

Using ArcGIS Mobile



For Road Inventory And Management



Background

- 174 Miles of Road to Maintain
- Limited Personnel, Must Outsource Large Projects
- 30 Year Backlog on Drainage and Street Repairs
- Outdated Work Order Management System

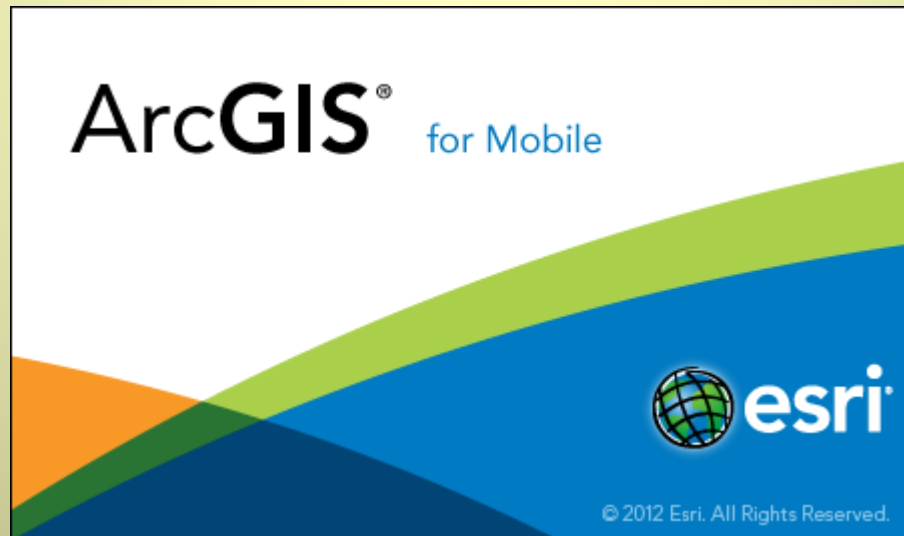
Problem

“I have X Dollars Budgeted for Road Maintenance This Year, What Roads Are Getting Fixed This Year.”

Can This Be Accomplished With GIS?

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Yes



Why ArcMobile for Desktop

- Budget Constraints Prevent Purchase of ArcServer
- ArcMobile for Desktop Included With Basic, Standard, and Advanced License
- Easy to Learn
- Easy to Deploy
- Low Cost Solution to Data Collection

Phase One

Hardware Selection

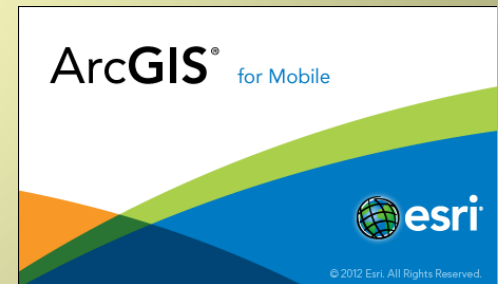
- Acer Iconia Tab W500p
 - Windows 7 Tablet
- Dual Electronics XGPS150A
 - Universal Bluetooth GPS (1-3 Meter WAAS)



Phase Two

Software Setup

➤ Software Installation



Phase Three

- Interview Street Department Superintendant & Public Works Director
 - Special Requests
 - Specific Data Requirements

Phase Four

- Database Creation
 - What Attributes
 - Domains

Phase Four

➤Fields, Description, Domains

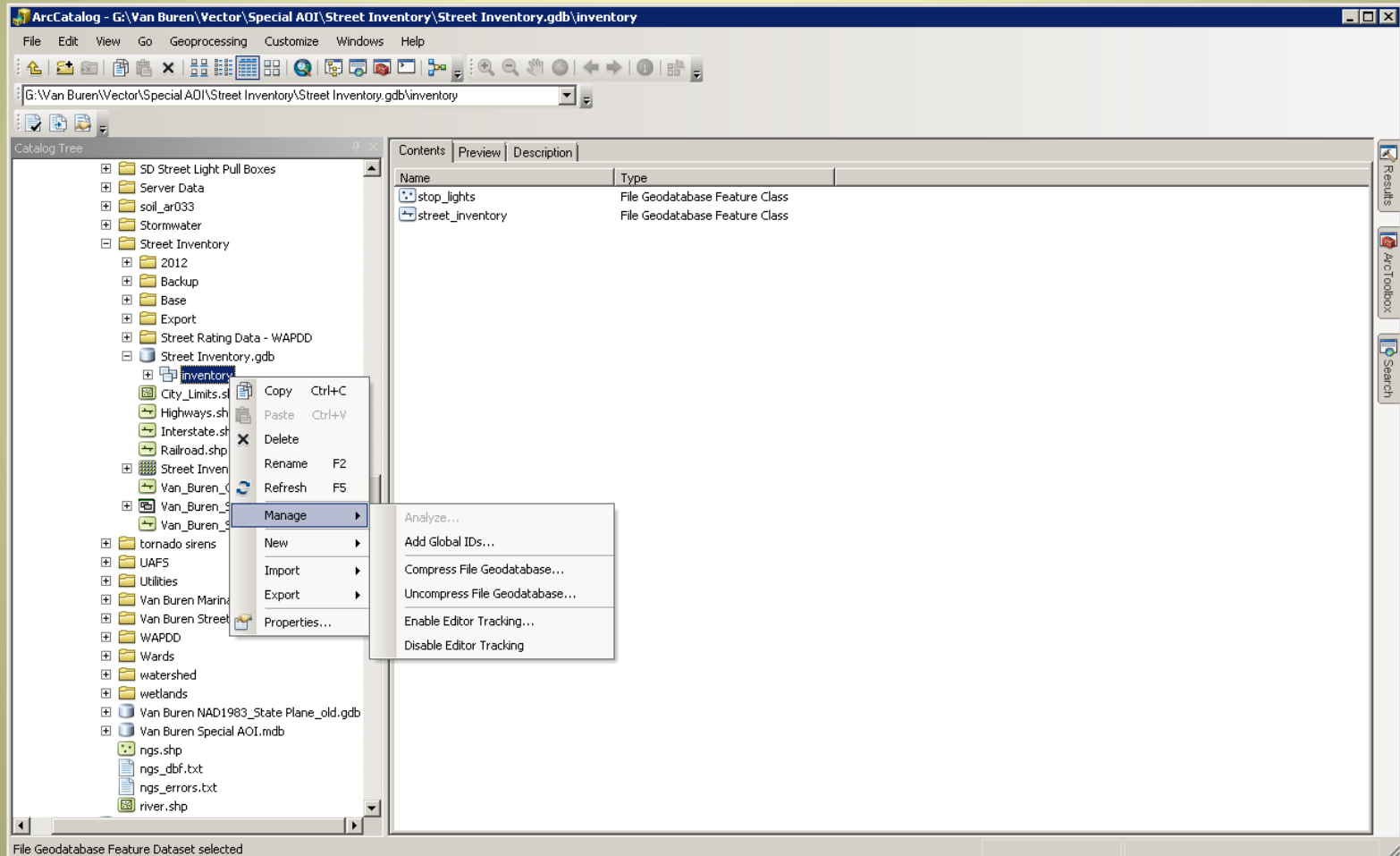
STREET	Name of Street	
CLASSIFICATION	Street Type	Arterial, Collector, Local
SURFACE CONDITION	Scale 1-10	1 = Worst 10 = Best
DRAINAGE CONDITION	Scale 1-10	1 = Worst 10 = Best
SURFACE TYPE	Material of Road	Asphalt, Gravel, Dirt
PAVEMENT WIDTH	Measurement	
LEFT CURB	Is There Curb	Yes, No
RIGHT CURB	Is There Curb	Yes, No
LEFT SHOULDER MATERIAL	Material of Shoulder	Grass, Concrete, Asphalt
RIGHT SHOULDER MATERIAL	Material of Shoulder	Grass, Concrete, Asphalt
LEFT SHOULDER WIDTH	Measurement	
RIGHT SHOULDER WIDTH	Measurement	
MILES	Length	
MINUTES	Travel Time	
SPEED	Speed Limit	
TRAFFIC COUNT	Traffic Count of Location	
COMMENT	Misc Information	

Phase Four

- Database Creation
 - What Attributes
 - Domains
- Special Considerations
 - Data Must Be In Esri File Geodatabase
 - Editable Features In ArcMobile REQUIRE a Global ID

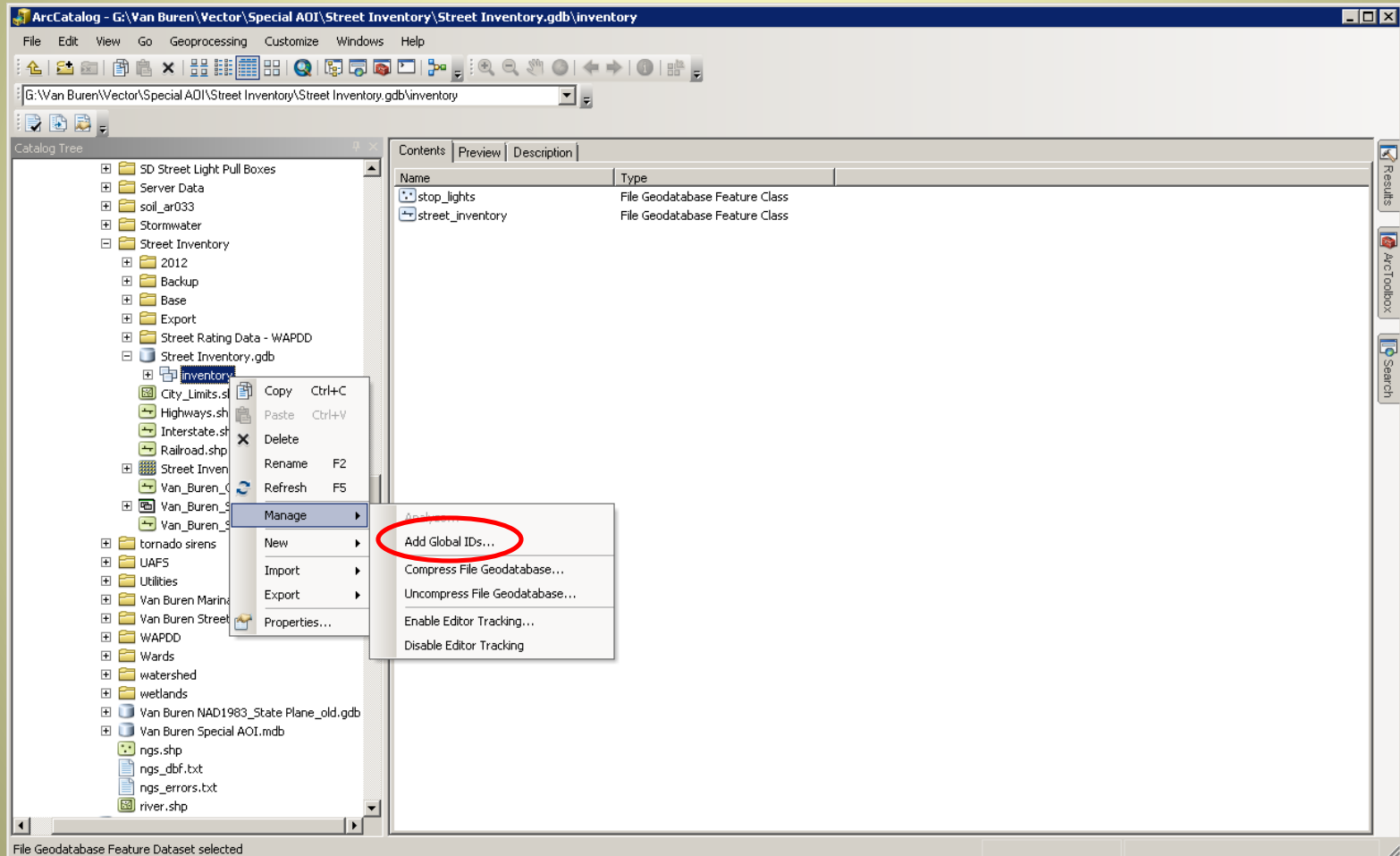
Phase Four

➤ Esri Global ID



Phase Four

➤ Esri Global ID



Phase Four

- Keep It Simple
- Surface Condition

Phase Four

- Keep It Simple
- Surface Condition
 - 1-3 Bad



Phase Four

- Keep It Simple
- Surface Condition

- 4-7 Fair



Phase Four

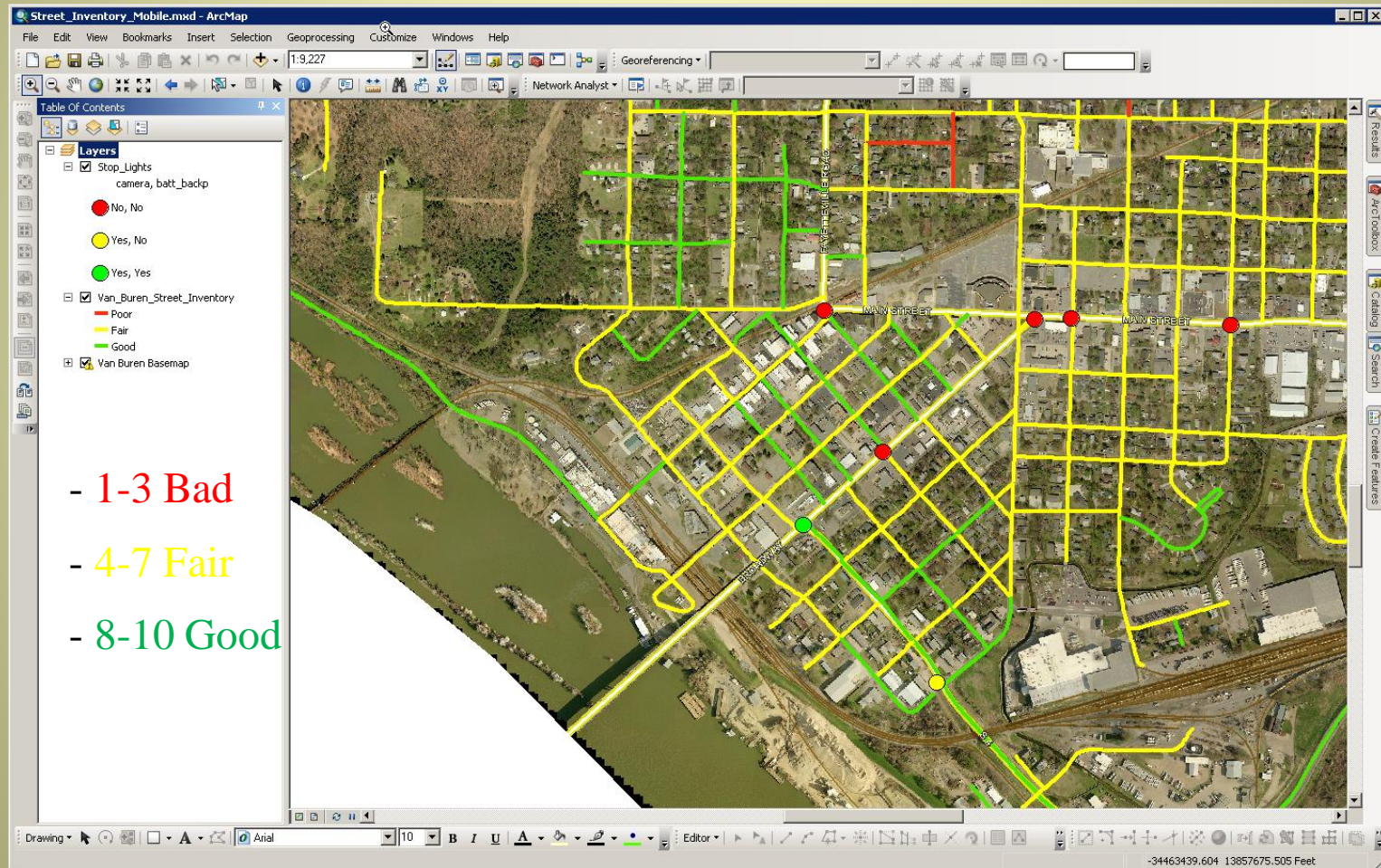
- Keep It Simple
- Surface Condition

- 8-10 Good



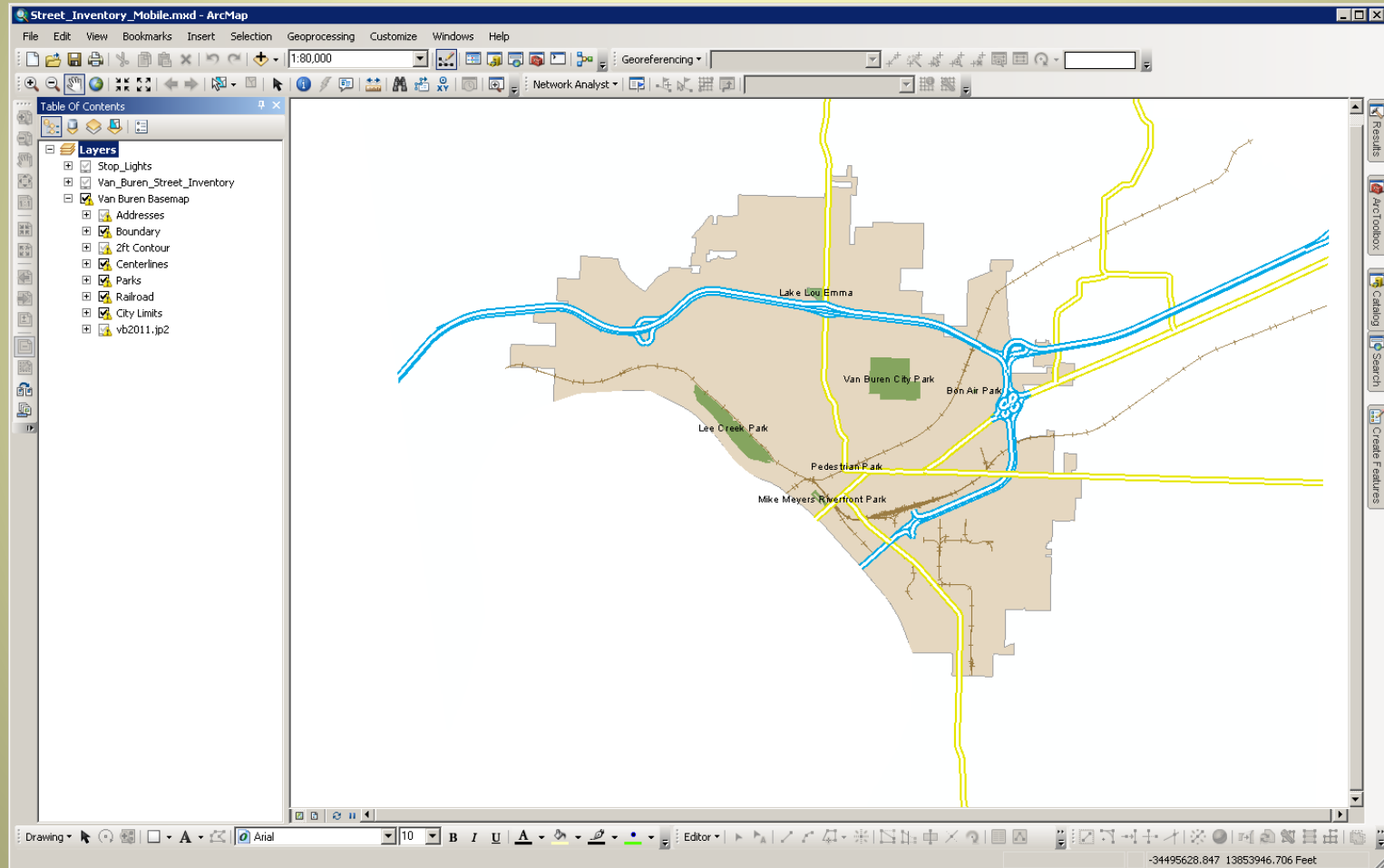
Phase Five

➤ Create the Application



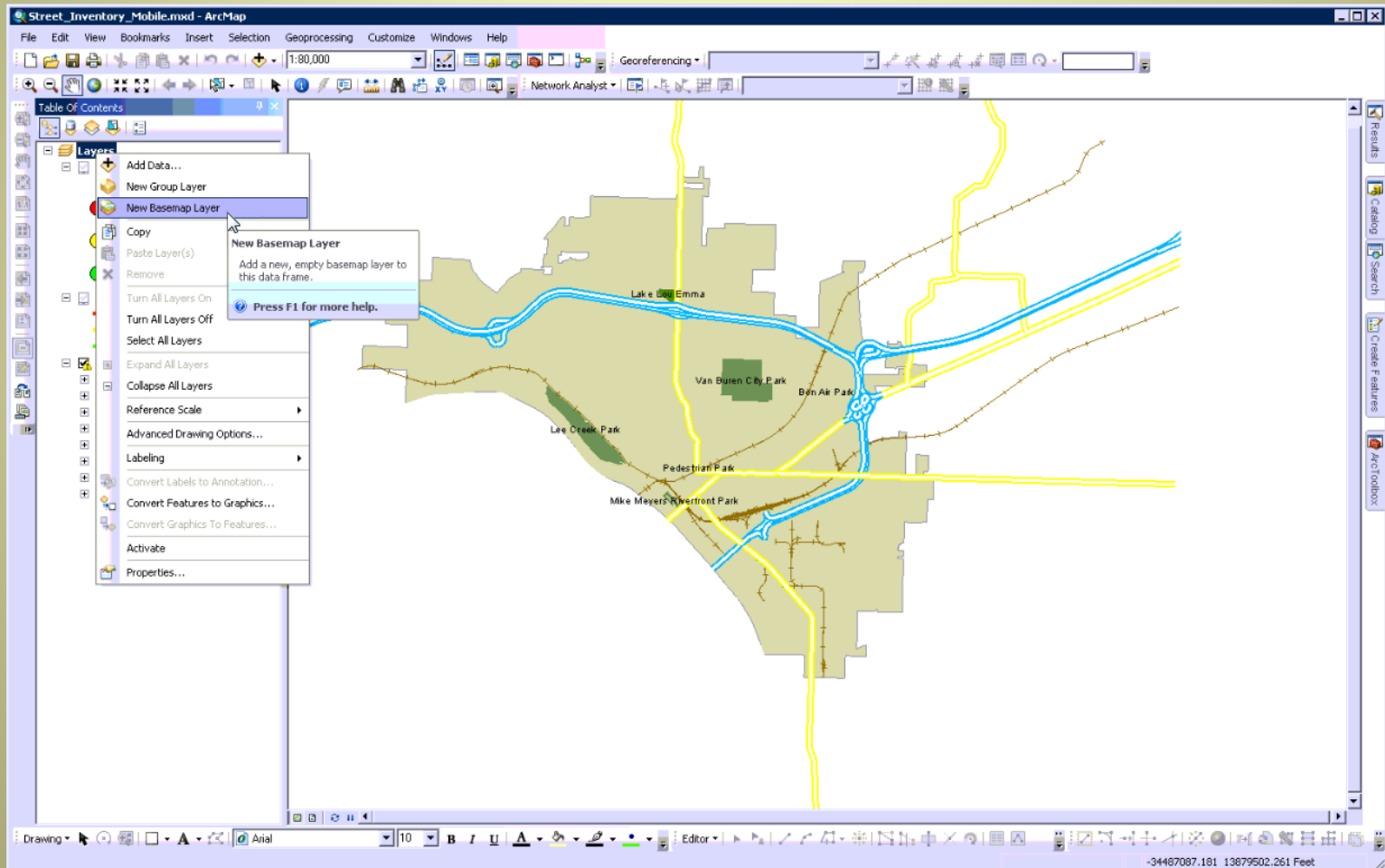
Phase Five

➤ Tile Cache (Basemap)



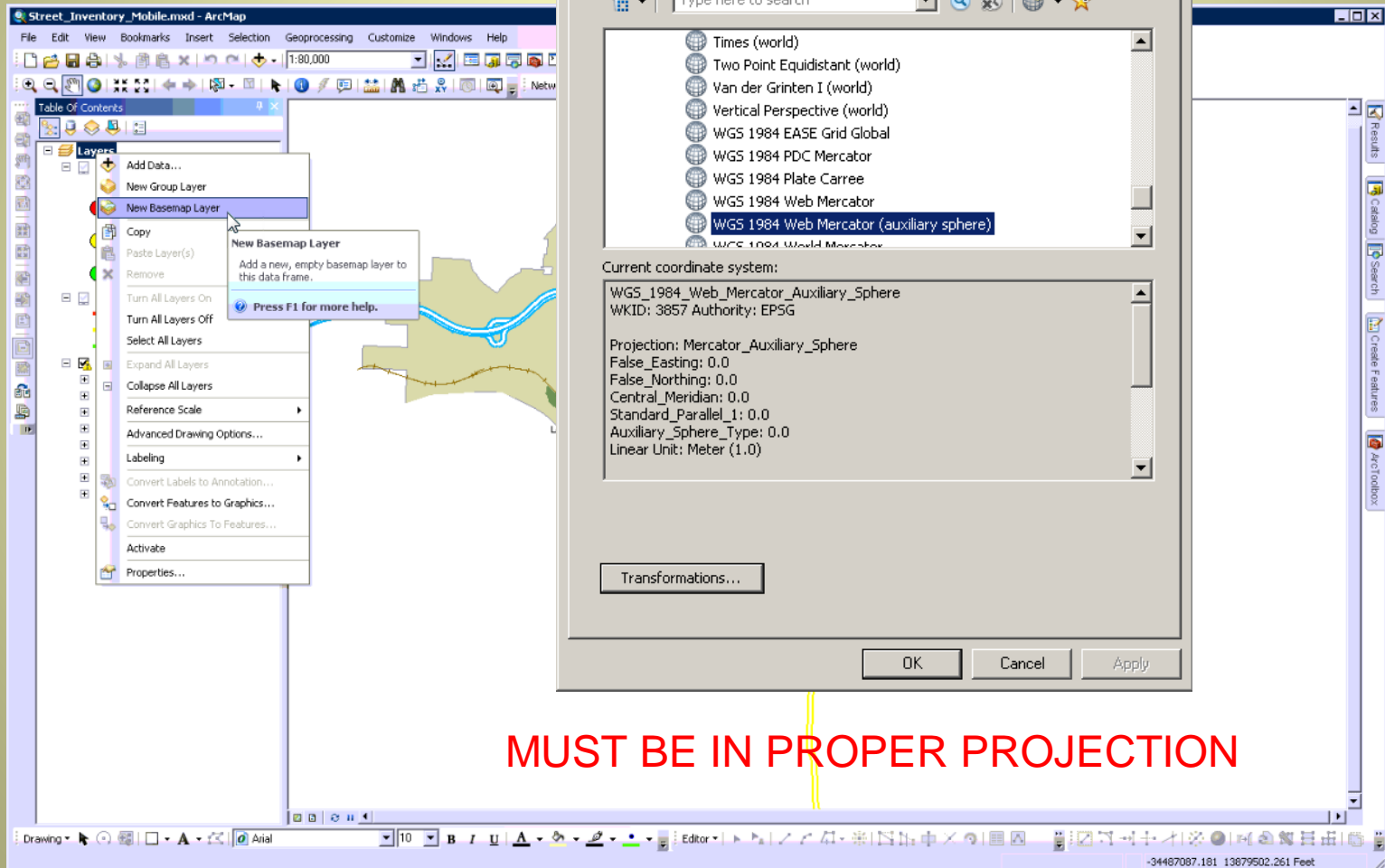
Phase Five

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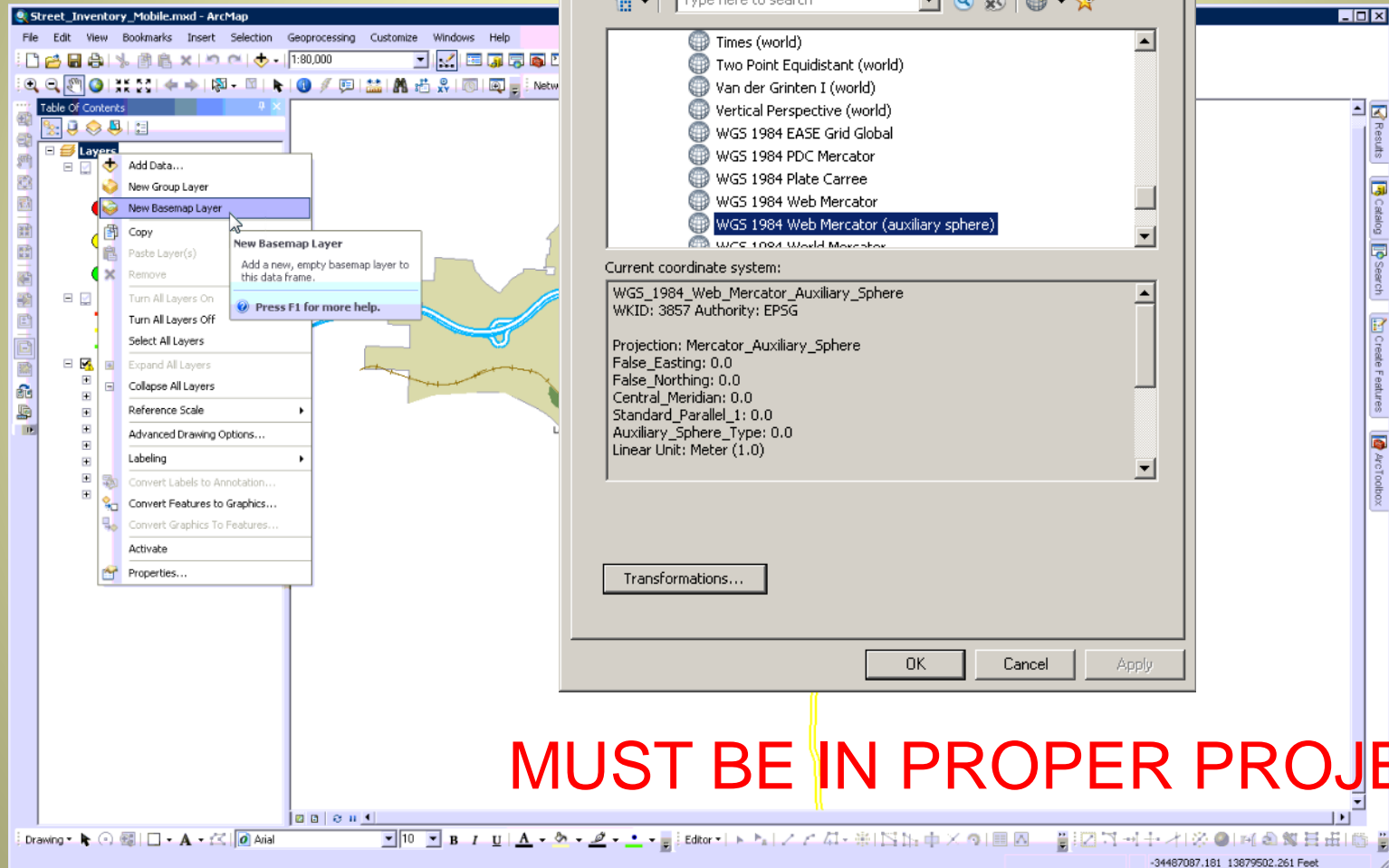
Phase Five

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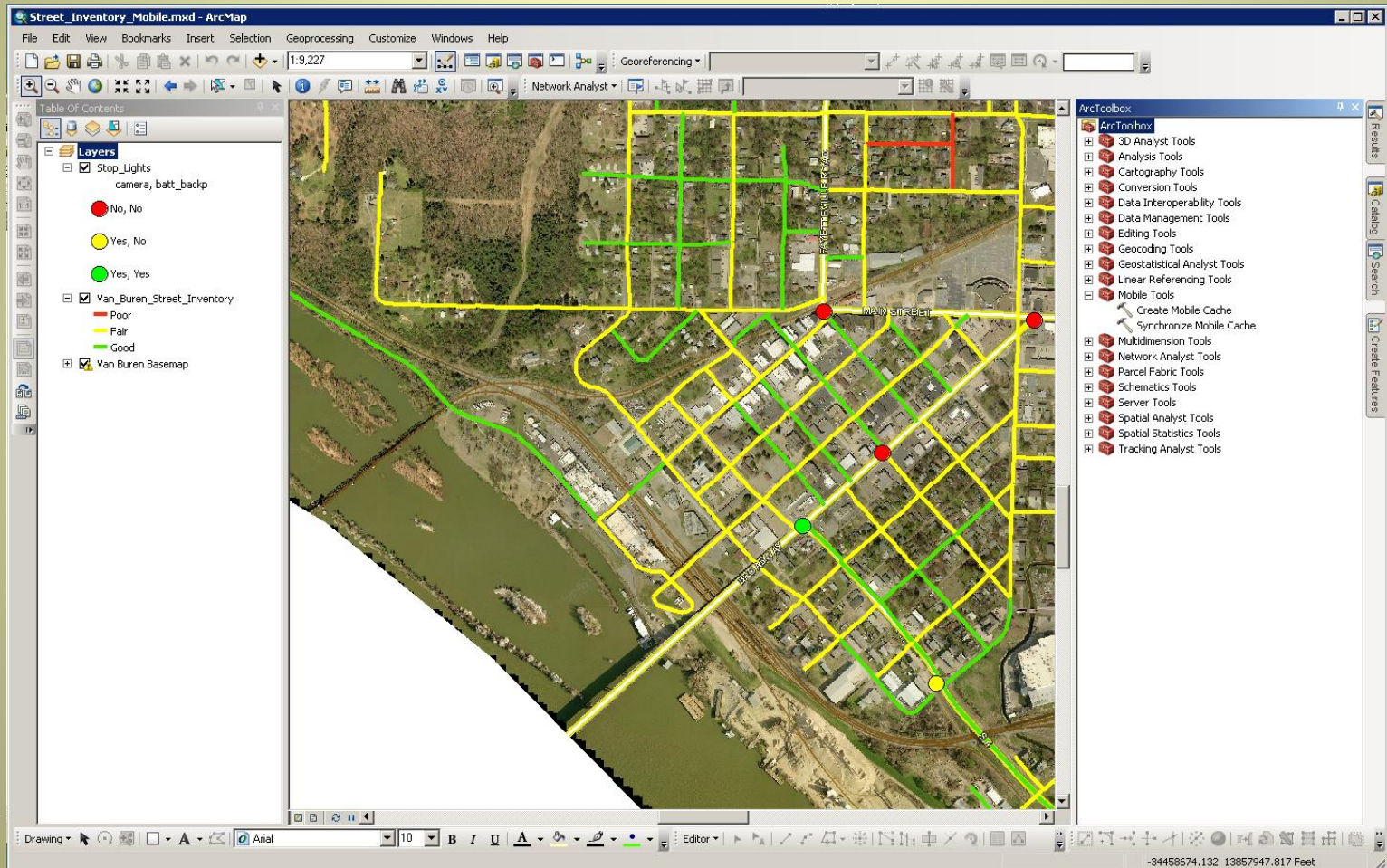


Phase Five

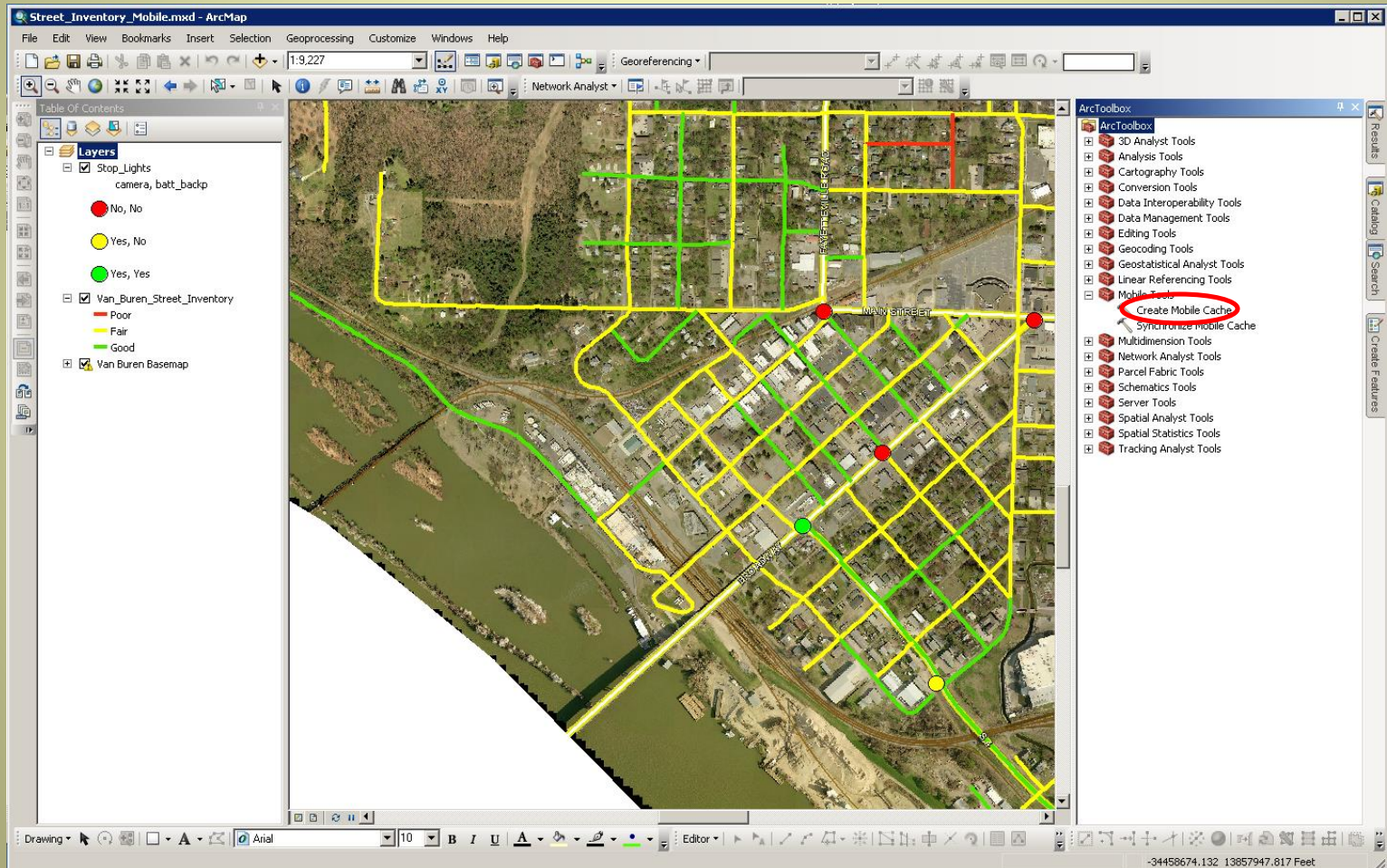
➤ Tile Cache (Basemap)



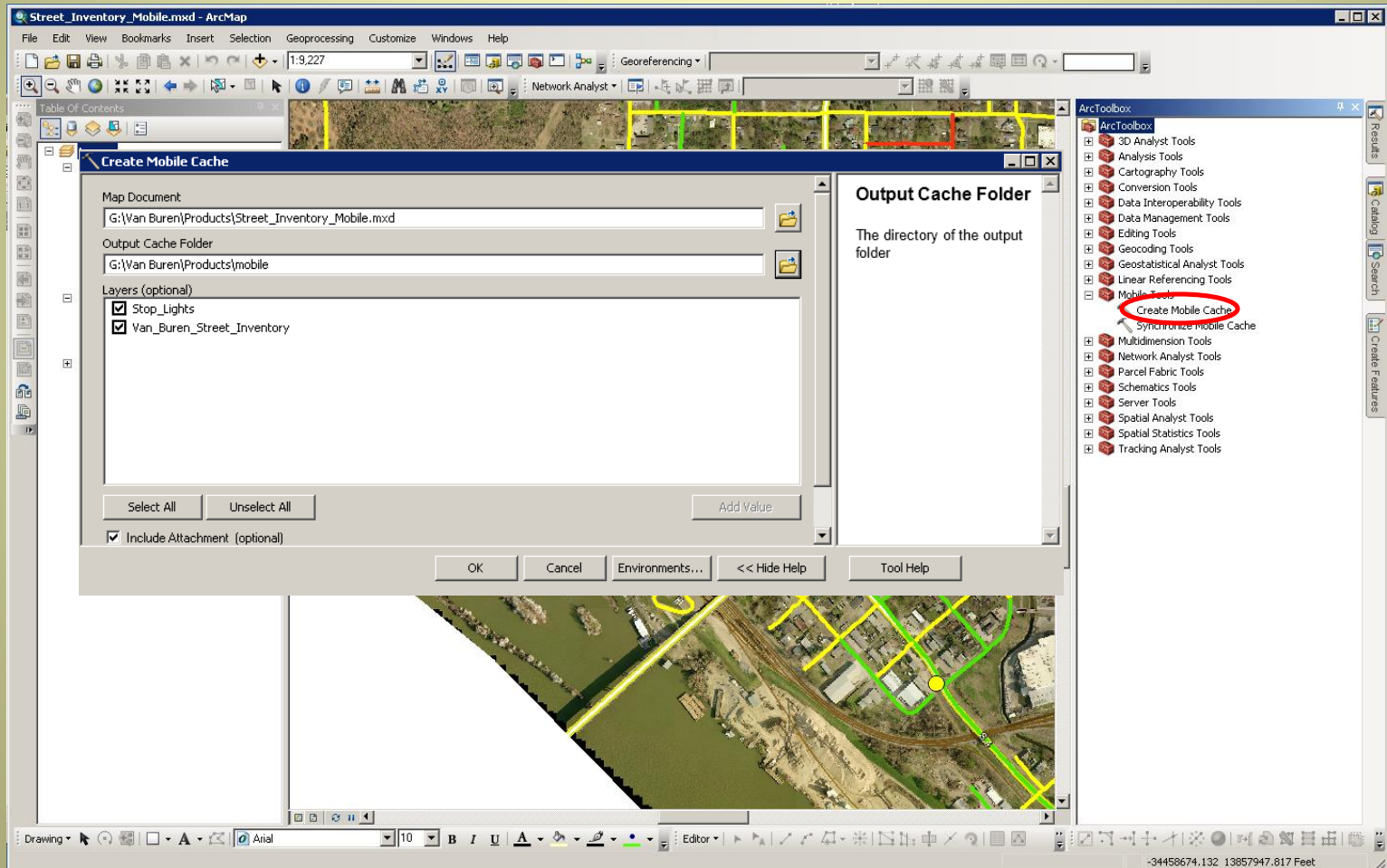
Phase Five



Phase Five

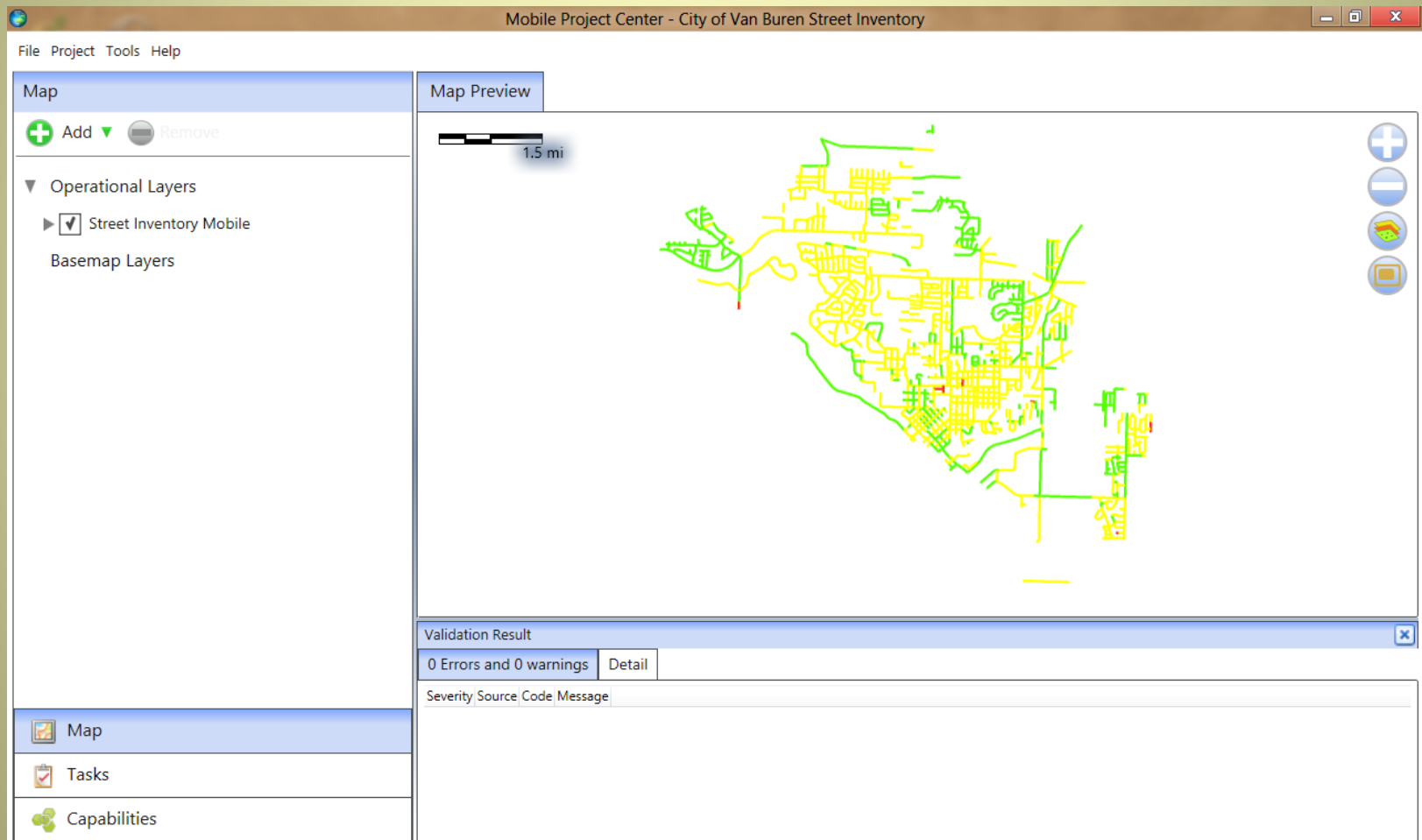


Phase Five



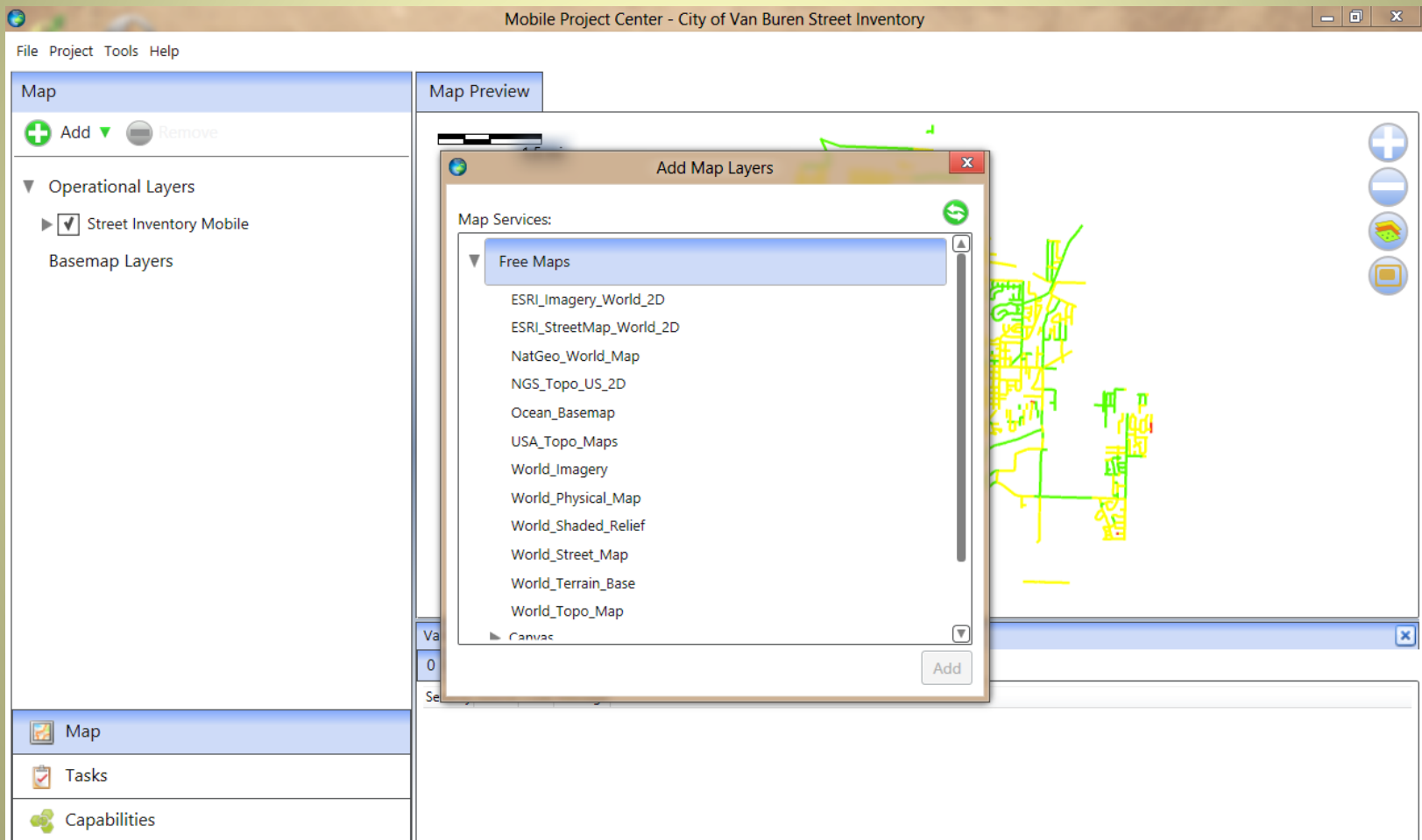
Phase Five

ArcGIS Mobile Project Center



Phase Five

➤ Tile Cache (Basemap)



Phase Five

Mobile Project Center - City of Van Buren Street Inventory

File Project Tools Help

Map

+ Add - Remove

Operational Layers

- Street Inventory Mobile
 - street_inventory

Basemap Layers

- image_tile_cache

Map Preview Layer Fields

Field	Viewing	Updating	Collecting
STREET [String]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CLASSIFICA [String]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SURFACE_CO [Double]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DRAINAGE_C [Double]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SURFACE_TY [String]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PAVEMENT_W [Double]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
LEFT_CURB [String]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
RIGHT_CURB [String]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
L_SHLDRMAT [String]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
R_SHLDRMAT [String]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
L_SHLDRWID [String]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
R_SHLDRWID [String]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MILES [Double]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Ensure Box Is Checked For Action You Are Wanting To Accomplish

Validation Result

0 Errors and 0 warnings Detail

Severity Source Code Message

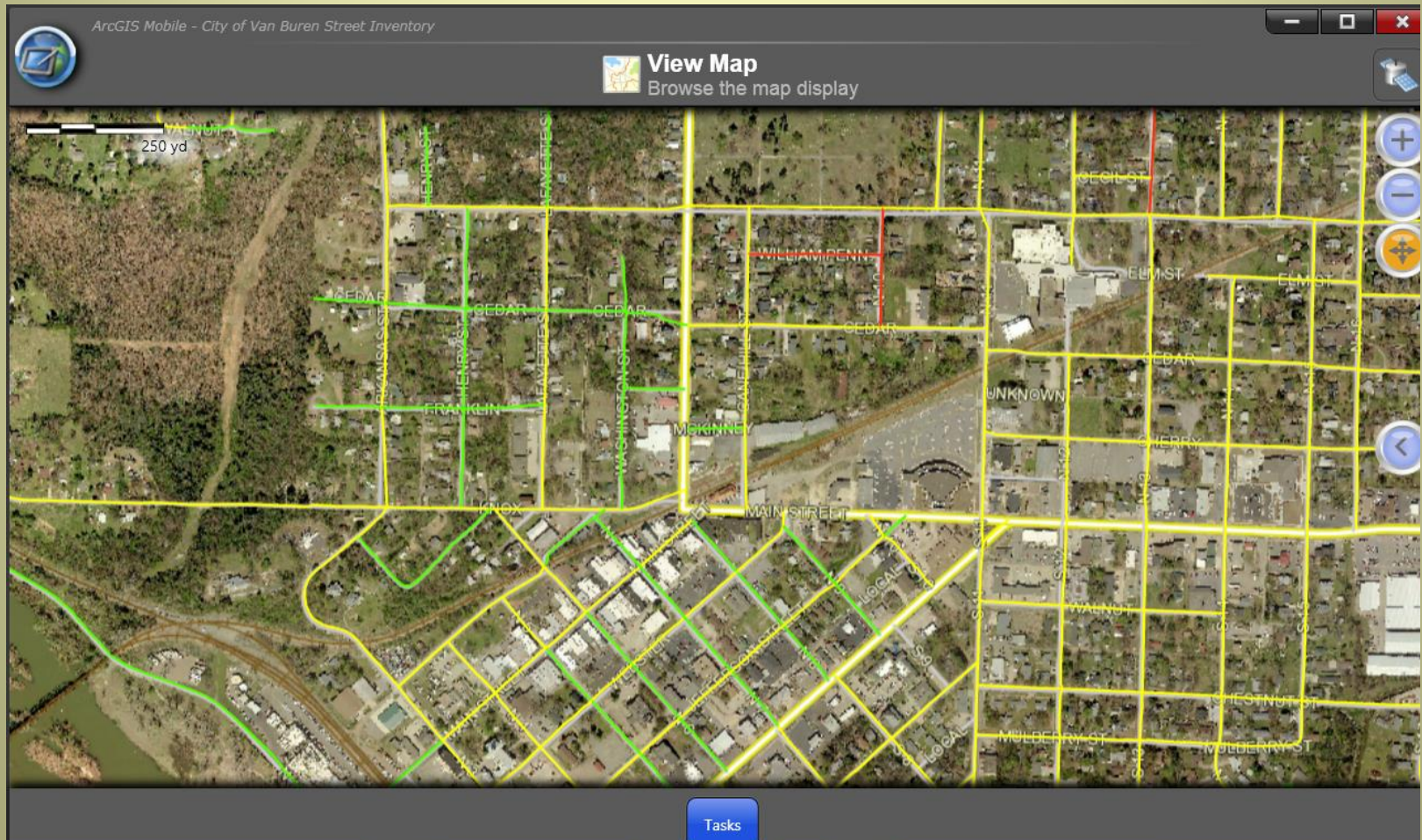
Map

Tasks

Capabilities

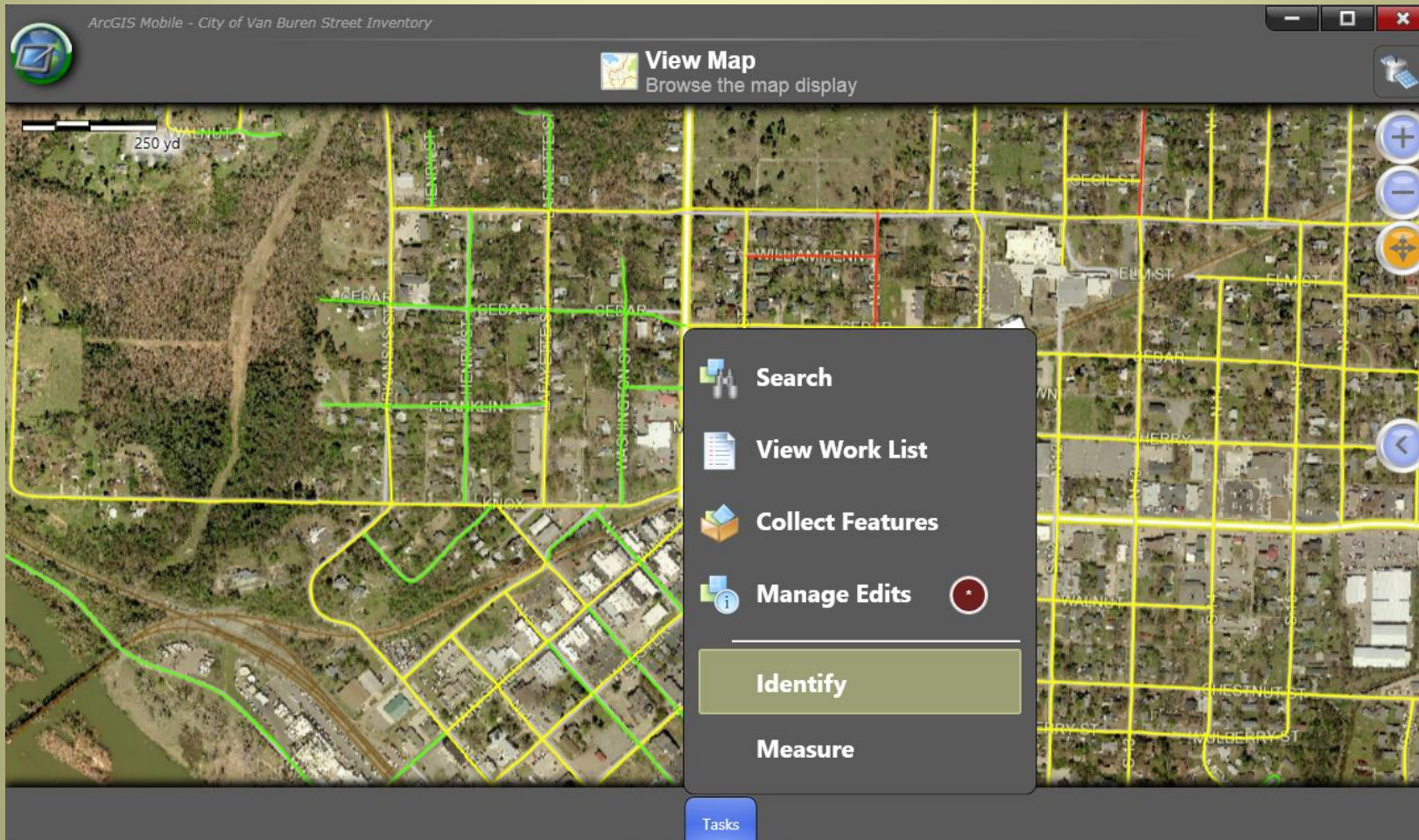
Phase Six

ArcMobile



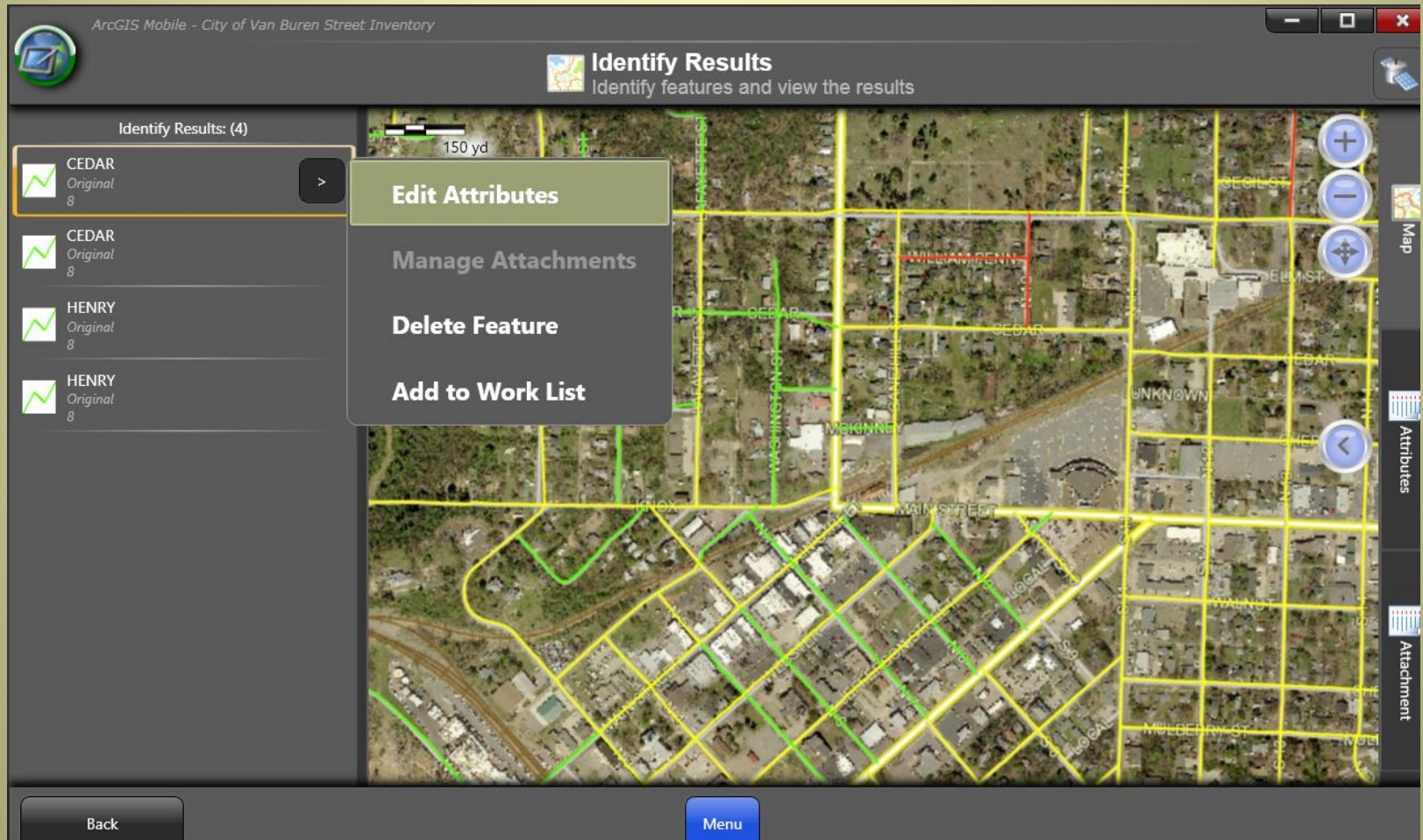
Phase Six

ArcMobile



Phase Six

ArcMobile



Phase Six

ArcMobile

ArcGIS Mobile - City of Van Buren Street Inventory

 **Edit Attributes**
Click an attribute to edit its value

STREET	CEDAR	>
CLASSIFICA	Local	>
SURFACE_CO	8	>
DRAINAGE_C	5	>
SURFACE_TV	Pavement	>
PAVEMENT_W	20	>

Cancel Finish

Phase Six

ArcMobile

ArcGIS Mobile - City of Van Buren Street Inventory

Edit Attributes

SURFACE_CO

8

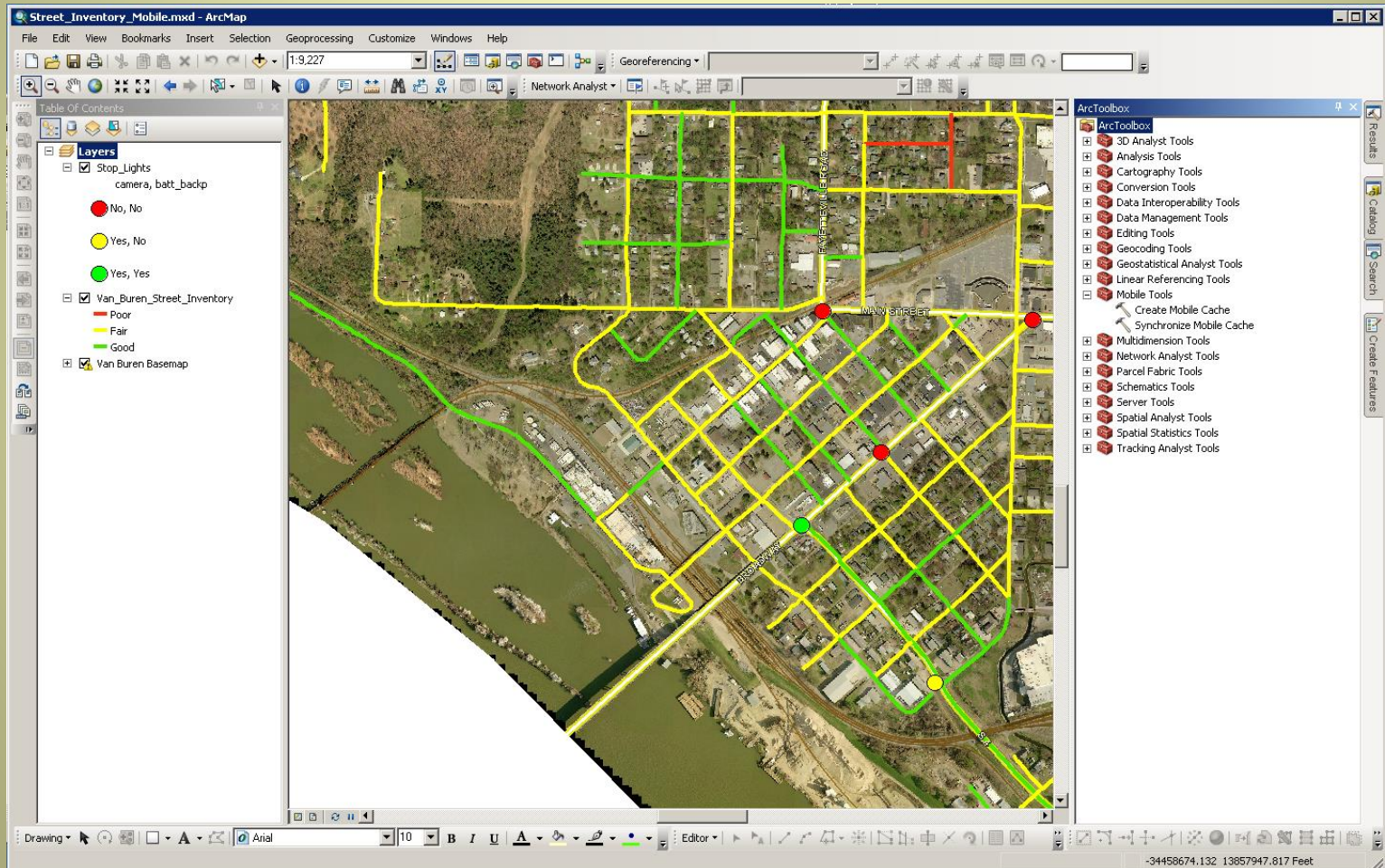
Enter a numeric value.

1	2	3	.	Tab	Bksp	Del
4	5	6	-	Home	↑	End
7	8	9	0	←	↓	→

Cancel Ok

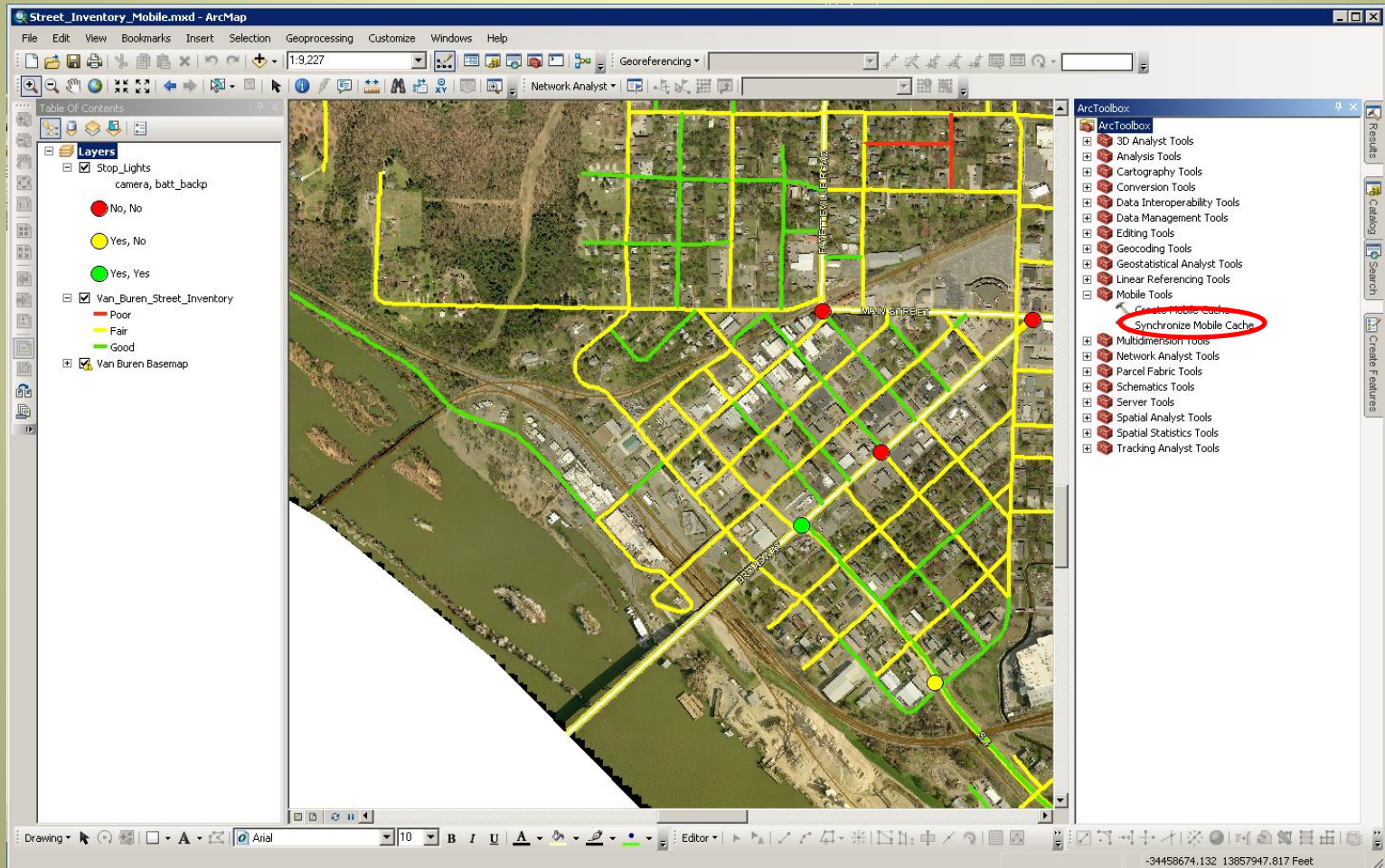
Final Phase

Synchronization



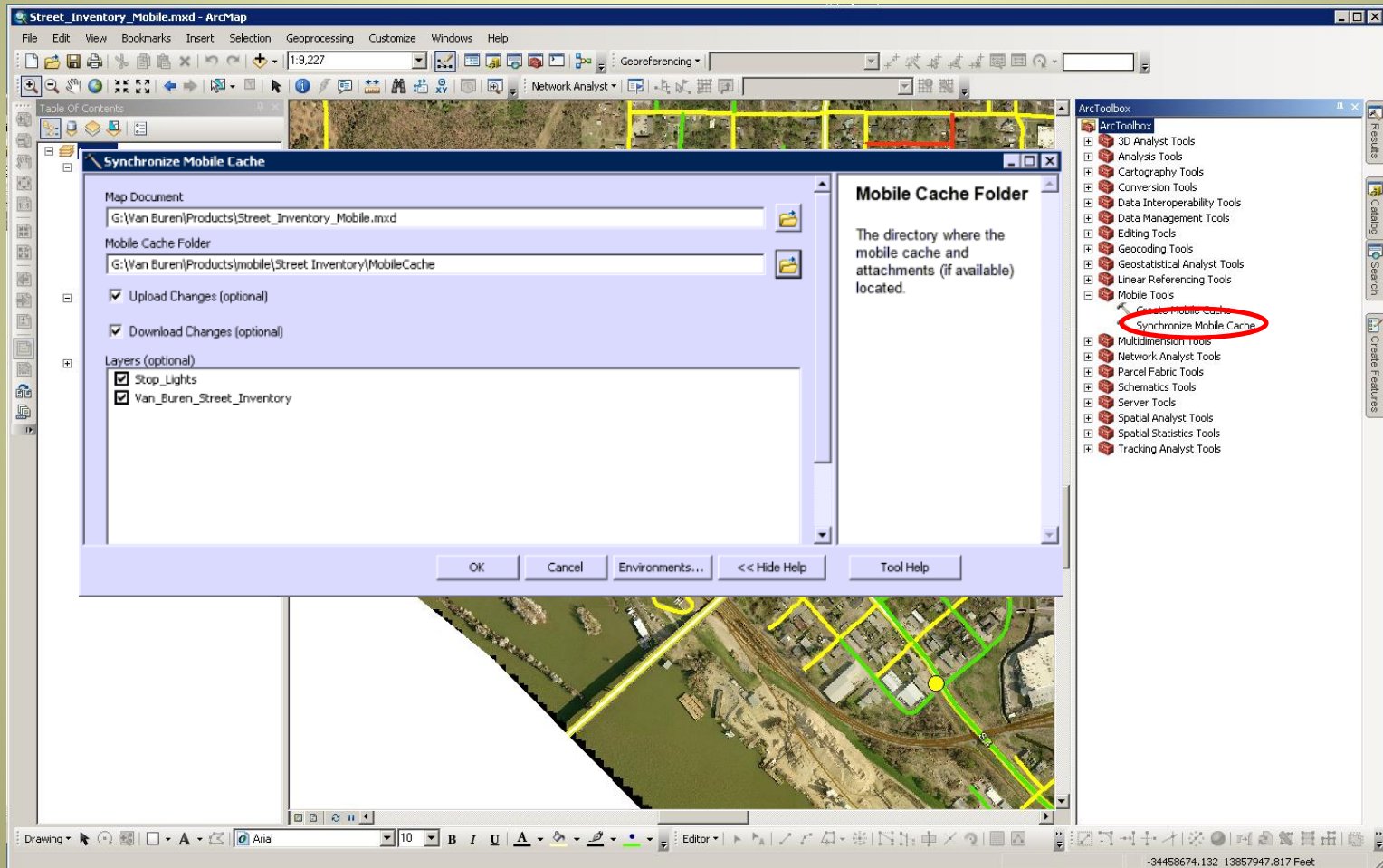
Final Phase

Synchronization



Final Phase

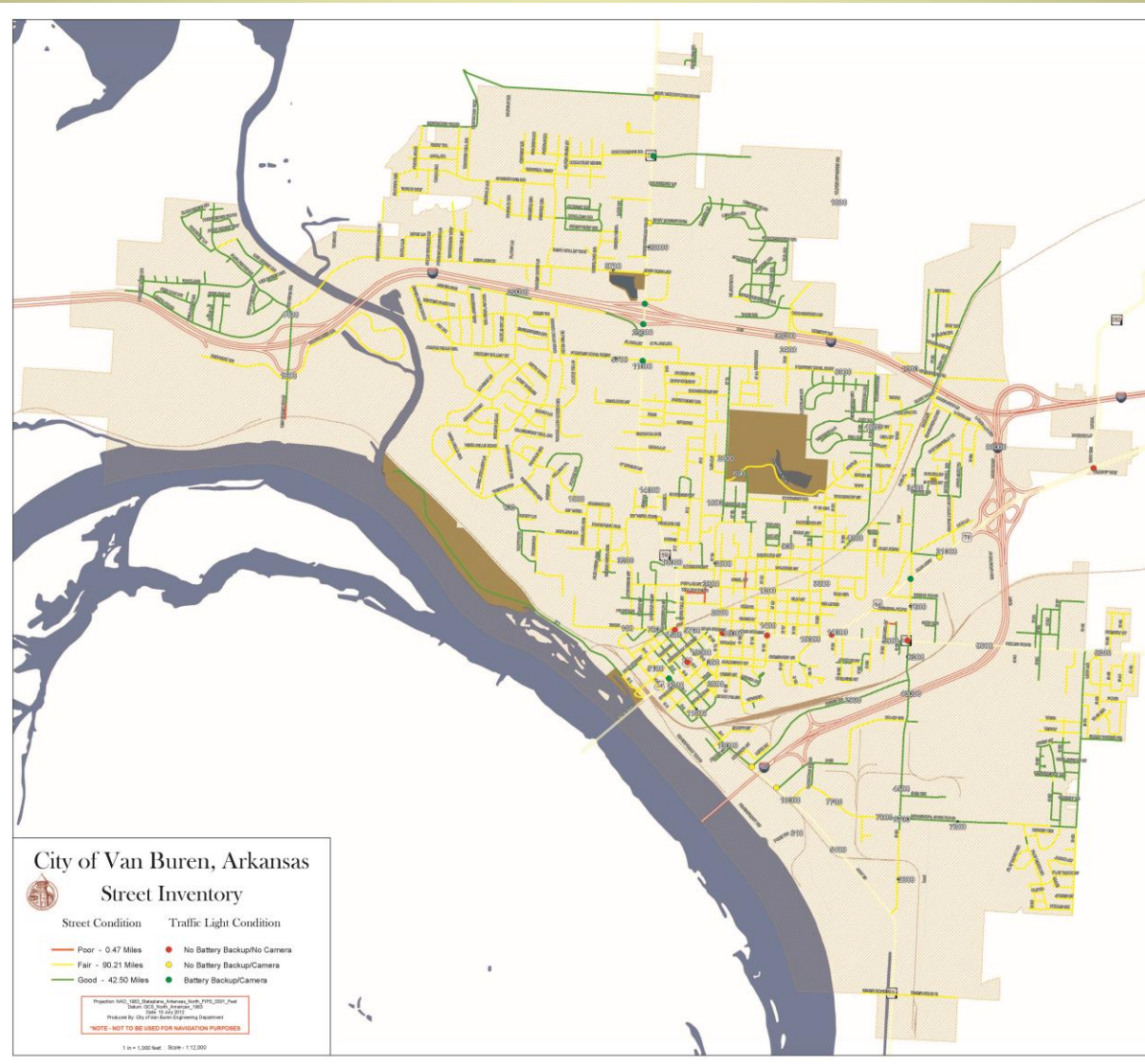
Synchronization



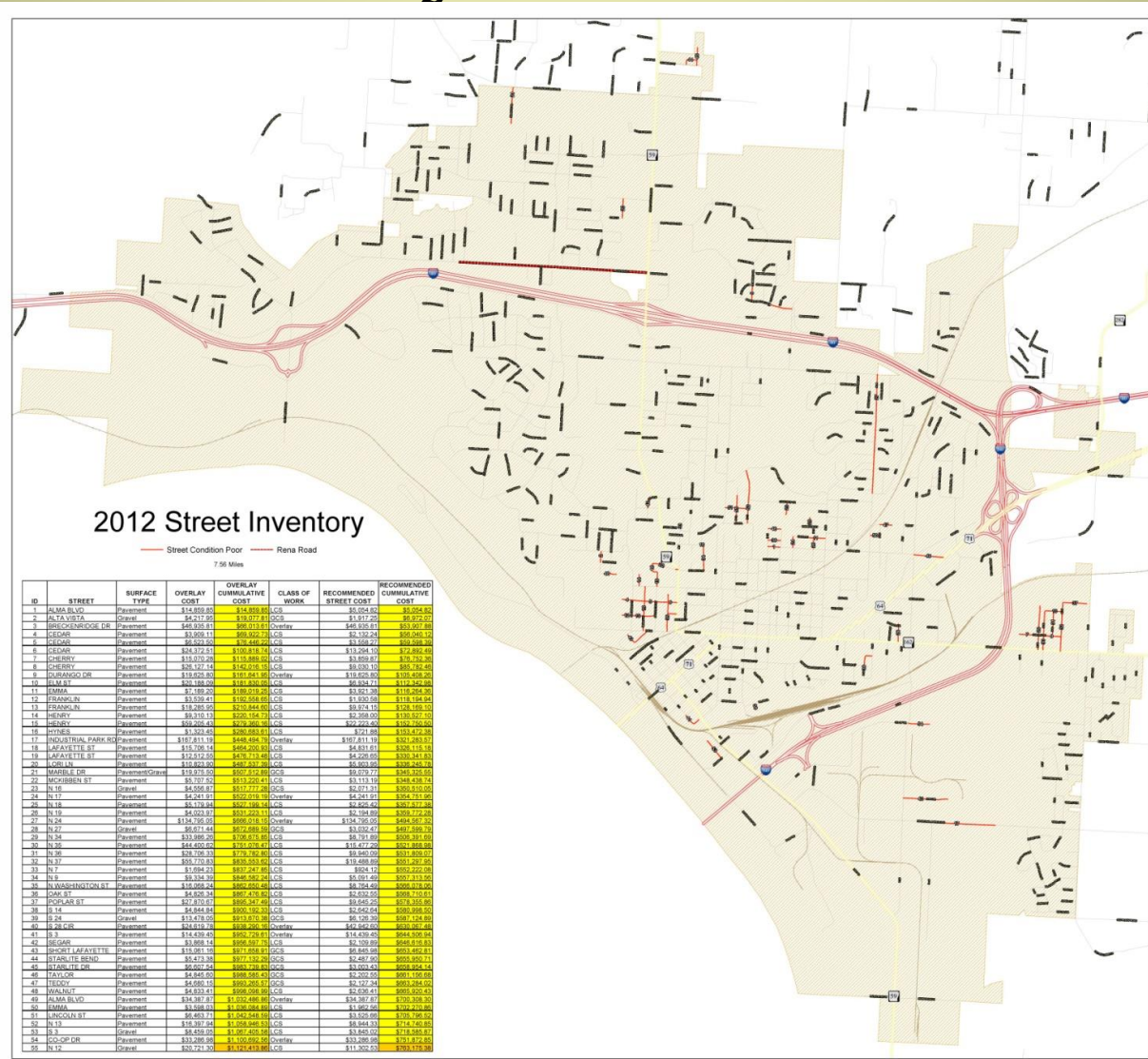
Back To The Problem

“I have X Dollars Budgeted for Road Maintenance This Year, What Roads Are Getting Fixed This Year.”

Results



Analysis Results



Analysis Results

ID	STREET	SURFACE TYPE	OVERLAY COST	OVERLAY CUMMULATIVE COST	CLASS OF WORK	RECOMMENDED STREET COST	RECOMMENDED CUMMULATIVE COST
1	ALMA BLVD	Pavement	\$14,859.85	\$14,859.85	LCS	\$5,054.82	\$5,054.82
2	ALTA VISTA	Gravel	\$4,217.95	\$19,077.81	GCS	\$1,917.25	\$6,972.07
3	BRECKENRIDGE DR	Pavement	\$46,935.81	\$66,013.61	Overlay	\$46,935.81	\$53,907.88
4	CEDAR	Pavement	\$3,909.11	\$69,922.73	LCS	\$2,132.24	\$56,040.12
5	CEDAR	Pavement	\$8,523.50	\$78,446.23	LCS	\$3,558.27	\$59,598.39
6	CEDAR	Pavement	\$24,372.51	\$100,818.74	LCS	\$13,294.10	\$72,892.49
7	CHERRY	Pavement	\$15,070.28	\$115,889.02	LCS	\$3,859.87	\$76,752.36
8	CHERRY	Pavement	\$26,127.14	\$142,016.15	LCS	\$9,030.10	\$85,782.46
9	DURANGO DR	Pavement	\$19,625.80	\$161,641.95	Overlay	\$19,625.80	\$105,408.26
10	ELM ST	Pavement	\$20,188.08	\$181,830.05	LCS	\$6,934.71	\$112,342.98
11	EMMA	Pavement	\$7,189.20	\$189,019.25	LCS	\$3,921.38	\$116,264.36
12	FRANKLIN	Pavement	\$3,539.41	\$192,558.65	LCS	\$1,930.58	\$118,194.94
13	FRANKLIN	Pavement	\$18,285.95	\$210,844.60	LCS	\$9,874.15	\$128,169.10
14	HENRY	Pavement	\$9,310.13	\$220,154.73	LCS	\$2,358.00	\$130,527.10
15	HENRY	Pavement	\$58,205.43	\$278,360.16	LCS	\$22,223.40	\$152,750.50
16	HYNES	Pavement	\$1,323.45	\$280,683.61	LCS	\$721.88	\$153,472.38
17	INDUSTRIAL PARK RD	Pavement	\$167,811.19	\$448,494.79	Overlay	\$167,811.19	\$321,283.57
18	LAFAYETTE ST	Pavement	\$15,708.14	\$464,200.93	LCS	\$4,831.61	\$326,115.18
19	LAFAYETTE ST	Pavement	\$12,512.55	\$476,713.48	LCS	\$4,226.65	\$330,341.83
20	LORILYN	Pavement	\$10,823.90	\$487,537.38	LCS	\$5,903.95	\$336,245.78
21	MARBLE DR	Pavement/Grave	\$19,975.50	\$507,512.89	GCS	\$9,079.77	\$345,325.55
22	MCKIBBEN ST	Pavement	\$5,707.52	\$513,220.41	LCS	\$3,113.19	\$348,438.74
23	N 16	Gravel	\$4,556.87	\$517,777.28	GCS	\$2,071.31	\$350,510.05
24	N 17	Pavement	\$4,241.91	\$522,019.19	Overlay	\$4,241.91	\$354,751.96
25	N 18	Pavement	\$5,179.94	\$527,199.14	LCS	\$2,825.42	\$357,577.38
26	N 19	Pavement	\$4,023.97	\$531,223.11	LCS	\$2,194.89	\$359,772.28
27	N 24	Pavement	\$134,795.05	\$666,018.15	Overlay	\$134,795.05	\$494,567.32
28	N 27	Gravel	\$6,671.44	\$672,689.59	GCS	\$3,032.47	\$497,599.79
29	N 34	Pavement	\$33,988.28	\$706,675.85	LCS	\$8,791.89	\$506,391.69
30	N 35	Pavement	\$44,400.62	\$751,076.47	LCS	\$15,477.29	\$521,868.98
31	N 36	Pavement	\$28,706.33	\$779,782.80	LCS	\$9,940.09	\$531,809.07
32	N 37	Pavement	\$55,770.83	\$835,553.62	LCS	\$19,488.89	\$551,297.95
33	N 7	Pavement	\$1,694.23	\$837,247.85	LCS	\$924.12	\$552,222.08
34	N 9	Pavement	\$9,334.39	\$846,582.24	LCS	\$5,091.49	\$557,313.56
35	N WASHINGTON ST	Pavement	\$16,088.24	\$862,650.48	LCS	\$8,784.49	\$566,078.06
36	OAK ST	Pavement	\$4,826.34	\$867,476.82	LCS	\$2,632.55	\$568,710.61
37	POPLAR ST	Pavement	\$27,870.87	\$895,347.49	LCS	\$9,645.25	\$578,355.86
38	S 14	Pavement	\$4,844.84	\$900,192.33	LCS	\$2,642.64	\$580,998.50
39	S 24	Gravel	\$13,478.05	\$913,670.38	GCS	\$6,126.39	\$587,124.89
40	S 28 CIR	Pavement	\$24,619.78	\$938,290.16	Overlay	\$42,942.60	\$630,067.48
41	S 3	Pavement	\$14,439.45	\$952,729.61	Overlay	\$14,439.45	\$644,506.94
42	SEGAR	Pavement	\$3,868.14	\$956,597.75	LCS	\$2,109.89	\$646,616.83
43	SHORT LAFAYETTE	Pavement	\$15,061.16	\$971,658.91	GCS	\$6,845.98	\$653,462.81
44	STARLITE BEND	Pavement	\$5,473.38	\$977,132.29	GCS	\$2,487.90	\$655,950.71
45	STARLITE DR	Pavement	\$6,607.54	\$983,739.83	GCS	\$3,003.43	\$658,954.14
46	TAYLOR	Pavement	\$4,845.60	\$988,585.43	GCS	\$2,202.55	\$661,156.68
47	TEDDY	Pavement	\$4,680.15	\$993,265.57	GCS	\$2,127.34	\$663,284.02
48	WALNUT	Pavement	\$4,833.41	\$998,098.99	LCS	\$2,636.41	\$665,920.43
49	ALMA BLVD	Pavement	\$34,387.87	\$1,032,486.86	Overlay	\$34,387.87	\$700,308.30
50	EMMA	Pavement	\$3,598.03	\$1,036,084.89	LCS	\$1,982.56	\$702,270.86
51	LINCOLN ST	Pavement	\$6,483.71	\$1,042,568.59	LCS	\$3,525.66	\$705,796.52
52	N 13	Pavement	\$16,397.94	\$1,058,966.53	LCS	\$8,944.33	\$714,740.85
53	S 3	Gravel	\$8,459.05	\$1,067,405.58	LCS	\$3,845.02	\$718,585.87
54	CO-OP DR	Pavement	\$33,286.98	\$1,100,692.56	Overlay	\$33,286.98	\$751,872.85
55	N 12	Gravel	\$20,721.30	\$1,121,413.86	LCS	\$11,302.53	\$763,175.38

Answer

- \$600,000.00 Originally Budgeted for Street Repairs
- 7.56 Miles Classified 1-3 (Poor)
- \$1,121,413.86 to Overlay All Poor Roads
- \$763,175.38 to Classify Road Repairs Based on Traffic Counts and Current Surface Type
- Decision Was Made to Repair Every Road Classified as Poor

Conclusion

- ArcMobile = Low Budget Solution to Asset Management Data Collection
- Quick and Simple Solution to Deploy and Requires Minimal Training
- We Have Deployed This Solution for a Stormwater Drain Inventory, Recently Finished the 2013 Update to Street Inventory, and Currently Using This Solution for Data Collection for Van Buren Municipal Utilities Database

Questions.....