

SCHEDULE 8

Concessionaire's Service Proposals

It is acknowledged by both Parties that notwithstanding that various provisions of the Concessionaire's Service Proposals state that a Sub-Contractor of the Concessionaire will have certain responsibilities or will perform certain actions, for the purpose of the Concession Agreement and as between HPTE and the Concessionaire, all actions and responsibilities set out herein as actions and responsibilities of any Sub-Contractor to the Concessionaire are deemed to be actions and responsibilities of the Concessionaire.



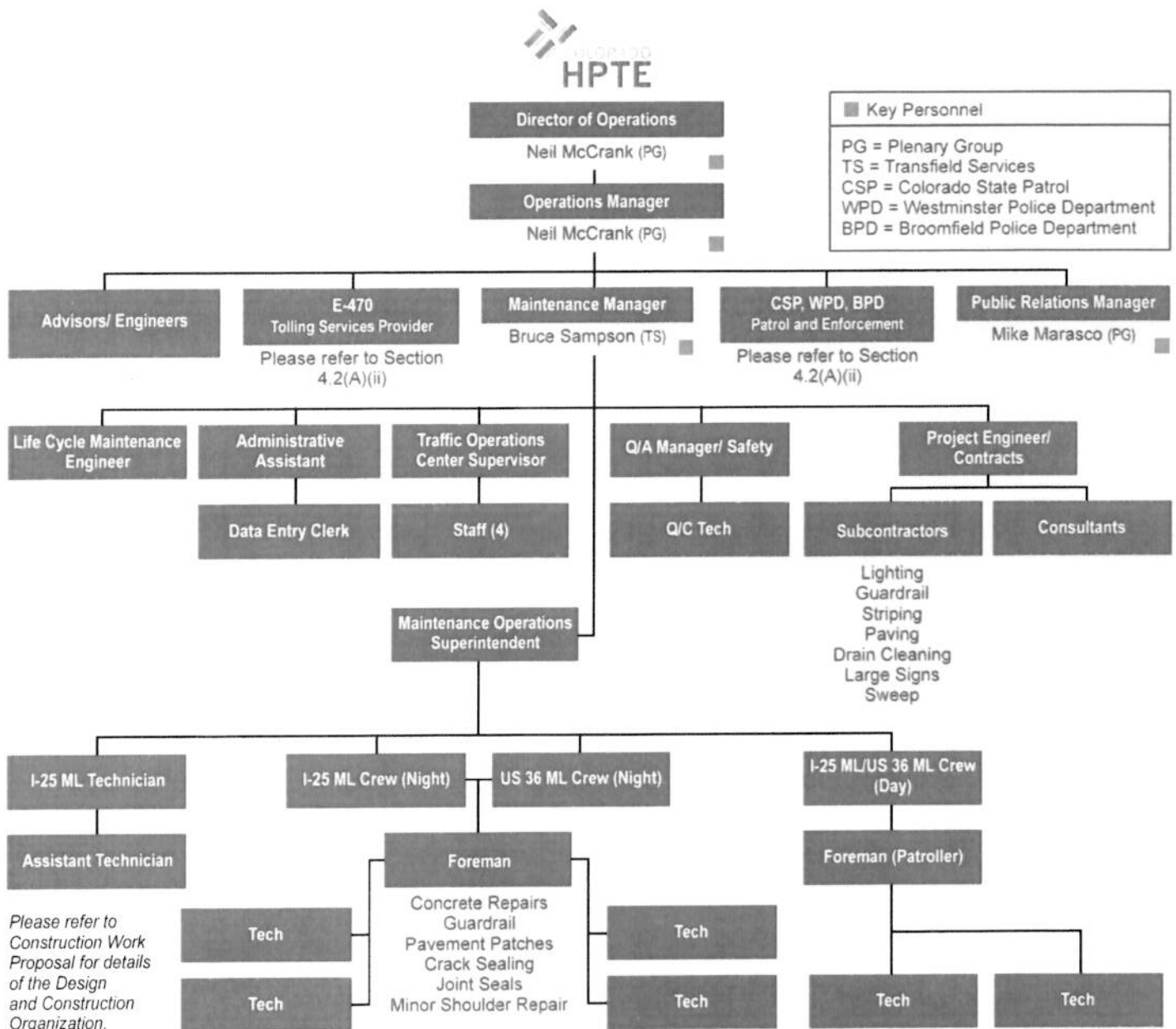
Part 3 – Volume III – Service Proposal

4.1 – Management Structure and Personnel

4.1.A – Organizational Chart

Figure I provides an overview of the PRD structure that will be implemented to carry out the operations and maintenance of the Project. The organization has been structured to provide clear delineation of responsibility, clear reporting channels and importantly to ensure that expert and empowered individuals are in place to undertake the services. PRD's Key Personnel bring a high level of expertise to their roles to ensure the Project is a success.

Figure I: Service Organization



1.B – Plenary Roads Denver Roles

Operations Manager – Neil McCrank

Neil McCrank will serve as the interim Operations Manager until a permanent Operations Manager can be sourced from the local job market. During the period between Commercial Close and Financial Close, PRD will recruit and train a qualified Operations Manager to be dedicated 100 percent to the Project. This is a similar approach that Plenary Group successfully adopted for its Disraeli Bridges and Freeway Project in Winnipeg, Canada. For that project, Neil McCrank recruited and trained the operations director shortly after commercial close. Training ensued and the Plenary Group team was able to “hit the ground running” at service commencement.

The Operation Manager will have overall responsibility for PRD’s day-to-day operations. In this effort the Operations Manager will oversee every aspect of the services, including operations, maintenance, plan development, reporting, inspections, tolling and marketing and public relations. The Operations Manager also will manage and coordinate with all PRD subcontractors, including Transfield, E-470, the enforcement agencies and various other subcontractors and consultants.

Neil has a wealth of experience in developing operational and maintenance plans and has played a pivotal role in developing the MMP, OMP, Quality Management Plan, Incident Report Plan and Transition Plan for this Project. The Operations Manager (first Neil acting as the Interim Operations Manager, then later the permanent Operations Manager) will continue to monitor and review these plans and will approve plan amendments during the Services Period.

The Operations Manager will have authority to act on behalf of PRD for day-to-day matters. The permanent Operations Manager will report to Neil McCrank.

The Operations Manager will develop a close working relationship with Bruce Sampson, the Transfield Maintenance Manager. Bruce will keep the Operations Manager fully apprised of Transfield Service’s work. The PRD Operations Manager will work with Bruce to resolve any issues that arise in the context of PRD’s greater requirement under the CA.

The Operations Manager will be dedicated 100 percent to the project.

PRD Director of Operations – Neil McCrank

After the Operations Manager is hired, trained and proficiently undertaking duties, Neil will transition into the PRD Director of Operations role. Although day-to-day matters will be handled by the Operations Manager, Neil will have ultimate responsibility for delivering the services.

The PRD Director of Operations will be dedicated 25-33 percent to the Project.

Public Relations Manager – Mike Marasco

Mike Marasco will act as PRD’s Public Relations Manager to lead all stakeholder relations on behalf of PRD. Mike is a media trained spokesperson with extensive experience in public communications. Mike will work with the HPTE, Ames/Granite JV and Transfield representatives and all other stakeholders as required on all communications matters.

During construction Mike will coordinate with Sheryl Machado (The Design-Build Public Information Officer) on all communication/stakeholder relations matters. Although Sheryl will be in charge of coordinating communications with HPTE’s PI staff during construction, she will work with Mike to ensure messaging is coordinated and consistent with the greater project scope.

The PRD Public Relation Manager will be dedicated 50 percent to the Project in the initial and transition stages of the Project, and will reduce to 10-25 percent (as needed) once stable operations have been achieved.

Maintenance Manager – Bruce Sampson

As Maintenance Manager, Bruce Sampson will have responsibility for Transfield’s undertaking of the Operations and Maintenance of the Project. Bruce will organize and oversee all routine maintenance and life cycle maintenance work. His specific duties will include:

- O&M budgeting
- Strategic work planning
- Resource allocation
- Client point of contact
- Coordination with Design-Builder
- Condition surveys of assets
- Primary responsibility for the MMP, OMP, Quality Management Plan, Incident Response Plan and Transition Plan, including annual updates
- Oversight of all data entry into client MMS system
- Quarterly Operations Report

Bruce Sampson will report to the Operations Manager.



In his duties, Bruce will coordinate with the PRD, Ames/ Granite JV, HPTE, CDOT, utility companies, RTD, police, fire and rescue, and the public (through the Customer Service Center). The Maintenance Manager will be dedicated 100 percent to the Project.

4.1.C – Task Managers Reporting to Key Personnel

The O&M Staffing Plan (please refer to Figure II) will include a team of supervisory, administrative, and O&M staff that will physically carry out the Operations and Maintenance work. In addition, Transfield will provide the required staffing for the Traffic Operations Center, Courtesy Patrol, I-25 Reversible

Lanes technician, Patrollers, a Life Cycle Maintenance Engineer, a QA/Safety Manager and subcontractors and consultants as needed. Transfield staff will perform the primary work with subcontractors used for specialty work or for work overload situations. Consultants will be used for required pavement asset surveys, bridge inspections and electrical inspections. Analysis of these surveys and inspections and work planning will be performed by our Maintenance Manager and our Life Cycle Engineer. Sample resumes for the various Task Managers are included in Volume III, Appendix. Figure II details the primary roles in the O&M Staffing Plan.

Sample resumes for Task Managers can be found in the Appendix at this end of this volume.

Figure II: O&M Staffing Plan

Responsibility	
Reporting Relationship/ Interrelations	
Project Engineer/ Contract Administrator	
<ul style="list-style-type: none"> Development of subcontracts Development of purchasing agreements Reviewing of Change Orders for O&M implications Condition surveys of assets Assist the Maintenance Manager and Operations Manager with work planning and budget control Short-term work planning (annual work plan) Long-term work planning (multi-year plan) 	<ul style="list-style-type: none"> Oversight and inspection of subcontractors Record keeping of contracted work Record keeping of all work planned, performed, quantities accomplished, locations or work performed, life expectancy of repaired asset or element Development and submittal of all project required reports to client Maintenance Work Reports NBIS bridge inspection reports
<p>Reports to the Maintenance Manager and will serve as Acting Maintenance Manager during Maintenance Manager absence. Interrelates with the Superintendent, Life Cycle Maintenance Engineer, QA Manager, Administrative staff, subcontractors and consultants.</p>	
Quality Assurance / Safety Manager	
<ul style="list-style-type: none"> Development of Quality Assurance / Quality Control program Development of the safety program Training of staff to conform to program requirements Performance of QA and Safety functions including: Random and sampling inspections 	<ul style="list-style-type: none"> Record keeping Non-Compliance notice rectification Process improvements Work place safety inspections OSHA compliance and record keeping Injury reports
<p>Report to the Maintenance Manager Interrelates with the Superintendent, Project Engineer, PRD and HPTE.</p>	
Life Cycle Maintenance Engineer	
<ul style="list-style-type: none"> Development of asset condition survey program Analysis of asset conditions and comparison to Performance Requirements Development of life cycle plan for each asset 	<ul style="list-style-type: none"> Development of annual maintenance and rehabilitation work plan for each asset Development of hand back plan for each designated asset Record keeping of all asset routine , preventive, rehabilitative and hand back maintenance
<p>Reports to the Maintenance Manager Interrelates with the Project Engineer, Superintendent and consultants</p>	

Traffic Operations Center staff supervisor

- Perform monitoring of US-36 and I-25 at Traffic Operations Center
- Responsible for conduct and 24/7 presence of required staff

Reports to the Maintenance Manager

Interrelates with other Traffic Operations Center staff, Superintendent, Courtesy Patrol, Work Crews, HPTE and CDOT.

Superintendent

- Oversight of all work operations
- Observation of project assets for work needs
- Day to day crew scheduling
- Roadway closures
- Winter patrol diaries
- Winter operations record
- Coordination of roadway closures between crews and subcontractors
- Stockpiled materials
- Fleet and equipment resources
- Snow and Ice Control planning and performance
- Assist Project Manager and Project Engineer with short-term and long-term work planning
- Incident response planning and performance

Reports to the Maintenance Manager.

Interrelates with the Project Engineer, Life Cycle Maintenance Engineer, QA / Safety Manager, Courtesy Patrol, Traffic Operations Center, work crews, Patroller, police, fire and rescue, subcontractors, consultants, material suppliers and the administrative staff.

Work Crews

Day Shift

- Maintenance activities limited to non-lane closure needs
- Fencing, litter, delineators, drainage ditches, security checks, small sign repairs, asset condition surveys, etc.
- Emergency pothole repairs, debris removal
- Incident response
- Observation of work needs, record keeping of work accomplished
- Snow and ice control operations

Direct report to the Superintendent

Interrelates with the Courtesy Patrol, Traffic Operations Center, QA/Safety Manager and Patroller.

Night Shift

- Maintenance activities requiring lane or shoulder closures
- Pothole patching (planned), striping, overhead sign repairs, traffic control for sub-contractors, etc.
- Emergency repairs, security checks, debris removal
- Incident response
- Observation of work needs, record keeping of work accomplished
- Snow and ice control operations

4.1.D – Current and Projected Workload and Backlog

Plenary Roads Denver

As a dedicated project-specific entity, PRD will be staffed locally to carry out its responsibilities and will therefore have no backlog. As Concessionaire, Plenary Group will, throughout the concession term, provide oversight and support to PRD. Plenary Group currently has more than enough staff available to provide this role. In fact, although our approach is to hire an Operations Manager in the months after being identified as Preferred Proponent, Plenary Group could, if required, easily commit Neil McCrank to this role for an extended period of time.

Neil McCrank is currently transitioning off the Disraeli Bridges and Freeway Project. That project has reached operations, and the full-time operations project director and SPV staff have taken over full day-to-day responsibilities. For the US36 Managed Lanes project, Neil has been actively

involved in the formulation of the Services plans, both internally for PRD as well as in conjunction with Transfield for the overall Services plans. Neil is committed to this Project through achievement of operations after the Full Services Commencement Date. He then will be gradually transitioned off as a full-time staff member employed by PRD takes over his role. Neil will remain involved in the Project as PRD Operations Director.

Transfield Services

Transfield provides comprehensive asset management services on more than 25 projects, maintaining more than 12,000 lane miles of primary and interstate roadways throughout North America. With nearly 2,000 employees in the United States and more than 24,000 worldwide, Transfield has the current and long-term capacity to perform O&M services on infrastructure projects anywhere in the world. At the core of Transfield's philosophy for successful work is a commitment to hiring locally and working with area subcontractors. Transfield continually trains and promotes from within the firm so that



experienced, well-trained personnel are consistently available.

Bruce Sampson will act as Maintenance Manager for the Project. Bruce has worked with Transfield since 2006 and has successfully managed a number of projects with prescriptive operations, maintenance, and rehabilitation obligations that also require significant consideration of strategies for sustainability and local involvement.

Currently, Bruce is managing a 5-year contract with the Texas Department of Transportation (TxDOT) to maintain 761 lane miles of IH 45, a major interstate highway from Galveston through downtown Houston. Bruce will transfer from the TxDOT project to this Project when required.

Transfield is accustomed to recruiting the bulk of its workforce from the local hiring pool. This strategy works because Transfield has an established process-driven training program that effectively trains new recruits in the correct processes and procedures to accomplish quality work. Additionally, each project is seeded with experienced and seasoned personnel placed in strategic leadership positions and supported by a cohesive team of professionals in the U.S. corporate office. Subcontractors will also be recruited locally for specialty work, including lighting, electrical, guardrail repair, bridge maintenance, asphalt and concrete paving, drain cleaning and towing services.

Transfield has existing purchasing and procurement relationships with suppliers of services and materials related to roadway maintenance both in the United States and internationally. Transfield will leverage these relationships and its buying power to assure that required supplies, roadway maintenance materials, equipment, and services are provided to meet the performance requirements. Material suppliers will be sourced regionally for de-icing chemicals, safety supplies, road patching materials, electrical/lighting, signs and posts, delineators, vehicles, arrow boards, variable message signs, and snow trucks.

4.2 – Operations and Maintenance Management

4.2.A – Operations Management Plan

Plenary is one of the largest dedicated, active PPP equity investors -- we take an active role in all of our projects, and have 10 years of experience in managing operations, including on highway projects. Transfield, itself, brings more than 15 years of specific operations and maintenance (O&M)

experience on transportation facilities to the PRD team. With this combined experience comes a thorough understanding of the importance of efficient and effective O&M management. Proper management is instrumental in meeting the goal of providing the traveling public a safe facility while providing the High Performance Transportation Enterprise (HPTE) with O&M services that meet or exceed expectations.

Transfield has been a leader in the development of asset management solutions for roads and highways, establishing the first Performance Specified Maintenance Contract in the United States in 1995 and developing its turnkey asset management approach through a range of contracts since then. Transfield has been the lead O&M firm on four public-private design, build, operate and maintain (DBOM) programs across North America, on each one playing an integral role through the design, development and construction phases, and then into the transition to maintenance.

As members of these teams, Transfield is present on site to perform maintainability analyses during the design and construction phases and to perform a full inventory of condition assessments that will culminate in multi-year asset management plans. Transfield maintains communications with partners, from procurement through design and construction, to ensure a seamless transition to O&M and an effective maintenance approach over the long term to maximize life cycles of the infrastructure assets.

4.2.A.i – Roadway Operations

Based on our combined extensive experience in the roadway Life Cycle Maintenance management and operation field, Transfield and PRD have developed an effective Operations Management Plan (OMP) for this project. This plan is focused on a local needs-based approach and is detailed below.

The key to our approach for this project is to divide the system into distinct zones of operation and then assign maintenance crews comprised of maintenance supervisors and work crews to perform the O&M functions in these zones. This allows for attention to detail and in-depth knowledge of the assets within the zone and creates a greater sense of ownership for the infrastructure, as well as ensuring response times are met 24/7. These maintenance crews will work together to maintain these zones for their required performance standards. The project will be set up into two zones of operation. Zone 1 will be I-25 and the eastern portion of US 36 from I-25 to Pecos Street. Zone 2 will be US 36 Phase 1 Project and Phase 2 Project.

Zone personnel/resources will be available to overlap for faster response when required and provide additional resources on combined zone operations.

The Foreman Supervisors are responsible for management of O&M work within their zones. This includes identification of work needs, issuing work orders, inspecting and managing the work of both Transfield crews and subcontractors.

Each work zone will be staffed with dedicated crews led by working lead technicians. Transfield specialty crews will focus on corridor-wide attributes, including herbicide treatment, sign repairs, tree trimming and fence repair.

Crews will be equipped with specially designed trucks that have built-in toolboxes and integral arrow boards for incident response and traffic control, and will carry sufficient maintenance of traffic signs and cones to perform a single lane closure for routine work zones or initial emergency incident response. The project support facility will be equipped with additional emergency response equipment and spare parts as necessary.

Crews will perform routine maintenance and will be available 24/7 to respond to emergencies and incidents. A combination day and night crews will be scheduled to comply with performance requirements. Local subcontractors will be used for specialty maintenance. This may include guardrail and attenuator repairs, bridge maintenance, mowing, lighting, pavement repairs and roadway sweeping.

Training. Transfield will conduct mandatory safety orientation and training programs for all project staff, which will include, at a minimum, PRD and HPTE requirements, and as relevant, site-specific safety processes, responsibilities and hazards, including a thorough review of the OMP. Training will continue throughout the term of the contract, with the goal to ensure all employees understand the project expectations and objectives, their responsibilities, their roles in contributing to the quality of service, and their impact on safety and environmental aspects of the work. The training program will employ a range of training resources selected to meet the particular skill area, the number of training candidates available, and the impact of training on the project operations. Throughout the project term, Transfield will conduct audits to verify that the management team is administering the O&M Plan, conducting training, providing safe work instructions, and identifying and closing issues.

Detection and Response to Emergencies and Incidents

Emergencies, Accidents, Breakdowns and other Incidents.

Transfield will provide sufficient resources, trained and equipped to patrol and monitor the Managed Lanes and deal with any incidents that will occur. In addition, emergencies, breakdowns, accidents and incidents will be detected and identified by our physical roadway and courtesy patrols, as well as by local law enforcement, emergency response agencies, and commuters using the system. Transfield staff in the Colorado Department of Transportation (CDOT) Traffic Operations Center (TOC) as well as site-based employees will receive calls from these external sources. Transfield's phone responder will ask the caller a series of questions in order to determine the nature of the service/support request - name, location of the incident, nature of the incident, etc. After determining the nature of the service/support request, the phone responder will initiate the appropriate response and deploy field staff as required to the scene of the incident with fully equipped incident response vehicles to secure the site and provide assistance.

Transfield will be available to respond to traffic and/or roadway-related incidents in accordance with the Traffic Incident Management Plan. The Transfield emergency responders will be appropriately trained in incident management in keeping with National Incident Management System (NIMS) requirements. First-line supervisors, mid-level management staff, and general staff will complete ICS-100 and ICS-200. The Maintenance Supervisors will have completed ICS-100, ICS-200 and IS-700.

Transfield's personnel with a direct role in emergency preparedness, incident management or response will complete NIMS IS-700. Incident responders will be empowered to make decisions, gather pertinent information from the person(s) reporting the incident, and support police, fire and life safety personnel with the appropriate response. Transfield's personnel will set up barricades and safety equipment as needed, to warn and protect motorists from any hazards and to protect the integrity of the road system.

Transfield will ensure a timely response through adequate staffing (with additional backup available) in fully equipped vehicles to respond to incidents. When Transfield's emergency response vehicle arrives on the scene of an incident, on-site personnel will secure the area using traffic control signage, reflective cones, arrow boards and other safety and directional equipment, as appropriate, to ensure the safety and protection



of motorists and emergency responders. Personnel will then concentrate on clearing the site.

For major incidents that require extended lane closures, the Transfield project staff will implement detours, if necessary, and ensure personnel are available to remain on site until it is cleared and traffic flow is restored. In the case of managed lane responsibility only, a decision will be made along with the scene commander about usability of the shoulder to direct traffic flow around the incident. If this is not feasible, the managed lane may have to be closed until the lanes are cleared.

Transfield also will supplement in-house response efforts with our subcontractor team. As a part of the engagement of our subcontractors, we will make provisions for their availability to support our incident response. Through this redundancy, we will ensure that our response capability is scalable to meet the projected needs.

Hazardous Weather Response. Transfield will monitor weather forecasts, using road weather information systems (RWIS) sites, region-wide radar, satellite meteorological systems, and will be in close contact with adjacent highway and road maintainers before, during and after hazardous and inclement weather. The objectives of the response to hazardous and inclement weather include:

- Safeguard lives and property
- Keep the system operational as long as possible
- Re-open system as soon as possible

The policies covering storm actions include:

- Consideration for safety will govern actions
- Roadways or facilities will be returned to service after the facility has been made safe for the public to use
- Maintain communication with emergency response agencies, HPTE and CDOT by means of scheduled email correspondence and conference calls. This communication will serve to provide regular updates of management efforts before, during and after the weather event
- Implement Emergency Response Plan should the event be declared an Emergency

PRD and Transfield will monitor local weather services and the National Weather Service for storm alerts. Snow and ice events are generally well predicted and provide sufficient time to set up trucks and drivers. To handle unexpected snow and ice events, Transfield will have trucks with plows and spreaders at the ready during the snow season to respond. Maintenance crews will handle these trucks to provide immediate response.

Other hazardous weather events include tornadoes, wind storms and severe thunderstorms. Should our project be hit with one of these hazardous events, our response plan is as follows:

1. Secure our own facilities, workers and equipment. Workers should not be out in tornado or other hazardous conditions.
2. Have crews report to secure locations until safe to move about.
3. As soon as the weather system has moved on, coordinate with CDOT TOC to identify safety and problem locations.
4. Send patrollers out to identify immediate problems and locations. Notify the CDOT TOC.
5. Direct work crews and equipment to identified locations.
6. Mitigate safety issues first. Coordinate with Police, Fire, Rescue and the TOC as necessary.
7. Restore open lanes as soon as possible.

Liaising and Coordination with Emergency Services

PRD and Transfield will liaise and coordinate with the various emergency services in two ways; through pre-event planning and at an incident scene. An incident response plan will be in place to coordinate our efforts with emergency services to reduce or eliminate confusion and poor response at an incident scene. At an incident scene, the Police or Fire typically are directed by the scene commander. Transfield will coordinate with the scene commander to:

- Provide traffic control to move traffic safely around the scene
- Provide towing services to remove disabled vehicles
- Clean and remove debris and waste materials from the roadway
- Repair or mitigate as necessary any damages or safety concerns

Coordination with emergency services will concern lane closures, disruption of traffic flow, expected time until traffic is restored, notification and updating the CDOT TOC, special equipment or resource needs, public information, notification to RTD and restoration of the facility.

Incident Response Plan. During the O&M mobilization period, PRD and Transfield will meet with local emergency management officials to develop the detailed Incident

Response Plan (IRP) for handling emergency services, including necessary coordination responsibilities with CDOT and all emergency service providers. PRD and Transfield will arrange and conduct one-on-one and group meetings semi-annually with the appropriate emergency management organizations to review and update plans with management supervisors from the following:

- HPTE
- CDOT
- Colorado State Patrol (CSP)
- Broomfield and Westminster Police Departments
- Local fire and rescue departments
- Other authorities having jurisdiction

In line with the IRP, during incidents, a designated team member of Transfield located in the TOC will coordinate with appropriate agencies, including local, regional and state emergency management officials and federal officials, as required.

An on-site incident response crew will communicate directly with other agency on-site commanders and relay information back to the TOC, allowing a quick flow of communications on site to quickly resolve issues and stabilize the incident. Transfield will deploy further resources as required.

Traffic Management and Coordination with CDOT ITS

Transfield has established strong coordinated working relationships with ITS branches of other DOT's in states such as Florida and Virginia. This has had huge benefits, particularly when dealing with challenging traffic management situations. Traffic incident response teams can use information from the ITS system to affect their response and better prepare for the situation before they reach the site of the incident. This ultimately results in a more efficient resolution of the situation.

This working relationship will be enhanced with the embedding of a Transfield representative in the CDOT TOC in Golden, Colorado. Before the start of maintenance management operations, PRD and Transfield senior project management personnel and operators will arrange to meet with the management of the CDOT ITS branch. The aim of this meeting will be to build a professional working relationship with the staff of the CDOT ITS branch and to establish effective training and communication protocols.

The training and communication protocols will be integrated into the Transfield IRP; this will ensure synergy between the Transfield staff and the staff of the CDOT ITS branch.

Transfield will perform all traffic management functions with the goal of providing an open travel way with minimal detours or diversions. Certain maintenance operations will require lane closures or detours in order to accomplish the work safely. PRD and Transfield will prepare a traffic control plan and submit to HPTE for approval prior to any planned maintenance operation. This plan will be based on the MUTCD manual, the current Colorado Supplement to MUTCD and CDOT's Region 4 and Region 6 Lane Closure Strategies. In addition, all lane closures or detours will be scheduled for non-peak periods. Transfield will place variable message boards several days to a week in advance of the planned work to advise motorists.

Accident Analysis and Improvements to User Safety

After any major accident, PRD and Transfield will work in partnership with emergency services agencies to review data on the cause of the accident. A joint session including Police, HPTE, PRD and Transfield will be organized as soon as possible after the incident when all Police reports and Transfield Incident Response reports have been completed. The purpose of this session is to determine whether similar incidents could be prevented through better management of the facility and whether the response was adequate or could be improved. Transfield will enter this information into the incident log and assess whether operational or maintenance changes can be made to reduce the potential for further incidents. When trends in accidents are apparent, Transfield will determine whether this potential cause is present elsewhere on the roadway and will make recommendations for improvements to PRD and HPTE.

Policing the Roadway

Transfield will have a trained and dedicated team for the operating period to police and monitor the managed lanes for hazardous- and safety-related conditions, as well as conditions that may impede the efficient flow of traffic. Members of this team will be trained to identify, report and, when possible, correct all noted hazardous conditions immediately. Transfield has developed a multi-layered strategy to police the managed lanes. The first layer of the strategy involves the observations made by the courtesy patroller. The patroller will be trained to observe the roadway for hazardous objects, debris and conditions.

Furthermore, the patroller will be trained to remove easily manageable pieces of debris from the travel way. The second layer of the strategy involves the observations and actions of the Zone Maintenance Superintendent and work crews.



The work crews will be trained to respond to their own observations regarding debris and be on hand to quickly remove larger pieces of debris. The third layer of the strategy to police the roadway enlists the assistance of law enforcement and emergency response personnel and Transfield personnel located in the TOC.

4.2.A.ii – Managed Lanes Tolling Operations

Description of Managed Lanes Tolling Operations

The following organization chart depicts the PRD team members responsible for carrying out the Managed Lanes Tolling Operations for the Project (the Tolling Operations Group).

Figure III: Tolling Organization



PRD will have overall responsibility for the Managed Lanes Tolling Operations. PRD will manage and coordinate the Tolling Operations Group and ensure compliance with the Concession Agreement. The Operation Manager will coordinate with and report to HPTE on all Tolling and Civil Penalty Provisions, including the Established Toll and Penalty Schedule and ensure the Managed Lanes Goals are met.

Transfield Services will undertake the maintenance of Tier 1 Tolling Equipment. Tier 1 Equipment includes the tolling infrastructure such as the gantries, signage, gates and cabling. As detailed below, Transfield Services, coordinating with E-470, will perform the PRD Customer Service role.

E-470 will undertake all of PRD’s back office services including processing EXpressTolls and License Plate Tolls transactions, account management, violation processing, account collection and administrating the adjudication process for citations (the “Back-Office Services”). PRD is also proposing to use E-470 to perform maintenance of the Tier 2 Tolling Equipment, including maintenance of the lane controllers, readers, cameras and software.

Transcore will perform maintenance on the hosting system and provide technical advisory services on ETCS, the host system and enforcement technologies.

It is expected that PRD will enter into agreements to perform enforcement services with the Colorado State Patrol, and Westminster and Broomfield Police Departments.

Customer Service Approach. PRD’s customer service approach is based on being highly accessible, providing prompt and courteous service, providing fast information dissemination, maintaining detailed records and quickly rectifying issues. As discussed below, PRD’s customer service will be primarily handled by E-470 and Transfield.

PRD will maintain a 24/7 “Hot Line” for contact from the Traffic Operations Center, HPTE, CDOT, E-470, Emergency Services or the public. An email address and website for customer service and distributing information regarding operations and maintenance of the Project and general project inquiries will also be provided. Any complaints or inquiries received regarding the back-office services (account services, violation processing, toll disputes, etc.) will be directly forwarded to E-470.

E-470 will maintain a separate dedicated telephone line, email and website for customer service related to the back-office services. It is expected E-470 will use its existing systems to maintain a customer service rating program, maintain a complaint tracking system, and generate the monthly reporting to PRD and HPTE. Any complaints and requests from users that are received via telephone, website, email or in person will be quickly and effectively handled.

A corrective action program will be implemented by both E-470 and PRD to quickly rectify issues, with safety-related complaints taking the highest priority. Safety-related complaints or requests for services that are beyond PRD’s scope will be forwarded to HPTE within the required timeframes and include relevant detailed information.

Information dissemination regarding the operation of and general information on the managed lanes is a key component to our customer service approach and described in detail in the following section, “Managed Lanes Communications and Marketing Approach.”

Adjustment to the Concept of Operations for the Managed Lanes

We do not propose any changes to the concept of operations for the managed lanes.

Courtesy Patrol Approach

Transfield Services will be providing the courtesy patrollers on both the US 36 and I-25 managed lanes free of charge to traveling public. Trained Courtesy Patrol drivers will complete a circuit of the US-36 and I-25 Managed Lanes approximately every hour during the day, unless stopped to render assistance. On weekends drivers will be assigned to be “On-Call.” These drivers will be able to respond quickly to any need. Courtesy Patrol vehicles will conform to statewide standards in services provided, paint scheme, markings and equipment load-out.

Courtesy Patrol staff will clear disabled vehicles from travel lanes, ramps and shoulders, change flat tires, jumpstart batteries and remove minor non-hazardous spills and debris from the highway, and assist the Colorado State Patrol during incidents. Transfield Services will engage at least two local towing contractors to provide their services as needed.

In addition to the specific functions of providing a Courtesy Patrol to the public, the Courtesy Patrol will fulfill the patrolling requirement and conduct regular patrols of all lanes of the facility to identify conditions that are unsafe or have the potential to become unsafe; to identify conditions that could threaten the infrastructure; and to attend to existing or changing conditions. Any deficiencies found will be documented for type of deficiency, priority and location. This information will be forwarded to our Operations Superintendent for action.

During inclement weather events, the Transfield Service Operations Foremen will also perform the patrolling function. They will observe actual weather conditions across the corridor, local trouble spots that might cause roadway flooding, status of snow and ice control measures, disabled vehicles, any other roadway needs that affect the public. This information will be relayed to the Operations Superintendent and to the Traffic Control Center.

Proposed Initial Toll Rate Structure

As discussed in the following section, “Methodology for Tolling,” PRD will initially pursue a “time of day” toll methodology for the Project. The proposed initial toll rate structure is depicted in Figure V and Tolling Segments correspond to those set out in Figure IV.

Figure IV: Tolling Segments

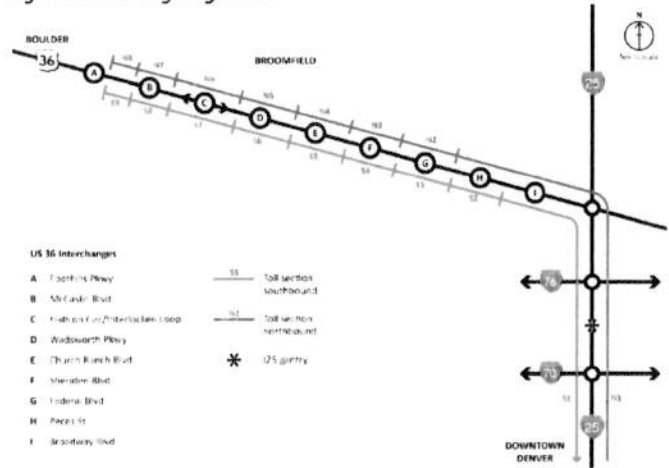


Figure V: Proposed Initial Toll Rate Structure

		2015 -Tolls (Real 2012)				
Tolling Segment		AM Shoulder	AM Peak	Middays	PM Shoulder	PM Peak
I25	N1	N/A	N/A	0.53	1.74	4.10
US36	N2	0.21	0.22	0.21	0.21	0.22
US36	N3	0.30	0.52	0.21	0.21	0.52
US36	N4	0.21	0.40	0.21	0.21	0.30
US36	N5	0.21	0.34	0.21	0.21	0.26
US36	N6	0.22	0.38	0.21	0.21	0.29
US36	N7	0.28	0.48	0.21	0.21	0.36
US36	N8	0.32	0.54	0.21	0.21	0.41
I25	S1	3.21	4.10	N/A	N/A	N/A
US36	S2	0.21	0.21	0.21	0.21	0.21
US36	S3	0.21	0.45	0.21	0.26	0.32
US36	S4	0.41	0.90	0.26	0.52	0.64
US36	S5	0.31	0.50	0.21	0.40	0.50
US36	S6	0.21	0.34	0.21	0.25	0.34
US36	S7	0.21	0.38	0.21	0.28	0.38
US36	S8	0.28	0.48	0.21	0.36	0.48
US36	S9	0.32	0.54	0.21	0.41	0.54
US36	US36 N	1.76	2.88	1.48	1.48	2.34
US37	US36 S	2.16	3.80	1.74	2.68	3.41
Corridor	Total N	1.76	2.88	2.01	3.22	6.44
Corridor	Total S	5.38	7.89	1.74	2.68	3.41

Please note the initial toll rate structure is based on current traffic forecasts and may be revised prior to bid. PRD reserves the right to update the Initial Toll Rate as per the Concession Agreement.



The above tables detail ExpressToll toll rates. A 25-50 percent premium will be charged on License Plate Toll transactions ("LP Premium").

Vehicles with four axles or more will be initially set at a \$25 premium (the "Truck Premium").

Methodology for Tolling

Although PRD's ETCS will allow for dynamic tolling from the Phase 1 Service Commencement Date, initially we propose tolling will follow a fixed time of day pricing methodology. Toll rates will be determined based on the time of the day a vehicle passes under a gantry.

Time of day pricing has been adopted because it has several benefits, including: the Colorado public is familiar and comfortable with this methodology; E-470 is experienced, proficient and has the required systems to undertake this methodology; there is no significant revenue benefit to fully dynamic tolling at current and near-term flow rates.

It is expected that traffic flows eventually will dictate fully dynamic toll pricing to control a minimum flow rate of 45 mph. At this time PRD will switch to fully dynamic tolling. Many other factors will be considered in determining when to switch methodologies, including maintaining consistency with other roads.

Managed Lanes Communications and Marketing Approach

PRD's communications plan is based on providing open, clear, and responsive communication to users and affected stakeholders.

The communications strategy for this Project is based on early and prompt communications with the public, users and all stakeholders. PRD will coordinate communications with HPTE and E-470 to ensure consistent messaging for all public communications. Providing Back-Office Services (including the Customer Service function), E-470 will be a primary interface with Managed Lane users and therefore performs an important communication function. Upon being selected Preferred Proponent, PRD will work with E-470 to finalize an integrated communications plan.

The objectives of PRD's communications strategy for the Project include:

- Ensure public accessibility to appropriate and timely Project information
 - The public will be provided accessible points of contact, the ability to make inquiries into the Project, and quick response to its inquiries.

- Engender public support for the Project
 - By being informative and responsive, by effectively addressing Managed Lane users and stakeholder issues, by seeking feedback and developing solutions to issues, we will encourage public support for and ownership of the Project.

PRD communications will be led by Mike Marasco, PRD's Public Relations Manager. During the construction period, Mike will coordinate with Sheryl Machado (the D-B Public Information Officer), and HPTE's PI staff to ensure construction-related communication (such as traffic pattern changes, construction updates, etc.) are effectively managed.

"From stakeholder relations through issues management, to crisis communications and media relations – our colleagues at Plenary consistently demonstrate a pro-active, professional, and responsive approach. In an ever dynamic and demanding environment, working with a project partner that truly understands and respects the unique characteristics and circumstances of our project is essential. We commend and congratulate Plenary as a true communications partner."

Chief Communications Officer, Niagara Health System

PRD will utilize several methods to dispense information and interact with the public in an attempt to reach as many affected stakeholders and users as possible, including the following communications tools:

A Project Website. A Project Website will be established by PRD to serve as a consistent and updated information source throughout the entire concession term. Key information provided on the website will include:

- Information on construction, including timelines, traffic advisories and a detailed construction progress section (including photos)
- Information on the tolling scheme and toll rates
- A Customer Service portal
- Easily accessible links to the E-470 website for tolling account sign-up, bill paying and disputes
- Information on the PRD team, including project contact details
- Detailed map of the Project
- Email sign-up tool to enable quick receipt of relevant communication materials that are released through the website
- Media section with links to or postings of related media reports

After we are selected as Preferred Proposer, PRD will work with E-470 to ensure PRD's website and E-470's website are coordinated to minimize user confusion. It is hoped that a fully integrated single website can be developed to provide a single interface for stakeholders and users.

Media Relations. The PRD media relations program will provide a quick handling and response system for media inquiries, including:

- Receiving and tracking public inquiries
- Monitoring media coverage to stay on top of how the Project is being reported locally
- Strategic response to inquiries and media coverage (e.g. news releases and responses to editorial/public letters)

Mike Marasco will be the primary media contact for all communication actions by HPTE. Mike is a trained media spokesperson, and his contact information will be provided to relevant local media.

In addition, PRD will utilize key media materials (as the circumstances require), including:

- News releases
- Public service announcements
- Circulation of background materials on the Project and the PRD team

It will be imperative that all media releases are perceived as either a joint statement between the HPTE and PRD, or as a statement by one party that is fully supported by the other. For this reason, PRD will consult/coordinate with HPTE for all key media releases.

Public Meetings/Open Houses. PRD fully understands that the local public is keenly interested in the status and progress of the Project. Open houses will be provided in an inclusive and interactive way for members of the public to:

- Gather facts about the Project, and clear up misperceptions that may have caused concern
- Understand the impact that the Project will have on them, as well as the measures that will be implemented by the PRD team to reduce such impact
- Be exposed to the PRD team to put faces on the Project
- Have a voice and be able to ask questions about the Project to the people best able to answer them

PRD will promote such public meetings through direct advertising, media relations and website communications, in order to encourage involvement and participation of the public.

Marketing Approach. Initially PRD's marketing will focus on providing information regarding the phased implementation of the project and the increase in tolls on the I-25 Managed Lanes. The focus of messaging will later shift to marketing of ExpressTolls, process to obtain the new transponders, and provision of information updates on construction and operations and maintenance.

Public relations will focus heavily on earned media and will leverage partnerships with opinion leaders, including community leaders, local politicians, local skilled trades, and neighboring institutions. We will also work closely with the established transportation management organizations along the corridor, 36 Commuting Solutions and Boulder Transportation Connections, to take advantage of the communication channels they have already established with corridor stakeholders.

A branded website will be a significant component of our marketing campaign and will be launched soon after the achievement of Financial Close.

In addition, marketing/advertising communications will include a mix of the following media:

- Billboards
- Print media
- Targeted publications (including bulletins and newsletters)
- Broadcast (primarily radio)
- Market testing

Strategic Messaging. The approach for communications and messaging will be staged and will be tailored to the launch of each segment of the Managed Lanes, and later to the ongoing communications requirements of the business.

Stage 1: Transfer of I-25 and Toll Increase

The first period of intensive public relations will commence on achievement of Commercial Close. The objective of the campaign will be to manage any backlash and educate users about the need to increase tolls on the I-25 Managed Lanes. Given the existing clientele of the I-25 Managed Lanes, the marketing/advertising campaign will focus heavily on driving users to use ExpressToll accounts by highlighting the value proposition of being an account holder. Secondary messaging may target new customers, with a focus on dependability of the roadway for users.

Stage 2: Launch of Phase 1 Managed Lanes

A communications campaign will be launched to build momentum for the completion of the Phase 1 Managed Lanes.



The advertising campaign will target new customers and heavily market ExpressToll accounts. A parallel public relations campaign will leverage construction milestones to drive awareness and market the new Phase 1 Managed Lanes.

Stage 3: Launch of Phase 2 Managed Lanes

In anticipation of the launch of Phase 2 Managed Lanes, a similar campaign to the Phase 1 campaign will be undertaken to build momentum for the additional lanes. The advertising campaign will again target new customers and marketing ExpressToll accounts. A parallel public relations campaign will again leverage construction milestones to drive awareness and market the new toll route as an alternative to existing routes. This campaign will leverage customer feedback from the two existing phases of the project.

Ongoing Communications

Communications activities will include targeted public relations events in local communities, as well as targeted ongoing marketing with a focus on converting customers to ExpressToll accounts. Contingencies will be put in place to boost Managed Lane use, as required, with additional marketing/advertising.

In addition, updates about road closures and scheduled maintenance during the concession will be communicated to the public via local news outlets and the website.

Location of Enforcement Zones

There will be seven new enforcement zones located in close proximity to each toll gantry.

The Enforcement Zones have been strategically placed to provide patrol officers with safety and optimal sightlines to enforce toll and HOV violations, and convenient access to entry and exit ramps on the highway.

Required Enforcement Equipment and Approach

PRD expects to enter into agreements with the Colorado State Patrol (“CSP”), Westminster Police Department (“WPD”) and Broomfield Police Department (“BPD”) to perform enforcement services.

Figure VI sets out our preliminary assessment of which agency will be responsible for enforcing the tolling segments depicted in Figure IV.

Figure VI: Enforcement Agencies

Agency	Tolling Segment
CSP	All Segments
BPD	N5, N6 S6, S7
WPD	N2, N3, N4 S2, S3, S4, S5

PRD expects that two to three officers, working 4-hour shifts, five times a week, will be required to adequately patrol the Managed Lanes. Enforcement will be accomplished by stationary patrols in the seven enforcement zones and moving patrols. Although hours of patrol will mostly occur during peak periods, off-peak periods also will be patrolled in order to create a sense of randomness.

Officers will be equipped with technologies to assist in enforcement, including notification systems to allow officers to determine if a vehicle has paid the toll and whether it should be examined for occupancy violations. This technology will include tag status beacons that display a light at the toll zone that will flash a different color based on tag status (e.g., Green for SOV, Yellow for HOV, or no tag) and likely handheld readers that allow an officer to query the tag of a vehicle that they pulled over to determine the status.

Although not economically feasible at this time, PRD also will look to adopt remote occupancy recognition technology (through video and infrared technology) as it becomes more widely accepted and cost efficient (to the extent it complies with existing law).

Methods for Performance Monitoring

PRD and Transfield will use the quality assurance procedures to verify and document that all services are being performed in full compliance with the performance standards. The QA Manager will perform assurance testing by both observation and analysis of the records. The QA Manager will prepare a checklist of functional requirements and minimum standards of compliance. Field and office quality control checks will be planned for each month. A statistical analysis will show percentage of compliance. In addition, the monthly QA audit will include descriptions, locations, photos and, if necessary, a commentary on actions needed to achieve compliance. These monthly QA reports will be shared with HPTE.

As discussed in Section 4.2.A.iv, PRD will use Maintenance Management Online Management Systems (“MOMS”) to monitor the performance of the ETCS. MOMS is an intranet-based maintenance and inventory control system. MOMS is a collection of menus, screens, maps, reports and charts that allows authorized personnel, from any computer within the customer network, to track ETCS problems from the time of failure until they are resolved. MOMS provides an automated method of creating, updating, tracking and reporting failures and preventive maintenance activities for sites, facilities, host equipment and applications.

MOMS will be integrated with the in-lane equipment and will receive messages from the lane controller regarding the status of the equipment at the different toll locations. MOMS will also be integrated with the VTMS to monitor the sign communications and operations. The real-time monitoring provided by MOMS will support the generation of work orders and notifications to maintenance personnel that there is an issue that needs attention.

Tolling Parameters

The priority in establishing and adjusting the tolling parameters will be to achieve the Managed Lanes Goals detailed in Schedule 16 of the Concession Agreement are satisfied. Working with our Traffic Advisor, Buro Happold, toll rates will be adjusted to achieve the managed lanes goals and optimize revenues within those parameters. Peak period and off-peak time periods also will be adjusted for the observed traffic congestion patterns.

The truck premium is set and will be adjusted to effectively “price out” all truck traffic in the managed lanes. Truck traffic in managed lanes is a hindrance to traffic flow and therefore not consistent with the managed lane goals.

The License Plate (LP) Premium will be set and adjusted to persuade customers to establish EXpressToll accounts. Current capture of EXpressToll is approximately 72 percent of customers. Through setting of our toll parameters and marketing program, we aim to shift this capture to 80 to 85 percent (in-line with industry standards), and thereby improve transaction processing and collections. We note this will benefit all local toll roads.

When congestion dictates, a dynamic toll setting methodology will be adopted to achieve the managed lanes goals.

Maximum Toll

The maximum toll that PRD will charge for tolled vehicles for the journey along the entire length of the Managed Lanes is \$13.91. Please note that maximum toll has been calculated by adding significant buffer to the expected real end of Concession toll. As such, we do not expect tolls to be this high at any point during the Concession. The LP Premium and Truck Premium will be in addition to the maximum toll.

4.2.A.iii – Routine Maintenance - Roadway - Maintenance Management Plan

Work planning begins by dividing anticipated work activities into functional element categories, then detailing the methods Transfield will employ to accomplish the maintenance goals using a proven asset management process.

The Transfield project team will develop estimated annual workloads based on achieving a stated performance measure. The estimates will be used to develop specific maintenance plans for each individual work activity, with plans described in terms of a Performance Measures and Maintenance Standard, a Condition Assessment and Workload Forecast, and a work method matched with capabilities to successfully accomplish the task at hand for that activity. Figure VIII depicts a sample of a maintenance plan.

The work plan process of Transfield will feed directly into the development of the Maintenance Management Plan. The annual work plan is a fluid document that will be updated monthly. In this plan, the first future month is always the most accurate, with planned work units and work orders plus allowances for emergency work requirements. Second and third future months are accurate for routine and seasonal work needs, but planned work orders are not firmed up at this time. Future months (four- to 12-month plans) contain monthly routine seasonal work needs.

Figure VII sets out the major elements of the Sample Work Plan, while Figure VIII sets out the Maintenance Management Plan.



Figure VII: Sample Work Plan

Description	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
PAVEMENT MAINTENANCE												
Asphalt Patching (Manual) US 36 (ML & GP)/I-25 (ML)												
Asphalt Patching(Mech.) I-25 (ML)												
Bit. Pavement Joint Repair US 36 (ML & GP)/I-25 (ML)												
Asphalt Resurfacing I-25 (ML)												
Asphalt Crackseal I-25 (ML)												
Grinding US 36 (ML & GP)/I-25 (ML)												
Concrete Pavement Joint Repair US 36 (ML & GP)/I-25 (ML)												
Concrete Pavement Full Depth Repairs US 36 (ML & GP)/I-25 (ML)												
Concrete Pavement Surface Repair US 36 (ML & GP)/I-25 (ML)												
ROADSIDE MAINTENANCE												
Rep N-paved Shld, Slopes, Ditches (Man) - US 36 (GP)												
Misc. Slope & Ditch Repair - US 36 (GP)												
Sound Barrier Repair - US 36 (GP)												
Fence Repair (Chainlink and Farm Fence) - US 36 (GP)												
DRAINAGE MAINTENANCE												
Clean Culverts US 36 (ML & GP)/I-25 (ML)												
Clean Drainage Structures(Inlets and Manholes) US 36 (ML & GP)/I-25 (ML)												
Repair Curb and Gutter US 36 (ML & GP)/I-25 (ML)												
Concrete Repair US 36 (ML & GP)/I-25 (ML)												
Roadsweeping(Mech.) US 36 (ML & GP)/I-25 (ML)												
VEGETATION AND AESTHETICS MAINTENANCE												
Mowing - US 36 (GP)												
Chemical Weed and Grass Control US 36 (ML & GP)/I-25 (ML)												
Graffiti Removal US 36 (ML & GP)/I-25 (ML)												
Roadside Litter Removal US 36 (ML & GP)/I-25 (ML)												
TRAFFIC SERVICES MAINTENANCE												
Delineators US 36 (ML & GP)/I-25 (ML)												
Signs (Ground Signs 30 sf or less) US 36 (ML & GP)/I-25 (ML)												
Signs (Ground Signs over 30 sf and All Overlane) US 36 (ML & GP)/I-25 (ML)												
Sign Cleaning US 36 (ML & GP)/I-25 (ML)												
Guardrail Repair US 36 (ML & GP)												
Attenuator Inspect. & Serv. US 36 (ML & GP)												
Attenuator Repair US 36 (ML & GP)												
Pavement Striping US 36 (ML & GP)/I-25 (ML)												
Pavement Symbols US 36 (ML & GP)/I-25 (ML)												
Routine Patrolling US 36 (ML & GP)/I-25 (ML)												
Incident Management US 36 (ML & GP)/I-25 (ML)												
Highway Lighting Maintenance US 36 (ML & GP)/I-25 (ML)												
High Mast Light Poles US 36 (ML & GP)/I-25 (ML)												
SNOW AND ICE CONTROL												
Stockpiling Winter Materials US 36 (ML & GP)/I-25 (ML)												
Plowing and Spreading US 36 (ML & GP)/I-25 (ML)												
Winter Patrolling US 36 (ML & GP)/I-25 (ML)												
Anti-icing US 36 (ML & GP)/I-25 (ML)												
FACILITY MAINTENANCE												
Emergency Generator US 36 (ML & GP)/I-25 (ML)												
Carpentry Repair - Node Building												
Exterior Painting Maintenance - Node Building												
Exterior Toll Plaza Cleaning US 36 (ML & GP)/I-25 (ML)												
BRIDGE MAINTENANCE												
Bridge Joint Repair US 36 (ML & GP)/I-25 (ML)												
Bridge Deck Maintenance US 36 (ML & GP)/I-25 (ML)												
Superstructure Maintenance US 36 (ML & GP)												
Substructure Maintenance US 36 (ML & GP)												
Bridge Deck Repair/Supr. Repair/Spot Paint US 36 (ML & GP)/I-25 (ML)												
Bridge Deck Replacement US 36 (ML & GP)/I-25 (ML)												
Major Bridge Painting - Steel Bridges US 36 (ML & GP)/I-25 (ML)												
Bridge Joint Replacement US 36 (ML & GP)/I-25 (ML)												
Bridge Electrical Maintenance US 36 (ML & GP)/I-25 (ML)												
Cleaning Drains US 36 (ML & GP)/I-25 (ML)												

Figure VIII: Maintenance Management Plan

Maintenance Operations		
Reactive	Scheduled	Programmed
Incident Response	Mowing	Bridge Repairs
Signal Light Outage	Signal Controller cabinet air filters	Pavement Repairs
Down Regulatory Signs	Signal Conflict Monitor testing	Striping and Pavement Markings
Safety Items	RPM's	Tree trimming
Potholes - Temporary patch	Herbicide	Landscaping
Slope Repairs - Emergency	Bridge Inspections	Potholes - Permanent patch
Illegal sign removal	Replace Non-Reflective signs	Curb Repairs
Guardrail Repair	Attenuator Inspection	Drainage & Ditch maintenance
Snow and Ice Control	Deliverable inspections	Crack Sealing
	Sweeping	Joint Sealing
	Litter	Snow and Ice Control
	Delineators	
	Sign Repair	
	Lighting	
	Special Events	
	Picnic Area Maintenance	
	Pavement Inspection	

Life-Cycle Maintenance Cost Analysis

Transfield has been engaged in the PRD design process to ensure our design reflects all elements of the asset's Life Cycle Maintenance management requirements. As a result, Transfield understands the design concepts and details, allowing it to deliver an integrated solution for the 50-year operating period. The Life Cycle Maintenance Plan developed by Transfield and PRD will be founded on a thorough knowledge of and involvement in the design-build (DB) stages of the project. Transfield has and will continue to review the design and equipment/material selection with PRD, the Ames/Granite JV and HDR to achieve a design that reflects the broader issues of constructability, energy efficiency, serviceability and long-term reliability.

The Life Cycle Maintenance Plan will be a central document for the analysis of Life Cycle Maintenance costs over the duration of the Concession Agreement.

The Life Cycle Maintenance Plan will identify each major asset element that is not subject to routine/annual maintenance and for which Life Cycle Maintenance, repair, reconstruction, rehabilitation, restoration, renewal or replacement is expected to require significant investment of time and funds, and for which thorough advance planning and scheduling is essential.

Components included in the Life Cycle Management plan that will be important for the analysis of Life Cycle Maintenance cost will be:

- The estimated residual life of the asset element
- The description of the anticipated type of Life Cycle Maintenance methods and efforts to be performed on the asset element
- The underlying assumptions used to develop the Life Cycle Maintenance Plan
- The total estimated cost of Life Cycle Maintenance for each year covered by the Life Cycle Maintenance Plan

The initial assumptions and estimations applied to develop the Life Cycle Maintenance Plan will be used to establish a baseline against which subsequent Life Cycle Maintenance costs can be tracked and compared and future Life Cycle Maintenance plans and costs can be developed.

The Life Cycle Maintenance Plan will include procedures for Transfield to conduct regular condition surveys to evaluate asset performance against the life expectancies of the asset elements established in the Life Cycle Maintenance Plan. Should the results of any survey indicate that the condition of



any asset element requires additional maintenance, Transfield will update the Life Cycle Maintenance Plan and incorporate those elements into the work schedule for implementation.

In summary, Transfield will carry out a detailed, whole-life cost analysis of all the assets based on life cycle analysis techniques, including:

- Expected life of the asset or element
- Routine maintenance costs (including costs for access, unavailability adjustments),
- Durability of materials and specifications,
- Cost to repair/replace an element, particularly regarding any future price volatility, and handback requirements

Material durability: Through the approach detailed above and continuing to work closely with the Ames/Granite JV and HDR, PRD and Transfield have and will continue to evaluate a number of factors in relation to durability. These include evaluation of materials specifications, corrosiveness in the local environment and in contact with other elements, long-term ability to withstand environmental factors (wind, rain, temperature), and ability to withstand stresses. PRD and Transfield understand that over the 50-year duration of the concession agreement some materials used for Life Cycle Maintenance efforts will become obsolete due to various factors. For this reason, PRD and Transfield will continue to remain current with the advancement of material specifications as dictated to be appropriate by CDOT. Furthermore, PRD and Transfield will monitor the serviceability and durability of the materials used for both routine and Life Cycle Maintenance efforts. The results of this monitoring effort will be used as factors for the updating of the Life Cycle Management Plan and developing Life Cycle Maintenance cost strategies.

Price variation: PRD and Transfield will evaluate materials and systems based on pricing number of aspects to include initial costs; forecasted future costs; labor and resource needs to perform future rehabilitation/replacement, and changes in technology. Acknowledging that future labor, energy and material costs will rise, PRD and Transfield have sought and will continue to seek replacement systems that will reduce these costs.

Details and Locations of Maintenance Yards

PRD will have a maintenance facility nearby to the intersection of I-25 and US-36, to provide the necessary facilities for both Transfield and PRD. This facility will include administrative office space for management, salt storage for winter use, sand storage for winter use, garage space for

minor maintenance on trucks, indoor storage for stockpiling of supplies (signs, bags of cold patch, delineators, electrical components, snow plow and spreader repair parts, etc.), a laydown area for storage of large equipment and materials (cones, barrels, spare light poles, sign posts, arrow boards, variable message signs, spreaders, plows, etc.), parking area for work trucks and snow trucks, and parking for staff. The location will be within two miles of an interchange. This will afford quick and easy access onto the highway for incident response and winter snow response. This will also reduce deadheading time for the snow trucks when reporting to or from the yard.

In addition, to this yard, Transfield intends to utilize the CDOT 70th Avenue maintenance yard for additional operational support of snow and ice control needs on I-25 and the eastern end of US-36. Transfield may provide a trailer at this location for snow crew needs. As per the project specifications we will have non-exclusive use of the yard. We have inspected this facility and do not anticipate any problems with sharing the yard with CDOT. The specifications do provide for exclusive use of the existing salt storage shed and the brine tank, including maintenance thereof. We agree to this and do not anticipate any coordination issues with CDOT when using this facility.

Preliminary List of Specialized Equipment

The Transfield custom-designed crew truck will be equipped for on-the-road maintenance and for implementing traffic management for work zones and incidents. The vehicle specification includes vehicle-mounted illumination; signal and communication devices; programmable arrow boards; high-intensity, roof-mounted warning light bars; and secure equipment storage areas.

Below is a list of the equipment that will be available for use throughout the operating period:

- | | |
|-----------------------------|----|
| ■ Pickup trucks | 6 |
| ■ Utility trailer | 2 |
| ■ Hot box trailer | 1 |
| ■ Plow/spreader combo units | 17 |
| ■ Front-end loader | 2 |
| ■ Snow blower | 1 |
| ■ Snow loader | 1 |
| ■ Truck-mounted attenuator | 3 |
| ■ Message board trailer | 1 |
| ■ Arrow board trailer | 2 |
| ■ Backhoe | 1 |
| ■ Turbine blower | 1 |

Supply and Management of Maintenance Spare Parts

Transfield will implement a SAP-based computerized stock control and inventory management system for the project.

Transfield will develop spare parts inventory procedures as part of the maintenance plan. Within the SAP-based computerized inventory management system, Transfield will use a concept of 'mandatory spares' to identify components that have long lead times, are custom in nature and perform a safety function, such as impact attenuators, guardrails, regulatory and warning signs. On a weekly basis, the Superintendent will review stock levels and procurement times for these components.

Using the SAP-based computerized inventory system, Transfield will identify trends in high usage spare part items and will adjust stock controls accordingly. The inventory will include a complete list of parts and supplies both on and off site. Transfield will use stock rotation procedures where shelf life is critical; for example, welding consumables.

General Sweeping, Cleaning, Removal of Debris, Graffiti

PRD and Transfield will fully comply with the technical requirements related to routine maintenance work. Plans to undertake these services are described below.

Sweeping and cleaning: The Transfield work crews will routinely conduct inspections of channel, hard shoulders, ramps, intersections, islands and frontage roads on a monthly basis for sweeping and cleaning needs. Transfield will ensure that buildup does not accumulate to more than 24 inches wide or 0.5 inches deep in order to comply with the performance and measurement standard reference 14.1 of Appendix 6-1. To support the work crews, Transfield will subcontract with a road-sweeping contractor and will identify local firms that are suitably qualified to carry out this work. Road sweeping efforts will be the final routine function of snow and ice removal operations, ensuring that any aggregate used to manage snow and ice removal is removed as part of the operations.

Debris removal: Transfield will maintain the roadways of the managed lanes in a clean and safe condition by removing objects that create hazards. Work crews will be trained on the requirements of the MUTCD standards and will be equipped with appropriate tools and protective equipment to remove debris. PRD and Transfield will patrol the roadway daily to identify and immediately clear the debris to facilitate safe and unimpeded traffic flow.

Graffiti removal: Transfield will maintain structures, barrier walls and signs in a clean, functional and aesthetically pleasing, graffiti-free condition. Transfield will prioritize the removal

of vulgar, offensive and other forms of graffiti that requires immediate attention to ensure a calm driving environment. Transfield will train personnel to report all graffiti and permanently remove within 28 days, in accordance with the performance and measurement standard reference 12.1 of Appendix 6-1. Transfield personnel will remove graffiti using materials that restore the surface to an appearance similar to adjoining surfaces.

Transfield will paint over graffiti on surfaces where paint can be matched. Graffiti will be removed through a combination of sand blasting, pressure washing, approved chemicals, and/or paint, as appropriate.

Abandoned Vehicles: Vehicles abandoned in the managed lanes, or the shoulders adjacent to the managed lanes create an increased potential for incidents that would ultimately impede traffic flow and cause unsafe conditions. The courtesy patrol will be the primary means by which abandoned vehicles will be identified due to their familiarity with the routes they will regularly travel to conduct their services. All vehicles observed and found to be abandoned for longer than 48 hours (or sooner if they present a danger) will be towed and impounded.

Traffic Management during Maintenance Work

To ensure safe and efficient travel conditions during maintenance work, PRD and Transfield will establish a Traffic Management Task Force to assure proper coordination with affected agencies during planned and emergency maintenance activities. The Traffic Management Task Force will include, at a minimum, PRD's Public Information Officer, Transfield Services Project Engineer, Transfield Services Superintendent, HPTE, RTD, and local agency representatives. The Traffic Management Task Force will meet monthly during the maintenance operating period and will discuss and coordinate traffic management plans for planned maintenance operations.

Transfield will develop and adhere to a strict, comprehensive Traffic Management Plan (TMP) that defines the plan for traffic management during maintenance work. Transfield will use the TMP as a planning and policy guide to develop and execute the maintenance of traffic during maintenance-related work. The TMP will comply with the standards and procedures detailed in the FHWA MUTCD and appropriate Colorado manuals. Lane closures will comply with the time restrictions provided by PRD and HPTE and described in Section 4.4.2 of the Schedule 6 Service Requirements. PRD and Transfield will schedule the lane closures to avoid peak hours, holidays and special events to reduce traffic delays and increase safety.



PRD and Transfield will coordinate with and make use of the Colorado Traffic Management Center (CTMC) to communicate in advance plans to manage traffic on the managed lanes during maintenance operations. Routine requests for use of the CTMC VMS boards shall be submitted to HPTE by 10:30 a.m. on Thursday of the week prior to when the VMS boards will be needed (Monday through Sunday of the following week).

Inspection and Testing

Inspection and testing of asset element items by trained and competent personnel is an essential function for the development and updating of the Life Cycle Management Plan, maintenance of asset conditions and service levels and development of maintenance programs to minimize the effect of maintained elements on road users.

Transfield will develop and implement an inspection program that:

- Ensures the continuing safety of the managed lanes for customers
- Prioritizes and initiates appropriate repair responses for Category 1 and Category 2 Defects
- Responds to reports and complaints received from internal and external sources
- Includes prompt condition inspections after incidents, emergencies and extreme weather events affecting the managed lanes
- Collects and organizes data to monitor the performance of the managed lanes and is used to establish priorities for future maintenance operations and Life Cycle Maintenance efforts

Integrated into the inspection program will be the provision for Transfield to perform three types of inspections for the project roadways – general inspections, specialist inspections and audit inspections. Results of all inspections will be recorded within the Transfield SAP-based computerized management system. Further inspections will be carried out once rectification and repair has been reported as completed. The results of the close-out inspection will be entered into the Transfield system.

- General inspections: These will consist of visual and basic inspections of roadway assets. Transfield personnel will perform inspections of assets during routine patrolling to identify defects or failures. PRD staff will also conduct general inspections as part of their activities.
- Specialist inspections and tests: On a scheduled basis

for elements listed in Table 6-1 to include pavement, structures, electrical supplies to lighting, signs, traffic signals and communications equipment and toll equipment.

- Audit Inspections: To include scheduled element inspections and scheduled condition assessment surveys of randomly selected auditable sections at least once quarterly. Transfield will schedule these inspections with PRD and in agreement with HPTE.
- Identification, classification and rectification of defects and inspection failures: Transfield will use its SAP-based computerized maintenance management system to record the results of all inspections and identification of inspection failures.

Transfield will generate a work request that will identify the category of any defect and the required response/repair time. Transfield will use a SAP based system of service orders to track maintenance activities. Each service order will have a time stamp as a timed record of discovery of a failure; this time stamp cannot be amended. Transfield will provide rectification procedures as part of its quality program, for approval by PRD and HPTE. The Transfield Quality/Safety Manager will verify approved procedures are being followed for all inspection and rectification work and will be responsible for final acceptance.

Maintaining Records

Transfield will use an electronic record and document filing system to store as built drawings, records of inspections, and maintenance activities. The system will be compatible and integrated into the Maintenance Management Information System (MMIS) and will also assist in the scheduling of routine and planned maintenance activities.

Transfield's electronic record and document filing system operates as defined below:

- Provides a record of all assets with a description of the item/equipment, location, tag number, equipment nameplate data and maintenance intervals. This inventory is developed during the mobilization period and uses data both from Transfield's previous experience and expertise, from the manufacturer's recommendations and from the design drawings.
- Planned and routine maintenance work schedules will be prepared from the system using the maintenance frequency data captured during the mobilization period
- As planned and routine maintenance activities are carried out, the details of the work completed will be entered into the system

- Records day and time that equipment is taken out of service and returned to service, as well as detailed information regarding the type of repairs or failures and identification of the maintenance work performed
- Records results of inspections and tests. All dates and times of reporting and rectification will be time stamped. This allows analysis of the appropriate noncompliance points and associated deductions to be calculated. The system will generate reports of such performance to be included in the monthly maintenance report.

Enhanced Maintenance Program for I-25 Managed Lanes Structures

The following section sets out a summary of the I-25 Preventative Maintenance Program proposed to extend the life of the existing structures.

Goal. To develop a robust deck and expansion device preventive maintenance program to avoid the need for major replacement of any of the designated structures.

Strategy. To meet the goal, a four-part program will be established.

- 1. Immediately halt any deterioration presently occurring due to lack of properly sealed concrete surfaces, properly sealed expansion joints, intrusion of water and/or chlorides, over flow or run-off of water and/or chloride-laden water into the bridge deck or onto any structural elements below the top of deck, and leakage from any deck drains or drainage systems
- 2. Repair / replace any failed systems that are permitting deterioration to occur
- 3. Perform NBIS and Pontis bridge condition assessments at a maximum recurrence, biennially. This interval may be reduced due to flagged conditions. Evaluate bridge needs for type and priority. Develop a bridge maintenance program to improve any deteriorated elements or systems, to meet a minimum NBIS rating of 7, and be functional, to safeguard and protect all deck and superstructure and substructure elements
- 4. Perform annual maintenance inspections in addition to the NBI and Pontis inspections, of these structures and associated elements and deterioration protection systems. Identify and repair / replace systems and elements as necessary. Rather than relying on a two year interval, these inspections may identify needs sooner. This will allow us to correct deficiencies sooner, before they grow to a major problem.

Methods. The elements to be protected will be divided into the following groups and their protection methods, as shown in the matrix below.

Figure IX: Methods Matrix

Top of deck & Parapet walls	<ol style="list-style-type: none"> 1. Sealers; Penetrating sealers, Crack sealers 2. High friction waterproofing overlays; Epoxy, Nova chip, Proprietary 3. High density or impervious concrete overlays; polyester concrete, latex modified concrete, silica fume concrete
Joints and seals <ul style="list-style-type: none"> ■ Expansion ■ Non-Expansion ■ Cold Joints ■ Deck Patches ■ Concrete Pour ■ Deck to Parapet wall 	<ol style="list-style-type: none"> 1. Expansion seals; neoprene strip seals, neoprene compression seals, silicone seals. 2. Joint sealant; Hot poured, cold poured. 3. Crack sealer 4. Urethane sealer
Edge of deck, Bottom of deck	<ol style="list-style-type: none"> 1. Drip edges 2. Lengthened scupper downspouts 3. Eliminate deck run off over the edge
Superstructure	<ol style="list-style-type: none"> 1. Maintain protective coating on all steel elements and components 2. Eliminate deck run off from reaching superstructure
Substructure	<ol style="list-style-type: none"> 1. Maintain protective coating on all elements and components 2. Eliminate deck run off from reaching substructure
Drainage System	<ol style="list-style-type: none"> 1. Ensure that all deck run off is directed to scuppers 2. Downspouts must be of sufficient length to protect superstructure and substructure 3. Drainage piping systems must be leak free, no clogs or obstructions, and free flowing.

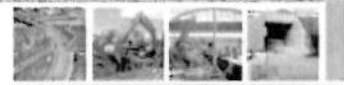
Treatments - Group A: Deck and Parapet Walls

An investigation must be conducted to determine each bridge deck's age, current type of deck protective layer, condition of protective layer, and remaining life of current protective layer.

Bare Concrete Deck and Parapet Walls – Options

1. Penetrating Sealer – reseal at three-year intervals, or
2. Install and maintain high friction waterproof overlay
 - a. Epoxy – remove and replace at 10-year intervals
 - b. Novachip – remove and replace at 10-year intervals
 - c. Proprietary overlays – per manufacturer recommendations

Above options will require routine patching and annual crack sealing.



Bonded Deck Overlays (high density, impermeable)

1. Polyester Portland Cement Concrete
 - Mill and replace at 20-year intervals
2. Latex modified concrete
 - Mill and replace at 20-year intervals
3. Silica fume concrete
 - Mill and replace at 20-year intervals

Bonded Deck Overlay - The asphalt wearing course will be replaced periodically based on condition assessment. The surface will be milled. The waterproofing layer will be repaired/replaced. The asphalt wearing course will be replaced.

Above options will require routine patching and annual crack sealing.

Treatments - Group B: Joints and Seals

1. Expansion Joints – typical lifespan of neoprene rubber strip seals and compression seals is seven to 10 years. (10 years with close attention to keeping debris and silt out of seals and monitoring seals)
 - a. Spring and fall seal cleaning program with pressure washer and vacuum
 - b. Annual seal inspections
 - c. Repair of unbonded neoprene
 - d. Replacement of seals at 10-year intervals
2. Modular Joints and Seals – typical lifespan of neoprene rubber compression seals is 15 years
 - a. Spring and fall seal cleaning program with pressure washer and vacuum
 - b. Annual seal inspections
 - c. Annual adjustment to modular components, including Teflon sliders, bolts, vertical alignment and horizontal alignment
 - d. Repair of unbonded neoprene
 - e. Replacement of seals at 15-year intervals
3. Non-Expansion Joints, Cold Joints, Deck Patches
 - a. Seal all non-expansion joints with hot-poured or cold-poured joint sealant by routing and filling
 - b. Cracks in concrete shall be sealed with epoxy if the crack is vertical or poses a structural weakness

- c. Horizontal cracks in concrete (non-structural) and crack in asphalt overlays may be sealed with hot-poured joint sealant to meet CDOT specifications

4. Joint between top of deck and bottom of parapet wall

Note: This interface is a prime target for de-icing chemical intrusion, chloride buildup, rebar corrosion, and deck and parapet wall deterioration

- a. Apply moisture-cure urethane sealant to the base of all parapet walls at the joint with the deck. Expected life is 15 years unless physically damaged.
- b. Annual inspections of seal. Repair as necessary.
- c. Replace or overseal at 15-year intervals.

Treatments - Group C: Edge of Deck, Bottom of Deck

Note: Water and de-icing chemical run-off allowed to travel over the edge of the deck and under the deck (at any location) will introduce moisture and chlorides directly into the lower portions of the deck.

1. All surface water on top of the deck should be directed to scuppers
2. All deck lower edges should be constructed with drip edges

Treatments - Group D: Superstructure

1. Maintain protective coatings on steel members, bearing, anchor bolts and guide plates
2. Eliminate all joint leaks and other sources of water/de-icing chemical contamination of superstructure elements

Treatments - Group E: Substructure

1. Install penetrating sealer or waterproof overlay below joint seals on top of pier caps and abutment shelves
2. Seal substructure within the splash zone
3. Inspect and clean annually
4. Repair as needed

Treatments - Group F: Drainage System

1. Maintain all deck surface water flow to scuppers
2. Ensure that scupper downspouts extend to below the top of pier caps
3. Ensure that drainage piping systems are leak-free, unobstructed and free-flowing

4. Semi-annual spring and fall inspections of scuppers, draining grates, downspouts and piping systems
5. Repair/replace as necessary to ensure functionality

Note: The I-25 Preventative Maintenance Program will have appended relevant excerpts from the RFP, Concession Agreement, a bridge inventory and condition table and a I-25 bridge map. Due to page restrictions we have not included these in this section. Please find the HPTE email confirming acceptance of our Preventative Maintenance Plan in the Appendix to this Part 3, Volume III.

4.2.A.iv – Electronic Toll Collection System Maintenance

General Approach

PRD's base proposal is to contract with E-470 to provide maintenance of the ETCS field equipment. E-470 will initially install the ETCS equipment and our maintenance strategy capitalizes on this experience and familiarity with the equipment, minimizing equipment maintenance and startup inefficiencies. Maintenance and support of the Host System (trip matching, interface to the back office) will likely be contracted with TransCore.

The maintenance philosophy for the in-lane equipment and host system is based on continuous, proactive monitoring of the system to identify issues before they arise. The first line of monitoring is the maintenance management system described in the following section. This system is integrated with the

host servers and lane equipment to monitor performance of different features and applications. Should a device fail, maintenance staff will be notified to commence trouble shooting and repair activities. The maintenance system also provides warnings when different system elements (available disk space, network traffic, etc) reach certain user defined thresholds. This allows for systems and maintenance personnel to investigate issues before they create a problem that will impact system performance.


Maintenance Management System

PRD will use the Maintenance Management Online Management Systems (MOMS). MOMS was developed for use on toll systems and is used for toll maintenance across the country and overseas. The system is currently used by over 25 separate toll agencies and monitors over 1,000 toll lanes.

MOMS is an intranet-based maintenance and inventory control system with a collection of menus, screens, maps, reports and charts that allows authorized personnel, from any computer within the customer network, to track equipment problems from the time of failure until they are resolved. MOMS provides an automated method of creating, updating, tracking and reporting failures and preventive maintenance activities for sites, facilities, host equipment and applications.

MOMS will be integrated with the in-lane equipment and receive messages from the lane controller regarding the status of the equipment at the different toll locations. MOMS also will be integrated with the VTMS to monitor the sign

Figure X: MOMS Reports

Work Order Summary Report By Registered Date Time												
Report Filter: Start Date, End Date, Equipment Type, Site, Location, Assigned To, Work Order Type, Priority, Project No., Availability Filter												
Filter Value: 2/1/2010 -- 2/1/2010 All All All All All All All All												
Work Order	Project	Pri	Registration Time	Site	Loc	Equipment Type	Registered Date Time	Assigned To	Repaired By	Rep. Time (HH:MM)	Fix Category	
124		3	2/1/2010 5:00:00 AM	13	0	33 PLAZA PREVENTIVE MAINTENANCE		JV604		00:00		
125		3	2/1/2010 5:00:00 AM	25	0	33 PLAZA PREVENTIVE MAINTENANCE		JV604		00:00		
126		3	2/1/2010 5:00:00 AM	2	0	33 PLAZA PREVENTIVE MAINTENANCE		JV604		00:00		
127		3	2/1/2010 5:00:00 AM	34	0	33 PLAZA PREVENTIVE MAINTENANCE	2/8/2010 10:42:06 AM	KK602	KK602	114:56	PREVENTIVE MAINTENANCE PERFORMED	
128		3	2/1/2010 5:00:00 AM	39	0	33 PLAZA PREVENTIVE MAINTENANCE	2/8/2010 12:18:26 PM	KK602	KK602	108:14	PREVENTIVE MAINTENANCE PERFORMED	
129		3	2/1/2010 5:00:00 AM	62	0	33 PLAZA PREVENTIVE MAINTENANCE	2/8/2010 2:18:01 PM	KK602	KK602	124:46	PREVENTIVE MAINTENANCE PERFORMED	



communications and operations. The real-time monitoring provided by MOMS will support the generation of work orders and notifications to maintenance personnel of an issue that needs their attention.

MOMS Work Order Management. Work orders are used to track any action taken on equipment, servers and parts. There are multiple types of work orders that can be created automatically or manually. The work order management feature allows you to create and maintain all work orders and to track and report on repair activities and parts used from the time of generation until resolution.

MOMS categorizes work orders into priority levels: priority one (high), priority two (medium) and priority three (low). An optional priority four (very low) also is available.

In addition, MOMS also will classify work orders as corrective (equipment failure), preventive (scheduled maintenance) or predictive (based on failure analysis).

MOMS Work Order Notification and Escalation. The application can automatically assign a new corrective work order to a staff member and electronically notify the person using the Automatic Assignment and Notification feature. Using work order priority level, maintenance schedule and business rules, the application determines if the work order should be assigned, and to whom, as well as if an automatic notification should be sent. Default technicians, such as a dispatcher, can be configured to be assigned to a work order in the event the maintenance schedule feature is not used.

If a technician fails to acknowledge the notification within a configured time frame, the application sends an escalated notification to the assigned back-up technician. Back-ups are assigned to each technician using the escalation management feature.

MOMS Inventory Management. MOMS Inventory Management feature will track ETCS parts and inventories, supplier information, price, warranties and the location of all

parts that comprise the system. Multiple suppliers and prices can be used for each piece of inventory for a part without overriding information previously entered.

MOMS Reports. The MOMS application will provide an extensive set of reports and charts that are standard with MOMS, as well as flexibility in generating, viewing and exporting the reports. The browser in which each report is displayed provides flexibility and functionality that allows the user to search for specific information within the report, navigate through report pages, and back and forth between parent and drill-down reports, zoom in and out for better viewing, print the report, and export the report into multiple formats. The following table presents a listing of the different reports that can be created by the MOMS:

- Work Order Summary by Registered Date Time
- Time to Respond Exception
- Work Order Summary by Repaired Date Time
- Parts Aging
- Failure Analysis
- Maintenance Activity
- Part Performance Report
- Asset Depreciation
- Work Order Summary by Arrived Date Time
- Work Order Summary by Failure Time
- Part Inventory History
- Inventory Valuation by Location
- Work Order Detail History
- Event History
- Part Inventory
- Preventive Maintenance
- Work Order Detail
- Maintenance Summary
- Staff Performance
- Weekly Maintenance
- Open Work Order
- Availability Status
- Part Reorder
- Site and Location
- Mean Time Between Failure
- System Availability
- Inventory Valuation by Equipment Type Report
- Equipment Type Failure Group Mapping
- Time to Repair Exception
- Time to Travel
- Part Usage
- Event Definition

Figure XI: Management Online Management Systems (MOMS)



Preventive and Routine Maintenance

In addition to the continuous system monitoring provided by the MOMS, personnel will also conduct preventive maintenance of the system. This will include checking the in-lane equipment to conduct a visual review of all of the toll sites. This inspection will verify that all of the equipment is still oriented properly and secure. Any items that may interfere with equipment performance will be noted and addressed. This includes items such as removing debris or dirt from the video cameras so that clean images can be obtained, and verifying the antenna alignment. Twice a year, detailed preventive maintenance will be conducted at each of the sites. This will include reviewing all of the in-lane equipment, and checking all cabling and terminations.

The preventive maintenance of the host system will include a weekly review of the system performance and database to verify proper operation and to look for any anomalies. These checks are beneficial to identifying issues at the early stages and initiating a response plan. In addition to the system reviews, the routine maintenance of the system will include applying software updates for commercial off-the-shelf software products (operating system storage, etc). Prior to deploying these updates, they will be verified and checked on a development system to verify that the application software is not adversely affected by the updates.

Emergency Response and Disaster

PRD has developed an approach to emergency response and disaster recovery across the entire toll collection system. For the in-lane equipment, we will employ a multi-tiered approach for emergency response and disaster recovery. The typical emergency repair activity is an unexpected device failure that affects system operation, or an accident where equipment is damaged. For any issues that may impact public safety, our maintenance team will be the first responder to secure the area and address public safety issues (remove damaged equipment that can impact travel way, shut down power to equipment, etc.). We expect the contract with E-470 will include provisions for emergency response and repair. This will allow PRD to mobilize resources so that damaged equipment can be repaired and the sites brought back online. We will work with E-470 to define the appropriate spare parts to have on hand to facilitate replacement of damaged equipment and bringing the toll sites back online. In the case of an accident which damages a toll site, an assessment will be made as to the suitability of the support infrastructure. Assuming no infrastructure damage, work will be initiated to have the site brought back

on-line in a timely manner. In the rare instance where the infrastructure is damaged, an assessment of the infrastructure will be conducted and the appropriate repair/replacement performed. Depending on the extent of the damage it may be possible to operate a site in a degraded mode that still allows for toll collection.

The toll host system (trip processing, dynamic pricing, etc.) will be delivered with redundant virtual servers. This architecture allows for the system to continue processing toll transactions even if there is a catastrophic failure of one of the servers. The system will be configured to back up data on a daily basis and these backups will be stored off-site. In a “disaster” scenario that leads to destruction of the host system or the facility where it is located (major damage to the maintenance facility) the system will be able to be recreated on new hardware using these backup tapes. This may result in a temporary loss of toll processing while a new system is setup and communications links established to new facilities. The lane controllers at the toll sites are capable of storing toll transaction data for multiple days, so once the system is restored the toll transaction data can be recovered from the lane controllers, toll processed and revenue loss minimized.

E-470 will be required to utilize their existing systems and procedures in place for the emergency repair and disaster response of the Back-Office systems.

4.2.A.v – Transition Management Plan

The Transition Management Plan developed by Transfield and PRD will be structured around Transfield assuming full responsibility for operations and designated maintenance activities for the managed lanes upon each of the three different Services Commencement Dates. This Transition Management Plan will be a separate document from the Maintenance Management Plan (MMP) and the OMP and will be comprised of three distinct but integrated sections: the service transition plan for the I-25 Managed Lanes, the service transition plan Phase 1 Corridor and the service transition plan for the Phase 2 Corridor.

I-25 Managed Lanes

The first commencement date will be for the operation and maintenance of the I-25 Managed Lanes. This will require that all the steps and activities necessary to coordinate with HPTE, CDOT and E-470 as the Tolling Services Provider to achieve a smooth transition be clearly identified and planned for.

- PRD and Transfield will develop a set of fully developed operational plans, including MMP, OMP, Quality



Management Plan (QMP), Incident Response Plan (IRP), Transition Management Plan (TMP) and the Snow and Ice Removal Operations Plan.

- PRD and Transfield will have a fully formed staff structure in place at least four months prior to the I-25 Managed Lanes Commencement Date including: Operations Manager, Quality Manager, Maintenance Manager, Admin, Project Engineer, Lifecycle Engineer, QA/Safety Manager, Superintendent. Also, hiring of field staff will commence at this time for Field Maintenance Crews.
- PRD will make arrangements to staff the Customer Service Center in order to start training and interfacing with E-470 and CDOT at least three months prior to the I-25 Managed Lanes commencement date. The system used to fulfill the obligations set out in section 4.2 Customer Service Center/Back Office Operations will need to be operational at least one month prior to the I-25 Managed Lanes service commencement date. Transfield will provide staff to man the TOC and be trained and interface with CDOT at least three months prior to the I-25 Managed Lanes Commencement Date.
- PRD will make arrangements with E-470 to perform the testing and commissioning of the ETCS and the hosting systems and will work with E-470 to train E-470 and HPTE staff on required systems.
- Transfield will have all equipment on site, materials purchased, training for staff completed, sub contract services secured and materials purchased at least one month prior to the I-25 Managed Lanes service commencement date. Especially important will be plans and arrangements to successfully handle the snow removal operations for the I-25 Managed Lanes, the incident response for the I-25 Managed Lanes and the I-25 Managed Lanes Specialty Operations as described in Section 4.4.5 of the RFP.
- PRD and Transfield will start one-on-one meetings with HPTE, CDOT, CSP and local Emergency Management Services at least three months prior to the I-25 Managed Lanes service commencement date to coordinate service expectations and forge good working relationships for the operating period.

Phase 1 and Phase 2 Managed Lanes

These will be very similar in approach to each other and will be sequentially implemented based on the service commencement dates for each corridor. Many of the operational plans developed for the I-25 Managed Lanes will be adopted for

use on the US 36 Managed Lanes (and General Purpose (GP) lanes if required). Adjustments to the plans will be made to the plans to accommodate the differences in the operation of the I-25 Roadway and the US 36 Roadway. Many arrangements already will be in place as a result of the transition of the I-25 O&M, including staff (although additional staff will be hired), relationships with key partners and stakeholders, equipment (although additional equipment will be procured), materials and subcontractor services.

There are unique factors that will be incorporated into the US 36 Phase 1 and Phase 2 transition management plans. These include:

- Input into the road design for maintenance considerations
- Inclusion in QA/QC functions during construction and inspection and acceptance of construction
- Hiring, training and equipping of courtesy patrol operators at least a month before the Phase 1 and Phase 2 corridor service commencement dates

4.2.A.vi – Changes Required to Accomplish Routine Maintenance of US 36 GP Lanes

Transfield will be more than adequately prepared to manage the Routine Maintenance operations for the US 36 GP lanes. Should HPTE choose to exercise this option, Transfield will promptly make the necessary arrangements to secure the additional labor, equipment, material and subcontract resources to successfully perform the GP Lanes Routine Maintenance responsibilities. Securing the extra resources will present no problems or delays to the developed work plans and schedules as this will form a logical and natural extension of the services required for the Managed Lanes.

There will be sufficient time to mobilize for this optional work along with the Phase 1 and 2 managed lanes work. We will work with CDOT to transition our staff and operations into full responsibility for routine maintenance of these lanes. Our courtesy patrols will monitor these lanes along with the managed lanes. Our staff at the TOC also will monitor these lanes along with the managed lanes. Additional crew technicians and subcontractor support will manage the work activities required to maintain the additional pavement, ramps, shoulders, bridge area, landscaping and vegetation, signs and other assets.

To provide the performance level required for both the Managed Lanes and the General Purpose Lanes, Transfield will add another three full-time technicians. These crew members

will be combined with our currently planned day and night crews. These extra personnel will add in-house capability to maintain vegetation, mowing, signs, delineators, pavement patching, drain cleaning, graffiti removal, fence repairs, concrete repairs, manual sweeping, and incident response. We will also add two additional TMA trucks and an arrowboard for lane closure needs. The acquisition of the additional personnel and equipment will represent a slight change to Section 4.1 Management Structure and Personnel. These changes will be reflected on a revised Organizational Chart. There will be no supervisory, administrative, or managerial changes and the reporting structure will remain unchanged.

Section 4.2 (a) i – Roadway Operations will be altered slightly by the addition of the extra resources mentioned above. An extra zone will be created and manned by the additional personnel. The project will now be setup into three zones of operation. Zone 1 will be I-25 Managed Lanes. Zone 2 will be US 36 Phase 1 Project and Phase 2 Project (Managed Lanes). Zone 3 will be US 36 Phase 1 Project and Phase 2 Project (General Purpose Lanes). There will be no significant changes required to the following parts of Section 4.2 (a) i – Roadway Operations:

- Training
 - Emergency and Incident Detection and Response
 - Hazardous Weather Response
 - Liasing and coordination with Emergency Services
 - Development of Incident Response Plans
 - Traffic Management and Coordination with CDOT ITS
 - Accident Analysis and Improvement to User Safety
 - Policing Roadway

In order to perform the Routine Maintenance activities related to the GP Lanes, Transfield's operations and maintenance program will expand to encompass the additional list of activities and also the additional level of service. This will represent a change in Section 4.2 (a) iii Routine Maintenance - Roadway – Maintenance Management Plan as the work activities within our Managed Lanes work program will be enhanced upon award of the additional scope of services to include the US 36 General Purpose Lanes. These include pavement patching, striping, litter and debris pick up, lighting, drainage, mowing and vegetation control, bridge maintenance and snow and ice control. Certain new activities will be added to maintain the General Purpose lanes. These include Right of Way fencing and retaining walls. Transfield utilizes subcontractors for certain specialty work. These services will increase also. This work may include lighting, sign panel replacements, striping, paving and joint sealing.

Section 4.2.(a) v - Life Cycle Maintenance Cost Analysis will remain unchanged except for the inclusion of the two additional TMA trucks to the to the list of specialized equipment.

4.2.A.vii – Life Cycle Maintenance

Transfield has reviewed and will continue to review the design and equipment/material selection for the managed lanes to facilitate a holistic decision-making process that reflects the broader issues of constructability, energy efficiency, serviceability and long-term reliability. In addition, Transfield has conducted on site, due diligence field surveys to assess the conditions and lifecycle maintenance factors associated with the I-25 Managed Lanes and the US 36 GP lanes. These reviews of the design selections and existing roadway conditions has enabled Transfield Services to fully understand the fundamental Life Cycle Maintenance issues that are intrinsic to this project. This will ensure all requirements of the Project are met and that O&M and Life Cycle Maintenance Services can be provided in accordance with the technical requirements throughout the concession period.

Transfield has carried out a detailed analysis of all the assets based on life cycle analysis techniques, including:

- Expected life of the asset or element
- Cost to repair/replace asset or element
- Term of project
- Hand-back requirements

Life Cycle Maintenance-related asset replacement is more significant, both in amount of work and cost involved, than routine maintenance. To reduce cost and maximize lane availability, Transfield will implement a rolling program of effective and efficient preventive maintenance to maximize the life of the asset, to meet or exceed its design life and to minimize life cycle costs. Working closely with the PRD team, Transfield has assessed the design life of assets on numerous factors, which include the temperature range of locality, annual rainfall, vehicle usage, percentage of heavy trucks, design type, materials used and planned maintenance program. Based on these factors and the duration of the concession, the Transfield life cycle analysis for different assets determines the optimum type of design and the selection and use of materials. An example of this relates to the Life Cycle Maintenance and hand back requirements for the managed lanes road pavement. The accepted design calls for 10-inch-thick PCCP. Transfield Services is considering various options to extend the life of this pavement throughout the operating period of the maintenance agreement and also factoring in the hand-back requirements and the effect of the disruption to traffic during this process.



In overview, the Transfield approach to whole life performance is summarized as follows:

Design concept stage

- Consultancy (design and operational integration)
- Value management of the design proposals

Detail design stage

- Consultancy and preparation of initial Planned Preventative Maintenance (PPM) programs
- Detailed design and specification optimization
- Technical audit of the design proposals

During construction

- Technical audit of the construction process
- Verification of the design intent and compliance with good practice

During the O&M Concession period

- Management of the PPM program
- Evolution of whole life methodology based on actual component durability

Program of Work and Costing

Using the results of inspections, Transfield will establish the Rehabilitation Work Schedule that will detail the following:

- Estimated useful life
- Estimated residual life
- A brief description of the type of rehabilitation work anticipated to be performed at the end of the element's residual life
- A brief description of any rehabilitation work anticipated to be performed before the end of the element's residual life, including reasons why this work should be performed at the proposed time
- Estimated cost in current dollars of such rehabilitation work
- Total estimated cost in current dollars of rehabilitation work in each of the years rehabilitation work is anticipated to be performed under the Rehabilitation Work Schedule

Transfield will estimate the useful life of each element within the Rehabilitation Work Schedule based on reasonable expectations respecting the manner of use, levels and mix of traffic; environmental conditions; wear and tear; and the assumption that, when subject to routine maintenance, the element will comply throughout its useful life with each applicable performance requirement.

Transfield will estimate the residual life of each element within the Rehabilitation Work Schedule based on its age and whether the element has performed in service in the manner and with the levels and mix of traffic and wear and tear originally expected, whether Routine Maintenance of the element was performed, and whether the element has complied throughout its age with each applicable performance requirement.

Rolling Program of Major Maintenance

Transfield will perform maintenance work as required to maintain, at a minimum, compliance with the concession agreement specifications. Transfield Services will restore the useful life of each element at the end of its life. Transfield will base the program for major maintenance repairs and replacements on the results of its inspection program. Transfield will conduct all inspections that will identify required quantity and types of work and will investigate the most cost-efficient and effective methods for the work.

Record drawings of the work will be prepared and stored in the MMIS. PRD and Transfield annually will carry out inspections and prepare the work schedule for the remaining operating period. Transfield will submit this work schedule for approval.

By thoroughly identifying, planning and coordinating maintenance work, Transfield will complete several maintenance activities within the same section of road and the same closure, to minimize disruption to traffic. In addition, Transfield will limit work zones and planned maintenance to night work or off-peak hours.

Ensuring Handback Requirements

PRD will fully comply with the handback requirements stated in the concession agreement. A key element of the handback plan will be the work schedule for each of the last five years of the operating period. This schedule will be prepared in a similar way to that for maintenance work during the operating period, showing the activities needed to meet the handback requirements. The work schedule for the last five years will include, but will not be limited to, scope and schedule of any residual life testing; and the estimated cost of the work for each element at the end of its life.

PRD and Transfield will carry out handback inspections to establish the condition of all elements and verify the extent of the required work. PRD and Transfield will review and analyze the results of these inspections to submit to HPTE.

Using the results of these inspections, PRD and Transfield will prepare the work schedule for the last five years, by element, as follows:

- Determine the estimated useful life
- Determine the estimated residual life
- Describe the type of work expected to be performed at the end of the element's life, including reasons why this work should be performed at the proposed time
- Estimate the cost in current dollars of the work and schedule the costs in each of the final five years prior to handback

Specific Elements of the I-25 Enhanced Maintenance Program

Specific components of the lifecycle plan for the I-25 Enhanced Maintenance Program include the following:

- Annual maintenance inspection of each bridge. Rather than wait for the NBIS report every other year, Transfield will perform its own maintenance inspection to observe and identify problems early. These then will be added to the bridge work plan.
- Review of the NBIS bridge inspection reports provided by CDOT. Deficiencies identified within our scope of responsibility will be added to the bridge work plan.
- Development of a work plan for each individual bridge
- Maintenance of joint seals to prevent leakage of salt-laden snow melt onto structural elements below the deck
- Patching of potholes and delaminations
- Full depth deck repairs, joint repairs
- Crack sealing of cold joints at deck repairs to prevent water from seeping down to rebar level
- Cleaning, painting of bearings
- Maintenance of protective coating on steel superstructure

Avoiding Impacts to the US 36 GP Lanes

During the execution of the work related to Life Cycle Maintenance in the managed lanes, traffic control and construction work zones will be established within the space allocated for the managed lanes only – that is the 48 feet allocated to the travel lanes, including the barrier wall. In some cases the construction zones will be separated from access by the traveling public by movable concrete barriers. In all cases: (i) work will be carried out at non-peak times as much as possible, and (ii) traffic patterns will be reconfigured to allow travel in both directions so that the standard of service for the traveling public using the managed lanes is not diminished and also so that there is no impact on the users of the GP Lanes.

4.2.B – Approach to Operations and Maintenance Quality Management

PRD considers quality to be a line function; that is, each individual performing work is responsible for the quality of that work, and each supervisor and manager is responsible for the work done by their subordinates. Quality must be built into every product, process and service. This is accomplished by each employee following the requirements specified in procedures, instructions, drawings and specifications under the purview of the PRD Quality Management System, which will evaluate the level of performance compared to the minimum operations performance requirements. The O&M Quality Plan implemented by PRD will ensure that delivered products and services meet HPTE's expectations and conform to contract requirements.

4.2.B.i - Approach to Operations Quality Management

While reporting to PRD's Quality Manager (QM) during the mobilization phase, the Transfield Quality/Safety Manager will develop the O&M QMP in compliance with the requirements of Section 1.7.3 of the Schedule 6 Service Requirements. This O&M QMP will describe the processes and procedures that PRD and Transfield will use to execute the scope of the O&M and Life Cycle Maintenance works.

Transfield will issue the draft O&M Quality Plan to PRD for approval. PRD will review this Plan and provide input to Transfield for inclusion in the final O&M QMP for approval by the HPTE.

During the operating period, both the Transfield Quality/Safety Manager and PRD's QM will prepare an audit plan and a schedule of internal audits, which will be issued to HPTE, which will have access to the audit reports and the updated log of any non-conformances resulting from the audits. The non-conformance log will identify the status of the close-out actions.

Both PRD and Transfield will carry out management reviews of the O&M QMP. For Transfield, this will be performed by the Head Office Support team. For PRD, this will be by the Operations Manager. Both reviews will direct amendments to their respective quality programs, which will be incorporated into the revised O&M QMP and issued to HPTE for approval. The updated Operating Period QMP will be adopted after approval.



Quality Assurance and Quality Control Functions

The PRD and Transfield quality program consists of two parts: 1) quality assurance (QA), which ensures that processes and procedures yield consistent quality performance across all project functions; 2) quality control (QC), which includes the execution of individual work elements to ensure achievement of quality standards.

QA functions essentially ensure the consistency of the product. The key in QA is to set out a detailed audit plan that will be carried out on the Transfield processes and procedures to verify that the maintenance production procedures have been followed and that all timeliness criteria, maintenance actions and reports are consistently meeting the service requirements as set out in the concession agreement and other documentation. The person responsible for carrying out such audits and issuing audit reports will be the Transfield Quality/Safety Manager. To ensure compliance, the PRD QM will carry out an audit of the Transfield quality program. All audit reports will be available to HPTE through access to the operational computerized management system. All non-conformances, regardless of the source, will be reported on the non-conformance log available to HPTE. This log will identify the actions agreed upon with HPTE to rectify non-conformances and will record the status of each action.

QC functions will be set out in the processes and procedures within the Transfield QMP. The QC component of the QMP will focus on the way the work is executed and will include authorized maintenance procedures for each maintenance activity associated with the Project. For example this would include documented procedures on the work execution, quality inspection and sign-off of pothole repairs. These procedures will govern the way Transfield will carry out the scope of O&M Work for the I-25 and US 36 Managed Lanes. Where appropriate, distinct QA and QC procedures will be developed for work associated with the General Purpose (GP) Lanes – if the performance and measurement criteria for these deviate significantly from those of the managed lanes. The responsibility for achieving quality control within the QMP criteria is ultimately that of the Transfield O&M Manager who will lead the O&M project management staff to ensure that all incident reports, non-compliance reports, traffic reports and maintenance work reports are completely documented, reviewed and that the information from these reports is used productively to maintain the quality of work related to the scope of the O&M work.

Reporting Relationships and Responsibilities

Incident reports will generally be generated by the TOC staff and the staff under the control of the Maintenance Operations Superintendent. It will be the responsibility of the Transfield O&M Manager to review these reports and ensure proper formatting and regular reporting to HPTE.

Non-compliance reports will most commonly be generated by the Transfield Quality/Safety Manager. After generation, these will be submitted to the Transfield O&M Manager for review and follow up remedial action.

Traffic reports and work reports will usually be generated by the TOC staff and the Maintenance Operations Superintendent. These will also be reviewed by Transfield's O&M Manager and compared to the performance standards to ensure that the minimum performance requirements are being met and so that strategies can be developed quickly to resolve noncompliance issues and ensure a high standard of work is consistently being produced.

At the regular quality meetings between HPTE and PRD's QM, progress will be discussed as well as a detailed discussion on audits carried out in the period and the progress with close-out of any non-conformances. PRD's QM and Transfield will always provide information regarding any changes that may be required to HPTE on the approved Operating Period QMP. After approval with HPTE, the PRD QM will make changes as necessary.

The Transfield Quality/Safety Manager will report to the PRD QM for all quality related matters. PRD's QM will report to HPTE and to the concessionaire's Executive Board. In this way, quality-reporting lines maintain independence to ensure that HPTE has transparency and confidence in the achievement of quality in the operating period.

Preparing and Reviewing Incident and Maintenance Reports

The Transfield QMP will define the responsibility for preparing and reviewing incident and maintenance reports and will include a procedure for preparation of all incidents and maintenance reports. When completed, the incident and maintenance reports will be entered into the Transfield computerized management system.

- The Transfield O&M Manager will designate an O&M management team member to prepare these reports. This will be based on roles, authority, and designation of incident responder or supervisor.

- A set of instructions will be used for the preparation of all incident reports that include guidance on completing the report form
- A supervisor will review all incident reports for completeness, accuracy and timeliness before submission to the Transfield O&M Manager for review
- Report forms will be returned to the originator where it is identified any incomplete or inaccurate information
- Incident and maintenance data will be entered into Transfield's computerized management system once verified for accuracy

Preparing and Reviewing Non-Conformance Reports

Any member of the PRD and Transfield team will be able to generate non-conformance reports. Non-conformances also may arise from the audits carried out on the processes and procedures by both Transfield Quality/Safety Manager and the PRD QM.

- A set of instructions will be used for all non-conformance reports. This will include guidance on filling out each required field on the report form.
- A copy of all non-conformance reports will be submitted to the HPTE
- A report will be generated regarding changes to any processes or procedures to prevent this non-compliance from occurring again
- New processes and procedures will be added after approval by HPTE to the QMP and the Operations Manual with copies submitted through PRD to HPTE, Transfield, and all O&M staff

The Transfield O&M Manager will be responsible for managing the work necessary for closing out any non-conformances. Verification that close-out actions have been completed will be the responsibility of the Transfield Quality/Safety Manager and the PRD QM.

4.2.B.ii – Approach to Maintenance Quality Management

The Transfield Quality Management System (QMS) includes internal control methods to provide quality throughout our operations. The systems we propose have been tested and proven to deliver the required asset management outcomes on projects around the world. The QMS incorporates built-reporting, providing evidence to PRD and HPTE that Transfield is meeting technical requirements.

Planning is a key component of a successful asset maintenance program. In preparation for this proposal, Transfield

conducted a field survey to determine current conditions of the assets included in this RFP. Following this survey, our staff assessed the maintenance effort that will be required to achieve and subsequently maintain the performance standards specified by HPTE for the term of the contract. This practice is essential to establish a benchmark for the current overall quality of the system. This pre-project quality data can be used along with the specified performance standards to track the effectiveness of the QMP implementation.

At the start of the Project, Transfield and PRD will conduct additional detailed investigations into the maintenance needs of these assets. This will include additional in-depth site inspections and discussion with HPTE on current maintenance programs and key issues. This local knowledge can be of great value, especially when it relates to local issues. Through similar discussions on other projects, we have been able to develop maintenance plans to address specific local concerns, such as localized flooding or problem vegetation sites. The local knowledge gained from these investigations and discussions with the current system maintainers will be incorporated into the QMP to make it more effective and relevant to the project performance standards and the avoidance, or management of noncompliance issues.

Transfield will develop a detailed maintenance plan that takes into consideration the criticality of the assets in terms of safety and the impact the asset or its maintenance needs may have on traffic flows. The QMP will focus on the following key elements for each asset group:

- Maintenance actions
- Maintenance resources
- Specific needs and localized issues
- Inspection methods
- Reporting requirements

The Transfield quality management system is based on detailed planning. The end document will be regularly reviewed and relevantly updated to ensure that the desired results are being achieved.

Inspection Program. PRD and Transfield will apply the principles developed in the compliance planning phase to develop an inspection program for the various asset groups along project's roadways. Our inspection program is a key tool used to manage the asset management process. Efficient asset management practice relies on understanding the actual condition of the assets being managed. We have developed an inspection program to provide this information. The object of the inspection program is to provide an ongoing flow of asset



condition data that can be used both for compliance reporting and work planning.

Routine Patrolling. Routine patrolling of the roadways will be conducted on a regular basis by both PRD and Transfield staff. The patrolling will involve driving the system to check for obvious, routine, and urgent safety defects. Transfield maintenance supervisors are responsible for recording observations and referencing them by mile marker and direction. This information is transferred to a problem identification database and work orders then are issued for needed repairs. Urgent items are addressed to meet timeliness requirements, and with additional input from the road crews, passed on to the O&M Manager.

Operations Compliance Management Monitor (OCMM). The OCMM is a quality management system that was created by Transfield to be used by the O&M Manager, Quality/Safety Manager and other O&M Management staff to identify and monitor the timely and satisfactory completion of contract deliverables. The OCMM system will ensure time-critical components are delivered as required and on schedule by:

- Identifying specific issues and processes by location and due dates for completion
- Identifying issues and processes for areas of operational timeliness, including but not limited to, asset inspections, report delivery, asset repairs
- Assigning ownership of the subject issues/processes
- Clearly identifying days remaining to targeted completion date(s)
- Updating and reviewing the display with a formal review conducted during staff meetings during which issue/process owners will report on progress
- Reporting on any/all changes and new issues to the Project Manager as they occur for incorporation in the monitoring module

Quality Assurance and Quality Functions

The Quality Assurance and Quality Functions for the maintenance quality management are the same as for the operations quality management as set out in Section 4.2.b.i.

Reporting Relationships and Responsibilities

There are two primary reporting channels in this project. First is the internal reporting framework used within the Transfield organization and to PRD to ensure the project is managed to deliver the specified requirements and resolve quality issues. The second channel connects the PRD team to HPTE.

The Transfield Quality/Safety Manager will report to the PRD QM for all quality related matters. The PRD QM will report to HPTE and to PRD's Executive Board. In this way, quality-reporting lines maintain independence to ensure that HPTE has transparency and confidence in the achievement of quality in the operating period.

HPTE/CDOT Oversight Procedures

Monthly meetings involving representatives from HPTE, CDOT, PRD and Transfield will be scheduled to specifically discuss quality management issues. At these meetings reports and documentation regarding the quality management system will be reviewed and discussed. These regular meetings will provide a forum for HPTE and CDOT to monitor and oversee the Project's quality management procedures and provide input into these procedures based on document and field observations.

Self-monitoring process. The Transfield QMS included internal control methods to provide quality throughout all operations. The methods proposed and currently used have been tested and proven to deliver the required asset management outcomes on projects around the world. The QMS incorporates built-in reporting, providing evidence to PRD and HPTE that Transfield is meeting tolerance and criteria requirements.

Project staff performs daily road patrols in their respective zones of operation to identify defects. The patrolling will include driving the roadways to check for obvious, routine and urgent safety defects. The inspectors are responsible for recording observations and referencing them by mile marker and direction. As defects are noted in the field, they will be marked to indicate identification and to enable work crews to easily find the asset needing repair. This information will be entered into the maintenance management system and included in the work program. Urgent and safety related items are addressed to meet timeliness requirements, and with additional input from the road crews, passed on to the O&M Quality/Safety Manager.

During the daily patrol, the inspectors will review the progress on maintenance issues. Upon completion of the work, the inspector will document the repair so the item can be logged and closed. The process plays a critical role in planning the road patrol by providing the list of open maintenance issues that need to be checked during patrols.

Transfield will use documented inspection and test plans to analyze the work process and plan the testing program to allow

is to prove that we have achieved the specified compliance. Any maintenance activities, such as grass mowing, litter collection, and drain cleaning, can be monitored by carrying out visual inspections and checking response times. Other activities require in-process inspection and tests to verify that the required quality standards are achieved.

Transfield will manage the quality control practices with procedural check lists, which describe the process steps, relevant inspection duties, and, if necessary, testing requirements. Checklists will be completed by the work crews undertaking the activity and signed off at each step by the most senior person responsible for the task. The completed checklist then becomes auditable proof of work execution and compliance. For simple tasks, such as litter removal or mowing, the work order will be the auditable proof of completion and compliance.

There will be no material changes to the Maintenance Quality Management necessary to manage the increased scope of the GP Lanes.

Integration of Quality Management into Maintenance Inspections

The Transfield QMP will recognize that continuous improvement of the overall system is a feature that cannot be overlooked. Similarly, PRD's approach to Quality Management recognizes that continuous improvement needs to be achieved to learn the lessons from past performance.

Transfield will track trends in the amount and frequency of Planned and Routine Maintenance that indicate the asset is not performing as forecast or that Routine Maintenance regimes need to be amended. Any amendments to processes and procedures will be identified and updated within a revised operating period QMP which will be submitted by the PRD QM to HPTE for approval. Once approved, the revised QMP will be adopted. If the amendment is required to the routine or planned maintenance element, such change will be made in the asset inventory from which planned and routine maintenance schedules are prepared.

4.3 – Snow and Ice Control Services

PRD has invested significant time in developing our Snow and Ice Control Services plan.

As discussed in our Snow and Ice Control Service plan, Transfield Services has reviewed the Snow and Ice Control Services performance requirements, the existing I-25 lane configurations, ramps and terminus points, the proposed US-36 Phase 1 and Phase 2 lane configurations, ramps and terminus points, the 70th Avenue Maintenance Yard facility and location and the Denver Maintenance Yard facility and location. Based on this information, Transfield Services has prepared the Snow and Ice Control plan. Our intent is to provide the users of these roadways with a safe and passable thoroughfare during times of inclement weather. Our proposal schedule to obtain a fully approved Snow and Ice Control plan is as follows:

- March 1, 2013 - Initial Snow and Ice Control Plan submittal with technical proposal.
- April 5, 2013 – Award selection
- May 6, 2013 (Suggested Date) - Meeting with HPTE and CDOT to review issues and solutions, prior to resubmittal.
- June 6, 2013 – Resubmittal of Snow and Ice Control Plan.
- July 5, 2013 – Receive final comments from HPTE and CDOT.
- July 15, 2013 – Final submittal of Snow and Ice Control Plan.
- August 1, 2013 – Approval of Snow and Ice Control Plan from HPTE and CDOT.



Part 3 – Volume III – Appendix

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Life Cycle Maintenance Engineer

Role & Responsibility

The Life Cycle Maintenance Engineer establishes and improves long-term work plans for each major asset group. She reviews asset condition assessments and develops appropriate work plans to maximize asset life and ensure contract hand-back requirements will be satisfied.

Essential Duties and Responsibilities

- Develops project-specific asset condition survey program.
- Develops life cycle plan and annual maintenance program for each asset group.
- Improves work flow by studying process flowcharts; recommending modifications in work flow, work stations, and product; developing new procedures; recommending equipment modifications and purchases.
- Reduces waste by studying methods, equipment, and operator techniques; works with Maintenance Manager to recommend changes.
- Implements work improvement programs in coordination with Maintenance Manager and Project Engineer.
- Develops hand-back plan for assets.
- Maintains maintenance records and analyzes to ensure compliance with life cycle plan and contract requirements.

Maintenance Operations Superintendent

Role & Responsibility

The Maintenance Operations Superintendent holds overall responsibility for operations of the project. He verifies work, interprets the contract, and gives direction on schedules and subcontractor work. The Maintenance Operations Superintendent works in collaboration with the Maintenance Manager to coordinate the development, implementation, and evaluation of a services plan consistent with the identified needs of the client and the contract.

Essential Duties and Responsibilities

- Ensures completion of condition assessment of pavements, signs, guardrails, bridges, vegetation, and other contract requirements.
- Determines best approach (self-performance or subcontract) for bringing assets into contract compliance considering cost, timeliness, and efficiency. Sources and qualifies new subcontractors.
- Monitors operational and financial performance, conducts operational and financial analysis, and prepares performance information and recommendations for incorporation into the periodic reports to management.
- Serves as technical advisor to work crews.
- Works with Project Engineer to schedule work to be performed.
- Inspects in-process and completed work to ensure compliance with contract requirements.
- Acts as a communication link between the Maintenance Manager and operations personnel.
- Ensures foremen are actively supervising, scheduling, and evaluating maintenance crews. Coach foremen on management techniques.
- Obtains, inspects, and controls fleet (maintenance, fuel cards, etc.). Manage, monitor, and control highway project assets and materials.
- Responsible for proper work reporting, timesheets, budgeting, and other systems. Prepares reports and correspondence as necessary. Ensures data in the MMIS is accurate.

Maintenance Work Crews

Role & Responsibility

The Maintenance Work Crews will typically be comprised of a foreman and technician assigned to a work vehicle to perform routine maintenance activities and respond 24/7 to incidents or emergencies. Subcontractors will provide support for additional needs.

Essential Duties and Responsibilities

- Perform routine maintenance activities, such as:
 - Litter and debris removal
 - Fence repairs
 - Delineator replacement
 - Sign repairs
 - Drainage and ditch maintenance
 - Pavement repair
 - Tree and vegetation management
 - Guardrail repair
 - Curb and Gutter repairs
 - Traffic Control
 - Striping and symbol repairs
- Perform snow and ice control/removal operations
- Respond to incidents 24/7
- Perform work needs surveys
- Patrolling

Project Engineer

Role & Responsibility

The Project Engineer serves as on-site technical resource for operations and maintenance projects. He coordinates contractor sourcing and qualification, prepares contract documents and condition assessments, schedules and coordinates subcontractor work and ensures work meets contract specifications, and enters data into the MMIS.

Essential Duties and Responsibilities

- Serves as technical engineering advisor to project staff.
- Reviews quality assurance analysis results and provides recommendations to project staff.
- Performs routine condition assessment of pavements, signs, guardrails, bridges, vegetation and other contract requirements. Analyzes work needs, based on condition assessments and contract performance requirements.
- Determines best approach (self-performance or subcontract) for bringing assets into contract compliance considering cost, timeliness, and efficiency. Sources and qualifies new subcontractors.
- Works with Maintenance Operations Superintendent to schedule work to be performed.
- Inspects in-process and completed work to insure compliance with contract requirements.
- Enters data into the work reporting and other databases/systems.
- Prepares and maintains reports and other documentation including project work plan.
- Responds to incident emergencies and coordinates work of on-site responders.
- Assist with routine work plan activities such as traffic control, maintenance work.
- Makes suggestions for methods to reduce expenses and improve efficiency
- Develops and conducts technical training programs. Trains and mentors other employees.
- Assists the Maintenance Manager with work planning and budget planning.
- Prepares contract development schedule.
- Prepares contracts for work to be performed including, preparation of documents in the MMIS, advertisements, pre-bid meetings, contract administration.
- Prepares estimates of quantities and costs to perform necessary work.
- Conducts permit approvals for clients, including review of permits and plans for compliance with state and local codes, inspection of completed work to verify compliance.

Quality Assurance / Safety Manager

Role & Responsibility

The Quality Assurance / Safety Manager assists the Maintenance Manager with project-level monitoring, reporting, and compliance related to the Quality Management Plan (QMP) and the Safety Plan. He creates monthly quality assurance reviews and conducts field reviews to ensure processes and measures and their outcomes are aligned with the QMP and with contract requirements. The Quality Assurance / Safety Manager also provides leadership on health, safety, and environmental (HSE) requirements for the project.

Essential Duties and Responsibilities

- Conducts audits as required to verify compliance with the contract and the quality management plan and the Safety Plan.
- Works with the Maintenance Manager to determine best practices for managing administrative processes in order to maximize efficiency and effectiveness.
- Initiates actions to prevent the occurrence of non-conformities in processes and systems.
- Performs QA / QC and safety field reviews of required client inspections and reports, reviews maintenance management reporting, and ensures quality and accuracy of data.
- Acts as liaison for all vendors and contractors to assure quality customer service and prompt payments.
- Designs, implements, and directs execution of HSE policies, procedures, and programs. Responsible for managing the workers' compensation loss control program including claims, benefits, compensation, and modified work programs. Approves and negotiates settlement of claims.
- Responsible for enforcement and compliance with all HSE regulations, including documentation, tracking, and statistical reporting for regulatory agencies.
- Advises project leadership of associated HSE risk management issues and take proactive steps to manage risks.
- Oversees training programs and requirements to ensure the safe operations, including the development of annual safety plans in coordination with the Maintenance Manager.
- Conducts risk assessments, safety reviews, and audits. Identifies and resolves HSE deficiencies.

Traffic Operations Center Staff Supervisor

Role & Responsibility

The Traffic Operations Center Staff Supervisor is responsible for readiness of assigned shift personnel and equipment, as well as safety and performance of assigned shift personnel. The staff supervisor shall maintain a high level situational awareness during all incidents and emergencies to ensure timely and appropriate management and resolution to issue and events.

Essential Duties and Responsibilities

- Maintains regular communication with HPTE and CDOT representatives, Maintenance Manager, Maintenance Operations Superintendent, courtesy patrol, work crews, and other Traffic Operations Center staff.
- Ensures assigned staff is present and able to perform shift duties.
- Monitor CCTV cameras, traffic sensors, environmental sensors, and courtesy patrol for events that occur on the roadway.
- Ensures staff accurately record incident and event information in logs and reviews for accuracy.
- Must maintain composure during active and ongoing highway situations.
- Must use proper communications decorum and procedures at all times.

From: Farber - CDOT, Nicholas [<mailto:nicholas.farber@state.co.us>]
Sent: Friday, February 01, 2013 11:31 AM
To: Brian Clark
Subject: Preventive Maintenance Program Response

Brian,

The submitted draft Preventive Maintenance Program has been reviewed and accepted with the attached comments. Final Preventive Maintenance Plans shall be submitted with your proposal as required by the RFP Part 3, Section 4.2 (a)(iii)(9). You should make changes to their I-25 Preventative Maintenance Program Proposals in line with these comments and include the amended proposals as part of their Proposals submitted on the Proposal Due Date.

As always, please let me know if you have any questions.

Regards,

Nick

**Nicholas J. Farber, JD | Enterprise Specialist | High Performance
Transportation Enterprise | Direct: (303) 757-9448**

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I-25 BRIDGES

Preventive Maintenance Program



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 - II. Excerpt of RFP Schedule 6, Section 1.4.1.1.2
 - III. Excerpt of Concession Agreement, Schedule 1, Definitions, "I-25 Bridges"
 - IV. Excerpt of I-25 Initial Work Package, dated October 2, 2012
 - V. Spreadsheet of 14 bridges and information
 - VI. Map of bridge locations
-

Subject: Bridges on I-25, as identified in the Concession Agreement, Schedule 1, Definitions, "I-25 Bridges", and further described in the RFP, Schedule 6, Section 1.4.1.1.2, "I-25 Managed Lanes Structures".

Goal: Due to the age and expense of replacing structures, a robust deck and expansion device preventive maintenance program shall be developed by the Concessionaire, to avoid the need for major replacement of any of the designated structures.

Strategy: To meet the goal, a four part program will be established.

1. Immediately halt any deterioration presently occurring due to lack of properly sealed concrete surfaces, properly sealed expansion joints, intrusion of water and/or chlorides, over flow or run-off of water and/or chloride laden water into the bridge deck or onto any structural elements below the top of deck, and leakage from any deck drains or drainage systems.
2. Repair / replace any failed systems that are permitting deterioration top occur.
3. Improve any deteriorated elements or systems, to meet a minimum of NBIS rating of 7, and must be functional, to safeguard and protect all deck and superstructure and substructure elements as necessary in accordance with Appendix 6-1.2.
4. Perform annual maintenance inspections of these structures and associated elements and deterioration protection systems. Identify and repair / replace systems and elements as necessary.

Methods: The elements to be protected will be divided into the following groups and their protection methods. (see matrix below):

Methods to Protect Bridge Elements

<p>A. Top of deck, Parapet walls</p>	<ol style="list-style-type: none"> 1. Sealers; Penetrating sealers, Crack sealers 2. High friction waterproofing overlays; Epoxy, Nova chip, Proprietary 3. High density or impervious concrete overlays; polyester concrete, latex modified concrete, silica fume concrete
<p>B. Joints and seals</p> <ul style="list-style-type: none"> • Expansion • Non-Expansion • Cold Joints • Deck Patches • Concrete Pour • Deck to Parapet wall 	<ol style="list-style-type: none"> 1. Expansion seals; neoprene strip seals, neoprene compression seals, silicone seals. 2. Joint sealant; Hot poured, cold poured. 3. Crack sealer 4. Urethane sealer
<p>C. Edge of deck, Bottom of deck</p>	<ol style="list-style-type: none"> 1. Drip edges 2. Lengthened scupper downspouts 3. Eliminate deck run off over the edge
<p>D. Superstructure</p>	<ol style="list-style-type: none"> 1. Maintain protective coating on all steel elements and components 2. Eliminate deck run off from reaching superstructure
<p>E. Substructure</p>	<ol style="list-style-type: none"> 1. Maintain protective coating on all elements and components 2. Eliminate deck run off from reaching substructure
<p>F. Drainage System</p>	<ol style="list-style-type: none"> 1. Ensure that all deck run off is directed to scuppers 2. Downspouts must be of sufficient length to protect superstructure and substructure 3. Drainage piping systems must be leak free, no clogs or obstructions, and free flowing.

Treatments:

Group A: Deck and Parapet Walls

An investigation must be conducted to determine each bridge deck's age, current type of deck protective layer, condition of protective layer, and remaining life of current protective layer.

Bare Concrete Deck and Parapet Walls – Options

1. Penetrating Sealer – reseal at three-year intervals, or
2. Install and maintain high friction waterproof overlay
 - a. Epoxy – remove and replace at 10-year intervals
 - b. Novachip – remove and replace at 10-year intervals
 - c. Proprietary overlays – per manufacturer recommendations

Above options will require routine patching and annual crack sealing.

Bonded Deck Overlays (high density, impermeable)

1. Polyester Portland Cement Concrete
 - Mill and replace at 20-year intervals
2. Latex modified concrete
 - Mill and replace at 20-year intervals
3. Silica fume concrete
 - Mill and replace at 20-year intervals

Above options will require routine patching and annual crack sealing.

Group B: Joints and Seals

1. Expansion Joints – typical lifespan of neoprene rubber strip seals and compression seals is seven to 10 years. (10 years with close attention to keeping debris and silt out of seals and monitoring seals)
 - a. Spring and fall seal cleaning program with pressure washer and vacuum
 - b. Annual seal inspections
 - c. Repair of unbounded neoprene
-

- d. Replacement of seals at 10-year intervals
2. Modular Joints and Seals – typical lifespan of neoprene rubber compression seals is 15 years
- a. Spring and fall seal cleaning program with pressure washer and vacuum
 - b. Annual seal inspections
 - c. Annual adjustment to modular components, including Teflon sliders, bolts, vertical alignment and horizontal alignment
 - d. Repair of unbounded neoprene
 - e. Replacement of seals at 15-year intervals

3. Non-Expansion Joints, Cold Joints, Deck Patches

Note: All unsealed joints in concrete are a point of entry for water and de-icing chemicals. These pose a threat of freeze damage, chloride induced corrosion and horizontal delamination of the deck.

- a. Seal all non-expansion joints with hot-poured or cold-poured joint sealant by routing and filling.
 - b. Cracks in concrete shall be sealed with epoxy if the crack poses a structural weakness or are vertical to meet CDOT specifications.
 - c. Horizontal cracks in concrete (non-structural) and crack in asphalt overlays may be sealed with hot-poured joint sealant to meet CDOT specifications.
4. Joint between top of deck and bottom of parapet wall

Note: This interface is a prime target for de-icing chemical intrusion, chloride buildup, rebar corrosion, and deck and parapet wall deterioration.

- a. Apply moisture-cure urethane sealant to the base of all parapet walls at the joint with the deck. Expected life is 15 years unless physically damaged.
- b. Annual inspections of seal. Repair as necessary.
- c. Replace or overseal at 15-year intervals.

Group C: Edge of Deck, Bottom of Deck

Note: Water and de-icing chemical run-off allowed to travel over the edge of the deck and under the deck (at any location) will introduce moisture and chlorides directly into the lower portions of the deck.

1. All surface water on top of the deck should be directed to scuppers.
2. All deck lower edges should be constructed with drip edges.

Group D: Superstructure

1. Maintain protective coatings on steel members, bearing, anchor bolts, and guide plates.
2. Eliminate all joint leaks and other sources of water/de-icing chemical contamination of superstructure elements.

Group E: Substructure

1. Install penetrating sealer or waterproof overlay below joint seals on top of pier caps and abutment shelves.
2. Inspect and clean annually.
3. Repair as needed.

Group F: Drainage System

1. Maintain all deck surface water flow to scuppers
 2. Ensure that scupper downspouts extend to below the top of pier caps
 3. Ensure that drainage piping systems are leak-free, unobstructed, and free-flowing.
 4. Semi-annual spring and fall inspections of scuppers, draining grates, downspouts and piping systems.
 5. Repair/replace as necessary to ensure functionality.
-

I-25 Bridges, Preventive Maintenance Program, Appendices

I. Excerpt from RFP:

3.11 The following background underlies the approach which HPTE has decided to adopt in relation to the allocation of responsibility for maintenance for structures associated with the I-25 Managed Lanes:

(a) The section of I-25 which includes the present express lanes, which will become the I-25 Managed Lanes for the purposes of the Concession Agreement, mainly consists of the road pavement resting on a layer of sub-grade, but includes the 14 I-25 Bridges. Of these 14 bridge structures, four carry only the express lanes and the remainder carry both the express lanes and the I-25 GP Lanes (the percentage attributable to the express lanes varying between 17% and 29%).

(b) Where the I-25 pavement rests on the sub-grade there are other structures which underlie the pavement (such as drainage structures).

(c) HPTE believes that the difficulty in assessing the cost of Life Cycle Maintenance of the structures associated with the I-25 Express/Managed Lanes, means that Proposers would be likely to include significant contingencies in their proposals and therefore that it is unlikely that transferring full Life Cycle Maintenance risk in relation to those structures will represent a good value for the money.

(d) In relation to the I-25 Bridges, HPTE considers that the risk of a major replacement of any of the structures during the term of the Concession Agreement can be mitigated by the following:

(i) An initial work package (the "I-25 Initial Work Package") will be specified to address the current condition of the structures

(ii) A maintenance regime (the "I-25 Preventative Maintenance Program") must be developed by the Concessionaire and approved by HPTE for the bridges. The I-25 Preventative Maintenance Program must provide a program that is proactive and prevents any damage to the substructure including the following items::

(1) resealing and replacing expansion joints on the bridge decks whenever inspections indicate signs of leaking or damage (e.g. 0"-4" expansion device replaces seals approximately every 5 years, and entire expansion joint approximately every 20 years);

(2) protecting the bridge decks, by sealing existing bare concrete decks and maintaining or replacing the waterproofing membrane and overlay for existing concrete decks with asphalt overlay (sealing cycle to be determined by product used, e.g. penetrating sealers: ~2-3 years, 3/8" epoxy overlays: ~10 years, 3/4" polyester overlay: ~20 years);

(3) sealing exposed substructure concrete in the splash zones;

(4) rehabilitation of the bridge decks or sealers/overlays in areas where damage occurs (cracking or delamination of overlay, potholing, etc.)

(iii) CDOT will include the I-25 Bridges in their biannual bridge inspections program. Additional inspections may be proposed by the Concessionaire as part of its proposed I-25 Preventative Maintenance Program.

3.12 The risk allocation in the draft Concession Agreement reflects a division of responsibility between the Concessionaire and HPTE which takes into account the matters set out in Section 3.12.

3.13 Updated HPTE Service Requirements (which will initially be posted to the Concession Project Website prior to incorporation in the Service Requirements) will specify the I-25 Initial Work Package

and clarify the requirements for the I-25 Preventative Maintenance Program. HPTe will also post drawings to clearly demarcate the I-25 Bridge Deck Superstructure for which the Concessionaire is responsible from the substructure for which HPTe is responsible. HPTe will require Proposers to make a submission setting out their respective proposals for the I-25 Preventative Maintenance Program prior to the Proposal Due Date so that HPTe can approve this (using a process analogous to the process for dealing with ATCs) prior to submission of the Proposals.

3.14 The issues described above only arise in relation to the civil engineering elements of the I-25 Bridges. Other Assets comprising/associated with the I-25 Managed Lanes (such as the signs dedicated to the I-25 Managed Lanes, moveable gates for the lanes, the tolling equipment and street lighting) will be the Concessionaire's responsibility for both Routine Maintenance and Life Cycle Maintenance.

II. Excerpt from RFP, Schedule 6, Service Requirements:

1.4.1.1.2 I-25 Managed Lanes Structures

There will be special requirements for the I-25 Managed Lanes associated with the fly-over structures. The Concessionaire will be responsible for all routine and capital maintenance of the I-25 Managed Lanes but due to the age and expense of replacing the structures the maintenance plan is required to be a robust deck and expansion device preventive maintenance program to avoid the need for replacing the structure. If this enhanced maintenance plan is properly executed by the Concessionaire and a replacement of the structure is required during the Services period, CDOT will then be responsible for the execution and cost of the replacement. The enhanced I-25 maintenance plan will be carried out as provided in the Services Proposal and further detailed in the approved MMP.

The structures are a cast-in-place post-tensioned box with a bare deck bridge with modular joints. The deck is approximately 6 ½" thick with a 2" epoxy concrete overlay. The structures are as numbered as: E-16-OP and D-03-V-045(A) are part of the HOV structure.

III. Excerpt from Concession Agreement, Schedule 1, Definitions:

"I-25 Bridges" means the 14 bridges supporting the I-25 Managed Lanes, and in some cases also supporting the I-25 GP Lanes, designated by CDOT as D-03-V-045(A); E-16-OP; E-16-PI; E-16-EM; E-16-FA; E-16-GC; E-16-NW; E-17-OX; E-17-OW; E-17-PA; E-17-PU; E-17-JK; E-16-RB; and E-17-NB.

COLORADO HIGH PERFORMANCE TRANSPORTATION ENTERPRISE
 US 36 MANAGED LANES CONCESSION PROJECT
 MEMORANDUM

Date: October 2, 2012

I-25 Initial Work Package Information

As contemplated in No. 3 of the HPTE Responses to the Comments of the Draft RFP posted to the US 36 Concession Project Datasite on August 17, 2012, below are requirements which will be included in the I-25 Initial Work Package for the I-25 Managed Lanes, excluding requirements in relation to the 20th Street structure.

Proposers should note that the information below will be supplemented with additional information, including information relating the 20th Street structure, prior to finalization of the RFP.

15.2.3.10 I-25 Initial Work Package

HPTE has determined that the structures listed in Table 15.2-10 will need to be rehabilitated as part of the I-25 Initial Work Package.

Table 15.2-10 I-25 BRIDGE REHABILITATIONS	
Structure Description	Structure No.
US 36 over Pecos Street	E-16-RB
US 36 over SH224/Broadway	E-17-NB
HOV over I-25 SB	E-17-JK
70 th Ave (US224) over I-25	E-17-OO
HOV 70 th Ramp over I-25 Access	E-17-PU
I-25 SB and HOV over Clear Creek	E-17-PA
I-25 over 62 nd Avenue	E-17-OW
I-25 over UPRR	E-17-OX
I-25 over 48 th Ave, RR Spur	E-16-NW
I-25 over Ramps to I-25/I-70	E-16-GC
I-25 over Fox Street	E-16-FA
I-25 over RR Spur	E-16-EM
20 th St HOV Ramp over I-25 NB	E-16-OP
20 th St HOV over Roads/River/RR	D-03-V-045A
20 th St HOV/DUT Ramp over RR/Parking Lot	D-03-V-046

Current Structure Inspection Assessment (SIA) Reports from CDOT will be made available to the Concessionaire for all existing structures. Additional SIA reports will be made available to the Concessionaire when completed. The Concessionaire shall repair all structural damage listed in Table 15.2-11 as part of the Phase 2 Construction Work.

Preliminary quantities for the rehabilitation work described in Table 15.2-11 are provided in the I-25 Initial Work Package Quantities in the Reference Documents. Within 30 Days after Financial Close, the Concessionaire shall provide to HPTE, for Acceptance, unit costs, items costs, and costs per structure based on these preliminary quantities to establish an initial total cost for the I-25 Initial Work Package. These numbers shall sum to the I-25 Initial Work Package Price. These Accepted unit costs will be used as the basis for a negotiated Change Order if a change in quantities results in an increase or decrease to the initial total cost for the Initial Work Package.

Within 120 Days after Financial Close, the Concessionaire, along with HPTE agents, shall conduct a visual inspection of all the structures listed in Table 15.2-10. All visible damage, concrete delamination, and concrete cracks (greater than 0.03-inch) identified during these inspections shall be repaired as part of the Contract.

On the structures requiring a new asphalt overlay and waterproofing membrane as listed in Table 15.2-11, the Concessionaire shall completely remove the old asphalt overlay and waterproofing membrane down to the bare concrete. The Concessionaire shall visually inspect the bridge deck and assess repair options prior to the completion of the asphalt overlay and waterproofing membrane. The Concessionaire should assume that special equipment will be required on the existing bridge decks. This special equipment shall produce a smooth finished concrete surface, required for the installation of the new waterproofing membrane.

On the structures requiring deck repair, the Concessionaire shall perform Class 2 repair. If it appears that the damaged deck area is going to exceed Class 2 deck repair quantity shown in the preliminary quantities, the Concessionaire shall produce a detailed bridge deck condition report, to be submitted to HPTE for Acceptance.

If structure rehabilitation quantities vary from the preliminary quantities based on the visual inspection or actual conditions encountered, HPTE reserves the right to prioritize work elements and transfer unused quantities from one structure to another, within the above list, to remain within the initial total cost established for the I-25 Initial Work Package. If it appears that the structure rehabilitation/repair is going to exceed the preliminary quantities, the Concessionaire shall produce a detailed bridge condition report and detailed cost estimate, to be submitted to HPTE for Acceptance. HPTE reserves the right to prioritize the rehabilitation/repair items shown in the bridge condition report. Rehabilitation work above the initial total cost established for the I-25 Initial Work Package shall be subject to a Change Order in accordance with the Concession Agreement. The methods and procedures for repairs to existing structures shall be left up to the Concessionaire, with the review and Acceptance of HPTE. Proposed methods and procedures for repairs shall be submitted to HPTE, as part of the QMP.

Table 15.2-11 STRUCTURE REHABILITATION ELEMENTS	
Structure No.	Rehabilitation Elements
E-16-RB US 36 over Pecos Street	<ul style="list-style-type: none"> • Add protective concrete sealer with corrosion inhibitor to bare concrete deck and approach slabs • Clean joint, patch spalls and replace pourable joint seal at abutments • Patch concrete and seal cracks in concrete abutment faces • Seal cracks in concrete pier cap and columns • Seal cracks in concrete wingwalls • Provide structural concrete coating on pier columns (splash zone) • Provide concrete sealer with corrosion inhibitor on pier columns (splash zone) • Repair slope paving that has settled and broken at wingwalls
E-17-NB US 36 over SH224/Broadway	<ul style="list-style-type: none"> • Seal cracks in concrete deck • Seal cracks in concrete pier columns • Seal cracks in concrete wingwalls • Clean deck drains • Seal joint between approach and wall • Repair "D" cracking, install backing material, and seal joint with a pourable seal • Provide structural concrete coating on pier columns (splash zone) • Provide concrete sealer with corrosion inhibitor on pier columns (splash zone)

**Table 15.2-11
STRUCTURE REHABILITATION ELEMENTS**

Structure No.	Rehabilitation Elements
<p>E-17-JK HOV over I-25 SB</p>	<ul style="list-style-type: none"> • Patch concrete spalls and seal cracks in concrete box girders • Seal cracks in concrete pier columns • Seal cracks in concrete wingwalls • Clean deck drains • Clean non-expansion joints at abutments • Provide structural concrete coating on pier columns (splash zone) • Provide concrete sealer with corrosion inhibitor on pier columns (splash zone) • Repair slope paving that has cracked and buckled at abutment 3
<p>E-17-OO 70th Ave (US224) over I-25</p>	<ul style="list-style-type: none"> • Repair potholes in bridge deck • Mill 2" asphalt overlay • Add new waterproofing membrane • Replace 2" asphalt overlay • Replace modular expansion joint at Pier 4 • Seal joints at far ends of approach slabs • Repair "D" cracking, install backing material, and seal joint at abutment with a pourable seal • Seal cracks and patch spalls in concrete bridge rail • Clean deck drains • Clean and paint rust locations interior of steel box girders at modular expansion joint location and utility box locations. • Clean and paint exterior of steel box girders, within 10 feet at ends of bridge • Provide structural concrete coating on pier columns (splash zone) • Provide concrete sealer with corrosion inhibitor on pier columns (splash zone)
<p>E-17-PU HOV 70th Ramp over I-25 Access</p>	<ul style="list-style-type: none"> • Add protective concrete sealer with corrosion inhibitor to bare concrete deck and approach slab • Replace strip seal expansion joint at Abutment 1 • Clean, seal cracks in Pier 2 strip seal expansion joint end dam and replace gland • Provide structural concrete coating on pier columns (splash zone) • Provide concrete sealer with corrosion inhibitor on pier columns (splash zone)
<p>E-17-PA I-25 SB and HOV over Clear Creek</p>	<ul style="list-style-type: none"> • Add protective concrete sealer with corrosion inhibitor to bare concrete deck and approach slabs • Clean deck drains • Replace strip seal expansion joints • Clean joint and replace pourable joint seal at abutments • Seal cracks in concrete abutment faces • Clean reinforcing steel and patch spalls in concrete box girders. If 30% section loss has occurred in reinforcing, add 10-20 lb reinforcing • Seal cracks in concrete box girders. • Repair damaged concrete rails

**Table 15.2-11
STRUCTURE REHABILITATION ELEMENTS**

Structure No.	Rehabilitation Elements
E-17-OW I-25 over 62 nd Avenue	<ul style="list-style-type: none"> • Add protective concrete sealer with corrosion inhibitor to bare precast panel concrete deck and approach slabs • Patch spalls and seal cracks in concrete abutment faces and curtain wall • Add gapped joint to bridge rail at abutment/approach slab joint location • Patch concrete spalls and repair cracks in concrete box girders • Clean and seal longitudinal Construction/Non-Expansion Joint at abutments with a pourable seal • Replace strip seal expansion joints • Provide structural concrete coating on pier columns (splash zone) • Provide concrete sealer with corrosion inhibitor on pier columns (splash zone)
E-17-OX I-25 over UPRR	<ul style="list-style-type: none"> • Patch spalls and add protective concrete sealer with corrosion inhibitor to bare precast panel concrete deck and approach slabs • Seal cracks in concrete abutment faces • Clean reinforcing steel and patch spalls in concrete box girders. If 30% section loss has occurred in reinforcing, add 10-20 lb reinforcing • Seal cracks in concrete box girders. • Replace strip seal expansion joints • Add gapped joint to bridge rail at abutment/approach slab joint location • Clean and seal longitudinal Construction/Non-Expansion Joints at Bays J and O with a pourable seal • Clean joint and replace pourable joint seal at abutments
E-16-NW I-25 over 48 th Ave, RR SPUR	<ul style="list-style-type: none"> • Add protective concrete sealer with corrosion inhibitor to bare concrete deck and approach slabs • Seal cracks in concrete abutment faces and pier caps • Seal cracks in concrete box girders • Clean strip seal expansion joints • Provide structural concrete coating on pier columns (splash zone) • Provide concrete sealer with corrosion inhibitor on pier columns (splash zone)
E-16-GC I-25 over Ramps to I-25/I-70	<ul style="list-style-type: none"> • Seal cracks in approach slabs • Seal cracks in concrete abutment and piers • Clean strip seal expansion joints • Provide structural concrete coating on pier columns (splash zone) • Provide concrete sealer with corrosion inhibitor on pier columns (splash zone)

**Table 15.2-11
STRUCTURE REHABILITATION ELEMENTS**

Structure No.	Rehabilitation Elements
<p>E-16-FA I-25 over Fox Street</p>	<ul style="list-style-type: none"> • Clean joint and replace pourable joint seal at abutments • Patch concrete spalls and seal cracks in pier columns • Seal cracks in concrete box girders • If necessary, replace the rusted metal access door in the end spans so inspection of abutments can take place • Provide structural concrete coating on columns and end walls (splash zone) • Provide concrete sealer with corrosion inhibitor on columns and end walls (splash zone)
<p>E-16-EM I-25 over RR SPUR</p>	<ul style="list-style-type: none"> • Patch concrete and repair cracks in abutment faces and pier caps • Clean joint, repair cracks and replace pourable joint seal at abutments • Clean deck drains
<p>20th St HOV (E-16-OP: 20th St HOV over I-25; D-03-V-045A: 20th St HOV over Roads/River/RR; D-03-V-046: 20th St HOV/DUT Ramp over RR/Parking Lot)</p>	<ul style="list-style-type: none"> • Clean deck drains • Remove and replace bridge rail (steel only) • Remove and replace fence and fence posts • Provide structural concrete coating on pier columns (splash zone) • Provide concrete sealer with corrosion inhibitor on pier columns (splash zone) • Repair spalled or delaminated areas in deck and locations where reinforcing clear cover will be less than 2" after existing overlay is milled, as determined from Ground Penetrating Radar (GPR) results. • Remove silica fume concrete overlay. • Add waterproofing membrane (Units 1-5) • Add 2" asphalt overlay (Units 1-5) • Add protective concrete sealer to bare concrete deck and approach slab (Unit 6) • Replace modular expansion joints at Hinges 4, 7 10, 12 and Abutment 20. • Clean strip seal expansion joints at Abutment 1, Hinge 16A, Abutment 22, and Abutment 20 approach slab • Replace pourable joint seal at Abutment 22 • Clean steel, patch concrete spalls and repair cracks in prestressed concrete box girders • Repair cracks in reinforced concrete box girders



SECTION IV: Excerpt of Initial Work Package

I-25 MANAGED LANES – INITIAL WORK PACKAGE

COLORADO US 36/I 25 MANAGED LANES BRIDGE CONDITION AND INVENTORY

National Bridge Inventory (NBI) Number	Facility Carried	Feature Intersected	Year Built	Status	Material Design	Structure Length (m)	# of Spans in Main Structure	Deck	Superstructure	Substructure	Sufficiency Rating
D-03-V-045 (A)	20th St HOV	Roads/River/RR	1994	Functionally Obsolete	Prestressed Concrete Continuous	1041.5	17	Fair (5)	Fair (5)	Good (7)	76.2
D-03-V-046	20th St HOV - DUT	Road	TBD	Functionally Obsolete	TBD	TBD	TBD	TBD	TBD	TBD	TBD
E-16-OP	HOV Ramp	I 25 NBND R	1993		Prestressed Concrete Continuous	189	3	Satisfactory (6)	Good (7)	Very Good (8)	97.3
E-16-PI	I 25 Main Lines	Storm Drainage	1993		Concrete	17.7	3	N/A	N/A	N/A	70
E-16-EM	I 25 Main Lines	RR	1949 - Reconstructed 1992		Steel Continuous	97.7	6	Good (7)	Very Good (8)	Good (7)	83
E-16-FA	I 25 Main Lines	Fox St	1949 - Reconstructed 1992		Prestressed Concrete Continuous	71.5	4	Good (7)	Good (7)	Good (7)	97
E-16-GC	I 25 Main Lines	Ramps to I 25/I 70	1989		Steel Continuous	109.5	3	Good (7)	Good (7)	Good (7)	89.1
E-16-NW	I 25 Main Lines	48th Ave/RR	1992		Prestressed Concrete Continuous	55.8	2	Good (7)	Very Good (8)	Good (7)	87.9
E-17-OX	I 25 Main Lines	RR	1993		Prestressed Concrete Continuous	58.2	3	Good (7)	Very Good (8)	Good (7)	82.8
E-17-OW	I 25 Main Lines	62nd Ave	1993		Prestressed Concrete	51.4	3	Good (7)	Good (7)	Good (7)	88.4
E-17-PA	I 25 SBND & HOV	Clear Creek	1993		Prestressed Concrete Continuous	83.8	3	Good (7)	Very Good (8)	Very Good (8)	92.4
E-17-PU	HOV Ramp	I 25 Access	1993	Functionally Obsolete	Prestressed Concrete	47.6	1	Very Good (8)	Very Good (8)	Very Good (8)	86.4

E-17-JK	HOV	I 25 SBND	1972		Concrete Continuous	75	2	Satisfactory (6)	Fair (5)	Good (7)	68.1
E-16-RB	US 36 Main Line	Pecos St	2001		Prestressed Concrete	60.5	2	Good (7)	Very Good (8)	Good (7)	93.6
E-17-NB	US 36 Main Line	SH 224 Main Line	1986 (Reconstructed 1997)	Functionally Obsolete	Steel Continuous	44.3	4	Good (7)	Very Good (8)	Good (7)	96

