

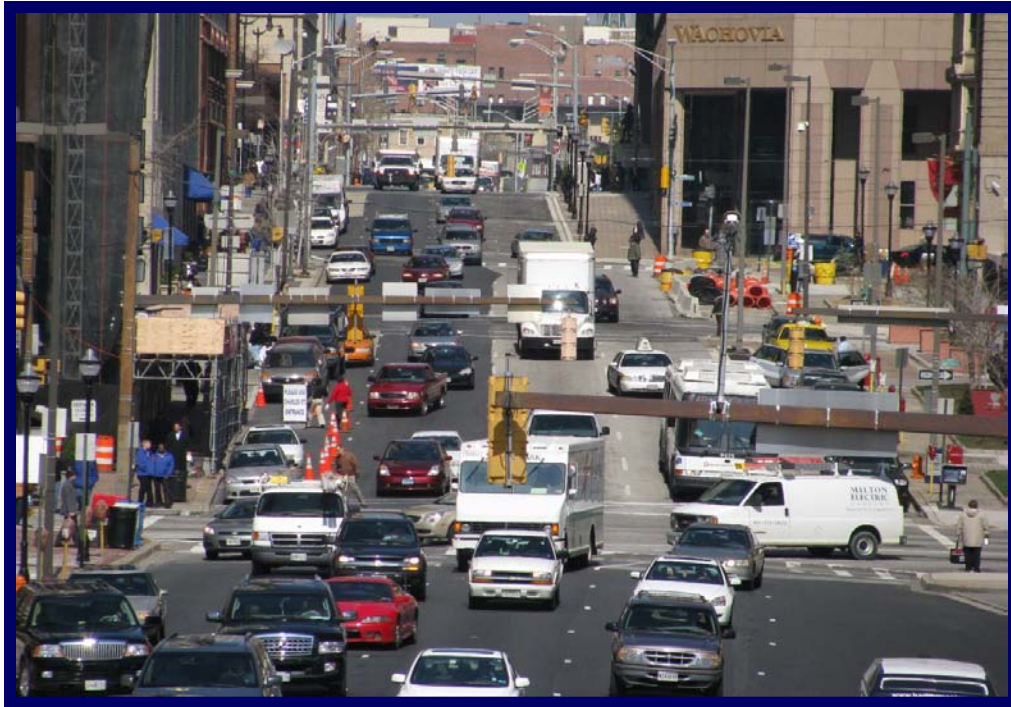


***Incorporating Sidewalks into
Transportation Asset Management***

**Presentation by
Alan S. Kercher, P.E.
Kercher Engineering, Inc.**

Integrated Management of Infrastructure

Example: Urban Environment

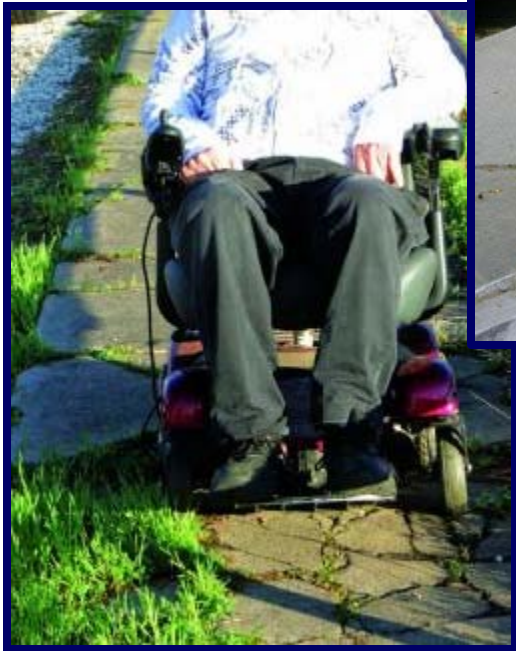


- Pavements
- Pavement Markings
- Drainage
- Signs/Signals
- Bridges
- Safety Management
- Utilities
 - Above-ground
 - Below-ground
- Urban Forestry

Not only Vehicles



Conditions



Non-ADA Compliant



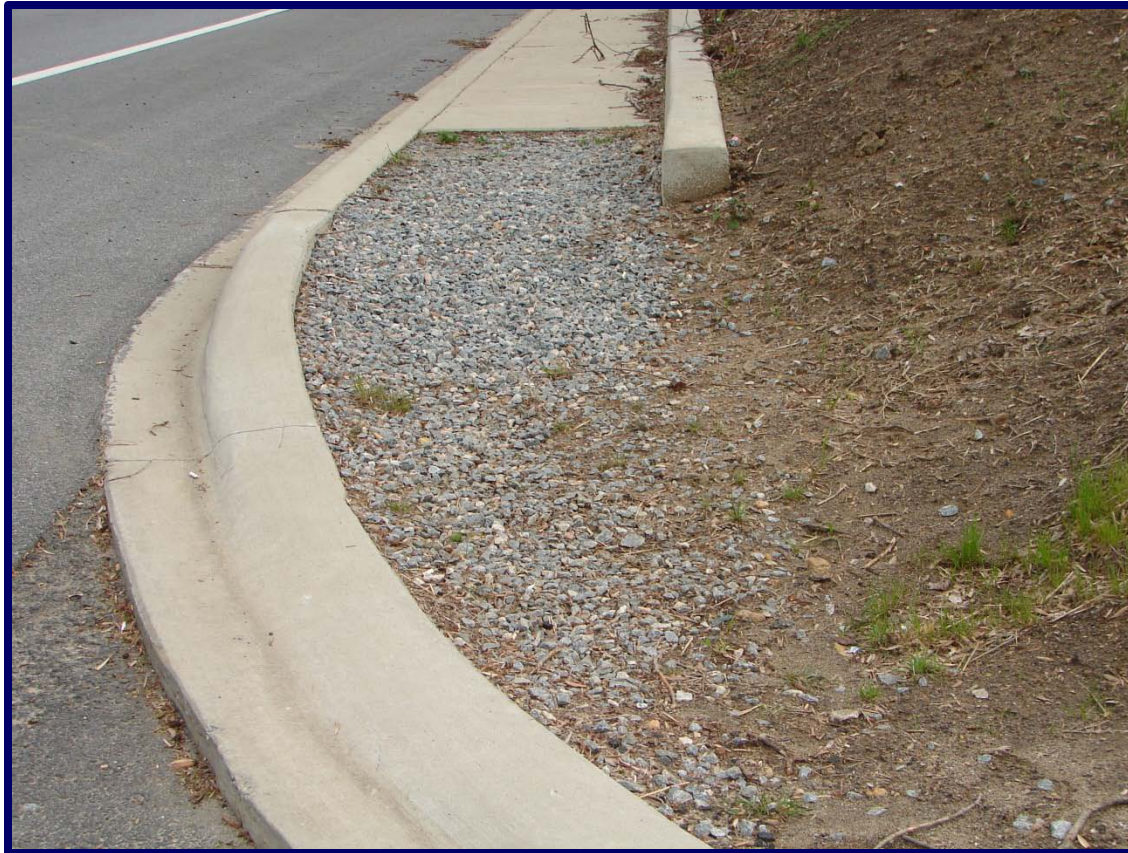
Obstacle Course



Safe Routes to School



5 Year Old Subdivision – No Ramp
How did this get approved by the City?



Multiple Problems



Reconstruction to Meet ADA Compliance



ADA Compliance Issues

- Ramps
 - Slope
 - Landing Areas
 - Truncated Warning Domes
- Sidewalk
 - Cross Slope and Longitudinal Slope
 - Width
 - Driveway Aprons
- Obstructions
 - Signs, Trees, Utilities, Existing Buildings, etc.
- Tripping Hazards
- Construction Issues (No Tolerances)

The Only Logical Solution

Sidewalk Management System

(Part of a tightly-integrated TAMS)

Sidewalk Management System

- Focused on Sidewalks
- Maintenance Management (Short-term)
 - Scheduling Resources
 - Productivity Analysis
- Analysis Tools (Long-term)
 - Transition Plans (Roadmap to ADA Compliance)
 - Safe Routes to School
 - Walkable Communities/Connectivity
- Integrate with other assets to improve efficiencies

A Balance of the Capital and Maintenance Budgets

Requires:

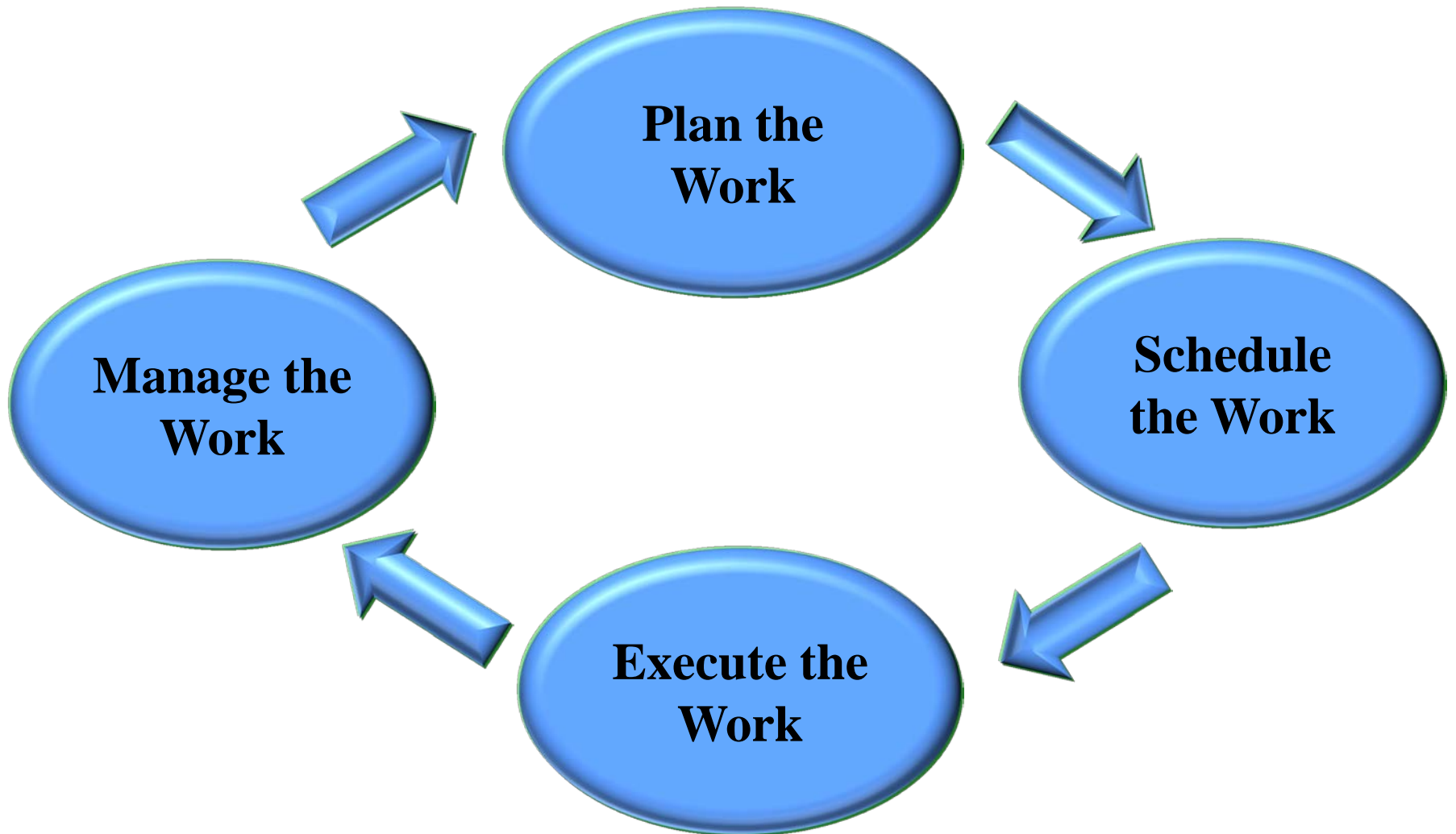
- Combined strategy for improvements
- Criticality-based response
- Collaboration of initiatives and processes
- Evaluation of alternative approaches
- Consideration of effective repairs and replacement versus enhancement

Maintenance Management

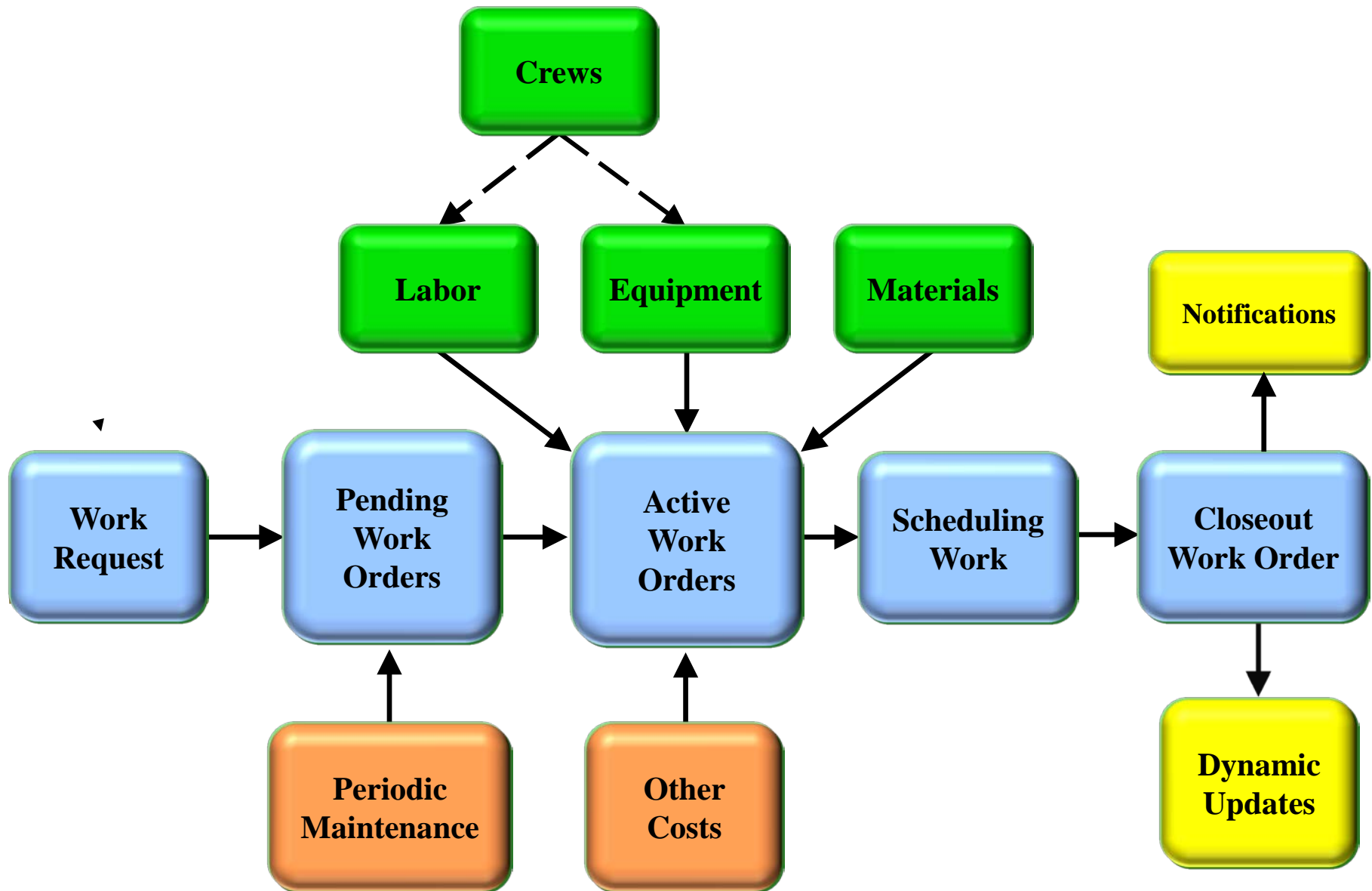
Short-Term (Day-to-Day)

Maintenance Management Cycle

Improve Planning and Execution



Possible Work Order Process



Work Orders

Tracking Labor, Equipment, Materials, Contractors, etc.

Activated Work Orders

1 pages (8 rows)

Work Request No.	Work Order No.	Asset Type	Activity	Project/Contract	Plan Amount	Calendar	Responsible Crew
	37813	Sidewalks	0301 REPLACE SIDEWALK [SF]	Contract No. 2010-002 (Concrete Work)	300	Regular	Roads Crew 1
	37816	Sidewalks	0301 REPLACE SIDEWALK [SF]	ADA Compliance Grant No. 1256	10	Regular	Roads Crew 1
	37817	Sidewalks	0301 REPLACE SIDEWALK [SF]	ADA Compliance Grant No. 1256	100	Regular	Roads Crew 1
	37818	Sidewalks	0301 REPLACE SIDEWALK [SF]	ADA Compliance Grant No. 1256	300	Regular	Roads Crew 1
	37823	Sidewalks	0301 REPLACE SIDEWALK [SF]	Contract No. 2010-002 (Concrete Work)	200	Regular	Roads Crew 2
	37824	Sidewalks	0301 REPLACE SIDEWALK [SF]	ADA Compliance Grant No. 1256	300	Regular	Roads Crew 2
7	37826	Sidewalks	0301 REPLACE SIDEWALK [SF]	ADA Compliance Grant No. 1256	200	Regular	Roads Crew 2
	37831	Sidewalks	0304 CURB REPLACE [LF]	Contract No. 2010-003 (Sidewalk Work)	50	Regular	Roads Crew 1

Activity Guidelines

Estimated Cost: \$96.40
 Estimated Man-Hours: 5
 Suggested Duration: 1

DESCRIPTION:
 All work associated with the replacement of any concrete sidewalk for damaged, uneven or deteriorated sections within County right of ways to provide a level transition from slab to slab. Activity includes the removal and replacement of any damaged concrete sections and restoration as required. This may also include sidewalk that crosses through a driveway. This also includes root grinding.

Recommended Procedure:
 WORK METHOD:
 1. Receive instructions from supervisor.
 2. Ready equipment and materials or order concrete.
 3. Travel to job site.
 4. Set up Traffic Safety control.
 5. Cut sidewalk as required.
 6. Remove concrete and haul away.
 7. If required remove root or grinding of roots.
 8. Form sidewalk.

Employees Short List

3 pages (23 rows)

Select	Employee #	Employee Name	Labor Class Code	Rate	Hour
<input checked="" type="checkbox"/>	33982	BOZEAT, SHANE	MVII	\$15.24	
<input type="checkbox"/>	90170	FOSTER, REED	AE0I	\$13.49	
<input type="checkbox"/>	27334	MATTSON JR, EDWARD	AE0I	\$16.92	
<input type="checkbox"/>	28982	ALI, LUQMAN ABDUL	AE0I	\$14.69	
<input type="checkbox"/>	18312	YUEN, ALBERT J	AE0I	\$18.95	
<input type="checkbox"/>	90599	LOPEZ, ESTANISLAO A	MVII	\$11.56	
<input type="checkbox"/>	90167	GUAY, LOREN	TT	\$14.00	
<input type="checkbox"/>	90148	HELLUAS, TIM	STT	\$14.57	
<input type="checkbox"/>	90423	TIPTON, SEAN	TT	\$13.61	
<input type="checkbox"/>	01688	WITHERS, BRUCE E	ADIRHWY	\$32.81	

Assigned Employees

1 pages (4 rows)

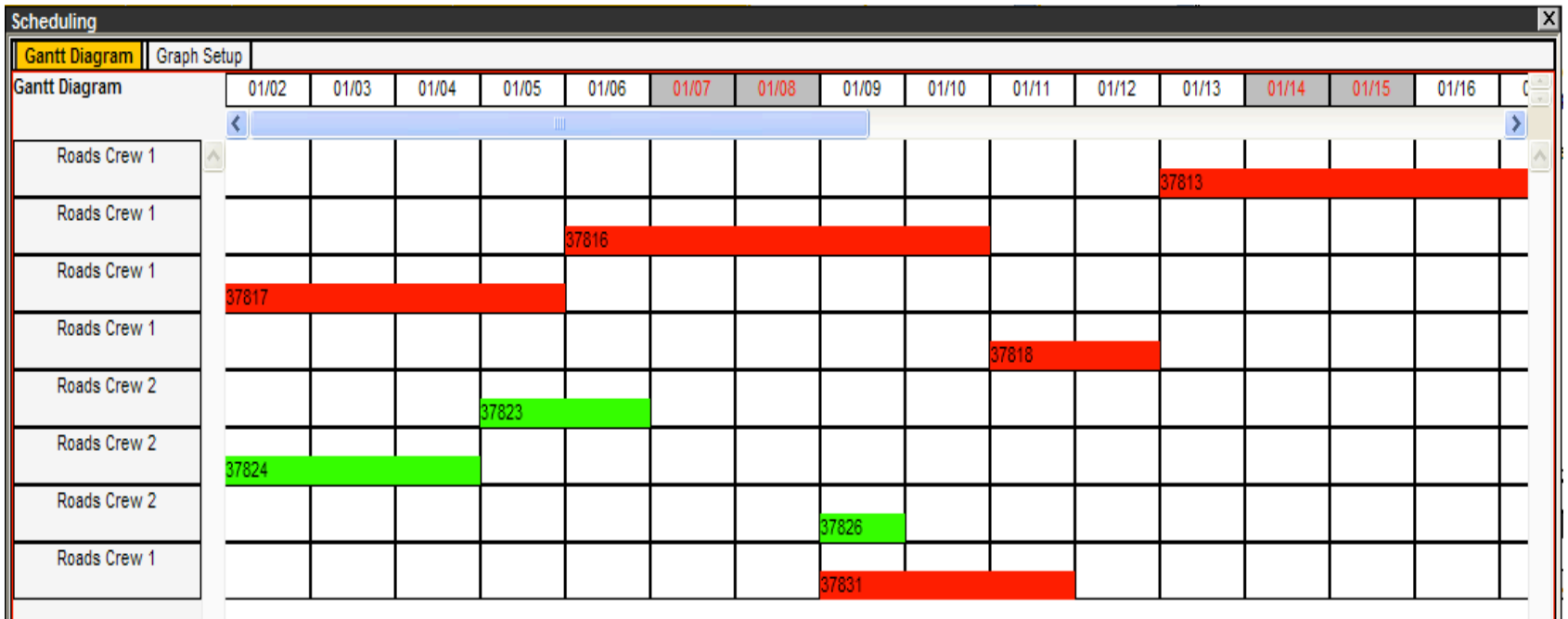
* Employee
ABELLA, ENRIQUE
COOPER, IVAN E
SAVAS, CHRIS
BIANCO, PAUL

Employee Daycards

0 pages (0 rows)

Approved	* Employee	* Work Date	* Tim...	* Total Units	Total Budget
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Scheduling



Productivity – Planned vs. Actual

Report Filters

Fiscal Year: 2011

Division: 109

Admin Unit: Sidewalks – ADA

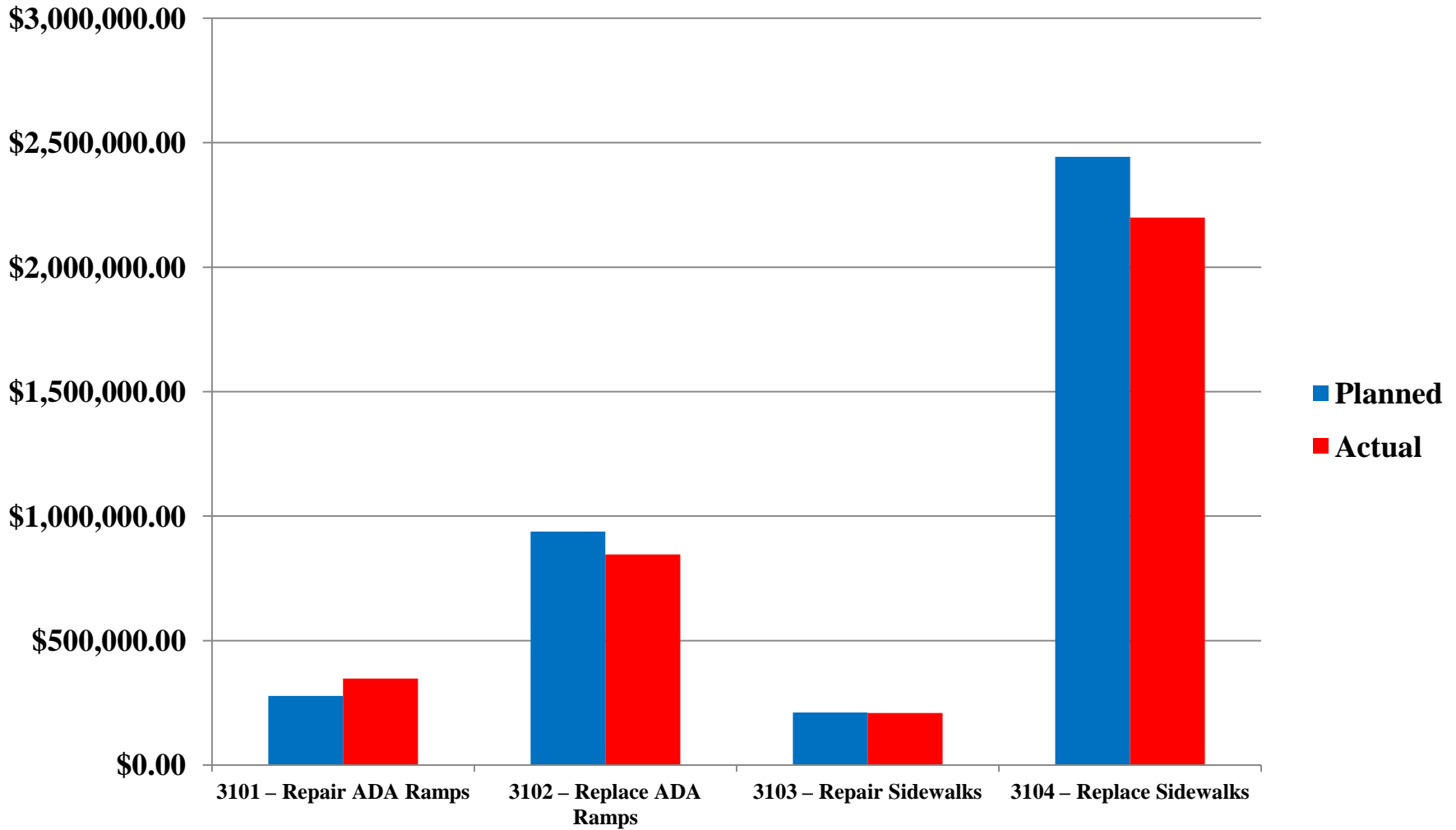
MMS Jasper Report

WBS Element: 11.10861

<u>Work Function</u>	<u>Planned Cost</u>	<u>Actual Cost</u>	<u>Planned Work</u>	<u>Actual Work</u>	<u>Planned Rate</u>	<u>Actual Rate</u>
3101 – Repair ADA Ramps	\$278,349.00	\$347,335.00	213	184	\$1,306.80	\$1,887.69
3102 – Replace ADA Ramps	\$938,362.00	\$846,004.00	182	182	\$5,155.84	\$4,648.37
3103 – Repair Sidewalks	\$211,045.00	\$209,560.00	21314	17184	\$9.90	\$12.20
3104 – Replace Sidewalks	\$2,443,678.00	\$2,199,842.00	93214	78669	\$26.22	\$27.96
3105 – Remove Obstruction - Trees	\$56,981.00	\$38,567.00	202	159	\$282.08	\$242.56
3106 – Relocate Obstruction - Signs	\$10,556.00	\$11,843.00	130	130	\$81.20	\$91.10
3107 – Relocate Obstruction - Lights	\$117,874.00	\$87,685.00	73	56	\$1,614.71	\$1,565.80
3108 – Relocate Obstruction - Mailboxes	\$15,482.00	\$13,835.00	97	81	\$159.61	\$170.80
3109 – Relocate Obstruction - Utilities	\$212,138.00	\$178,003.00	47	43	\$4,513.57	\$4,139.60
3110 – Repair Trailways	\$15,115.00	\$13,860.00	1879	1879	\$8.04	\$7.38
3111 – Repair Trailways	\$76,500.00	\$69,582.00	3564	3631	\$21.46	\$19.16
Totals	\$4,376,080.00	\$4,016,116.00				

Manage Work

- Productivity: Planned vs. Actual



Long-term Planning

ADA Transitional Plan

Safe Routes to School

Walkable Communities/Connectivity

Prioritization

- Areas surveyed were selected based on the ADA Title II regulations that require prioritization of curb ramp installation:
 - Government offices
 - Schools/libraries
 - Medical facilities
 - Major retail centers
 - Major employment centers
 - Transit stops
- Order based on Functional Class
 1. Arterials
 2. Collectors
 3. Locals
- Other factors - ?

Sample Prioritization Formula

$$\text{Score} = ((V1 * V2 * WF1) + (V2 * V4 * WF2)) * V5$$

Ranking Levels (Value: 1 to 5)

V1 - Value for Safe Route to School

V2 - Value for Proximity to School

V3 - Value for Land Use

V4 - Value for Density

V5 - Value for Transit Stop

Weighting Factors

WF1 - Weighting Factor "School Factors"

WF2 - Weighting Factor "Land Use"

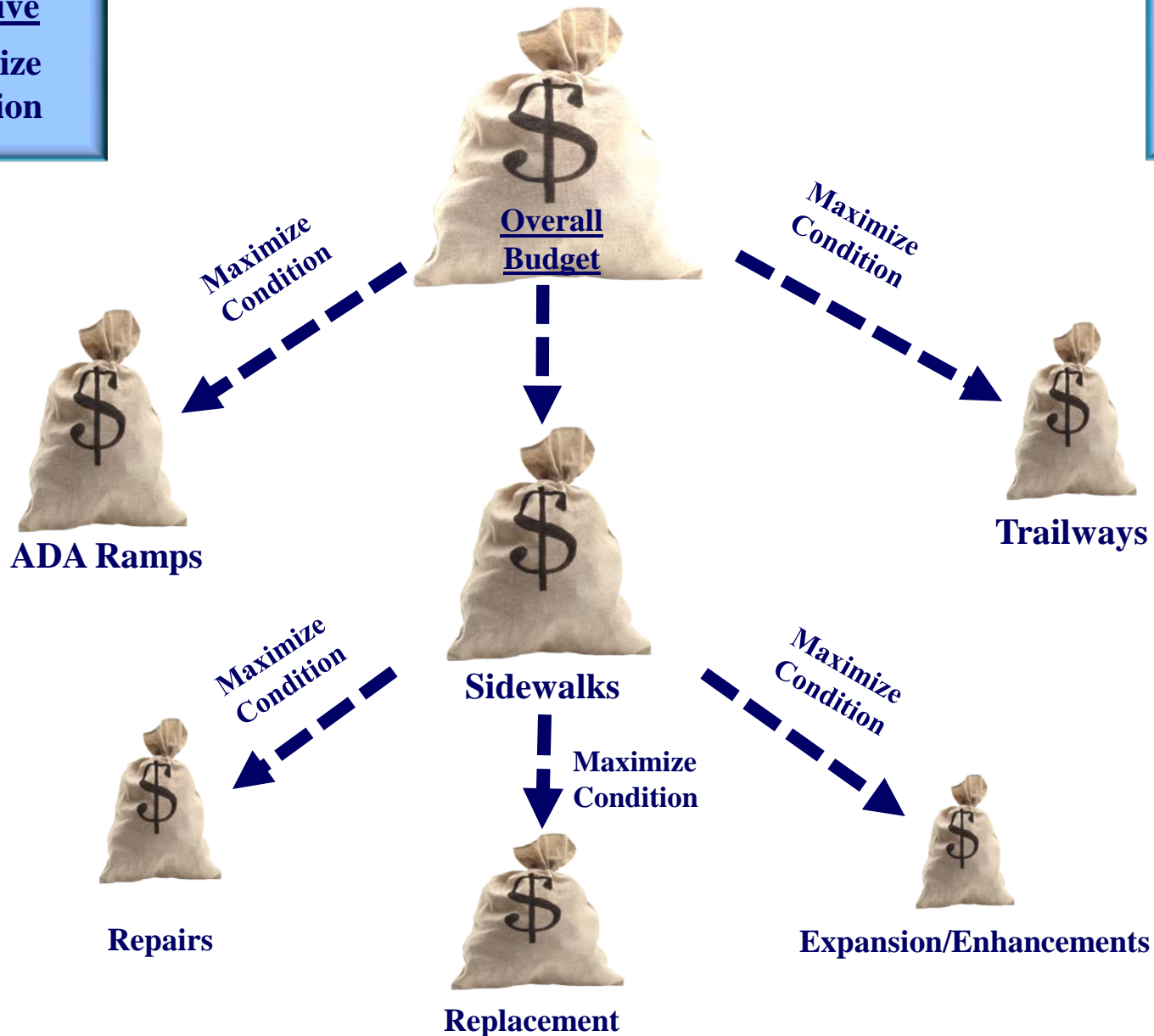
Sidewalk Transition Plan – Prioritized Segments

Sidewalk Segment_ID	Street Name	From Street	To Street	Safe Route to School	Proximity to School	Density	Land Use	Transit Stop	Priority Score
SW022	2nd Avenue	26th Street	27th Street	2	5	3	1	4	260
SW038	Main Street	12th Street	13th Street	2	5	3	2	3	240
SW027	Olive Street	28th Street	Brook Street	2	5	2	1	4	240
SW026	Olive Street	28th Street	Brook Street	2	4	2	1	4	200
SW012	Main Street	27th Street	28th Street	2	4	3	1	3	165
SW001	Olive Street	27th Street	28th Street	2	4	3	1	3	165
SW025	Olive Street	Brook Street	Center Road	1	2	3	2	4	160
SW036	Olive Street	Center Road	Frederick Rd	1	2	3	2	4	160
SW024	Olive Street	Brook Street	Center Rd	1	1	3	2	4	140
SW035	Olive Street	Center Road	Frederick Rd	1	1	3	2	4	140
SW029	Main Street	13th Street	14th Street	2	5	2	2	2	140
SW039	Main Street	17th Street	18th Street	1	2	3	2	3	120
SW033	Main Street	18th Street	19th Street	2	4	2	2	2	120
SW021	2nd Avenue	27th Street	28th Street	1	3	3	1	4	120
SW023	2nd Avenue	26th Street	27th Street	1	2	3	1	4	100
SW020	3rd Avenue	26th Street	27th Street	1	2	3	1	4	100
SW018	3rd Avenue	27th Street	28th Street	1	2	3	1	4	100
SW009	Olive Street	Frederick Rd	Georgia Ave	1	2	2	2	3	90
SW037	Olive Street	Frederick Rd	Georgia Ave	1	2	2	2	3	90
SW028	Market Street	6th Street	7th Street	1	1	2	2	3	75
SW013	Main Street	27th Street	28th Street	1	2	3	1	3	75
SW004	Olive Street	26th Street	27th Street	1	2	3	1	3	75
1155071	Walnut Street	1st Avenue	2nd Avenue	1	1	3	2	2	70
SW005	Olive Street	26th Street	27th Street	1	1	3	1	3	60

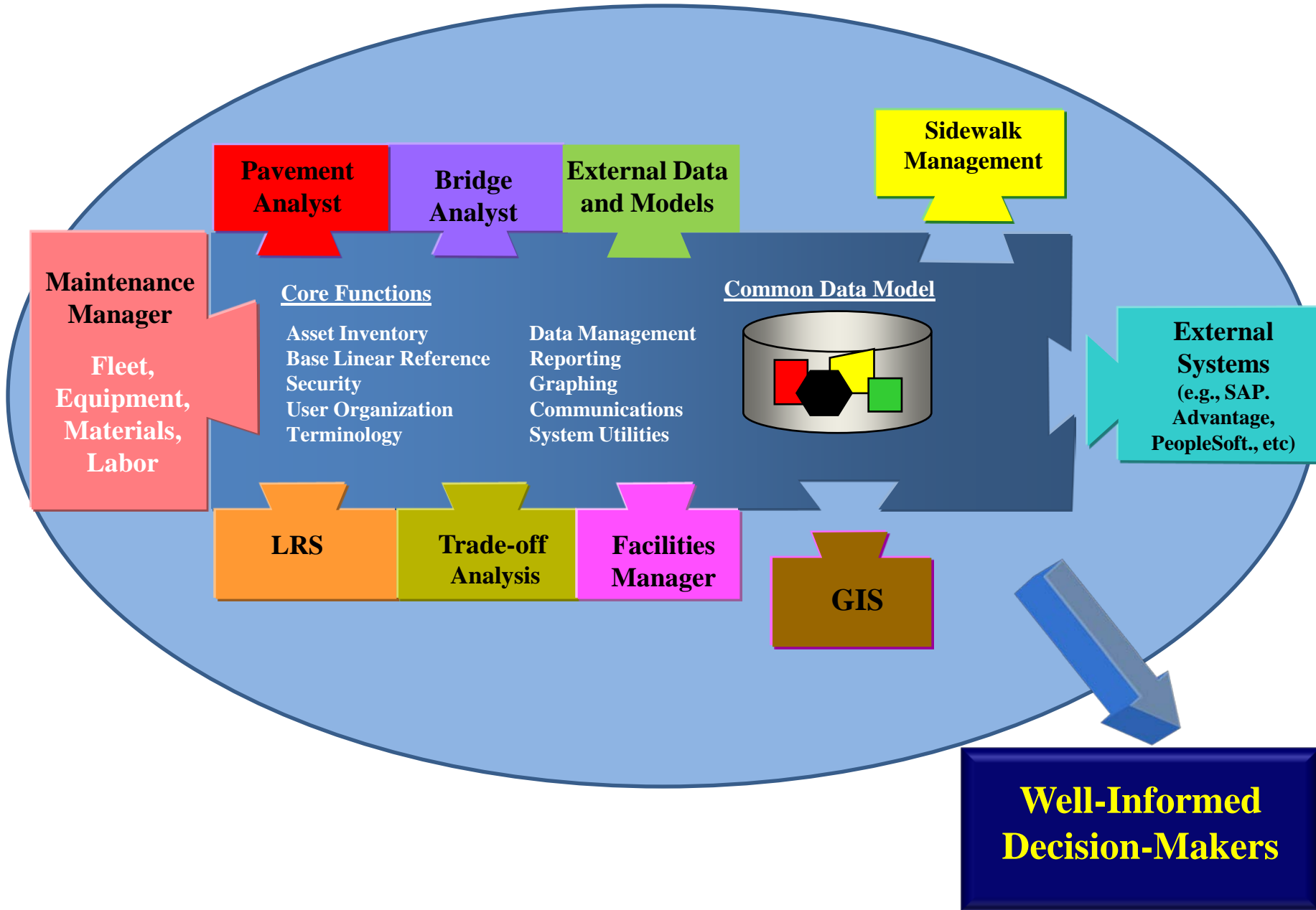
Multi-Constraint Scenario Analysis

Objective
Maximize
Condition

Constraint
Budget



Asset Integration - Modular Framework



Integrate with Other Assets

Urban Forestry

- Coordinate Sidewalks and Pathways w/Trees
- Designated “Significant Trees”
 - Trees
 - Tree Sites
- Project
 - Design Phase
 - Contract Doc’s Preparation
 - Protection/Replacement Plans
 - Inspection
 - Construction
 - Post-Construction

Integrate with Other Assets

Sign Management

- Coordinating Proper Signage
 - Adding Mid-block Cross-walks
- Coordinate Obstructions
 - Relocating Signs
 - A Signs Department Activity
 - Update Sidewalk Obstructions
 - Sidewalk repair/replacement/expansion project
 - Notify Signs Department

Integrate with Other Assets

Pavements

- Annual paving program
 - Non-compliant ADA Ramp Upgrades
 - Other issues
 - Failed areas
 - Driveway Aprons
 - Crosswalks
 - Tree Root issues
 - Pavement
 - Sidewalks/Curbs
 - Realignments/Widenings

Sidewalk Management

2 Options

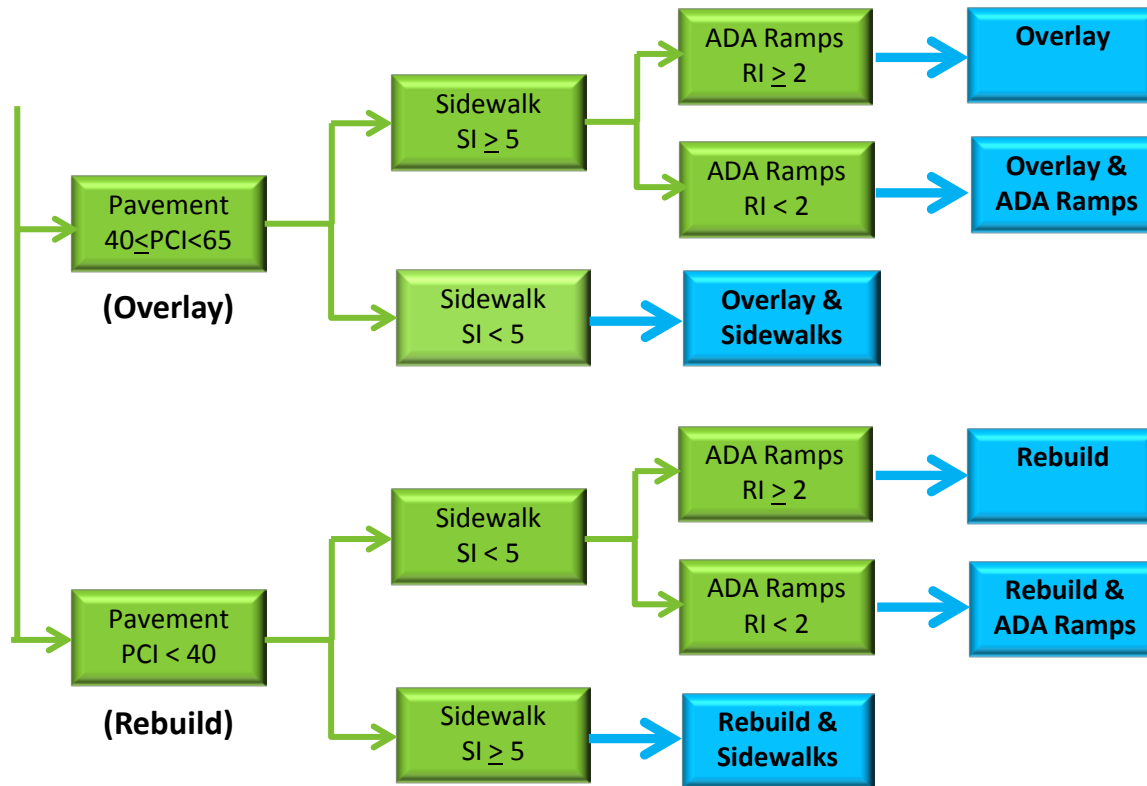
Full Management System

Pseudo (Simple System)

Pseudo (Simple) System

- Build within PMS (PMS-focused)
 - Within Standard Decision Trees
 - Add additional decision nodes
 - Separate Trees
 - Pavement Treatments
 - Sidewalk, Ramp and Crosswalk Repairs
 - Combine costs in reports
 - Con
 - Not tightly-integrated with all assets
 - Possibly no broad planning tools – Transition Plan, SRS, Connectivity

Sidewalks integrated into PMS Decision Trees



Legend



Decision
Node



Result
Node

Indices

PCI – Pavement Condition Index
SI – Sidewalk Index
RI – (ADA) Ramp Index