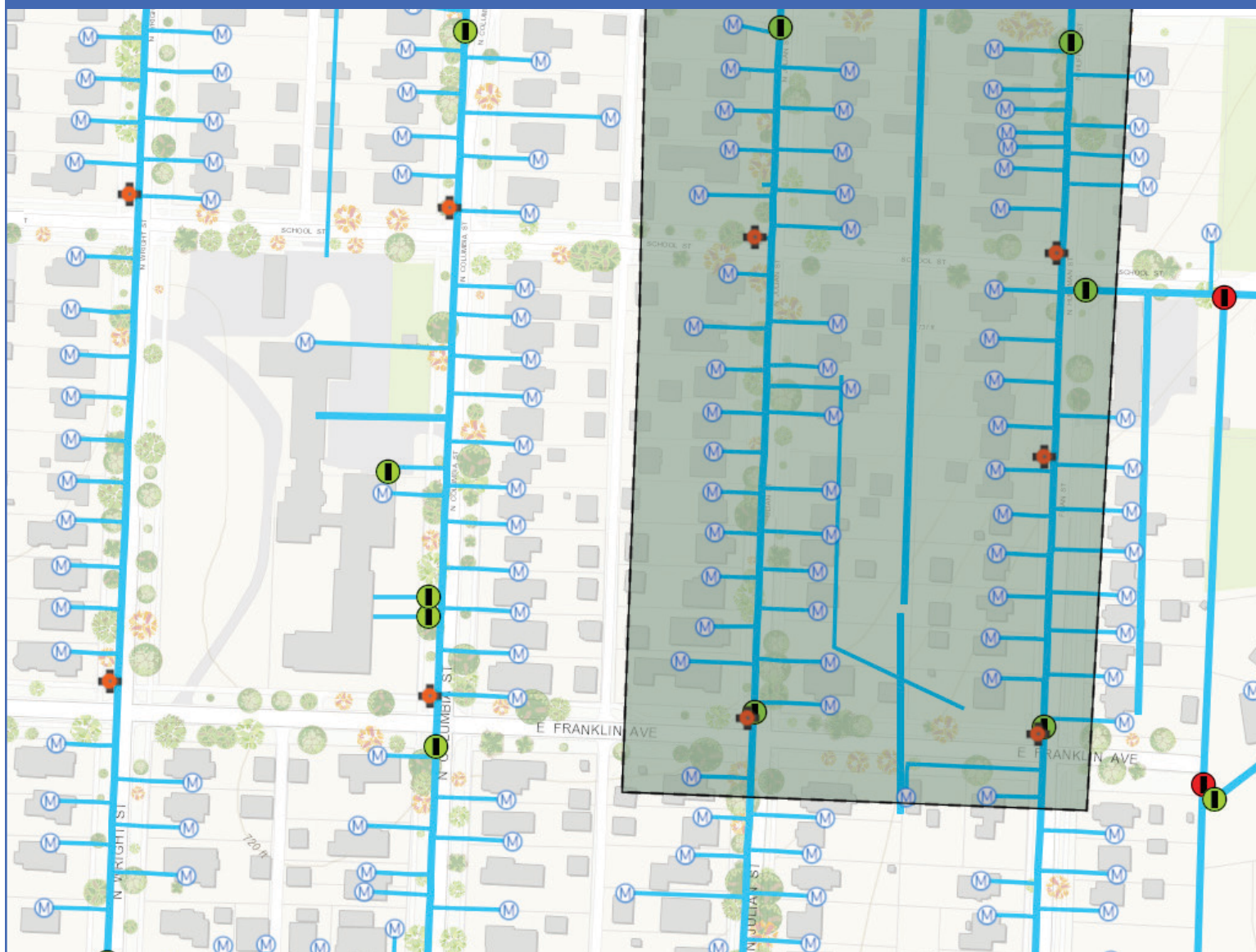


Cost Map

An integration between RSMeans data from Gordian and ArcGIS by Esri

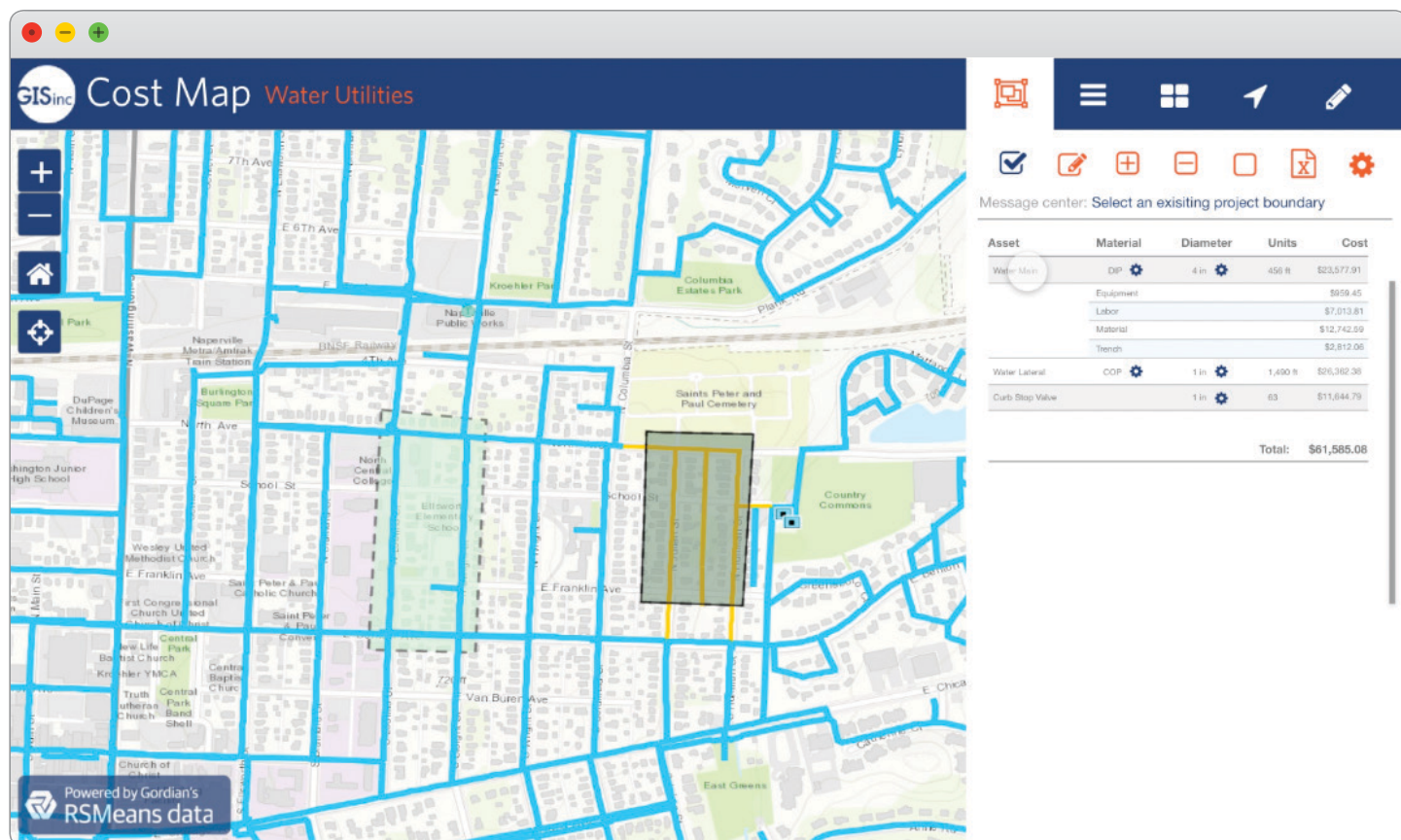


1

What is Cost Map?

Cost Map is a web-based solution that integrates RSMeans data API from Gordian with the ArcGIS Platform from Esri. Cost Map provides a quick and reliable construction cost estimation process through hosted content, services and costing information.

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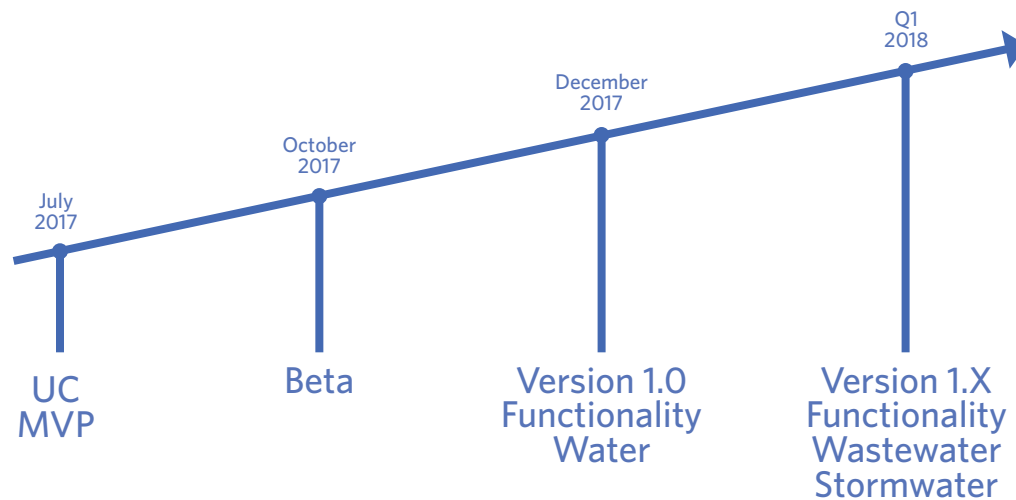
RSMeans data - is North America's leading source of construction cost information. It offers dependable cost data that is locally relevant, accurate and up-to-date and is available through an online API. [Web Site](#)

ArcGIS - is a mapping and analytics platform that offers a unique set of capabilities for applying location-based analysis to business practices. These capabilities include; spatial analytics, mapping and visualization, 3D GIS, Real-time GIS, imagery/remote sensing, data collection, and management. [Web Site](#)

2

Development Schedule:

The initial development strategy for Cost Map will support the Esri Water Distribution Model, which will be the first dataset at version 1.0; scheduled for released by end of 2017. Following 1.0, additional functionality and datasets will be introduced in 2018.



3

Framework: GISinc's Spinal Map

Cost Map is built using Spinal Map, which is a GISinc web-based development platform designed to streamline application development and align with Esri's ArcGIS platform. It supports many of the core requirements of common web mapping applications such as:

- Map Navigation
- Data Visualization
- Out-Of-The-Box Widgets

Applications built using Spinal Map leverage the Esri's ArcGIS platform and readily integrated with many of its services including identity management, geoenrichment, and feature editing.

Spinal Map is designed using a modern front-end technology stack making it accessible from mobile devices as well as desktops:

- JavaScript
- HTML5
- CSS3

Spinal Map leans heavily on the Bootstrap CSS framework, as well as, the Backbonejs JavaScript framework. The Spinal Map library supports the development of custom functionality, allowing developers to focus primarily on the unique requirements for an application. In addition, Spinal Map includes a responsive design that provides a rich experience across all your devices.

Cost Map 1.0 Functionality

Name	Description
User defined parameters	Window for defining additional parameters
Greenfield	New construction
Replacement	Replacing existing infrastructure
Repair	Repair existing infrastructure
Future	1-12 quarters (beyond 36 months?) Long range planning
Factor	Ability to apply a factor to cost results or multiplier, client side action
Locality	Region / state, time of year (Season)
Replacement	Select features that are aged i.e. 15 years since installed
Filter Results	Feature list should be able to deselect assets from being calculated
Save Project	Ability to save a project and attached to project boundary
Export results	Excel
Highlight Features	Highlight features on map that correlate with project area
Results	Breakdown by linear foot or asset type (i.e. \$35/foot 4" PVC Water Main or \$25/Curb Valve) on saved results.
Results	Drill down UI to see detailed list of cost lines
Authentication	Fix OAuth between RSMeans and ArcGIS (Use ArcGIS identity process)
User Analytics	Track analytics on user interaction (Google Analytics)

Cost Map 1.1 Scheduled Functionality

Name	Description
Unit Creation	Comprised of multiple components of an asset (configure unit or assembly of an asset)
Connectivity	Ability to select infrastructure to a given pipe, valve, intersection etc. Based on digitized data
Wastewater	Support Wastewater

Cost Map 1.2 Scheduled Functionality

Name	Description
Custom Costs	Ability to add new cost line/s
Custom Costs	Ability to apply own costs to items in results list breakdown
Storm	Support Storm

Cost Map Future Functionality

Name	Description
ArcGIS Desktop	If interested in this product, contact us at: marketing@gisinc.com
AutoCAD	If interested in this product, contact us at: marketing@gisinc.com
Microstation	If interested in this product, contact us at: marketing@gisinc.com

5

Cost Map Use Case:

- User accesses the Cost Map through a public facing URL, <http://costmap.gisinc.com>
- User must authenticate using a L2 AGOL named user account



Use Case #1

- Activates cost tool
- Draw polygon extent on map
 - Or pick a project area from an existing polygon feature layer
- Cost tool aggregates all features
- Cost tool displays each feature aggregate within application window
- Option to adjust feature type and size
- Option to adjust future quarter
- Execute tool
- Results are displayed on screen



Use Case #2

- Edits are made to existing data set, i.e.
 - Add new water main
 - Adjust material type or size
- Re-run use case 1



Use Case #3

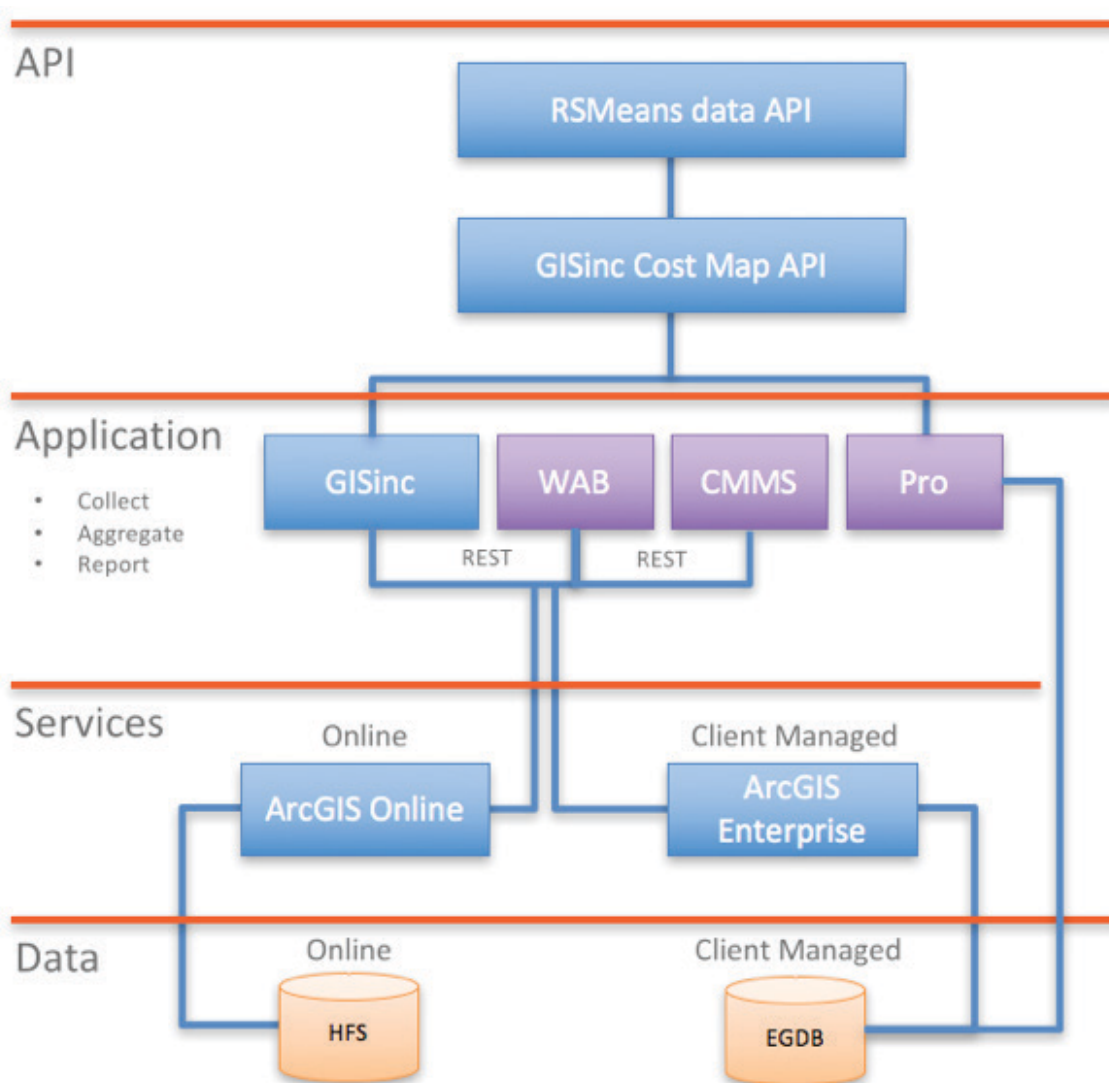
- Pick existing projects and CIP estimates from a dropdown
- Map zooms to extents of project
- Estimates are shown on screen

API Tier - RSMeans data API is responsible for all cost values, GISinc's API is responsible for collecting, aggregating and reporting back results.

Application Tier - Currently Cost Map is a web based solution that collects, aggregates, and Reports the construction cost estimation. Future plans will support other environments such as; Web AppBuilder as a custom widget, ArcGIS Pro, CAD Tools and potentially CMMS solutions such as Cityworks.

Data Tier - Cost Map will support data stored and managed within either a Hosted Feature Service in ArcGIS Online or ArcGIS Enterprise as well has data in an EGDB (Enterprise Geodatabase). If using a EGDB a Feature Service will need to be publish through ArcGIS Enterprise.

Services Tier - Either ArcGIS Online and ArcGIS Enterprise can be used to manage and host feature services. It is important to publish a feature service as Cost Map allows for online feature editing.



Implementations of Cost Map will require a level of data mapping that align data elements in the dataset model to the RSMeans data API.

GISinc has provided the ground work and will continue to enhance this data mapping process to insure a simple integration path.

Water Distribution Model

RSMeans data API

ASSET	ASSETTYPE	DIAMETER1	CODE	TRENCH-8	NOTES
Control Valve	Air Release	2	333113103020	G10308071350	Chose Public Sanitary utility, 4 choices, all similar labor #s
Control Valve	Air Release	0.75	331216201105	G10308071350	Water utility only 3/4" found
Control Valve	Air Release	1	331216201110	G10308071350	Water utility only 1" found
Control Valve	Air Release	0/ 2"	333113103020	G10308071350	0 doesn't make sense
Control Valve	Air Release	30	NAN	G10308071350	Nothing that big, maybe 3" water utility is 331216201130
Control Valve	Altitude	16/ 12	331216200280	G10308071350	12 largest
Control Valve	Altitude	12	331216200280	G10308071350	used single acting, double also available
Control Valve	ARV/Air Release	2	333113103020	G10308071350	Used multiple searches ARV Automatic Recirculation Valve
Control Valve	Ball	0	230523805380	G10308071350	Chose middle of the road 1"steel valve 1500psi
Control Valve	DCVA	2	221119421260	G10308071350	double check valve assembly
Control Valve	DCVA	1.5	221119421140	G10308071350	Only type with all sizes 4 types available
Control Valve	DCVA	4	221119421220	G10308071350	Only type with all sizes 4 types available
Control Valve	DCVA	3	221119421210	G10308071350	Only type with all sizes 4 types available
Control Valve	DCVA	6	221119421230	G10308071350	Only type with all sizes 4 types available
Control Valve	DCVA	8	221119421240	G10308071350	Only type with all sizes 4 types available