APPENDIX A. OPERATIONAL PROCESS FLOW CHARTS

The flow charts on the following pages illustrate the operational processes that could be carried out by the corridor management system envisioned in this requirements document. They show how the various “actors” in the system (the people and the technical components) could interact to execute a variety of tasks, including:

- Assessing corridor performance
- Detecting and verifying incidents
- Assessing the impact of incidents
- Creating, reviewing, and approving response plans
- Reviewing ICM system operations
- Addressing asset failures
A.1. INCIDENT RESPONSE CONTROL LOOP

Figure A-1 – Envisioned Incident Response Control Loop
A.2. PERIODIC CORRIDOR PERFORMANCE ASSESSMENT

Figure A-2 – Periodic Corridor Performance Evaluation Process
A.3. INCIDENT/EVENT DETECTION

Figure A-3 – Incident Detection and Verification Process
Figure A-4 – Event Detection and Verification Process
Figure A-5 – Incident Characterization Process
A.4. ONLINE CORRIDOR MODEL ADJUSTMENTS

**MODEL UPDATE REQUEST** (e.g., following an incident)

- Simulation Subsystem retrieves the corridor model representing current operations (*Current Simulation Model*).
- Simulation Subsystem retrieves from IMS a list of incidents that have been recently terminated.
- Simulation Subsystem compares list of active incidents from IMS with events defined in *Current Simulation Model*.
- Simulation Subsystem removes from *Current Simulation Model* all incidents that have been terminated.
- Simulation Subsystem retrieves from IMS a list of active incidents.
- Simulation Subsystem compares list of active incidents from IMS with events defined in *Current Simulation Model*.

- IMS incident list differ from list of incidents coded in *Current Simulation Model*.
- Incident in ICM list identical to incidents coded in *Current Simulation Model*.

- Simulation Subsystem removes from *Current Simulation Model* all incidents no longer on the IMS list.
- Simulation Subsystem adds in *Current Simulation Model* incidents on IMS list not already coded in the model.

**Simulation Subsystem** retrieves from Data Hub data characterizing the current status of control devices:
- Current timing plan
- Current metering rate
- Current posted messages

**Simulation Subsystem** adjusts if necessary the status the following modeled control devices in *Current Simulation Model*:
- Traffic signals
- Ramp meters
- Changeable message signs

**Simulation Subsystem** retrieves from Data Hub real-time data characterizing the current status of roadway elements:
- Flow rates
- Queue length
- Density
- Etc.

**Simulation Subsystem** estimates traffic conditions on individual roadway links within the modeled network area.

**Simulation Subsystem** adjusts, if necessary, the following elements in *Current Simulation Model*:
- Roadway characteristics
- Travel demand
- Network flow pattern

**Simulation Subsystem** stores an updated version of *Current Simulation Model* for use in subsequent ICM system activities.

**Simulation Subsystem** estimates traffic conditions on individual roadway links within the modeled network area.

**Simulation Subsystem** adjusts, if necessary, the following elements in *Current Simulation Model*:
- Roadway characteristics
- Travel demand
- Network flow pattern

**Simulation Subsystem** stores an updated version of *Current Simulation Model* for use in subsequent ICM system activities.

**Figure A-6 – Corridor Model Online Adjustment Process**
A.5. INCIDENT/EVENT IMPACT ASSESSMENT (RESPONSE NEED ASSESSMENT)

Figure A-7 – Incident/Event Impact Assessment Process
A.6. RESPONSE PLAN CREATION

Figure A-8 – Response Plan Creation Envisioned Process
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A.7. RESPONSE PLAN REVIEW/APPROVAL

Figure A-9 – Response Plan Review/Approval Envisioned Process
A.8. ICM SYSTEM OPERATIONAL REVIEW

Following an incident, Local TMC Operator decides to review how the ICM system responded to the event.

TMC Operator uses the ICMS User Interface to request a summary of system activities associated with a specific event or specific day/time period.

ICM Simulation Data is retrieved from the Data Hub for the day/time of interest.

ICM User Interface retrieves from the Data Hub the DSS activity log for the day/time of interest.

ICM System Manager reviews submitted issue(s), consulting if needed with ICM/Local Maintenance Staff, Local TMC Operators, Local Transportation Managers, and ICM Corridor Manager.

ICM System Manager determines, in consultation with Local Maintenance Staff, Local TMC Operators and ICM Corridor Manager, changes to make to the ICM system to correct the identified problems.

Local TMC Operator brings the identified issue(s) to the ICM Corridor Manager.

Problem related to ICM System Component

Problem related to local system

ICM Maintenance Staff instructed to modify the system to address the identified issue(s).

Local Maintenance Staff instructed to fix the identified issue(s) with local system.

Repairs/adjustments

Repairs/adjustments

Figure A-10 – ICM System Operation Review Envisioned Process
A.9. RESPONDING TO ASSET FAILURES

Figure A-11 – Envisioned Process for Addressing a Traffic Sensor Fault
Figure A-12 – Envisioned Process for Addressing a Traffic Signal Controller Fault