

**Portland's 2008 road deaths fewest since 1925
by Joseph Rose, The Oregonian
Thursday April 02, 2009**

- Portland saw just 20 traffic deaths in 2008, the lowest number since the city began recording fatalities in 1925, transportation officials said today.
- And what big-city mayor promising "safer city streets" wouldn't like those stats?
Mayor Sam Adams released a statement crediting a long list of his own transportation initiatives - from green bike boxes to helping neighborhoods get speed bumps -- for the good news.

But one has to wonder if his staff bothered briefing him on this simple fact about modern commuting: People are driving less -- and, thus, dying less -- almost everywhere in the U.S.

**Chakraborty, J. and Armstrong, M.P. (2001).
Assessing the impact of airborne toxic release on
populations with special needs. Professional
Geographer, 53(1):119-131.**

Background

- USEPA Risk Management Program: offsite consequences of accidental release of regulated substances need to be analyzed.
- Environmental justice movement: studies the disproportionate distribution of risk on people and places.

Objectives

- Assess the potential exposure of people with special needs to accidental release of hazardous chemicals.
- Target population groups: people with physical disabilities and health concerns
- Study area: Cedar Rapid metropolitan, Iowa

Methods Overview

Potential exposure model

- Spatial unit of vulnerable area
 - Administrative units
 - Circular buffer
 - Dispersion model output

Population model

- Spatial unit of population distribution
 - Census units
 - Individual locations

Overlay analysis

- Mismatch of spatial units – areal interpolation

Spatial pattern analysis

- Spatial randomization

Methods

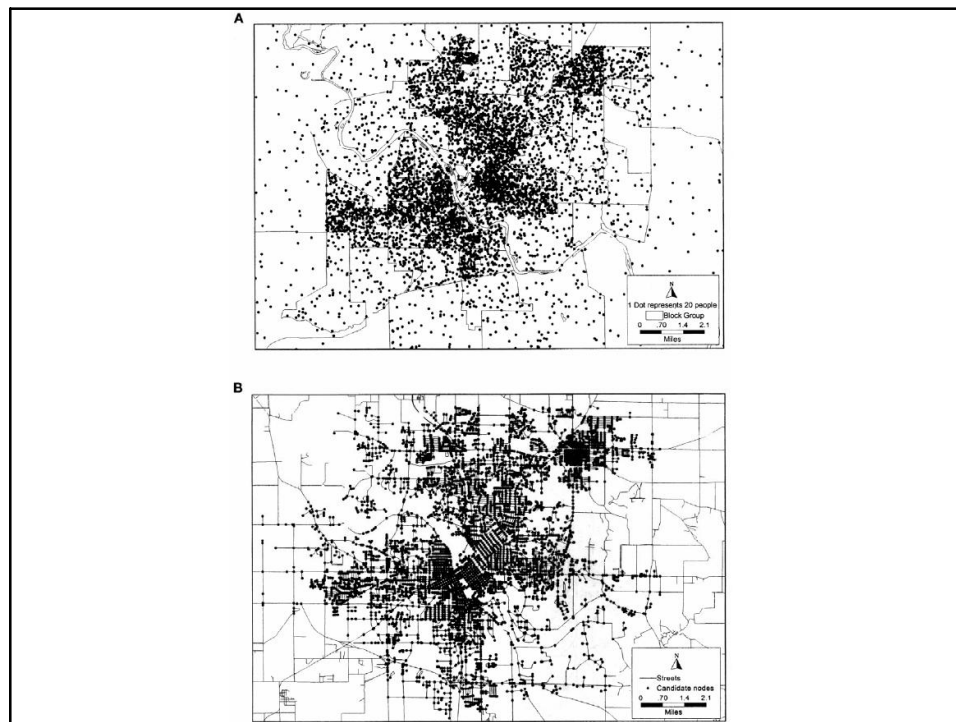
- Geocoding
 - EHS facilities
 - Self-identified individuals with special needs
- Geographic masking
 - Affine transformation
 - Random perturbation
 - Aggregation

Methods (cont.)

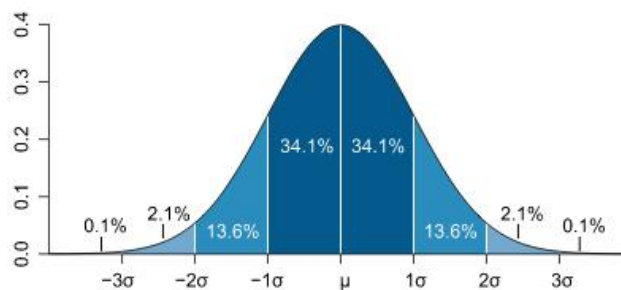
- Chemical Dispersion Model (ALOHA)
 - Worst-case release
 - Specified weather condition
 - Buffer distance (IDLH)
- Exposure risk analysis
 - Summarizing using point-in-polygon (554)
- Spatial distribution of SNP

Measurement of Disproportion

- Observed pattern
 - Locations of 903 individuals
- Candidate locations for neutral pattern
 - Based on street nodes (6260 points)
 - Node densities are strongly positively correlated to census block group population density
 - Randomly selected 1000 sets of 903 nodes
 - Summarizing using point-in-polygon



Normal Distribution



- PDF: Probability Distribution Function of a random variable.
- 68.2% within +/- one standard deviation of the mean
- 95.4% within +/- two StDev of the mean
- 99.6% within +/- three StDev of the mean

Results

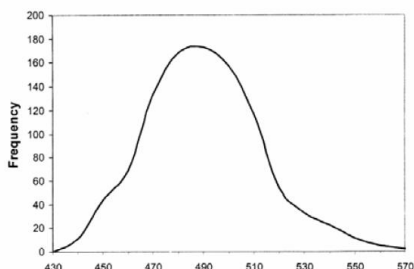


Table 2 Analysis of Disproportionate Impacts Based on 1,000 Randomly Simulated Location Patterns of the Special Needs Population.

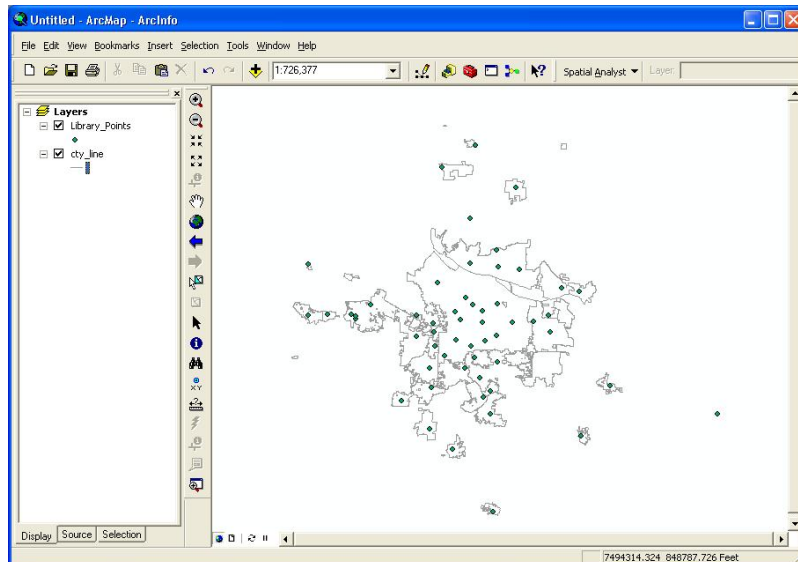
Number of Vulnerable Zones	Population at Risk* (P _{obs})	Population at Risk in Simulated Location Patterns (P _{exp})				
		Max	Min	Mean	Patterns with P _{exp} < P _{obs}	Significance Level
At least 1	554	567	436	493	996	99.6%
2 or more	341	368	259	311	982	98.2%
3 or more	257	284	182	228	971	97.1%
4 or more	140	161	89	120	963	96.3%

* Based on assignment to nearest TIGER/Line file node.

Comments/Critiques

- Historical weather data not used
- Buffer Distance (IDLH) not adjusted for people with physical conditions.
- Possibility vs. probability

Randomization



Attributes of Library_Points

Shape *	NAME	ADDRESS	CITY	STATE	ZIP	Rt
Point	Forest Grove City Library	2114 Pacific Ave	Forest Grove	OR	97116	
Point	Cornelius Public Library	1355 N Barlow St	Cornelius	OR	97113	
Point	Shute Park Library	775 SE 10th Ave	Hillsboro	OR	97123	
Point	West Slope Community Library	3678 SW 78th Ave	Portland	OR	97225	
Point	St. Johns Library	7510 N Charleston Ave	Portland	OR	97203	
Point	North Portland Library	512 N Killingsworth St	Portland	OR	97217	
Point	Sellwood-Moreland Library	7860 SE 13th Ave	Portland	OR	97202	
Point	Gregory Heights Library	7921 NE Sandy Blvd	Portland	OR	97213	
Point	Rockwood Library	17917 SE Stark St	Portland	OR	97233	
Point	Midland Library	805 SE 122nd Ave	Portland	OR	97233	
Point	Hollywood Library	4040 NE Tillamook St	Portland	OR	97212	
Point	Belmont Library	1038 SE 39th St	Portland	OR	97214	
Point	Washougal Community Library	1661 C St	Washougal	WA	98671	
Point	Vancouver Community Library	1007 E Mill Plain Blvd	Vancouver	WA	98663	
Point	Vancouver Mall Library	8700 NE Vancouver Mall D	Vancouver	WA	98662	
Point	Cascade Park Community Library	301 SE Heathwood Blvd	Vancouver	WA	98684	
Point	Central Library	801 SW 10th Ave	Portland	OR	97205	
Point	Hillsdale Library	1525 SW Sunset Blvd	Portland	OR	97239	0
Point	Woodstock Library	6008 SE 49th Ave	Portland	OR	97206	0
Point	Holgate Library	7905 SE Holgate	Portland	OR	97206	0

Record: 1 | Show: All | Selected | Records (0 out of 55 Selected) | Options

Field Calculator

Fields:

- FID
- NAME
- ADDRESS
- CITY
- STATE
- ZIP
- Rnd_No
- Selected

Type:

☒ Number
☐ String
☐ Date

Functions:

- Abs ()
- Atn ()
- Cos ()
- Exp ()
- Fix ()
- Int ()
- Log ()
- Sin ()
- Sqr ()

Pre-Logic VBA Script Code ☒ Advanced

random_number = rnd

Rnd_No =

random_number

☐ Calculate selected records only

Buttons: Load..., Save..., Help, OK, Cancel

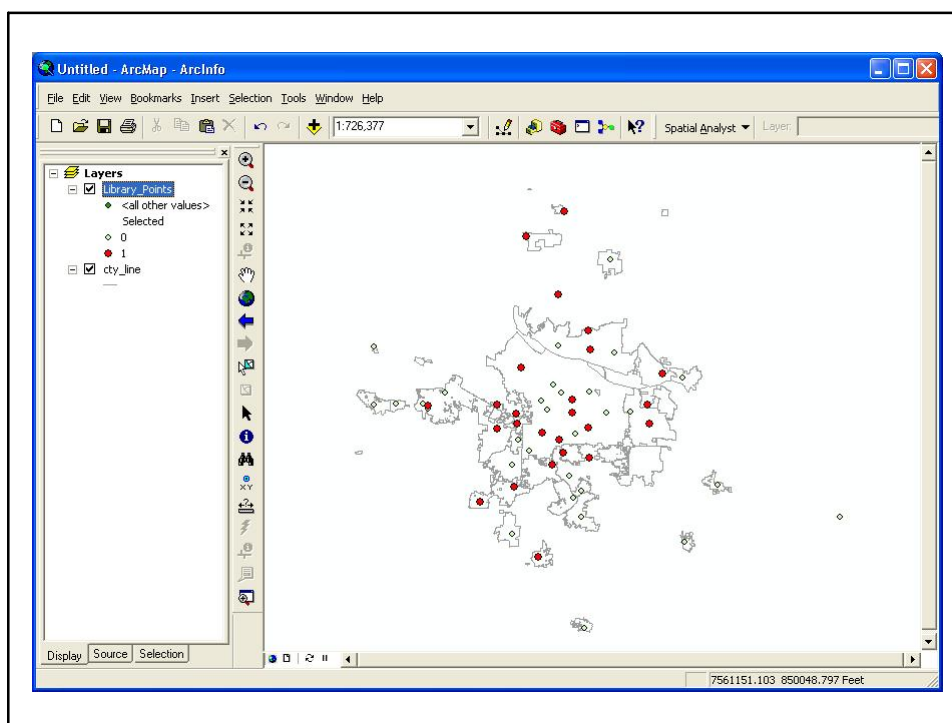
Attributes of Library_Points

Shape *	NAME	ADDRESS	CITY	STATE	ZIP	Rnd_No	Selected
Point	Forest Grove City Library	2114 Pacific Ave	Forest Grove	OR	97116	0.705548	0
Point	Cornelius Public Library	1355 N Barlow St	Cornelius	OR	97113	0.533424	0
Point	Shute Park Library	775 SE 10th Ave	Hillsboro	OR	97123	0.579519	0
Point	West Slope Community Library	3678 SW 78th Ave	Portland	OR	97225	0.289562	0
Point	St. Johns Library	7510 N Charleston Ave	Portland	OR	97203	0.301948	0
Point	North Portland Library	512 N Killingsworth St	Portland	OR	97217	0.77474	0
Point	Sellwood-Moreland Library	7860 SE 13th Ave	Portland	OR	97202	0.014018	0
Point	Gregory Heights Library	7921 NE Sandy Blvd	Portland	OR	97213	0.760724	0
Point	Rockwood Library	17917 SE Stark St	Portland	OR	97233	0.81449	0
Point	Midland Library	805 SE 122nd Ave	Portland	OR	97233	0.709038	0
Point	Hollywood Library	4040 NE Tillamook St	Portland	OR	97212	0.045353	0
Point	Belmont Library	1038 SE 39th St	Portland	OR	97214	0.414033	0
Point	Washougal Community Library	1661 C St	Washougal	WA	98671	0.862619	0
Point	Vancouver Community Library	1007 E Mill Plain Blvd	Vancouver	WA	98663	0.79048	0
Point	Vancouver Mall Library	8700 NE Vancouver Mall D	Vancouver	WA	98662	0.373536	0
Point	Cascade Park Community Library	301 SE Hearthwood Blvd	Vancouver	WA	98684	0.961953	0
Point	Central Library	801 SW 10th Ave	Portland	OR	97205	0.871446	0
Point	Hillsdale Library	1525 SW Sunset Blvd	Portland	OR	97239	0.056237	0
Point	Woodstock Library	6008 SE 49th Ave	Portland	OR	97206	0.949557	0
Point	Holgate Library	7905 SE Holgate	Portland	OR	97206	0.364019	0
Point	Gresham Regional Library	385 NW Miller Ave	Gresham	OR	97030	0.524868	0
Point	Garden Home Community Library	7475 SW Oleson Rd	Portland	OR	97223	0.767112	0
Point	Tualatin Public Library	18880 SW Martinazzi Ave	Tualatin	OR	97062	0.053505	0
Point	Capitol Hill Library	10723 SW Capitol Hwy	Portland	OR	97219	0.592458	0
Point	Ledding Library of Milwaukie	10660 SE 21st Ave	Milwaukie	OR	97222	0.4687	0
Point	Lake Oswego Public Library	706 4th St	Lake Oswego	OR	97034	0.298165	0
Point	Oak Lodge Library	16201 SE McLoughlin Blvd	Oak Grove	OR	97267	0.622697	0
Point	Wilsonville Public Library	8200 SW Wilsonville Rd	Wilsonville	OR	97070	0.647821	0

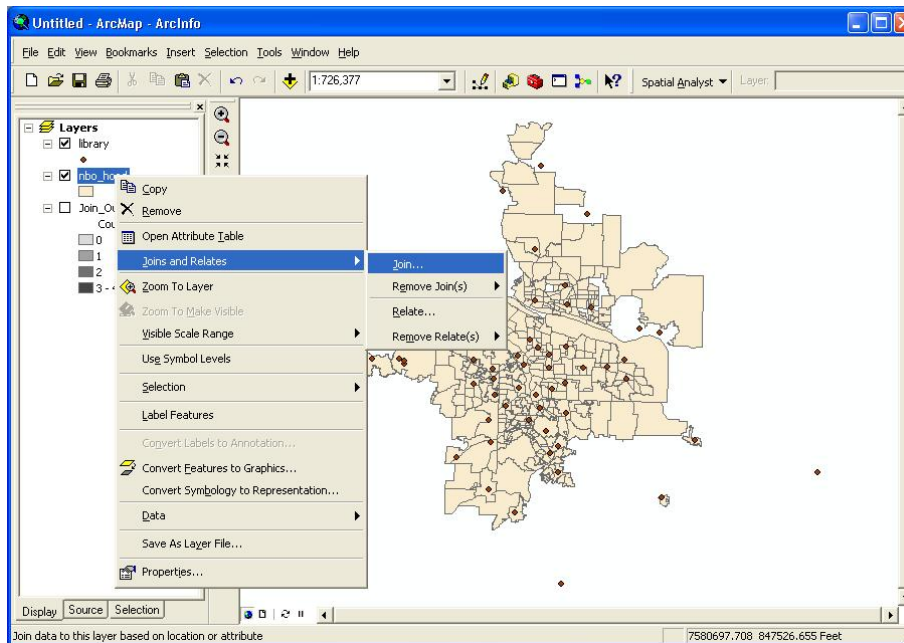
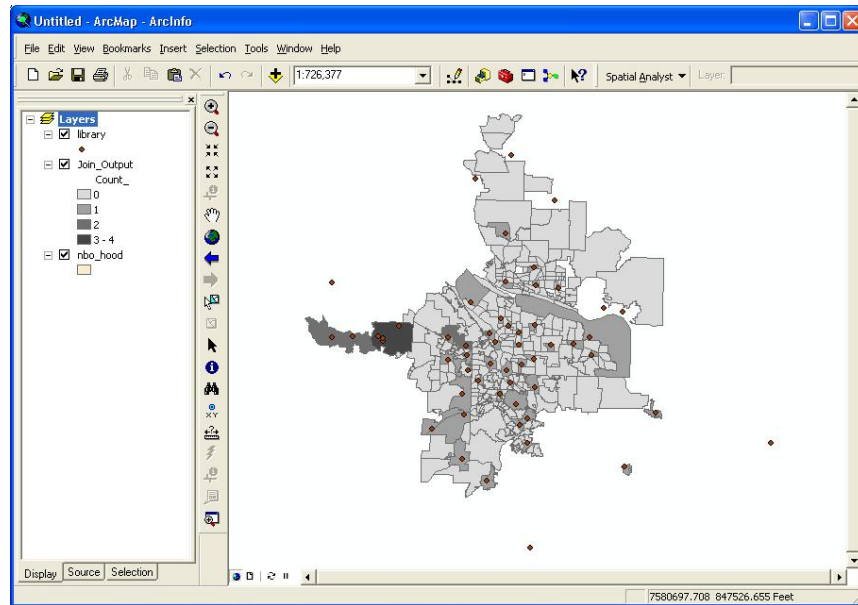
Record: 0 Show: All Selected Records (0 out of 55 Selected) Options

Attributes of Library_Points							
Shape *	NAME	ADDRESS	CITY	STATE	ZIP	Rnd_No	Selected
Point	Sellwood-Moreland Library	7860 SE 13th Ave	Portland	OR	97202	0.014018	1
Point	Cedar Mill Community Library	12505 NW Cornell Rd	Portland	OR	97229	0.015704	1
Point	Hollywood Library	4040 NE Tillamook St	Portland	OR	97212	0.045353	1
Point	Ridgefield Community Library	210 N Main Ave	Ridgefield	WA	98642	0.045649	1
Point	Tualatin Public Library	18880 SW Martinazzi Ave	Tualatin	OR	97062	0.053505	1
Point	Hillsdale Library	1525 SW Sunset Blvd	Portland	OR	97239	0.056237	1
Point	Tuality Health Resource Center	334 SE 8th Ave	Hillsboro	OR	97123	0.100052	1
Point	Oregon College of Art & Craft	8245 SW Barnes Rd	Portland	OR	97225	0.103023	1
Point	Beaverton City Library	12375 SW 5th	Beaverton	OR	97005	0.10637	1
Point	Sherwood Public Library	22560 SW Pine St	Sherwood	OR	97140	0.226866	1
Point	Fairview-Columbia Library	1520 NE Village St	Fairview	OR	97024	0.243931	1
Point	Canby Public Library	292 N Holly St	Canby	OR	97013	0.263793	1
Point	Clackamas Corner Branch	11750 SE 82nd Ave	Portland	OR	97266	0.279342	1
Point	La Center Community Library	1402 E Lockwood Creek R	La Center	WA	98629	0.28448	1
Point	West Slope Community Library	3678 SW 78th Ave	Portland	OR	97225	0.289562	1
Point	Three Creeks Community Library	800-C NE Tenney Rd	Vancouver	WA	98685	0.295773	1
Point	Lake Oswego Public Library	706 4th St	Lake Oswego	OR	97034	0.298165	1
Point	SW Washington Medical Center	400 NE Mother Joseph Pl	Vancouver	WA	98664	0.30097	1
Point	St. Johns Library	7510 N Charleston Ave	Portland	OR	97203	0.301948	1
Point	Holgate Library	7905 SE Holgate	Portland	OR	97206	0.364019	1
Point	Vancouver Mall Library	8700 NE Vancouver Mall D	Vancouver	WA	98662	0.373536	1
Point	Camas Public Library	625 NE 4th Ave	Camas	WA	98607	0.382011	1
Point	Belmont Library	1038 SE 39th St	Portland	OR	97214	0.414033	1
Point	Ledding Library of Milwaukie	10660 SE 21st Ave	Milwaukie	OR	97222	0.4687	1
Point	Gresham Regional Library	385 NW Miller Ave	Gresham	OR	97030	0.524868	1
Point	Cornelius Public Library	1355 N Barlow St	Cornelius	OR	97113	0.533424	0
Point	Northwest Library	2300 NW Thurman St	Portland	OR	97210	0.533873	0
Point	Tigard Public Library	13500 SW Hall Blvd	Tigard	OR	97223	0.575184	0

Record: 0 Show: All Selected Records (25 out of 55 Selected) Options



Count Points in Polygons



Join by Location

