

An Investigation into Employee Drive Distances to Work

Information Technology – GIS

119 W Indiana Ave

Deland, FL

Visit us at www.volusia.org/gis



An Investigation into Employee Drive Distances to Work

(or thank goodness, I get to do GIS for a change)

In July 2008, with gas prices fast approaching \$4 a gallon, Volusia County Environmental Management asked whether the GIS Team could use its tools to analyze and portray the over 3000 County employee's current driving routes to and from work. Using existing databases and by employing ESRI's Network Analyst extension we undertook the project of identifying employee's shortest path from their home to their workplace.

This presentation will investigate the approach, the problems found in the source data and the corresponding workarounds, and the compelling results of this analysis for encouraging changes in employee commuting practices.



Volusia County is in East-Central Florida covering about 1500 square miles. The County has 16 municipalities and a population of just over 500,000 people

.... with good access to roads and public transit opportunities.

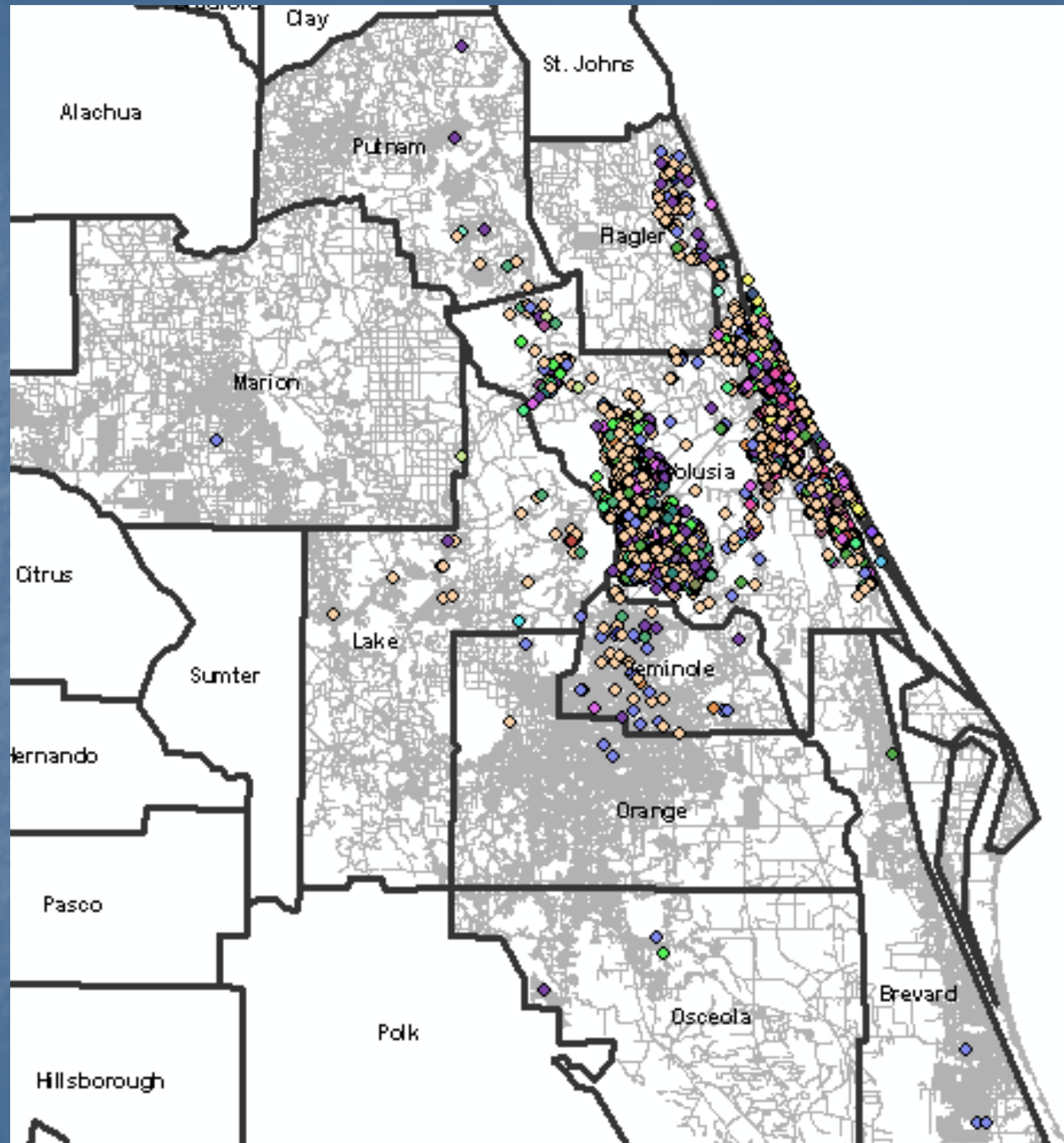


Inputs into the project included a database from Human Resources containing 3049 employee records, providing employee name, home address information and a workplace location code.

	A	B	C	D	E
1	EMPLOYEE-HOME-LINE1-DD	EMPLOYEE-HOME-CITY-NM	EMPLOYEE-HOME-ZIP-PREFIX	WORKLOC	AGENCYCODE
2	3140 CABOT COURT	DELTONA	32738	105010	400
3	815 OAK TREE LANE	LAKE HELEN	32744	133006	770
4	PO BOX 740052	ORANGE CITY	32774	110006	635
5	161 CRYSTAL OAK DRIVE	DELAND	32720	105002	400
6	121 PINE LAKE PKWY N, APT #715	PALM COAST	32137	107002	520
7	73 UHL PATH	PALM COAST	32164	221002	570
8	525 W. MINNESOTA AVE	DELAND	32720	105001	400
9	4535 FAIRPORT RD	DELEON SPG	32130	134001	760
10	1296 E. MINNESOTA AVE.	DELAND	32724	105001	400
11	4 EDGE LANE	PALM COAST	32164	105013	400
12	4583 WOOD COVE DR	PORT ORANGE	32127	105010	400
13	1310 SUTTON ISLAND DRIVE	DELAND	32724	105001	400
14	53 PALM DR.	ORMOND BY THE SEA	32176	220001	130
15	P.O. BOX 5063	ORMOND BEACH	32175	222009	640
16	1763 ARASH CIR	PORT ORANGE	32128	116001	540
17	762 BARROWS DAIRY ROAD	PORT ORANGE	32127	115001	860
18	5 PINE TREE CIRCLE	ORMOND BEACH	32176	128001	820
19	6721 CALISTOGA CIRCLE	PORT ORANGE	32128	218007	325
20	4573 MILES DRIVE	PORT ORANGE	32129	105003	400

Inspection of this file led to a surprising discovery ...

The table of county employee home addresses was matched against a regional street file (with a 99% match rate).



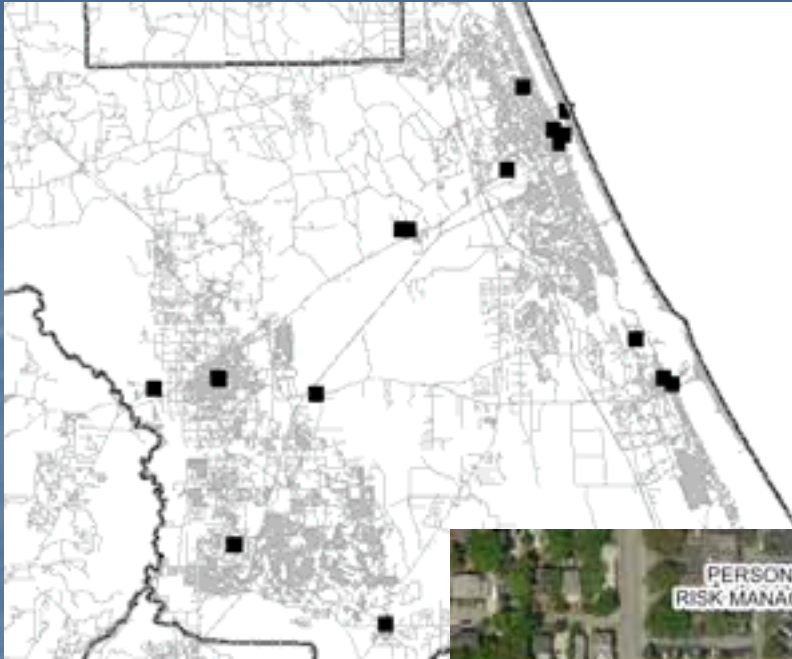
	A	B	C	D	E	F
1	TIME CLERKS DEPARTMENT LIST - LOCATOR CODES					
2						
3	LOC	CODE	DEPARTMENTS	DEPT CONTACT / TIME CLERKS	PHONE #	WORK LOCATION
4	101001, 2	CM	COUNTY COUNCIL / MANAGER - LEADERSHIP	CATHY NATALI / KAREN YARIS	2240 / 2919	KELLY BLDG, 3 FL
5	102001	LG	LEGAL DEPARTMENT	MARGIE HELTON / JENNIFER LOVELESS	2948 / 2941	KELLY BLDG, 3 FL
6	103002, 3	RB	PUBLIC WORKS - OPERATIONS ROAD & BRIDGE	RAQUEL TAYLOR / SUSAN COLLINS	822-6422	2560 W. SR 44
7	103005, 7		ROAD & BRIDGE	RAQUEL TAYLOR / SUSAN COLLINS	71-9-239-6535	455 WALKER ST HOL HILL
8	103008		ROAD & BRIDGE	PAM LOW	72-9- 424-2925	530 N.DIXIE HWY-NSB
9	103009		ROAD & BRIDGE (OSTEEN)	RAQUEL TAYLOR / SUSAN COLLINS	668-4745	200 HWY 415 OSTEEN
10	103015		ROAD & BRIDGE	RAQUEL TAYLOR / SUSAN COLLINS		2560 W. SR 44
11	10400Z 1-3	LS	LEISURE SERVICES - GR & RES MGMT	LANA KAYLER / BOBBIE BRYANT / CHRISTINE FRENCH	2662 / 5873 / 6742	202 N.FLORIDA AV
12	105001-13	SO	SHERIFF'S OFFICE - LEADERSHIP	TINA MCCLISH / EDGAR BURGOS / RACHEL JEMISON	2110 / 2833 / 2125	KELLY BLDG, 4 FL
13	106005	TX	REVENUE - TAXES - OCCUPATIONAL LICENSE	SALLY BRUNER / JAIMIE STEWART	2332 / 4640	KELLY BLDG, 1FL
14	106006		REVENUE - TAG & TITLE	SALLY BRUNER / JAIMIE STEWART		KELLY BLDG, 1FL
15	107001, 2, 4	CO	CORRECTIONS - PUBLIC PROTECTION	NOLA GREEN / EMILY BURTON / ANDY	1939 / 1624 / 1515	1300 REDJOHN DR
16	107002		BRANCH JAIL / PROGRAM SERVICES	EMILY BURTON / NOLA GREEN	1515 / 1939	1300 REDJOHN DR
17	108001	ES	FIRE SERVICES ADMINISTRATION	JUDY MCFADDEN / PAM JOHNSON	2904 / 2488	COURT HOUSE 125 W NY
18	109001	AC	ANIMAL CONTROL - PUBLIC PROTECTION	SHARI WILLIAMS / ELAINE BENSLEY	1211 / 1223	29 KEYTON DR DB
19	110001, 5, 6	HS	COMMUNITY SERVICES - LEADERSHIP	JOYCE KENNEDY / CARLOTTA HIERS	2908 / 2956	110 W RICH AVE
20	112001	EL	ELECTIONS - LEADERSHIP	KAREN SPINA / CONSTANCE GIMBA	2582 / 2249	COURT HOUSE 125 W NY
21	113001	AS	ASSESSMENTS	CHRISTY SHACKLETTE / KATHY SEAMAN	2048 / 5353	KELLY BLDG, 1FL
22	114001	AG	AGRICULTURAL CTR - COMM. SVCS Main #5400	ARLENE CHILDS // L WHEELER	5413 / 5425 / 5427	3100 E. SR 44

Utilizing a Finance database 76 distinct Department / Division / Building Work locations with a Locator Code were identified. This field was also present in the Human Resources Employee database.

Home address → Work Loc → Loc → Work Location

This provided us the linkage to start our “home to work and back” analysis, but this was further refined to identify “core” work locations to make the analysis more straightforward.

18 major work locations in the County were identified



This identified a major shortcoming to the data set.

Employees work locations in the database are based on administration, affecting four groups of employees:

- Fire Services

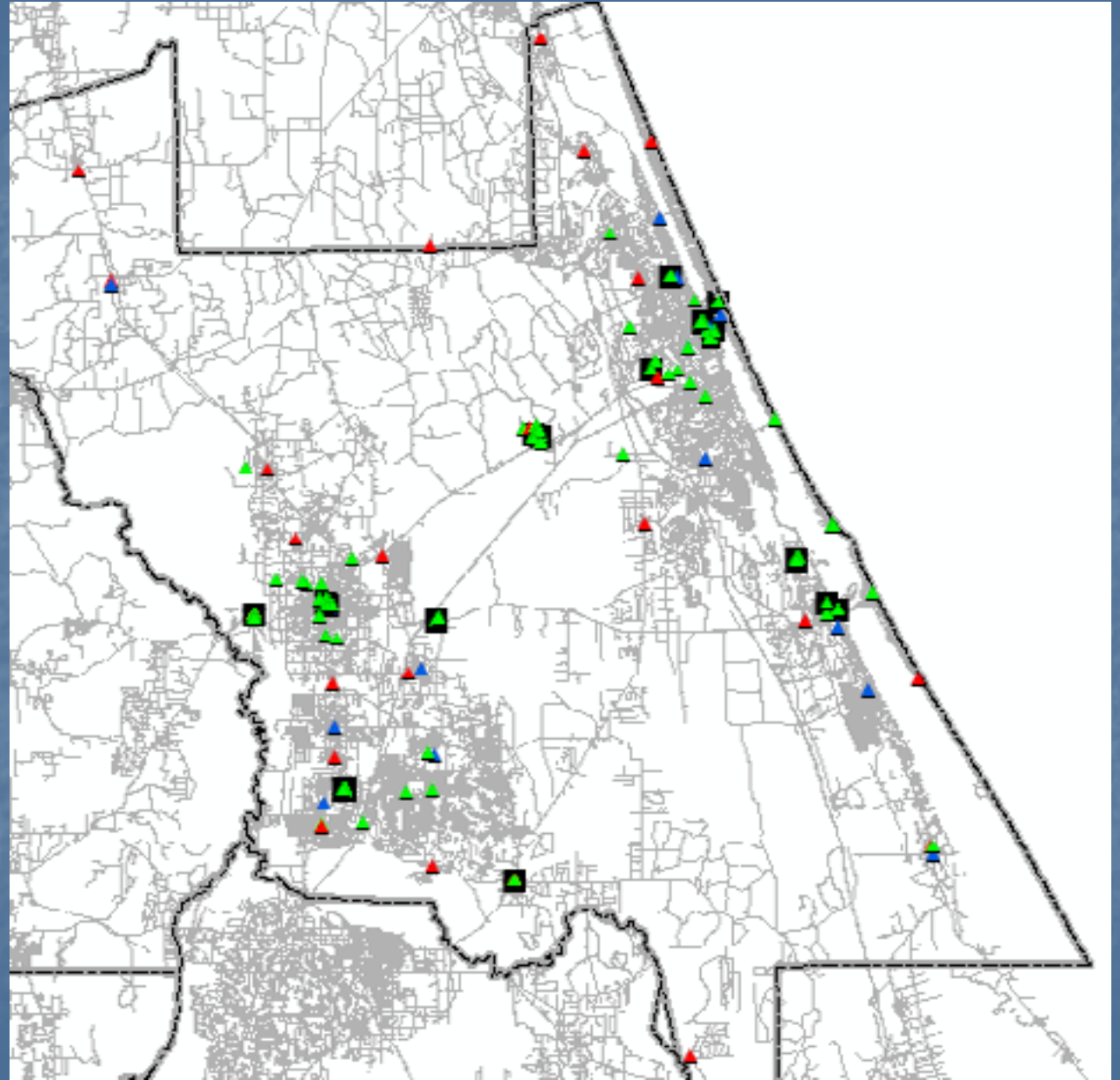
- Sheriff Deputies

- Library Services staff

- Public Works staff

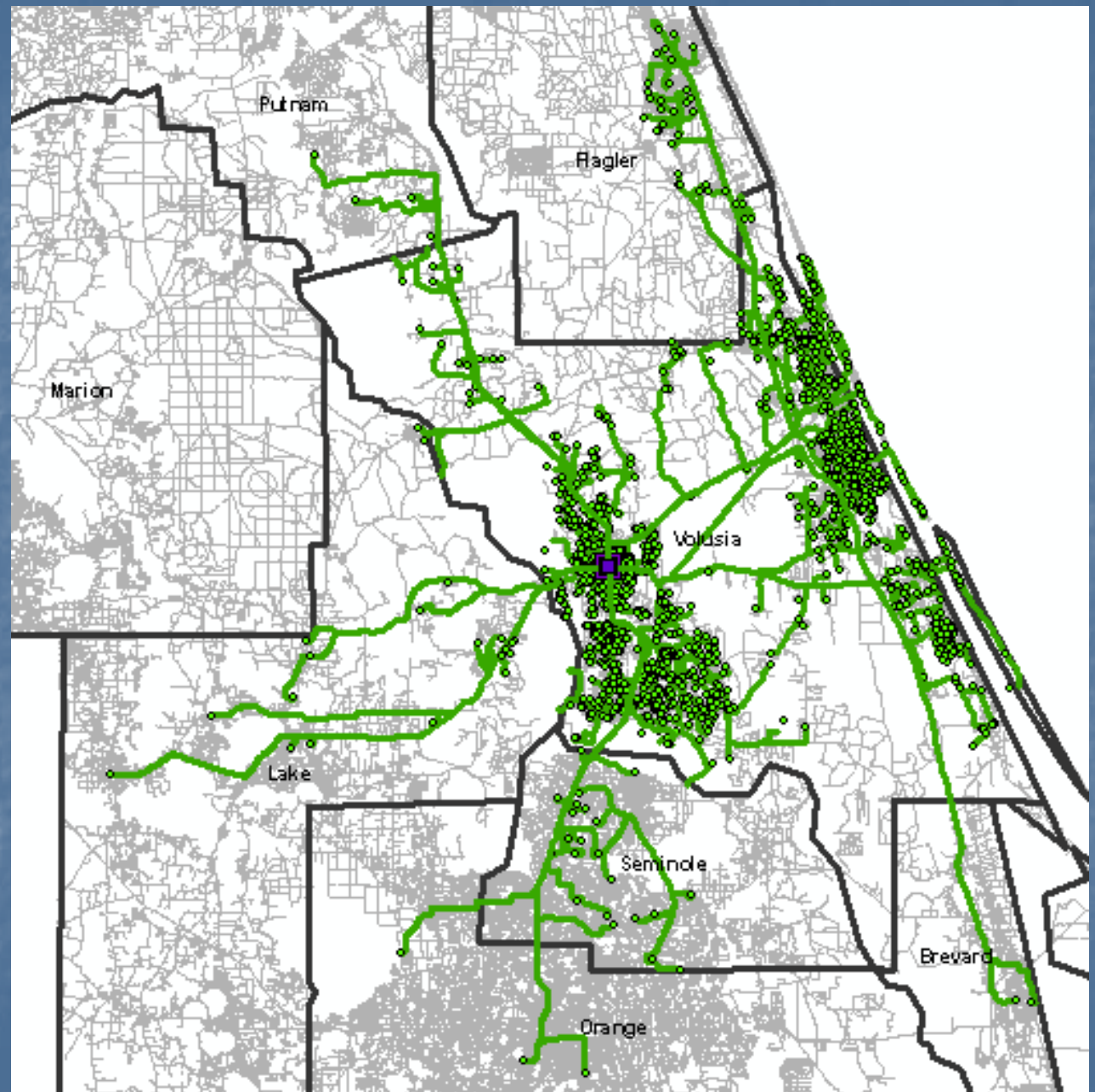
This became evident when all County facilities were compared to the identified work locations.

County Fire Stations are shown in red, Libraries are in blue, all other County work locations in green. These workplace assignment anomalies were not addressed in the preliminary investigation, but were considered in the final analysis.



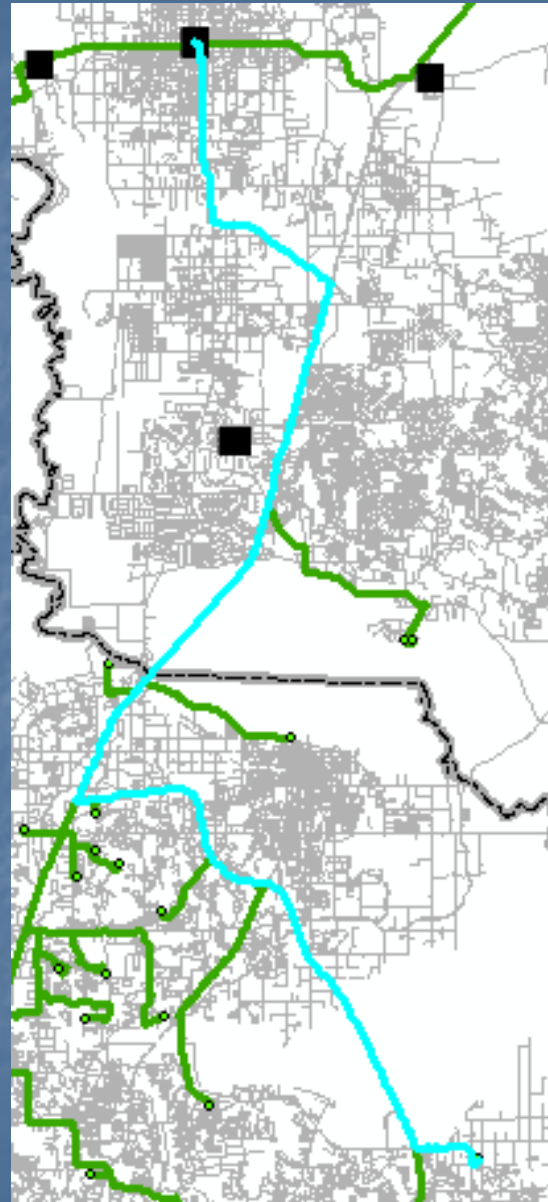
Using Network Analyst, employees were routed on the shortest path to their workplace. In this example 1467 employees were routed to 123 W Indiana Ave.

The interpolated driving distance, one way, was 25679 miles (averaged 16 miles per employee).



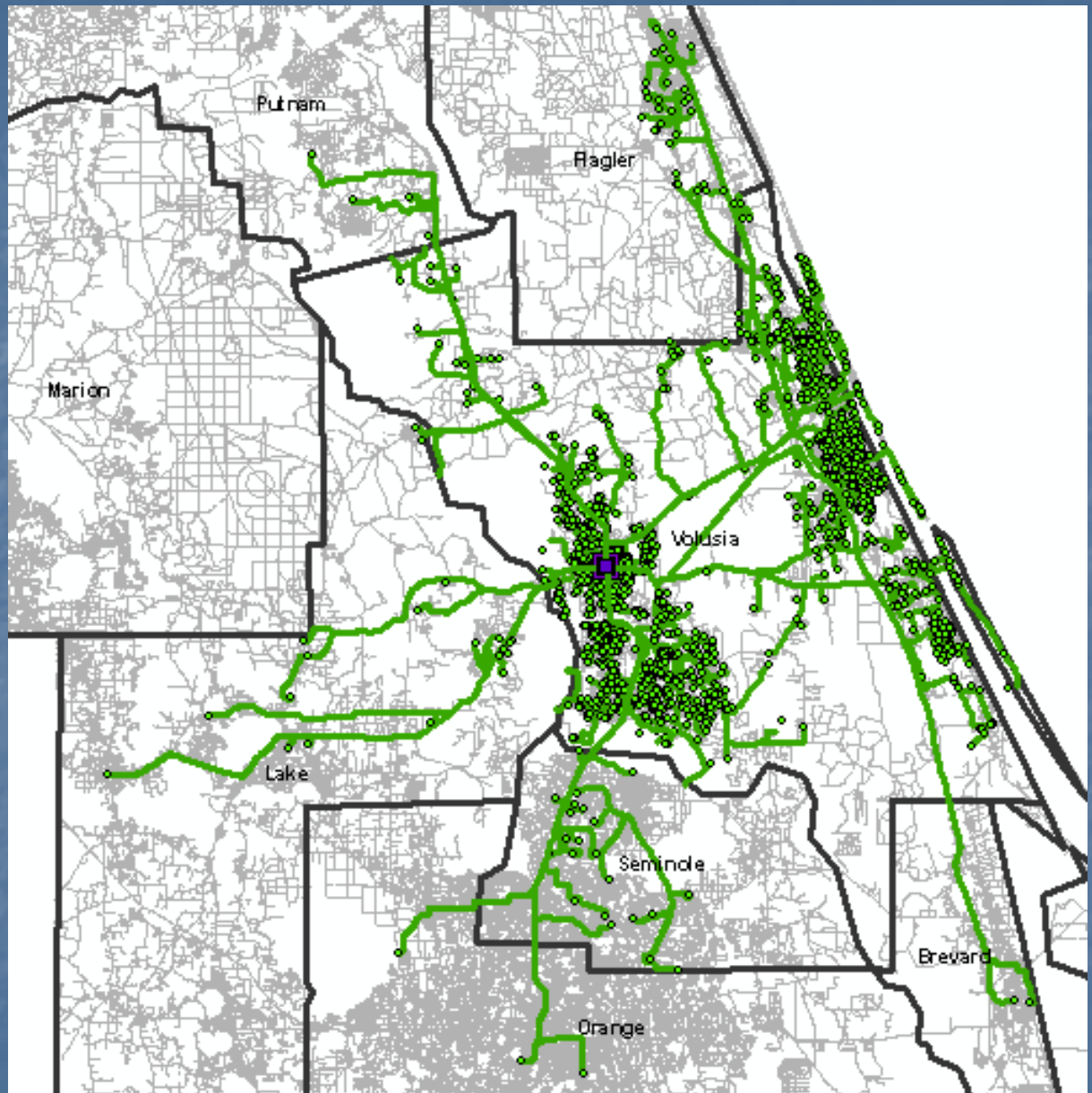
Each home to work route could be separated out for review and in several cases were used for actual verification with the employee.

In this example the route chosen by Network Analyst was the exact route driven each day by the employee.



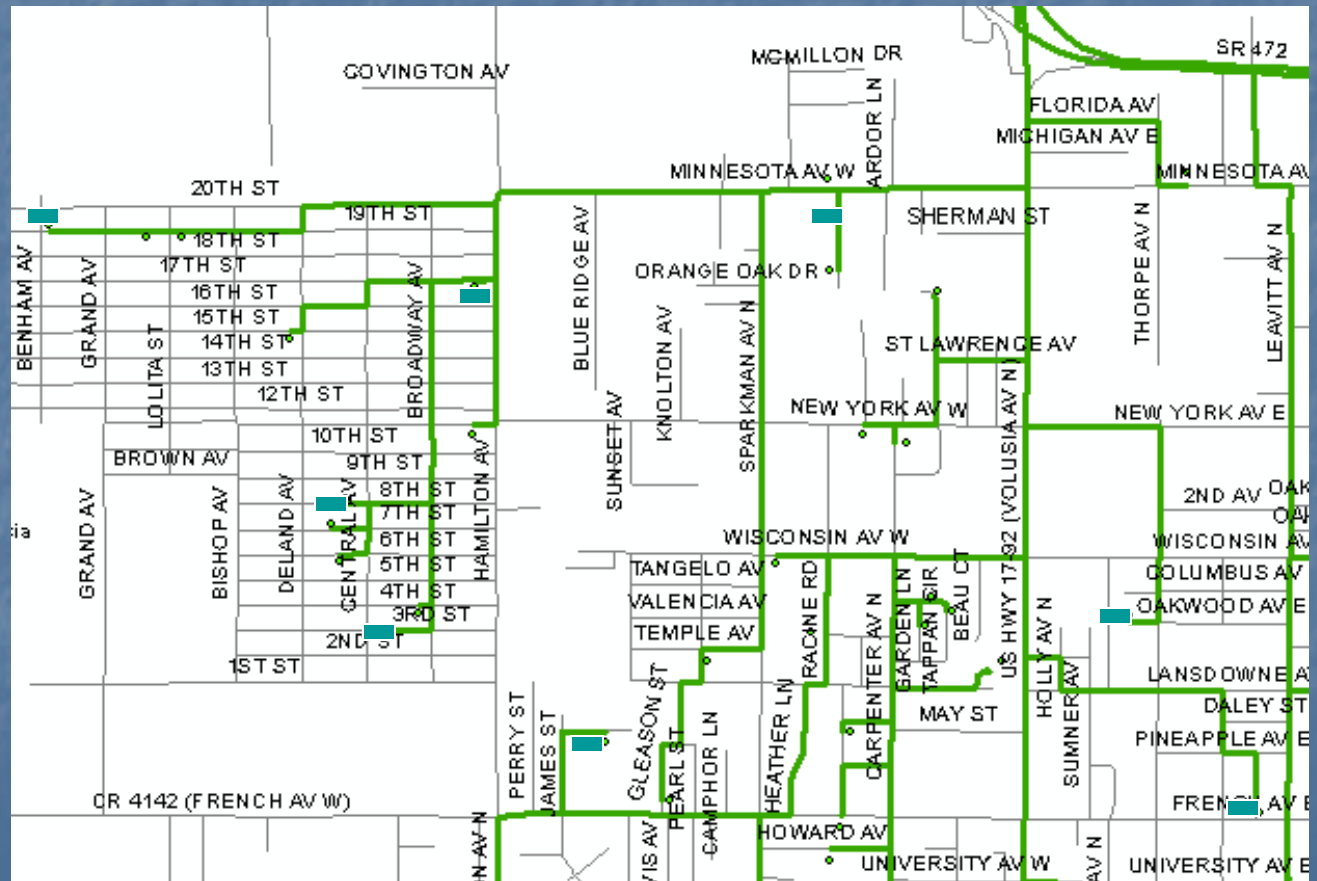
The results?
County employees
drive approximately
51,172 miles one
way to work each
day.

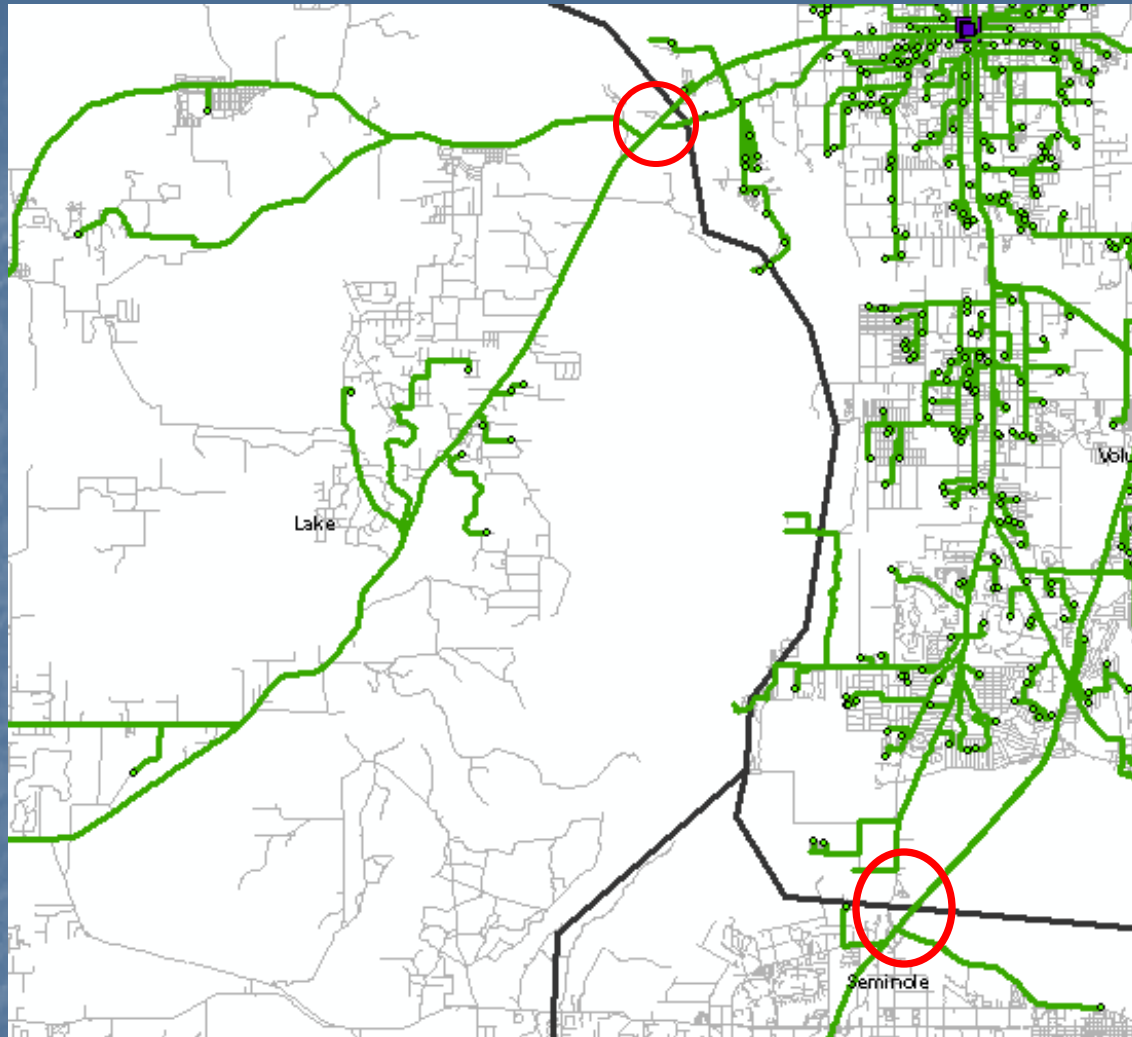
At \$4 a gallon,
employees pay over
\$102,344 for gas in a
week.



This information was reviewed at the local level to identify potential car or van pool groups...

- same work location / same schedule



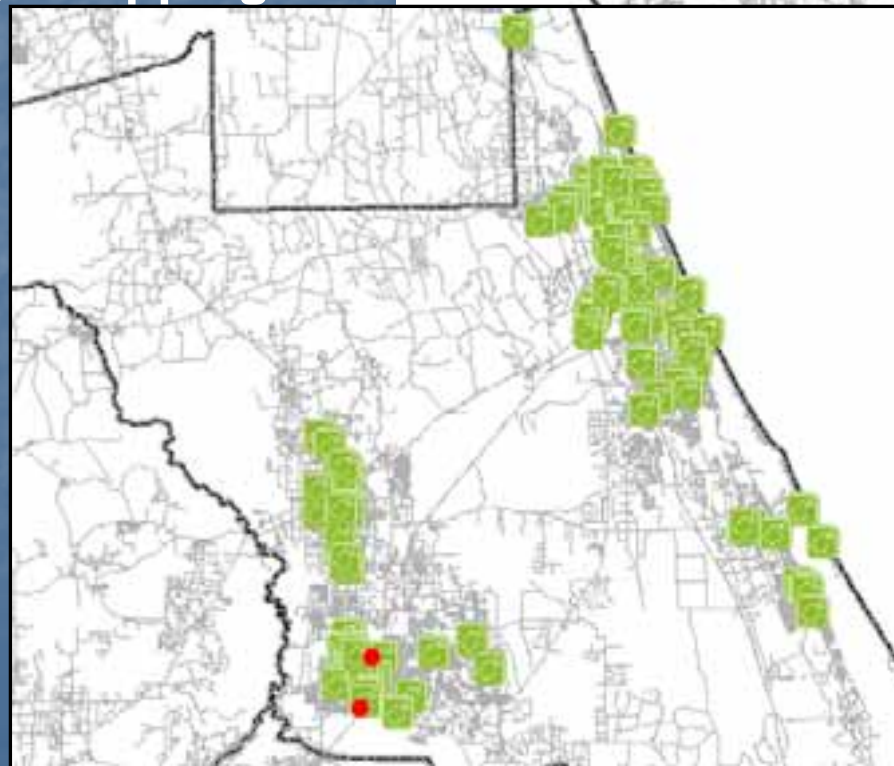
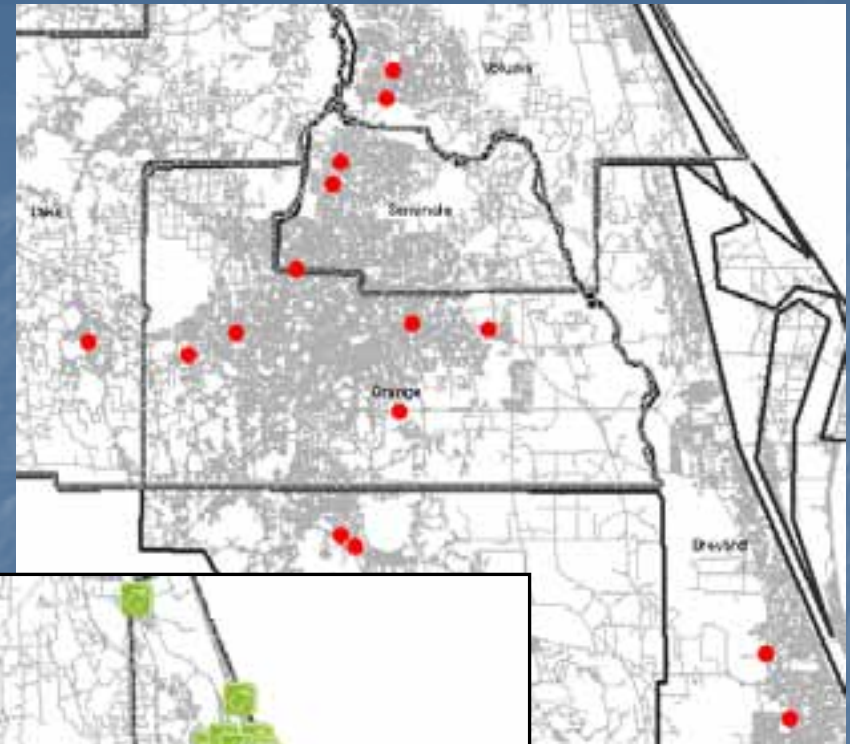


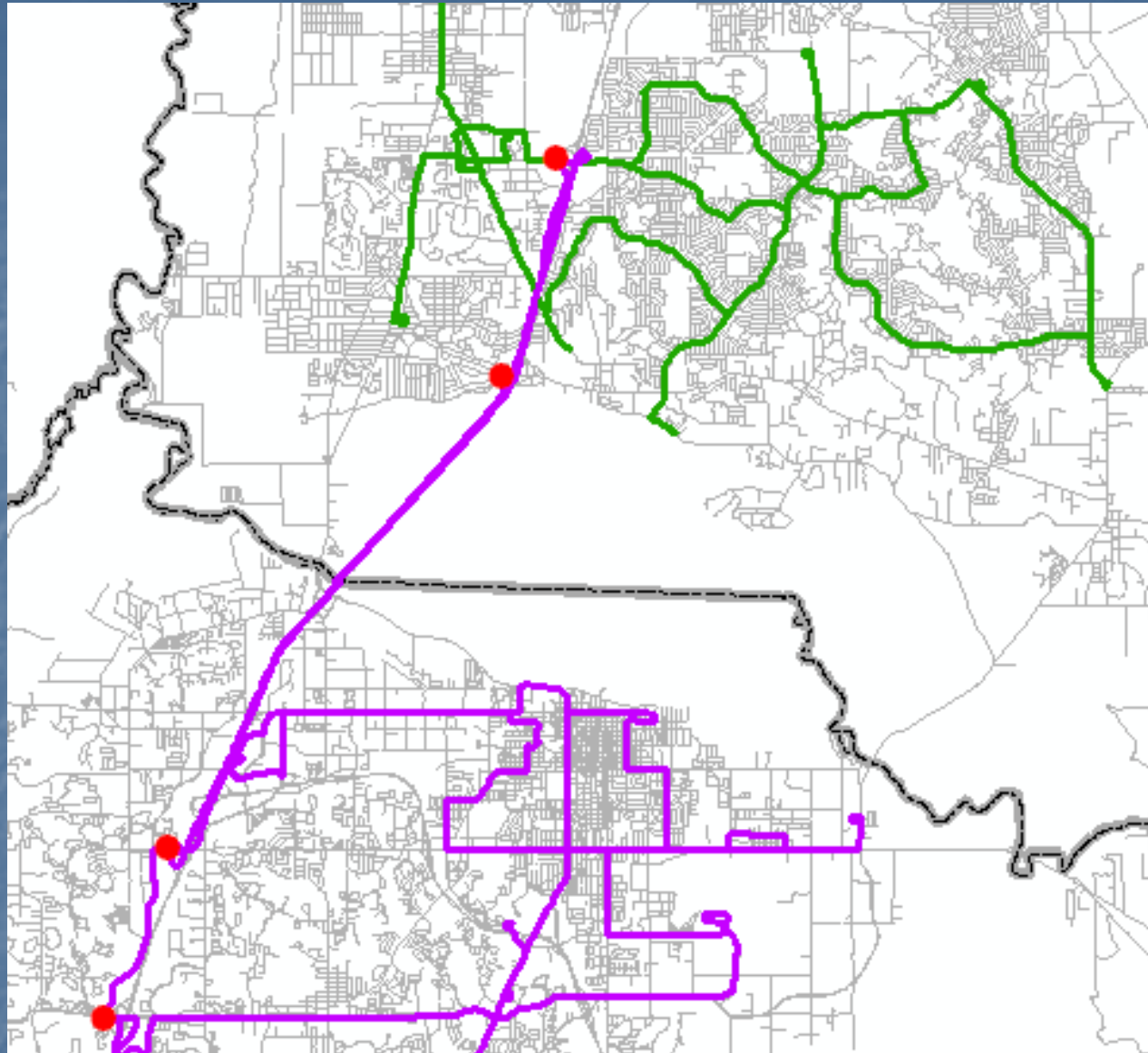
... and to identify “choke points” such as the St Johns River Bridge from Seminole County or the SR 44 bridge from Lake County where multiple paths converge

This data was also compared against other layers of data in GIS, for example, shopping centers, bus routes, and the proposed commuter rail corridor.

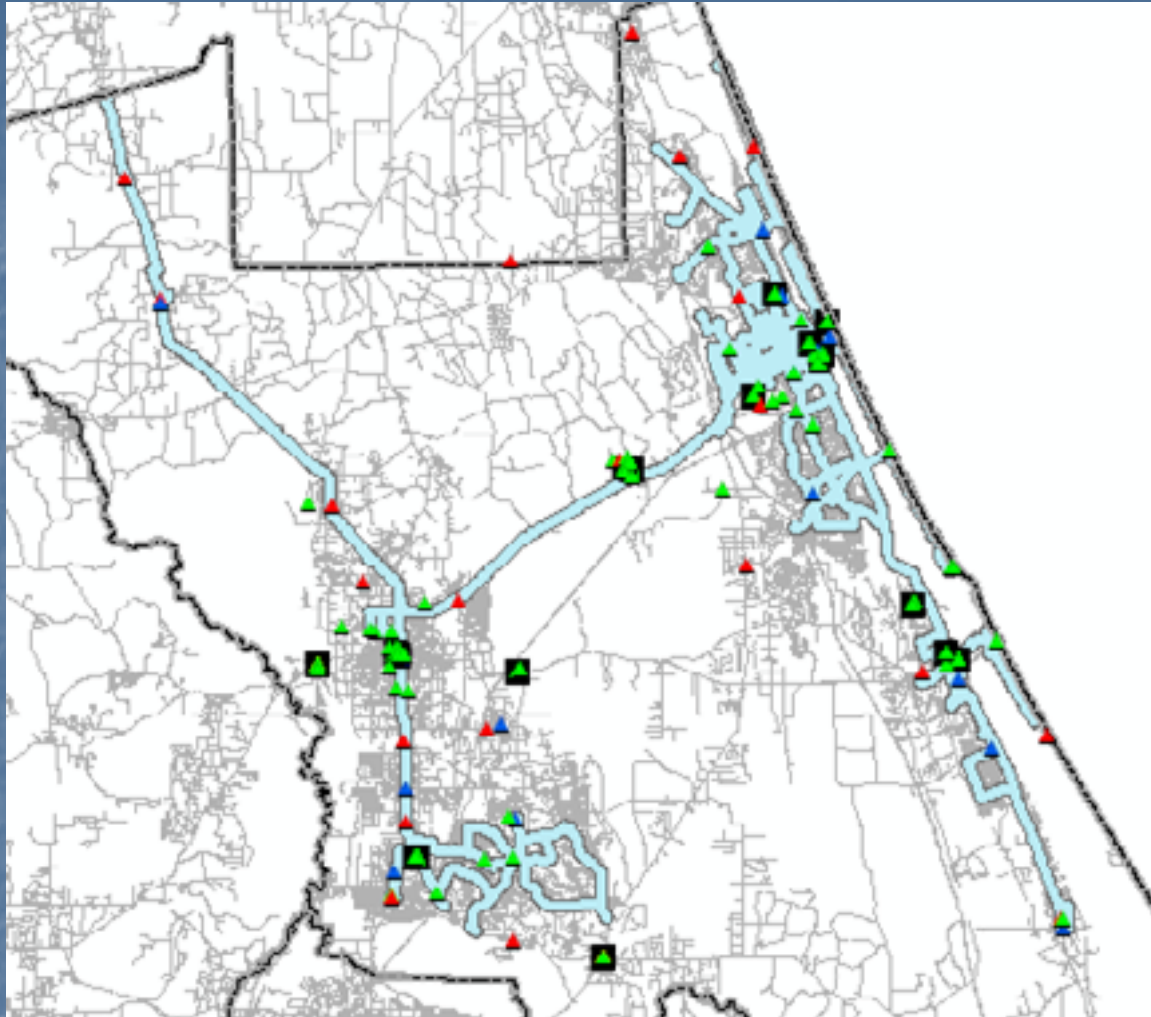
Park & Ride locations were obtained from LYNX, the Regional Transportation Authority and confirmed against County VOTRAN data.

We already had location and ownership information on 123 separate large County shopping Centers that could potentially provide parking.

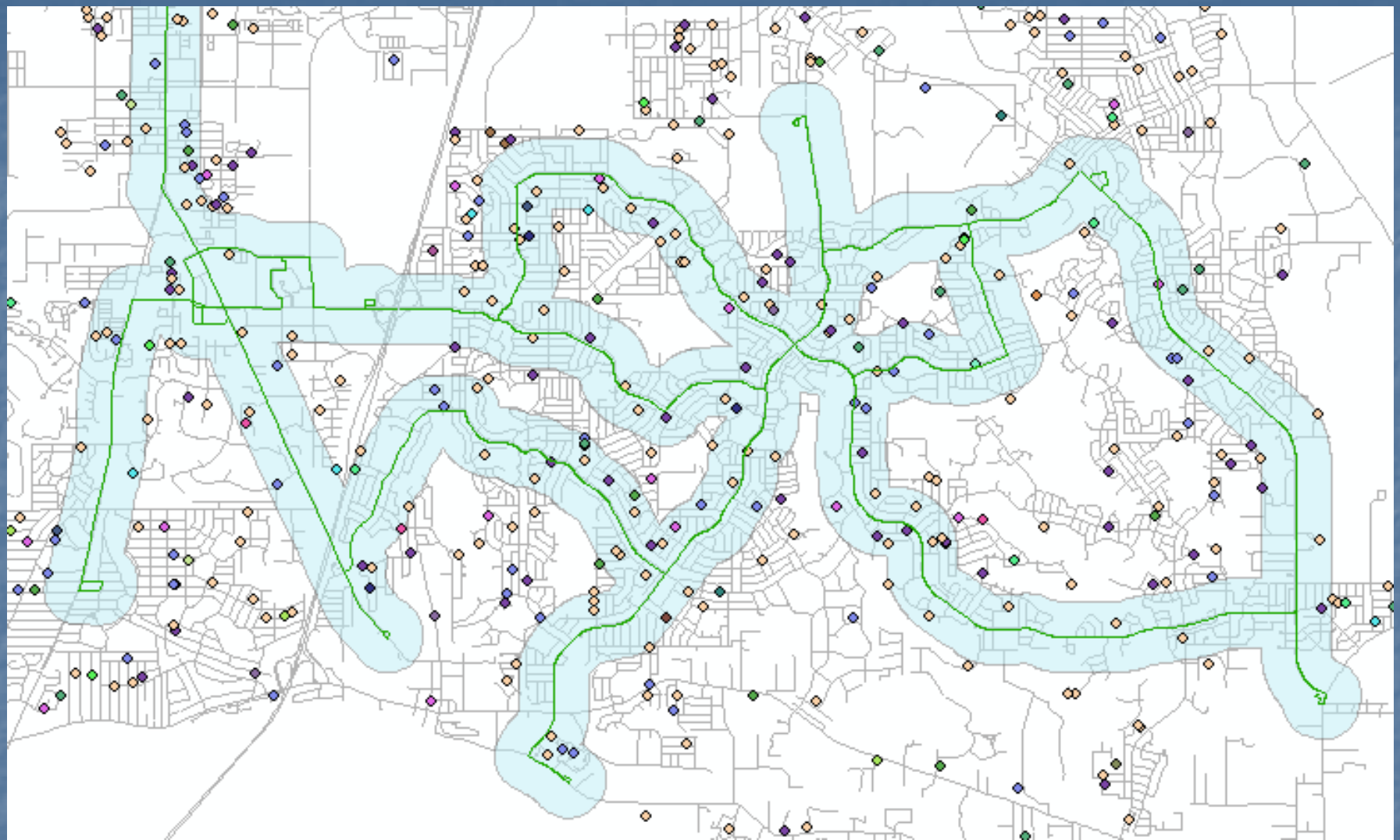




We even compared and contrasted LYNX and VOTRAN bus routes.



A comparison of County work locations and a ¼ mile buffer on VOTRAN bus routes was run. Then a similar process against employees homes within the buffer



While 969 employees live within the buffer zone, only 475 both live and work within ¼ mile of an existing bus route.

So where do we go from here?

- The drop in fuel prices moved this to project to the “back burner”.
- This workflow was offered to our member municipalities should they wish to take advantage.
- Some shopping centers have been approached for use as Park & Ride locations.
- Fleet Services offered up to six county vans for possible van pooling if departments decide to take advantage.
- Teleworking proposals being discussed.



Teleworking, because sometimes, you just can't get to the office...

So where do we go from here?

- VOTRAN, Environmental Management and Human Resources using the data to encourage car pooling.
- Workplace modifications being discussed.
- “Green” travel being encouraged...biking and walking





Volusia County's public transit system

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Commuter Assistance Program

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More than 56,000 commuters live in Volusia County and work in Brevard, Orange and Seminole counties. Votran, Volusia County's public transit system, offers four **Commuter Assistance Programs** (CAP) which can benefit both employers and employees. These include:

Guaranteed Ride Home
Volusia/Orlando I-4 Express
Park and Ride lots

RideShare matching
Van Pooling
Sunrail

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... all in all, many interesting possibilities exist to use the data identified.

Questions?

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