

# City of Newark ROW Management Assessment and Priority System

Project Briefing  
June 11, 2009



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## Project Goals

- Perform an inventory and evaluation of street conditions
- Populate Asset Management System
- Optional service and systems for additional infrastructure management needs
- Training
- System support



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## Baker Team

- Michael Baker Jr., Inc.
  - Prime Consultant
- GoodPointe Technologies
  - ICON Pavement Software
- Lambda Tech International
  - Imaging van and feature extraction software
- ACT Engineers, Inc. (DBE)
  - Imaging and feature extraction assistance



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## Project Phases

- Phase 1 – Inventory and Pavement Condition Assessment
  - Funded at \$195,334
  - Completed in 2008
- Phase 2 – Other Asset Inventory
  - Unfunded
- Re-Occurring Inventory and Maintenance



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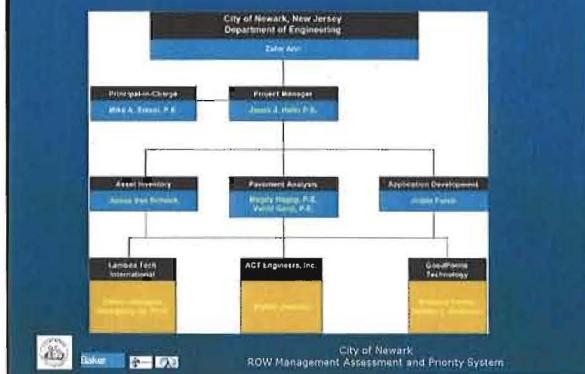
## Project Approach

- Using vehicle based digital image collection and feature extraction techniques to populate an off-the-shelf asset/pavement management system (ICON)



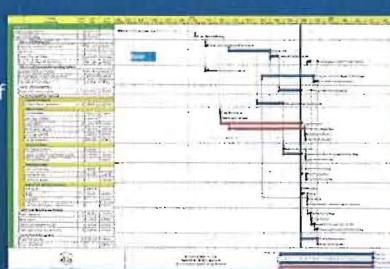
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## Project Staffing



## Project History

- Baker team selected 6/12/2006
- Project Kickoff 7/17/2007
- Phase 1 Data Delivered 7/9/2008



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## Phase 1 Tasks

- Linear Reference System development
- ICON Pavement Management Software procurement, implementation & training
- GIS file development
- Image inventory along city streets
- Image-based pavement condition rating
- Straight Line Diagram development
- Videolog development

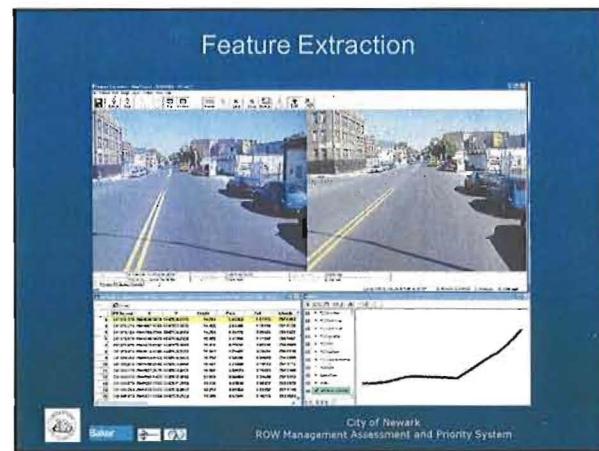
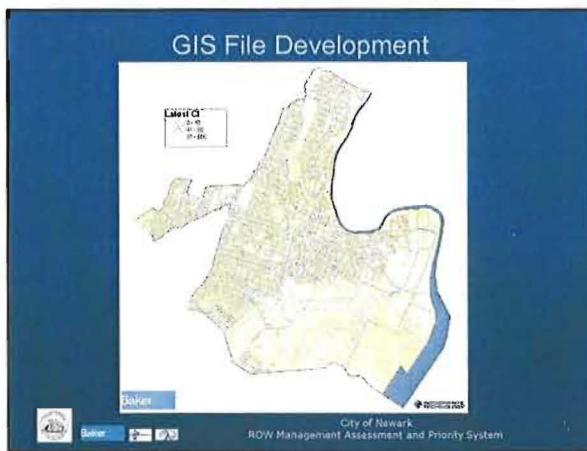
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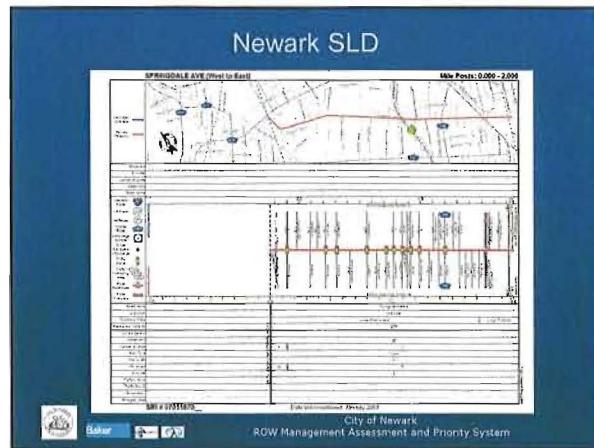
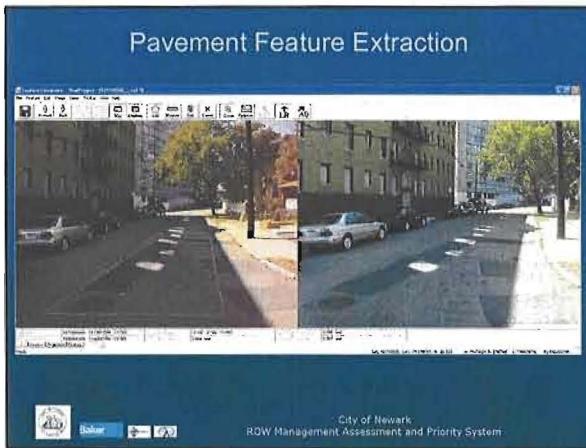
**Linear Referencing System Development**

Newark ROW Management Assessment and Priority System

STREET NAME	ST#	From	To
1ST STREET	1241101	MEXICAN AVE	SEASIDE AVENUE
2ND STREET	1241102	AVENUE 10	SEASIDE AVENUE
3RD STREET	1241103	MOSES AVENUE	HOSPITAL AVENUE
4TH STREET	1241104	GRAND AVENUE	AVENUE 10
5TH STREET	1241105	GRAND AVENUE	SEASIDE AVENUE
6TH STREET	1241106	GRAND AVENUE	SEASIDE AVENUE
7TH STREET	1241107	GRAND AVENUE	SEASIDE AVENUE
8TH STREET	1241108	GRAND AVENUE	SEASIDE AVENUE
9TH STREET	1241109	GRAND AVENUE	SEASIDE AVENUE
10TH STREET	1241110	GRAND AVENUE	SEASIDE AVENUE
11TH STREET	1241111	GRAND AVENUE	SEASIDE AVENUE
12TH STREET	1241112	GRAND AVENUE	SEASIDE AVENUE
13TH STREET	1241113	GRAND AVENUE	SEASIDE AVENUE
14TH STREET	1241114	GRAND AVENUE	SEASIDE AVENUE
15TH STREET	1241115	GRAND AVENUE	SEASIDE AVENUE
16TH STREET	1241116	GRAND AVENUE	SEASIDE AVENUE
17TH STREET	1241117	GRAND AVENUE	SEASIDE AVENUE
18TH STREET	1241118	GRAND AVENUE	SEASIDE AVENUE
19TH STREET	1241119	GRAND AVENUE	SEASIDE AVENUE
20TH STREET	1241120	GRAND AVENUE	SEASIDE AVENUE
21ST STREET	1241121	GRAND AVENUE	SEASIDE AVENUE
22ND STREET	1241122	GRAND AVENUE	SEASIDE AVENUE
23RD STREET	1241123	GRAND AVENUE	SEASIDE AVENUE
24TH STREET	1241124	GRAND AVENUE	SEASIDE AVENUE
25TH STREET	1241125	GRAND AVENUE	SEASIDE AVENUE
26TH STREET	1241126	GRAND AVENUE	SEASIDE AVENUE
27TH STREET	1241127	GRAND AVENUE	SEASIDE AVENUE
28TH STREET	1241128	GRAND AVENUE	SEASIDE AVENUE
29TH STREET	1241129	GRAND AVENUE	SEASIDE AVENUE
30TH STREET	1241130	GRAND AVENUE	SEASIDE AVENUE
31ST STREET	1241131	GRAND AVENUE	SEASIDE AVENUE
32ND STREET	1241132	GRAND AVENUE	SEASIDE AVENUE
33RD STREET	1241133	GRAND AVENUE	SEASIDE AVENUE
34TH STREET	1241134	GRAND AVENUE	SEASIDE AVENUE
35TH STREET	1241135	GRAND AVENUE	SEASIDE AVENUE
36TH STREET	1241136	GRAND AVENUE	SEASIDE AVENUE
37TH STREET	1241137	GRAND AVENUE	SEASIDE AVENUE
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39TH STREET	1241139	GRAND AVENUE	SEASIDE AVENUE
40TH STREET	1241140	GRAND AVENUE	SEASIDE AVENUE
41ST STREET	1241141	GRAND AVENUE	SEASIDE AVENUE
42ND STREET	1241142	GRAND AVENUE	SEASIDE AVENUE
43RD STREET	1241143	GRAND AVENUE	SEASIDE AVENUE
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48TH STREET	1241148	GRAND AVENUE	SEASIDE AVENUE
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50TH STREET	1241150	GRAND AVENUE	SEASIDE AVENUE
51ST STREET	1241151	GRAND AVENUE	SEASIDE AVENUE
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53RD STREET	1241153	GRAND AVENUE	SEASIDE AVENUE
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55TH STREET	1241155	GRAND AVENUE	SEASIDE AVENUE
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57TH STREET	1241157	GRAND AVENUE	SEASIDE AVENUE
58TH STREET	1241158	GRAND AVENUE	SEASIDE AVENUE
59TH STREET	1241159	GRAND AVENUE	SEASIDE AVENUE
60TH STREET	1241160	GRAND AVENUE	SEASIDE AVENUE
61ST STREET	1241161	GRAND AVENUE	SEASIDE AVENUE
62ND STREET	1241162	GRAND AVENUE	SEASIDE AVENUE
63RD STREET	1241163	GRAND AVENUE	SEASIDE AVENUE
64TH STREET	1241164	GRAND AVENUE	SEASIDE AVENUE
65TH STREET	1241165	GRAND AVENUE	SEASIDE AVENUE
66TH STREET	1241166	GRAND AVENUE	SEASIDE AVENUE
67TH STREET	1241167	GRAND AVENUE	SEASIDE AVENUE
68TH STREET	1241168	GRAND AVENUE	SEASIDE AVENUE
69TH STREET	1241169	GRAND AVENUE	SEASIDE AVENUE
70TH STREET	1241170	GRAND AVENUE	SEASIDE AVENUE
71ST STREET	1241171	GRAND AVENUE	SEASIDE AVENUE
72ND STREET	1241172	GRAND AVENUE	SEASIDE AVENUE
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74TH STREET	1241174	GRAND AVENUE	SEASIDE AVENUE
75TH STREET	1241175	GRAND AVENUE	SEASIDE AVENUE
76TH STREET	1241176	GRAND AVENUE	SEASIDE AVENUE
77TH STREET	1241177	GRAND AVENUE	SEASIDE AVENUE
78TH STREET	1241178	GRAND AVENUE	SEASIDE AVENUE
79TH STREET	1241179	GRAND AVENUE	SEASIDE AVENUE
80TH STREET	1241180	GRAND AVENUE	SEASIDE AVENUE
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82ND STREET	1241182	GRAND AVENUE	SEASIDE AVENUE
83RD STREET	1241183	GRAND AVENUE	SEASIDE AVENUE
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87TH STREET	1241187	GRAND AVENUE	SEASIDE AVENUE
88TH STREET	1241188	GRAND AVENUE	SEASIDE AVENUE
89TH STREET	1241189	GRAND AVENUE	SEASIDE AVENUE
90TH STREET	1241190	GRAND AVENUE	SEASIDE AVENUE
91ST STREET	1241191	GRAND AVENUE	SEASIDE AVENUE
92ND STREET	1241192	GRAND AVENUE	SEASIDE AVENUE
93RD STREET	1241193	GRAND AVENUE	SEASIDE AVENUE
94TH STREET	1241194	GRAND AVENUE	SEASIDE AVENUE
95TH STREET	1241195	GRAND AVENUE	SEASIDE AVENUE
96TH STREET	1241196	GRAND AVENUE	SEASIDE AVENUE
97TH STREET	1241197	GRAND AVENUE	SEASIDE AVENUE
98TH STREET	1241198	GRAND AVENUE	SEASIDE AVENUE
99TH STREET	1241199	GRAND AVENUE	SEASIDE AVENUE
100TH STREET	1241100	GRAND AVENUE	SEASIDE AVENUE

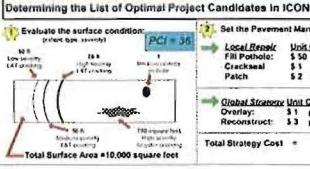
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### ICON Decision Support

**Determining the List of Optimal Project Candidates in ICON**

1. Evaluate the surface condition (prior type, severity):  


2. Set the Pavement Management Policy Parameters:  
 Local/Break: Unit Cost  
 Fill Pothole: \$0.50 per pothole  
 Crackseal: \$1 per linear foot  
 Patch: \$2 per s.f.  
 Global Strategy Unit Cost: PCI Range  
 Overlay: 3.1 per s.f. 10 years 30 - 60  
 Reconstruct: 3.3 per s.f. 15 years 0 - 40  
 Total Strategy Cost = Local Cost (variable) + Global Cost (fixed)

3. Which Global Strategy should be recommended? (if two qualify in overlapping PCI range):  
 Use the formula:  $\{(\text{Local Cost}) + (\text{Global Cost})\} / \text{Life obtained from strategy}$   
 Overlay:  $((\$0 + \$50 + \$2 \times 750 + \$50) + (\$1 \times 10,000)) / 10 \text{ years}$   
 $= (\$11,650) / 10 \text{ years} = \text{life cycle cost ratio}$   
 Reconstruct:  $((\$0) + (\$3 \times 10,000)) / 15 \text{ years}$   
 $= (\$30,000) / 15 \text{ years} = \text{life cycle cost ratio}$   
 ICON will select the best (lowest) ratio of the competing strategies

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### Deliverables

- Linear-referenced street network with SRI and milepost values assigned
- GIS layer of street network
- ICON Pavement/Asset Management System software with unlimited concurrent users
- Populated pavement condition data in ICON
- Street level images with Videolog

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### Budget Analysis

**ICON Parameters for Budget Analysis Projections**

Graph showing Budget per Year (Millions) vs Pavement Age (Years). The Y-axis ranges from 0 to 100, and the X-axis ranges from 0 to 60. Three curves are shown: 'History' (dashed line), 'Start of Plan' (solid line), and 'Routine Maintenance Only' (dotted line).

Pavement Age (Years)

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### Proposed Phase 2 Tasks

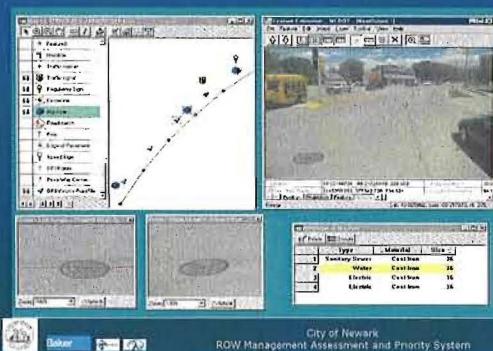
- Feature extraction of non-pavement features
  - Sidewalks/Pedestrian Ramps
  - Guiderail
  - Bridges
  - Traffic Control (Signs/Signals)
  - Manholes/Utilities
  - Drainage
  - Etc.
- ICON Sign and ROW management modules
  - Procurement
  - Implementation
  - Training

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Traffic Control Feature Extraction



Signal/Utility Feature Extraction

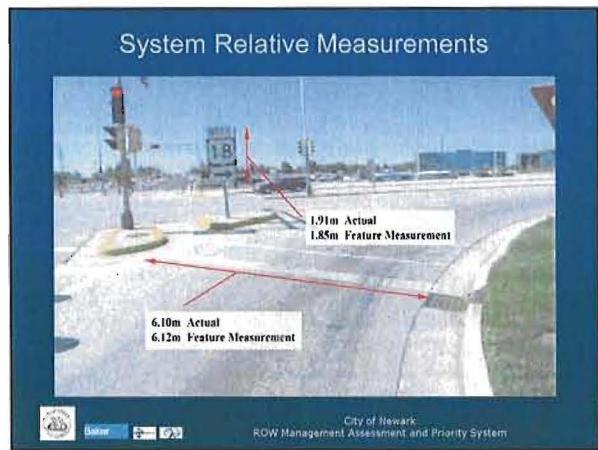
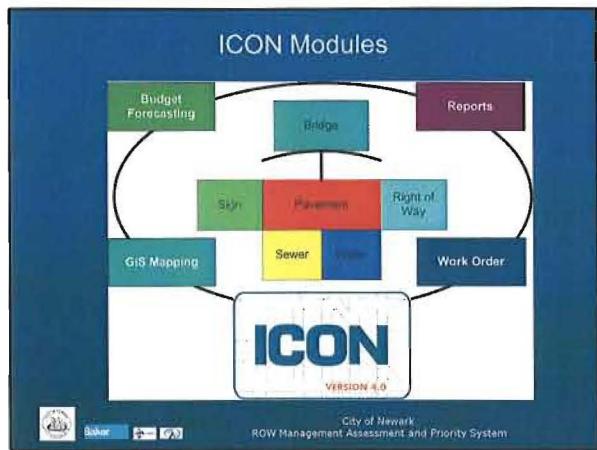


Traffic Control Feature Extraction



Any Visible Feature





- Optional Re-Occurring Tasks**
- Re-imaging of city streets to capture new digital images
  - Feature extraction of pavement condition
  - Other feature extraction
  - Updating Videolog and SLD with latest data
  - Annual ICON support
  - ICON User Group membership
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