GIS In Human Service Transportation Planning and Coordination

Mark Agee
Brian Smith
University of Virginia
Smart Travel Lab
Department of Civil Engineering.

Outline

- Project overview.
- Use of GIS.
  - Why use GIS?
  - Data collection and entry.
  - Data analysis.
  - Observations.
- Future directions
- Questions

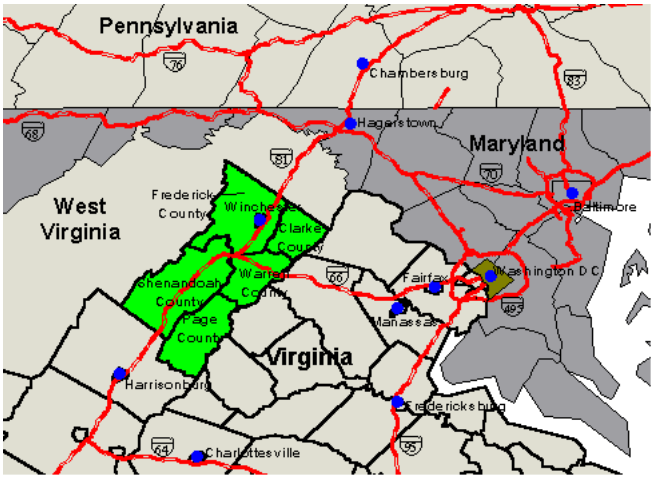
Northern Shenandoah Valley Public Mobility Project

- GIS as an evaluation tool.
- Effort to help people who are unable to provide their own transportation.
- Sponsored by VDOT and VDRPT.

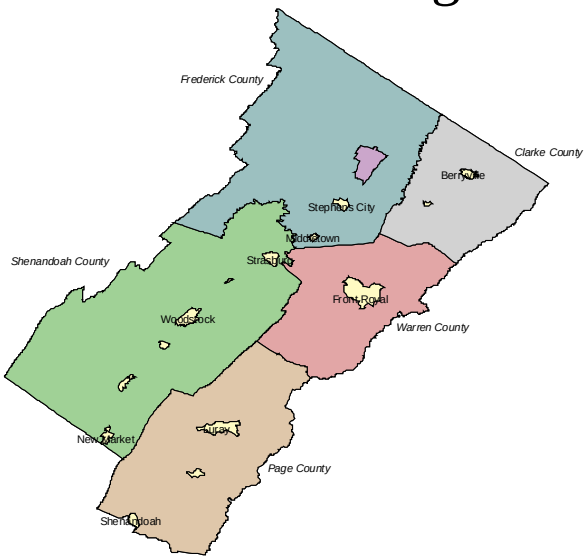
Organizations Involved

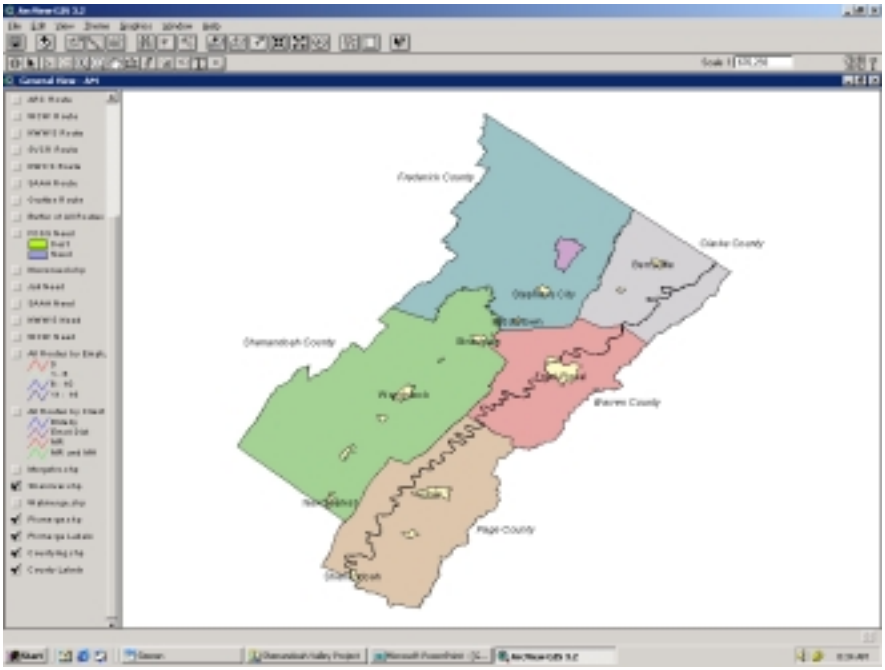
- Northwestern Community Services
- Northwestern Workshop
- Shenandoah Area Agency on Aging
- Shen-Paco Industries
- Shenandoah Valley Community Residence
- Frederick Dept. of Social Services
- Clark/Frederick/Winchester Jail
- Access Independence
- Wincester/Frederick Red Cross
- Winchester Public Transit

Lord Fairfax Planning District



Lord Fairfax Planning District





Project Vision

- To provide improved transportation service by coordinating efforts with the help of technology.
- Scheduling and dispatching software with enhanced networking capability.

Why use GIS?

- Data with spatial nature as well as associated attributes.
- Visualization of routes and service areas.
- Feasibility of coordination.

GIS Tools Used

- ArcView 3.2
- Network Analyst Extension
- TIGER data for base map and street net

Data Collection

- Location of each stop.
- Time stop made.
- Number of passenger picked up and dropped off.
- Vehicle capacity.

Agency: Vehicle #:

"Stop #" indicates the order in which the stops are made.
"Time" indicates the time that the vehicle reaches that location. Indicate range if exact not known.
"Action" indicates what takes place at that location:
- "Depart" for departing location with no passengers (beginning a route).
- "PU" for picking up passengers.
- "Drop" for dropping off passengers.
- "Return" for returning with no passengers (end of a route).

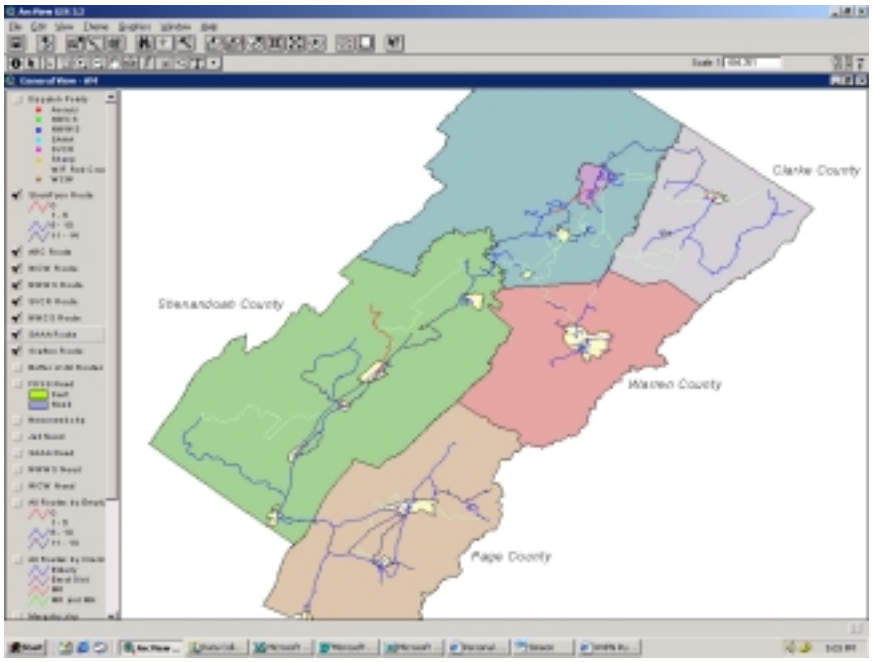
"Address," "City," "Zip" indicate the present location of the vehicle (where the action is performed.
"# PU/Drop" indicates the number of passengers either picked up or dropped off.

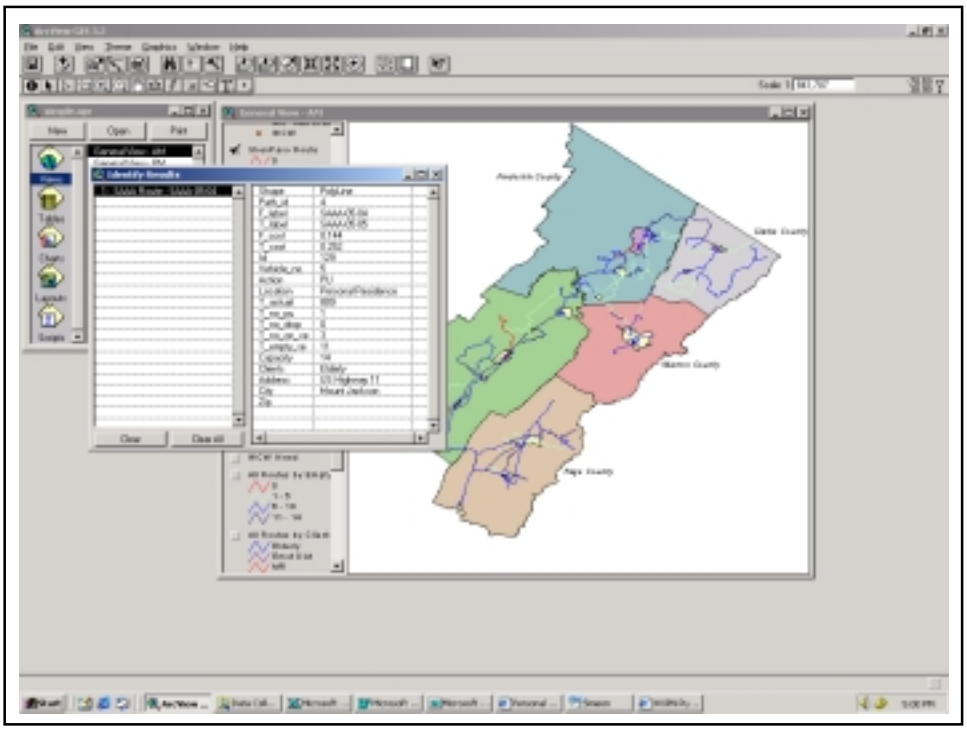
Day of week:						
Stop #	Time (am/pm)	Action	Address	City	Zip	# PU/Drop
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

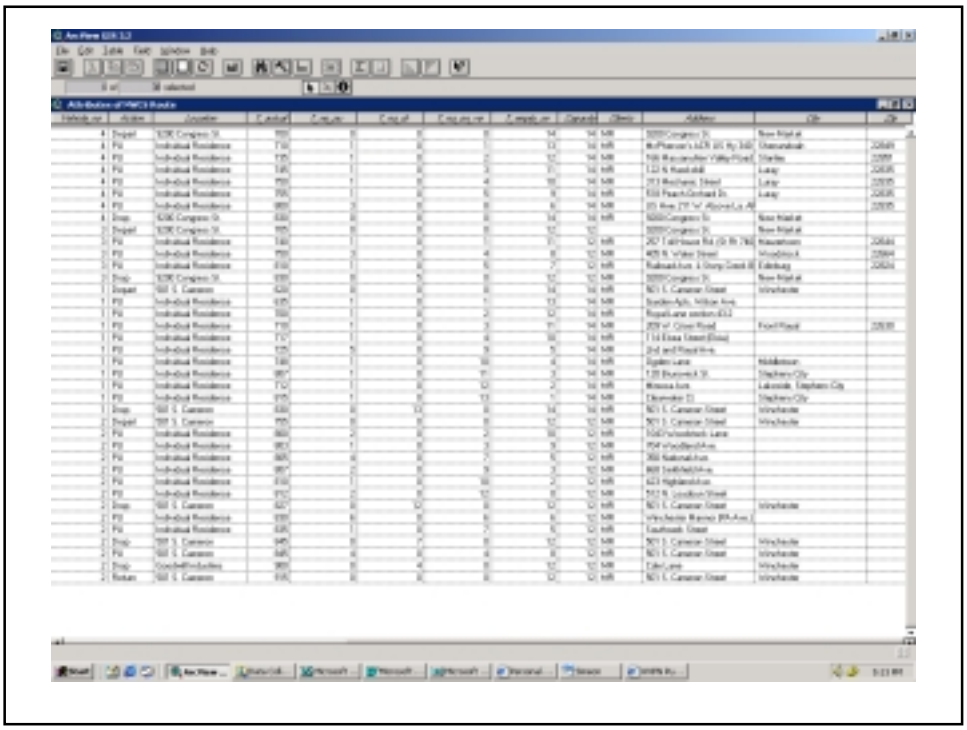
On the back, please note times when the vehicle is idle and whether the driver is available or unavailable during those times.
Also indicate if the vehicle is used sporadically during that idle time in its regular route.

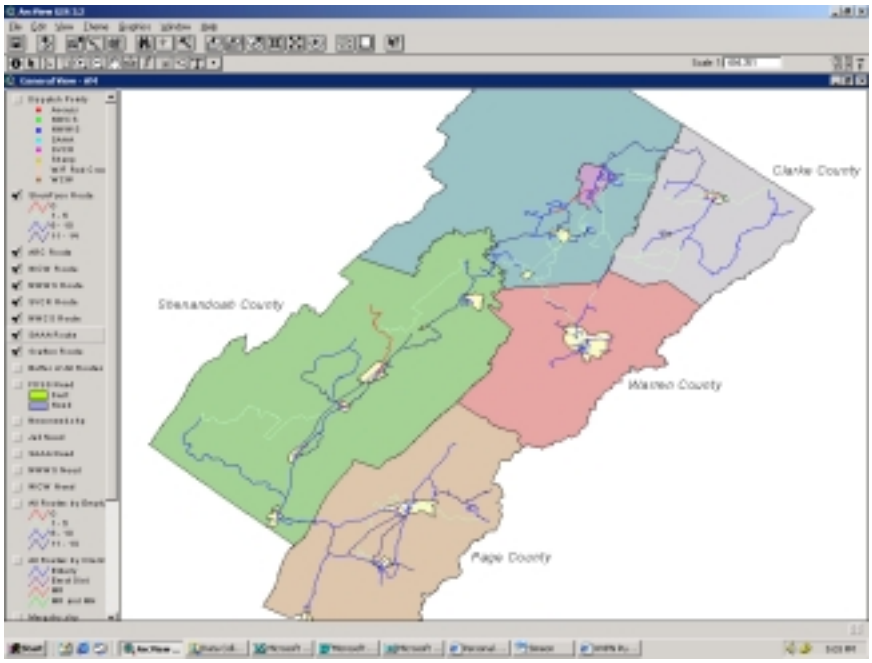
Data Entry

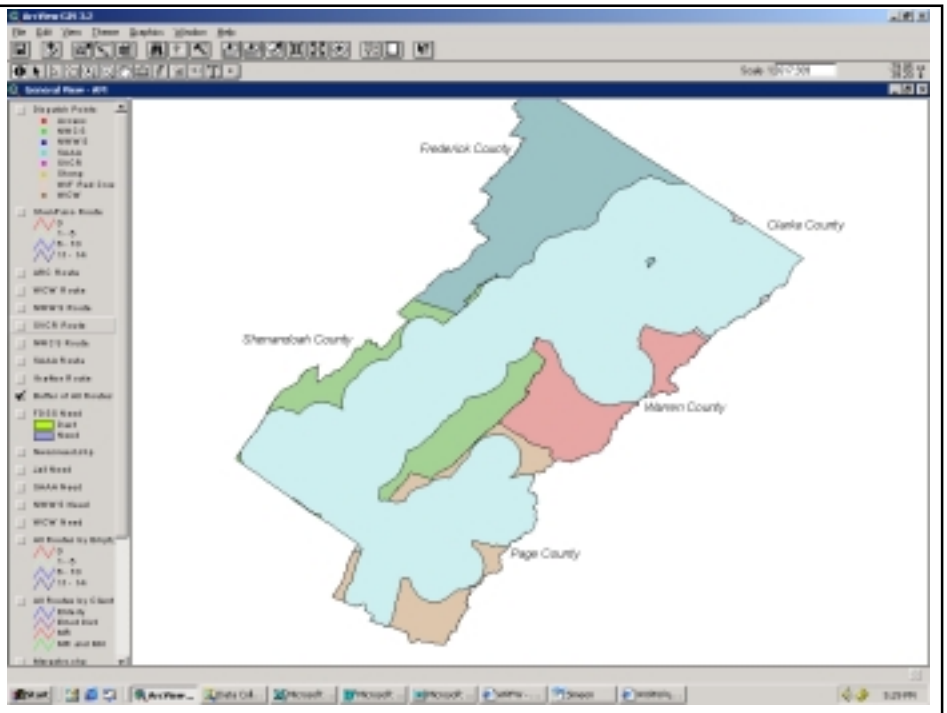
- Entered attribute data in Excel then saved as a .dbf file to open in Arcview.
- Geocoded stop locations.
- Network Analyst to produce reasonable routes.
- Joined stop table to Route Table generated by Network Analyst.

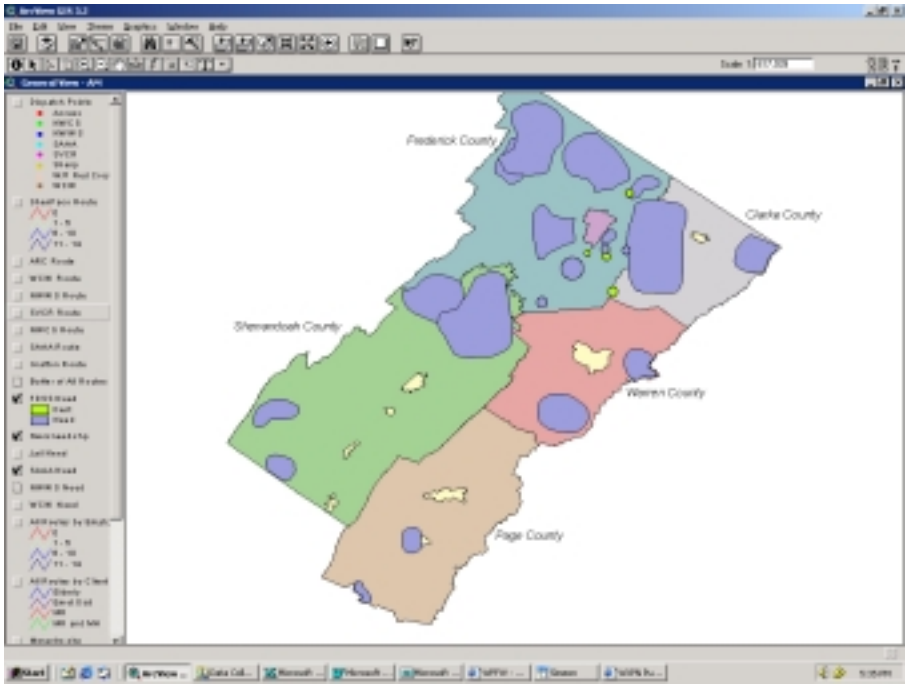


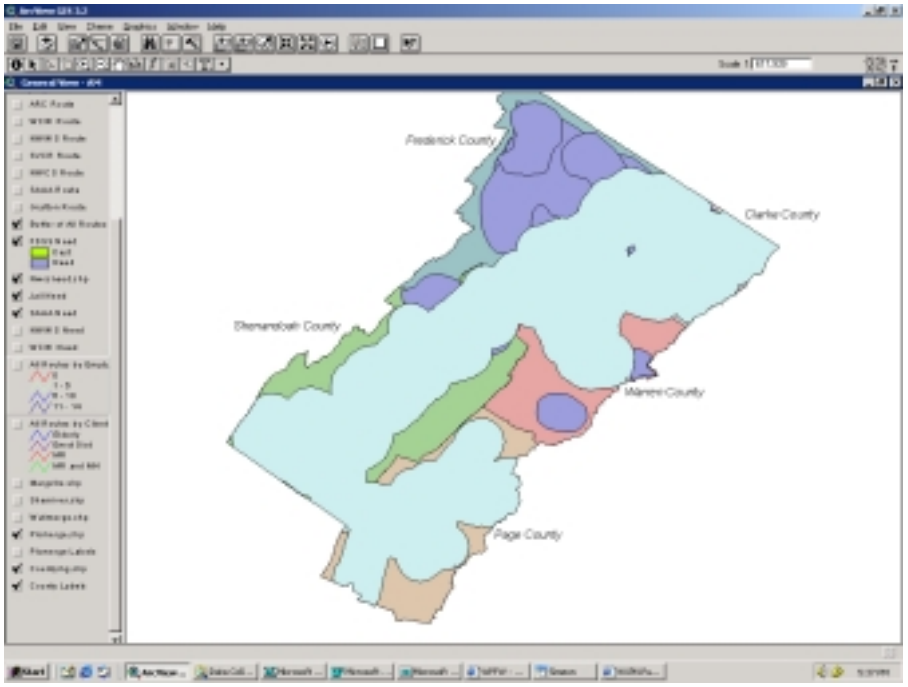





Clarke County
Shenandoah County
Warren County
Page County


Frederick County
Clarke County
Shenandoah County
Warren County
Page County


Frederick County
Clarke County
Shenandoah County
Warren County
Page County


Frederick County
Clarke County
Shenandoah County
Warren County
Page County

Difficulties

- Data collection
- Geocoding
- How do you deal with map features that change as a function of time?
  - Location of a vehicle along a route.
  - Direction of travel.

Results and Future Directions

- Scheduling and coordinating software purchase.
- To what extent will GIS be a part of the solution? Unclear.

Conclusions

- GIS was an excellent tool for this project.
- Difficulties
- Rural areas pose particular problems for people who cannot provide their own transportation because there is typically little public transportation.

Contact

Mark Agee

804-243-8595

dma4a@virginia.edu

Brian Smith

804-243-8406

briansmith@virginia.edu

web: smarttravellab.virginia.edu