Spatial Analysis in Veterans Cemetery Location

Southern Regional Science Association Meeting, Arlington, Virginia, March 27-30, 2008

WELDON COOPER
CENTER FOR PUBLIC SERVICE
University of Virginia

History

Timeline

- National Cemetery System started in 1862
- **1873.** Burial privileges extended to all honorably discharged Civil War veterans
- **1899.** Burial privileges extended to Spanish American war veterans in 1899
- **1948.** Burial privileges extended to spouses and dependent children
- **1978.** State Cemetery Grant program started.

Service Area Rules

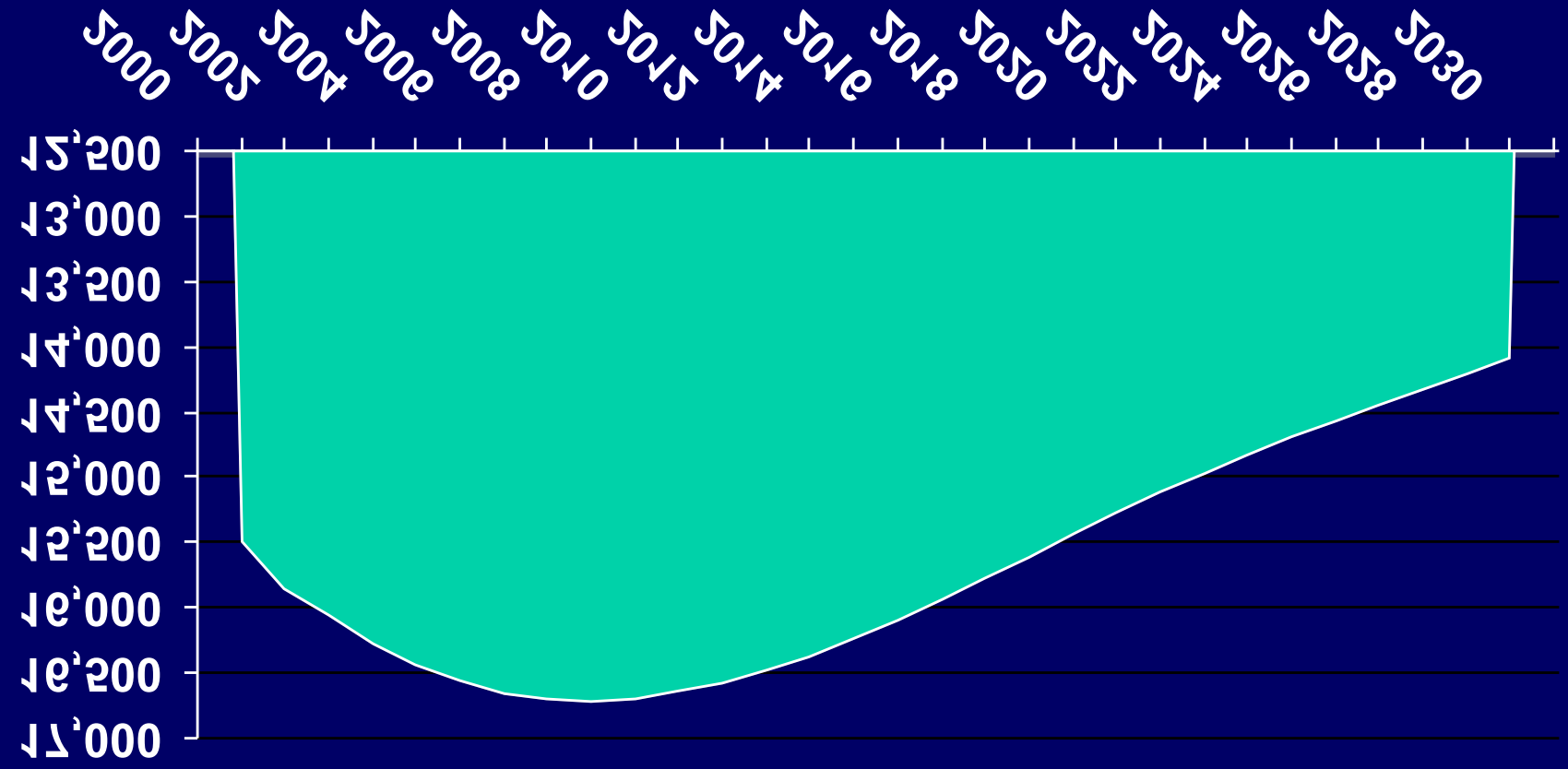
- 1940s. 250 mile service area
- Current rules:
  - National Cemetery rule. At least 170,000 veterans would live within 75 miles of a new cemetery.
  - The State Cemetery System used to provide access to veteran populations that fall below the 170,000 threshold for national cemetery eligibility.

Determinants of Burial Needs

Top Veteran States, 2000

State	Number of veterans
California	2,569,340
Texas	1,875,597
Florida	1,754,809
New York	1,361,164
Pennsylvania	1,280,788
Ohio	1,144,007
Illinois	1,003,572
Michigan	913,573
New Jersey	792,646
Virginia	***786,359***

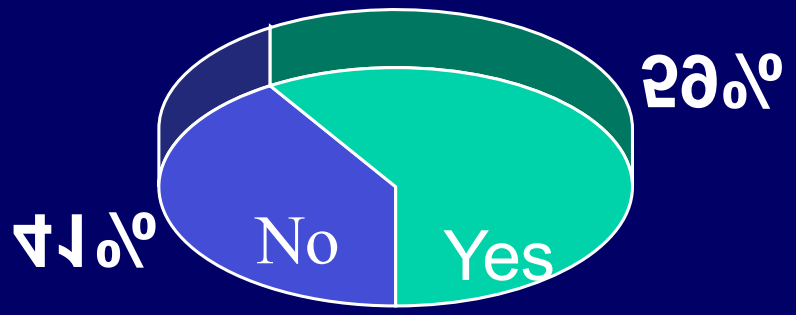
Veteran Projected Deaths



U.S. Department of Veterans Affairs, VetPop2004 (2007)

Awareness of Veteran Burial Benefits

- Two in five of veterans are unaware of their national and state burial benefits



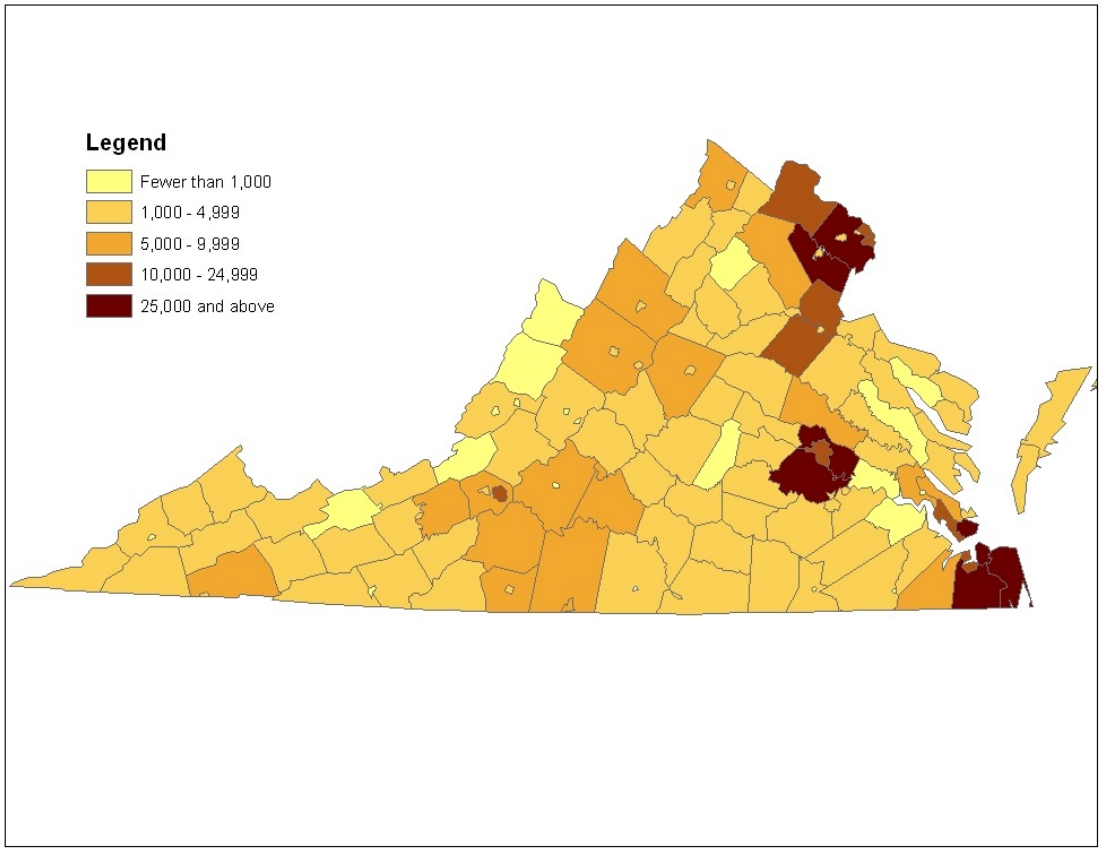
U.S. Department of Veterans Affairs, National Survey of Veterans (2001)

Reasons for not Choosing Veterans Cemetery

Reason	% of Respondents
Wanted location close to other family members	**44.6**
Made other arrangements	41.2
Didn't know eligibility criteria	8.6
Veterans' cemetery too far away	**6.6**
Didn't know how to make arrangements with VA	2.4
VA services don't accommodate religious preferences	0.7
Too difficult to make arrangements with VA	0.6
Wanted services that weren't available at Veterans' cemetery	0.3
Quality of service	0.2
Unable to make advance arrangements with VA	0.2
Some other reason	15.5

U.S. Department of Veterans Affairs, National Survey of Veterans (2001)

Veterans by County/City, 2000

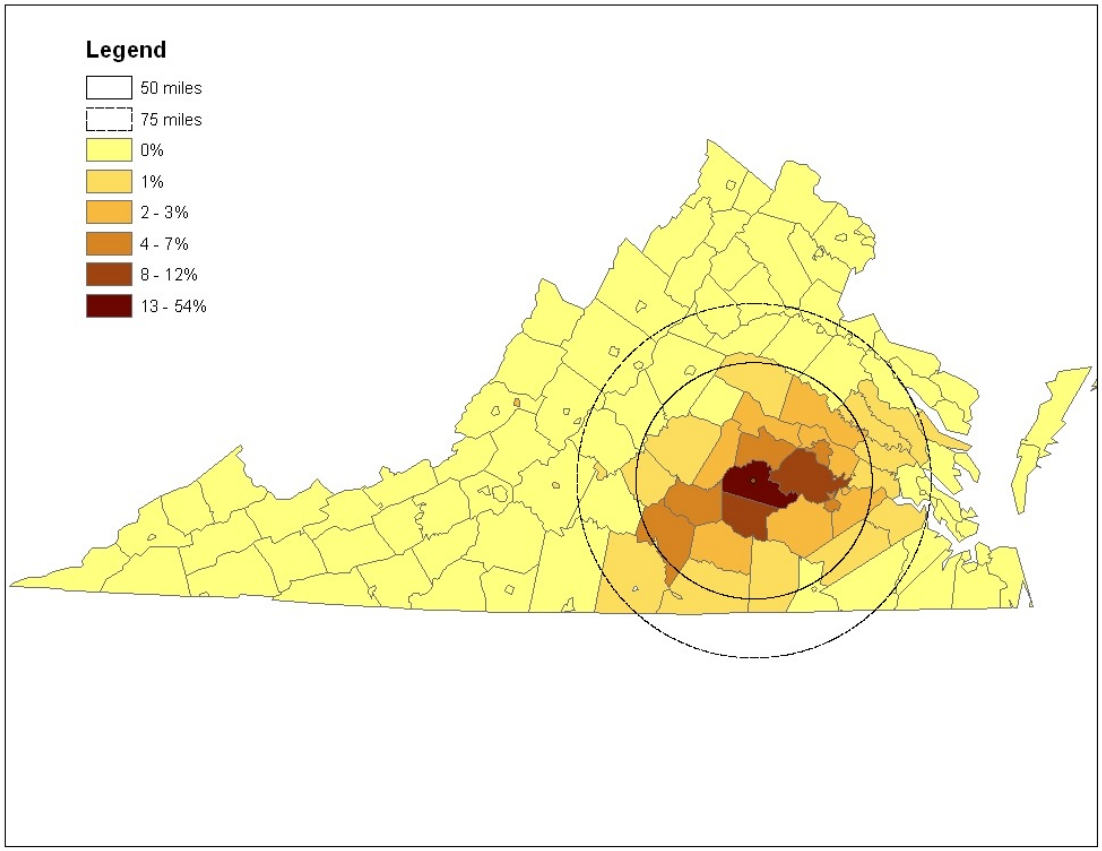


Source: U.S. Census Bureau

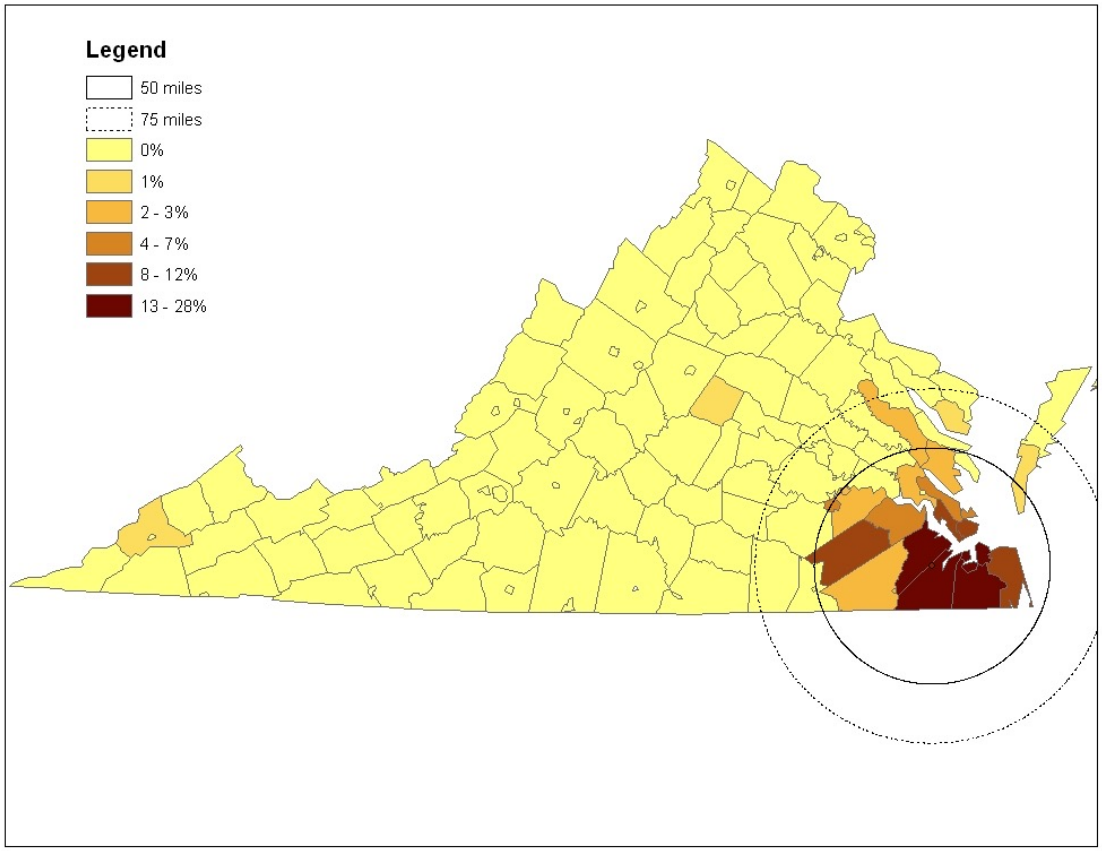
State Veterans Cemeteries

Cemetery	Location	Dedicated	Acreage	Total Interments
Albert G. Horton, Jr. Memorial	Suffolk	Nov. 2004	73	1,243
Virginia Veterans	Amelia	May 1997	129	1,603
Southwest Virginia	Dublin	--	80	--

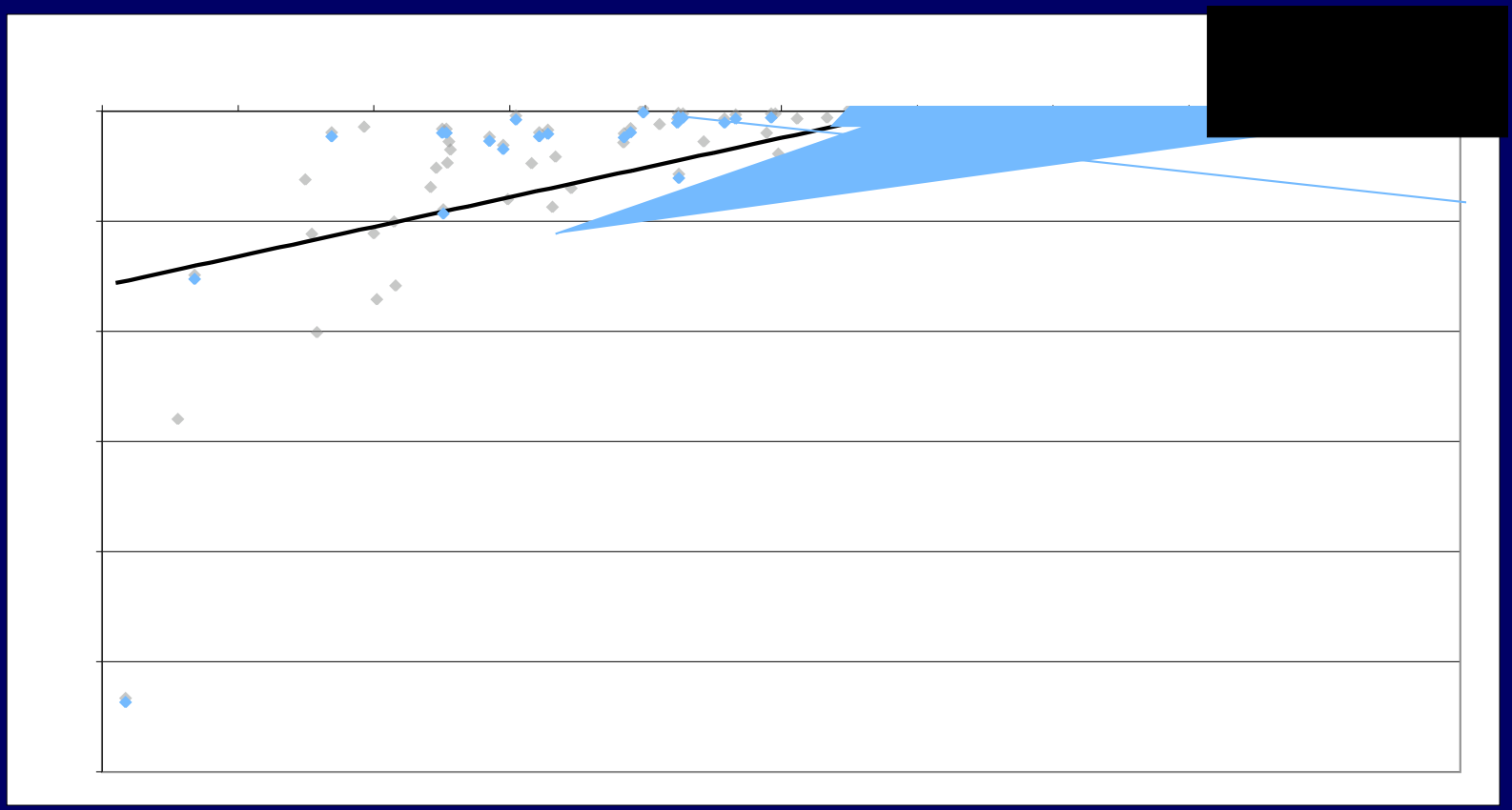
Virginia Veterans Cemetery



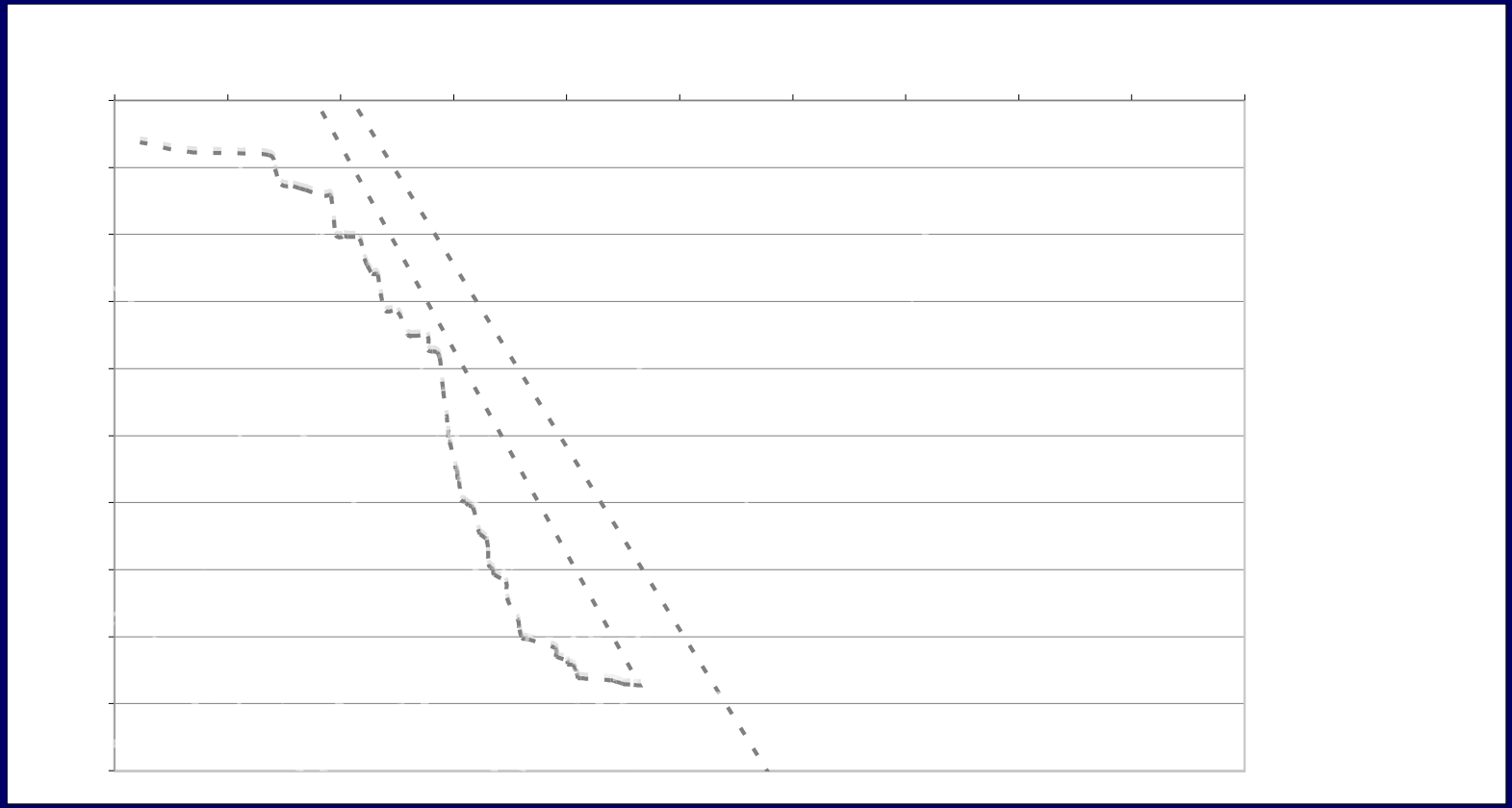
Albert G. Horton, Jr. Memorial Cemetery



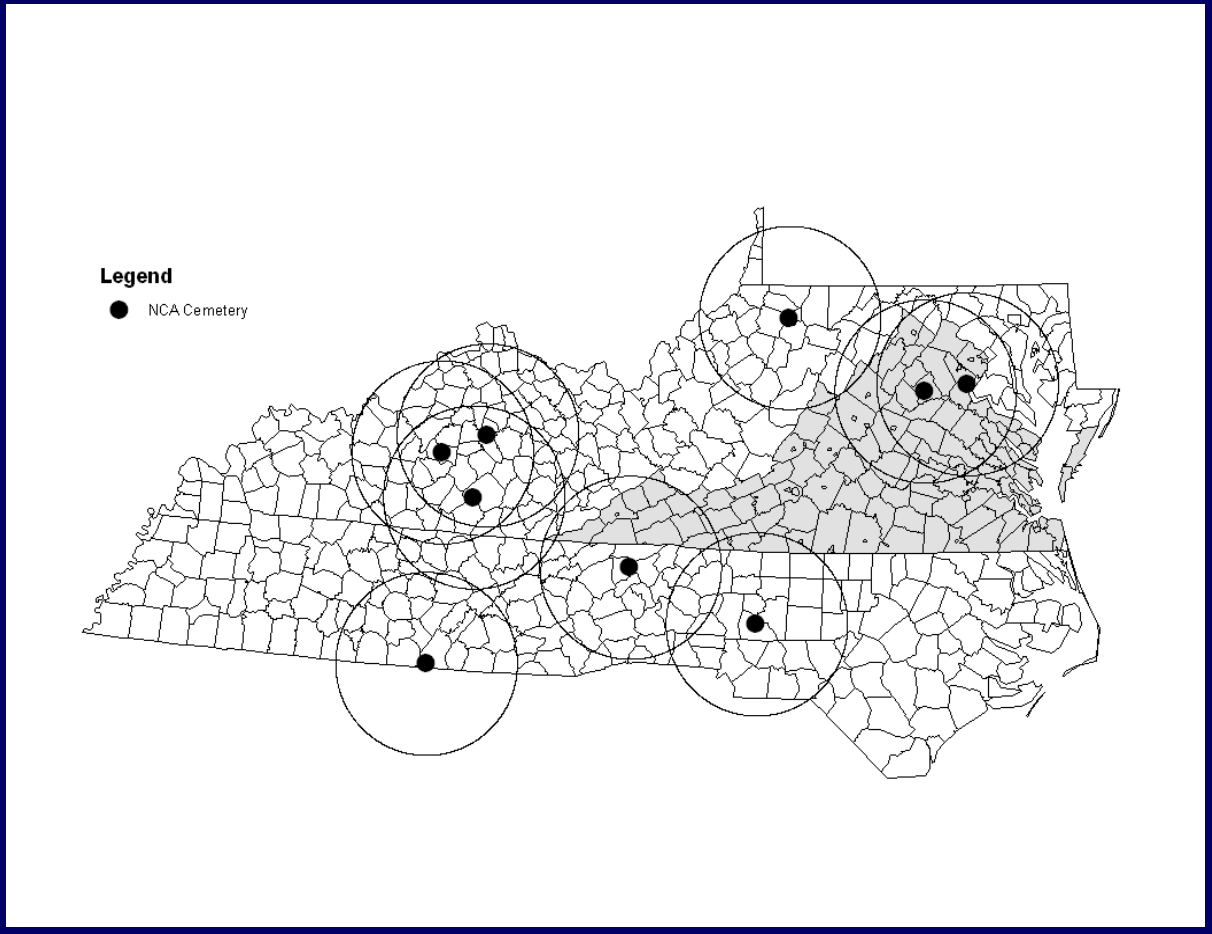
Burial Draw Rates by Distance



Straight-line versus Roadway Distance



Locations of National and State Veterans Cemeteries



National Cemeteries

Cemetery	FY 2006 Interments	Occupied Gravesites
Culpeper, VA	211	8,552
Quantico, VA	1,169	19,111
Salisbury, NC	501	20,219
Mountain Home, TN	361	11,423
West Virginia (Grafton), WV	223	2,791

Location Analysis

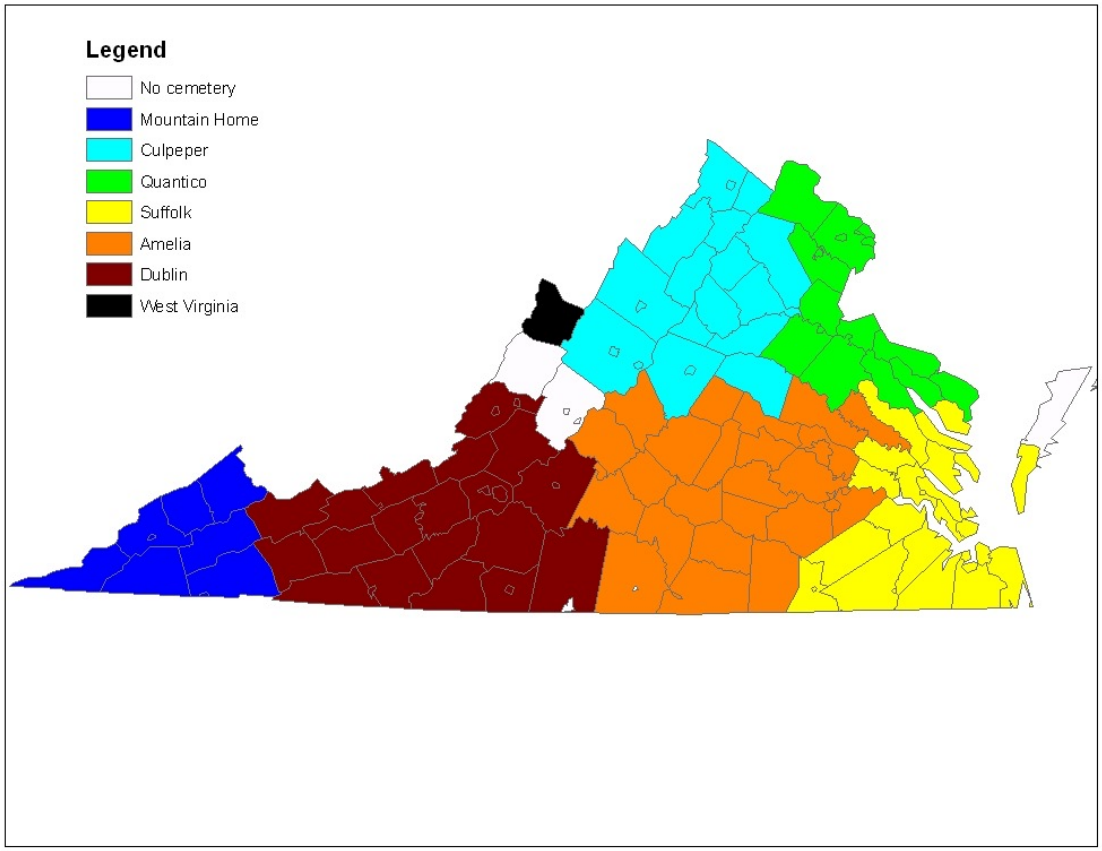
Location-Allocation Model

- Maximal coverage model used
  - Church and ReVelle 1974. The maximal covering location problem. *Regional Science Association Papers* 32,1: 101-118
- Maximal Covering algorithm in ESRI ARC/INFO Workstation
  - LOCATEALLOCATE COMMAND
    - MAXCOVER CRITERION

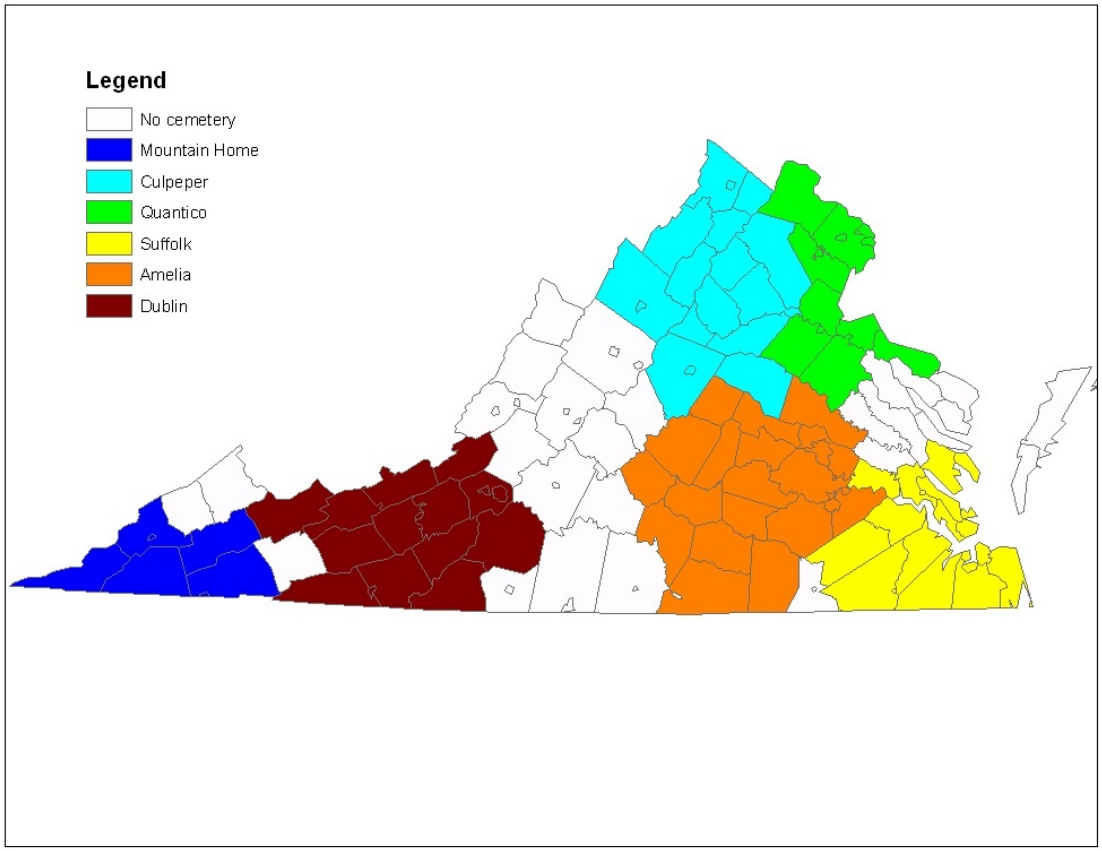
Assumptions

- Existing regional national cemeteries, two existing state cemeteries and proposed Dublin state cemetery assumed
- 75 mile versus 50 mile
- With and without Culpeper National Cemetery

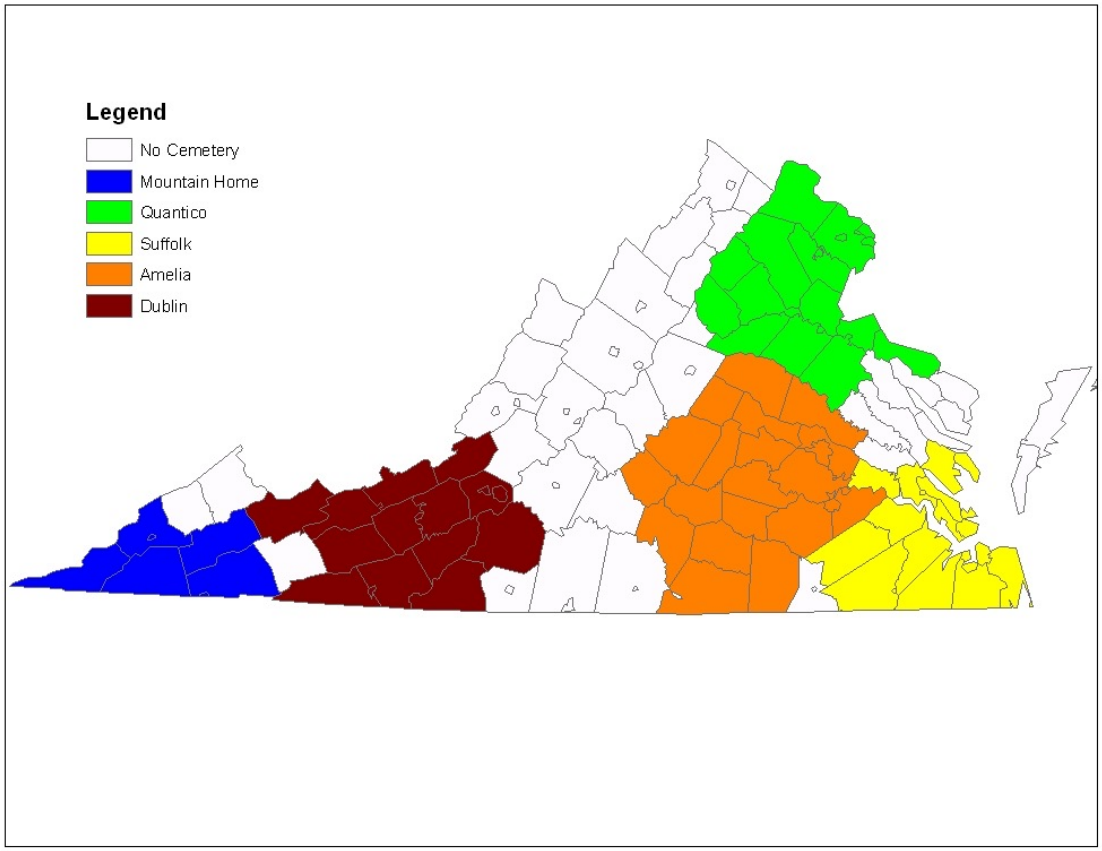
Current Coverage with 75 Mile Service Area



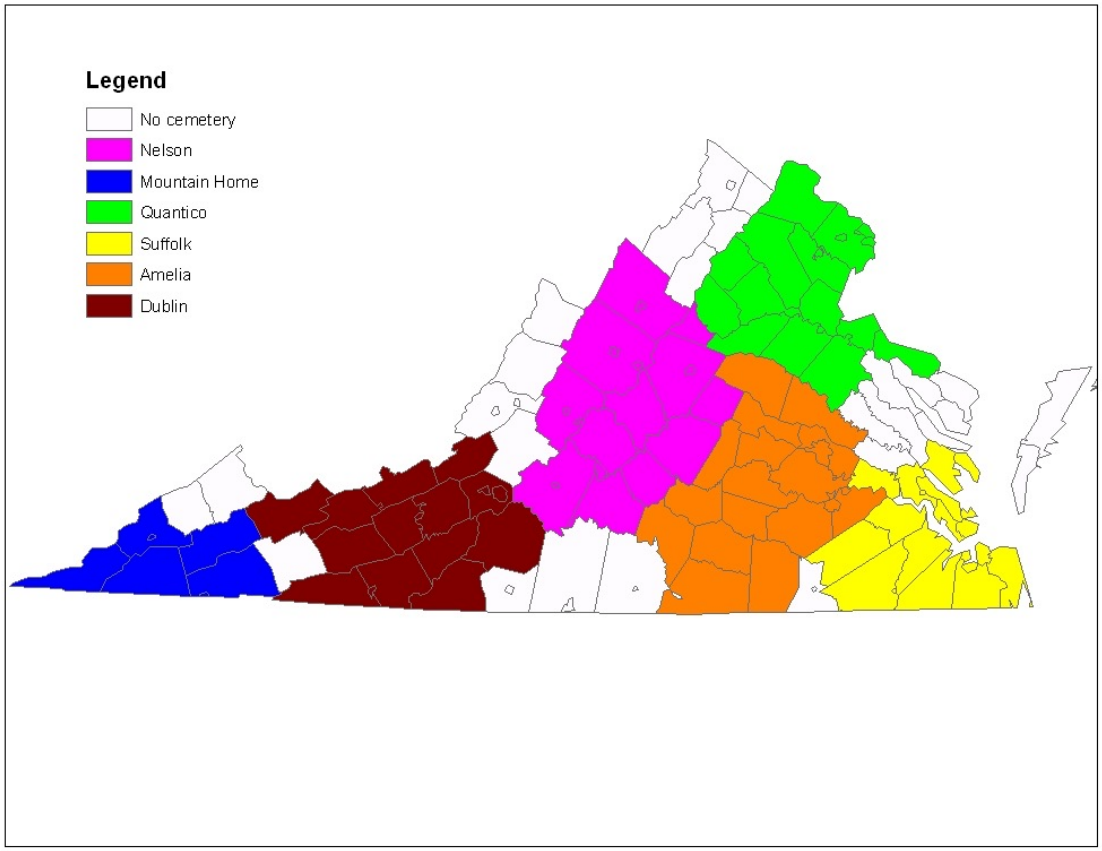
Current Coverage with 50 Mile Service Area



Current Coverage with 50 Mile Service Area without Culpeper



Current Coverage with 50 Mile Service Area without Culpeper and New Cemetery



Increment in Veterans Cemetery Service Area Population

- In FY 2008, 89% are within 75 miles of an existing cemetery. A Dublin cemetery would add 65,293 veterans (9%) bringing total served to 98%.
- In FY 2030, 90% of veterans would be within 50 miles of an existing cemetery if Culpeper National Cemetery were still available.
- In FY 2030, 85% of veterans would be within 50 miles of an existing cemetery if Culpeper National Cemetery were lost. A Nelson County cemetery would add 7% bringing the total served to 92%.

Summary and Conclusion

- 50 miles is a better estimate of a veterans cemetery service area boundary than 75 miles.
- Adding a fourth cemetery would provide better coverage to west central Virginia veterans and extend coverage for 50 mile boundary service area above 90% for the foreseeable future.