Mobile Technology
Current Status and the Road Ahead

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• From paper maps in the field
• To early mapping tools
• To smart, task-oriented solutions
• To mobility as a part of an enterprise
Introduction – 1001 uses

- Spatial data continues to make inroads in the field
- Mobile technology shortens the time of data entry to corporate databases
- Reduces cost of paper work and data collection
- Minimizes manual data entry errors
- Highly dependent on ROI
- Form factor remains one of the largest constraints
- Not all devices are suitable for field use
- ESRI offers a range of products suitable in a variety of mobile scenarios
Taking GIS Everywhere

- Utility system attribute updates
- Fire Hydrant Inspection
- Flow Test program
- Mapping storm drain and sign infrastructure
- Sensitive environment access path delineation
- Pipeline location and attributes
- Street Light Inventory
- Valve survey
- Oil and gas development and planning
- Call before you dig
- Field verification
- Pole attachment inspections
The Position of Mobility – Platform view

- Focused / Mobile
- Generic / Desktop

Feature set / Capability

Complexity / Price
• Simple workflow driven scenarios with no or minimal map interaction
• Basic data collection and editing
• Limited map interaction
• Redlining

• Complex workflows
• Advanced field data collection and editing
• Geometry editing
• Interactive maps
• ‘Mobilized desktops’
Top Mobile GIS Tasks

1. View/Navigate
2. Identify
3. Find/Query
4. Modify Attribute Values
5. Mark/Redline
6. Modify Geometry
7. Integrate with office data
Traditional Workflow

- Define data dictionary (sometimes in the field)
- Capture data ad-hoc “in isolation”
- Send data to GIS department
- GIS department uses (custom) tools to validate data

- Send data to GIS department (again) to validate and integrate
Enterprise GIS Workflow

- Design and create geodatabase
- Extract data
  - Schema or data to be edited
  - Reference data
- Capture data
  - Attribute rules validated
  - Spatial rules implicitly validated with use of reference data

Send data to GIS dept.
GIS dept. checks in and validates data using standard tools
What is currently available?

• ArcWeb Services
• ArcReader
• ArcEngine/ArcGIS
• ArcPad
ArcWeb Services

• Lightweight
• Up to date data
• Low maintenance
• No local data
• No editing/relining capabilities
• Lack of vector data

Mobility Rating: ★★★
ArcWeb Services

• Most server-centric approach
• Good framework for users planning to adopt Location Based Services
• Easy to deploy
• Standards based - can be integrated in other mobile solutions
• Requires always-on connectivity
• Benefits from fast, reliable networks

Mobility Rating: ★★★
ArcReader

- Maps created with ArcGIS Publisher Extension
- Offers option of compressed and secured data
- Easy to share among large user base at a low cost
- ArcEngine based
  - Provides a good foundation for deployment of custom, focused ArcEngine-based solutions
- Custom Reader application via control available with Publisher extension

Mobility Rating: ⭐⭐⭐
ArcReader

• Good to quickly deploy maps for field viewing, but

• Not really a all-around mobile solution
  – Large footprint
  – Not workflow-centric
  – Static copy of the data
  – Cannot edit
  – Cannot collect new data
  – Limited queries
  – Data is linked to but not contained in the solution

Mobility Rating: ★★★
ArcGIS/TabletPC

• Full ArcGIS experience
• Advanced customizations
• Consistent desktop and mobile user experience
• Easily integrated with existing office architecture
• Considerable footprint and hardware requirements
• Large scale deployment challenges
• Tablet PCs offer stylus support improving device interaction

Mobility Rating: ⭐⭐⭐⭐
ArcEngine

- Access to all core ArcObjects
- Flexibility to build focused applications
  - Stand-alone applications
  - Non visual applications
  - Embedded applications
- “ArcView without the applications”
- A selection of developer controls

Mobility Rating: ★★★★☆☆
ArcEngine

- Read all supported ESRI data formats including the Geodatabase
- Map Authoring (create & edit MXD)
- ArcGIS level Cartography
- Query and Analysis
- Geocoding
- Simple Editing (shp & pGDB)
ArcPad

- Generic data viewing and editing application
- Small footprint
- Extensive customization capabilities
- Multiple platform support
- Proven technology
- Numerous code samples
- Large, experienced install base
- Many third party integrators
- Continuing support and development

Mobility Rating:
ArcPad 7.0 Enhancements

- Improved performance
- Enhanced editing tools
  - snapping
  - undo
  - offsets for points, lines, polygons
  - repeated features
  - segmented line features
- Laser range finder support
- Easier, automated GPS connectivity
- Integrated camera support

Mobility Rating: ⭐⭐⭐⭐⭐
ArcPad 7.0 Enhancements

- Improved symbology
  - map legend in TOC
  - symbol editor
  - stylesheets
    - Can be imported from ArcGIS
  - complex line symbols
    - hash
    - marker
    - pattern strings
    - end arrows
  - complex polygon symbols
    - marker, line, gradient, raster fill types

Mobility Rating: ★★★★★
ArcPad 7.0 Enhancements

• Improved labeling
  – placement options
  – label expressions e.g. [NAME] & vbCrLf & [YEAR]
  – label angle
  – “smart” labelling

• Support for Graphics layer
  – for redlining or mark-up
  – import/export tools for ArcGIS

• Automatic map rotation

Mobility Rating: ★★★★★
ArcPad 7.0 Enhancements

- Additional data formats
  - JPEG2000
  - TIFF (including GeoTIFF)
  - Coordinate system (.prj) and georeferencing (world file) information read from image header or AUX file if present
ArcPad 7.0 Enhancements

• Additional projections and transformations
  – NADCON datum transformation
  – Hotine Oblique Mercator Azimuth Natural Origin
  – Hotine Oblique Mercator Azimuth Center
  – Krovak (S-JTSK)

• Customization
  – wizard for creating custom forms
  – editing of related tables
    (via read/write subtable control)
  – auto-increment attributes

• Updated platform support
ArcPad 7.0 Platform Support

- Supported versions of Windows
  - Windows CE 4.2 (Windows Mobile 2003 for Pocket PC) and higher
  - Windows 2000, XP
- Supported Windows CE CPU chips
  - ARM (e.g. Samsung, StrongARM, XScale,)
Smart Clients

Looking into the future

Mobility Rating: ★★★★★
What are Smart Clients?

Smart clients provide the same rich interface as a thick client and also has the ability to manage content changes efficiently. Moreover, smart clients can provide these features while minimizing the resources such as disk space and memory-that it uses.
Smart client software combines the reach of the Internet with the power of local computing hardware

- Easily deployed over a network
- Applications can automatically update themselves to the latest version
- Users can work with data even when they are not connected to the Internet
- Solutions can be tailored to run on a range of devices
Smart Client vision for ESRI Mobile Technology

• **Developer SDK** to allow creation of focused lightweight solutions
• **ArcGIS Server-centric technology** that provides tight integration with geodatabase replication
• Direct server updates from the field
• Editable, field geodatabase approximation
• Variety of mobile devices
  – Pocket PCs and Laptops
  – .NET and Java
Your Smart Client applications

- Simple to use
- Focused
- Shallow learning curve
- Familiar user experience
- Easy to deploy
- Easy to manipulate
- Integrated
  - Workflow
  - Field & desktop
  - Data
- Support various connectivity modes
Always Connected Scenario

Feature Updates

Maps

Web Server
Disconnected Scenario

Feature Updates

Web Server

Maps
Occasionally connected scenario

Web Server

Feature Updates

Maps

Update Grams
Occasionally connected scenario
What are your Smart Client needs?
Thank you!
Questions?

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