Performance-Based Contract Maintenance in the District of Columbia - Results and Lessons Learned at the Half-Way Point

Paper No. 04-4340
Transportation Research Board Annual Meeting
January 12, 2004

Mark Robinson, Ph.D., P.Eng. and Eloisa Raynault, SAIC
Simon Rennie, DDOT
Edward A. Sheldahl, P.E., FHWA

Presentation Overview

- DC Streets Project Introduction
- What is Performance-Based Asset Preservation?
- Why Privatize using Asset Preservation?
- DC Streets Goals and Project Coverage
- Performance Measures and Standards
- How is Performance Tracked?
- Results to Date
- Lessons Learned
- Summary
- Future Work

DC Streets - Project Introduction

- DC Streets is a contract to rehabilitate and maintain the District of Columbia's portion of the National Highway System
- DC Streets was the first urban performance-based asset preservation contract in the US

Partners and Roles

- Customer: District Department of Transportation (DDOT)
- Funding and Engineering Services: FHWA DC Division Office and Office of Asset Management
- Consultant Team: SAIC, Baker, MacTec, ICT, Spectra Informatics, LaMountain & Associates
- Contractor: VMS, Inc.

Contract Information

- *Contract Amount:* $69,619,334
- *Contractor:* VMS, Inc.
- *Length of Contract:* 5 years
- *DDOT Project Manager:* Luke DiPompo/ Simon Rennie/ Derege Seifu
- *Date of Start of Work:* July 10, 2000
- *Procurement Type:* Request for Proposals with best buy analysis based on scores for cost, technical, staffing plan, management plan, quality control/quality assurance plan, and past performance.
- *Funding:* 80% FHWA, 20% DDOT

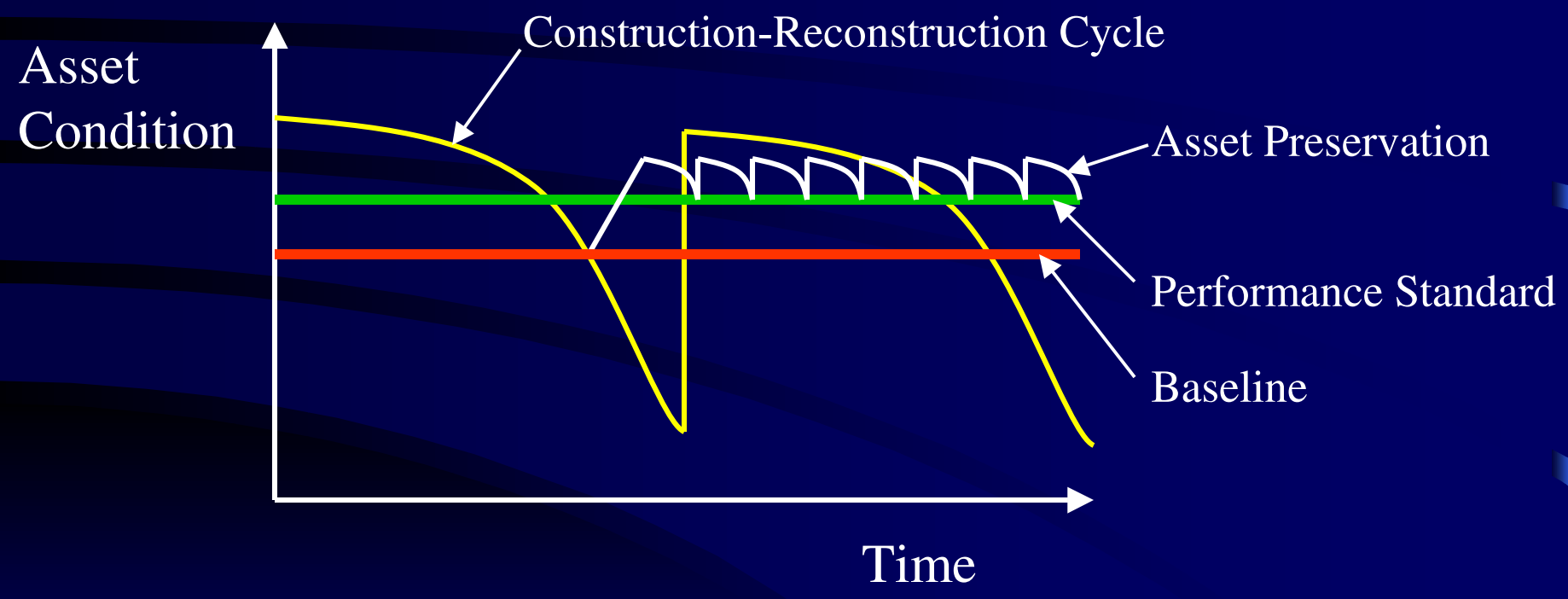
What is Performance-Based Asset Preservation?

- A management approach to rehabilitate and maintain roadway and roadside assets in stable, safe, pre-defined conditions…*establish the baseline and raise the bar*
- Performance standards are specified instead of maintenance techniques…*not what to do, rather what to achieve*
- Moves the risk from the customer to the contractor
- Contractor receives a schedule of payments in return for an agreed level of asset condition performance
- Innovation in management and maintenance techniques is encouraged

What Performance-Based Asset Preservation is Not

Asset Preservation ≠ Reconstruction

Asset Preservation Vs. Construction-Reconstruction



Why Privatize Maintenance using Asset Preservation? – DC Streets Example

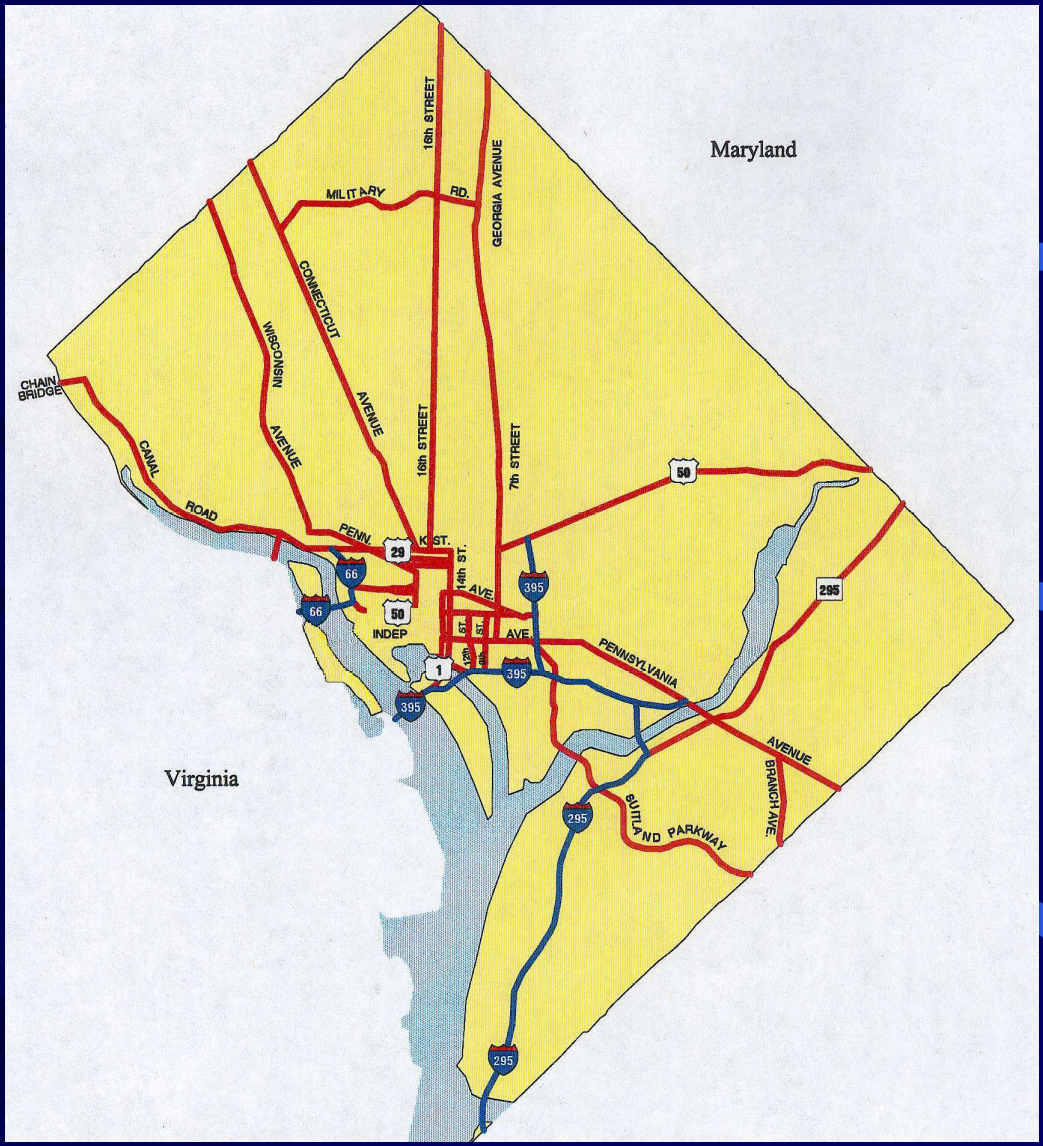
- Infrastructure needs were outpacing staff resources and available funding
- FHWA agreed to provide funding as an experimental project
- DDOT could allocate their maintenance resources to local neighborhood streets
- DDOT could provide local small businesses and residents with increased opportunities for employment

What are the DC Streets Goals?

- Enhance the NHS Infrastructure by meeting or exceeding the performance standards
- Receive positive feedback from the public and the press
- Revitalize the community
- Institutionalize performance-based contracting
- Produce innovative methods, procedures and processes for infrastructure maintenance

Project Coverage

- Right-of-way to right-of-way
- Excludes traffic signals



Performance Measures and Standards

- 14 Maintenance Categories
  - Pavement Structure
  - Roadway Cleaning
  - Drainage
  - Roadside (curbs, gutters and sidewalks)
  - Traffic Safety (guardrails, barriers and attenuators)
  - Roadside Cleaning
  - Roadside Vegetation
  - Bridges
  - Tunnels
  - Snow and Ice Control (2nd through 5th year only)
  - Pavement Markings
  - Traffic Signs
  - Highway Lighting
  - Miscellaneous (pedestrian bridges, weigh-in-motion stations)

Performance Measures and Standards (Cont'd)

- Each Category Subdivided Into Elements
- Example: Category - Bridges
  - Elements:
    - Bridge Decks
    - Bridge Superstructure
    - Railings Barriers and Parapets
    - Bridge Substructure
    - Bridge Approaches
- Elements Further Subdivided into Performance Measures
- 170 separate measures are used

Performance Measures and Standards (Cont'd)

- Each Measure Evaluated on a 1 to 5 Scale

  5 = Excellent

  1 = Very Poor

- Performance Standard (Pass) is a 4
- Scale Designed To Be:
  - As quantifiable as possible
  - Easily measured

Annual Evaluation (Cont'd)

Example: Performance Measure #10

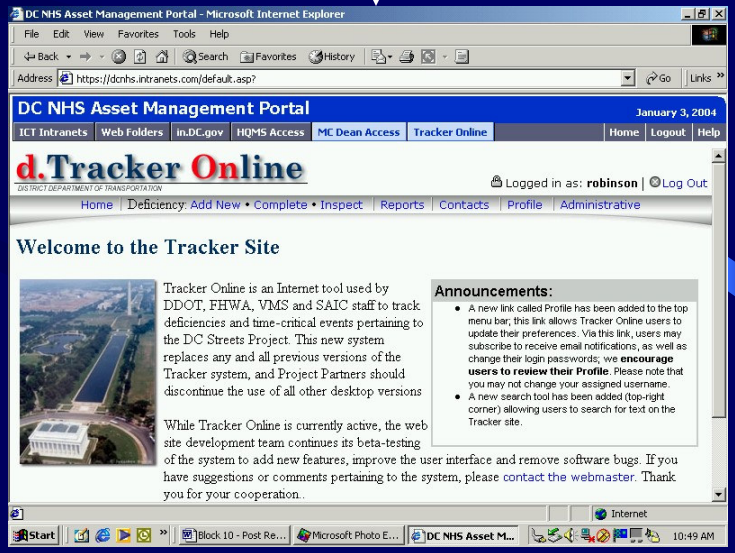
Number of Potholes/ Blowups	Excellent 5	Good 4	Fair 3	Poor 2	Very Poor 1
	No Potholes	No potholes encompassing an area > 64 square inches	1 Pothole on the 1/10th mile segment encompassing an area > 64 square inches	2 Potholes on the 1/10th mile segment, each encompassing an area > 64 square inches	3 or more Potholes on the 1/10th mile segment, each encompassing an area > 64 square inches

How is Performance Tracked?

- Daily
- Monthly
- Annually

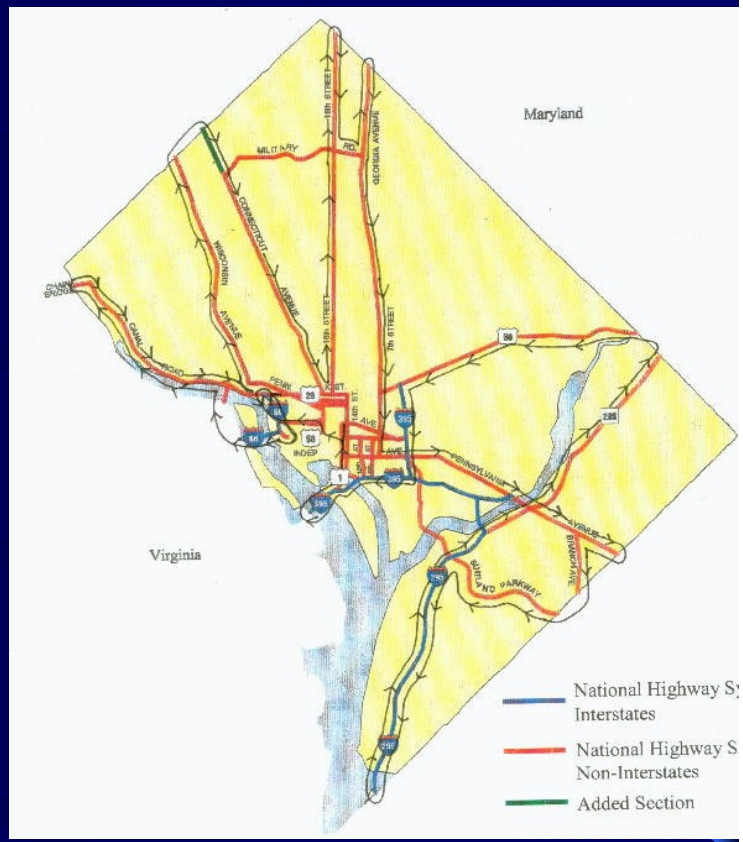
Daily Tracking

- Daily field inspections are performed to identify deficiencies
- Deficiencies are reported and tracked using an on-line database
- Daily activities log maintained by VMS in line with approved QC/QA plan
- DC Project Manager works with VMS to resolve questions and monitor activities
- QC is VMS' role and responsibility

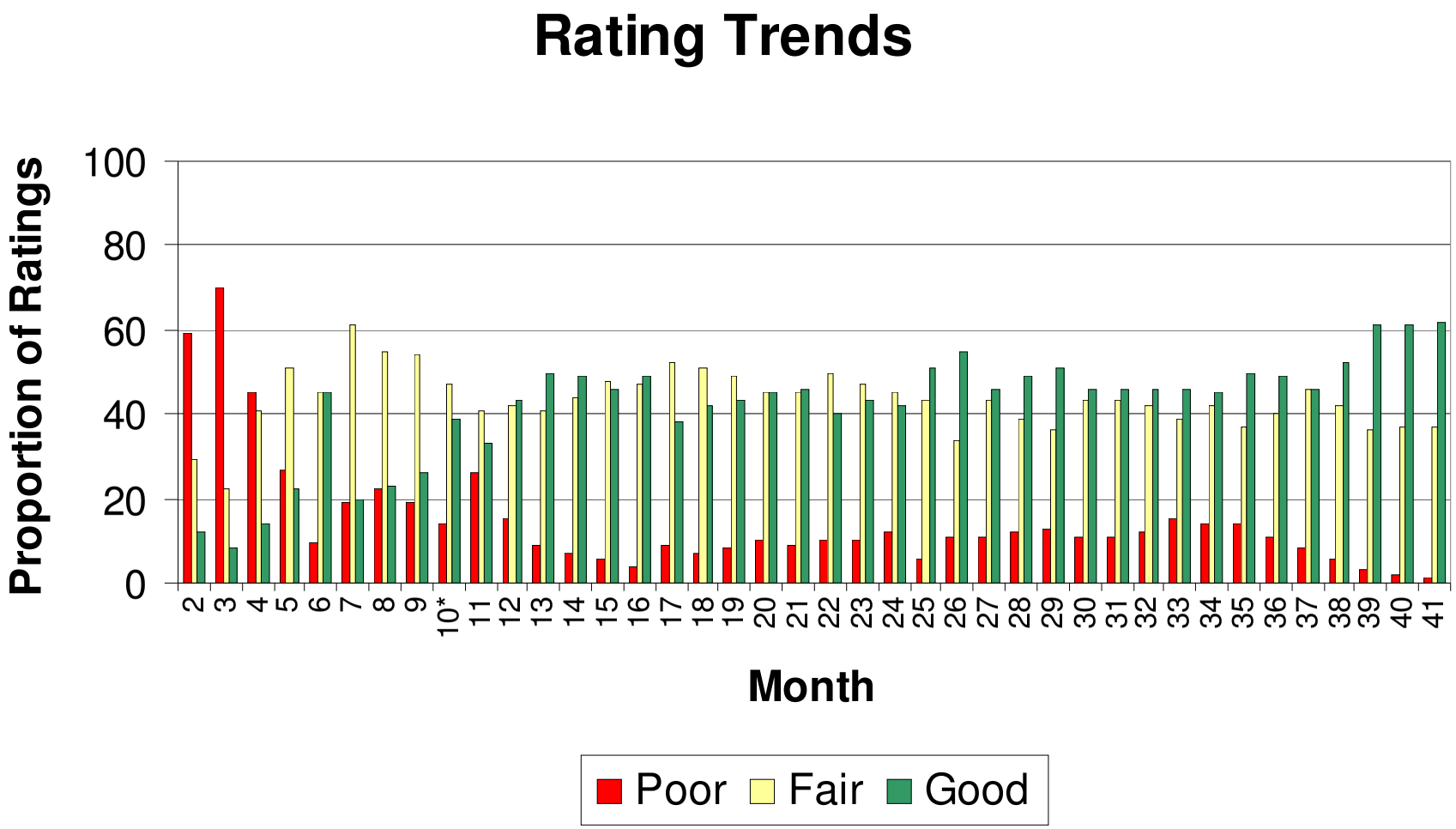


Monthly Evaluations

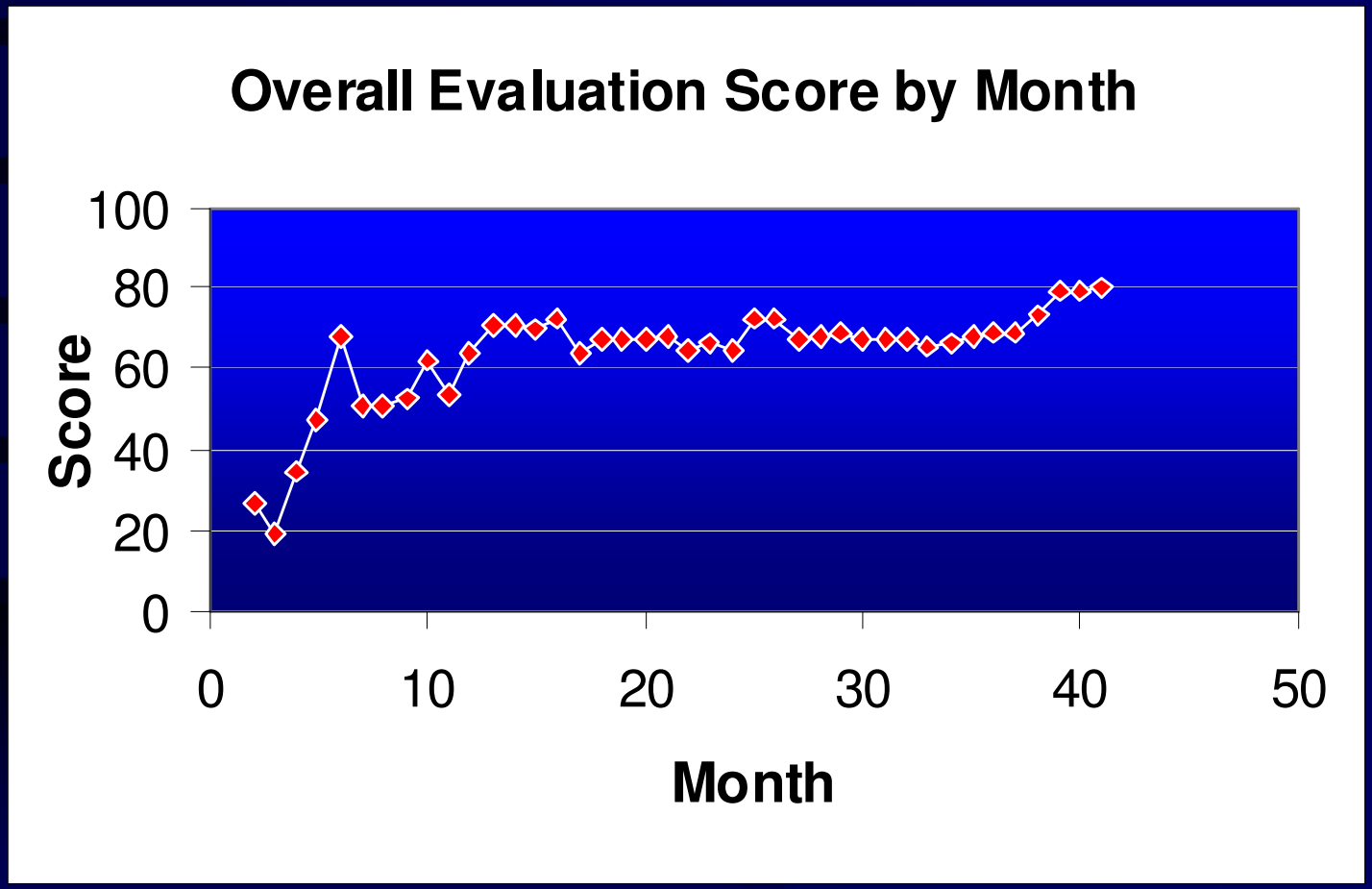
- Monthly team field inspection (windshield survey)
- Assets receive a subjective condition rating of good, fair or poor
- Areas of recurring problems or continuing concerns are documented
- Review is captured on video



Monthly Evaluation Rating Results to Date



Monthly Evaluation Scores To Date



Annual Evaluation

- Objective engineering evaluation of contractor's performance
- Inspectors sample one-tenth mile segments for all roadways on the system
- Within sample segments, each asset is evaluated for compliance with the performance standards
- Variable award fee compensation for excellent performance

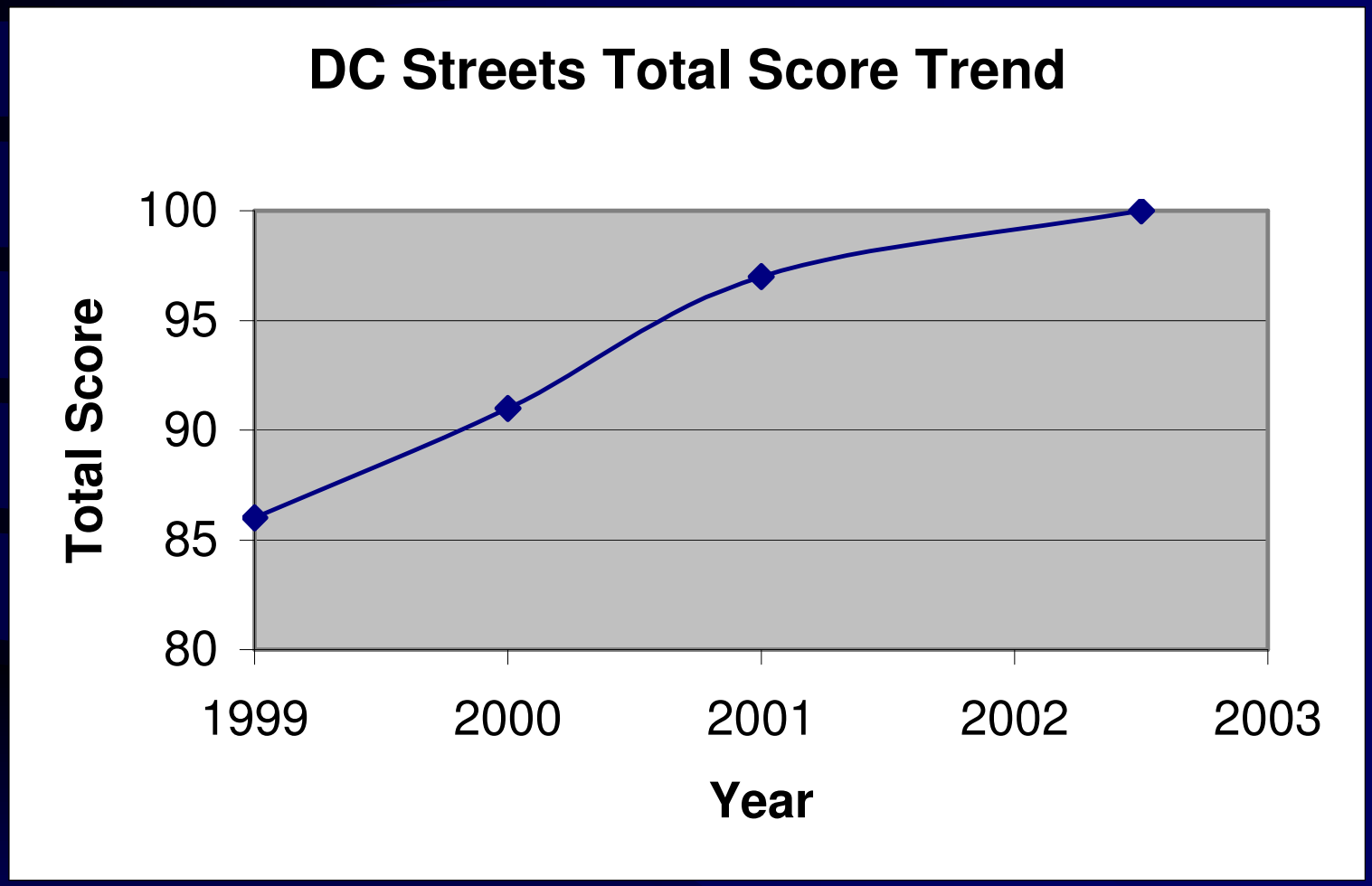
Overall Score Computation

- The scores for each sample are averaged (weighted) to compute an average score for the performance measure
- Scores for Maintenance Categories are computed through a weighted average of the performance measures within that category
- The overall score is computed through a weighted average of the Maintenance Category Scores
- Weights were based on the results of an extensive rating exercise performed by the project partners
- Weights allow the recognition of relative importance

Year 2.5 Annual Evaluation Results

Maintenance Category	Score	%
Pavement Structure	8.8	97%
Roadway Cleaning	6.1	83%
Drainage	7.1	104%
Roadside (Curbs, Gutters, Sidewalks)	7.6	113%
Traffic Safety: Guardrails, Barriers and Attenuators	9.0	123%
Roadside Cleaning	5.9	89%
Roadside Vegetation	5.2	86%
Bridges	7.9	96%
Tunnels	8.6	99%
Traffic Safety: Pavement Markings	6.9	100%
Traffic Safety: Signs	5.6	84%
Traffic Safety: Lighting	5.5	79%
Miscellaneous Assets: Ped. Bridges and WIM	5.2	95%
Snow and Ice Control	8.1	113%
Total	**97.4**	

Annual Evaluation Scoring Trends



Note: Time Critical Scores Excluded

Lessons Learned

- Formal project partnering works
- Payment should begin after work on each maintenance category has begun
- Specific amounts and times for mobilization should be specified
- The agency PM should be identified early and should be involved in the contract development and procurement stages
- Damages for failure to comply with the performance standards should be included
- Incentives should be achievable
- Hold regular team meetings
- Perform evaluations monthly
- Perform evaluations on randomly chosen established routes

Lessons Learned - Continued

- Record key meetings and reviews on video
- Capture system condition by video or photo-log just before the contract starts
- Use multi-level performance standards instead of pass/fail
- Good information flow is key
- A good working relationship between the transportation agency's project manager and the contractor's day-to-day project manager is essential for project success
- A contract can't cover every conceivable issue - Project partners must work together within the spirit of the contract to make a project like this work
- The urban environment is dynamic and challenging to work in due to heavy traffic and the large number of people/organizations to work with and to please

Summary

- DC Streets is a demonstration project to showcase the effectiveness of working together with the private sector to improve and preserve the infrastructure of the NHS
- DC Streets has had a successful first half
  - Asset conditions have improved
  - Positive feedback has been received from the public, press and politicians
  - DC residents and small contractors have learned new skills and have steady employment
  - DDOT is considering using performance-based asset preservation for other District assets

Future Work

- Continue performing maintenance
- Continue tracking progress and performance
- Spread the word about lessons learned and project successes
- Encourage the use of performance-based asset preservation

Questions?

Mark Robinson, Ph.D., P.Eng.

SAIC

703-676-2384

mark.d.robinson@saic.com