A Developers Guide To Mobile GIS

David Cardella, Jeff Shaner
What is mobile GIS?

Extends the reach of ArcGIS from the office to the field

• With a mobile GIS solution you can:
  - Carry your maps to the field
  - Collect and Update Geographic Information
  - Track and Geo-collaborate
What are the benefits of mobile GIS?

Leverages the investment of your enterprise GIS

- Improve Efficiency and Accuracy of Field Operations
- Rapid Data Collection and Seamless Data Integration
- Helps to Make Informed and Timely Decisions
- Replaces paper based work flows
ArcGIS mobile functionality exposed through applications and APIs

ArcGIS System

Web

Mobile

Desktop

Cloud

Enterprise

Local

- Discover
- Create
- Manage
- Visualize
- Analyze
- Collaborate

ArcGIS mobile functionality exposed through applications and APIs
Esri Mobile Technologies

Mobile capabilities of the ArcGIS system

Apps and APIs

Form Factors

Platforms
- iOS
- Windows Phone
- Linux
- Windows Mobile
- Android
- Windows 7

Functionality (Mobility Services)
Esri Mobile Products

ArcGIS for ...

ArcGIS Mobile

iOS

Microsoft Windows Phone

Android

Rugged Devices

Smartphones and Slates

ArcPad
ArcGIS on Rugged Devices

*Windows and Windows Mobile Devices*

- Designed for harsh field conditions
- One handed/vehicle-mounted use
- Occasionally connected workflows
- High accuracy data collection
  - GPS integration
  - Laser integration
- Replace Paper Surveys
  - Intelligent forms
  - Barcode integration

Water Facilities Mapping

Asset Maintenance/Inspection

First Responders

Land Management
ArcPad on Rugged Devices

• **Application**
  - Single application for Desktop/Mobile devices
  - Advanced Data Collection Tools
    - GPS/Laser Integration
    - Data collection forms
  - Configurable using VBScript/JScript
  - 10.0 is First ArcPad maintenance release

• **Platforms:**
  - Windows XP, Vista, Windows 7
  - Windows Mobile
ArcGIS Mobile on Rugged Devices

- **Application**
  - Rapid Deployment of Maps, Apps & Projects
  - Task-based, Workflow Driven User Experience
  - Synchronization of Data between Field & Office
  - Local Caching of Data

- **API**
  - Coarse-grained .NET API
  - Build focused, custom solutions
  - Extend COTS application

- **Platforms:**
  - Windows XP, Vista, Windows 7
  - Windows Mobile
ArcGIS Mobile SDK

- Coarse-grained .NET SDK
  - Extend field applications
  - Create focused Mobile GIS applications
  - Embed ArcGIS into existing line of business applications

- Included in ArcGIS Mobile Setup

- Help and Samples location at ArcGIS Mobile Resource Center

*Using the SDK…*
Market Opportunities

Focused Solutions for Vertical Markets

- Timber Management
- Asset Management
- Work Order Management
- Utility Field Inspections
ArcGIS Products for Rugged Devices

Windows and Windows Mobile Devices

- **ArcGIS Mobile**
  - Focused Mobile Applications
  - Task-based, defined workflow
  - High Accuracy Data Collection
  - Users have little GIS training
  - Scalable to large field workforce

- **ArcPad**
  - Ad-hoc Mobile Application
  - High Accuracy GPS Workflow
  - Targets small/mid-size org
  - Users typically have GIS Training
ArcGIS on Smartphones and Slates

iOS, Windows Phone and Android Devices

- Designed for touch-screen phones
- One handed use
- Connected Workflows (Wifi, 3G)
- Assisted-GPS Integration
- Replace Paper Surveys
  - Intelligent forms
  - Field Validation
  - Media Integration

- Service Requests
- Parcel Valuation
- VGI
- Campus Maps
- Emergency Operations
ArcGIS on Smartphones and Slates

iOS, Windows Phone and Android Devices

- **Application**
  - Easy access to on premise ArcGIS Server content using Apple’s iPhone/iPad
  - Gateway to online ArcGIS system

- **API**
  - Build focused mapping applications
  - Native API
What can the ArcGIS Applications do?

- Display and navigate maps
- Find addresses and places
- Identify locations and features
- Query map layers
- Measure distance and area
- Find and share maps
- Data collection
What can the ArcGIS APIs do?

iOS, Windows Phone, Android

• **Maps**
  - Supports multiple map projections
  - Dynamic and cached (tiled) map services plus Bing and Open Street Map

• **Graphics**
  - Sketch graphics on map canvas
  - Create pop-ups

• **Tasks**
  - Query, Identify, Find GIS features
  - Collect GIS features
  - Locate/Geocode addresses
  - Geometry operations
  - Geoprocessing Tasks
How do I get an ArcGIS API?

- ArcGIS Resource Center
  - API download
  - Conceptual and reference help
  - Community resources
  - Samples

- API Download*
  - Libraries
  - Help System
  - IDE Integration

http://resources.arcgis.com/
How are they licensed?

- Free for Enterprise Deployments
- Free for Store Deployments*
- Cost with Esri if:
  - App generates revenue
  - App is in an store
  - Not licensed for server (commercial)

- Attribution is Required for all Apps!
  - Esri Attribution for ArcGIS Online map layers
  - Bing Attribution for Bing map layers
  - About Box Attribution
ArcGIS for iOS
ArcGIS Application

- ESRI’s first iOS application
- Universal Application:
  - iPad
  - iPhone
  - iPod Touch
- Works with maps:
  - ArcGIS Online
  - On Premise Content Server

Available on the App Store
ArcGIS Application – How is it doing?

- **31,528** downloads after 1 week (Mon July 5th – Sun Jul 11th)
  - #1 Free Productivity App
  - #12 Featured New App
- Over 150,000 downloads
- Supported in 6 languages
  - English
  - French
  - German
  - Spanish
  - Japanese
  - Simplified Chinese

Downloads in over 79 countries!
City of Amherst, MA

Using a ready-to-deploy application

- ArcGIS online group devoted to sharing various maps to city employees:
  - Open Work Orders
  - Water Distribution Network
- Public
  - Trails and Land Conservation
ArcGIS API for iOS

- Native objective C API targeting iPhone developers
- Build focused mapping applications
- Embed GIS into an existing applications

Available from ArcGIS for iOS Resource Center
iOS Application Deployment

- App Store deployment or Internal Enterprise Deployment
- Application management via Apple Developer Portal or iTunes Connect

Data

Corporate Server
ArcGIS Online

Applications

External
ArcGIS Online
App Store

Internal
iTunes via Enterprise
ArcGIS API Developer Experience

- Download, Develop, Submit, Deploy, Manage

Download ArcGIS API for iOS

Develop iOS Application

Submit App Store/iTunes

Deploy App Store/iTunes Manage
Windows Phone
ArcGIS for Windows Phone

- **Application**
  - 1.1 Released
  - Available from the Zune Marketplace
  - iOS 1.5 compliant in functionality
  - Available in Zune Marketplace
ArcGIS API for Windows Phone

• Silverlight Development using VS 2010
  • Download Windows Phone Developer Tools, ArcGIS API
  • Develop Applications using Silverlight API for Windows Phone
  • Publish your .XAP to App Hub for approval
  • Customers download App from Zune Marketplace

• ArcGIS for Windows Phone Resource Center
  - Download Bits
  - Concepts and reference doc
  - Forums, blog, code gallery
  - Interactive SDK
Android
ArcGIS for Android

• **Application**
  - Currently In development
  - V1 functionality equivalent with iOS app V1.5
  - Built on the API
  - Will be available from Esri Resource Center
  - Considering various Android Marketplaces
    - Google Marketplace
    - *Amazon Marketplace
    - International Marketplaces
ArcGIS API for Android

- Java development using Eclipse 3.5 or higher
  - Download Eclipse
  - Install ArcGIS API via Eclipse plug-in
  - Develop Application
  - Determine deployment strategy
    - Marketplace
    - Enterprise Distribution

- ArcGIS for Android Resource Center
  - Download Bits
  - Concepts and reference doc
  - Forums, blog, code gallery

Requires Android 2.1 API 7 and higher
Market Opportunities

Focused Solutions for Vertical Markets

- E311/Service Request
- Campus Routing
- Where To/Entertainment
- Parcel Valuation

Images: City Sourced app interface, maps, and navigation tools.
Road Map
ArcPad 10.1

- Improved Customization Experience
- Support for Annotation
- Direct Support for AXF in ArcGIS
- Improved Symbology
- StreetMap update
- Windows Embedded Compact 7 Support
ArcGIS Mobile 10.1

- **Data Model Support**
  - Support tables, attachments

- **Data Collection and Editing**
  - Simplified Data Collection Experience
  - Editing of Existing Feature Geometry
  - Related feature data collection
  - Improved GPS Collection (GNSS/RTK support)

- **Map Display**
  - Waypoint Navigation
  - GPS Improvements (Heads-up display, Configuration)
  - Coordinate display (MGRS, DMS, ...)

- **Publishing and Deployment**
  - Map Analyzer and Publishing support (MSD)
  - Project Center improvements
    - Improved Ux
    - Packaging projects and cache
    - Basemap Catalog
  - Improvements to support desktop workflows
  - Improved ArcGIS Online/Portal integration
Smartphone and Slate Release Schedule

ArcGIS Smartphone Apps

<table>
<thead>
<tr>
<th>July</th>
<th>Oct</th>
<th>Jan</th>
<th>April</th>
<th>July</th>
<th>Oct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viewer</td>
<td>Editing</td>
<td>Localization</td>
<td>Pop-ups</td>
<td>Routing</td>
<td>Offline</td>
</tr>
</tbody>
</table>

iOS

- 1.0
- 1.5
- 1.8
- 2.0
- 2.1
- 3.0

WP7

- 1.0
- 1.1
- 2.0
- 3.0

Android

- 1.0
- 2.0
- 3.0
# Smartphone and Slate Release Schedule

## ArcGIS Smartphone APIs

<table>
<thead>
<tr>
<th>July</th>
<th>Oct</th>
<th>Jan</th>
<th>April</th>
<th>July</th>
<th>Oct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Editing</td>
<td>Sketch</td>
<td>Pop-ups</td>
<td>Offline</td>
<td>Editing</td>
<td>Pop-ups</td>
</tr>
</tbody>
</table>

### iOS

- **1.0** (July)
- **1.8** (October)
- **1.8*** (January)
- **2.0** (April)
- **3.0*** (July)
- **3.0** (October)

### WP7

- **2.1** (July)
- **2.2*** (October)
- **2.2** (January)
- **3.0*** (April)
- **3.0** (July)

### Android

- **1.0*** (July)
- **1.0** (October)
- **2.0** (January)
- **3.0** (April)

*Indicates a major update or release.
ArcGIS for Smartphones

**APIs have Incremental Updates to support apps**

- Pop-ups
- Improved Ux
- Bookmarks
- Switch Base Maps
- Legend
- iPad Ux Improvements
- Flat Earth
- ArcGIS Portal
- Sharing
- V.Next
  - Routing
  - Offline Use
  - Time Analysis
  - Tracking/Geo- Collaborate
  - More…
Mobile Presentations

Tuesday
- Introduction To ArcGIS for iOS (1:00pm – 2:15pm) Now 😐
- Choosing a Mobile Deployment Platform (2:45 – 4:00pm)
- Introduction to ArcGIS API for Android (4:30 – 5:45pm)

Wednesday
- Developing Applications with the ArcGIS Mobile API (10:30 – 11:45am)
- Advanced Development with the ArcGIS API for Android (8:30am – 9:45am)

Thursday
- Advanced Development with the ArcGIS API for iOS (8:30am – 9:45am)
- Advanced Development with the ArcGIS API for WinPhone (10:15am – 11:30am)
- Deploying ArcGIS Mobile Across the Enterprise (10:15am – 11:30am)
- Advanced Development with the ArcGIS API for Android (1:30pm – 2:45pm)
- Advanced Development with the ArcGIS API for iOS (1:30pm – 2:45pm)

Don’t forget about the Mobile GIS Island and Demo Theatres!!
Thank You