

EXHIBIT 2-G

PRELIMINARY OPERATIONS AND MAINTENANCE PLAN

[attached]

### 4.3 Preliminary Operations and Maintenance Plan



The main objective of Operations and Maintenance (O&M) is to safely provide high quality and rapid response service and to maintain the roadway with reduced disruption to the traveling public.

Isolux currently manages eight highway concessions. For all eight, Corsan has been or is the D-B Contractor. Two of the eight are under construction and three are fully operational. The remaining three, in which the construction part of the contract involves upgrades and expansion of existing roads, are simultaneously under construction and in operation.

Isolux has significant experience providing O&M activities to the satisfaction of its clients on a number of P3 projects. Safety and mobility are our main goals.

Isolux is currently performing O&M activities for more than 850 miles of highways/roads, including divided and undivided highways. The experience of Corsan and Isolux undertaking this type of O&M contract in an urban environment similar to I-69 Section 5 is listed in [Figure 4.3-1](#).

#### 4.3.1 Operations and Maintenance Technical Solutions

The proposed I-69 DP Operation and Maintenance Team (O&M Team) will provide the IFA with

innovative and proven O&M technical solutions to maintain the safe and comfortable use of I-69 Section 5 by the traveling public throughout the Project’s operational lifecycle. This will be accomplished by employing a variety of measures to ensure safe, cost effective routine maintenance activities; and through well managed scheduling and delivery of necessary rehabilitation works.

O&M will be managed according to our P3 Project Management System (P3PMS, as defined in [Section 4.1: Preliminary Project Management Plan](#)) and will comply with the requirements stated in the PPA and the Technical Provisions



#### 4.3.1.1 Roadway and Bridge Operations

The O&M Team will be responsible for routine patrolling of the Project and for the Incident response during both the Construction Period and Operating Period O&M Limits. Incident detection and response will be fast, efficient and precise to ensure safe use of the roadway. The O&M Team understands the local context, including interaction and interfaces with stakeholders, local authorities, public information provision and the anticipation and management of potential hazardous situations.

The O&M Team will initially develop an Operations and Maintenance Plan (OMP) prior substantial completion that will be updated in order to address the transition to the Operating Period, and at least annually during the whole life of the Project to ensure all procedures are revised, upgraded or replaced as necessary.

Project	Country	Isolux Share	Length (mile)	Number of lanes	Status	Urban Areas	O&M Annual Cost
Via Bahia	Brazil	70%	423	1+1 and 2+2	In Operation/ Under Construction	Yes	
NH-1	India	61%	181	2+2 and 3+3	In Operation/ Under Construction	Yes	
NH-2	India	50%	120	2+2 and 3+3	In Operation/ Under Construction	Yes	
NH-6	India	50%	83	2+2	Under Construction	Yes	
NH-8	India	50%	58	3+3	Under Construction	Yes	
A-4	Spain	51%	42	2+2 and 3+3	In Operation	Yes	
Monterrey Saltillo	Mexico	100%	59	1+1 and 2+2	In Operation	Yes	
Perote Xalapa	Mexico	50%	37	2+2	In Operation	No	

Figure 4.3-1: O&M Contracts

### 4.3.1.1.a Monitoring the Roadway

The O&M Team’s priority is safe passage for the traveling public and project staff. During the Construction and Operating Periods, the roadway will be patrolled 24 hours per day, every day of the year. The O&M Team will provide customized patrol vehicles dedicated to the Project. We will use equipment such as movable flashing arrows for safer traffic management during incidents or maintenance activities.



Figure 4.3-2: One of our customized patrolling vans.



The O&M Team will also provide two motorcycles in order to reach the Incident site as quick as possible to comply with the target set forth in the Technical Provisions Attachment 18-1, Performance Requirements and Measurement Tables A&B (item 13.2.)

#### Detection of Emergencies:

The O&M Team will have access to several sources of information in order to promptly detect and respond to incidents:

- O&M Team roadway patrols
- Customer contact line
- Weather forecast monitoring
- Traffic Wise
- Web-site and I-800 system for 24 hours messages

#### Response to Emergencies:

The O&M Plan will include the Emergency Response Plan (ERP) that will designate the responses to be implemented in the event of an Incident within the O&M Limits. The ERP will include a comprehensive list of Incident types that could occur on the roadway and will include requirements and strategies for Incident detection,

I-69 DP will have the resources to provide quick Incident Response and keep Users safe.



responsibilities and procedures for Incident verification, and specific response strategies for each. Upon notice of an event, the O&M Team will immediately inform the INDOT Traffic Management Center (TMC) and the Hoosier Helpers. After the detection of an incident, the O&M Team will proceed to secure the site and will provide immediate assistance. Patrollers located either at the O&M Management Center (OMMC) or patrolling on the Project, will be able to provide Incident response in less than 30 minutes. O&M Team managers will be available, if necessary, to attend to the Incident. The O&M Team’s focus will be to ensure safety for the traveling public, adjacent landowners and all Project staff. Team members will have specialized equipment on hand to secure the site. Quick installation of appropriate temporary traffic management measures will reduce the impacts of the Incident, including secondary crashes and excessive traffic delays.



Figure 4.3-3: We will work closely with the Hoosier Helpers and Traffic Wise

#### Keeping the TMC and Users Informed

The O&M Team will immediately inform and continuously update the TMC of any Incidents, its impact on traffic, response actions undertaken, restoration of normal traffic flow and any related information.

Once the O&M Team has informed the TMC, we will use the latest technologies and social media, such as Twitter, Facebook and email to inform users. This combined approach will minimize the impacts of Incidents and provide timely and accurate information to the Users of the facility.

**4.3.1.1.b Coordination with Emergency Service Providers**

Prior to the start of construction, the O&M Team will work with INDOT to coordinate the ERP with the specific emergency service providers, law enforcement agencies and relevant private sector responders. Within the ERP will be procedures to liaise with emergency services. Meetings will be held with the different agencies and departments involved on a monthly basis, to discuss any adjustments necessary to the ERP and to review any Incidents that did happen and how management of incidents and accidents could be improved.

In an emergency situation, the O&M Team will inform the appropriate authorities and will implement the procedures established in the ERP. An O&M Team roadway patroller will be sent to ensure the safety of the site and the traveling public. Once the emergency responders have arrived on site, they will take the lead. The O&M Team will stay on site to assist in traffic management under the direction of the emergency responders.



The O&M Team will also participate in quarterly traffic incident management team meetings led by INDOT. The ERP will be updated to take into account feedback received from INDOT and lessons learned. After consultation and discussion with INDOT, a contract will be established with local towing companies to enable them to respond to Incidents in accord with the Performance Requirements set forth in the Technical Provisions.

**4.3.1.1.c Accident Analysis and Implementation of User Safety Improvements**

Accidents will be reported on a daily and monthly basis, in accordance with requirements defined in the ERP. The quarterly Operations Report issued to IFA will include a summary of these reports.

Three different kinds of events are considered within the O&M Team’s review and assessment process:

- Near misses: events that in slightly different conditions, would result in an Incident
- Incidents: events with non-significant consequences
- Accidents: Incidents with significant consequences

The ERP will describe the methodology for the tasks shown on the **Figure 4.3-4**.

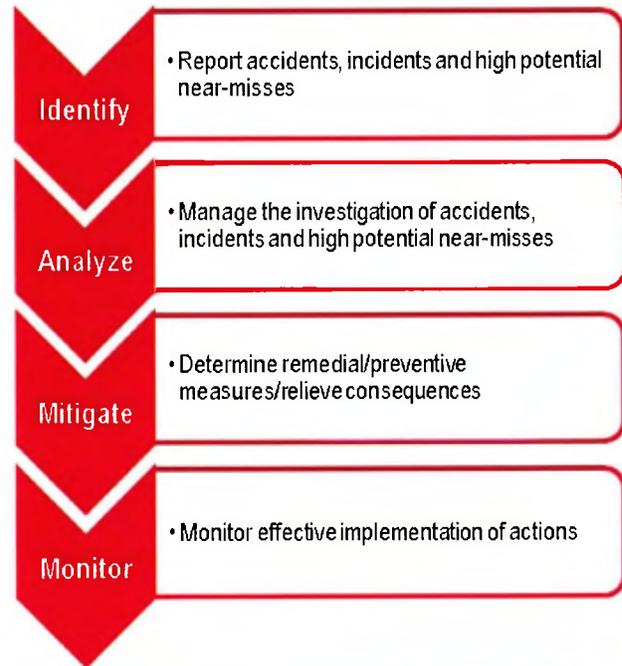


Figure 4.3-4 The O&M Plan will describe the methodology to accomplish the above tasks.



Data provided will be analyzed by the O&M Team to identify the root causes of the events. Furthermore, we will obtain a historical record of traffic data, enabling a comprehensive analysis of traffic incidents to implement the correspondent measures to improve the motorist’s safety.

Enhancing the safety of road users and project workers will be a priority for the I-69 DP on all O&M activities.

I-69 DP understands the importance of training and will periodically facilitate emergency exercises with the participation of emergency services and various third parties (see 4.3.2.1.d) At the end of each exercise and after each significant accident, a debriefing meeting will take place and a feedback report will be prepared to assess and refine procedures. In addition, full time maintenance staff will be responsible for cleaning litter and removing debris and graffiti in accordance with the Technical Provisions Attachment 18-1, Performance

Requirements and Measurement Tables B (items 1.1. and 3.10.)



The O&M Team will regularly carry out safety audits to assess effectiveness of the safety procedures for the Project, identify high accident locations that will be registered in the I-69 MMS (see section 4.3.1.2.h), implement mitigation measures, and review the Good Industry Practices. Any mitigation measures introduced throughout this process will be recorded and monitored to verify their effectiveness.

**4.3.1.2 Routine Maintenance**

I-69 DP’s Routine Maintenance approach is centered on proactive preventive maintenance. Routine Maintenance is critical to maintain a safe and reliable roadway system. The Maintenance Plan, together with a frequent inspection program, ensures early identification of maintenance needs and their quick implementation to prevent small deteriorations from becoming larger problems.

**4.3.1.2.a Life Cycle Cost Analysis over the Duration of The Agreement**



The O&M Team will be fully involved throughout design development to assist with maintenance and lifecycle optimization of design and the anticipation of resulting maintenance costs.

During the design stage, I-69 DP Team is committed to ensure the designed infrastructure assets are durable and maintainable.

To determine expected material durability and Useful Life, I 69 DP will use benchmark data from its extensive list of projects in operation, combined with up to date Good Industry Practice guidelines and industry research data.

For each element of the project, the O&M Team will analyze potential technical solutions; accounting for variability of cost, increasing labor rate, and impacts of maintenance on roadway resources availability.

The analysis includes market research, and requests for quotations to compare and choose the most appropriate local firm to carry out each of the different Rehabilitation Works. Data bases and performance records from previous experiences will

Our primary O&M goal is to provide a high level of service to the traveling public while considering safety, availability, and reliability. Therefore we will implement continuous improvement actions measured against Performance Requirements

also be used to compare with the prices received We will use escalation index databases for the items whose market prices are more sensitive to market conditions. This way, we will be able forecast inflation and estimate future prices for elements such as asphalt, steel, fuel oil, labor, or construction machinery.

A Rehabilitation Work Schedule with a five-year renewal works schedule, updated annually, will be submitted to the Department. The Rehabilitation Work Schedule (see preliminary schedule in Figure 4.3-25) will assess annual Performance Requirements.

**4.3.1.2.b Details and Locations of Operation and Maintenance Management Center**

For the Operating Period, the I-69 DP Team will construct the Operation and Maintenance Management Center (OMMC). These facilities and features of the OMMC will include:

- Parking lot for staff and visitors
- Vehicle and spare parts storage covered area
- Office building with public reception area
- Covered storage facility for de-icer materials



Figure 4.3-5: One of our OMMC office buildings

We believe that one of the parcels close to Sample Road as identified in ATC 22 would be an optimum location for our OMMC due to the following reasons:

- Its central location within the middle of the Project, allowing for better incidence response
- Easy access to the Project via the new Sample Road interchange.
- Greater availability of property
- More affordable prices compared with other areas adjacent to the project (for example, areas near the SR-46 interchange
- All the parcels are already affected by the right of way takes for the Project

The possible OMMC sites are shown in **Figure 4.3-6**



**Figure 4.3-6: Possible OMMC parcels**

**4.3.1.2.c Preliminary List of Specialized Maintenance Equipment**

During Construction Period, the O&M Team will use customized equipment for the maintenance activities they will directly carry out, such as mowing and vegetation control, snow and ice removal, incident response and assistance to Users. The D-B Contractor will be responsible for the rest of the routine maintenance works. The assignment of maintenance tasks during the Construction Period is better defined in **Figure 4.3-8**.

All our vehicles (snowplows, trucks, patrolling pickups) will be equipped with GPS to allow real-time tracking by O&M supervisors or other authorized parties

The O&M Team’s equipment for O&M During and After Construction will include the items shown in **Figure 4.3-7**.

O&M During Construction Equipment	O&M After Construction Equipment
4 Pickups	5 Pickups
2 Mid-size Cars	2 Mid-size Cars
2 Motorcycles	2 Motorcycles
1 Truck Mounted crane	2 Truck Mounted crane
1 Hydraulic Guardrail Installation Machine	1 Hydraulic Guardrail Installation Machine
3 Snowplows	3 Snowplows
2 Plows for Pickups	2 Plows for Pickups
4 Plow for Snowplows	4 Plow for Snowplows
2 De-icer Spreader and De-icer Tanks for Pickup	2 De-icer Spreader and De-icer Tanks for Pickup
	1 Man Lift
	1 Backhoe Loader
	1 Vibratory Roller
	2 Road Sweeper Cars

**Figure 4.3-7: Specialized equipment for O&M**

Other auxiliary equipment will include portable luminous arrow boards, portable changeable message signs, signal devices, trimmers, painting and welding equipment, and other equipment.

**4.3.1.2.d Supply and Management of Maintenance Spare Parts**



The O&M Team will use dedicated software to manage and monitor the supply and use of spare parts. This ensures an up-to-date inventory of all parts to support expected maintenance requirements plus a reasonable amount for emergencies. Quantities of spare parts used and ordered will be reviewed on an ongoing basis to identify and resolve any issues where parts are failing more often than expected. The most restrictive requirements for maintenance spare parts are light bulbs and electric equipment to support lighting maintenance, barriers, guardrail and impact attenuator components and signage elements, as set forth in sections 5, 7 and 8 of the Technical Provisions Attachment 18-1, Performance and Measurement Tables.



Within the scope of the Sustainability Management Plan that will be delivered nine months before the commencement of the Operating Period and updated each five years, as indicated in **Figure 4.3-25** in section 4.3.2, recycling of waste oil, tires, tire scraps and light bulbs will be routinely done.

**4.3.1.2.e Routine Maintenance Activities Approach**

The O&M Team approach is to maximize self-performance of the basic Routine Maintenance activities and working with specialty subcontractors where necessary in order to carry out specialized maintenance. This will allow us to utilize the specialist’s knowledge, together with Good Industry Practices and research data from the specialized subcontractors.

**Routine Maintenance During Construction**

We are fully aware that good coordination with the Contractor is vital to fulfill the requirements of the O&M During Construction, ensure a smooth transition and avoid future maintenance issues during the Operating Period.

During construction, we will split the O&M task as defined in **Figure 4.3-8**. We consider this the most sensible approach because in this way the Contractor will be responsible for ensuring their activities have a minimum effect on the existing infrastructure, as they will also be responsible for repairing whatever damage they may cause. Since they have the appropriate machinery and personnel in place for their construction activities, they will be in the best position to correct any defects and ensure that the Performance Requirements are achieved.

The rest of the activities will be monitored by the O&M Team through inspections in order to verify that the conditions maintain or exceed the initial values of the Baseline Asset Condition Report. The frequency and planning of these activities will be handled by the O&M Team as shown in **Figure 4.3-9**. Our Deputy Project Manager – Technical, will ensure the coordination between Corsan and the O&M Team.

The allocation of O&M responsibilities are defined in the DB contract already in place, and we have used this same strategy to great success in all projects in which there was a O&M During

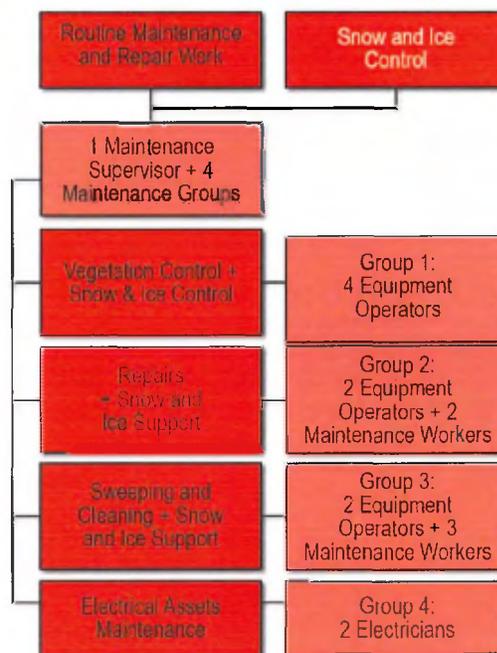
Construction phase, (766 miles in total: A4 Highway in Madrid (Spain), NH1 and NH2 in India and Viabahía in Brazil).

Activity	Corsan	I-69 DP
Sweeping and cleaning	✓	
Repairs (pavement, structures, barriers, guardrails, pavement marking, etc.)	✓	
Mowing and vegetation Control		✓
Snow and Ice Control		✓
Incident Response		✓
Attention to Users		✓

**Figure 4.3-8: O&M during Construction Responsibilities**

**Routine Maintenance during the Operating Period**

After the construction is complete, the O&M Team will carry out all Routine Maintenance with in-house resources (see Routine Maintenance crews in **Figure 4.3-10**.) supplemented by specialty subcontractors for such activities as major repairs, special inspections of structures, pavement marking placement and winter maintenance support (if additional staff is necessary during winter events).



**Figure 4.3-10: Routine Maintenance crews**





This allocation of activities and responsibilities will be updated on a yearly basis to comply with Performance Requirements of the Technical Provisions Attachment 18-1. This figure contains a breakdown of all the programmed O&M activities, in order to meet the targets set forth for each road category element as defined in the Technical Provisions Attachment 18-1.



Whether self-performing or outsourcing O&M activities, the O&M Team will focus on safety. Working on a live roadway involves hazards for maintenance staff and motorists. Detailed procedures to ensure safety for workers and motorists will be developed and used, whether by internal maintenance staff or specialized subcontractors.

The O&M Team will organize and program the Routine Maintenance activities with the appropriate equipment and staff, as shown in **Figure 4.3-9**, to comply with the Performance Requirements for each element.

**Performance Requirements**

The Performance Requirements will be managed with the resources shown in the **Figures 4.3-9 and 4.3-10** in order to meet the targets defined in the Technical Provisions Attachment 18-1.

**Winter Maintenance**

For winter maintenance, we will:

- Maintain staff and equipment in a state of readiness in order to keep the roadway safe during periods of snow and ice
- Use additional equipment



**Figure 4.3-11: Pickups with plows will be used on ramps and intersections**

We will use smaller vehicles such as a crew cab pickup truck with a plow and spreader to address areas that are difficult for the larger trucks to reach.

This will allow the larger snow plows to focus on the I-69 mainline, improving performance. The areas maintained by the smaller vehicles will be intersections, ramps and secondary roadways.

This will decrease the length of the area assigned to each plow, increasing the level of service as well as reducing clean-up time and proactively addressing problem areas. We will also:

- Maintain the roadway at all times and under all weather conditions
- Monitor weather forecasts
- Manage the use of de-icing materials

Prior to the winter maintenance season, we will obtain and stockpile adequate de-icing materials in our storage facilities.



**Figure 4.3-12: Isolux's Snowplow**



Surface Patrol Pavement Temperature Sensors will be mounted on O&M vehicles to measure and record temperatures changes of the pavement surface to accurately predict the need for application of de-icer thus allowing optimization of the quantities used.



We are currently exploring the use of alternative environmentally friendly de-icers. Special care will be taken to minimize de-icer use close to the karst areas.

We will subscribe to a weather reporting service with the purpose of automatically receive alerts for storm events that may require winter maintenance.

**Bare Pavement Event**

During winter season, I-69 DP will use its own in-house staff and equipment to plow and de-ice the roadway. These efforts will be supported, when necessary, by local subcontractors. The O&M Team's maintenance procedures will ensure that, following any winter weather event, plowing and

de-icing will finished within two hours in line with IFA’s requirement 12.1 of the Technical Provisions Attachment 18-1, Performance Requirements and Measurement, Tables A&B. We will issue a monthly report including the documenting performance achievements relating to the bare pavement events.



Figure 4 3-13: Bare pavement successfully achieved at A4 (Spain)

**Snow and Ice Control Plan**

All winter maintenance measures will be described in the Snow and Ice Control Plan. This plan will be updated annually to incorporate changes in strategy, Good Industry Practice and lessons learned, and submitted to IFA for its review and approval.

The preliminary proposed anti-icing and de-icing routes are shown in Figure 4.3-15.



The O&M Team will carry out an annual winter maintenance exercise at the beginning of each winter season. During this exercise, the staff and the specialized subcontractor partners will be trained in all related methods, risk and safety requirements. This exercise will also check that all winter maintenance equipment is operational and ready for the winter season.

**4.3.1.2.f Traffic Management During Maintenance**



I-69 DP understands that traffic management during maintenance activities is critical to ensuring a safe place of work for both O&M staff and the road users. Through training of our staff and specialty subcontractors on our proven traffic management approaches, we will ensure that proper and effective maintenance related traffic control is carried out. We understand disruption to traffic flow is viewed

critically by INDOT and will focus on keeping travel lane disruptions to a minimum.

All lane closures for Planned Maintenance work will comply with the INDOT Interstate Highways Lane Closure Policy. Where any deviation from the monthly Planned Maintenance schedule lane closures are required, the O&M Team will coordinate maintenance activities and associated lane closure requirements with IFA/INDOT a minimum of 14 days in advance of planned activities. Should the closures affect all lanes in the same direction of I-69, entrance ramps, exit ramps or frontage roads and access roads, the O&M Team will coordinate with the IFA/INDOT 28 days in advance.

Referring to this last issue, I 69-DP will thoroughly comply with all the restrictions indicated in section 18.2.3 of the Technical Provisions.

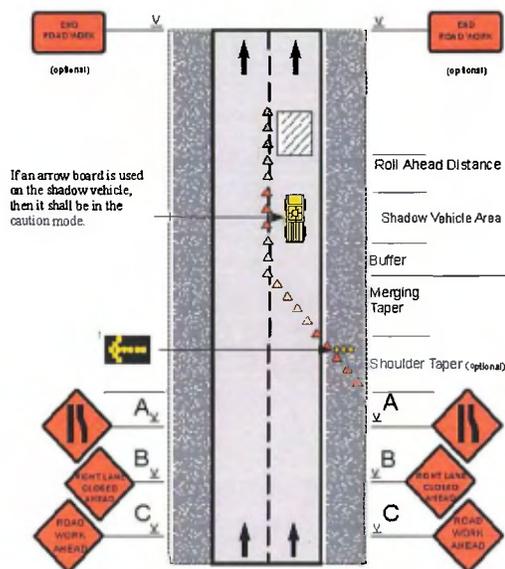


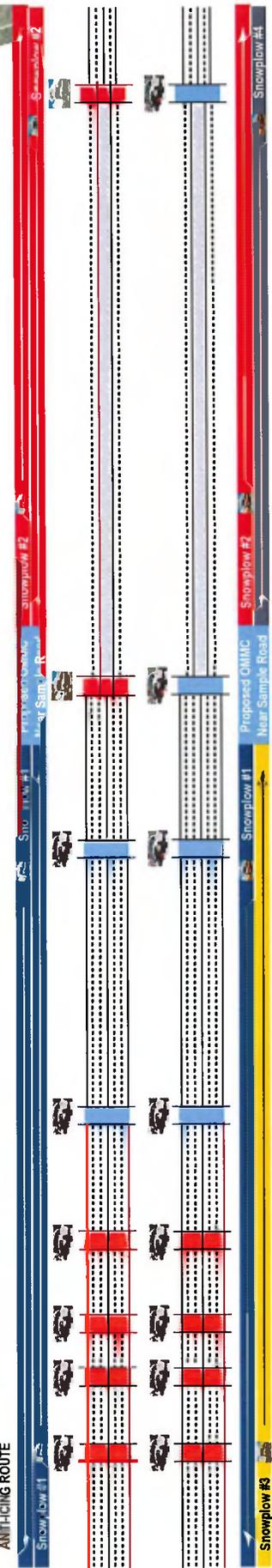
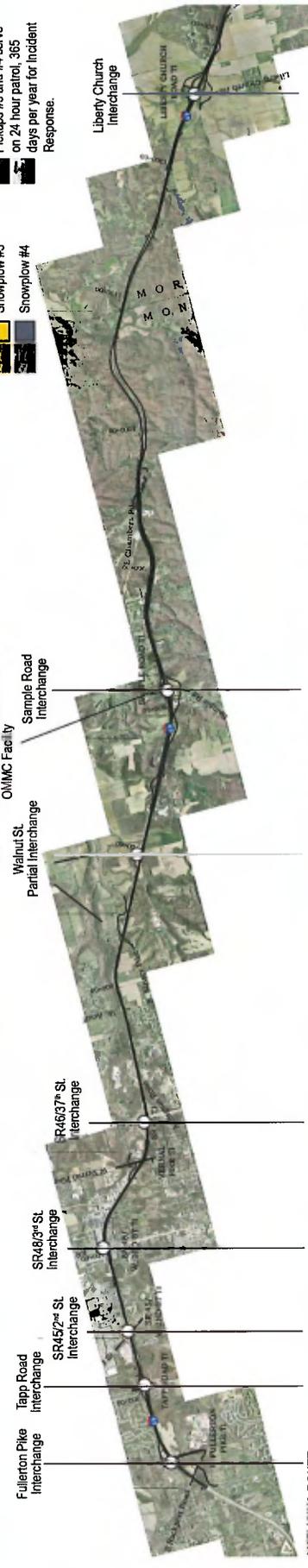
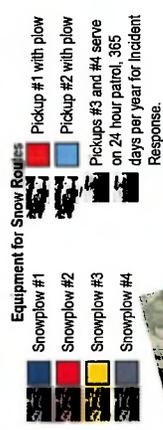
Figure 4.3-14: Traffic Management example

**Event Planning**

The O&M Team is responsible for planning and coordinating all routine and rehabilitation maintenance whether performed by the I-69 DP team, a specialty subcontractor or by other entities, such as public agencies.

**Notification**

Monthly Planned Maintenance and Routine Maintenance schedules will be submitted to IFA for approval at least 30 days in advance of the works. Annual Planned Maintenance schedules will be



Performance Requirements (Attachment 18-1 to the Technical Provisions)	Preventive/Curative Measures	Resources
12.1 Maximum plowing circuit time of 2 hours	Plowing and deicing routes as explained in the figure above.	4 snowplows, 2 pickups + plows, 8 Machinery Operators
12.2 Snow accumulation adjacent to barrier walls removed concurrent with mainline pavement snow removal	Plowing and deicing routes as explained in the figure above. Pickups will focus in areas with more difficult access	4 snowplows, 2 pickups + plow, 8 Machinery Operators, 4 Maintenance Workers
12.3 Achieve bare pavement after end of the winter event	Plowing and deicing routes as explained in the figure above.	4 snowplows, 2 pickups + plows, 8 Machinery Operators
12.4 Shoulders/Median/Crossovers	Plowing and deicing routes as explained in the figure above. Pickups will focus in areas with more difficult access	4 snowplows, 2 pickups + plows, 8 Machinery Operators
12.5 Address any hazard immediately upon detection or being made aware. Address isolated slippery conditions 100% of the time	24 hour patrolling	5 Patrolling Operators, 2 pickups
12.6 Salt stored in covered buildings at all times	O&M Management Center includes the OMMC facility	O&M Management Center includes the facility
12.7 All reporting requirements identified in Section 18 are accurate, complete, and timely 100% of the time	Templates prepared to fill in on a timely manner	Maintenance Supervisor

**Snow and Ice removal limits:**  
Snow and ice removal will be done within the O&M Limits, with the exception of the following overpasses: N Crossover Road West/Chambers Pike East Overpass, Kinser Pike West/East Overpass, Vernal Pike Overpass, and Rockport Road West/East Overpass.

Figure 4.3-15: Snow Routes and Deicing

submitted for IFA review and approval at least 90 days in advance of the commencement of the year. The schedules will describe, for each section of the works, all maintenance tasks or activities, dates, times and durations for each activity; the total quantity of Planned Maintenance hours and the permit closures required for Planned Maintenance

**Preparation**

The O&M Team will prepare a Temporary Traffic Control Plan for Planned Maintenance affecting the roadway, sidewalk or bridges, or any other event involving temporary traffic control. It will ensure safety of the staff and the traveling public. We will use QuickZone 2.0 software to determine queues associated with any lane closures or restrictions related to maintenance activities. The O&M Team will coordinate with the INDOT TMC to ensure that accurate information is supplied to the road users about lane closures or other traffic impacts. Communication of public information will be supported with press releases and other media (e.g. newspapers, radio, television, websites and social networks).

**Implementation**

 The placement, maintenance and removal of traffic control devices and temporary signage will meet the approved Traffic Operations Plan. With the assistance of our patrollers and roadway maintenance operators, traffic safety will be monitored and corrective action taken. We will notify the User and the TMC if congestion is caused by the O&M Work.

**Reporting**

 All Routine Maintenance and minor repair works will be recorded by the O&M Team in the I-69 Maintenance Management System (MMS). The information will then be streamed to INDOT’s Computerized Maintenance Management System (CMMS). These records will be used to develop the quarterly Maintenance Work Reports that will be submitted for IFA review. Each month, the report will identify all maintenance and

rehabilitation activities planned, will detail actual activities performed and will confirm that completed work complies with the approved maintenance procedures. This reporting will feed into the quarterly Operations Report provided to IFA.

**4.3.1.2.g Inspection, Testing and Defect Management**

 Regular inspections are a crucial part of our proactive, preventive maintenance approach as they identify early maintenance needs. This allows us to implement adequate mitigation measures before issues become problems that are difficult to fix. The inspections will:

- Determine deterioration rates
- Identify methods to mitigate deterioration
- Allow for adequate budgeting for future corrective actions
- Mitigate any potential disruption to road Users.

I-69 DP will also conduct the inspections shown in **Figure 4.3-17** to determine the condition of each Element after construction period. We will carry out the inspections to determinate the condition of each Element, allowing delivery of the Baseline Asset Condition Report (BACR) to IFA before the commencement of the Construction Period. We will summarize the results in the inspection and test reporting, which will identify, classify and prioritize any Defects (Category 1 or 2, as defined in the Technical Provisions) found. The inspection reports will be comparable with the Technical Provisions Attachment 18-1.

For Category 1 Defects, the O&M Team will take the necessary action to ensure that any hazard to Users is mitigated within the period specified in the column entitled “Category 1 Hazard Mitigation” in the Performance and Measurement Table A provided in the Technical Provisions Attachment 18-1, and will permanently remedy the Defect within the period specified in the column entitled “Category 1 Permanent Remedy”.



Figure 4.3-16: Traffic Management process for Routine Maintenance Activities

Element Category	Required Task	Measurement Method	Frequency
<b>ROADWAY</b>			
Bridge Deck	Inspect pavement surface in accordance with inspection and Measurement Method Table IR1 in accordance with the requirements in the FHWA HPMS Field Manual, Skid Resistance in accordance with the requirements in ASTM E274 and ASTM E524 at 40MPH.	Visual inspection Automated condition distress survey and physical measurement IR1, Skid Resistance	Monthly Annually Annually
Flexible Pavement	Inspect pavement surface in accordance with inspection and Measurement Method Table IR1 in accordance with the requirements in the FHWA HPMS Field Manual, Skid Resistance in accordance with the requirements in ASTM E274 and ASTM E524 at 40MPH. Ruling shall meet requirements in ASTM E950, ASTM E1707	Visual inspection Automated condition distress survey and physical measurement IR1, Skid Resistance, Ruling	Monthly Annually Annually
<b>DRAINAGE</b>			
Stormdrains & Drainage Features	Inspect drainage elements in accordance with inspection and Measurement Method for Table 18-B - Technical Provisions Inspect in accordance with the requirements of NBIS of the Code of Federal Regulations, 23 Highways-Part 650, the Department Bridge Inspection Manual and the Federal Highway Administration's Bridge Inspector's Reference Manual. Ensure that all erosion control measures are functioning as designed.	Visual inspection and records Visual inspection supplements by CCTV where required to inspect buried pipe work Visual inspection	Culverts, drains, ditches: B- Annually Underdrains, channels and pipes: Annually Annually
<b>STRUCTURES</b>			
Minor Damage	Repair Minor Damage	Visual inspection and records	Any incident involved in structural damage
Major Damage	Evaluate structural damage to structures in case of incident involved in structural damage	Visual inspection and records	Routine inspection: B- Annually
Bridges	Inspect structural elements in accordance with inspection and Measurement Method Table, National Bridge Inspections Standards Regulation (NBIS) of the Code of Federal Regulations, 23 Highways-Part 650, the INDOT Bridge Inspection Manual and the Federal Administration's Bridge Inspector's Reference Manual	Inspection will taken B- Annually by Specialist Inspectors	B- Annually
Load Ratings	Inspect and assess in accordance with the requirements of AASHTO's Manual for Bridge Evaluation and Load, the INDOT Bridge Inspection Manual and the Federal Highway Administration's Bridge Inspector's Reference Manual	Inspection will taken B- Annually by Specialist Inspectors	B- Annually
Retaining Walls and MSE Walls	Inspect retaining walls in accordance with inspection and Measurement Method Table	Inspection will taken B- Annually by Specialist Inspectors	B- Annually
Surface Coatings	Inspect structural elements in accordance with inspection and Measurement Method Table	Visual inspection	Annually
<b>PAVEMENT MARKING, OBJECT MARKERS, BARRIERS, MARKERS AND DELINEATORS</b>			
Pavement Markings	Inspect Markings, Symbols and Delineators in accordance with Inspection and Measurement Method for Table 18-B - Technical Provisions	Retroreflectivity as specified in Standard 808 07 and Indiana Test Method (ITM) 931	Annually
<b>TRAFFIC SIGNS</b>			
Signage	Inspect signage in accordance with inspection and Measurement Method for Table 18-B - Technical Provisions. Values of retroreflectivity below the requirements of MUTCD	Visual inspection Retroreflectivity	Annually Every four years
<b>SLOPES</b>			
Slopes	Inspect slopes in accordance with inspection and Measurement Method for Table 18-B - Technical Provisions	Visual inspection by geotechnical specialist and recorded instances of slope failure	Annually
<b>KARST FEATURES</b>			
Water Quality Sampling	Collect water quality samples. Two (2) of the quarterly samples will be sampled at base flow conditions and two (2) of the quarterly samples will be sampled at storm flow conditions. One (1) of the Semi-Annually samples will be sampled at base flow conditions and one (1) will be sampled at stormflow conditions	Sampling results	Quarterly in first year and Semi-Annually in following five (5) years
Cave Fauna Sampling	Cave fauna areas will be sampled for three (3) years after construction to determine if there are any changes in the faunal community	Sampling results	Annually in the first three (3) years
Karst Hazardous Spill Containment Measures	Inspect karst hazardous spill containment measures	Visual inspection and reports	
Karst Feature Water Quality Mitigation Measures	Inspect karst feature water quality mitigation measures and other stormwater control measures	Visual inspection and reports	Semi-Annually for first five (5) years. Then every two (2) years by maintenance staff and every ten (10) years by a karst specialist
Karst Feature Structural Treatment Measures	Inspect karst feature structural treatment measures	Visual inspection and reports	

Figure for 4.3-17: Reporting Inspections After Construction

For Category 2 Defects, the O&M Team will undertake the permanent repair within the period specified in the column entitled “Category 2 Permanent Repair” in the Technical Provisions Attachment 18-1, Performance and Measurement Table B

**4.3.1.2.h Maintain Accurate As-Built, Inspection and Maintenance Records**

During the Construction Period, the DB Team will maintain a database of all as-built drawings and construction records. This will be transferred to the O&M Team before Substantial Completion as part of the transition process. This database will include all assets to be maintained throughout the Operating Period and a description of each item and piece of

The I-69 MMS utilizes GIS and GPS for data collection, analysis, and creating reports.



equipment.

I-69 DP has its own Maintenance Management System (I-69 MMS) that will be fully compatible and integrated with INDOT’s Computerized Maintenance Management System database (CMMS). Its functionality will be demonstrated to IFA for approval 30 days prior to NTP2.

The O&M Team will be responsible for data collection and operation of the CMMS database and procedures for all records and reports as required. The CMMS database will include the preventive

maintenance activities required, as well as details of activities performed including dates and repair history. It will also include detailed information regarding any failures experienced, repairs carried out and all routine maintenance work performed. The O&M Team will use the CMMS for the quarterly Maintenance Work Reports.

I-69 DP will update and maintain the I-69 MMS database through the entire duration of the Term, and will identify all new and rehabilitated assets, for the purpose keeping a record of the Defects, the actions and the inspections through the Operating Period; all relevant information will be streamed to the CMMS on a daily basis. Some of the main automatic functions that the I-69 DP’s MMS will provide are:

- **Road Safety Module:** determining high accident locations and analyzing road safety
- **Pavement Expert Management Module:** obtaining non-destructive pavement test data and other data for predicting pavement conditions and life.
- **Routine Maintenance Module:** managing working reports related to maintenance activities



The Pavement Expert Management Module has been applied worldwide to more than 30,000 miles of roadways

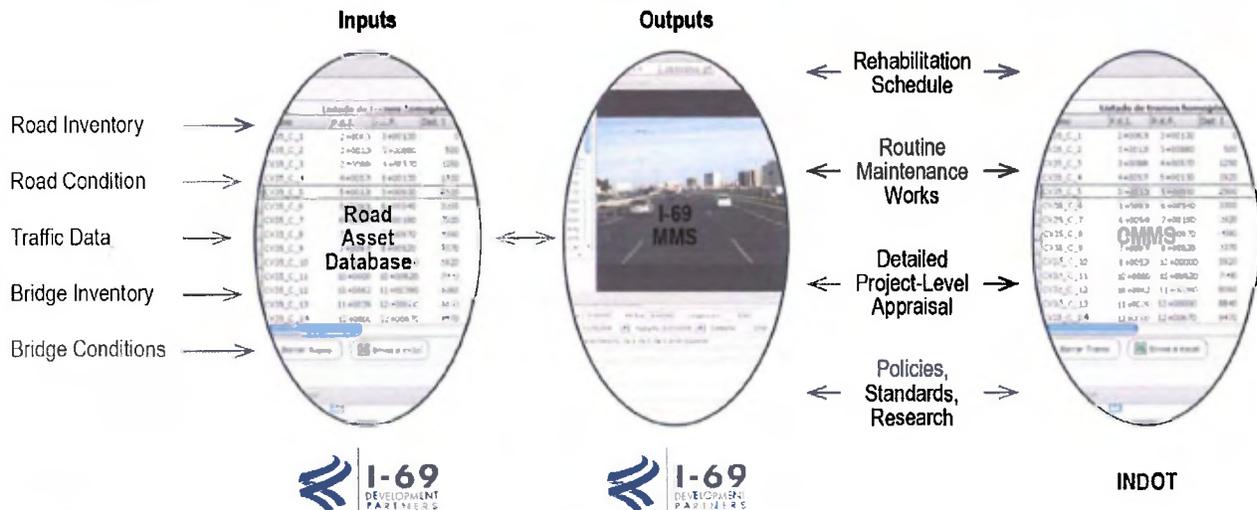


Figure 4.3-18: The I-69 DP MMS will fully compatible with the CMMS.

**4.3.1.3 Rehabilitation Work**



The O&M Team will take a proactive and preventive maintenance approach to the Project. Inspections and preventive maintenance will result in early identification and resolution of issues, minimizing cost impact and disruption for the road Users.

All major Rehabilitation Work will be subcontracted to local specialized subcontractors, who have already expressed their interest in collaborating on the Project.

The frequency and planning of these activities will be handled by the O&M Team through a Rehabilitation Work Schedule. This will be updated on a five-year basis to comply with Performance Requirements indicated in the Technical Provisions Attachment 18-1.

Rehabilitation Works will be managed according to a Rehabilitation Work Schedule that will be carried out considering the Maintenance Plan (MP) and the Performance and Measurement Tables included in the Technical Provisions Attachment 18-1. This program will set out the procedures for the inspection of assets determining:

- The need of Rehabilitation Works
- The planning and design of any major works required

Our preliminary Rehabilitation Work Schedule is compliant with the requirements of the Technical Provisions Attachment 18-1 and the Handback Requirements set forth in Section 19 of the Technical Provisions. Our approach is that all preventive rehabilitations are essential, thus we have scheduled all Rehabilitation Work prior to when possible issues are likely to appear, allowing us to avoid having them and becoming a problem which would be more difficult and expensive to fix.

Our rehabilitation strategy has been adapted to replace, renew or refurbish highway assets at appropriate intervals to meet service requirements and

During the full term of the Operating Period, we will maintain the highway to rigorous standards, exceeding those required within the Technical Provisions, to allow for a high degree of User satisfaction and allowing for the best product at Handback.

comply with the Handback Requirements. This Rehabilitation Work Schedule is combined with the proactive Routine Maintenance regime to maximize the life of roadway assets.

Renewal Work will also be required to upgrade assets when standards change and to maintain assets in a condition that meets Handback Requirements. Most renewal work activities are programmed based on asset deterioration models with the primary criteria being to maintain the prescribed condition rating levels.

The proposed major element Rehabilitation Works required to provide adequate service for the 35 years are described in the following sections.

All major rehabilitations/renewals will be developed as a construction project, with plans, specifications and estimates prepared by a local engineering company for approval by IFA/INDOT.

**4.3.1.3.a Rehabilitation of Pavement**

The surface condition dictates the safety of the operation of the roadway and is the most visible to the public in terms of User’s safety, comfort and general awareness of the performance of the management of the roadway. Our constant knowledge of pavement conditions will be used to plan repairs and renewals in a way that will minimize delay and disruption to the User.

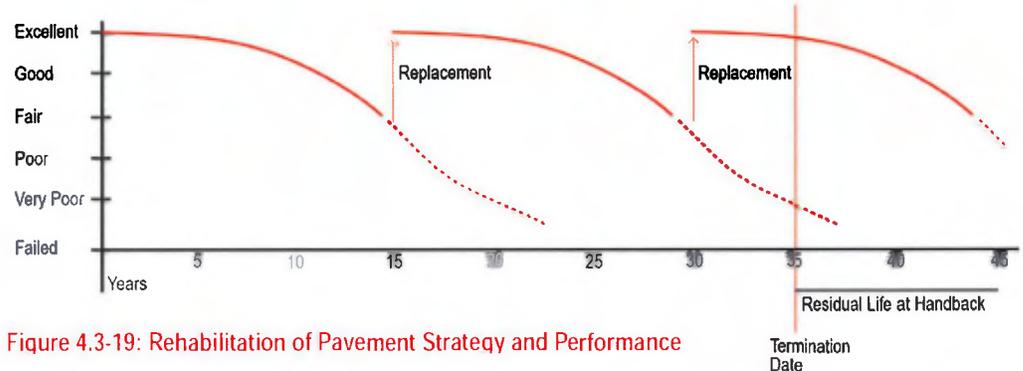


Figure 4.3-19: Rehabilitation of Pavement Strategy and Performance

The O&M Team will subcontract the rehabilitation of pavement to local firms.

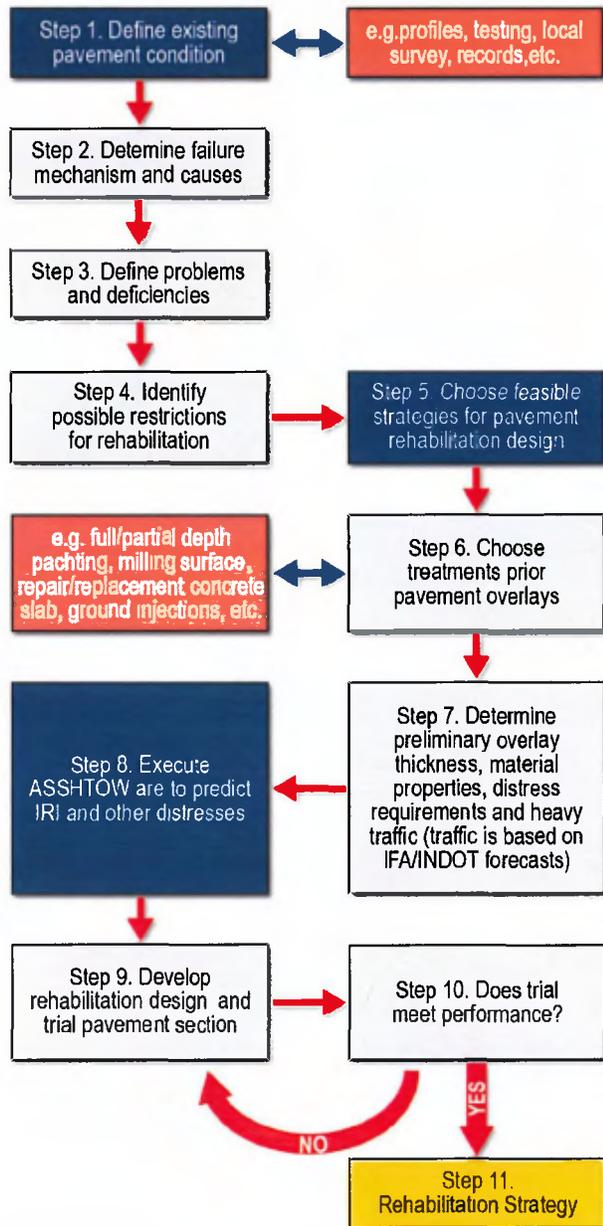


Figure 4.3-20: Pavement Rehabilitation Strategy Process

Rehabilitation of the pavement is scheduled at year 15 and 30 of the Term. The renewal strategy will be determined at the time of the rehabilitation based on the traffic data that is predicted at the time of the renewal, on advances in pavement materials or design methods and any other pertinent factors. However, we have assumed a conservative

preliminary pavement rehabilitation strategy, developed in conjunction with the construction design:



Figure 4.3-21: Pavement Rehabilitation Strategy

#### 4.3.1.3.b Rehabilitation of Structures

There are 31 bridges to be maintained by the O&M Team; 12 which are being constructed as part of the Project and 19 which exist. The rehabilitation program proposed for most bridges includes a major rehabilitation during construction in order to restore some deficient bridge elements to an optimum state. For those bridges that are not being rehabilitated during construction, the O&M Team will engage local subcontractors for the rehabilitation of the structures.

The bridge program proposed for most bridges includes a major rehabilitation During Construction in order to restore some bridge elements to an optimum state.

Preventive maintenance activities have been considered (steel painting, bearings replacement) during the O&M period for all bridges. Moreover two rehabilitation/repair periods have been projected in order to extend the lifetime of the existing and new structures beyond the required Residual Life defined in the Handback requirements.

The maintenance strategy for the new and existing structures is defined below:

- Group 1 – This includes 18 bridges that are either new, are being replaced during construction or that have been constructed or replaced in the last 20 years. Cyclical preventive maintenance activities such as replacing of wearing surface, steel painting, and replacing of bearings have been considered.
- Group 2 – This includes nine bridges that were erected in 1972 and reconstructed during the 1990’s. The aim of rehabilitation work for Group 2 is to extend the life of the structural elements over the O&M period and to comply with the Residual Life at Handback. It has been assumed that the deck will be in a worse condition than the superstructure as it is more exposed to traffic and weather conditions.
- Group 3 - This group includes four bridges constructed in 1972 or prior but that have not been reconstructed since they were built. The rehabilitations for these bridges are most extensive due to lack of or minimal rehabilitation/reconstruction works having been carried out since the construction.

### 4.3.1.3.c Rehabilitation of Road Signs and Pavement Marking

Pavement markings will be renewed as follows: renewal of lane lines every year, renewal of the right edge line every 2 years in urban mainline and 3 years in rural mainline, and the renewal of the left edge line every three years, regardless of whether they are in the urban or rural areas.

Roadway sign panels will be renewed every 15 years and sign structures will be renewed every 20 years.

The O&M Team will subcontract to local firms the rehabilitation/renewal of road signs and structures and pavement marking.

### 4.3.1.3.d Rehabilitation of Highway Lighting

Replacement of the lamps is scheduled every three years, and the luminaires every ten years. Lighting poles will be



Figure 4.3-22: Lamp replacement

replaced to meet the Handback Requirements. (See [Figure 4.3-24.](#))

### 4.3.1.3.e Costing

During the Operating Period, the O&M Team will produce an updated annual budget to meet the Rehabilitation Works Schedule.

The cost of Rehabilitation Works will be budgeted according to market prices obtained from quotes requested from local suppliers and subcontractors. Throughout the Construction Period, the budget will be reviewed and adjusted to match the expected rehabilitations.

### 4.3.1.3.f Handback Requirements

Together with the DB Team, the O&M Team will analyze again the Performance and Handback Requirements of the Project elements set forth in Table 19-1 of the Technical Provisions. These requirements will establish the design/materials of some elements, such as bridge deck and pavement, to meet or exceed targets.

The O&M Team will be responsible for developing the Rehabilitation Work Schedule and allocating resources to meet the requirements. A Handback Plan will be developed five years before the end of the Term of the contract. This plan will describe the three Residual Life Inspections (60 months, 18 months and 19 days before the end of the Term) to be performed and establish an approach for any Rehabilitation Works needed to meet the Handback Requirements.

We will provide O&M training to at least 10 members of INDOT, so that they will have a complete understanding of the infrastructure and the O&M activities required to maintain adequate performance.

### 4.3.1.3.g Schedule

The preliminary Rehabilitation Work Schedule is presented in the [Figure 4.3-24.](#)

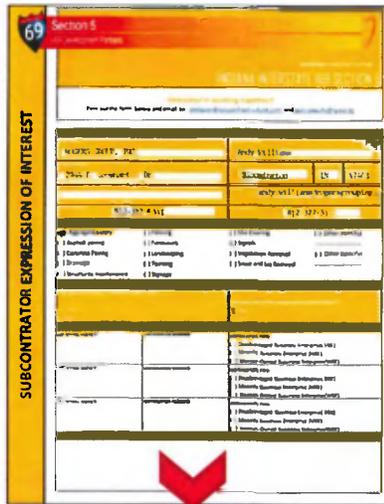
### 4.3.1.3.h Staged Construction and Management of Rehabilitation Work Simultaneously with Standard O&M



Under leadership of Operations and Maintenance Manager, Miguel Angel Barranco, the O&M Team will use an integrated approach to handle both

Routine O&M After Construction and Rehabilitation Work. This single point of leadership provides a coordinated approach to:

- Activity planning
- Traffic management
- Safety
- Quality control



<b>Expressions of Interest</b>	103
<b>Prequalified by INDOT</b>	101
<b>DBE/MBE/WBE</b>	16

Figure 4.3-23: Received Expression of Interest

The O&M Team has analyzed the roadway and bridge design to confirm that future rehabilitations and renewals can be accommodated through staged construction.

The Rehabilitation Work has been coordinated with complementary activities that can be carried out at the same period (e.g: pavements and safety barriers), so that temporary

mainline lane closures are minimized so to disrupt the Users to the least degree possible.

To that end, where feasible, activities will be scheduled in the same location and time to minimize impacts to the traveling public. Routine Maintenance schedule will be adapted to avoid possible interferences with Rehabilitation Work.

As was previously mentioned, the O&M Team will subcontract local firms to perform the major rehabilitation/renewal activities, such a rehabilitation of pavement structures, pavement markings and road signs. We have already contacted many local construction firms that will be available to provide different services through the Operating Period and have obtained their Expression of Interest to collaborate on future work.

### 4.3.2 Operations and Maintenance Management Approach

This section outlines the preliminary Operations and Maintenance Plan (OMP) which is part of the general Project Management Plan described in 1.5.2.5 of the Technical Provisions.

In order to fulfill with the Project Management Plan (PMP) requirements, I-69 DP Team has developed its own P3 Project Management System (P3PMS) as defined in 4.0.

The development of the plans that are required During and After Construction and through the Operating Period are summarized in **Figure 4.3-25**

#### 4.3.2.1 Organization

The I-69 DP organization reflects Good Industry Practice and the experience and skills obtained in operating and maintaining similar facilities. All disciplines are effectively integrated within our team, including specialist subcontractors. Team members are chosen for technical expertise and

The O&M Team uses an integrated approach with one team and one Operations and Maintenance Manager, Miguel Angel Barranco, handling both routine O&M After Construction and Rehabilitation Work.

their collaborative attitude.

#### 4.3.2.1.a.i Organization Chart

The O&M Team is depicted in the complete I-69 DP organization chart shown in **Figure 4.1-5**.

#### 4.3.2.1.a.ii Roles and Responsibilities

The O&M Team's proposed organizational structure is shown in the I-69 DP organizational chart, with the interrelation and lines of communication and reporting between all Project partners indicated. Each key partner's roles and responsibilities are found in Section 4.1 **Figure 4.1-6**.

The key person within the O&M Team is our Operations and Maintenance Manager, Miguel Angel Barranco. Miguel Angel Barranco is currently carrying out similar managing tasks in the operation and maintenance of Monterrey-Salttillo roadway. He will bring his extensive experience in O&M (described in Section 4.1.1.a) to the Project.

O&M AFTER CONSTRUCTION	
Rehabilitation Work Schedule	Year 1 2017
	Year 2 2018
	Year 3 2019
	Year 4 2020
	Year 5 2021
	Year 6 2022
	Year 7 2023
	Year 8 2024
	Year 9 2025
	Year 10 2026
	Year 11 2027
	Year 12 2028
	Year 13 2029
	Year 14 2030
	Year 15 2031
	Year 16 2032
	Year 17 2033
	Year 18 2034
	Year 19 2035
	Year 20 2036
	Year 21 2037
	Year 22 2038
	Year 23 2039
	Year 24 2040
	Year 25 2041
	Year 26 2042
	Year 27 2043
	Year 28 2044
	Year 29 2045
	Year 30 2046
	Year 31 2047
	Year 32 2048
	Year 33 2049
	Year 34 2050
	Year 35 2051

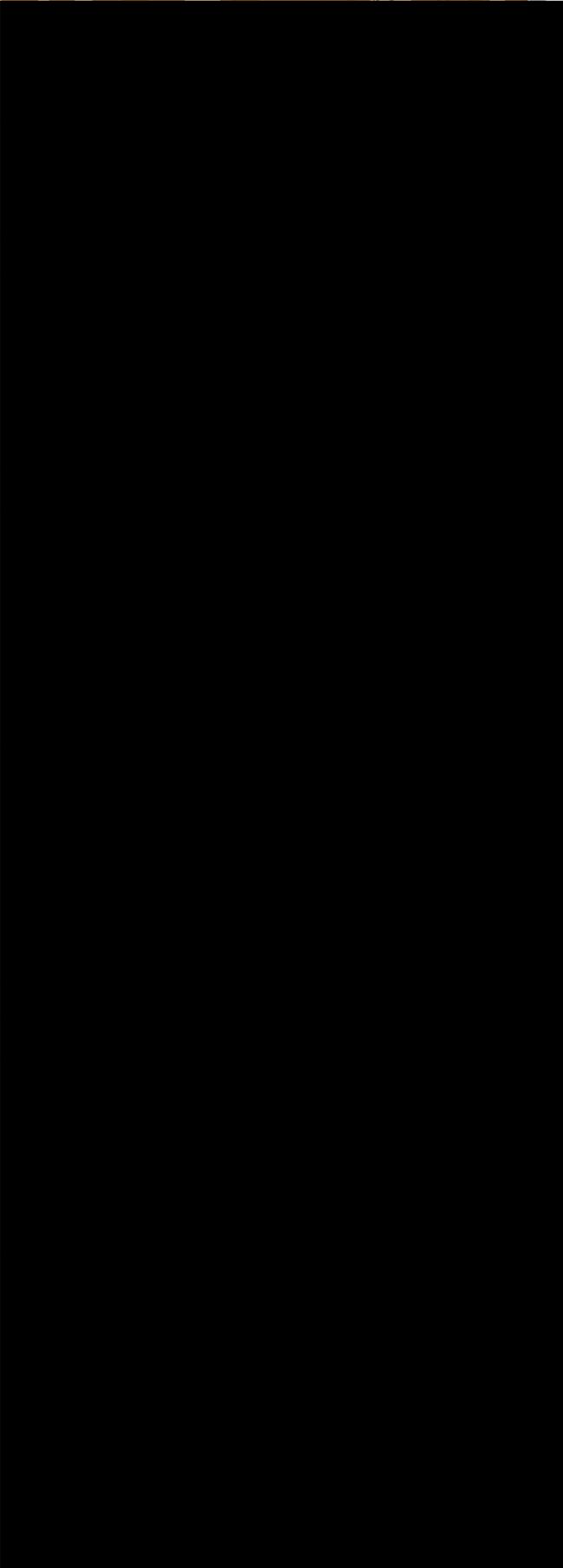


Figure 4.3.24 Preliminary Rehabilitation Work Schedule

**4.3.2.1.a.iii Qualification and Experience**

To ensure personnel meet and exceed IFA's requirements for safe and high quality O&M delivery, the O&M Team will only employ suitably qualified and experienced personnel. For every position, requirements, responsibilities, experience and qualifications have been established (Figure 4.1-8). Once hired, candidates will be given site specific training as required and periodic performance reviews.

**4.3.2.1.b Unified Approach to O&M**

The I-69 DP O&M Team is committed to working collaboratively as a joint venture and with IFA/INDOT at every stage. The common integrated management system applied is set out in section 4.1 Preliminary Project Management Plan.

**4.3.2.1.c Decision-Making Process and Dispute Resolution**

Every O&M Team manager is aware of empowerment to make decisions. This encourages correct and rapid resolution of issues at the lowest possible level. To facilitate decision making we will use a matrix of potential issues that could arise. This will clarify the hierarchy and reporting process that will be applied in each case. All partners are committed to resolve any internal disputes according to the terms of the Contract. The priority in the event of any dispute will be preserving the efficient continuation of O&M activities.

The decision-making process and dispute resolution system applied is set out in 4.1 Preliminary Project Management Plan and Figure 4.1-11

### 4.3.2.1.d Training Program



To ensure continuous improvement and safe O&M, staff will receive initial training with regular updates. O&M



Team will be trained to understand the importance of the O&M quality management system, focusing on the safety of users and workers.

The O&M Manager will be responsible for the organization of the training for patrollers and maintenance operators, assuring that subcontracted staff is also familiar with the procedures of the Quality Management Plan (see [Section 4.1.5](#)) and the safety procedures. Subcontracted firms will be trained as required for major maintenance works.

The O&M Manager will conduct team courses in order to address a complete skills and training matrix. These team courses, which will be required for all levels of the project organization, are participative action programs designed to develop individuals' abilities to contribute effectively in teams. Representatives from I-69 DP, operations staff, the contractor's team leaders and subcontractors, together with nominees from the IFA, its agents and major subcontractors will attend to the courses. Initial and ongoing training in Health and Safety, Quality and Environment will be main subjects of the training for all levels of the organization.

### 4.3.2.1.e Communication and Documentation

Internal lines of communication and reporting during the Operating Period will follow the O&M organizational structure set forth in [Figure 4.1-5](#) of the Preliminary Project Management Plan.

Document sharing requirements will be detailed in the O&M management system procedures of the OMP, including methodologies and reporting templates.

#### Internal Communication

Internal communication will be provided through multiple formal and informal channels to maximize collaboration and trust within the O&M Team (including supply chain). This will help support continuous performance improvement. Co-location of our O&M Team in the OMMC will assure

regular communications and close collaborations among its members.

#### Meetings

A schedule of meetings (see I-69 DP Team Key Internal Meetings in [Figure 4.1-12](#)) will be developed and implemented to enable the O&M management team and specialist subcontractors to review performance, ensure good governance and project control, support effective communication and facilitate decision making during the Operating Period of the Project. If subcontractor performance is inadequate it will be discussed at the regular performance meetings and an improvement plan will be implemented and monitored. Apart from the meetings held by managers, the O&M Manager will weekly meet with the Maintenance Supervisor, who will give briefings to O&M Team crews on a daily basis. The idea of these informal meetings is to review ongoing activities as well as to plan future activities.

#### Documentation and Data

Project management documentation data will be stored electronically and shared via collaboration tools and the I-69 MMS. Asset management and O&M Records will be stored in the INDOT-supplied CMMS. Access to both systems will facilitate document sharing and review by allowing information to be issued electronically by selecting from pre-stored list of email addresses. Maintaining centralized document controlling will ensure the availability and use of up to date information, by clearly identifying and tracking the superseded documents. I-69 DP will comply with security back-up for project documentation as explained in [Section 4.1.1.b.vi](#).

#### Reporting

The O&M Team has clear reporting responsibilities within our organization. Report templates will be agreed with IFA and used to make sure the current data is available, to ensure consistency and facilitate interpretation of results. Senior managers will use these reports to support continuous improvement.

The reporting process method applied is set out in [Section 4.1.1.b.ii](#). Preliminary O&M Reporting Schedule is provided in [Figure 4.3-27](#).

**4.3.2.1.f Approach to O&M Prior and Following Substantial Completion**



During the Construction Period, the O&M Team and contractor will split the activities as set forth in the [section 4.3.1.2. e](#).

Once IFA has issued Substantial Completion, the O&M Team will take over all O&M activities.

During construction, the O&M Team will be gradually ramped up until it is fully staffed at least one month before Substantial Completion. The time leading up to Substantial Completion will be used for O&M staff training.

**4.3.2.1.g Interfaces during O&M**

Throughout the Operation Period, establishing open and honest relations with the IFA, INDOT and all applicable third parties will be vital for safe operation and maintenance of I-69. The overall approach described in Section 4.1 will be employed. [Figure 4.1-13](#), shows key O&M interfaces.

Our Deputy Project Manager – Technical, Carlos Ursua will remain involved in the Project during the first year after Substantial Completion, ensuring a smooth transition to the Operating Period.

José R. Ballesteros, will be the main point of contact for IFA and INDOT. He will be supported by Carlos Ursúa, who will ensure the smooth transition from the Construction to the Operating Period though the first year of the Operating Period, and the O&M Manager, Miguel A. Barranco, who will coordinate with applicable third parties. The O&M Team will regularly report on performance in relation to Project progress, quality and safety as well as upcoming Planned Maintenance works.

**4.3.2.1.h Public Information and Communications Approach**

**Customer Response**

The O&M Team will ensure that an effective and quick response to the road Users is provided in compliance with the performance requirements. A dedicated website will be available for the User to request any type of information or register comments about any day-to-day issues that could

arise. A customer telephone contact line will be manned during normal business hours, with the option to leave voice mail messages at any time

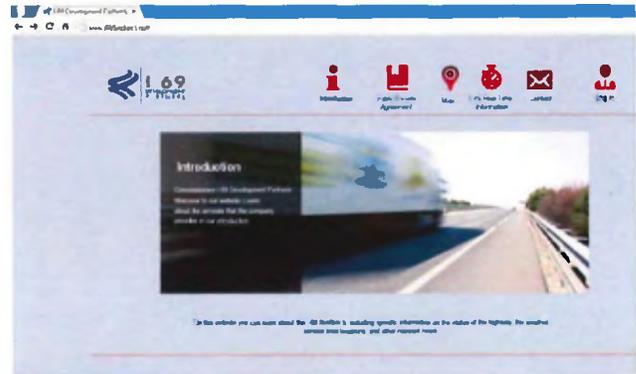


Figure 4.3-26: The I-69 DP Website will provide users with real time information.

**Public Information and Communications Approach During O&M**

The O&M Team understands the importance of providing clear, reliable and prompt information to the public throughout the Operating Period. This will be important to maximize safety and maintain a high quality image of the Project. We will provide regular O&M information via press releases and access to a company spokesperson when needed. The O&M Team will provide advanced information to IFA for approval prior to distribution to the public.

Public information and communication in all project stages will be controlled by Tony Carpenter, our Public Information Coordinator as outlined in the I-69 DP Public Information Plan (PIP). This Plan will be updated to reflect the changing requirements for public communications during the Operating Period (and become the O&M PIP).

**Operating Period PIP**

Procedures set out in the O&M PIP will ensure the full and regular consultation of all parties. This will occur annually, prior to implementation of substantial changes or as a part of the planning process for activities with significant potential impacts to Users (e.g. major Rehabilitation Work). All relevant information will be provided in advance and sufficient notice given to allow all concerned parties to consider potential issues. Notification to the public about upcoming lane closures/lane adjustments and detours will occur after IFA’s approval.

REPORTING Element Category	Required Task	Submit Schedule	Frequency
O&M Plan During Construction	Submit Initial O&M Plan DC Annual Updates to the O&M Plan DC	Approved by IFA prior to Commencement of Construction 90 days prior to the commencement of the year scheduled	Once Annual
O&M Plan After Construction	Submit Initial O&M Plan AF Annual Updates to the O&M Plan AF	Nine months prior to opening O&M segments to the general public 90 days prior to the commencement of the year scheduled	Once Annual
Baseline Asset Condition Report		30 days prior to NTP2	Once
Monthly and Annual Planned Maintenance Plan Schedule	Planned Maintenance Plan Schedule	30 days prior to the commencement of the month scheduled	Monthly
Monthly and Annual Routine Plans & Schedule	Routine Maintenance Plan Schedule	90 days prior to the commencement of the year scheduled	Annual
Quarterly and Annual Maintenance Work Reports	Maintenance and Rehabilitation Reports	M&R reports beginning at NTP2 and continuing until the Termination Date	Quarterly
Rehabilitation Work Plan & Schedule	Submit the Initial Renewal Work Plan	Maintenance reports 90 days after the end of year	Annual
Updated Rehabilitation Work Plan	Annual Updates to the Rehabilitation Work Plan	90 days before the beginning of 2nd full calendar year after Substantial Completion Date	Once
Rehabilitation Work Report	Rehabilitation Work Reports	90 days before the beginning of 3rd full calendar year after Substantial Completion Date and calendar year thereafter	Annual
Reporting Emergency Computerized Maintenance Management System (CMMS) Integrated	Emergency Reports	90 days after the end of year	Annual
Quarterly Operations Report	Provide inventory data to the Department for incorporation into the CMMS.	Developer MMS	When emergency occurs
Maintenance Patrols	Quarterly Operations Report (including lane closures and NC event)	Developer MMS	Monthly
Snow and Control Ice Plan	Conduct a daily maintenance patrol and visual inspection of the entire facility to identify any incidents or deficiencies.	Quarterly beginning at NTP2 and continuing until the Termination Date	Quarterly
Snow and Control Ice Report	Submit Snow and Control Ice Plan	Developer MMS	Daily
Winter Patrols	In accordance with Inspection and Measurement Method Table for Table 18-B - Technical Provisions	Prior to July 30	Annual
Bare Pavement Data	Winter Patrol Diary	Within 24 hours upon IFA's request	Daily during Winter Season
Performance Inspections Plan	Monthly Bare Pavement Report	Before the close of business seven days following each month's end	Monthly after each month that has a Winter Maintenance event
Performance Inspections Report	Submit proposed performance sections to audit randomly selected and at least 5% of total	90 days prior physical inspection	Annual
Karst Feature Erosion/Sediment Control Reviews	In accordance with Inspection and Measurement Method Table for Table 18-B - Technical Provisions	Quarterly beginning at NTP2 and continuing until the Substantial Completion Date	Quarterly during construction period
Karst Hazardous Spill Containment Measures	Inspection of Karst feature mitigation measures and other stormwater control measures		Semiannually for first five (5) years. Then every two (2) years by maintenance staff and every ten (10) years by a karst specialist during operating period
Karst Feature Water Quality Mitigation Measures	Inspect Karst hazardous spill containment measures		
Karst Feature Structural Treatment Measures	Inspect karst feature water quality mitigation measures and other stormwater control measures, (detention basins, hazardous materials traps, rock filters, peat filters, engineered wetlands, etc.)		
Sustainability Management Plan	Inspect karst feature structural treatment measures (concrete or aggregate caps, spring boxes, lined ditches, settlement markers, etc.)		
Updated the Sustainability Management Plan (S) Sustainability Monitoring and Reporting Program Handbook Plan	Preparation of a revised Sustainability Management Plan for the O&M period	Nine months before the beginning of O&M period	Once
Residual Life First Inspection Report	Five-year update to the Renewal Work Plan	30 days after the end of month	Every five (5) years
Residual Life Second Inspection Report	Sustainability Monthly Reports	60 months prior the Termination Date	Quarterly
Residual Life Third Inspection Report	Submit Handbook Plan	Between 56 and 59 months before end of term	Once
(Q) Road Safety Evaluation	Residual Life test results and calculations	Between 14 and 17 months before end of term	Once
	Residual Life test results and calculations	Not later than 60 days before end of term	Once
	Road Safety Inspection Audit. Assess accident data and evaluate roadway safety performance	Prior to July 30	Annual

**Figure 4.3-25: O&M Reporting Schedule**

#### 4.3.2.2 Baseline Schedule

I-69 DP has developed a detailed O&M Work schedule showing all activities and resources to meet the targets defined in the Technical Provisions Attachment 18-1. This schedule is summarized in the preliminary baseline schedule as provided in [Figure 4.3.-9](#). The baseline O&M schedule provides an outline of our expectations for all maintenance requirements over the 35-year Operating Period. This schedule has been developed based on the specific design of the Project and the experience performing similar services on other projects. This includes understanding of the latest Good Industry Practices, the expected Useful Life of the works constructed and manufacturer expectations of the materials to be used to construct the Project.

##### 4.3.2.2.a Schedule – Proposed O&M Schedule Methodology

The O&M schedule will remain as a live document throughout the Project lifecycle and is subject to ongoing review and update. It will enable us to manage all O&M Work effectively, allocate resources efficiently and closely monitor performance in all areas to achieve continuous improvement. The O&M Schedule will also include the activities of all specialty subcontractors.

##### 4.3.2.2.a.i Approach for Project Schedule and Payment Request

###### *Preparing, Controlling and Updating the Schedule*

The Planned and Routine Maintenance schedule will be an annual schedule showing all daily, weekly and monthly scheduled maintenance activities, as it is shown in [Figure 4.3-9](#). The O&M Manager has the flexibility to plan these activities according to local requirements, in response to the weather, special events or to minimize traffic disruption. This schedule will be updated weekly and submitted to IFA monthly. It will be reviewed internally to allow refinement of scheduling on a weekly/daily basis.

The Rehabilitation Works schedule is a 35-year schedule showing annual Planned Maintenance as described in [Figure 4.3-24](#). This will be updated yearly to allow activities to be planned for the

following years in response to issues identified during the periodic visual and detailed inspections.

##### *Calculating Monthly Performance*

Compliance with the Performance Requirements will be continually monitored throughout the Operating Period. Any issues, events or defects will be recorded as non-conformances.

The quarterly Operations Report provided to IFA will include the following O&M Records: complete records of any incidents, inspections, and assessments, details of rehabilitation works, monthly lane closures and supporting information necessary to identify the occurrence and confirm satisfactory resolution of any Noncompliance Events, Unavailability Events or defects. Based on this information, the report will include a high-level summary of Noncompliance Events, Unavailability Events and Noncompliance Point assessments.

All reports will be provided as required in the PPA and Technical Provisions and will be used in the performance calculation.

Using the I69 MMS, the O&M Team will be able to access real-time roadway O&M reports. Performance compliance data will be extracted monthly to enable real-time reporting and quick corrective actions to be undertaken in response to any Noncompliance Event.



##### *Preparing Quarterly Payment Request*

The O&M Team will calculate the Quarterly Payment Request using data from the CMMS and O&M reports.

##### 4.3.2.2.a.ii Approach to Integrating Subcontract Activities

Some subcontractor repairing activities are planned and some are emergencies. In either case, direct communication and coordination with them at all times is important and will be contractually assured. The Performance Requirements of the Technical Provisions will be built into all subcontracts, including financial penalties, so as to ensure that our partners are aware of the Project quality, safety and environmental requirements and embrace them. All O&M subcontractors will be required to commit to the overall management objectives. These will be

defined in a charter which all project participants, including the O&M Team, subcontractors, inspection organizations and main suppliers, will be requested to review and sign upon joining the Team.

#### 4.3.2.2.a.iii Approach to Achieve the Project Schedule and Recover Any Schedule Slippage

##### *Managing Resources and Activities*

Setting and communicating the goals for the scheduled maintenance activities will be the main way in order to manage in-house or subcontracted resources in order to achieve the OMP and the Rehabilitation Work Schedule. This will be supported by accurate on site updates of progress for incorporation into the schedules. These updates will identify any areas of delay and impacts of those delays. Updated schedules will be included in the quarterly Operations Report issued to IFA.

##### *Recovering Schedules Slippage*

Early identification of negative variance from either the OMP or Rehabilitation Work Schedule, through the ongoing review of performance against the schedules, will minimize the need for any schedule recovery. This will include the allocation of additional management resources if required and increased performance measurement until the slippage has been recovered.

#### 4.3.3 Operations and Maintenance Quality Management



The O&M Team is committed to achieving exceptional quality performance and meeting all of IFA's quality expectations for the Operating Period of the project. The general approach to quality management has been described in [Section 4.1.5](#). I-69 DP will apply QMP throughout all project stages to achieve a consistent approach to quality management, from design to construction to O&M.

During the Operating Period our quality commitments will be to:

- Achieve or exceed the quality thresholds, deadlines and budget goals set forth in the PPA in accordance with the applicable legal framework and standards
- Ensure that the O&M Team meets all project O&M requirements in line with the contractual

requirements, public safety standards and environmental standards

- Establish best practices and foster continuous improvement through solicited and unsolicited feedback
- Communicate with all interested parties, including IFA, Users and nearby residents, to promote a positive image of the Project and anticipate and address any potential sources of dissatisfaction

The O&M Quality Plan identifies the means for monitoring and evaluating all aspects of project delivery against the Performance Requirements specified in the Technical Provisions. All the supporting data and calculations used will be submitted to IFA in the quarterly Operations Report. Since the final design, equipment selections and construction quality have an important influence in the requirements of the Plan, the O&M Team will further consider these requirements during the design development phase. At that time, our outlined Plan will be adapted to ensure it meets the specific requirements of the facilities that we design and build.

#### 4.3.3.1 Description of Quality Assurance and Quality Control Function

As shown on [Figure 4.3-27](#), the O&M Team follows the same quality assurance and control principles used in the design and construction stages of the project detailed in [Section 4.1.5](#). The quality assurance system will include procedures to validate the data, times, dates and logs that are the basis to determine any Quarterly Payment Adjustments.



Our Quality Manager, Mario Benitez will be responsible for quality during the whole Term. The same approach and quality plan will apply during the design-build phase to provide a seamless and consistent process during the whole duration of the Project.

Our Deputy Project Manager Technical, Carlos Ursua, will ensure a smooth transition from the Construction to the Operating Period. This includes our independent quality assurance team which will monitor and assess the activities carried out.

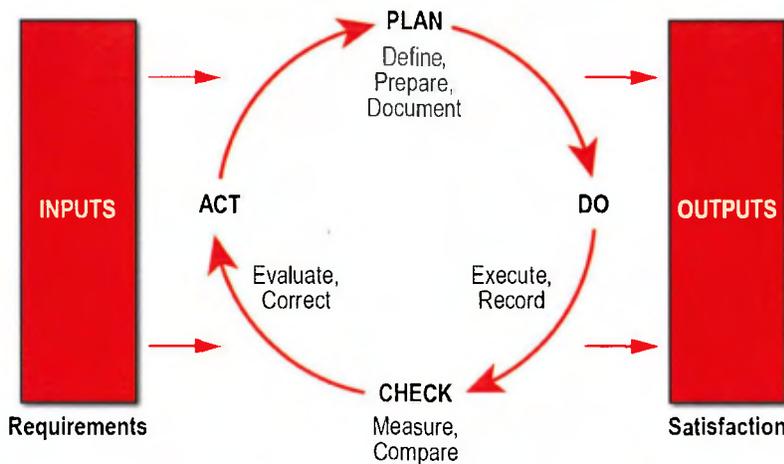


Figure 4.3-27: Quality Assurance

### 4.3.3.2 Approach to Involvement Reporting Relationships and Responsibilities for IFA and Department Oversight.

The quarterly Operations Report provided to the IFA form the basis of the IFA and Department’s review of our performance and progress. This key report includes all quality system results, including reports on closures, Unavailability Events, Noncompliance Event and Incident log data. It includes all findings from the O&M Quality Plan as well as our assessment of O&M subcontracted activities, potential areas for performance improvement and lessons learned where appropriate.

During the Operating Period, IFA will be able to:

- Accompany the O&M Team on physical performance inspections, conduct its own performance inspections and assess and score the O&M Team’s O&M Records.
- Monitor and audit the O&M Team’s detection, reporting, response times and times to rectify breaches and failures for which Noncompliance Points or Unavailability Adjustments may be assessed pursuant to Section 11.3 of the PPA in accordance with Exhibit 10 (payment mechanism)

The O&M Team will coordinate and cooperate with IFA, its authorized representative and INDOT to facilitate IFA’s and INDOT’s oversight activities. IFA has the ability to use and access the CMMS to aid in these observations. Observations will be identified either as conforming or non-conforming

to related requirements of the PPA documents. The O&M Team will respond to all detected instances of Nonconforming Work using the CMMS and the I-69 MMS.

### 4.3.3.3 Internal Process for Preparing and Reviewing Reports

O&M Team patrollers and roadway maintenance operators will maintain a daily record of operations that will document all incidents, Noncompliance Events, Unavailability Events, lane closures and any issue that might arise on the

project. The O&M Manager will review and approve the record at the end of each day. These records will be reviewed weekly by the Project Manager.

### 4.3.3.4 Documentation and Correction of Non-compliance Issues.

The O&M Team procedure for issuing Nonconformance Reports is set out in the O&M Quality Plan. All Noncompliance Events are considered as non-conformances. Non-conformances could arise in relation to:

- Application of the project management system detected during audits, following complaints or via claims to/from IFA.
- The O&M services provided by the O&M Team.
- The Project assets, as identified during Project inspections.

Non-conformance will be documented on checklists and specialist’s reports that will be included in the quality management activity procedures. The Quality Manager will be responsible for reviewing and submitting these documents, on a daily basis, and investigating reported instances to confirm or deny non-conformance. Confirmed instances of Nonconformance Event will be evaluated for their probability of reoccurrence.

Preventive or corrective action plans will be formulated and implemented for repeated problems. The development and implementation of these plans will be done by representatives from Quality and

O&M management. These plans will detail specific steps necessary to prevent or correct non-conformance and may include changes to O&M or quality management activity procedures. O&M and quality management will both agree on the plan and submit it to the Project Manager for approval.

The Quality Plan explains the methodology to deal with any current or potential non-conformances in a timely and efficient manner as well as for triggering corrective and improvement/preventive actions.

**4.3.3.5 Continuous Improvement through Remedial and Preventive Actions**

The O&M Team uses the results of our formal O&M quality performance audits, tests and

inspections, together with any team observations, claims or reported failures to comply with contract requirements, and identify continuous improvement opportunities. This list will include both remedial actions needed to correct deviations and avoid their recurrence and preventive actions needed to prevent future deviations from occurring.

As remedial and preventive actions are identified, they will be recorded in an actions list. This list explains how each action was defined, its approval cycle and related monitoring requirements. For all approved actions the list includes a detailed description, date of issue, deadline for action and identified owner.



Figure 4.3-28: Continuous Improvement Cycle