



GPS Activities at SHA

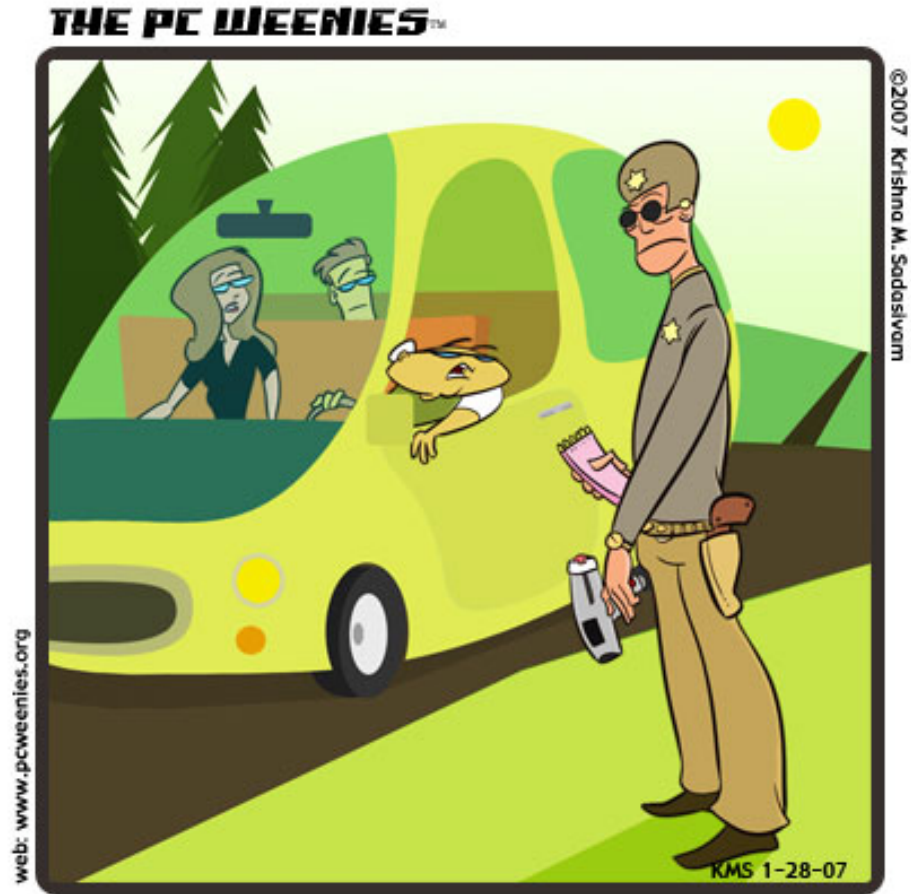
Joseph M. White

Maryland Department of Transportation

State Highway Administration

How did we get to where we are?

- Road Inventory
- Centerline/Routes
- Highway Mapping
- Asset Management



"LOOK, OFFICER. IF WE **WEREN'T** LOST, DO YOU THINK I'D BE ASKING YOU FOR DIRECTIONS TO THE NATIONAL GPS CONVENTION?"



Road Inventory History

- Inventory all publicly maintained roads in Maryland
- Maintain a database of the roadway characteristics
- Field verify County and Municipal yearly updates



State Re-Inventory Cycle

- Counties were re-inventoried every five years
- All state roads are re-inventoried
- HPMS samples are re-inventoried



Roadway Characteristics

- Roadway type and width
- Number of lanes
- Auxiliary lanes
- Shoulder type, width, curbs
- Sidewalks
- Medians

Roadway Characteristics

- **Intersecting Features**
 - Publicly maintained roads
 - Bridges
 - Roundabouts
 - Ramps
 - Cultural features (schools, shopping centers, firehouses, parks, etc.)
 - Traffic signals
 - Stop signs, speed limits, begin/end maintenance



Yearly Improvement Cycle

- Municipalities and counties send in yearly updates
- State improvements determined by the following
 - Access permits
 - Newspaper articles
 - Construction notices
 - Traffic signal notices
 - Mapping and other departments

Before Modern Technology

- Manual Inventory
- Lots of Paper



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Paper Inventory

- Straight Line Diagram
- Using DMI to get road length

COUNTY ALLEGANY ROAD NO. MD 135 PAGE 4 OF 10

SYSTEM		TRAFFIC		TRAFFIC		PAVEMENT DATA	
ROAD CLASS	TYPE	TRUCKS	TRUCKS	TRAFFIC	TRAFFIC	TRAFFIC	TRAFFIC
							See Next Page
						FY	X
							24' I
							2 ML
							X
							30' I
							3 C-C
							2 ML
							X
							55' I
							(ON TAPER TO 30' I)
							3 C-C
							2 ML
							X
							16' I RT
							10' I LT
							5 C-C
							2 ML
							X
							2-12' I
							7' I Int Med
							5 C-C out
							2 ML

RURAL MAJOR ARTERIAL STATE SECONDARY

RIVER RD
MU 0120
WESTERN PORT R. S.
RIVER RD
MU 0420
(1ST ST #2)
MUN 9012
CH 1 90
SIGN: RXR 1 06
RXR PAVE 1 93
1 91
1 89
MD 937
1 88
1 87
1 86 (RXR)
30°

What is Global Positioning?

- Satellites
- Base Stations
- GPS Receivers

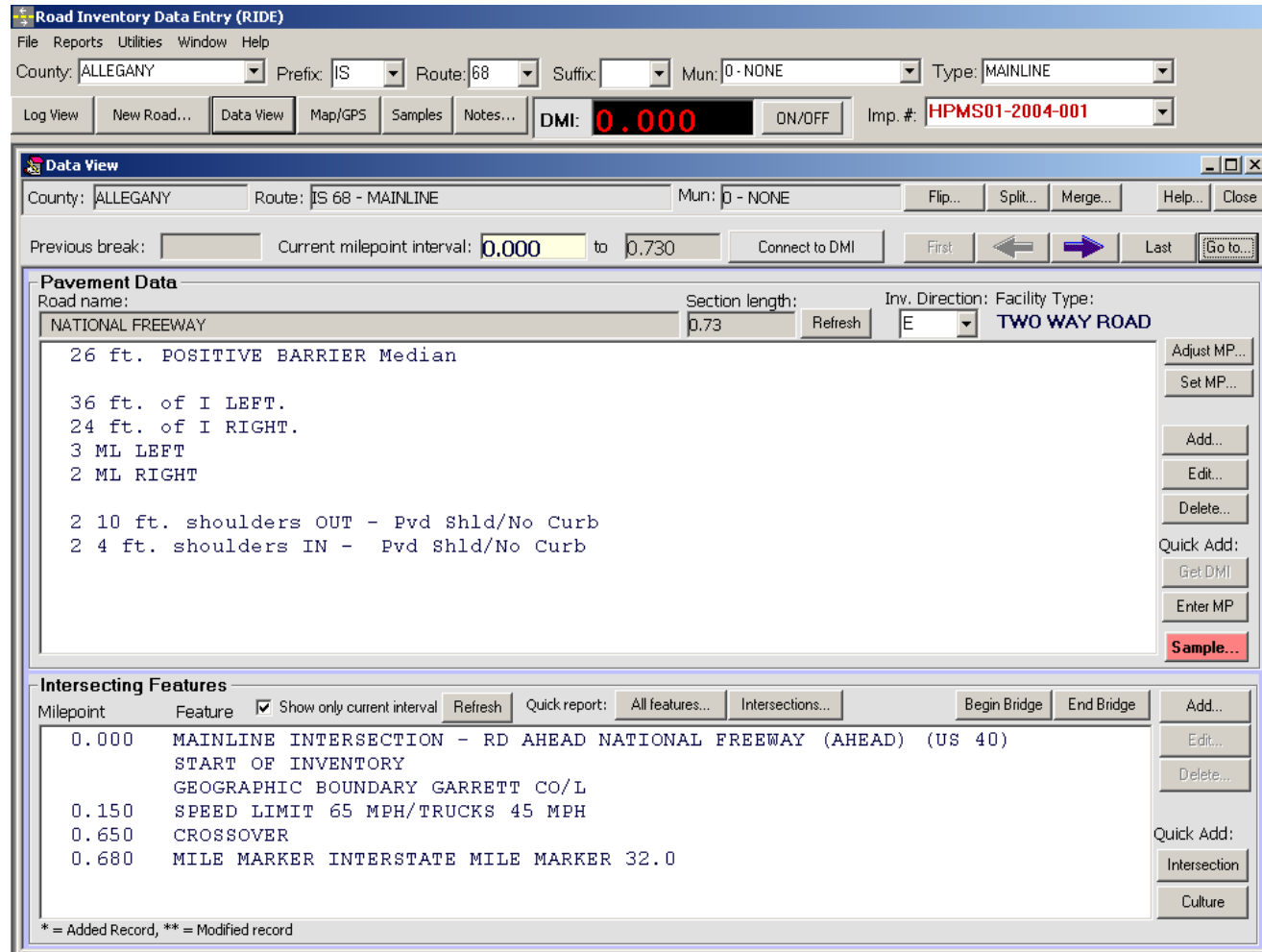


Equipment Set-up



Road Inventory Data Entry (RIDE)

- Reduced road inventory data collection time
- Reduced state re-inventory cycle
- Increases productivity in collecting and processing data
- Improved quality of data



Road Inventory Data Entry (RIDE)

File Reports Utilities Window Help

County: ALLEGANY Prefix: IS Route: 68 Suffix: Mun: 0 - NONE Type: MAINLINE

Log View New Road... Data View Map/GPS Samples Notes... DMI: 0.000 ON/OFF Imp. #: HPMS01-2004-001

Data View

County: ALLEGANY Route: IS 68 - MAINLINE Mun: 0 - NONE Flip... Split... Merge... Help... Close

Previous break: Current milepoint interval: 0.000 to 0.730 Connect to DMI First ← → Last Go to...

Pavement Data

Road name: NATIONAL FREEWAY Section length: 0.73 Refresh Inv. Direction: E Facility Type: TWO WAY ROAD

26 ft. POSITIVE BARRIER Median

36 ft. of I LEFT.
24 ft. of I RIGHT.
3 ML LEFT
2 ML RIGHT

2 10 ft. shoulders OUT - Pvd Shld/No Curb
2 4 ft. shoulders IN - Pvd Shld/No Curb

Adjust MP...
Set MP...
Add...
Edit...
Delete...
Quick Add:
Get DMI
Enter MP
Sample...

Intersecting Features

Milepoint Feature Show only current interval Refresh Quick report: All features... Intersections... Begin Bridge End Bridge Add...

0.000	MAINLINE INTERSECTION - RD AHEAD NATIONAL FREEWAY (AHEAD) (US 40) START OF INVENTORY GEOGRAPHIC BOUNDARY GARRETT CO/L	Edit... Delete...
0.150	SPEED LIMIT 65 MPH/TRUCKS 45 MPH	
0.650	CROSSOVER	
0.680	MILE MARKER INTERSTATE MILE MARKER 32.0	Quick Add: Intersection Culture

* = Added Record, ** = Modified record

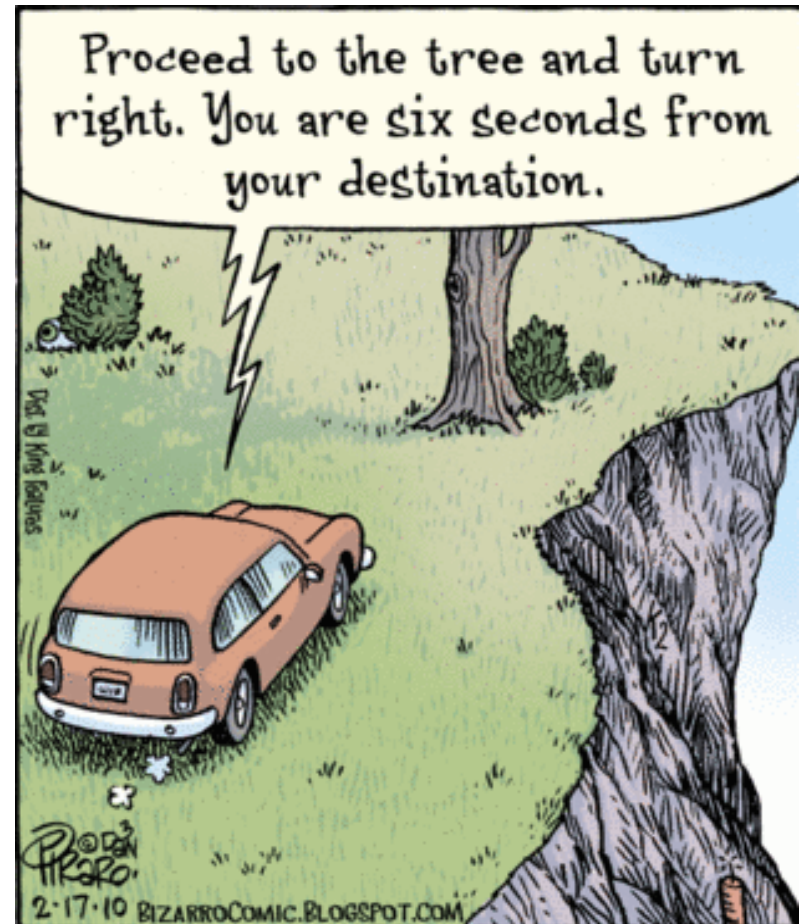


Centerline/Routes History

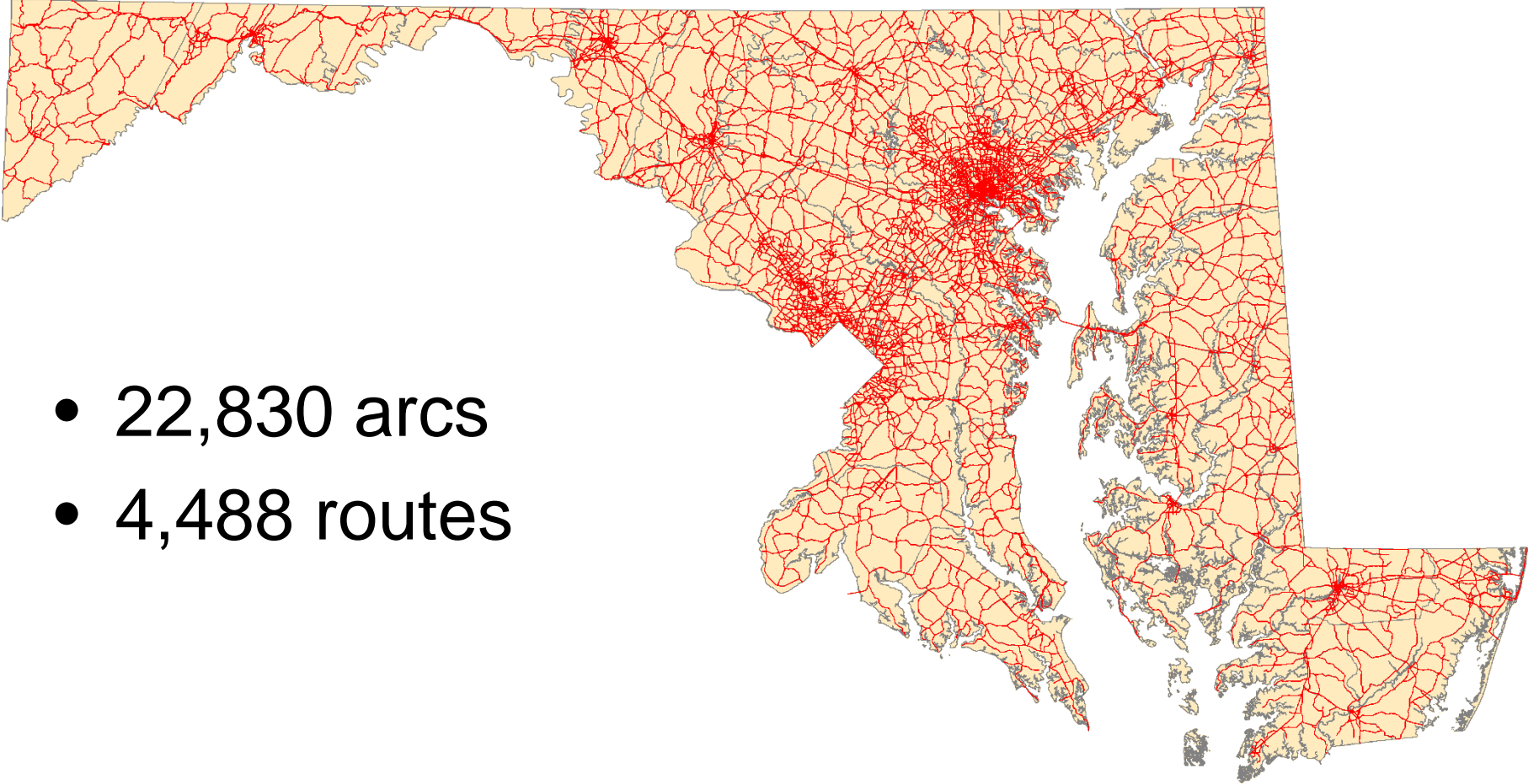
- Skeleton Files – 100k scale
- NetMaps – Network Maps – 24k scale

Data is only as good as.....

- GIS Event Mapping
- Building LRS
- Dynamic Segmentation
- Human Error



1996 Route System



- 22,830 arcs
- 4,488 routes

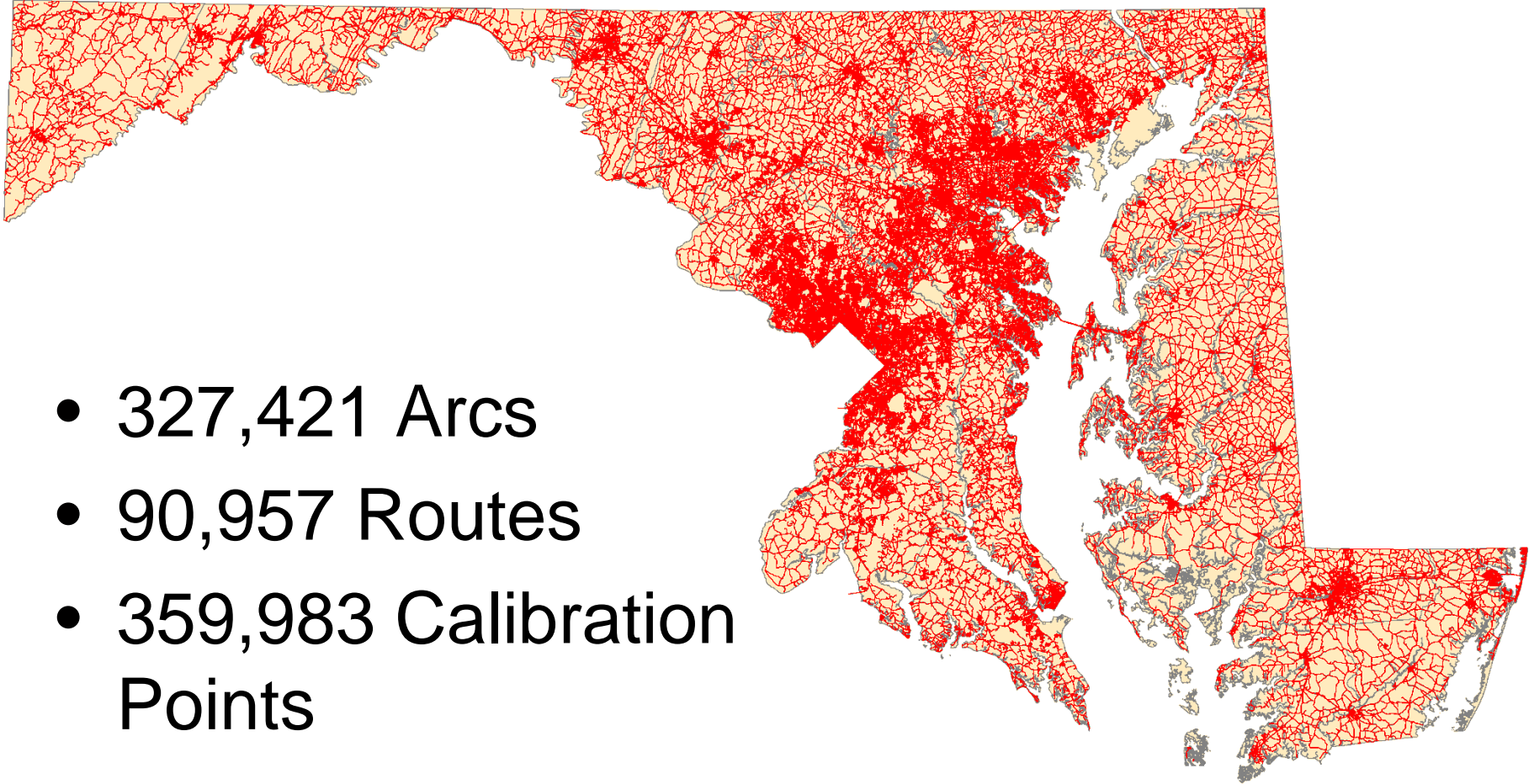




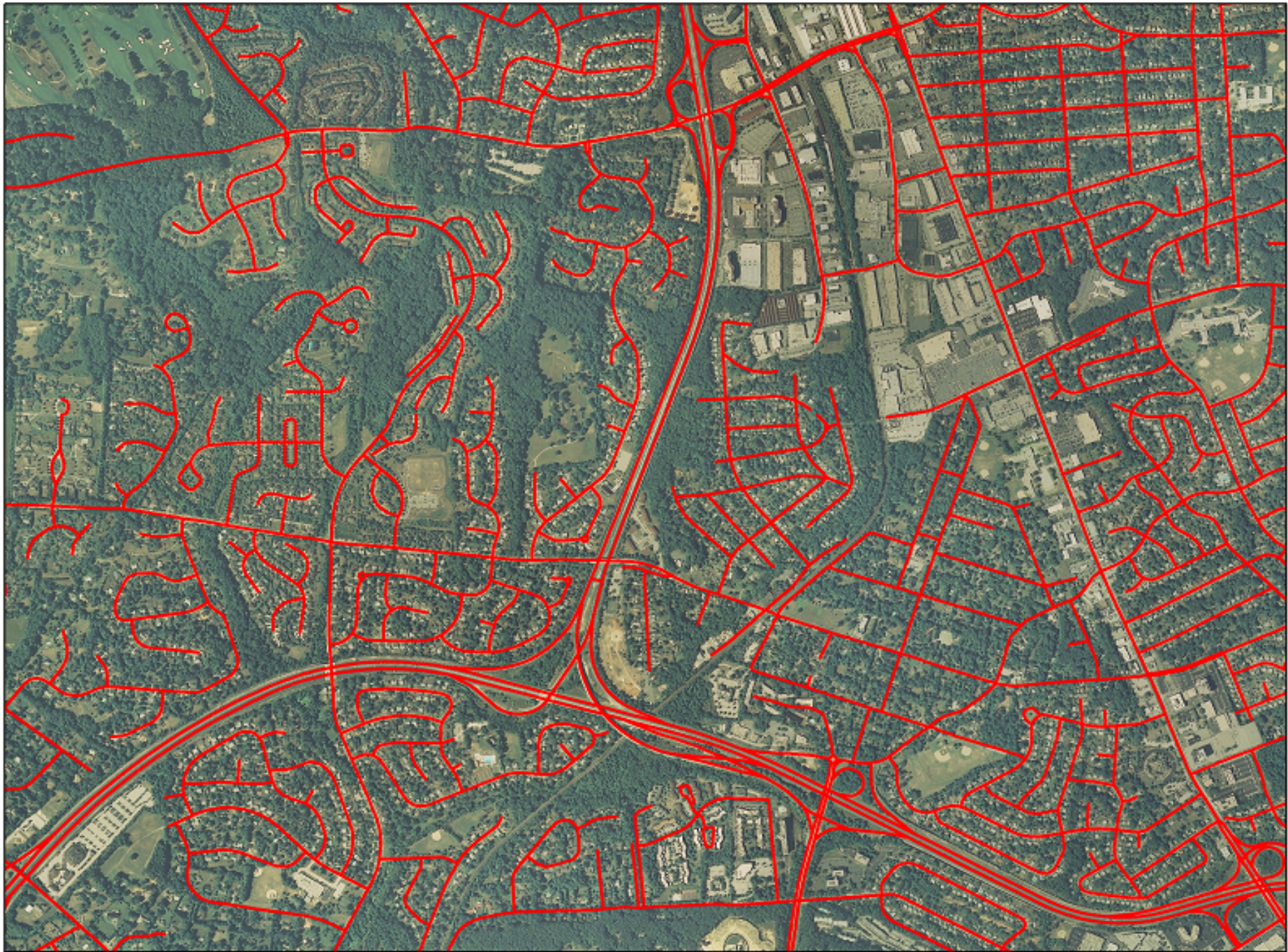
Centerline/Routes

- New Route Identifier
- Route measures calibrated with mile points
- Additional routes added, ramps and reverse direction
- Human Error still exist

2009 Route System



- 327,421 Arcs
- 90,957 Routes
- 359,983 Calibration Points



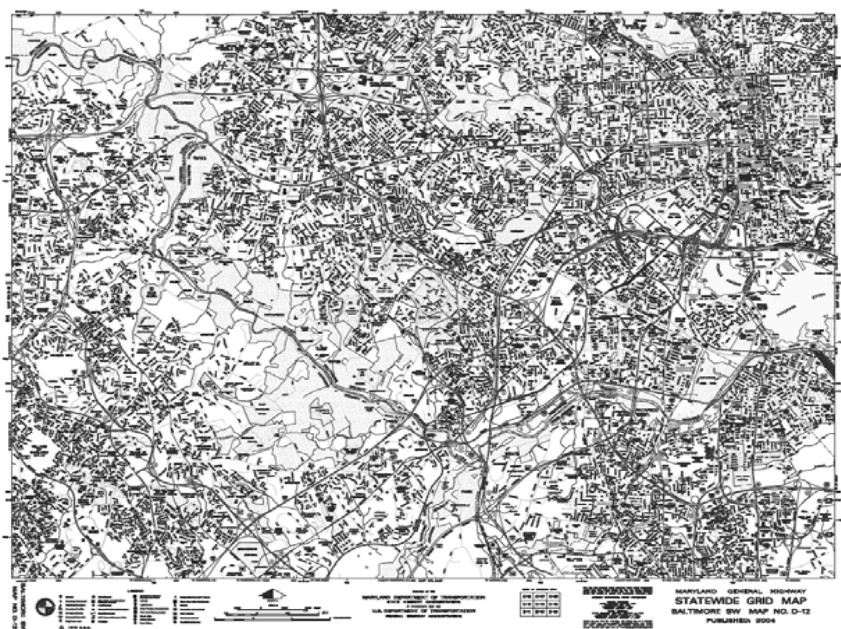
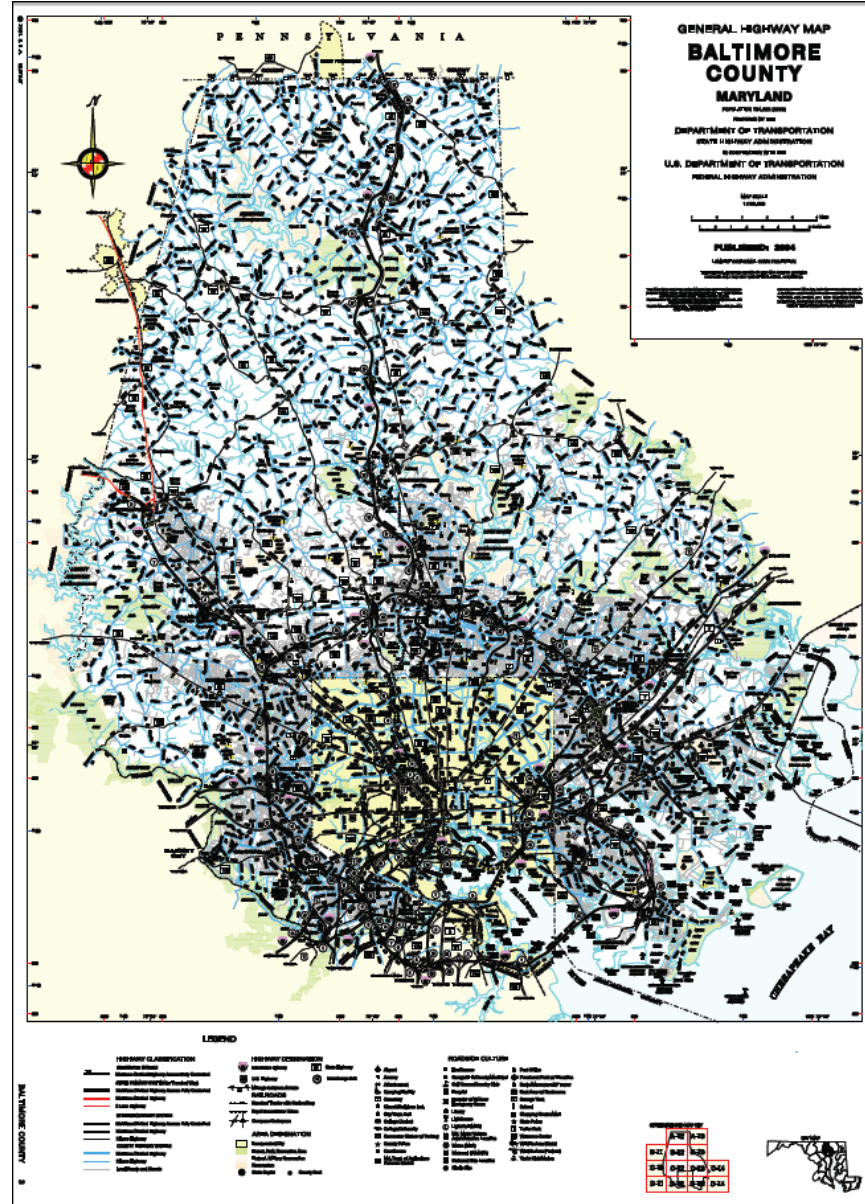
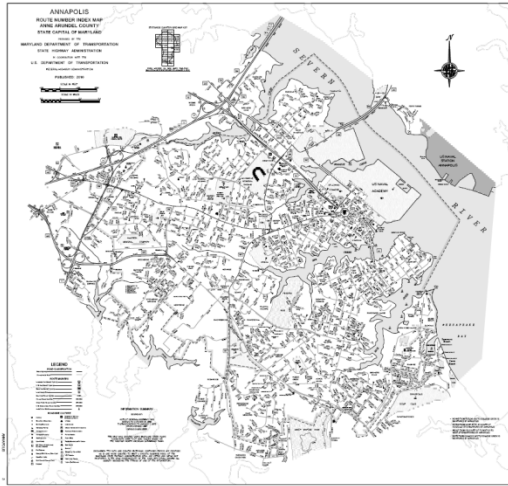


Centerline

- Centerline Status
 - SHA's centerline data is one year behind the current calendar year
 - The current statewide centerline corresponds with the 2009 Federal Highway Administration submission.
 - The data is posted at

<http://www.marylandgis.net/SHAdata/>

Mapping History



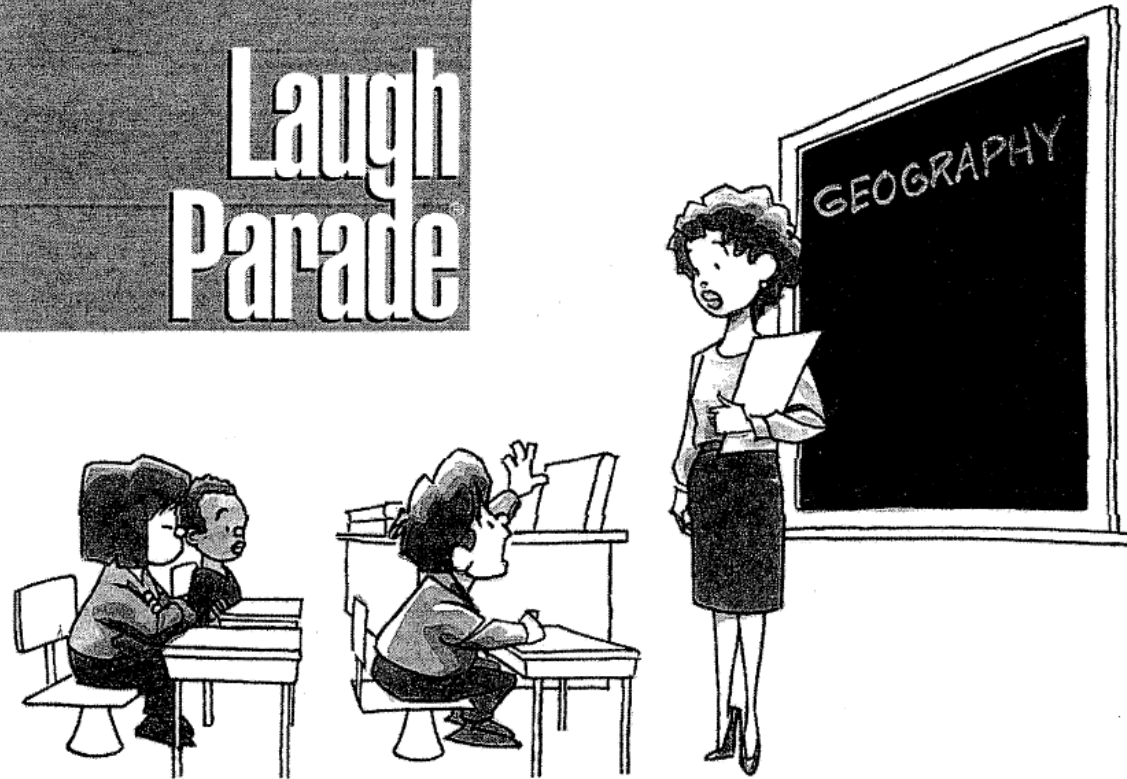
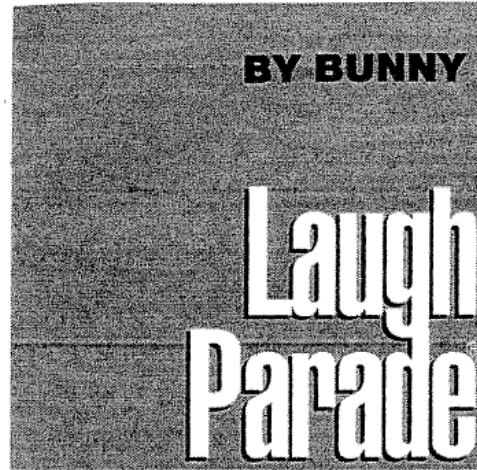


Mapping History

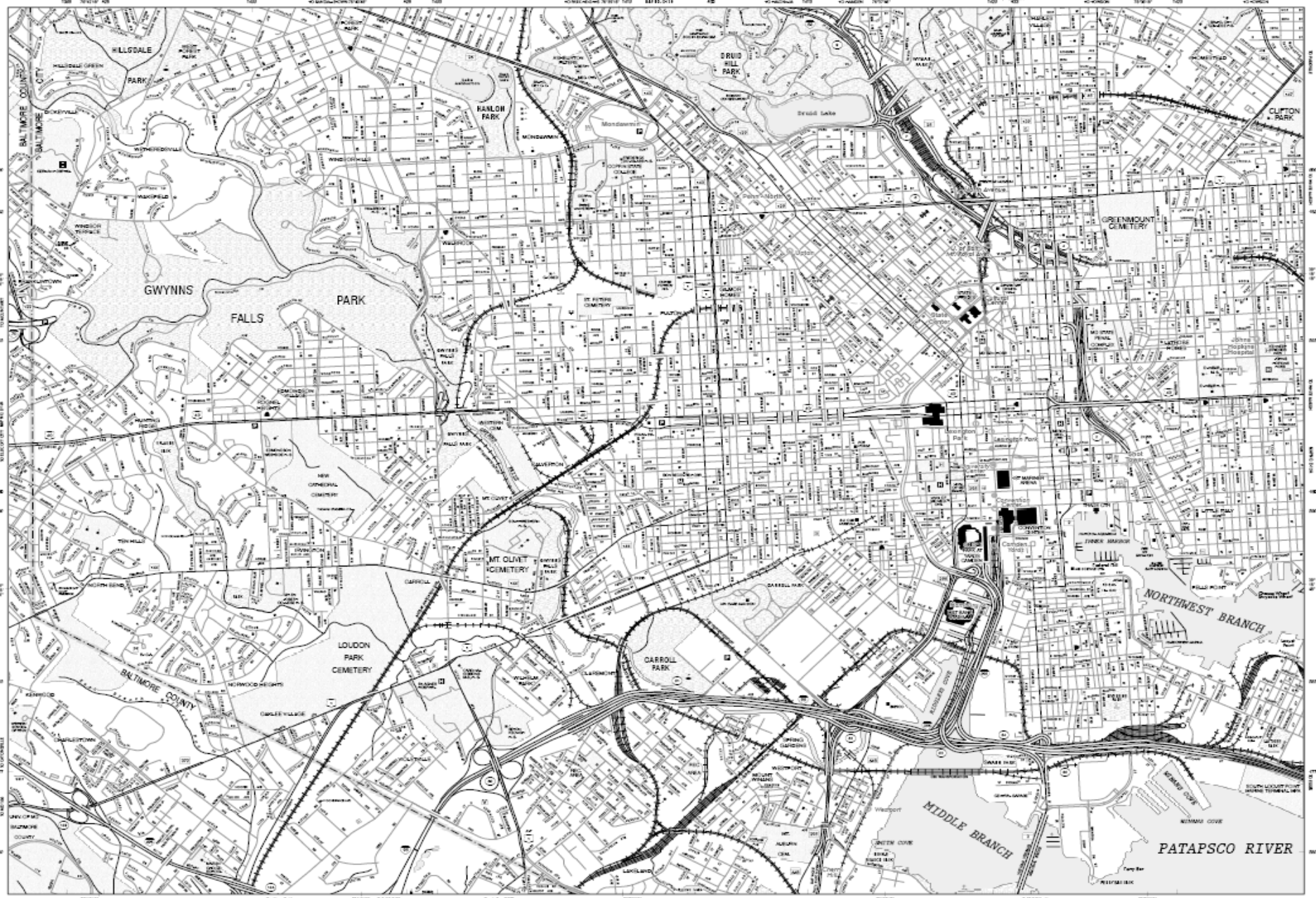
- Digitized from Mylar and maintained in MicroStation
- Separate CADD centerline base
- 3 year update cycle

Concerns

- New mapping base
- New Software
- Old Dogs/New Tricks



“When do we learn how to refold maps?”

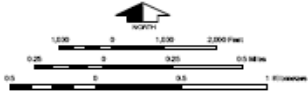


SEE ALSO BALTIMORE AND THAWVILLE



LEGEND

- 1. Water
- 2. Sewer
- 3. Fire Hydrant
- 4. Manhole
- 5. Fire Station
- 6. Telephone Station
- 7. Bus Stop
- 8. School
- 9. Hospital
- 10. Jail
- 11. Church
- 12. Synagogue
- 13. Mosque
- 14. Cemetery
- 15. Public Building
- 16. Office Building
- 17. Warehouse
- 18. Industrial Plant
- 19. Power Plant
- 20. Gas Station
- 21. Gas Station
- 22. Gas Station
- 23. Gas Station
- 24. Gas Station
- 25. Gas Station
- 26. Gas Station
- 27. Gas Station
- 28. Gas Station
- 29. Gas Station
- 30. Gas Station
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- 32. Gas Station
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- 42. Gas Station
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- 44. Gas Station
- 45. Gas Station
- 46. Gas Station
- 47. Gas Station
- 48. Gas Station
- 49. Gas Station
- 50. Gas Station



MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL ROAD ADMINISTRATION

DATE OF SURVEY

0-100	0-150	0-180
0-200	0-250	0-300
0-350	0-450	0-550
0-650	0-800	0-1000

THIS MAP WAS PREPARED BY THE STATE HIGHWAY ADMINISTRATION OF MARYLAND FROM DATA OBTAINED FROM THE BUREAU OF PUBLIC WORKS, BALTIMORE, MARYLAND.

MARYLAND GENERAL HIGHWAY STATEWIDE GRID MAP
BALTIMORE, SW MAP NO. D-12B
PUBLISHED: 2009

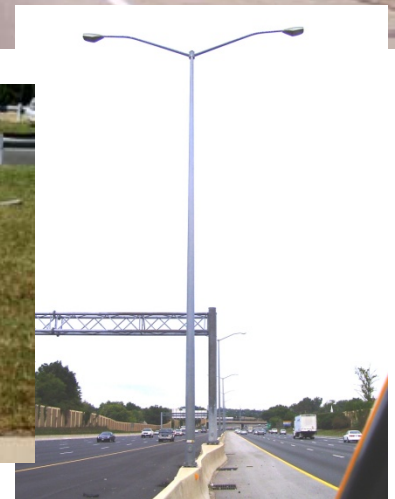
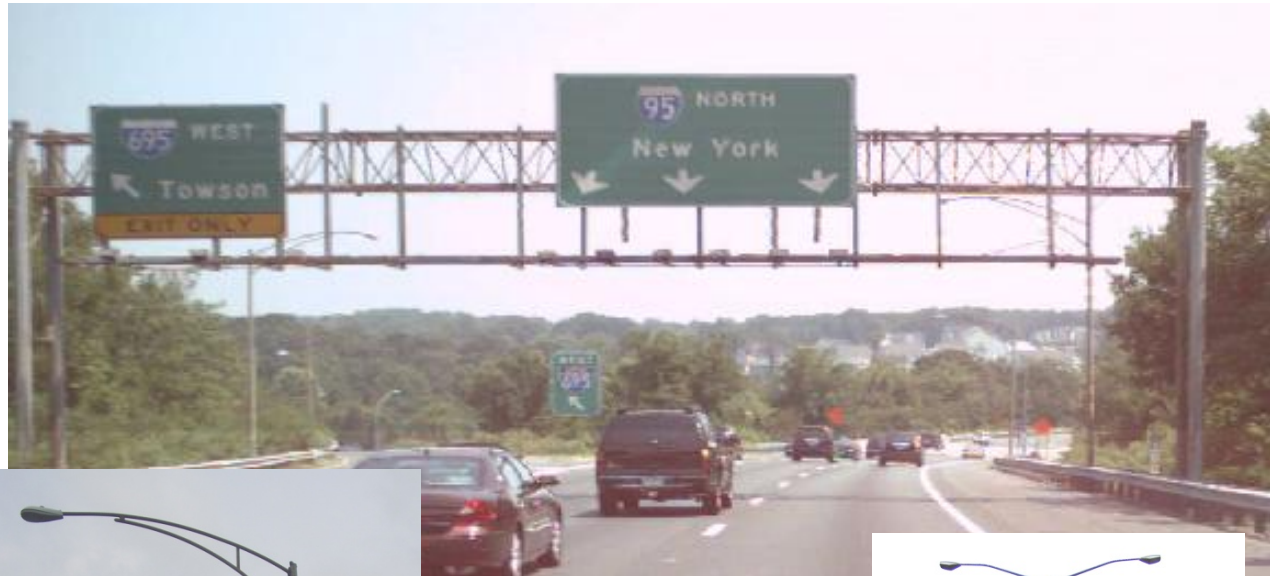


Highway Mapping

- 426 - Quarter Grids and 168 Town maps
- One Centerline base
- Maps now on 1year cycle

Asset Management

- Light poles, Guardrails, Signs, etc.
- Location, Condition, attributes of asset



Sidewalk Inventory

- State maintained sidewalks
- ADA Compliance



You get what you pay for

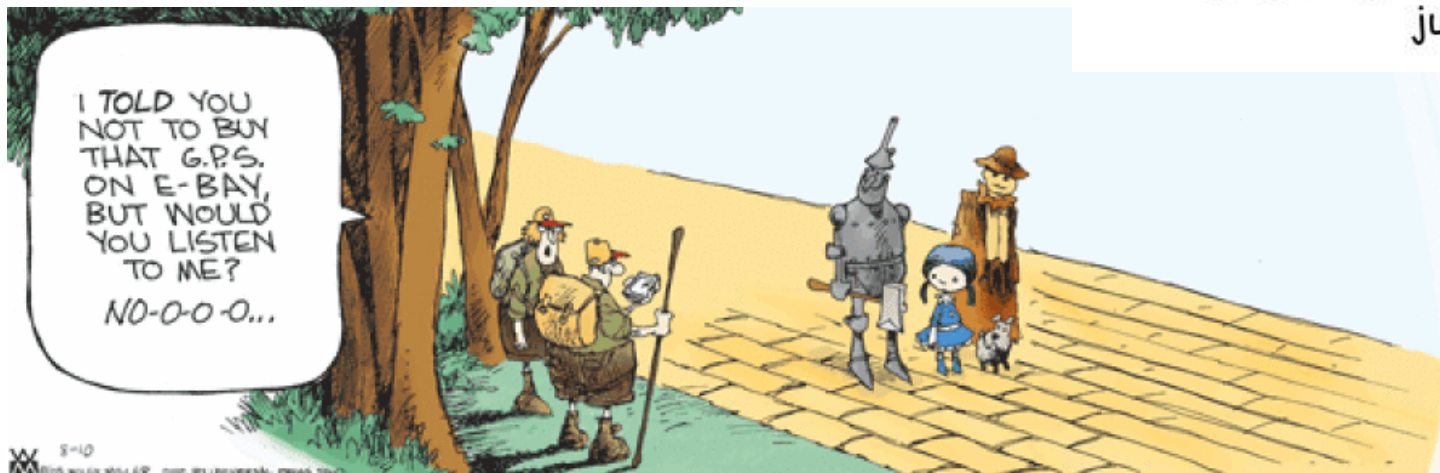
- Less Accuracy
- Limited Functions
- Increased office time

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"I'm afraid your GPS device is working just fine."



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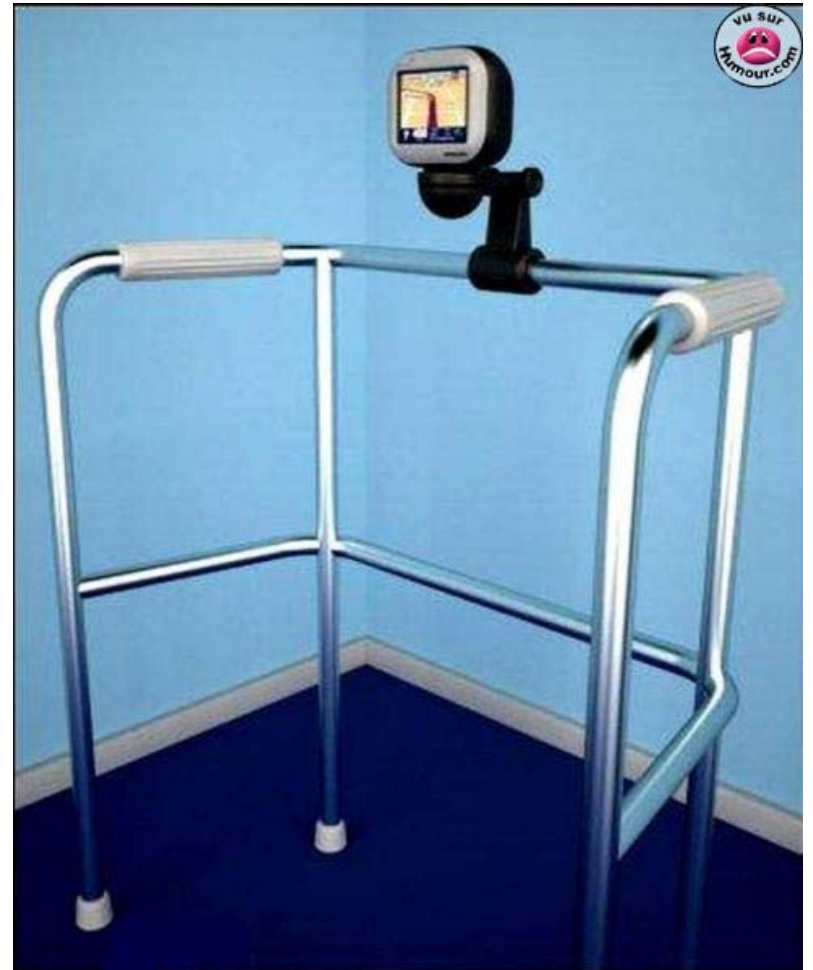
What Fun

- Dislike change
- Unlimited possibilities
- Recreational examples



Aging System and Applications

- Concerns of availability
- Program platform supported





Questions?