



Location-Based Crowd-Sourcing for Preference and Place Perception Analysis at UMass Amherst

Alexander C. Schreyer

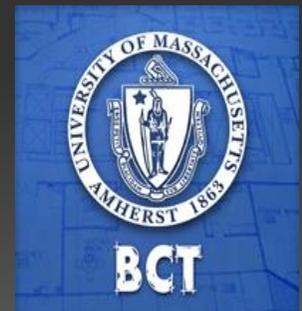
Lecturer, Building and Construction Technology

Alexander Stepanov

GIS Architect, A&F Administrative Systems

University of Massachusetts, Amherst

@ 2012 NEARC, Northampton, MA



Outline

- UMass Master Plan Background
- The "Favorite Places" Site
- The "Likes & Dislikes" Site
- Results

Purpose of the Campus Plan



So our short term decisions are part of a long term vision for the campus

To ensure the look, feel and function of our campus is reciprocal with our academic mission



To create a shared and supported framework which will inform our planning decisions campus wide

To create a document which can help us meet our goals, raise our aspirations, and help raise funds

The Participants

Division of Capital Asset Management

The University of Massachusetts Amherst

- Executive Oversight Committee
- Facilities and Campus Services
- Campus Planning

- Campus Master Plan Committee

- Stakeholder Groups
 - *Teaching, Research and Libraries*
 - *Student Life*
 - *Administration and Support*
 - *Transportation, Land Use and Open Space*
 - *Building, Grounds and OIT*

- Existing Governance and Committees
 - *Faculty Senate*
 - *Student Senate*
 - *Capital Asset Board*
 - *Parking Transportation Advisory Board*
 - *Campus Physical Planning Committee*
 - *University Public Art Committee*
 - *Pedestrian Safety Committee*

External Participants

- Neighbors
- Local Community Officials and Commissions
- Pioneer Valley Regional Plan Commission

Consultants

- Wilson Architects
- Ayers Saint Gross
- VHB
- Tighe and Bond

Over the Past Nine Months

- Nearly 200 Events
- Over 350+ Hours
- With
 - Campus Stakeholder Groups
 - CPPC, UPAC, PTAB, Pedestrian Safety, etc.
 - Faculty Senate
 - Individuals
 - Open Campus Forums
- Over 3,500 Web Visits



The "My Favorite Places" Site

Background

2010: University was starting Masterplan process.

Discussions in Campus Physical Planning Council (CPPC) led to question:

"Where are our sacred places?"



Needed tool to survey sentiment about locations!

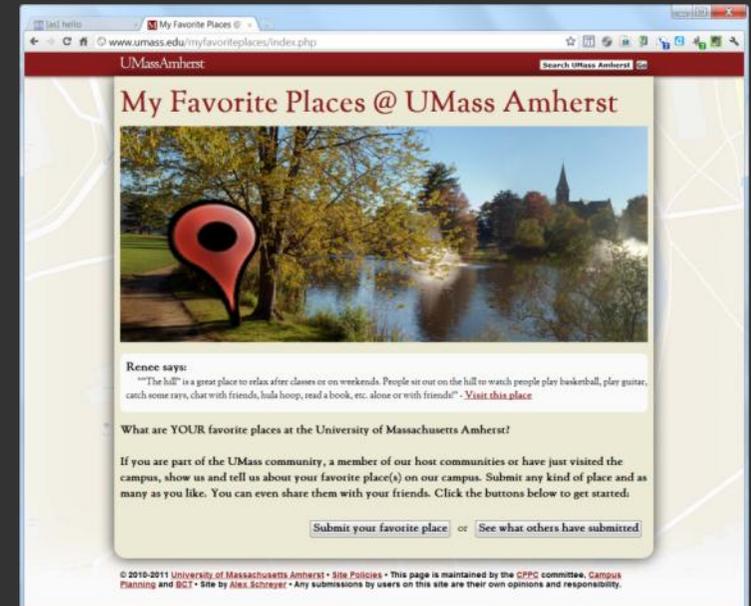
My Favorite Places Website

Goals:

- Fun to use
- Easy to add place
- Multiple submissions possible
- Aggregate submissions view
- Statistics generator
- Mobile website access
- Social sharing integration
- Spam control

Tools:

- Google Maps JavaScript API
- PHP / MySQL



My Favorite Places @ UMass Amherst



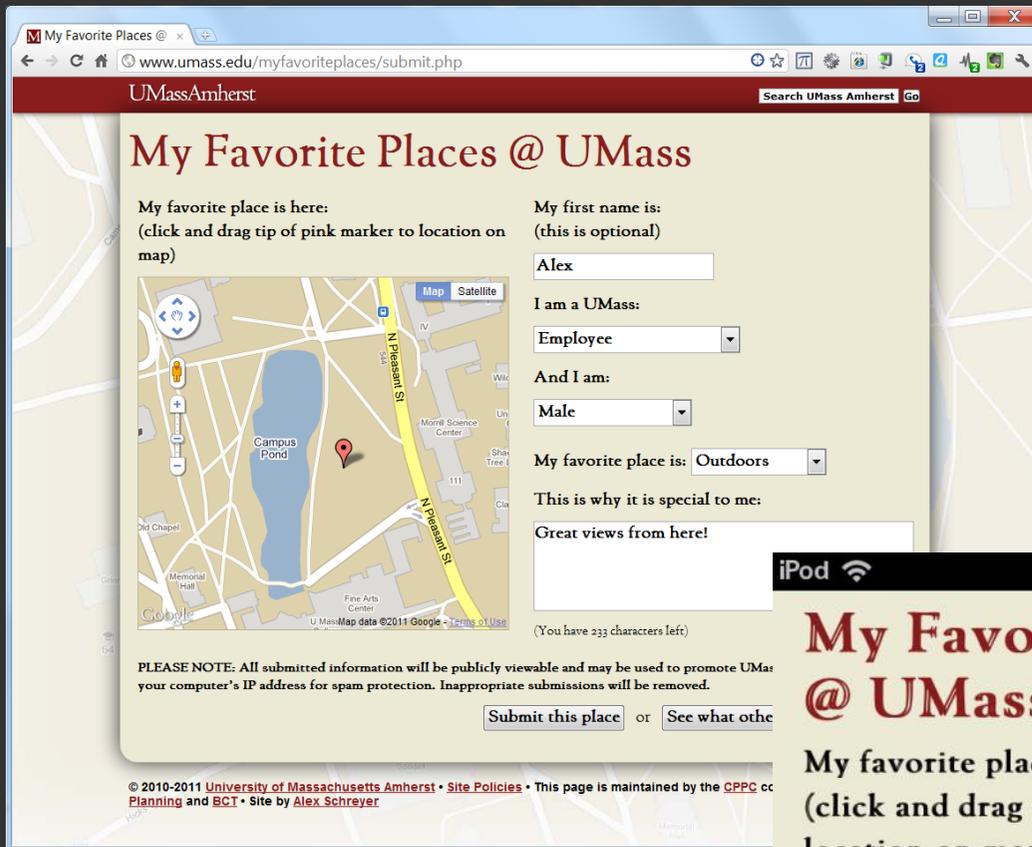
Renee says:

""The hill"" is a great place to relax after classes or on weekends. People sit out on the hill to watch people play basketball, play guitar, catch some rays, chat with friends, hula hoop, read a book, etc. alone or with friends!" - [Visit this place](#)

What are YOUR favorite places at the University of Massachusetts Amherst?

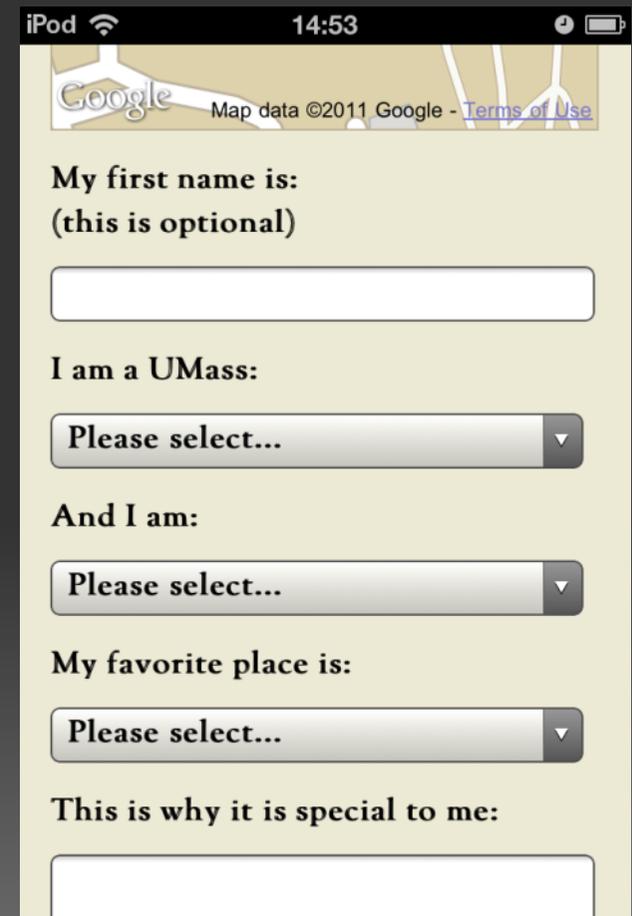
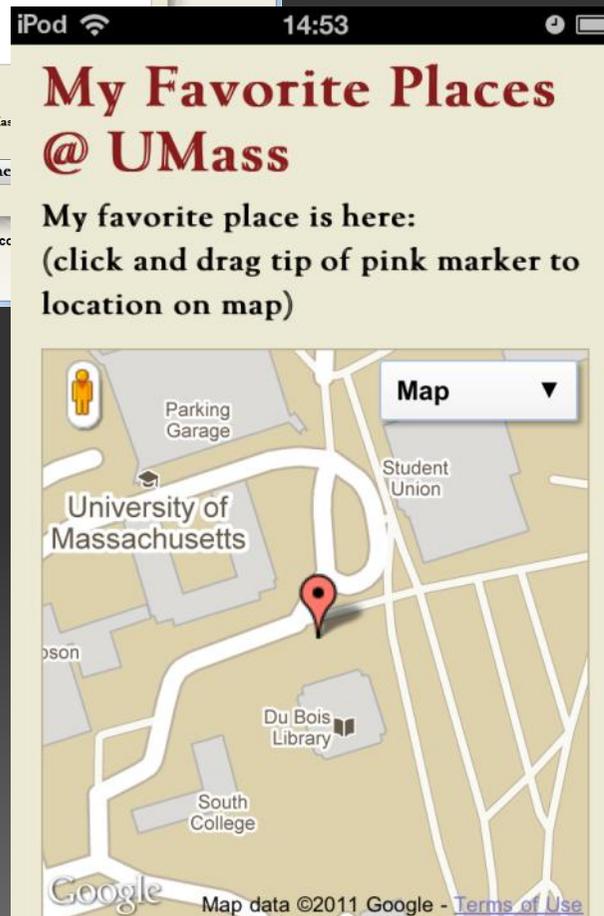
If you are part of the UMass community, a member of our host communities or have just visited the campus, show us and tell us about your favorite place(s) on our campus. Submit any kind of place and as many as you like. You can even share them with your friends. Click the buttons below to get started:

or



Desktop View

Mobile View



Responsive Design!

My Favorite Places @ UMass

The pins below show the most recent 500 submissions. Click the pins to view comments.

The map shows the UMass Amherst campus with numerous blue location pins. A pop-up comment box is visible over the map, containing the following text:

Sarah says:
 Being near the campus pond is always a treat, and seeing the lively student activities on the lawn near the library fills my day with color and a sense of community here on campus. Also, there are so many wonderful trees surrounding the area - wonderful!

[Link](#) | [Report](#)

Map data ©2011 Google - Terms of Use

Share this page:



Submit a favorite place

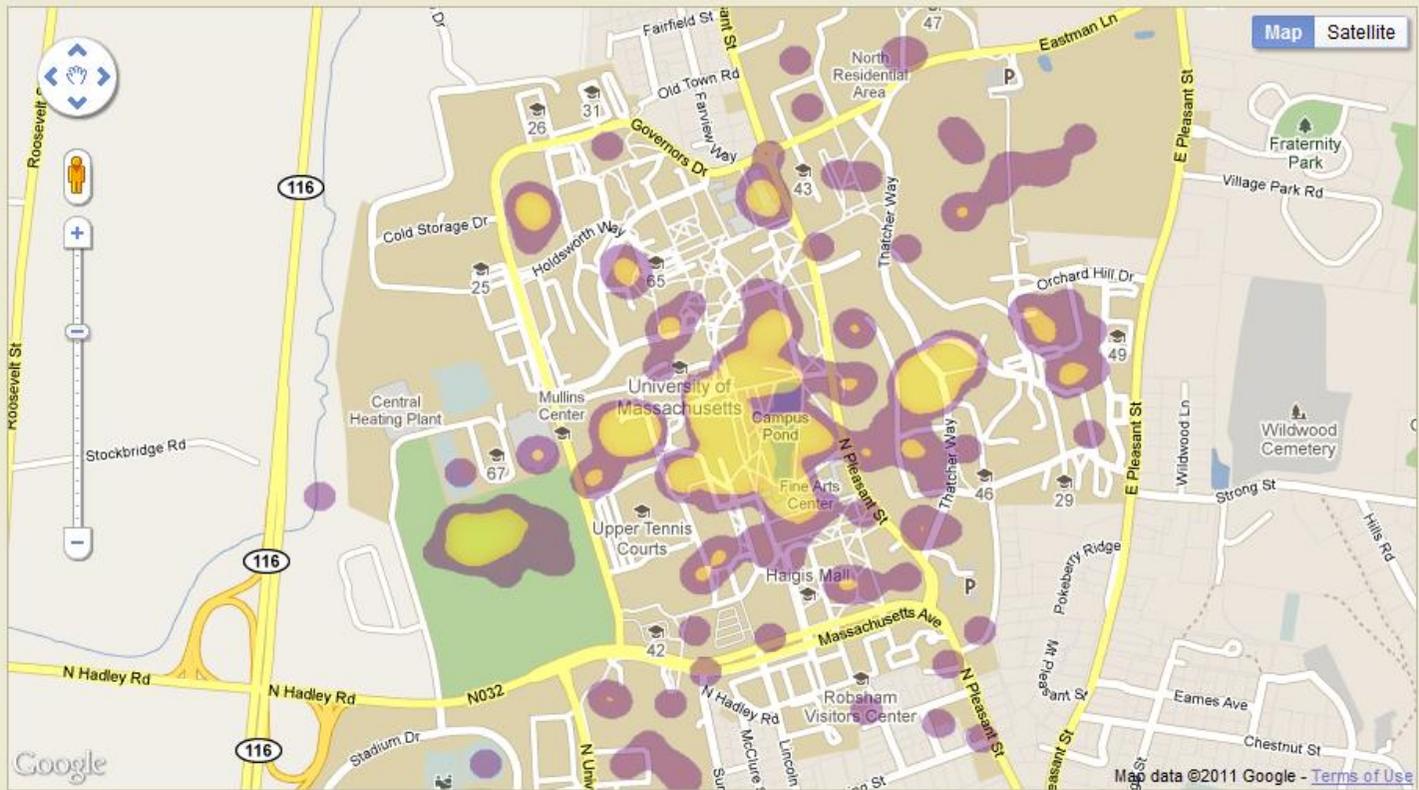
or

Visit UMass.edu

My Favorite Places @ UMass

This is what has been submitted so far. Filter by:

Show heatmap (full data)

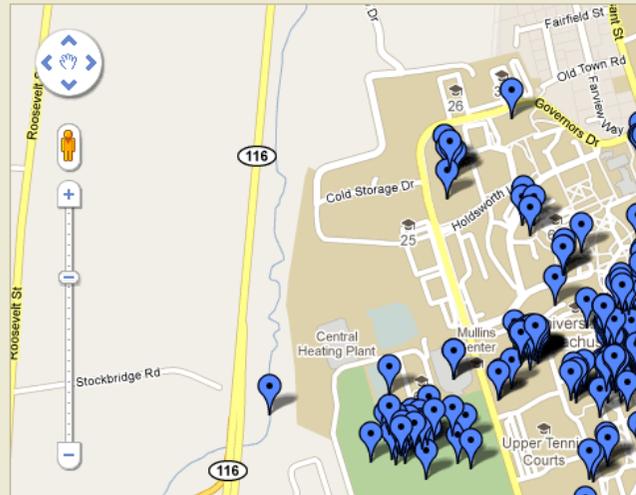


View as a [table](#) | Download entire data set: [KML](#) | View [Website Stats](#)

or

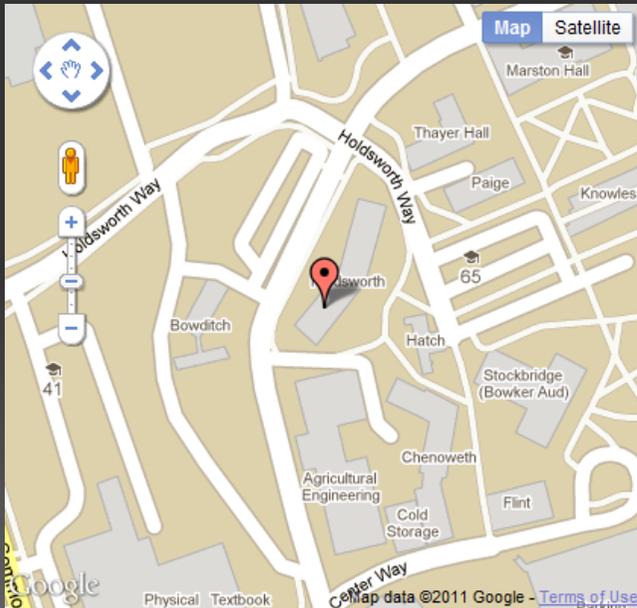
My Favorite Places @

The pins below show the most recent 500 submissions.



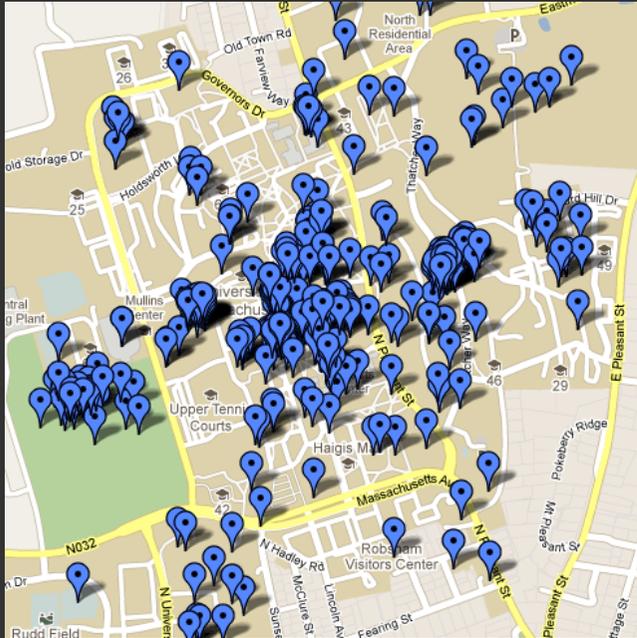
Map:

Google Maps Javascript API object
(few lines of code)



Geolocation - Pre-setting of pin to location
on campus:

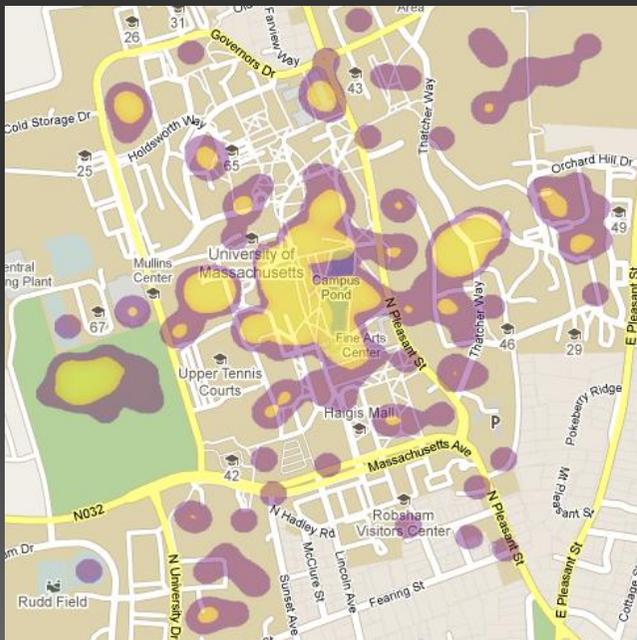
Google Maps Javascript API
(two lines of code)



Points import:

KML-file generated from database (using PHP, based on selection criteria). Loaded into map.

<http://umass.edu/myfavoriteplaces/getkml2.php?type=und&gender=mal&location=out>



Heatmap:

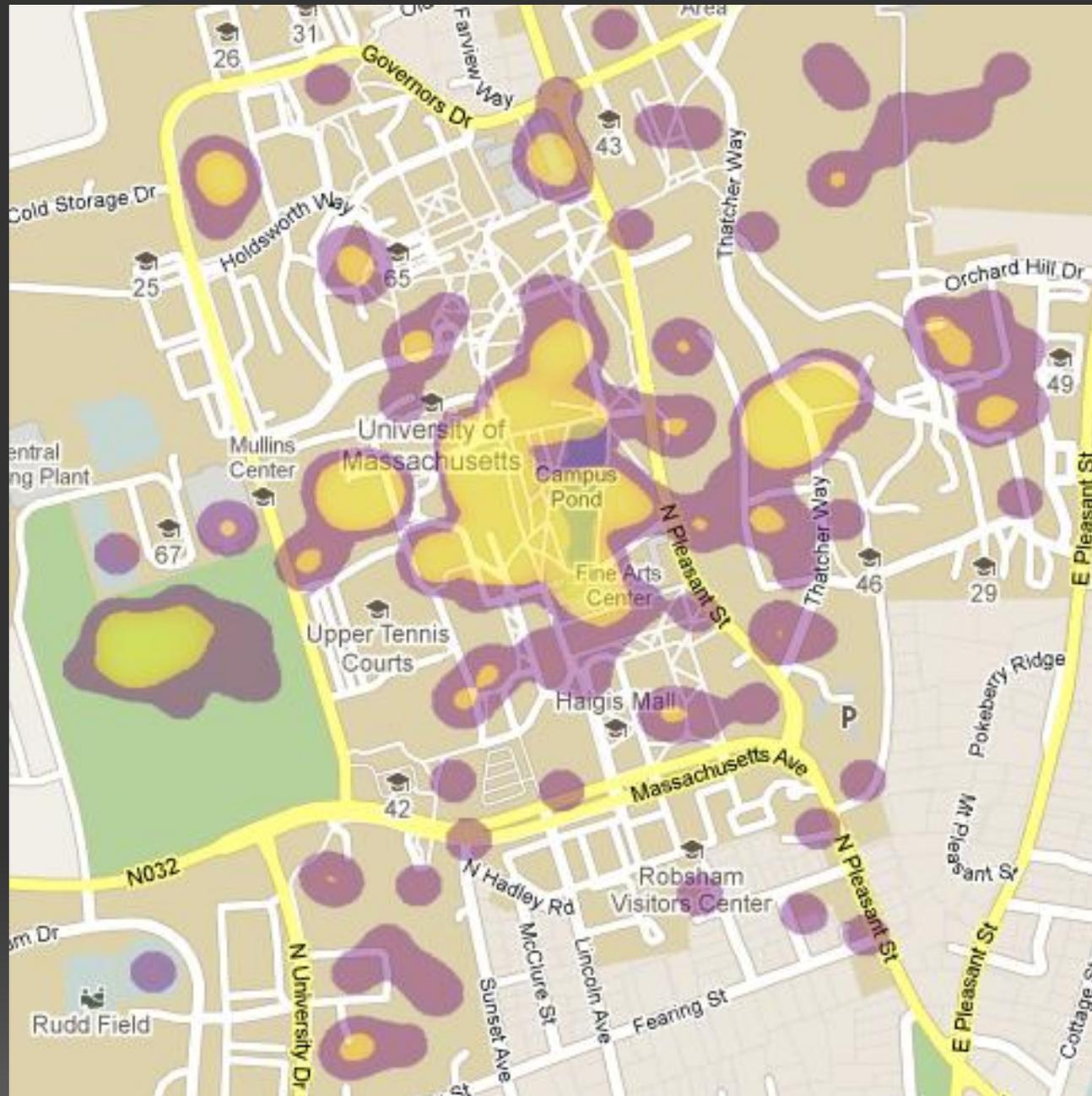
Color-mapped image generated with PHP/GD script. Overlay in Map.

Statistics

Submissions

	Female	Male	Other	Grand Total
Undergraduate S.	56	58	3	117
Graduate S.	28	28	2	58
Faculty	11	17		28
Employee	48	10	5	63
Alumni	126	74	3	203
Other	3	1		4
Grand Total	272	188	13	473





Heatmap Results



KMZ: <http://goo.gl/Z1oYJ>

© 2011 Europa Technologies
© 2011 Google
Image Town of Amherst

Image MassGIS, Commonwealth of Massachusetts EOE

42°23'13.46" N 72°31'49.00" W elev 191 ft

© 2010 Google

Imagery Date: 4/12/2009 1992

Eye alt 1398 ft

Quotes

The people are GREAT,
the view is excellent, and
it's the heart of the
campus!

This is where I met my
greatest mentor in life for
the first time.

It's a place where a lot of
people gather on warm days
to play music, sports and
hang out with friends.

This place has a really
nice vintage elevator.

Results for “My Favorite Places”

- Custom “pin” tools useful for generic location analysis (esp. with heatmap output).
- PHP / MySQL application flexible but intelligence (database structure, spam filtering etc.) must be added manually.
- Effective “spam” protection necessary.
- Desktop / mobile UI in same web-based app useful approach (smartphones are pervasive).

The "Likes & Dislikes" Site

“Likes and Dislikes” Web App

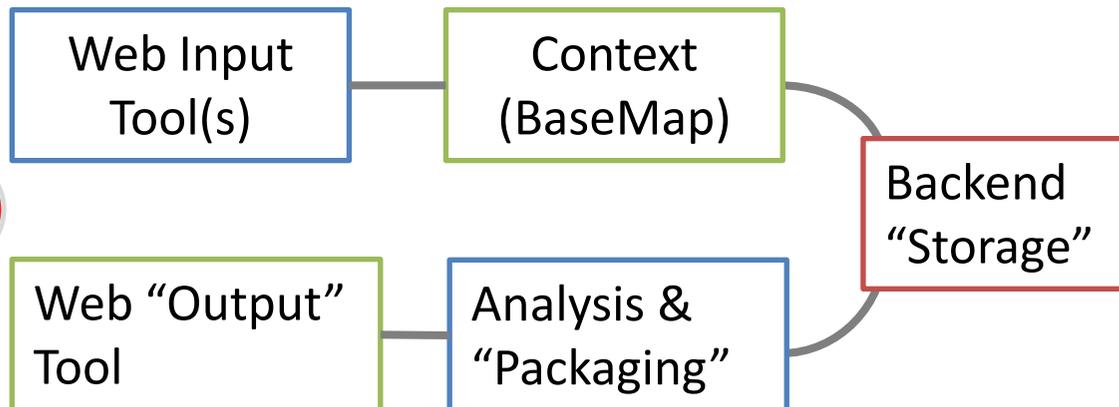
Purpose

1

- To outreach & engage Campus community in the master planning process
- To survey & document public’s perception of the Campus (+ & -)
what they like and what could be improved
- To facilitate Master Plan being “a living document”

Required Functionality

2

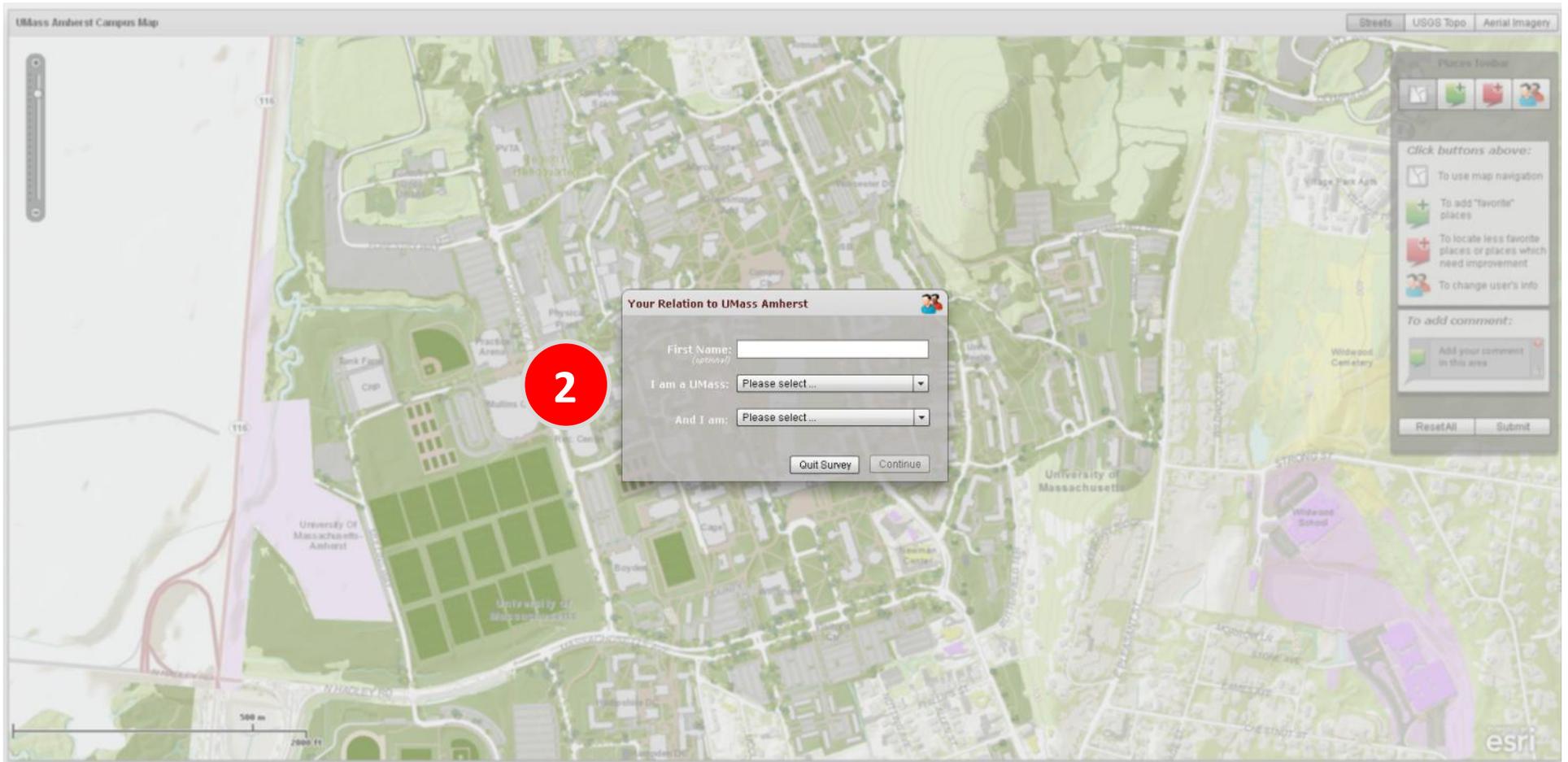


? Available Options ?!

3

- ArcGIS Online: the Community Base Map Program & University Campuses
- ESRI Web APIs: JavaScript, Flex and Silverlight
- Content Management System (Drupal) as backend storage

“Likes and Dislikes” Web App



1 <http://www.umass.edu/cp/sites/cp/apps/places/index.html>

Initial user survey

UMass Amherst Campus Map

Streets USGS Topo Aerial Imagery

Please select ...

- Undergraduate Student
- Graduate Student
- Alumnus
- Faculty
- Employee
- I am not with UMass

1

2

Your Relation to UMass Amherst

First Name:

I am a UMass: Please select ...

And I am: Please select ...

Quit Survey Continue

3

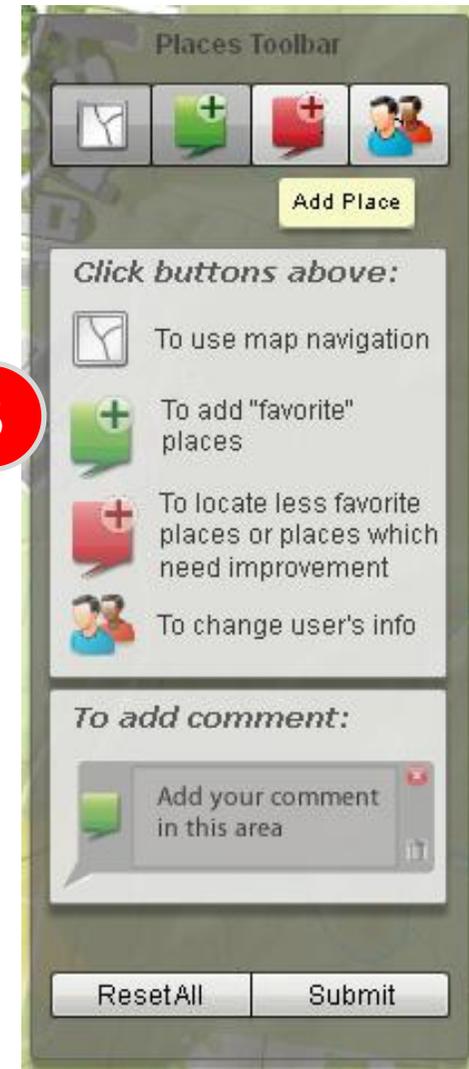
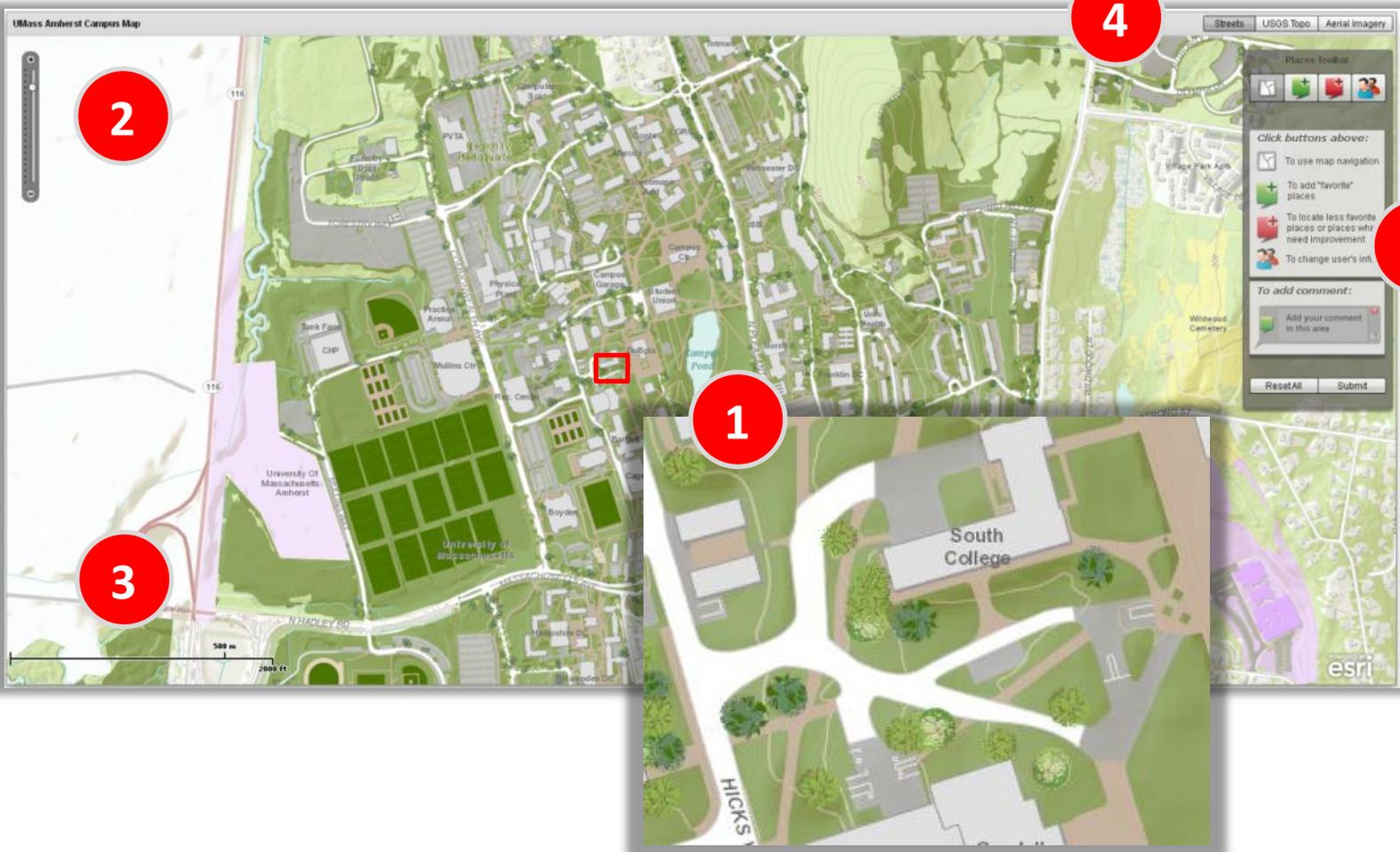
Please select ...

- Male
- Female
- I'd rather not say

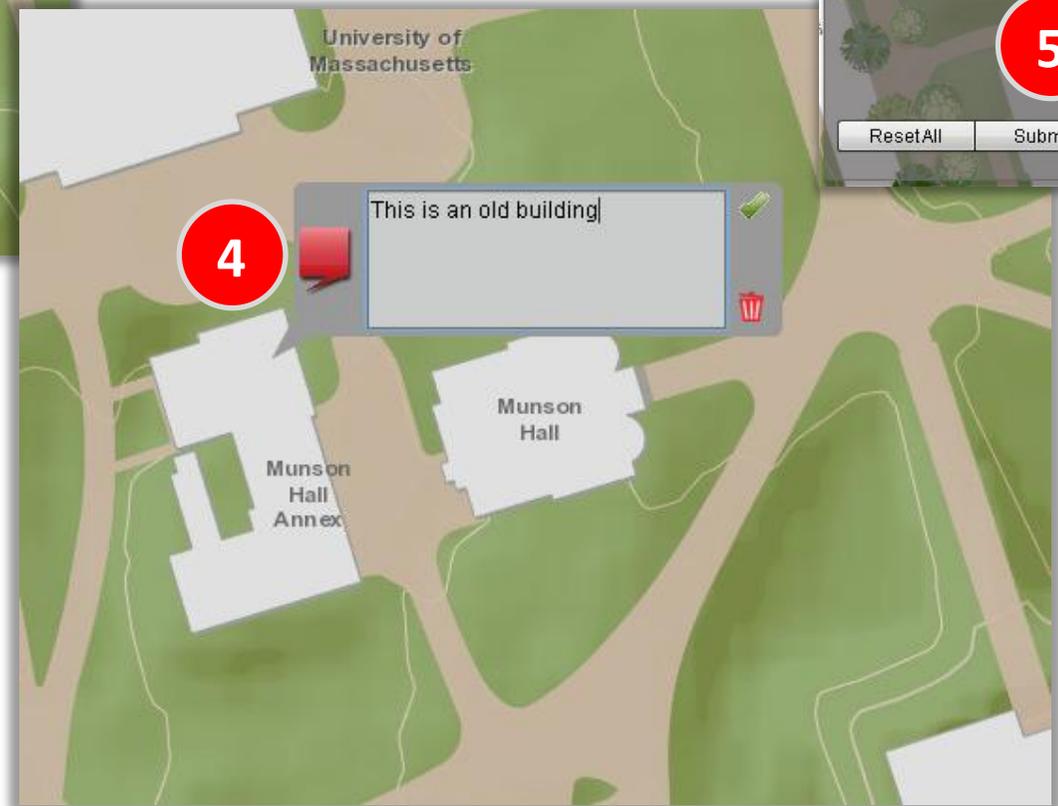
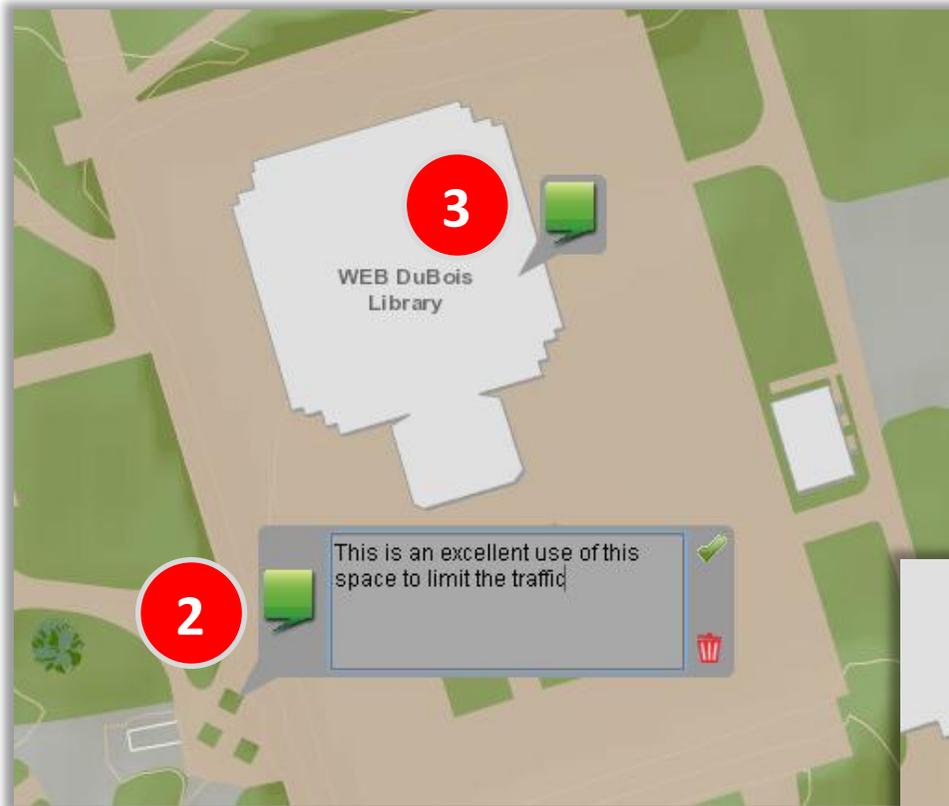
esri

<http://www.umass.edu/cp/sites/cp/apps/places/index.html>

Interface Elements



Define what(&where) you like and don't like



Done! What did other people say?

Education
Cape

Streets USGS Topo Aerial Imagery

Thank You!



Thank you for participating in this planning exercise. Your opinion is important for us to consider.

1

We would be glad to hear your feedback and suggestions at cp@cp.umass.edu



[See what other people submitted](#) [Planning Tools](#) [UMass Campus Planning](#) [Visit UMass Amherst](#)

2 **3** **4** **5**

Middlesex House

POWERED BY esri

ESRI Flex Viewer - Need a data stream!

The screenshot shows the ArcGIS Flex Viewer interface for 'CAMPUS PLANNING' at the University of Massachusetts. A central dialog box is displayed with the following text:

1

Welcome to ArcGIS Viewer for Flex.

This application is developed with ArcGIS Viewer for Flex 2.

More information at links below:

- [ArcGIS Viewer for Flex](#)
- [ArcGIS API for Flex](#)
- [Esri](#)

2

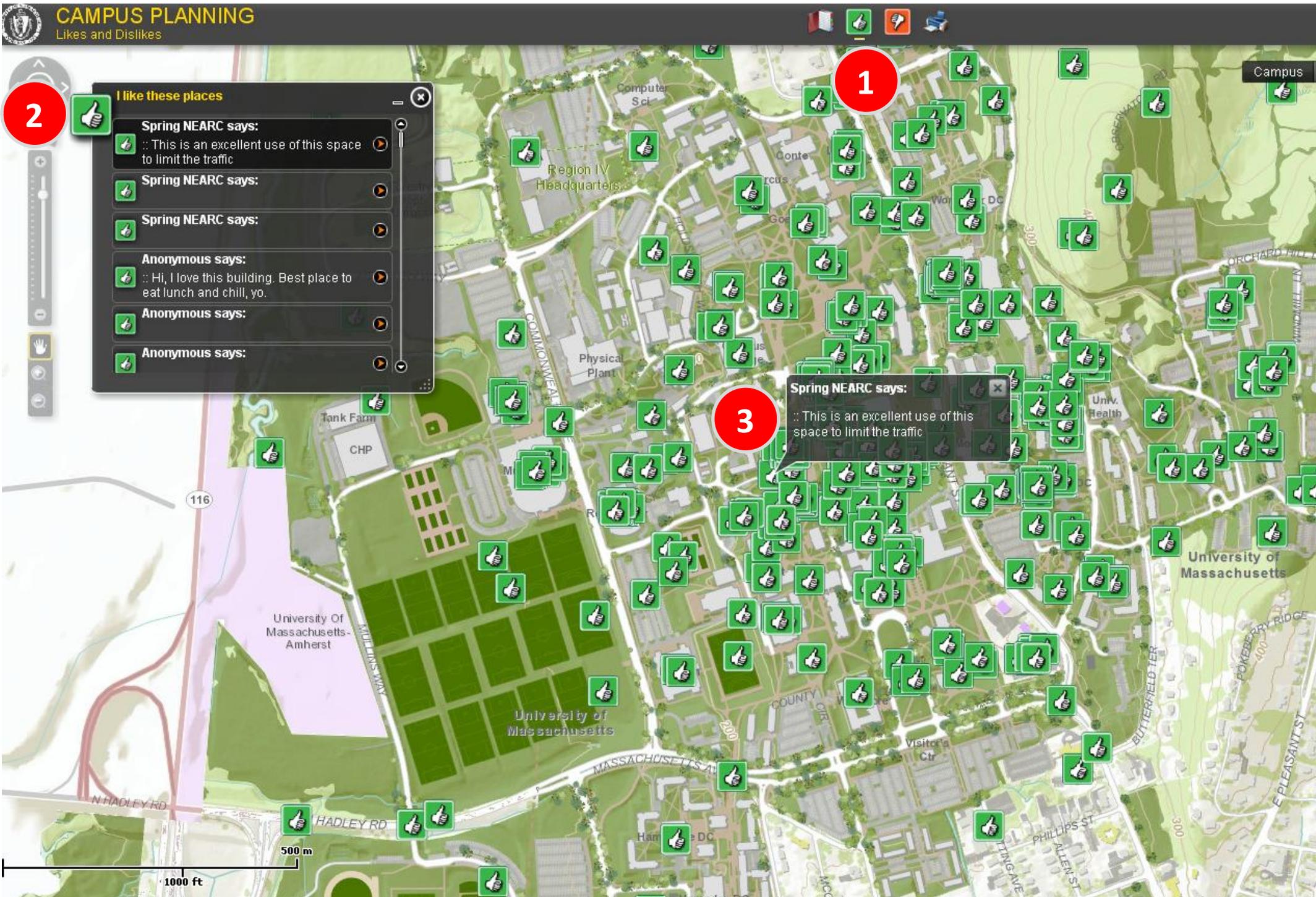
OK

The background map shows campus buildings and green spaces. A scale bar at the bottom left indicates 500m and 1000ft. The top right corner has map style controls (Campus, Region, Aerial, Topo) and an 'About' link. A red circle with the number '5' is in the top right corner of the interface.

<http://www.umass.edu/cp/sites/cp/apps/flexviewer/index.html?config=cp1.xml>

2

Interface Elements & “Likes” (Out of box)



What is to improve?

CAMPUS PLANNING
Likes and Dislikes

1

I like these places

- Spring NEARC says:**
:: This is an excellent use of this space to limit the traffic
- Spring NEARC says:**
- Spring NEARC says:**
- Anonymous says:**
:: Hi, I love this building. Best place to eat lunch and chill, yo.
- Anonymous says:**
- Anonymous says:**

2

I don't like these places

- Spring NEARC says:**
:: This is an old building
- Anonymous says:**
- Anonymous says:**
- Anonymous says:**
- Bryan says:**
:: I think this would be a great spot to expand the Student Union—which definitely needs more space. I picture a new, glass facade facing Stockbridge, which will connect the SU to directly to the Campus Center concourse, currently being renovated. With the new academic building being build behind this spot, this would complete a large central complex, making the CC plaza and the grass quad just north of the pond becoming a natural gathering spot.

3

Stockbridge Hall

Flint Lab

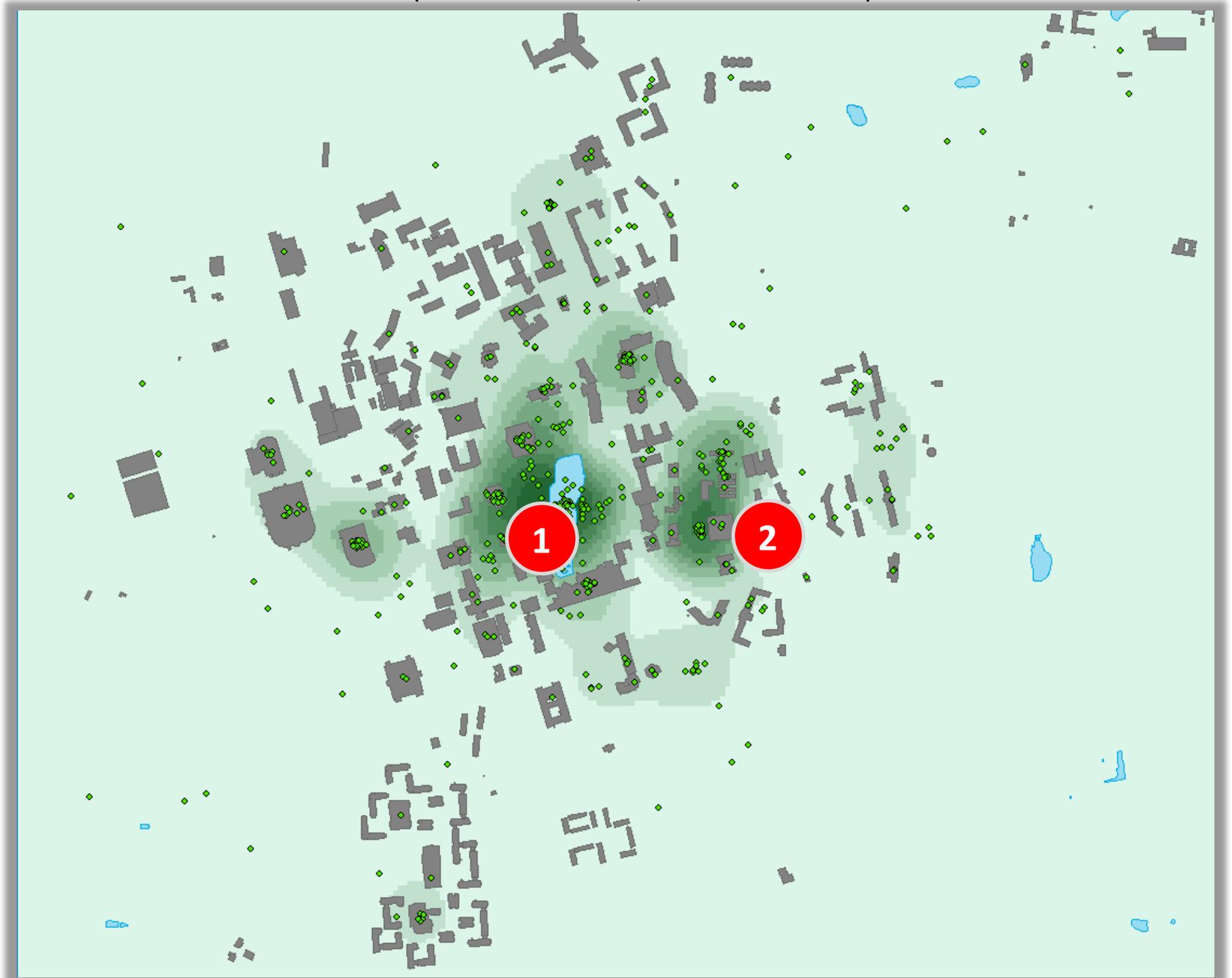
50 m

WICKS WAY

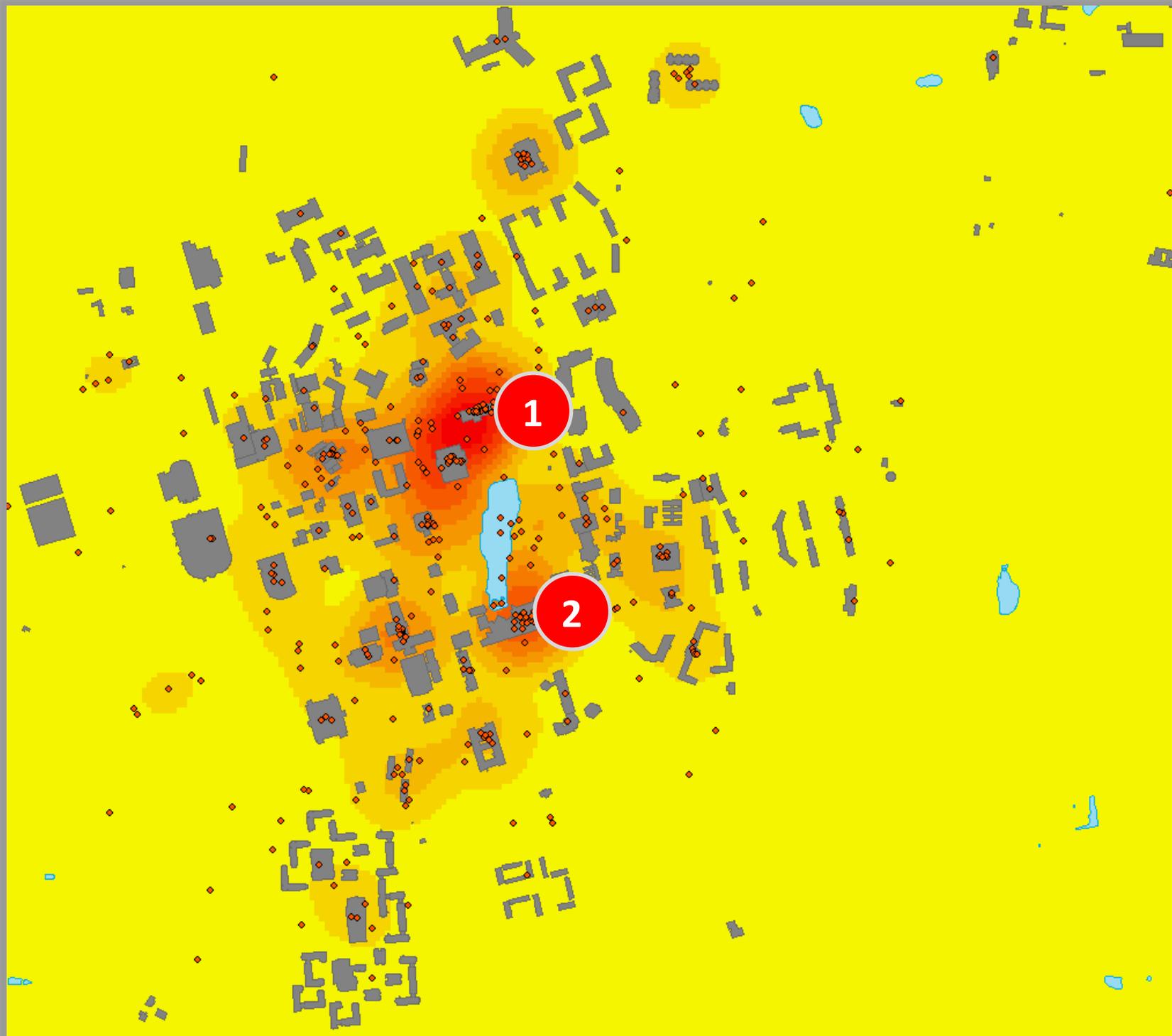
Campus

The image shows a digital campus planning tool. At the top, it says 'CAMPUS PLANNING Likes and Dislikes'. The main area is a map of a campus with various buildings and green spaces. Overlaid on the map are several user feedback elements. On the left, there are two vertical panels. The top panel, titled 'I like these places', contains a list of comments from 'Spring NEARC' and 'Anonymous' users, all accompanied by green thumbs-up icons. The bottom panel, titled 'I don't like these places', contains comments from 'Spring NEARC', 'Anonymous', and 'Bryan' users, all accompanied by red thumbs-down icons. A large red circle with the number '1' is positioned in the upper right quadrant of the map. Another large red circle with the number '2' is in the lower left quadrant. A third large red circle with the number '3' is in the lower right quadrant, pointing to a specific area on the map. A tooltip box labeled 'Bryan says:' is open over this area, displaying a detailed comment about expanding the Student Union and connecting it to the Campus Center. The map also features a compass, a scale bar (50m), and a 'WICKS WAY' label. In the top right corner, there are icons for a map, a thumbs-up, a thumbs-down, and a search icon.

Likes (481 Comments, as March 2012)



“Dislikes” (372 Comments, as March 2012)

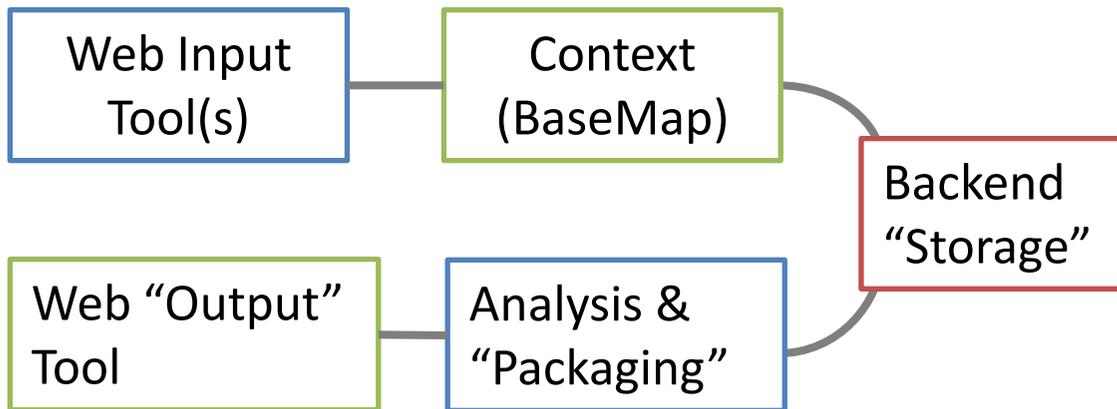


“Likes and Dislikes” Web App

Purpose

- To outreach & engage Campus community in the master planning process
- To survey & document public’s perception of the Campus – what they like about the Campus and what could be improved
- To facilitate Master Plan being “a living document”

Required Functionality

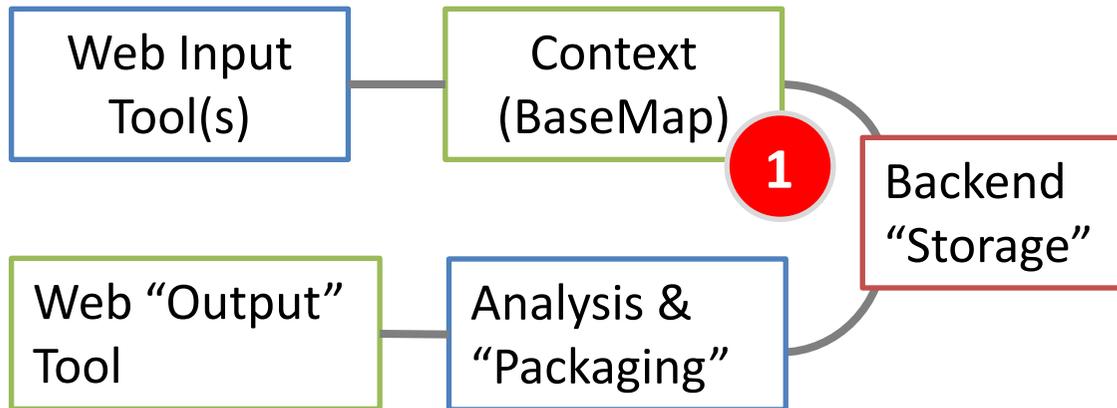


? Available Options ?!

- ArcGIS Online: the Community Base Map Program & University Campuses
- ESRI Web APIs: JavaScript, Flex and Silverlight
- Content Management System (Drupal) as backend storage

<http://www.umass.edu/cp/sites/cp/apps/places/index.html>

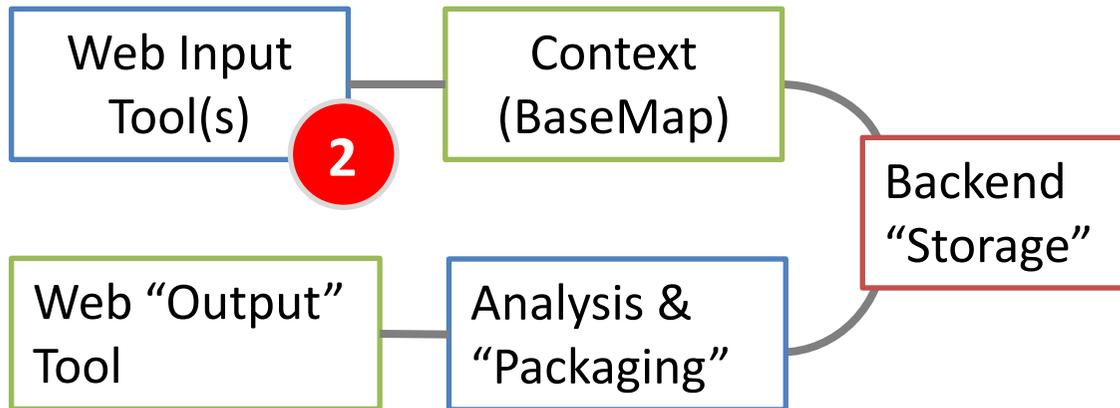
Design & Implementation



University of NC Chapel Hill
University of Kentucky
University of Massachusetts
University of Minnesota
Harvard
McMaster University
Pasadena City College
Cal State Domingues Hills

Please refer to ArcGIS Online
For more examples

Design & Implementation



Web APIs

The ArcGIS Web APIs offer similar GIS functionality; you choose your preferred developer platform.

Each API provides the resources you need. Read the API reference; view working samples that help you get started and show you what's possible; and communicate with others through the forums, blogs, and code galleries.

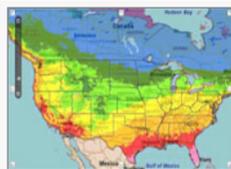
JavaScript

Develop custom JavaScript applications that mashup ArcGIS services. Use the [ArcGIS API for JavaScript](#) to take full advantage of powerful mapping, editing, geocoding, and geoprocessing services. Also provided are libraries for [ArcGIS Extension for Bing Maps](#) and [ArcGIS Extension for the Google Maps API](#).



Flex

Develop custom applications with ArcGIS services using the Flex framework. The API enables creating applications with an intuitive, visually rich, and responsive user interface. The [ArcGIS API for Flex](#) takes full advantage of the powerful mapping, geocoding, and geoprocessing capabilities of ArcGIS services.



Silverlight/WPF

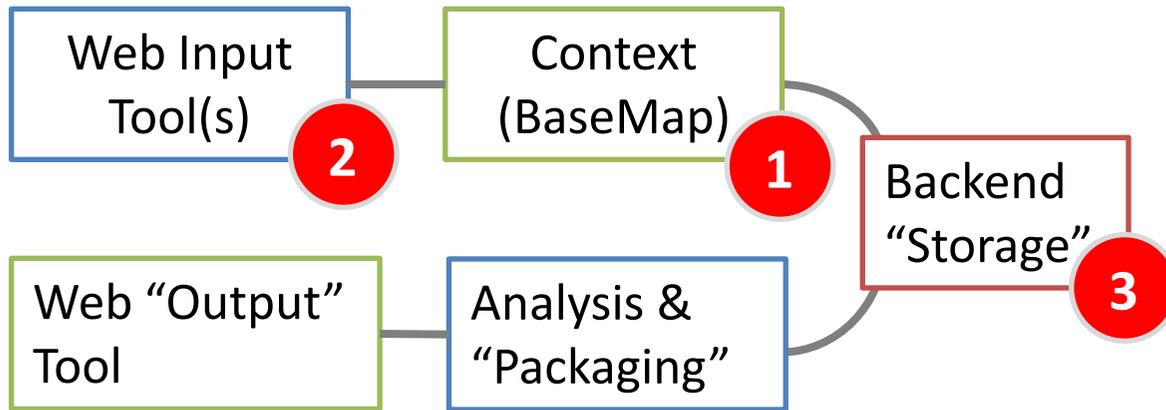
Develop custom applications with ArcGIS Server services using the [ArcGIS API for Silverlight](#) or the [ArcGIS API for WPF](#). Both APIs enable you to create highly interactive, visually rich, and expressive applications for both Web and desktop clients.



1. Evaluated JavaScript v.2.0 and Flex API
2. Free FlexBuilder for Academia
3. SolarBoston App as an inspiration
(Thanks to Greg Knight for help with MVC architecture!)



Design & Implementation



3

stepanov

- My account
- Node locations
- Create content
- Administer
 - Content management
 - Comments
 - Content
 - Content types
 - Post settings
 - RSS publishing
 - Taxonomy
 - Site building
 - Site configuration
 - User management
 - Reports
 - Help
- Log out

Who's online
There are currently 1 user and 0 guests online.

Home > Administer > Content management >

Content

[more help...]

Show only items where

- status is published
- type Campus Planning Tool

Update options

Publish

<input type="checkbox"/>	Title	Type	Author	Sta
<input type="checkbox"/>	Spring NEARC says: new	Place	CP Anonymous pu	
<input type="checkbox"/>	Spring NEARC says: new	Place	CP Anonymous pu	
<input type="checkbox"/>	Spring NEARC says: new	Place	CP Anonymous pu	
<input type="checkbox"/>	Spring NEARC says: new	Place	CP Anonymous pu	
<input type="checkbox"/>	Anonymous says: new	Place	CP Anonymous pu	
<input type="checkbox"/>	Anonymous says: new	Place	CP Anonymous pu	
<input type="checkbox"/>	Anonymous says: new	Place	CP Anonymous pu	

Home >

Spring NEARC says:

First name (optional): Spring NEARC
usertype: I
usersx: M
placetype: Strong

This is an excellent use of this space to limit the traffic

lat: 42.38938272376448
long: -72.52846895615608

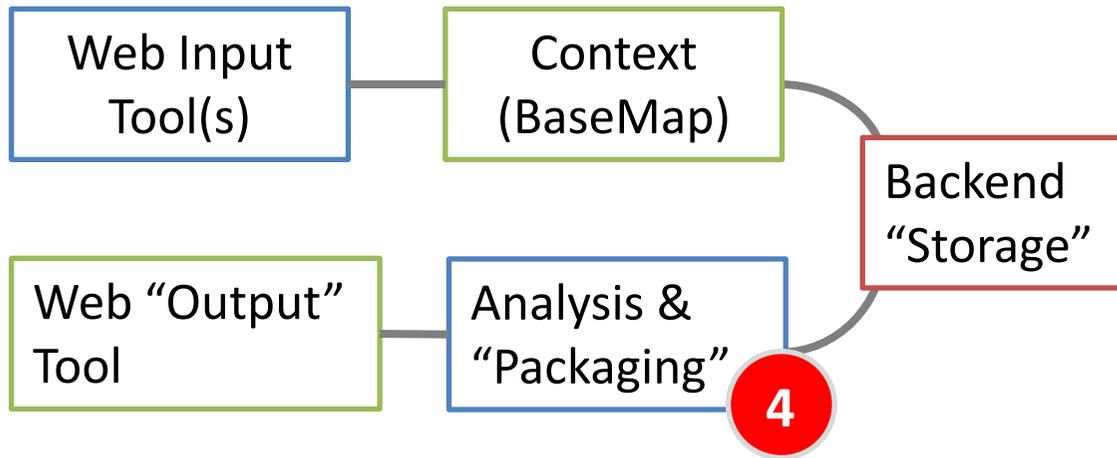
1. PHP&MySQL

2. **Drupal CMS**

3. "Geo-Comment" as
a content type

4. Content Management & Administration

Design & Implementation



www.umass.edu/cp/tools/georss_places_short.xml

Subscribe to this feed using

Always use OUTLOOK.EXE to subscribe to feeds.

Subscribe Now

GeoRss Places

Places

Spring NEARC says:
Friday, May 18, 2012 2:49 PM

This is an excellent use of this space to limit the traffic

Spring NEARC says:
Friday, May 18, 2012 2:49 PM

Spring NEARC says:
Friday, May 18, 2012 2:49 PM

Anonymous says:
Wednesday, May 16, 2012 5:14 PM

Hi, I love this building. Best place to eat lunch a

Source of: http://www.umass.edu/cp/tools/georss_places_short.xml - Mozilla Firefox

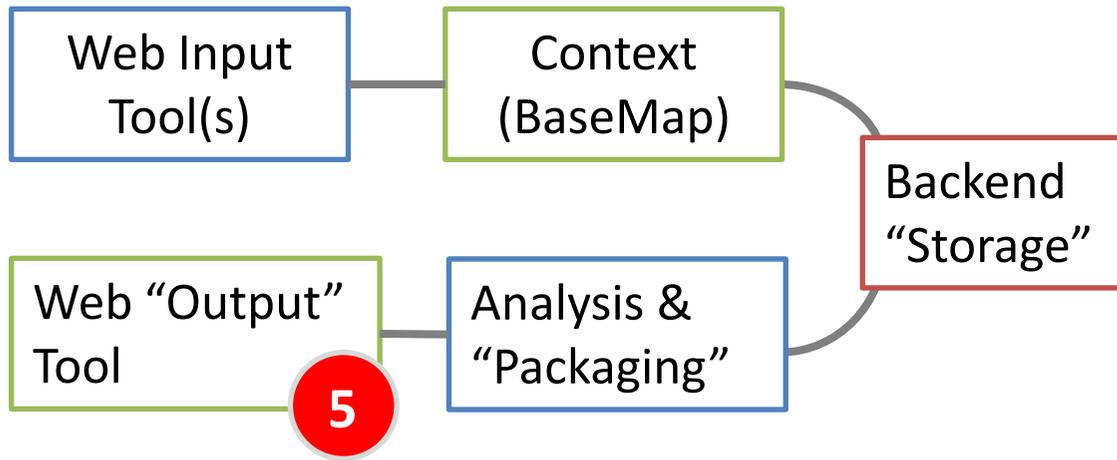
```
<?xml version="1.0" encoding="utf-8" ?>
<rss version="2.0" xmlns:dc="http://purl.org/dc/elements/1.1/" xmlns:georss="http://www.georss.org/georss">
  <channel>
    <title>GeoRss Places</title>
    <description>Places</description>
    <link>http://www.umass.edu/cp</link>
    <item>
      <title>Spring NEARC says:</title>
      <description>This is an excellent use of this space to limit the traffic</description>
      <dc:creator>Spring NEARC says:</dc:creator>
      <category>Strong</category>
      <pubDate>05/18/2012 - 14:49</pubDate>
      <georss:point>42.38938272376448 -72.52846895615608</georss:point>
      <georss:featureName>Strong</georss:featureName>
    </item>
```

Drupal CMS

4

is able to aggregate content types into "VIEWS", and publish them as GeoRSS

Design & Implementation



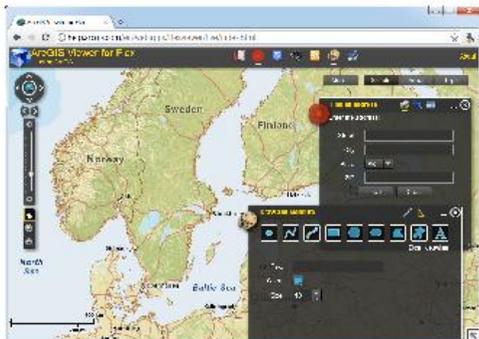
ArcGIS Viewer for Flex

March 2012 - version 3.0 prerelease available in [new resource center](#).

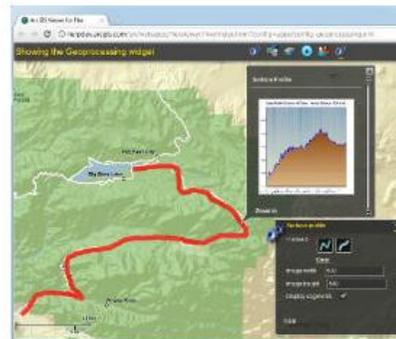
Read about [What's new in version 2.5](#) that was released in December 2011: [application builder](#), [Chart](#)

The ArcGIS Viewer for Flex is a ready-to-deploy viewer application. It is configurable, so you can easily custom widgets yourself with the ArcGIS API for Flex. The ArcGIS Viewer for Flex is ideal if you want mo

- Ready to deploy GIS Web client mapping application for ArcGIS Server built with ArcGIS API for Flex
- Easily configurable to meet custom business needs and requirements - no programming skills re
- Viewer functionality is defined by [widgets](#) - many core widgets are included.
- New functionality can be created by [developing custom widgets](#) using the ArcGIS API for Flex.



Default configuration

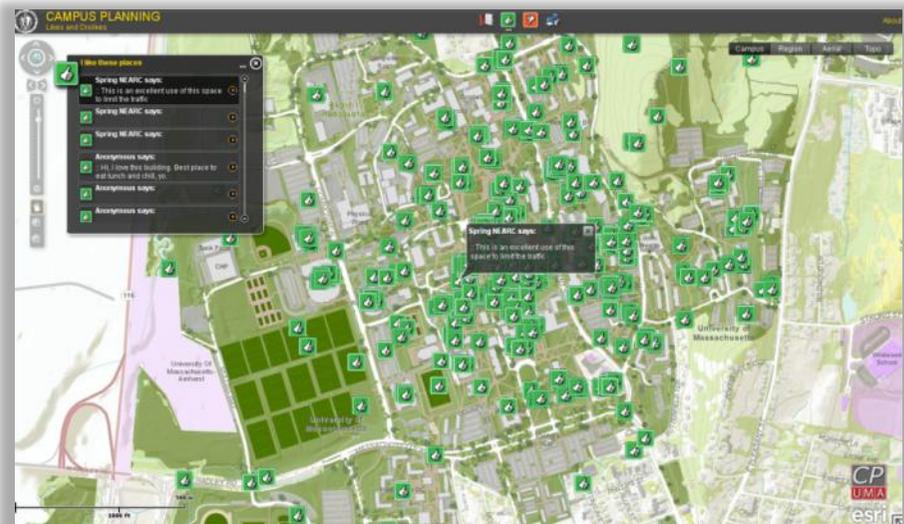


Geoprocessing widget examples

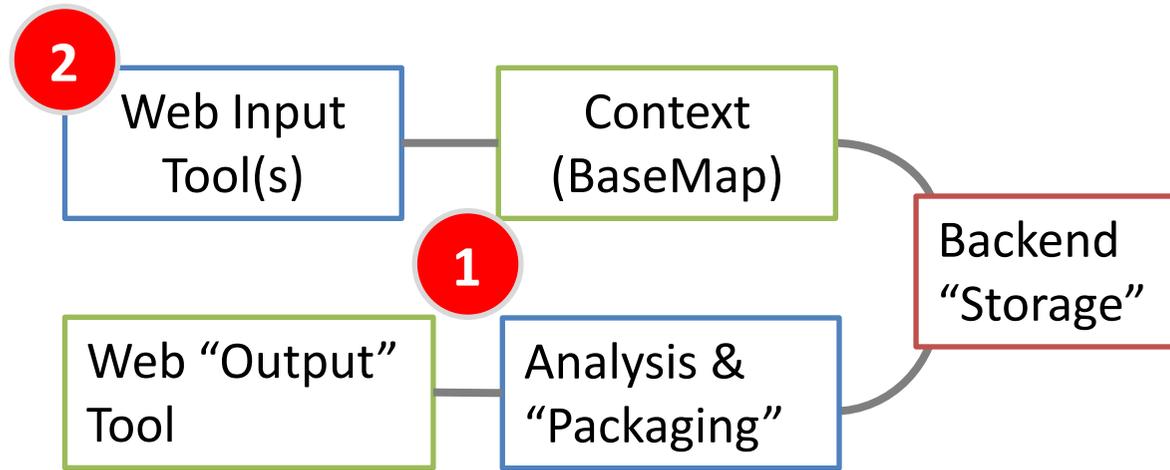
5

Flex Viewer v.2.x

- Campus Base Map
- GeoRSS feed from Drupal CMS



Design & Implementation



1

**System of components,
Not one supersize, do-it-all component**



2

**Only one custom component,
Combine existing and working solutions!**



3

Thank you!

Any questions?

GIS / CAD / BIM at the University of Massachusetts and the Five Colleges

Home Activity Stream Groups Blog & News Courses About

Northeast Arc User Group (NEARC) 2012 Spring Conference

by Michael Olin
April 27, 2012 in [News and Events](#)

The 2012 Spring NEARC Conference is coming up on May 22nd at Smith College in Northampton, MA. This one-day conference is an excellent chance for all users of Esri's ArcGIS GIS technology to connect, network, learn and enjoy seeing all that's new in the rapidly evolving world of GIS. Registration is open now. Register before [...]

0 Comments

BIM Forum and Academic Resources

by Isabelle Poirine-O'Brien, AIA, LEED A.P. BD+C
April 2, 2012 in [News and Events](#)

BIM Forum (<http://bimforum.org/>) is a terrific organization with the following mission from their website: "The BIMForum's mission is to facilitate and accelerate the adoption of building information modeling (BIM) in the AEC industry. We will lead by example and synchronize with counterparts in all sectors of the industry to jointly develop best practice for virtual design [...]"

0 Comments

2008 BIM Conference at UMass

by Isabelle Poirine-O'Brien, AIA, LEED A.P. BD+C
March 09, 2012 in [News and Events](#)

In 2008 when UMass was undergoing comprehensive academic planning projects and managing a large capital construction program, I organized a symposium on BIM that tapped industry experts to discuss the benefits and challenges of the BIM delivery method. The Symposium was designed around a Panel of Experts from selected member groups: architectural/engineering, construction management

What's new, Alex?

Alex Schreyer
Log Out

Recently Active Members

About This Site

Welcome to this Social Network / Blog / Course List for Geographic Information Systems (GIS), 3D Modeling / CAD and Building Information Modeling (BIM) at the University of Massachusetts, the Five Colleges and beyond.

Register using the form above to participate.

RSS Feeds

- Blog
- Blog Comments
- Network Activity

Supporters

UMASS AMHERST



<http://giscadbim.info/>

UMASS AMHERST *campus planning*
a division of facilities & campus services