HEALTHCARE ENVIRONMENTAL SERVICES AUTOMATION SOICETY

HESAS

ESM Transportation Management

Draft
December
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HESAS EMS Standards Document

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Message from the chairman

It is vividly evident that the world witnessed the worst public health and economic crisis due to COVID-19 pandemic. This inevitably mobilized the international community to act seriously and swiftly. However, the mortalities and morbidities induced by healthcare-acquired infections (HAI) are equally fatal, but the international community did not act similarly. Consequently, we are continuously and chronically suffering from HAI.

The current intervention for HAI is merely based on passively-set standards and enforcing these standards via regulatory agencies such as the centre for disease control and prevention (CDC), joint commission international (JCI), ministries of health, and other regulatory agencies. To efficiently address HAI, we inevitably need to mobilize the international community because HAI traverses a multitude of epistemological dimensions, requiring multidisciplinary tacit knowledge, and mandates active international collaboration. Besides, we believe that we can efficiently traverse deeply into the root-causes and solution landscapes by automating the entire healthcare environmental services and infection control within healthcare institutions using the latest advancements in computational epistemology, computational infection control models, computational epidemiological models, artificial intelligence, machine learning, distributed ledger technology, collective intelligence, cognitive technologies, internet of things, ubiquitous technologies, intelligent micro-measurement frameworks, artificial life, evidence-based program implementation, patient-centric care, strategy anchored execution, and symbiotic healthcare ecosystem services. Consequently, we developed these open standards that were tailored from diverse international standards to promote the automation of healthcare environmental services and infection control processes and best practices.

The Healthcare Environmental Services Operational Map (HESOM) and other standards were developed to efficiently leverage multidisciplinary experts and practitioners to contribute towards the eradication of HAI-induced mortalities and morbidities. Using ReXcels research and innovation environment, we cultivate collective intelligence by bringing together these multidisciplinary experts to iteratively develop these standards and adaptively support the innovation of computational technology that automates the execution and enforcement of these standards. As such, we cordially invite you to use these documents and participate actively in the further development of these standards to significantly reduce HAI-induced mortalities, morbidities, and their enormous negative economic externalities.

Hamid Adem
Interim Chairman, and Chief R&D Officer

Change Control

Version:	Date:	Changes:

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ESM Transporation Management

Purpose

1 Purpose

1. PURPOSE

The purpose of this document is to establish a Transportation Management process for Environmental Services department which would ensure:

- A safer transportation for staff
- Cost effective transportation
- Better quality transportation.

This document would establish an efficient Service Quality Management process based on international well acclaimed standards like:

- *NHS- National Health Services Standard*
- *OSHA- Occupational Safety and Health Administration standard*
- *CDC- Centers for Disease Control and Prevention standard*
- *Lean six sigma- Quality Standard*
- *JCI- Journal of Clinical Investigation standard*
- *JCAHO- Joint Commission on Accreditation of Healthcare Organizations (JCAHO)*
- *EPA- US Environmental Protection Agency*
- *HCAHPS - Hospital Consumer Assessment of Healthcare Providers and Systems*
- *HIPA- Health Information Privacy Act standard.*

*P.S: This process is a derivation from **ESM (Environmental Service Map),** which is a holistic and a comprehensive model for Environmental Services Management.*

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ESM Transporation Management

Structure of the Document

2 Structure of the Document

2. STRUCTURE OF THE DOCUMENT

The Transportation Management process document comprises the following chapters:

Chapter–3: *Scope*: This chapter describes the scope of the document and the Transportation Management process.

Chapter–4: *General Assumptions*: This chapter describes the underlined assumptions made for both the document and Transportation Management process.

Chapter–5: *Transportation Management Framework***:** This chapter exhibits the interaction of Transportation Management process with other related processes and also describes the high level process sequence for Transportation Management based on EMS framework.

Chapter–6: *Transportation Management Process***:** In this chapter Transportation Management process and sub processes (if any) will be depicted and specified using rigorous BPMN and process specification templates.

Chapter–7: *References***:** This chapter serves as a prime reference to Transportation Management process and presents the details supporting it in tabular formats. The chapter describes relevant Business Rules, Risks, Quality Attributes, Data Quality Dimensions, Operation Policies, KPIs, CTQs, Abstract Time-scales and SLAs terms specific to Transportation Management process.

The Transportation Management process is supposed to be a living document and consists of various variable values which would frequently evolve or change as Transportation Management process matures or changes.

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ESM Transporation Management

Scope

3 Scope

3. SCOPE

This process is applicable to all modes of official transportation for all stakeholders of the environmental services department.

4

ESM Transporation Management

General Assumptions

4 General Assumptions

4. GENERAL ASSUMPTIONS

The following are the general assumptions made:

- Senior management is committed to this process.
- There exists an automated capability to support the operation of this process.
- The roles defined in this document can be attached to the existing position
- Any process or sub process related assumptions are explicitly identified in related Process Specification table in Chapter 6.

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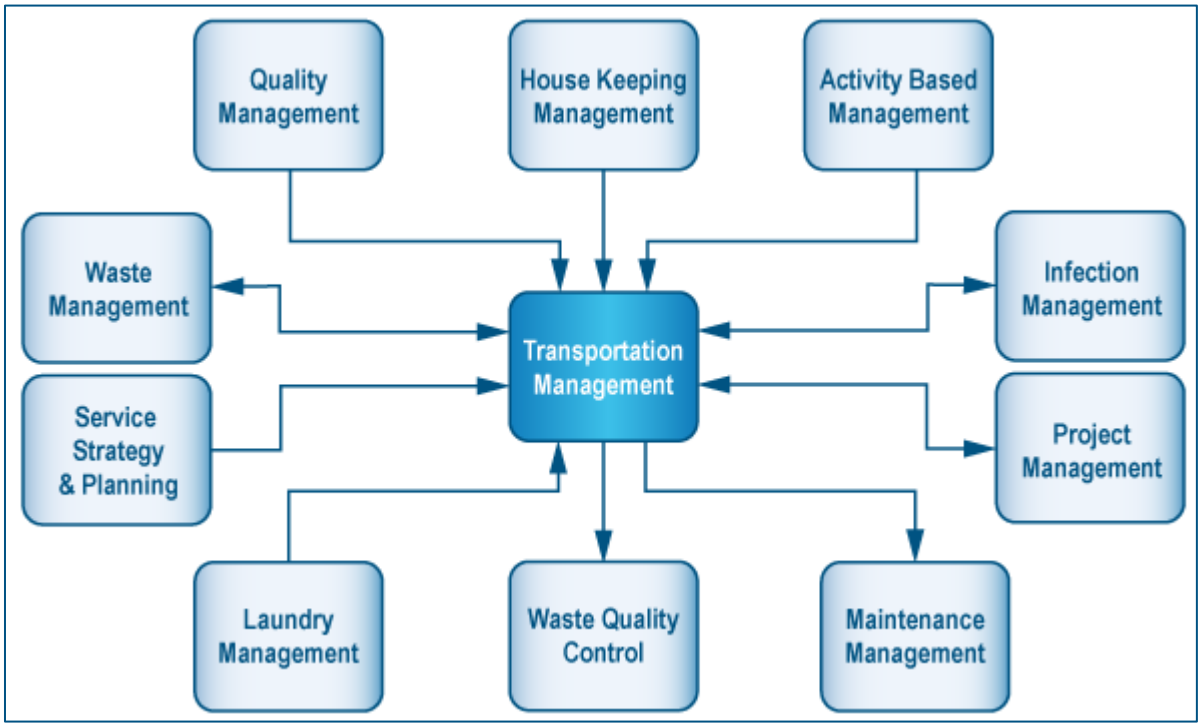
ESM Transporation Management

Transportation Management Framework

5 Transportation Management Framework

5.1 Transportation Management Interactions

The following depiction shows the points of interaction of Transportation Management process with other related EMS processes. The arrows moving into Transportation Management process signify the inputs from the other process to Transportation Management process, and the arrows moving out of the Transportation Management process signify the inputs from Transportation Management process to other related EMS processes. All these processes depicted below are defined in their own respective dedicated documents.



5 Transportation Management Framework

5.2 Transportation Management Process Sequence

The Transportation Management process comprises of following high level sequence of activities:

1. **Establish Transportation requirement**
2. **Establish Transportation Plan**
3. **Establish MSD prevention program**
4. **Performance improvisation**

Section 5.2.1 -5.2.4 describes the high level process sequence for Transportation Management process based on EMS framework. **Section 6.1** Process Model sheds more light on the flow of Transportation Management process.

5.2.1 Establish Transportation requirement

This involves establishing the transportation requirement for environmental service department. Following activities are performed:

- Identifying operations Requirements. This involves identifying:
  - *Commuting requirement.* Current travelling requirement of Environmental services department.
  - *Types of operations*. Daily, hourly, frequency of transportation etc.
  - *Operating environment*. The type of environment in which the transportation facility has to be operated.
  - *Support factors.* The other support factors required for the transportation
  - *Regulatory Requirements.* Regulatory requirements for the mode of transportation.
- Identifying financial factors. This involves establishing:
  - Acquisition type
  - Acquisition cost
  - Lifecycle cost
  - Standing cost.

5.2.2 Establish transportation Plan

This process aims at establishing a transportation plan which comprises of:

- Fuel Management. How efficiently the fuel is managed for the entire transportation of the environmental service department.
- Vehicle warranty and maintenance. To ensure that the vehicle provides its optimal performance.
- Risk Management. To ensure that all the transportation risks are identify and addressed.

- Safety management. To ensure that all the safety vehicle requirement are met for all the vehicles.
- Driver profile management. To keep an active profile of the driver and to identify safer and more reliable drivers.
- Vehicle acquisition and disposal. To ensure that vehicles are always available and old vehicles are timely disposed off financially.

5.2.3 Establish MSD prevention program

MSD is a term for injuries and disorders that affect our musculoskeletal system (i.e. muscles, tendons, ligaments, nerves, discs, and blood vessels). Work-related MSDs are caused or aggravated by various hazards present in the workplace. Few examples of MSD are as follows:

- Sprains and strains of muscles, ligaments and tendons (eg shoulder muscle strain leading to rotator cuff tear)
- Back injuries, including damage to the muscles, tendons, ligaments, spinal discs (eg ruptured discs), nerves (eg sciatica), joints and bones
- Joint injuries or degeneration, including injuries to the shoulder, elbow, wrist, hip, knee, ankle, hands and feet
- Bone injuries (eg fractures)
- Nerve injuries (eg carpal tunnel syndrome of the wrist)
- Soft tissue hernias (eg abdominal hernias)
- Muscular and vascular disorders as a result of hand-arm vibration (HAV)

This comprises of following phases:

5.2.3.1 Establishing Strategic foundation

This comprise of following:

- **Set objectives.** This involves establishing broad objectives depending on the needs of organization. Objectives could relate to legislative compliance, reducing the costs, MSD incidents, improving productivity, operational efficiency or a combination of these and other factors.
- **Clear Commitment**: All levels of management need to clearly communicate that they are committed to preventing MSDs in the workplace.
- **Resources availability**: Supervisors and workers should know that real efforts are being made to reduce exposures to MSD hazards and that resources will be allocated to make any necessary changes.

5.2.3.2 Categorizing hazards

Typically the MSD hazard can be classified as following:

- **Force**
  When a task requires them to exert a level of force that is too high for any particular muscle, it can damage the muscle or the related tendons, joints and other soft tissue.
  This damage can occur from a single movement or action that requires the muscles to generate a very high level of force. However, more commonly, the damage results when muscles generate moderate to high levels of force repeatedly, for a long duration, and/or while the body is in an awkward posture. Some job tasks result in high force loads on different parts of the body. For example, lifting a heavy load that is far from the body increases the load on the lower back. This can potentially damage both the spinal discs and the vertebrae.
- **Fixed or Awkward Postures**
  The farther a joint moves towards either end of its range of motion, or the farther away from the neutral posture, the more awkward or poor the posture becomes and the more strain is put on the muscles, tendons and ligaments around the joint. For example, when arms are fully stretched out, the elbow and shoulder joints are at the end of their range of motion. If the worker pulls or lifts repeatedly in this position, there is a higher risk of injury.
- **Repetition**
  The risk of developing an MSD increases when the same parts of the body are used repeatedly, with few breaks or chances to rest. Highly repetitive tasks can lead to fatigue, tissue damage, and, eventually, pain and discomfort. This can occur even if the level of force is low and the work postures are not very awkward.
- **Other MSD Hazards and Workplace Factors**
  Other MSD hazards and workplace factors that should be considered include:
  - Contact stress
  - local or hand-arm vibration
  - Whole-body vibration
  - Cold temperatures
  - hot work environments
  - Repeated impacts
  - Work organization, and work methods

5.2.3.3 Performing Initial MSD assessment

This comprises of following:

- **Checklist. C**hecking the current status of MSD prevention awareness and implementation in the transportation management worker. This comprises of performing assessment via a set of question "initial assessment checklist". This idea behind this step is to see if there are missing basic elements and furthermore, to help identify opportunities to strengthen existing program.

  Appendix C provides a sample checklist.
- **Reviewing records.** This comprises of reviewing accident and injury record and performing verbal discussions with transportation management workers, supervisors and managers. Common sources of such information include:
  - Injury records and trends
  - Incident and hazard reports
  - Issues raised by Check Inspectors, OHS committee members, deputies, employees, permanent and intermittent contractors

5.2.3.4 Conduct detailed MSD assessment

Based on the initial MSD assessment results, MSD detailed assessment might be conducted to identify MSD hazards. This comprises of utilizing a general MSD hazard identification tool to identify which hazards are present, and take input from the transportation management workers and staff with regards to the daily hazards that they encounter while performing their routine transportation management job.

Appendix D provides a tool for General MSD hazard identification.

5.2.3.5 Establishing Priority

The next step is to prioritize their hazard identification findings to help determine the priority level for further action. This step can help workplaces determine which findings are of extremely high priority to address and which may require no further action except to continually monitor for any changes in status.

Appendix E shows a table for prioritizing hazard findings

5.2.3.6 MSD Hazard Root Cause

This involves using a fish bone structure for determining root cause of the hazards. This method can be useful in helping identify where something may be going wrong, or be improved. Such a diagram is typically the outcome of a brainstorming session where problem solvers can offer suggestions. The main goal is represented by the trunk of the

diagram, and primary factors are represented as branches. Secondary factors are then added as stems, and so on. Creating the diagram stimulates discussion and often leads to increased understanding of a complex problem.

Causes are usually grouped into major categories to identify the sources of problem. The categories typically include:

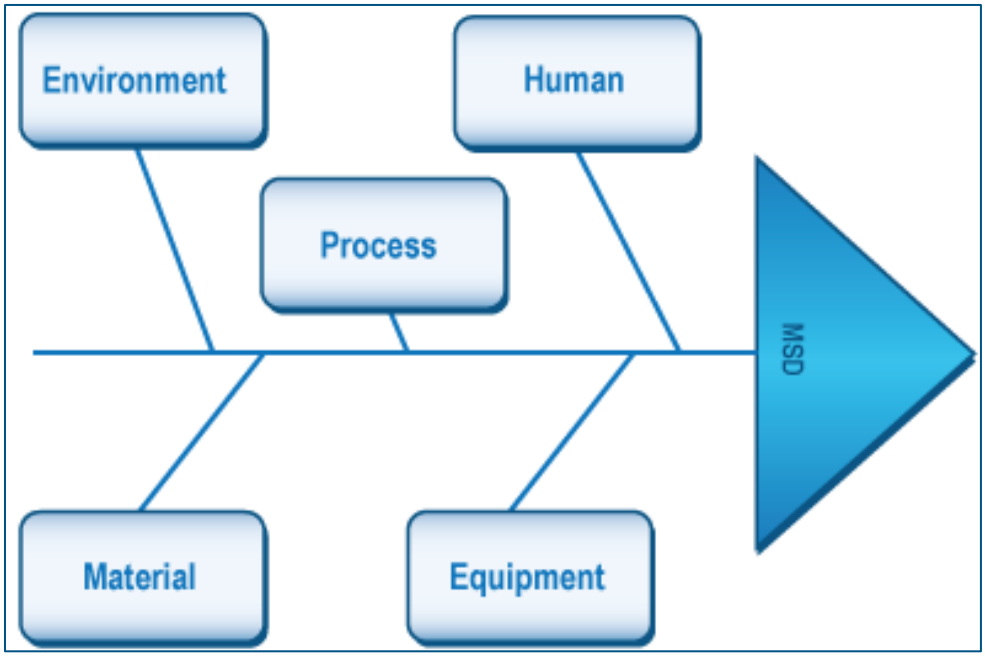
- **Human**: Anyone involved with the process
- **Process**: How the process is performed and the specific requirements for doing it, such as policies, procedures, rules, regulations and laws.
- **Equipment**: Any equipment, computers, tools etc. required to accomplish the job
- **Materials**: Raw materials, parts, pens, paper, etc. used to produce the final product
- **Environment**: The conditions, such as location, time, temperature, and culture in which the process operates.

Following points can be considered in each of the category:

- **Process**
  - Length of time allotted to tasks e.g., transferring patients.
  - Machine paced tasks. E.g. tuning vehicle
  - Duration of task e.g. pick up of staff.
  - Variety of tasks
  - Production/quality standards
  - Communication between staff within the department
- **Equipment**
  - Working height e.g., seat of driver
  - Location of controls and/or displays
  - Operation of the controls
  - Location of the transportation management units
  - Association with other equipment
  - Insufficient adjustability
  - Maintenance requirements of the machines
- **Materials**
  - Packaging
  - Weight and dimensions
  - Storage location
  - Quality

5 Transportation Management Framework

- **Environment**
  - Working space
  - Overcrowding
  - Room temperature of the vehicle
  - Flooring
  - Housekeeping
- **Human**
  - Insufficient training on techniques/processes
  - Insufficient supervision /coaching
  - Production pressures and demands
  - Inappropriate response to reports of MSD related concerns
  - Differences in work methods/techniques
  - Inconsistent use of equipment/controls that help reduce MSD risk



This comprises of following steps:

Step 1: Write down the specific MSD hazard you are concerned about to help focus the group.

Step 2: Ask why the MSD hazard exists – and identify the category on the worksheet

Step 3: For each answer, ask why again, and continue to do this until the group reaches consensus that the root cause has been identified

5.2.3.7 Choose and implement MSD hazard controls

This phase comprises of choosing the hazard controls based on the brainstorming. Following are some solutions which can be undertaken for each category:

- **Process**: Following solution can be used to address process categories:
  - Job enlargement and/or task rotation between workers
  - Improve communication between workers performing task
  - Self-paced tasks, time allows for micro-breaks in between
  - Improved work/material flow by process redesigning
  - Improve communication between departments
  - Timely response to reported defects, equipment breakdown, product/tool/equipment damage
  - Adequate staffing resources to handle workloads
- **Materials**: Following solution can be used to address materials categories:
  - Items weight should be taken into consideration for the organization of stock on shelves
  - Reduce use of sub-standard and poor quality materials
  - Lifting weight in manageable weights
  - Purchase materials in bulk containers
  - Store materials such as spares in areas that are easy to access
- **Equipment:** Following solution can be used to address equipment categories:
  - Provide mechanical lifts, hoists, conveyors, motorized carts
  - Improved workstation design to facilitate its operation
  - Chair adjustability (sit/stand, height adjustable)
  - Perform preventative maintenance
  - Perform regular inspections
  - Provide space for workers to move
  - Allow unconstrained postures
  - Provide material handling equipment for moving materials

- **Environment:** Following solution can be used to address environment categories:
  - Redesign layout to provide space for movement and required job tasks
  - Improve housekeeping
  - Comfortable working temperature using coolers, air conditioning and warmers.
  - Provide anti-fatigue matting
- **Human:** Following solution can be used to address Human categories:
  - Training transportation management staff on :
    - Signs & symptoms of MSD
    - MSD hazard awareness
    - How to report MSDs/MSD hazards
    - Work techniques and processes to avoid MSD
  - Reinforce need for use of equipment/controls that help reduce MSD risk
  - Improved communication from supervisors
  - Support for early reporting of concerns
  - Personal protective equipment (in-soles, knee pads, anti-vibration gloves)
  - Production pressures and demands

Appendix F provides tips that can be considered to remove various categories of MSD.

5.2.3.8 Follow up and evaluate success of MSD prevention program

This comprises of verifying whether the MSD hazards have been reduced or not. This comprises of:

- **Walk through surveys.** Making surveys and enquiring of the workers as to verify that the control is working (less pain, working as expected, no other hazards introduced)
- **Inspections.** This comprises of performing audits and inspections.
- **Record keeping.** Keep records of hazard identification, risk assessment and control processes to help meet regulatory requirements and ensure that MSD risks in performing manual task issues are being managed

Follow-up again after some time has passed to see if the control is still effective and to consider cost benefit issues.

5.2.3.9 Communicate results and acknowledge success.

This comprises of conveying the success of the program to all staff, and recognizing individual efforts undertaken to prevent MSD in the workplace

5.2.4 Performance Improvisation

This process comprises of:

- Performance metrics. This involves establishing various metrics and targets to monitor and measure transportation process efficiency.
- Training. This involves training the transportation staff properly so that they driver more efficiently and safely.

Feedback. Setup a capacity whereby passengers can provide feedback on the service as well as the operations of vehicles

6

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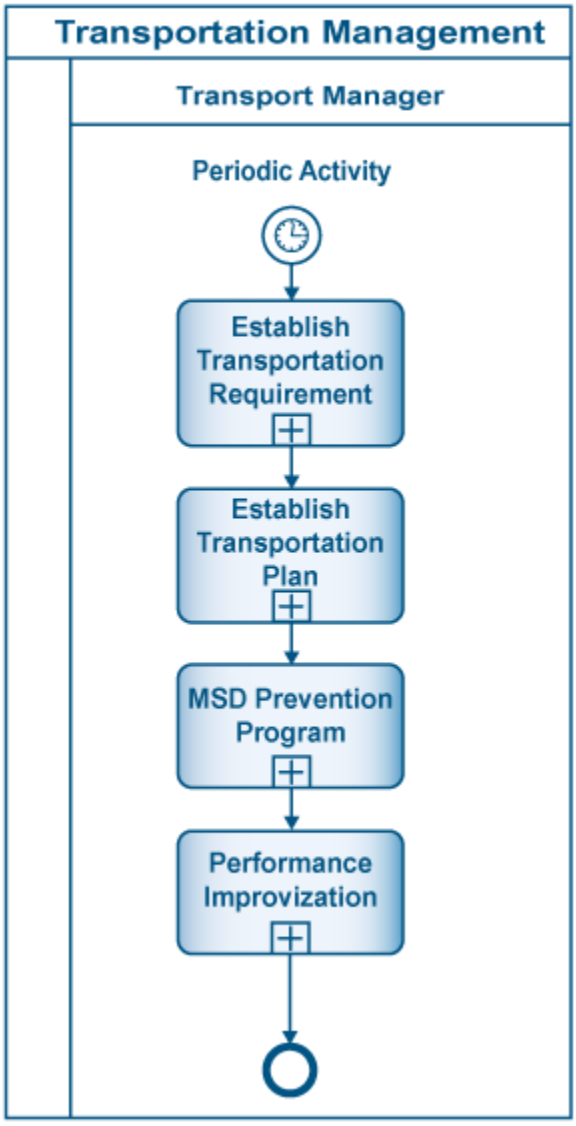
Transportation Management Process

6 Transportation Management Process

6.1 Process Model



6 Transportation Management Process

6.2 Process Specification

Specification	Description
Summary/Purpose	The purpose of this process is to create Transportation Management process for environmental services department.
Scope	This is a Level 1 Process Specification.
Primary Reference	• NHS- National Health Services Standard • OSHA - Occupational Safety and Health Administration standard • Lean six sigma- Quality Standard
Related ESM Practices	Waste Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, Project Management, Infection Management, Activity Based Management, House Keeping Management
Related Business Driver	Cost effective & quality management of transport.
Related Operational Policies	OP-001, OP-002, OP-003, OP-004, OP-005, OP-006(Ref. 7.5)
Assumptions	• Top level management commitment exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None

6 Transportation Management Process

<table>
<tr><td>Equipment & Accessories</td><td>Automated System for transportation management.</td></tr>
<tr><td>MSD Management</td><td>Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)</td></tr>
<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimensions</td><td><table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table></td></tr>
<tr><td>Trigger</td><td>• Periodic activity</td></tr>
<tr><td>Basic Course of Event</td><td>Transportation Management
1. Transportation Manager establishes transportation requirement
2. Transportation Manager establishes transportation plan
3. Transportation Manager establishes MSD prevention program.
4. Transportation Manager performs performance improvisation.
5. End</td></tr>
<tr><td>Alternative Path</td><td>None</td></tr>
<tr><td>Exception Path</td><td>System Down
1. Keep paper track until system is up and running
2. Update the System and clear all logs.
3. End.</td></tr>
<tr><td>Extension points</td><td>Waste Management, Quality Management, Maintenance Management, Infection Management, Activity based management, House Keeping Management</td></tr>
<tr><td>Preconditions</td><td>Adequate resources are available to the process.</td></tr>
<tr><td>Post -conditions</td><td>Transportation Management process is established.</td></tr>
</table>

6 Transportation Management Process

Related Business Rules	BR-001, BR-002, BR-003, BR-004, BR-005, BR-006, BR-007 (Ref 7.1)
Related Risks	RR-001, RR-002, RR-003, RR-004, RR-005, RR-005, RR-006, RR-007, RR-008 (Ref. 7.2)
Related Quality Attributes	Reliability, Service Reliability, Availability, Usability, Normal Usability Operations, Confidentiality, Authenticity, Data Integrity, Non-repudiation, Accountability, Security Integration, Performance, Scalability, Extensibility, Adaptability, Testability, Auditability, Operability and Deployability (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Believability, Reputation, Objectivity, Free-of-Error, Value Added, Relevance, Completeness, Timeliness, Appropriate Amount, Understandability, Interpretability, Concise Representation (Ref 7.4)
Related Primary SLA Terms	(Ref 7.9)
Related KPIs	TRRR, RCR, FCR, SCR, VNCR, VDR, VAR, TPRR, MHR, RCIR, MHPR (Ref 7.6)
Related CTQs	TRRRV, RCRV VDRV, VARV, TPRRV ,FCRV, SCRV, VNCRV, MOM, PWOM, CTQ, IOM, TOM, WRM, DRM, MHRV, RCIRV, MHPRV (Ref 7.7)
Actors/Agents	Transportation Manager
Delegation	Delegation Rule -1: Transportation Manager Not Available 1. Delegate the task to the agent with same role 2. Update the task 3. Log the delegation Delegation Rule -2: Transportation Manager Overloaded 1. Delegate the task to the agent with same Role 2. Update the task 3. Log the delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation

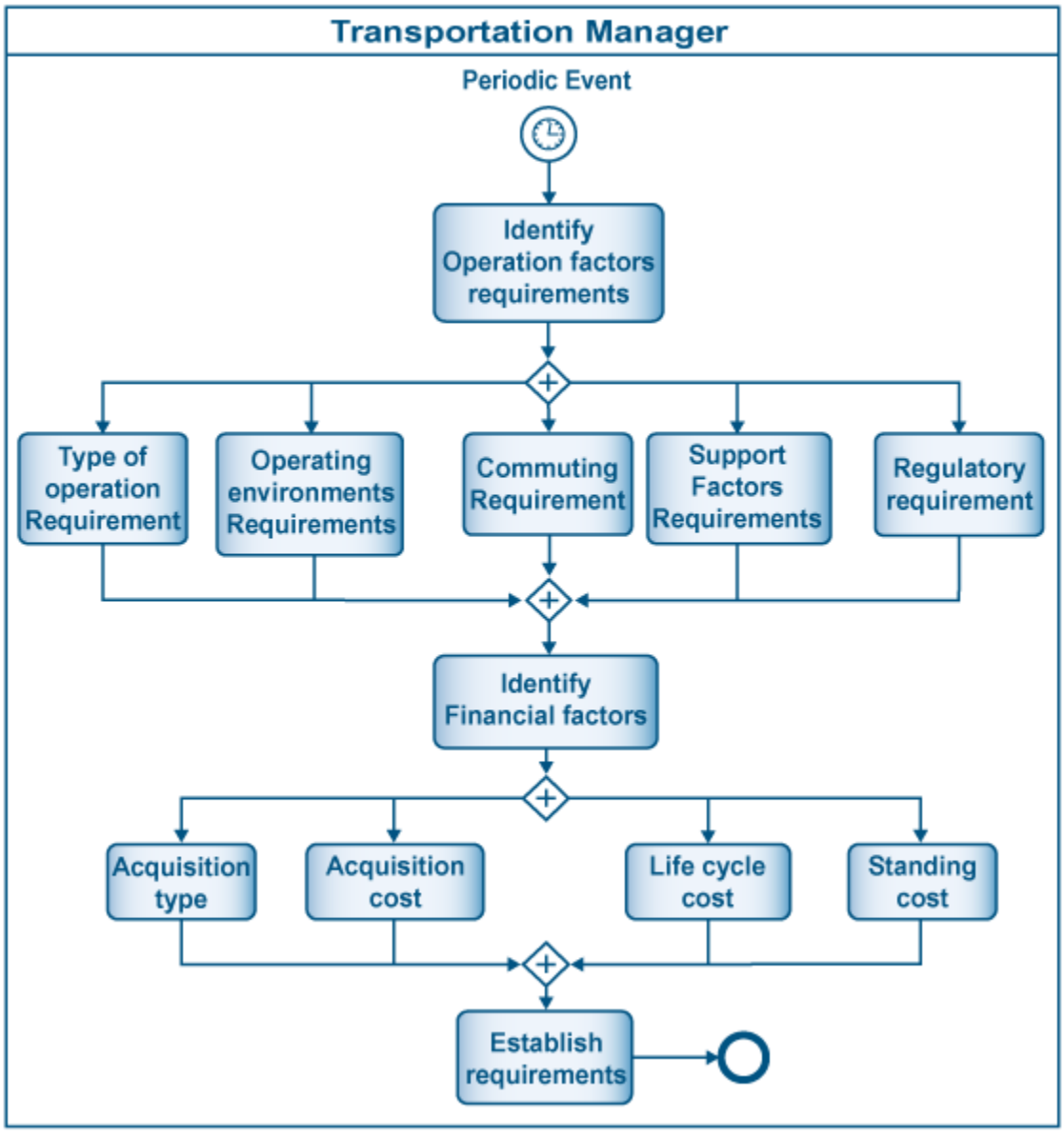
6 Transportation Management Process

Process Map	5.1
Process Model	6.1
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection Appendix C: Sample Checklist Appendix D: General Hazard Identification Tool Appendix E: Hazard Priority Table Appendix F:Tips For Preventing MSD

6.3 Roles and Responsibilities

Roles	Responsibilities
Transportation Manager	• Transportation Manager establishes transportation requirement • Transportation Manager establishes transportation plan • Transportation Manager establishes MSD prevention program. • Transportation Manager performs performance improvisation.

6.4 Sub Process – Establish Transportation requirement



6 Transportation Management Process

6.5 Sub Process – Establish Transportation Requirement Specification

Specification	Description
Summary/Purpose	To identify requirements for transportation management.
Scope	This is a Level 2 Process Specification.
Primary Reference	• NHS- National Health Services Standard • OSHA- Occupational Safety and Health Administration standard • Lean six sigma- Quality Standard
Related ESM Practices	Waste Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, Project Management, Infection Management, Activity Based Management, House Keeping Management
Related Business Driver	Cost effective & quality management of transport.
Related Operational Policies	OP-001(Ref. 7.5)
Assumptions	• Top level management commitment exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None

6 Transportation Management Process

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<tr><td>Trigger</td><td>• Periodic Event</td></tr>
<tr><td>Basic Course of Event</td><td><u>Establish Transportation requirements</u>
1. Transport Manager identifies operation factors (types of operations requirement, operating environment requirement, commuting requirement, support factors requirements, regulatory requirements)
2. Transport Manager identifies financial factors (acquisition types, acquisition cost, life cycle cost, standing cost)
3. Transport Manager establishes requirement.
4. End</td></tr>
<tr><td>Alternative Path</td><td>None</td></tr>
<tr><td>Exception Path</td><td>System Down
1. Keep paper track until system is up and running
2. Update the System and clear all logs.
3. End.</td></tr>
<tr><td>Extension points</td><td>Transportation Plan</td></tr>
<tr><td>Preconditions</td><td>Adequate resources are available to the process.</td></tr>
<tr><td>Post -conditions</td><td>Transportation Management Requirements are established.</td></tr>
</table>

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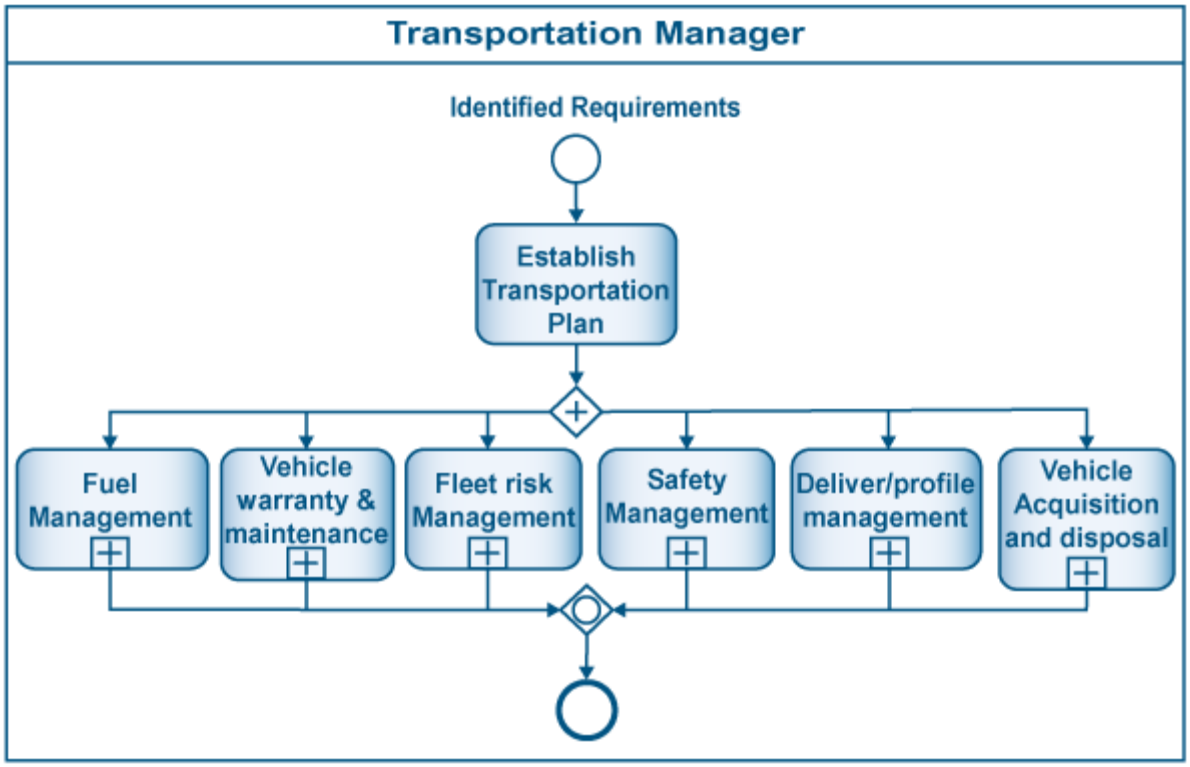
Related Business Rules	BR-OO1, BR-003 (Ref 7.1)
Related Risks	RR-004 (Ref. 7.2)
Related Quality Attributes	Reliability, Accountability, Auditability, confidentiality, authenticity, availability, testability (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, interpretability, Reputation, Objectivity, Free-0f Error, Relevance, Completeness (Ref 7.4)
Related Primary SLA Terms	(Ref 7.9)
Related KPIs	TRRR (Ref 7.6)
Related CTQs	TRRRV (Ref 7.7)
Actors/Agents	Transportation Manager.
Delegation	Delegation Rule -1: Transportation Manager Not Available 1. Delegate the task to the agent with same role 2. Update the task 3. Log the delegation Delegation Rule -2: Transportation Manager Overloaded 1. Delegate the task to the agent with same Role 2. Update the task 3. Log the delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	5.1
Process Model	6.4

Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.6 Sub Process – Establish Transportation Requirement Roles and Responsibilities

Roles	Responsibilities
Transportation Manager	• Transport Manager identifies operation factors (types of operations requirement, operating environment requirement, commuting requirement, support factors requirements, regulatory requirements) • Transport Manager identifies financial factors (acquisition types, acquisition cost, life cycle cost, standing cost) • Transport Manager establishes requirement.

6.7 Sub Process – Establish Transportation Plan



6 Transportation Management Process

6.8 Sub Process – Establish Transportation Plan Specification

Specification	Description
Summary/Purpose	The purpose of this process is to establish transportation management process plan for environmental services department.
Scope	This is a Level 2 Process Specification.
Primary Reference	• NHS- National Health Services Standard • OSHA- Occupational Safety and Health Administration standard • Lean six sigma- Quality Standard
Related ESM Practices	Waste Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, Project Management, Infection Management, Activity Based Management, House Keeping Management
Related Business Driver	Cost effective & quality management of transport.
Related Operational Policies	OP-002 (Ref. 7.5)
Assumptions	• Top level management commitment exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None

6 Transportation Management Process

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<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimension</td><td><table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table></td></tr>
<tr><td>Trigger</td><td>Transportation Requirement</td></tr>
<tr><td>Basic Course of Event</td><td><u>Establish Transportation Plan</u>
1. Transport Manager identifies transportation plan comprising of fuel management, Transport risk management, vehicle & warranty maintenance, Transport safety, driver profile management and vehicle acquisition and disposal management.
2. End</td></tr>
<tr><td>Alternative Path</td><td>None</td></tr>
<tr><td>Exception Path</td><td>System Down
1. Keep paper track until system is up and running
2. Update the System and clear all logs.
3. End.</td></tr>
<tr><td>Extension points</td><td>MSD prevention program</td></tr>
<tr><td>Preconditions</td><td>Transportation requirement is already established.</td></tr>
<tr><td>Post -conditions</td><td>Transportation plan gets formulated.</td></tr>
<tr><td>Related Business Rules</td><td>BR-001, BR-002, BR-003(Ref 7.1)</td></tr>
</table>

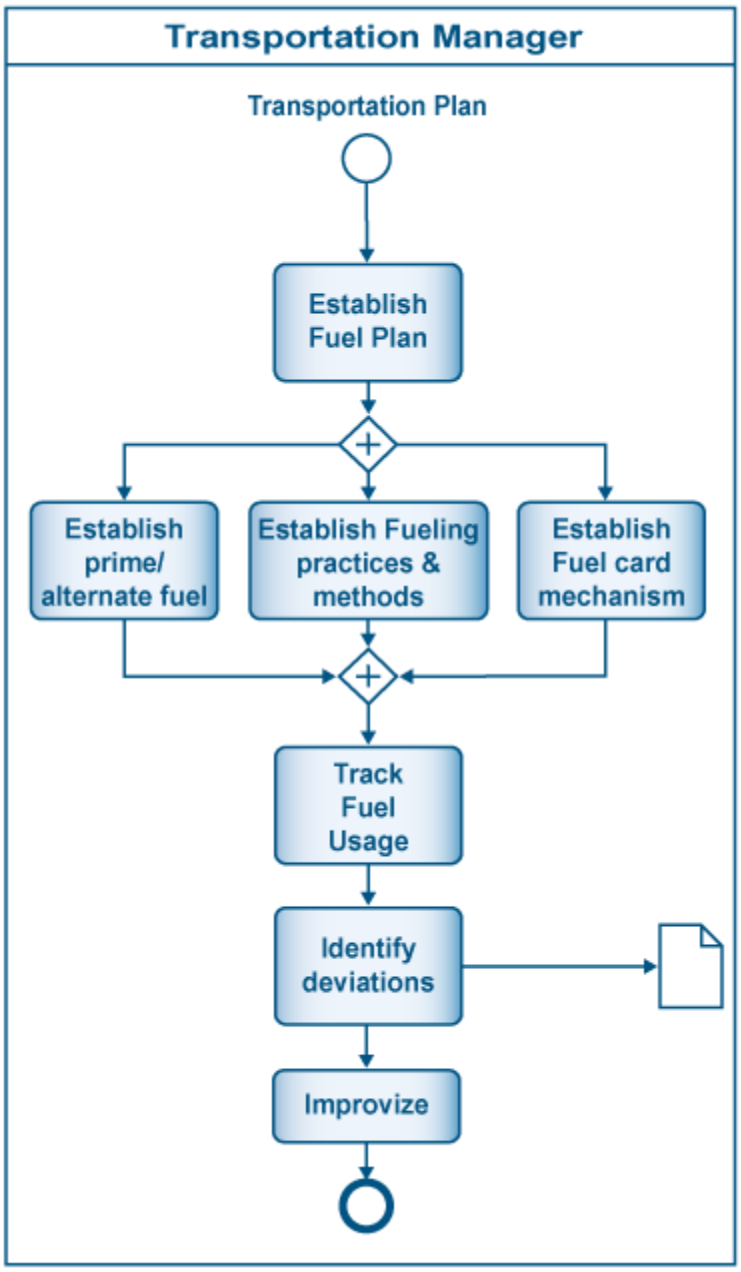
6 Transportation Management Process

Related Risks	RR-001, RR-002, RR-003, RR-004, RR-005(Ref. 7.2)
Related Quality Attributes	Reliability, Accountability, Auditability, confidentiality, authenticity, availability, (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, interpretability, Reputation, Objectivity, Free-0f Error, Relevance, Completeness (Ref 7.4)
Related Primary SLA Terms	(Ref 7.9)
Related KPIs	PRR (Ref 7.6)
Related CTQs	PRRV(Ref 7.7)
Actors/Agents	Transportation Manager.
Delegation	Delegation Rule -1: Transportation Manager Not Available 1. Delegate the task to the agent with same role 2. Update the task 3. Log the delegation Delegation Rule -2: Transportation Manager Overloaded 1. Delegate the task to the agent with same Role 2. Update the task 3. Log the delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	5.1
Process Model	6.7
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.9 Sub Process – Establish Transportation Plan Roles and Responsibilities

Roles	Responsibilities
Transportation Manager	• Transport Manager identifies transportation plan comprising of fuel management, Transport risk management, vehicle & warranty maintenance, Transport safety, driver profile management and vehicle acquisition and disposal management.

6.10 Sub Process – Fuel Management



6 Transportation Management Process

6.11 Sub Process – Fuel Management Specification

Specification	Description
Summary/Purpose	To enhance fuel management
Scope	This is a Level 2 Process Specification.
Primary Reference	• NHS- National Health Services Standard • OSHA- Occupational Safety and Health Administration standard • Lean six sigma- Quality Standard
Related ESM Practices	Waste Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, Project Management, Infection Management, Activity Based Management, House Keeping Management
Related Business Driver	Cost effective & quality management of transport.
Related Operational Policies	OP-002(Ref. 7.5)
Assumptions	• Top level management commitment exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	Different fuel types: petrol, CNG, Diesel.
Equipment & Accessories	Automated System for transportation management.

6 Transportation Management Process

<table>
<tr><td>MSD Management</td><td>Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)</td></tr>
<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimension</td><td><table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table></td></tr>
<tr><td>Trigger</td><td>Transportation Plan</td></tr>
<tr><td>Basic Course of Event</td><td><u>Fuel Management</u>
1. Fuel Manager establishes Fuel Plan
2. Fuel manager establishes fueling practices (establishes prime/ secondary fuel, establish fueling practices and methods, establish fuel card mechanism)
3. Transport Manager tracks fuel usage
4. Transport Manager identifies deviations.
5. Transport Manager improvises.
6. End</td></tr>
<tr><td>Alternative Path</td><td>None</td></tr>
<tr><td>Exception Path</td><td>System Down
1. Keep paper track until system is up and running
2. Update the System and clear all logs.
3. End.</td></tr>
<tr><td>Extension points</td><td>Improvise Performance</td></tr>
<tr><td>Preconditions</td><td>Transportation requirement is established.</td></tr>
<tr><td>Post -conditions</td><td>Transportation fuel management process gets established.</td></tr>
<tr><td>Related Business Rules</td><td>BR-004 (Ref 7.1)</td></tr>
</table>

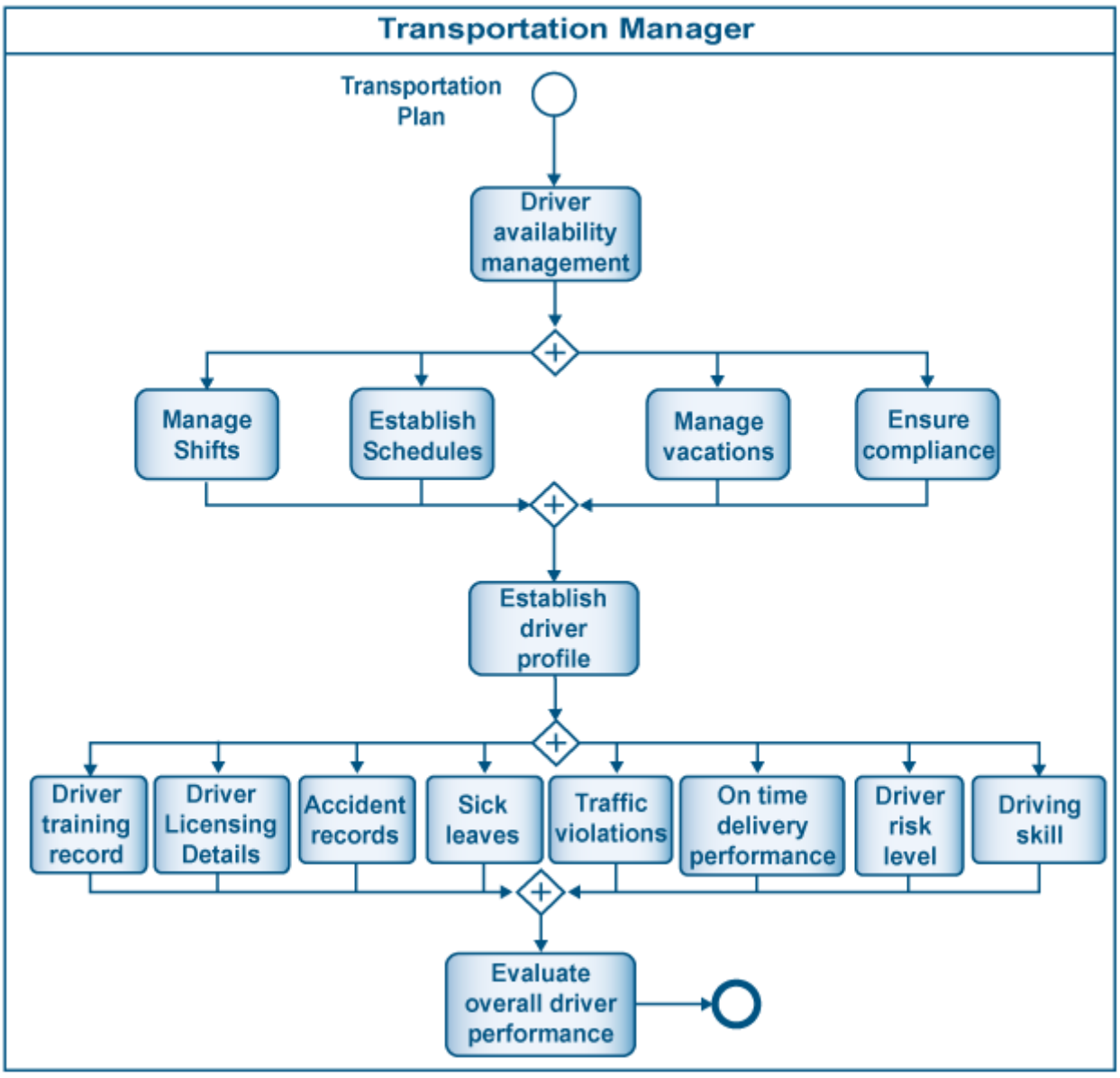
6 Transportation Management Process

Related Risks	RR-005 (Ref. 7.2)
Related Quality Attributes	Reliability, Accountability, Auditability, confidentiality, authenticity, availability, (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, interpretability, Reputation, Objectivity, Free-0f Error, Relevance, Completeness (Ref 7.4)
Related Primary SLA Terms	(Ref 7.9)
Related KPIs	FCR (Ref 7.6)
Related CTQs	FCRV (Ref 7.7)
Actors/Agents	Transportation Manager.
Delegation	Delegation Rule -1: Transportation Manager Not Available 1. Delegate the task to the agent with same role 2. Update the task 3. Log the delegation Delegation Rule -2: Transportation Manager Overloaded 1. Delegate the task to the agent with same Role 2. Update the task 3. Log the delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	5.1
Process Model	6.10
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.12 Sub Process – Fuel Management Roles and Responsibilities

Roles	Responsibilities
Transport Manager	Transport manager establishes fueling practices (establishes prime fuel, establish alternate fuel, establish fuel card mechanism), tracks fuel usage and identifies deviations

6.13 Sub Process – Driver Profile Management



6.14 Sub Process – Driver Profile Management Specification

Specification	Description
Summary/Purpose	To manage drivers performance.
Scope	This is a Level 2 Process Specification.
Primary Reference	• NHS- National Health Services Standard • OSHA- Occupational Safety and Health Administration standard • Lean six sigma- Quality Standard
Related ESM Practices	Waste Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, Project Management, Infection Management, Activity Based Management, House Keeping Management
Related Business Driver	Cost effective & quality management of transport.
Related Operational Policies	OP-003 (Ref. 7.5)
Assumptions	• Top level management commitment exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None
Equipment & Accessories	Automated System for transportation management.

6 Transportation Management Process

<table>
<tr><td>MSD Management</td><td>Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)</td></tr>
<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimensions</td><td><table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table></td></tr>
<tr><td>Trigger</td><td>Transportation Plan</td></tr>
<tr><td>Basic Course of Event</td><td><u>Driver Profile</u>
1. Transport Manager manages driver availability management (manage shifts, establishes schedules, manages vacations, ensure compliance)
2. Transport manager establishes driver profile (in terms of driver training record, driver licensing details, accident records, sick leaves, traffic violations, on time delivery performance, driver risk level, and driving skills)
3. Transport Manager evaluates overall driver performance.
4. End</td></tr>
<tr><td>Alternative Path</td><td>None</td></tr>
<tr><td>Exception Path</td><td>System Down
1. Keep paper track until system is up and running
2. Update the System and clear all logs.
3. End.</td></tr>
<tr><td>Extension points</td><td>Improvise Performance</td></tr>
<tr><td>Preconditions</td><td>Transportation requirement is established.</td></tr>
<tr><td>Post -conditions</td><td>Transportation fuel management process gets established.</td></tr>
<tr><td>Related Business Rules</td><td>BR-001 (Ref 7.1)</td></tr>
</table>

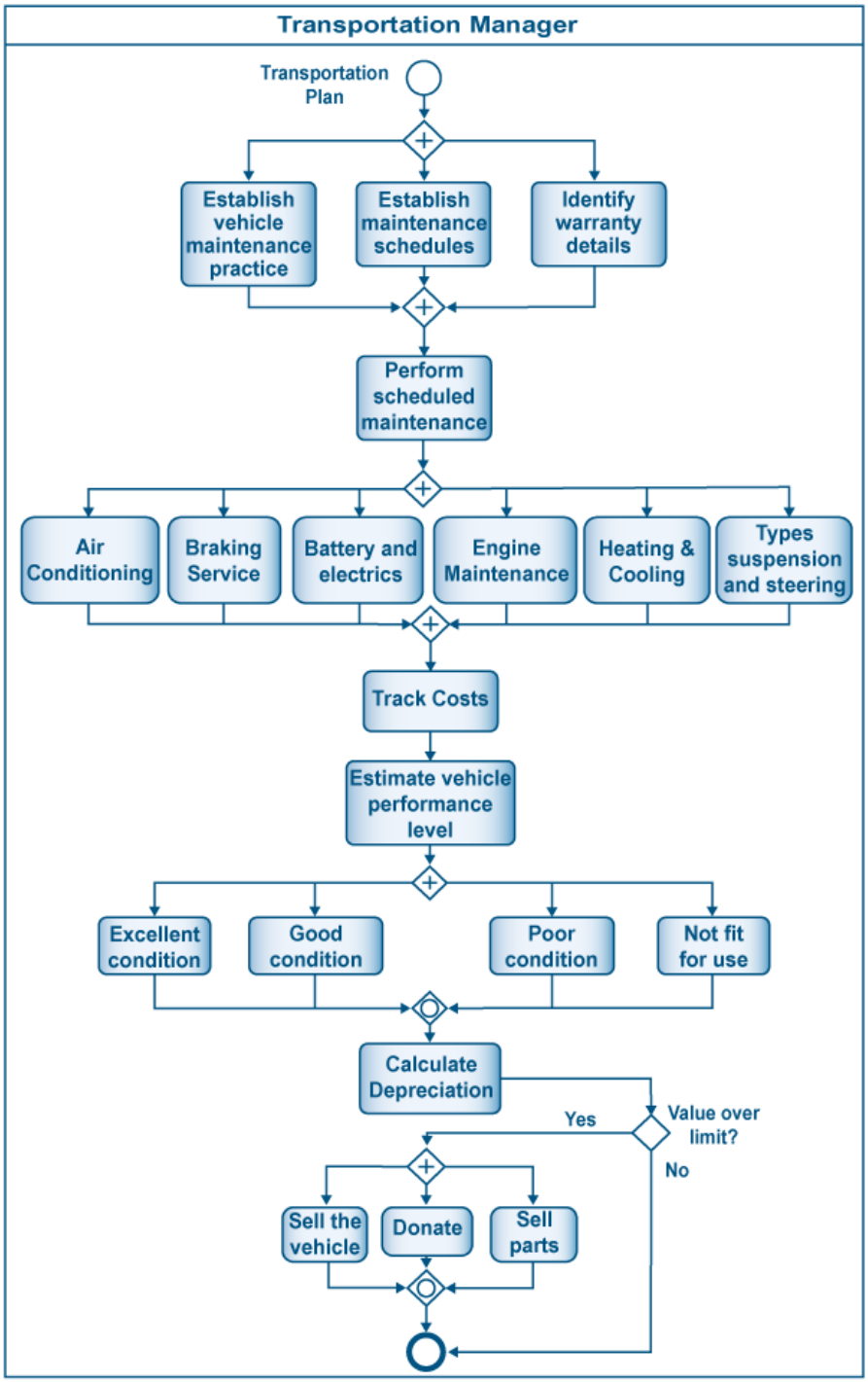
6 Transportation Management Process

Related Risks	RR-002 (Ref. 7.2)
Related Quality Attributes	Reliability, Accountability, Auditability, confidentiality, authenticity, availability, (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Reputation, Objectivity, Free-0f Error, Relevance, Completeness (Ref 7.4)
Related Primary SLA Terms	(Ref 7.9)
Related KPIs	(Ref 7.6)
Related CTQs	(Ref 7.7)
Actors/Agents	Transportation Manager.
Delegation	Delegation Rule -1: Transportation Manager Not Available 1. Delegate the task to the agent with same role 2. Update the task 3. Log the delegation Delegation Rule -2: Transportation Manager Overloaded 1. Delegate the task to the agent with same Role 2. Update the task 3. Log the delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	5.1
Process Model	6.13
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.15 Sub process – Driver Profile Management Roles and Responsibilities

Roles	Responsibilities
Transport Manager	• Transport Manager manages driver availability management (manage shifts, establishes schedules, manages vacations, ensure compliance) • Transport manager establishes driver profile (in terms of driver training record, driver licensing details, accident records, sick leaves, traffic violations, on time delivery performance, driver risk level, and driving skills) • Transport Manager evaluates overall driver performance.

6.16 Sub process – Vehicle Maintenance



6.17 Sub process – Vehicle Maintenance Specification

Specification	Description
Summary/Purpose	To manage vehicle maintenance
Scope	This is a Level 2 Process Specification.
Primary Reference	• NHS- National Health Services Standard • OSHA - Occupational Safety and Health Administration standard • Lean six sigma- Quality Standard
Related ESM Practices	Waste Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, Project Management, Infection Management, Activity Based Management, House Keeping Management
Related Business Driver	Cost effective & quality management of transport.
Related Operational Policies	Op-002 (Ref. 7.5)
Assumptions	• Top level management commitment exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None
Equipment & Accessories	Automated System for transportation management.

6 Transportation Management Process

<table>
<tr><td>MSD Management</td><td>Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)</td></tr>
<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimensions</td><td><table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table></td></tr>
<tr><td>Trigger</td><td>Establish transportation Plan.</td></tr>
<tr><td>Basic Course of Event</td><td><u>Vehicle Maintenance</u>
1. Transportation Manager establishes vehicle maintenance practice.
2. Transportation Manager establishes maintenance schedules for each vehicle.
3. Transportation manager establishes vehicle performance level (excellent, good, poor and not fit for use)
4. Transportation Manager calculates depreciation
5. End</td></tr>
<tr><td>Alternative Path</td><td><u>Vehicle Maintenance (value over limit)</u>
1. Transportation Manager sells or donates or sell part of the vehicle.
2. End</td></tr>
<tr><td>Exception Path</td><td>System Down
1. Keep paper track until system is up and running
2. Update the System and clear all logs.
3. End.</td></tr>
<tr><td>Extension points</td><td>Performance Improvisation</td></tr>
<tr><td>Preconditions</td><td>Transportation requirement is already established.</td></tr>
<tr><td>Post -conditions</td><td>Vehicle maintenance process gets established.</td></tr>
<tr><td>Related Business Rules</td><td>BR-002 (Ref 7.1)</td></tr>
</table>

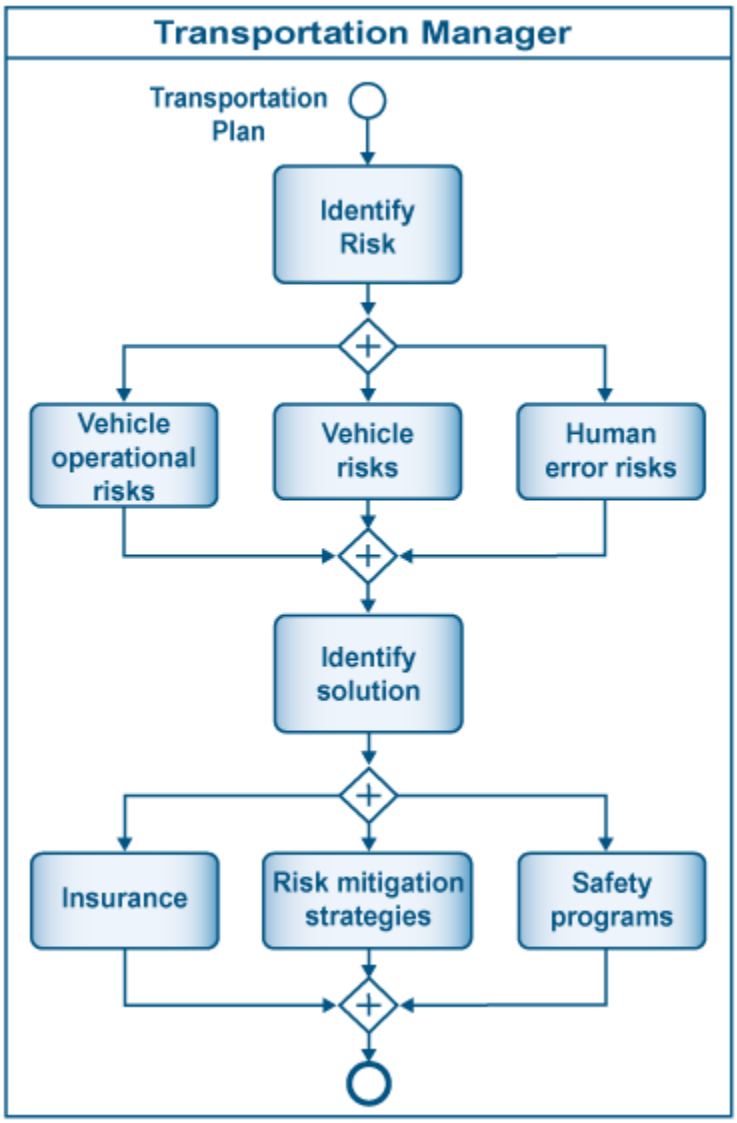
6 Transportation Management Process

Related Risks	RR-003 (Ref. 7.2)
Related Quality Attributes	Reliability, Accountability, Auditability, authenticity, availability, (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Reputation, Objectivity, Free-0f Error, Relevance, Completeness (Ref 7.4)
Related Primary SLA Terms	(Ref 7.9)
Related KPIs	VDR (Ref 7.6)
Related CTQs	VDRV (Ref 7.7)
Actors/Agents	Transportation Manager.
Delegation	Delegation Rule -1: Transportation Manager Not Available 1. Delegate the task to the agent with same role 2. Update the task 3. Log the delegation Delegation Rule -2: Transportation Manager Overloaded 1. Delegate the task to the agent with same Role 2. Update the task 3. Log the delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	5.1
Process Model	6.16
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.18 Sub Process – Vehicle Maintenance Roles and responsibilities

Roles	Responsibilities
Transportation Manager	Transportation Manager establishes vehicle maintenance practice, establishes maintenance schedules for each vehicle. Transportation manager establishes vehicle performance level and calculates depreciation

6.19 Sub Process – Risk Management



6.20 Sub Process – Risk Management Specification

Specification	Description
Summary/Purpose	To manage transport related risk
Scope	This is a Level 2 Process Specification.
Primary Reference	• NHS- National Health Services Standard • OSHA- Occupational Safety and Health Administration standard • Lean six sigma- Quality Standard
Related ESM Practices	Waste Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, Project Management, Infection Management, Activity Based Management, House Keeping Management
Related Business Driver	Cost effective & quality management of transport.
Related Operational Policies	OP-004 (Ref. 7.5)
Assumptions	• Top level management commitment exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None
Equipment & Accessories	Automated System for transportation management.

6 Transportation Management Process

MSD Management	Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)
EBC Procedures	None
Timing Dimensions	<table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table>
Trigger	Establish transportation Plan.
Basic Course of Event	**Transport Risk Management** 1. Transport Manager identifies risk (Transport operational risks, vehicle risks, human error risks) 2. Transport Manager identifies risk solutions (in terms of insurance, risk mitigation strategies, and safety training). 3. End
Alternative Path	None
Exception Path	**System Down** 1. Keep paper track until system is up and running 2. Update the System and clear all logs. 3. End.
Extension points	Performance Improvisation
Preconditions	Transportation requirement is already established.
Post -conditions	Vehicle risk management process gets established.
Related Business Rules	BR-005 (Ref 7.1)
Related Risks	RR-001, RR-002, RR-003, RR-004, RR-005, RR-006 (Ref 7.2)

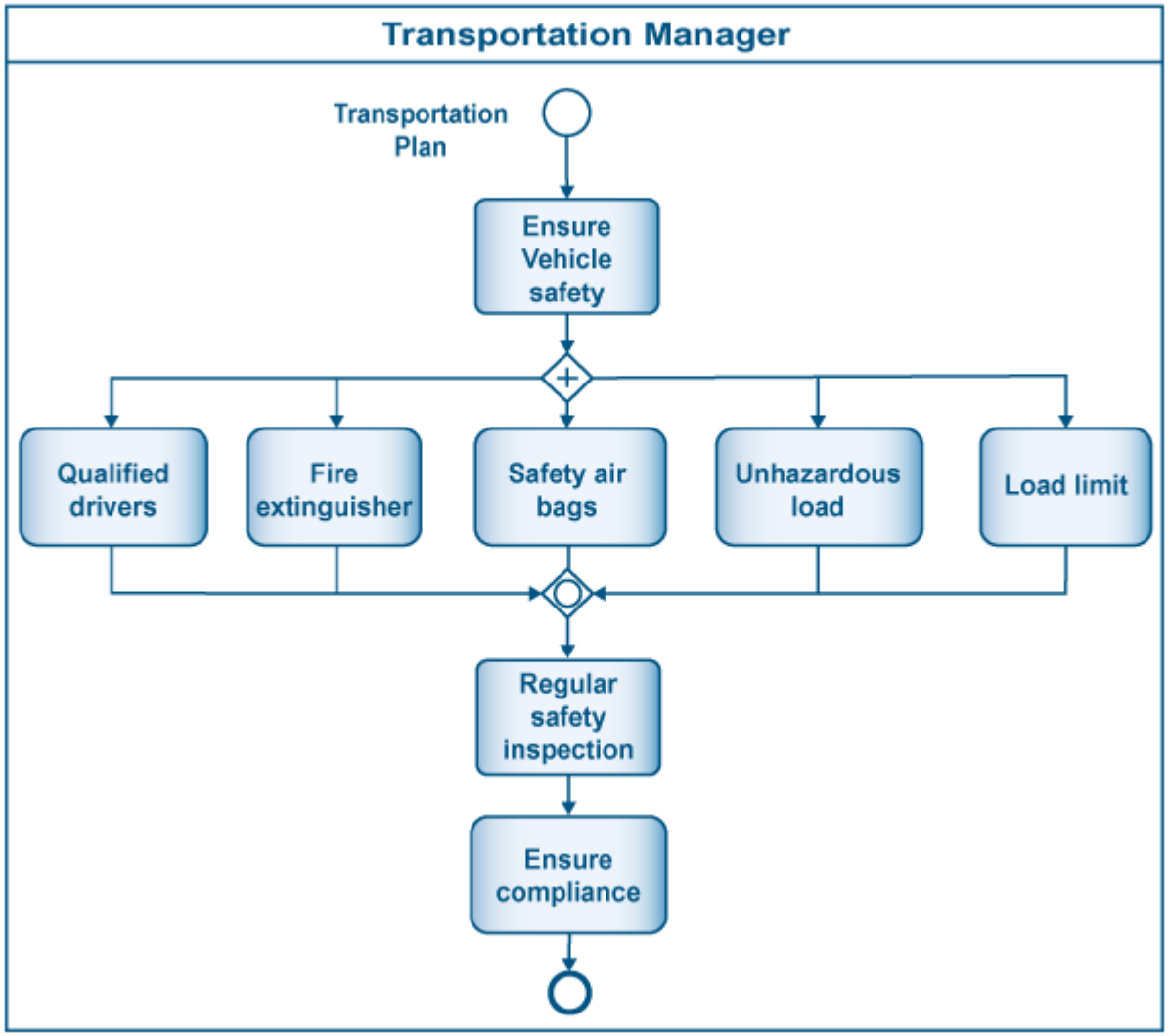
6 Transportation Management Process

Related Quality Attributes	Reliability, Service Reliability, , Data Integrity, Non-repudiation, Accountability, Performance, Scalability, Extensibility, Adaptability, Testability, Operability and Deployability (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Reputation, Objectivity, Free-of-Error, Relevance, Completeness, Timeliness, Appropriate Amount, (Ref 7.4)
Related Primary SLA Terms	(Ref 7.6)
Related KPIs	RCR (Ref 7.7)
Related CTQs	RCRV (Ref 7.8)
Actors/Agents	Transportation Manager.
Delegation	Delegation Rule -1: Transportation Manager Not Available 1. Delegate the task to the agent with same role 2. Update the task 3. Log the delegation Delegation Rule -2: Transportation Manager Overloaded 1. Delegate the task to the agent with same Role 2. Update the task 3. Log the delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	5.1
Process Model	6.20
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.21 Sub Process – Risk Management Roles and responsibilities

Roles	Responsibilities
Transportation Manager	Transportation Manager identifies risk (vehicle operational risks, vehicle risks, human error risks), and identifies risk solutions (in terms of insurance, risk mitigation strategies, and safety training).

6.22 Sub Process – Safety Management



6.23 Sub Process – Safety Management Specification

Specification	Description
Summary/Purpose	To ensure vehicle safety
Scope	This is a Level 2 Process Specification.
Primary Reference	• NHS- National Health Services Standard • OSHA- Occupational Safety and Health Administration standard • Lean six sigma- Quality Standard
Related ESM Practices	Waste Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, Project Management, Infection Management, Activity Based Management, House Keeping Management
Related Business Driver	Cost effective & quality management of transport.
Related Operational Policies	OP-003 (Ref. 7.5)
Assumptions	• Top level management commitment exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None
Equipment & Accessories	Automated System for transportation management.

6 Transportation Management Process

MSD Management	Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)
EBC Procedures	None
Timing Dimensions	<table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table>
Trigger	Establish transportation Plan.
Basic Course of Event	**Vehicle Safety Management** 1. Transport Manager ensures Transport safety (in terms of qualified drivers, fire extinguisher, safety air bags, un hazardous load, and load limit) 2. End
Alternative Path	None
Exception Path	**System Down** 1. Keep paper track until system is up and running 2. Update the System and clear all logs. 3. End.
Extension points	Performance Improvisation
Preconditions	Transportation requirement is already established.
Post -conditions	Vehicle safety management process gets established.
Related Business Rules	BR-003 (Ref 7.1)
Related Risks	RR-003, RR-002 (Ref 7.2)
Related Quality Attributes	Reliability, Service Reliability, Usability, Authenticity, Data Integrity, Non-repudiation, Accountability, PerformanceTestability, Auditability, Operability and Deployability (Ref 7.3)

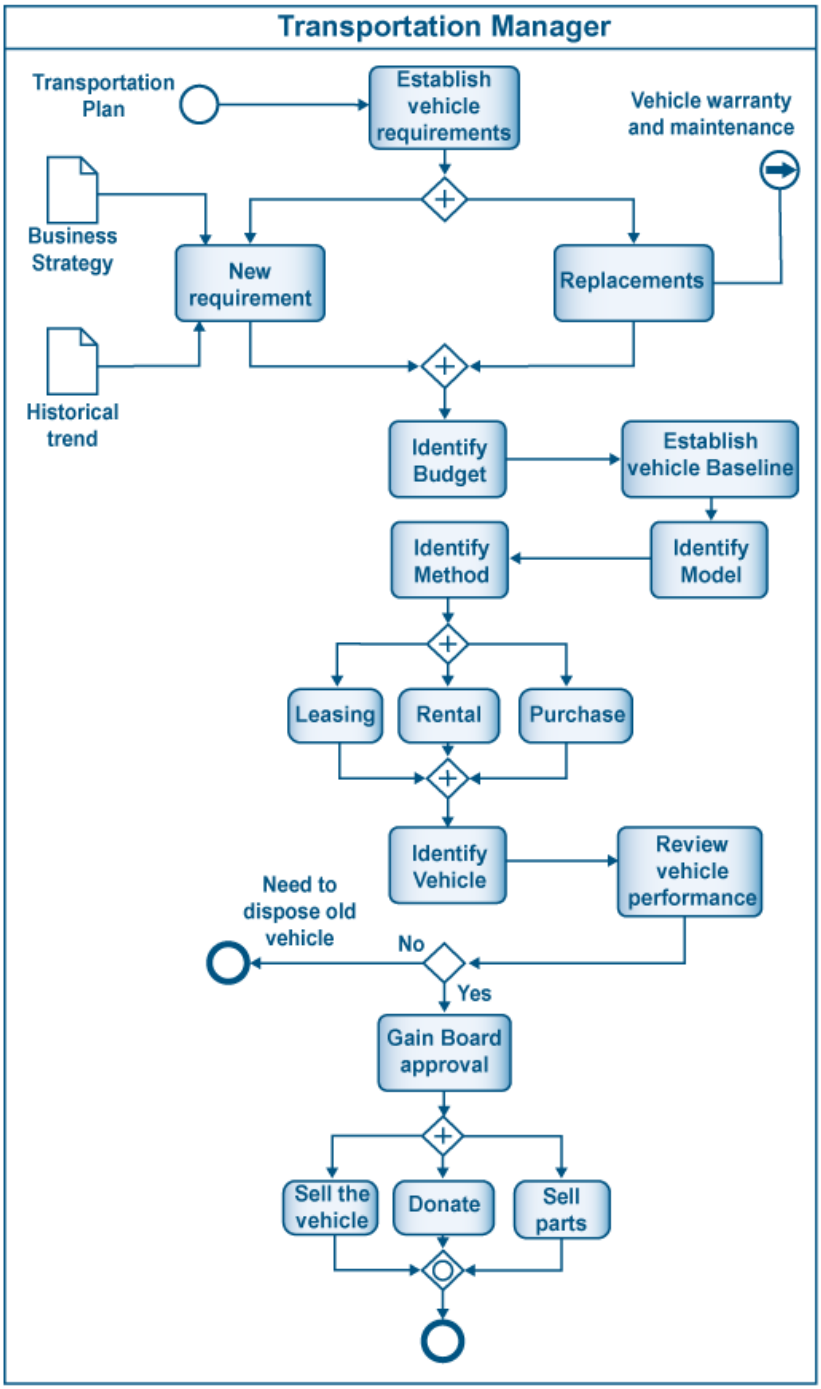
6 Transportation Management Process

Related Data Quality Dimensions	Accuracy, Believability, Reputation, Objectivity, Free-of-Error, Relevance, Completeness, Timeliness (Ref 7.4)
Related Primary SLA Terms	(Ref 7.9)
Related KPIs	VNCR (Ref 7.6)
Related CTQs	VNCRV (Ref 7.7)
Actors/Agents	Transportation Manager.
Delegation	Delegation Rule -1: Transportation Manager Not Available 1. Delegate the task to the agent with same role 2. Update the task 3. Log the delegation Delegation Rule -2: Transportation Manager Overloaded 1. Delegate the task to the agent with same Role 2. Update the task 3. Log the delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	5.1
Process Model	6.22
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.24 Sub Process – Safety Management Roles and responsibilities

Roles	Responsibilities
Transportation Manager	Transportation Manager ensures vehicle safety (in terms of qualified drivers, fire extinguisher, safety air bags, un hazardous load, and load limit)

6.25 Sub Process – Vehicle Acquisition and Disposal



6.26 Sub Process – Vehicle Acquisition and Disposal Specification

Specification	Description
Summary/Purpose	To establish process for Vehicle acquisition and disposal
Scope	This is a Level 2 Process Specification.
Primary Reference	• NHS- National Health Services Standard • OSHA- Occupational Safety and Health Administration standard • Lean six sigma- Quality Standard
Related ESM Practices	Waste Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, Project Management, Infection Management, Activity Based Management, House Keeping Management
Related Business Driver	Cost effective & quality management of transport.
Related Operational Policies	OP-002 (Ref. 7.5)
Assumptions	• Top level management commitment exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None
Equipment & Accessories	Vehicles

6 Transportation Management Process

<table>
<tr><td>MSD Management</td><td>Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)</td></tr>
<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimensions</td><td><table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table></td></tr>
<tr><td>Trigger</td><td>Establish transportation Plan.</td></tr>
<tr><td>Basic Course of Event</td><td><u>Vehicle Acquisition and disposal Management</u>
1. Transportation Manager establishes vehicle requirements (new requirements and replacements)
2. Transportation Manager establishes budget
3. Transportation Manager established vehicle baseline
4. Transportation Manager identify model
5. Transportation Manager identify method (leasing, rental or purchasing)
6. Transportation Manager identifies vehicle
7. Transportation Manager review vehicle performance
8. End</td></tr>
<tr><td>Alternative Path</td><td>Performance not up to mark
1. Transportation Manager gains board approval
2. Transportation Manager Sells the vehicle, donate or sells parts.</td></tr>
<tr><td>Exception Path</td><td>System Down
1. Keep paper track until system is up and running
2. Update the System and clear all logs.
3. End.</td></tr>
<tr><td>Extension points</td><td>Performance Improvisation</td></tr>
<tr><td>Preconditions</td><td>Transportation requirement is already established.</td></tr>
</table>

6 Transportation Management Process

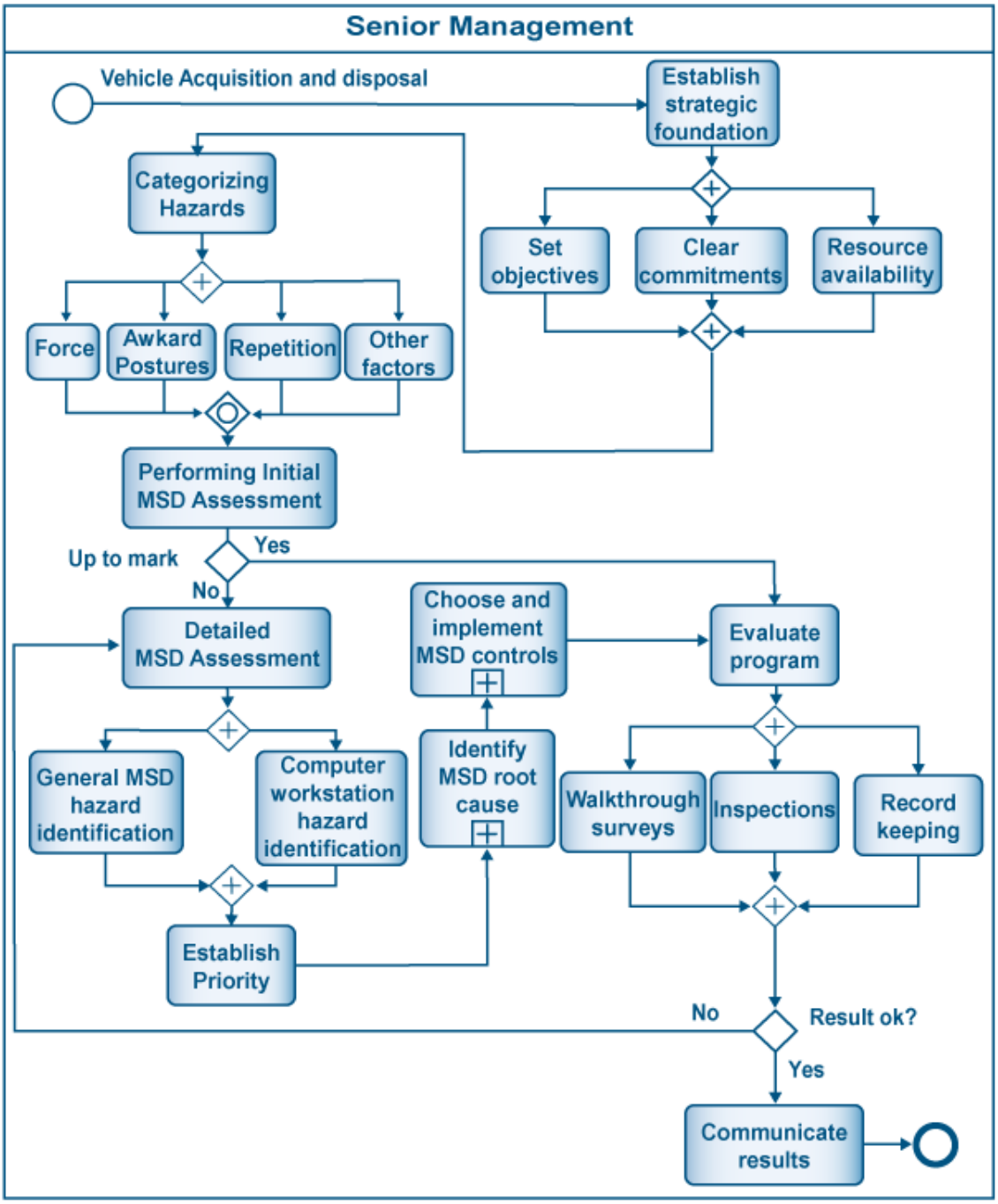
Post -conditions	Vehicle safety management process gets established.
Related Business Rules	BR-004 (Ref 7.1)
Related Risks	RR-005 (Ref 7.2)
Related Quality Attributes	Reliability, Service Reliability, Usability, Performance Testability, Auditability, Operability and Deployability (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Free-of-Error, Relevance, Completeness, (Ref 7.4)
Related Primary SLA Terms	(Ref 7.9)
Related KPIs	VAR (f 7.6)
Related CTQs	VARV (Ref 7.7)
Actors/Agents	Transportation Manager.
Delegation	Delegation Rule -1: Transportation Manager Not Available 1. Delegate the task to the agent with same role 2. Update the task 3. Log the delegation Delegation Rule -2: Transportation Manager Overloaded 1. Delegate the task to the agent with same Role 2. Update the task 3. Log the delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	5.1
Process Model	6.25

Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection Appendix C: Sample Checklist Appendix D: General Hazard Identification Tool Appendix E: Hazard Priority Table Appendix F:Tips For Preventing MSD

6.27 Sub Process – Vehicle Acquisition and Disposal Roles and responsibilities

Roles	Responsibilities
Transportation Manager	• Transportation Manager establishes vehicle requirements (new requirements and replacements) • Transportation Manager establishes budget • Transportation Manager established vehicle baseline • Transportation Manager identify model • Transportation Manager identify method (leasing, rental or purchasing) • Transportation Manager identifies vehicle • Transportation Manager review vehicle performance • Transportation Manager sells the vehicle, donate or sells parts.

6.28 Sub Process – Establish MSD Prevention Program



6.29 Sub Process – Establish MSD Prevention Program Specification

Specification	Description
Summary/Purpose	The purpose of this process is to establish standard process for establishing MSD prevention program.
Scope	This is a level 1 Process Specification.
Primary Reference	• OSHA
Related ESM Practices	Waste Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, Project Management, Infection Management, Activity Based Management, House Keeping Management
Related Business Driver	Ensure better safety of employees
Related Operational Policies	OP-005, OP-006,(Ref 7.5)
Assumptions	Senior Management Support exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None
Equipment & Accessories	Automated System for transportation Management

6 Transportation Management Process

<table>
<tr><td>MSD Management</td><td>Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)</td></tr>
<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimensions</td><td><table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table></td></tr>
<tr><td>Trigger</td><td>• Vehicle Acquisition and Disposal</td></tr>
<tr><td>Basic Course of Event</td><td>Establish MSD Program
1. Senior Management establishes strategic foundation which comprises of setting objectives, clear commitments and resource availabilities.
2. Senior Management categorizes MSD hazards into categories (force, awkward postures, repetition, and other factors)
3. Senior Management performs initial MSD assessment which comprises of checklist and records reviews.
4. Senior Management evaluates program which comprises of walkthrough surveys, inspections, record keeping.
5. Senior Management communicates results to the staff and management.
6. End</td></tr>
<tr><td>Alternative Path</td><td>Establish MSD Program (detailed MSD assessment)
1. Senior Management establishes strategic foundation which comprises of setting objectives, clear commitments and resource availabilities.
2. Senior Management categorizes MSD hazards into categories (force, awkward postures, repetition, and other factors)
3. Senior Management performs initial MSD assessment which comprises of checklist and records reviews.
4. Senior Management performs detailed MSD assessments
5. Senior Management establishes priority
6. Senior Management identifies MSD root cause</td></tr>
</table>

	7. Senior Management choose and implement MSD controls 8. Senior Management evaluates program which comprises of walkthrough surveys, inspections, record keeping. 9. Senior Management communicates results to the staff and management. 10. End **Establish MSD Program (result not okay)** 1. Senior Management performs detailed MSD assessments. 2. Senior Management establishes priority 3. Senior Management identifies MSD root cause 4. Senior Management choose and implement MSD controls 5. Senior Management evaluates program which comprises of walkthrough surveys, inspections, record keeping. 6. Senior Management communicates results to the staff and management. 7. End
Exception Path	**System Down** 1. Keep paper track until system is up and running 2. Update the System and clear all logs. 3. End.
Extension points	Quality of service
Preconditions	There exists a capability at environmental Services department to monitor the performance of OSH
Post -conditions	MSD hazards get reduced.
Related Business Rules	BR-006, BR-007 (Ref 7.1)
Related Risks	RR-007, RR-008(Ref. 7.2)
Related Quality Attributes	Reliability, Usability, Data Integrity, Non-repudiation, Accountability, Performance, Auditability, Service reliability, confidentiality, authenticity, availability, non repudiation, testability (Ref 7.3)

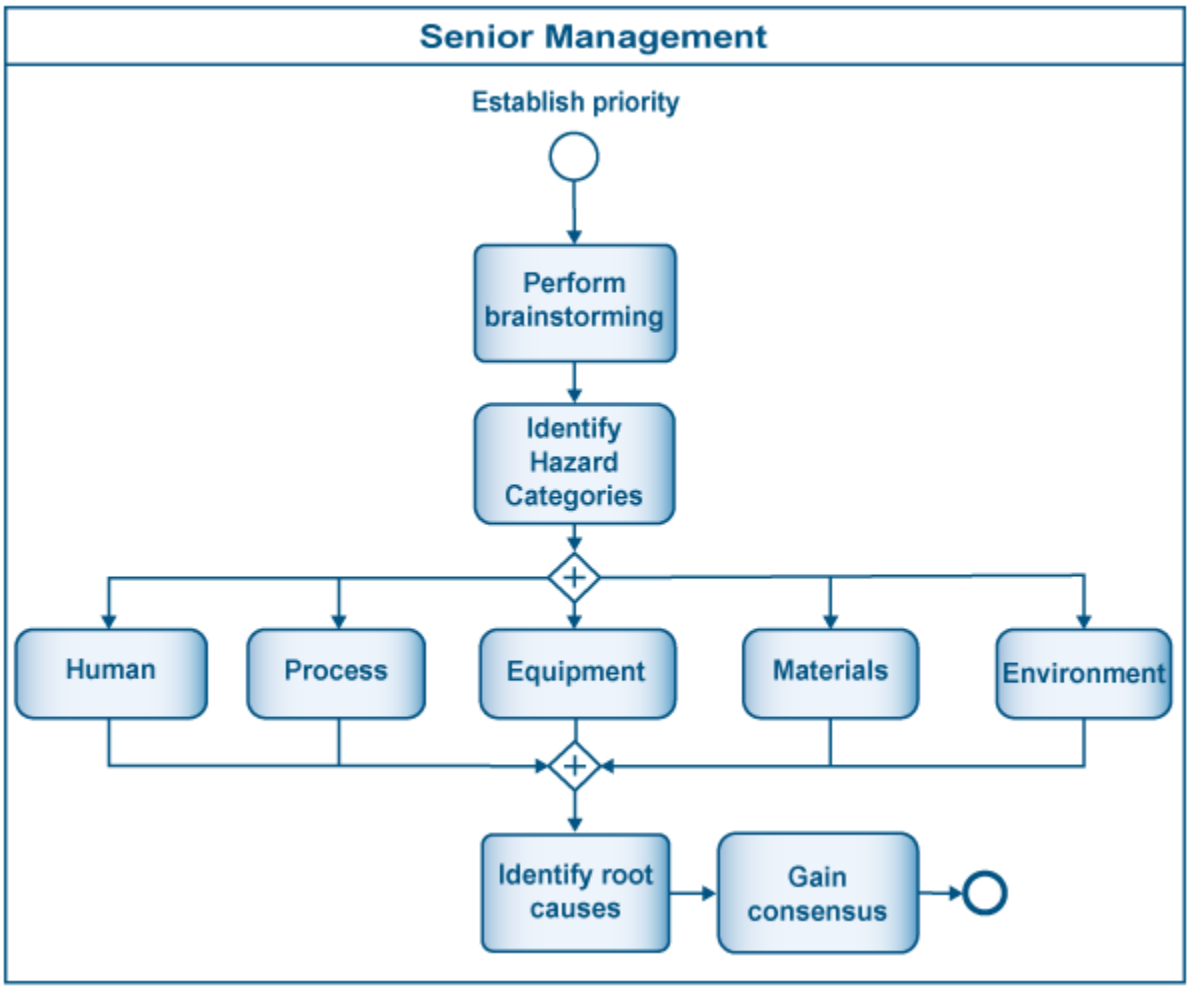
6 Transportation Management Process

Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Understandability, interpretability, Reputation, Objectivity, Free-0f Error, Relevance, Completeness, Timeliness, Concise Representation (Ref 7.4)
Related Primary SLA Terms	TBD (Ref 7.9)
Related KPIs	MHR, RCIR, MHPR (Ref 7.6)
Related CTQs	MHRV, RCIRV, MHPRV (Ref 7.7)
Actors/Agents	Senior Management
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation Delegation Rule -2: Agent Overloaded 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation
Escalation	Rule 1: Performance or operational or legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	Section 5.1
Process Model	Section 6.7
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection Appendix C: Sample Checklist Appendix D: General Hazard Identification Tool Appendix E: Hazard Priority Table Appendix F:Tips For Preventing MSD

6.30 Sub Process – Establish MSD Prevention Program Roles and responsibilities

Roles	Responsibilities
Senior Management	• Senior Management establishes strategic foundation which comprises of setting objectives, clear commitments and resource availabilities. • Senior Management categorizes MSD hazards into categories (force, awkward postures, repetition, and other factors) • Senior Management performs initial MSD assessment which comprises of checklist and records reviews. • Senior Management performs detailed MSD assessments which comprises of general MSD hazard identification and computer workstation hazard identification. • Senior Management establishes priority • Senior Management identifies MSD root cause • Senior Management choose and implement MSD controls • Senior Management evaluates program which comprises of walkthrough surveys, inspections, record keeping. • Senior Management communicates results to the staff and management

6.31 Sub Process – Identity MSD Root Cause



6.32 Sub Process – Identity MSD Root Cause Specification

Specification	Description
Summary/Purpose	The purpose of this process is identifying MSD root causes.
Scope	This is a level 2 Process Specification.
Primary Reference	• Lean waste minimization • Six sigma quality model • OSHA
Related ESM Practices	Waste Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, Project Management, Infection Management, Activity Based Management, House Keeping Management
Related Business Driver	Service quality improvisation
Related Operational Policies	OP-005 (Ref 7.5)
Assumptions	Senior Management Support exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None
Equipment & Accessories	Automated System for transportation management

6 Transportation Management Process

<table>
<tr><td>MSD Management</td><td>Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)</td></tr>
<tr><td>EBC Procedures</td><td>None</td></tr>
<tr><td>Timing Dimensions</td><td><table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table></td></tr>
<tr><td>Trigger</td><td>• Establish priority</td></tr>
<tr><td>Basic Course of Event</td><td>Identify MSD root cause
1. Senior Management performs brainstorming sessions
2. Senior Management identifies the hazard for categories (human, process, equipment, materials, environment)
3. Senior Management identifies the root cause for the hazards
4. Senior Management gains consensus.
5. End</td></tr>
<tr><td>Alternative Path</td><td>None</td></tr>
<tr><td>Exception Path</td><td>System Down
1. Keep paper track until system is up and running
2. Update the System and clear all logs.
3. End.</td></tr>
<tr><td>Extension points</td><td>Choose and implement MSD control</td></tr>
<tr><td>Preconditions</td><td>There exists a capability at environmental Services department to monitor the performance of this process.</td></tr>
<tr><td>Post -conditions</td><td>Root cause of hazard is identified.</td></tr>
<tr><td>Related Business Rules</td><td>BR-006 (Ref 7.1)</td></tr>
</table>

6 Transportation Management Process

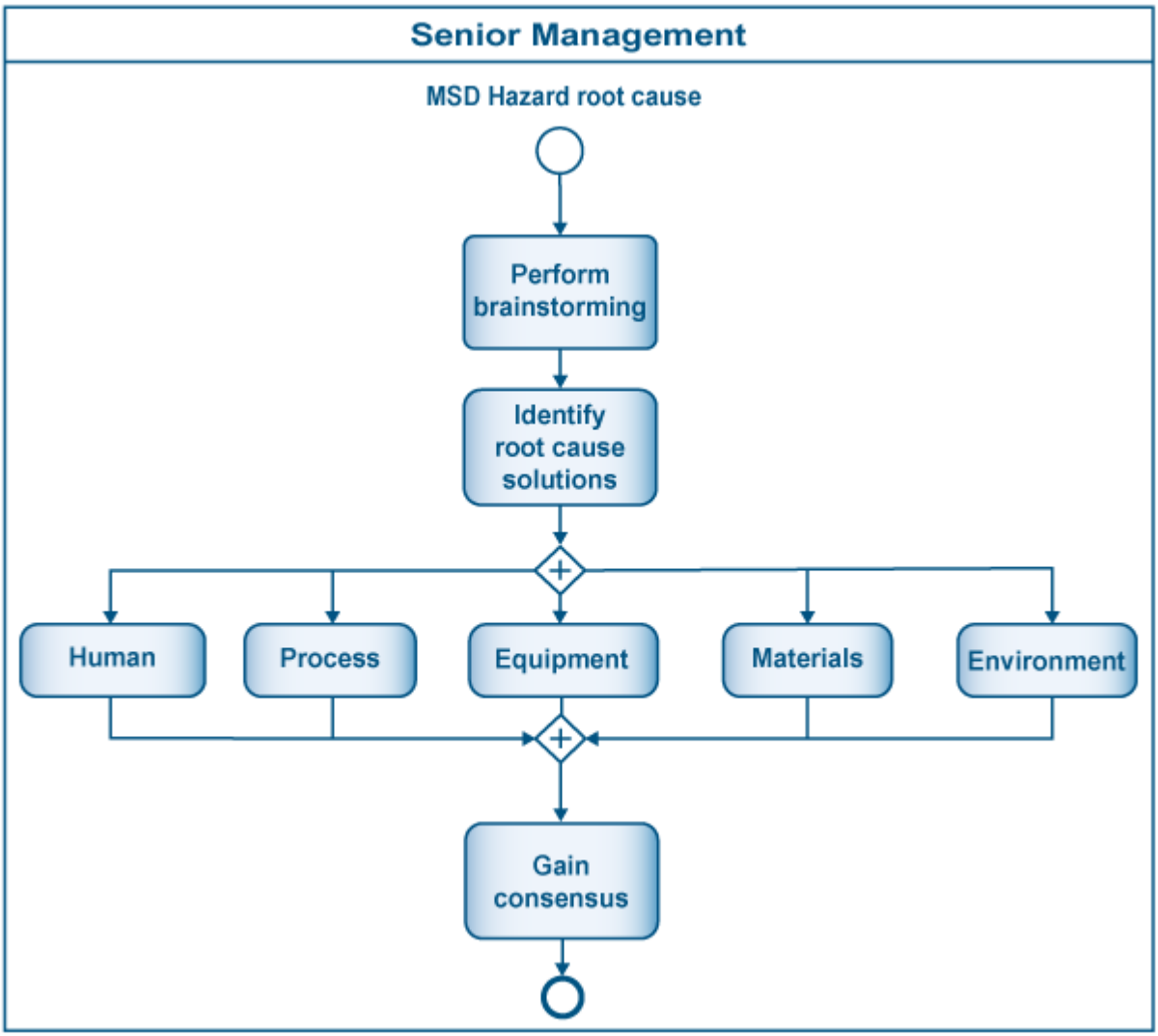
Related Risks	RR-007 (Ref. 7.2)
Related Quality Attributes	Reliability, Usability, Data Integrity, Non-repudiation, Accountability, Performance, Auditability, Service reliability, confidentiality, authenticity, availability, non repudiation, testability (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Understandability, interpretability, Reputation, Objectivity, Free-0f Error, Relevance, Completeness, Timeliness, Concise Representation (Ref 7.4)
Related Primary SLA Terms	TBD (Ref 7.9)
Related KPIs	RCIR (Ref 7.6)
Related CTQs	RCIRV (Ref 7.7)
Actors/Agents	Senior Management
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation Delegation Rule -2: Agent Overloaded 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation
Escalation	Rule 1: Performance or operational or legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	Section 5.1
Process Model	Section 6.10

Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.33 Sub Process – Identity MSD Root Cause Roles and responsibilities

Roles	Responsibilities
Senior Management	• Senior Management performs brainstorming sessions • Senior Management identifies the hazard for categories (human, process, equipment, materials, environment) • Senior Management identifies the root cause for the hazards • Senior Management gains consensus

6.34 Sub Process – Choose and implement MSD Controls



6.35 Sub Process – Choose and implement MSD Controls Specification

Specification	Description
Summary/Purpose	The purpose of this process is choose and implement MSD controls
Scope	This is a level 2 Process Specification.
Primary Reference	• Lean waste minimization • Six sigma quality model • OSHA
Related ESM Practices	Waste Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, Project Management, Infection Management, Activity Based Management, House Keeping Management
Related Business Driver	Service quality improvisation and reduction of MSD hazards
Related Operational Policies	OP-006 (Ref 7.5)
Assumptions	Senior Management Support exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None

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Equipment & Accessories	Automated System for transportation management
MSD Management	Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)
EBC Procedures	None
Timing Dimensions	<table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table>
Trigger	• Identify MSD hazard root cause
Basic Course of Event	**Choose and Implement MSD controls** 1. Senior Management performs brainstorming sessions 2. Senior Management identifies root cause solutions for the hazard categories (human, process, equipment, materials, environment) 3. Senior Management gains consensus. 4. End
Alternative Path	**None**
Exception Path	**System Down** 1. Keep paper track until system is up and running 2. Update the System and clear all logs. 3. End.
Extension points	Evaluate program
Preconditions	There exists a capability at environmental Services department to monitor the performance of this process.
Post -conditions	Root cause of hazard is implemented.

6 Transportation Management Process

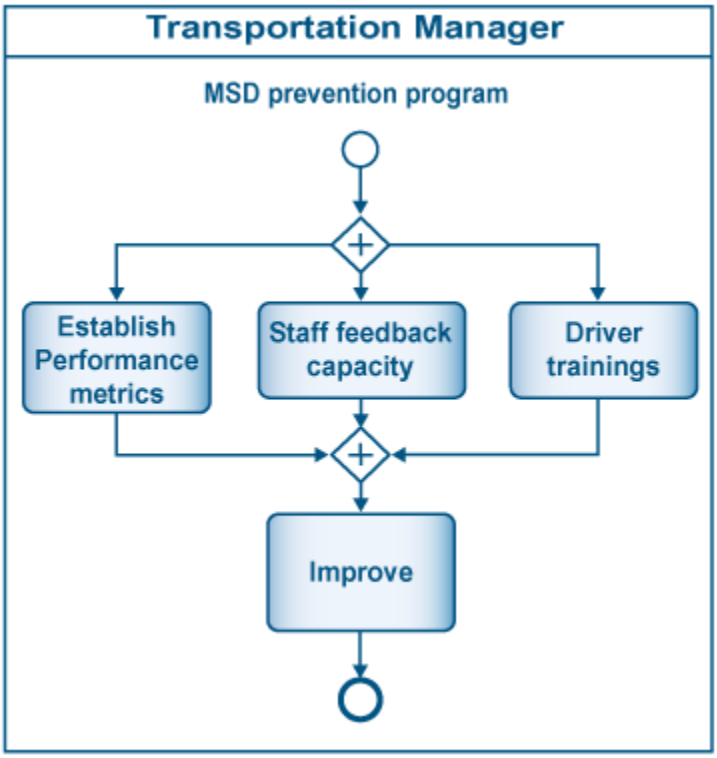
Related Business Rules	BR-007(Ref 7.1)
Related Risks	RR-008 (Ref. 7.2)
Related Quality Attributes	Reliability, Usability, Data Integrity, Non-repudiation, Accountability, Performance, Auditability, Service reliability, confidentiality, authenticity, availability, non repudiation, testability (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Relevance, Completeness, timeliness, Understandability, interpretability, Reputation, Objectivity, Free-0f Error, Relevance, Completeness, Timeliness, Concise Representation (Ref 7.4)
Related Primary SLA Terms	TBD (Ref 7.9)
Related KPIs	MHPR (Ref 7.6)
Related CTQs	MHPRV (Ref 7.7)
Actors/Agents	Senior Management
Delegation	Delegation Rule -1: Agent Not Available 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation Delegation Rule -2: Agent Overloaded 1. Delegate the Issue to additional Agent with same Role 2. Update the Issue 3. Log the Delegation
Escalation	Rule 1: Performance or operational or legal Issues 1. Escalate to environmental services department head.

	2. Log Escalation
Process Map	Section 5.1
Process Model	Section 6.13
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.36 Sub Process – Choose and implement MSD Controls Roles and responsibilities

Roles	Responsibilities
Senior Management	• Senior Management performs brainstorming sessions • Senior Management identifies root cause solutions for the hazard categories (human, process, equipment, materials, environment) • Senior Management gains consensus.

6.37 Sub Process – Performance Improvisation



6.38 Sub Process – Performance Improvisation Specification

Specification	Description
Summary/Purpose	To assure that the transportation process' performance is improvised.
Scope	This is a Level 2 Process Specification.
Primary Reference	• NHS- National Health Services Standard • OSHA- Occupational Safety and Health Administration standard • Lean six sigma- Quality Standard
Related ESM Practices	Waste Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, Project Management, Infection Management, Activity Based Management, House Keeping Management
Related Business Driver	Cost effective & quality management of transport.
Related Operational Policies	OP-002 (Ref. 7.5)
Assumptions	• Top level management commitment exists.
Voice of Customer	Hygiene, High and Consistent Quality of standards, Free of Infections, Timely Services, High Coordinating, Remove Waste, Excellent Ergonomic, Safety, Appearance, Excellent Worker Attitude. (Ref 7.10)
Customer Satisfaction Measure	Customer satisfaction index
COI Correlation	None
Raw Materials	None
Equipment & Accessories	Automated transportation management system

6 Transportation Management Process

MSD Management	Lifting/carrying, Disability, Force, Loaded motion, Physical ergonomics, Posture change, Excessive force, Scarceness, Noise, Concentration, Floor hazards, Clothing, Psychosocial factors. (Ref 7.12)
EBC Procedures	None
Timing Dimensions	<table><tr><th>Type</th><th>Normal</th></tr><tr><td>Average</td><td>30 min</td></tr><tr><td>Std</td><td>12 min</td></tr></table>
Trigger	Vehicle Acquisition and Disposal
Basic Course of Event	**Vehicle Performance Improvisation** 1. Transportation Manager establishes vehicle performance metrics, staff feedback capacity, and drivers' trainings. 2. Transportation Manager improvises. 3. End
Alternative Path	None
Exception Path	**System Down** 1. Keep paper track until system is up and running 2. Update the System and clear all logs. 3. End.
Extension points	Waste Management, Quality Management, Service Strategy & planning, laundry Management, Maintenance Management, Project Management, Infection Management, Activity Based Management, House Keeping Management
Preconditions	Transportation plan is already established.
Post -conditions	Vehicle performance improvisation process gets established.
Related Business Rules	BR-001 (Ref 7.1)

6 Transportation Management Process

Related Risks	RR-003 (Ref 7.2)
Related Quality Attributes	Reliability, Service Reliability, Auditability, Operability and Performance, (Ref 7.3)
Related Data Quality Dimensions	Accuracy, Objectivity, Free-of-Error, Relevance, Completeness, (Ref 7.4)
Related Primary SLA Terms	(Ref 7.9)
Related KPIs	SCR (Ref 7.6)
Related CTQs	SCRV (Ref 7.7)
Actors/Agents	Transportation Manager.
Delegation	Delegation Rule -1: Transportation Manager Not Available 1. Delegate the task to the agent with same role 2. Update the task 3. Log the delegation Delegation Rule -2: Transportation Manager Overloaded 1. Delegate the task to the agent with same Role 2. Update the task 3. Log the delegation
Escalation	Rule 1: Performance, operational legal Issues 1. Escalate to environmental services department head. 2. Log Escalation
Process Map	5.1
Process Model	6.28
Other References	Appendix A: Business Process Modeling Notation Reference Appendix B: Chain of Infection

6.39 Sub Process – Performance Improvisation Roles and responsibilities

Roles	Responsibilities
Transportation Manager	Transportation Manager ensures vehicle safety (in terms of qualified drivers, fire extinguisher, safety air bags, un hazardous load, and load limit)

7

ESM Transporation Management

Reference

7 Reference

This chapter serves as a prime reference to Chapter 6 and presents the details supporting Chapter 6 in tabular formats. This chapter consists of various variable values which would frequently evolve or change as Transportation Management process matures or changes.

At minimal this document can be updated biannually. However, if need arises this document may be updated earlier than its prescribed revision period.

7.1 Business Rules

BR ID	Description	Context	Rule	Source
BR-001	All drivers should have prior experience in driver.	TBD	TBD	TBD
BR-002	For all the vehicles whose maintenance cost is more than half of its price would not be retained	TBD	TBD	TBD
BR-003	All the vehicle should be safe for travelling.	TBD	TBD	TBD
BR-004	All vehicle related costs should be tracked and accounted for	TBD	TBD	TBD
BR-005	Risk would be calculated based on corporate risk management process.	TBD	TBD	TBD
BR-006	All MSD hazard should be identified and prioritized	Business	TBD	TBD
BR-007	All the root causes of MSD should be identified	Business	TBD	TBD

7 Reference

7.2 Risk

Risk ID	Description	Source	Severity Level	Status	Resolution
RR-001	Shortage of drivers	NA	High	NA	Senior management should plan the human resources well ahead so that there is never a shortage of drivers
RR-002	Lack of best and safety driving practice in drivers	NA	High	NA	Management should conduct awareness session for the driving team so that they are well aware about safety and better driving techniques.
RR-003	Poor monitoring of transportation activities	NA	High	NA	Senior Management should monitor implement a proper information system to ensure the optimal performance is achieved with regards to transportation managements.
RR-004	poor Vehicle warranty management	NA	Medium	NA	All the vehicles should have a automated means of identifying the due date for maintenance proactively.
RR-005	Inaccurate costing	NA	High	NA	Budgeting should take into account forecasting and trending analysis to be precise.
RR-006	Increase in fuel price	NA	High	NA	Vehicle which cheaper fuels (CNG, diesel) should be considered which procuring vehicles.
RR-007	The MSD assessment	NA	High	TBD	Detailed assessment techniques should be undertaken. If needed MSD professional

	results are not accurate				bodies should be contacted to perform assessment/
RR-008	Root cause for some MSD is not identified	NA	High	TBD	For those MSD for which root cause can't be identified there should be a work around solution identified until the cause is identified.

7.3 Quality Attribute

QA ID	Description	Threshold
QA-001	Interoperability	TBD
QA-002	Reliability	TBD
QA-003	Service Reliability	TBD
QA-004	Availability	TBD
QA-005	Usability	TBD
QA-006	Normal Usability Operations	TBD
QA-007	Confidentiality	TBD
QA-008	Authenticity	TBD
QA-009	Data Integrity	TBD
QA-010	Availability	TBD
QA-011	Non-repudiation	TBD
QA-012	Accountability	TBD
QA-013	Security Integration	TBD
QA-014	Performance	TBD

QA-015	Scalability	TBD
QA-016	Extensibility	TBD
QA-017	Adaptability	TBD
QA-018	Testability	TBD
QA-019	Auditability	TBD
QA-020	Operability and Deployability	TBD

7.4 Data Quality Dimension

DQ ID	Description	Threshold
DQ-001	Accuracy	TBD
DQ-002	Believability	TBD
DQ-003	Reputation	TBD
DQ-004	Objectivity	TBD
DQ-005	Free-of-Error	TBD
DQ-006	Value Added	TBD
DQ-007	Relevance	TBD
DQ-008	Completeness	TBD
DQ-009	Timeliness	TBD
DQ-010	Appropriate Amount	TBD
DQ-011	Understandability	TBD
DQ-012	Interpretability	TBD

DQ-013	Concise Representation	TBD

7.5 Operation Policy

Policy ID	Description	Context	Importance (1-5)
OP-001	All the transportation requirements would be thoroughly reviewed before approval	TBD	TBD
OP-002	All Transportation related plans and decisions should be thoroughly reviewed prior execution	TBD	TBD
OP-003	All drivers should be regulatory reminded of safety procedures.	TBD	TBD
OP-004	All risk related processes should be based on the corporate risk management methodology	TBD	TBD
OP-005	Advanced MSD assessment should be undertaken if the results from initial MSD assessment are not accurate	TBD	TBD
OP-006	Root cause identification and implementation would be done only when a consensus is reached by the brain storming team.	TBD	TBD

7 Reference

7.6 KPI

Name	Acronym	Description	Context	Importance	Soft Threshold	Hard Threshold
Fuel Cost rate	**FCR**	Fuel cost per month	NA	TBD	TBD	TBD
Transportation requirement review rate	**TRRR**	Number of time transportation requirements are reviewed annually	NA	TBD	TBD	TBD
Risk calculation rate	**RCR**	The number of time risk is calculated for transportation process per year	NA	TBD	TBD	TBD
Staff complaint rate	**SCR**	Number of staff complains per month	NA	TBD	TBD	TBD
Vehicle Non Compliance rate	**VNCR**	Number of compliance targets missed per vehicle.	NA	TBD	TBD	TBD
Transportation Plan Review rate	**TPRR**	The number of reviews done for the transportation plan per year	NA	TBD	TBD	TBD

7 Reference

Vehicle depreciate rate	**VDR**	The average percentage of depreciation per year	NA	TBD	TBD	TBD
Vehicle Acquisition rate	**VAR**	Number of vehicles acquired per year	NA	TBD	TBD	TBD
MSD hazards rate	**MHR**	Number of MSD hazard in the organization identified quarterly	NA	TBD	TBD	TBD
Root cause identification rate	**RCIR**	Number of hazards with root cause identified	NA	TBD	TBD	TBD
MSD hazard prevention rate	**MHPR**	Number of MSD hazard in the organization prevented quarterly	NA	TBD	TBD	TBD

7 Reference

7.7 CTQ

Name	Acronym	Description	Context	Importance	Soft Threshold	Hard Threshold
Fuel Cost rate variation	**FCRV**	Standard deviation of FCR	NA	TBD	TBD	TBD
Staff complaint rate variation	**SCRV**	Standard deviation of SCR	NA	TBD	TBD	TBD
Vehicle Non Compliance rate variation	**VNCRV**	Standard deviation of VNCR	NA	TBD	TBD	TBD
Transportation Plan Review rate variation	**TPRRV**	Standard deviation of TPRR	NA	TBD	TBD	TBD
Vehicle depreciate rate variation	**VDRV**	Standard deviation of VDR	NA	TBD	TBD	TBD
Vehicle Acquisition rate variation	**VARV**	Standard deviation of VAR	NA	TBD	TBD	TBD
Motion Optimization Measure	**MOM**	Management of motion	NA	TBD	TBD	TBD

		optimization measure				
Paper work Optimization Measure	**PWOM**	Management of Paper work Optimization Measure	NA	TBD	TBD	TBD
Correction reduction measure	**CRM**	Management of Correction reduction measure	NA	TBD	TBD	TBD
Inventory Optimization Measure	**IOM**	Management of Inventory Optimization Measure	NA	TBD	TBD	TBD
Transportation Optimization Measure	**TOM**	Management of Transportation Optimization Measure	NA	TBD	TBD	TBD
Waiting Reduction Measure	**WRM**	Management of Waiting reduction Measure	NA	TBD	TBD	TBD
Delays reduction measure	**DRM**	Management of delays reduction measure	NA	TBD	TBD	TBD

MSD hazards rate variation	**MHRV**	Standard deviation of MHR	NA	TBD	TBD	TBD
Root cause identification rate variation	**RCIRV**	Standard deviation of RCIR	NA	TBD	TBD	TBD
MSD hazard prevention rate variation	**MHPRV**	Standard deviation of MHPR	NA	TBD	TBD	TBD

7.8 Abstract Time – Scale

Name	Acronym	Description	Quantification
TBD	TBD	TBD	TBD

7.9 SLA Terms

SLA ID	Description	Context	KPI	CTQ
TBD	**TBD**	**TBD**	**TBD**	**TBD**

7 Reference

7.10 Voice of Customer

VOC	Customer	Description	Perceived Value
Hygiene	Doctors, Patients, Nurses, Housekeeping Supervisors, Housekeepers, Clerks, Visitors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker.	The environment should be attributing with great hygiene level.	• High quality healthcare services • Safe environment • Low infection rate • Low risk
High and Consistent Quality of standards	Doctors, Patients, Nurses, Housekeeping Supervisors, Clerks, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	High and Consistent Quality of standards.	• Reputation of organization or hospital • Professionalism • Trust • Positive psychological bias
Free of Infections	Doctors, Patients, Nurses, Housekeeping Supervisors, Clerks, Visitors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker,	Infections free and healthy environment.	• Safe environment • Reputation of hospital or organization • Trust • Quick healing • Positive psychological bias • Low risk

	Waste management worker, Housekeepers		
Timely Services	Doctors, Patients, Nurses, Housekeeping Supervisors, Visitors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	The response time for any request should be very short.	• Professionalism • Trust • Positive psychological bias • Reputation of hospital or organization • Safe environment
High Coordinating	Doctors, Patients, Nurses, Housekeeping Supervisors, Clerks, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	There should be high level of coordination between hospital employees and departments.	• Professionalism • Trust • Low risk • Excellent Ergonomic
Remove Waste	Patients, Nurses, Housekeeping Supervisors, Clerks, Visitors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	Wastes should be either removed or minimized.	• Safe environment • Low infection rate • Low risk • Reputation of hospital or organization • Low cost • Timely response • High quality

7 Reference

Excellent Ergonomic	Doctors, Patients, Nurses, Housekeeping Supervisors, Clerks, Visitors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	The hospital environment and policy should comply with physical, organization and cognitive ergonomics.	• Professionalism • Trust • Job accuracy • Excellent communication • Low risk • Reputation of hospital or organization
Safety	Doctors, Patients, Nurses, Housekeeping Supervisors, Clerks, Visitors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	Hospital environment should comply with occupational health and safety procedures.	• Safe environment • Professionalism • Low risk
Appearance	Housekeeping Supervisors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker, Waste management worker, Housekeepers	The appearance of the workers, supervisors and manager should induce positive biases.	• Professionalism • Reputation of hospital or organization • Trust • Positive psychological bias
Excellent Worker Attitude	Housekeeping Supervisors, Environmental Services Management, Laundry worker, Transportation worker, Maintenance worker,	The environment service employee should be free from negative attitudes.	• Professionalism • Reputation of hospital or organization • Trust • Positive psychological bias

	Waste management worker, Housekeepers		• Minimum disputes • Less employee turn over

7.11 Customer Context Matrix

Name of Customer	Acronym	Context of Customer	Coordination Process Area
Doctors	**DOC**	Direct	HIS Coordination
Patients	**PAT**	Direct	HIS Coordination
Nurses	**NUR**	Direct	HIS Coordination, Nurse Coordination
Housekeeping Supervisors	**HKS**	Direct	Quality Coordination, Nurse Coordination, infection control coordination
Clerks	**CLR**	Direct	HIS Coordination
Visitors	**VIS**	Indirect	HIS Coordination
Environmental Services Management	**ESM**	Direct	Nurse Coordination, infection control coordination
Other hospital workers	**OHW**	Indirect	Security coordination
Laundry worker	**LDW**	Direct	Nurse Coordination, HIS Coordination
Transportation worker	**TRW**	Direct	Quality Coordination, HIS Coordination
Maintenance worker	**MAW**	Direct	Quality Coordination, HIS Coordination

Waste management worker	**WMW**	Direct	Quality Coordination, HIS Coordination
Infection control professional	**ICP**	Indirect	Infection Control Coordination
Housekeepers	**HK**	Direct	HIS Coordination, Nurse Coordination

7.12 MSD Attributes

MSD Attribute	Description
Lifting/carrying	Large vertical movements, long carry distances.
Disability	Pose a risk to those with a health problem or a physical or learning disability.
Force	High initial forces to get the load moving.
Loaded motion	High forces to keep the load in motion.
Physical ergonomics	Constraints on body posture/positioning, confined spaces/narrow doorways.
Posture change	Strong force and awkward movement/posture. E.g. bent wrists.
Excessive force	Excessive force to grip raw materials, product or tools
Scarceness	Inadequate tools for repetitive use screwdrivers, pliers, hammers.
Noise	Noise which cause stress and muscle tension.
Concentration	Tasks require high levels of attention/concentration especially where the worker has little control over allocation of effect to the task.
Floor hazards	Remove slip and trip hazards through provision of appropriate floor surfaces and good keeping.

7 Reference

Clothing	Clothing/PPE may prevent sufficient movement for the task or reduce capability. E.g. to grip consider handling needs when selecting work wear/gloves.
Psychosocial factors	Adverse psychosocial factors can increase the potential for manual handling injuries. A workers psychosocial response to work and the workplace conditions can affect their health in general and MSDs in particular. The factors include the content, design, organization and management of the work

Glossary / Acronyms

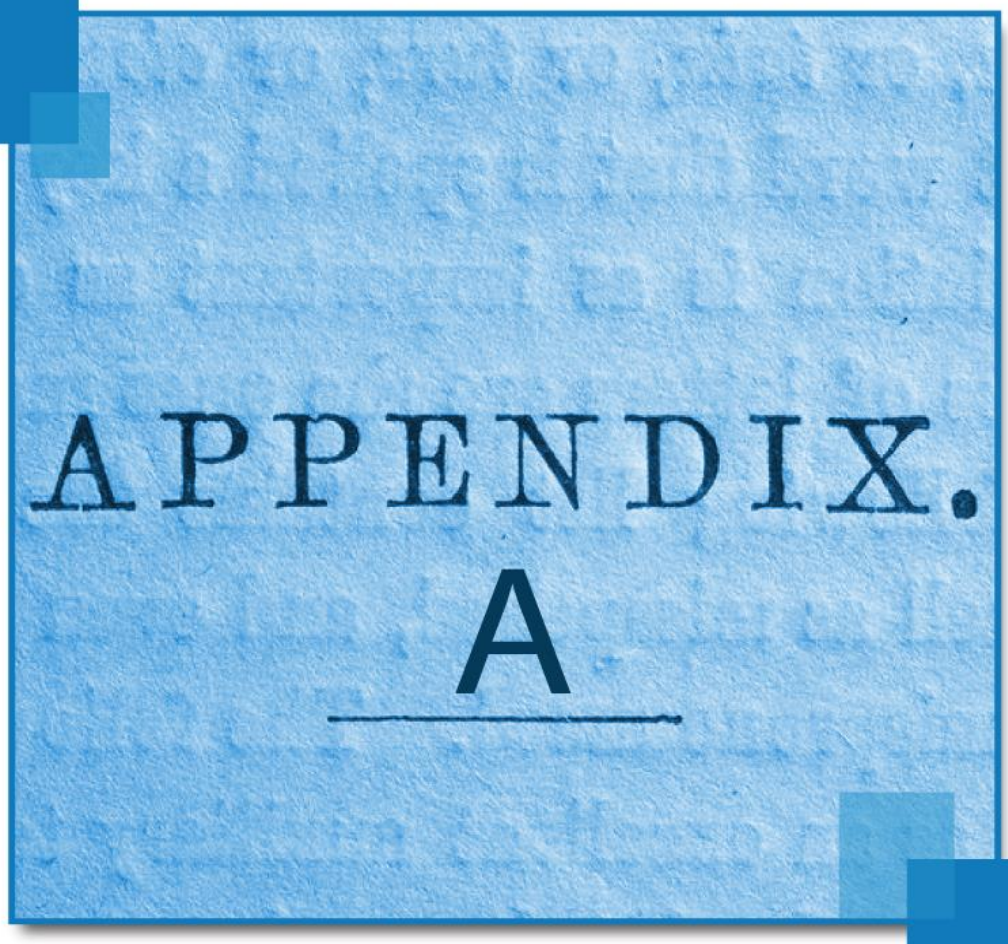
8 Glossary / Acronyms

Terminology	Description
Abstract Time Scale	Time Scale that will be quantified both during operations and continuous process improvement. These time identifiers are correlated with the soft thresholds that are dynamically specified during life span of the process.
BPMN	**Business Process Modelling Notation** Business Process Modelling Notation is the practice of documenting an organisation's key business processes in a graphical format.
Business Rules	Business Rules are intended to assert business structure or to control or influence the behaviour of the Business. Business rules describe the operations, definitions and constraints that apply to an organization
CRR	Contract Review Rate
CRRV	Contract Review rate Variation.
CTQ	**Critical to Quality** Critical To Quality (CTQ) is continuous measuring and monitoring tool agreed between the internal processes to achieve greater customer satisfaction.
Data Quality Dimensions	The totality of features and characteristics of data that bears on their ability to satisfy a given purpose
EBC	Evidence based Cleaning
ESM	Environmental services Map
KPI	**Key Performance Indicator** A metric that is used to help manage a process, IT service or activity. Many metrics may be measured, but only the most important of these are defined as KPIs and used to actively manage and report on the process, IT service or activity. KPIs should be selected to ensure that efficiency, effectiveness, and cost effectiveness are all managed.
MSD	Macro skeleton Disorder
OLA	**Organization level Agreement**

8 Glossary / Acronyms

	An Agreement between an IT Service Provider and another part of the same Organization
Operational Policy	Rules defined to operate the process.
Quality Attributes	Quality attributes are non-functional requirements used to evaluate the performance of a process.
Risk	A possible event that could cause harm or loss, or affect the ability to achieve Objectives. A risk is measured by the probability of a threat, the vulnerability of the asset to that threat, and the impact it would have if it occurred.
SLA	**Service Level Agreement** An Agreement between an IT Service Provider and a Customer. The SLA describes the IT Service, documents Service Level Targets, and specifies the responsibilities of the IT Service Provider and the Customer
VOC	**Voice of Customer**

Appendix A: Business Process Modeling Notation Reference



9 Appendix A: Business Process Modeling Notation Reference

INTRODUCTION

Business Process Modelling ("BPM") is the practice of documenting an organisation's key business processes in a manner which:

- Is highly graphical
- Focuses on business terminology rather than technical
- Allows all business steps/tasks to be included, not just those which involve a computer system

Mentioned below are the various core concepts of BPMN with the relevant definition and graphic notation.

PROCESS START

All processes have to start somehow, general notation for a process models commence with the START event, is a circle.	
One can use simply the *basic unmarked* start event as above, or one of the different types of start event, to provide more detail as described below.	
If a process starts when some sort of message arrives, mail, email, text. Following notation can be used	**Message start** 
If a process starts by virtue of the passage of time – e.g. 1st Jan review or 4 days after the purchase order is sent, following notation can be used	**TIMER Start** 
If the process starts when a rule/condition is met – e.g. when Incident Impact is more than 100,000.	**RULE Start** 
If a process starts when another process finishes. Following notation can be used	**LINK Start** 
If there is more than one 'trigger' for a process to start. Following notation can be used	**MULTIPLE Start** 

9 Appendix A: Business Process Modeling Notation Reference

TASK AND SUB PROCESS

Task	Task is a lowest level activity in a process map. A task is used when the work is not broken down to a finer level of detail	
Sub Process	A Sub-process is a compound activity which can be broken down into finer details.	
Loops	Loops task or sub process continues to iterate until the loop condition is true.	

INTERMEDIATE EVENTS

Following notation can be used to display the intermediate event, similar to start and end events.

BASIC	MESSAGE	TIMER	RULE	LINK	MULTIPLE
					

PROCESS END

All processes have to end somehow, general notation for a process models end will be a circle with a solid line.	
One can use simply use the *basic* end event as above, or you can use one of the different types of end event, to provide more detail, as described below:	

9 Appendix A: Business Process Modeling Notation Reference

If a process ends by something being sent via a message of some sort e.g., mail, email, document, following notation can be used.	MESSAGE End 
If the end of this process causes the start of another, following notation can be used.	LINK End 
If more than one consequence of the process ending, following notation can be used.	MULTIPLE End 

SWIMLANES

Pool	A *Pool* represents a participant in a Process. It is also acts as a "swimlane" and a graphical container for partitioning a set of activities from other Pools	
Lane	A *Lane* is a sub-partition within a Pool and will extend the entire length of the Pool, either vertically or horizontally. Lanes are used to organize and categorize activities.	

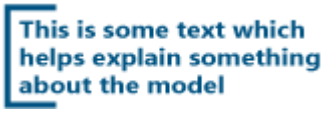
CONNECTORS

Sequence Flow	A *Sequence Flow* is represented by a solid line with a solid arrowhead (see the figure to the right) and is used to show the order (the sequence) that activities will be performed in a Process.	

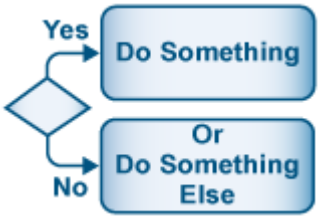
9 Appendix A: Business Process Modeling Notation Reference

Message Flow	A *Message Flow* is represented by a dashed line with an open arrowhead (see the figure to the right) and is used to show the flow of messages between two separate Process Participants. In BPMN, two separate Pools in the Diagram will represent the two Participants.	

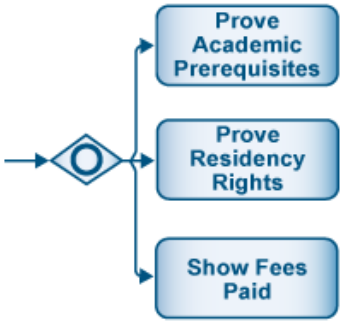
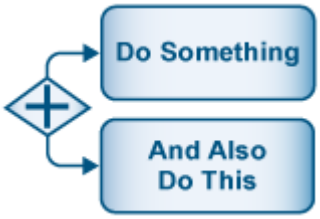
ARTIFACTS

Annotation	The ANNOTATION shape is used to add comments to a process model. It consists of text in a square left bracket	
Data Object	A data object represents a piece of data which is required or produced by the process eg. Customer details, output.	
Group	A grouping is purely for documentation or explanatory purposes. It has no impact on the model. It consists of a rectangle with dashed lines and rounded corners, usually enclosing other objects.	

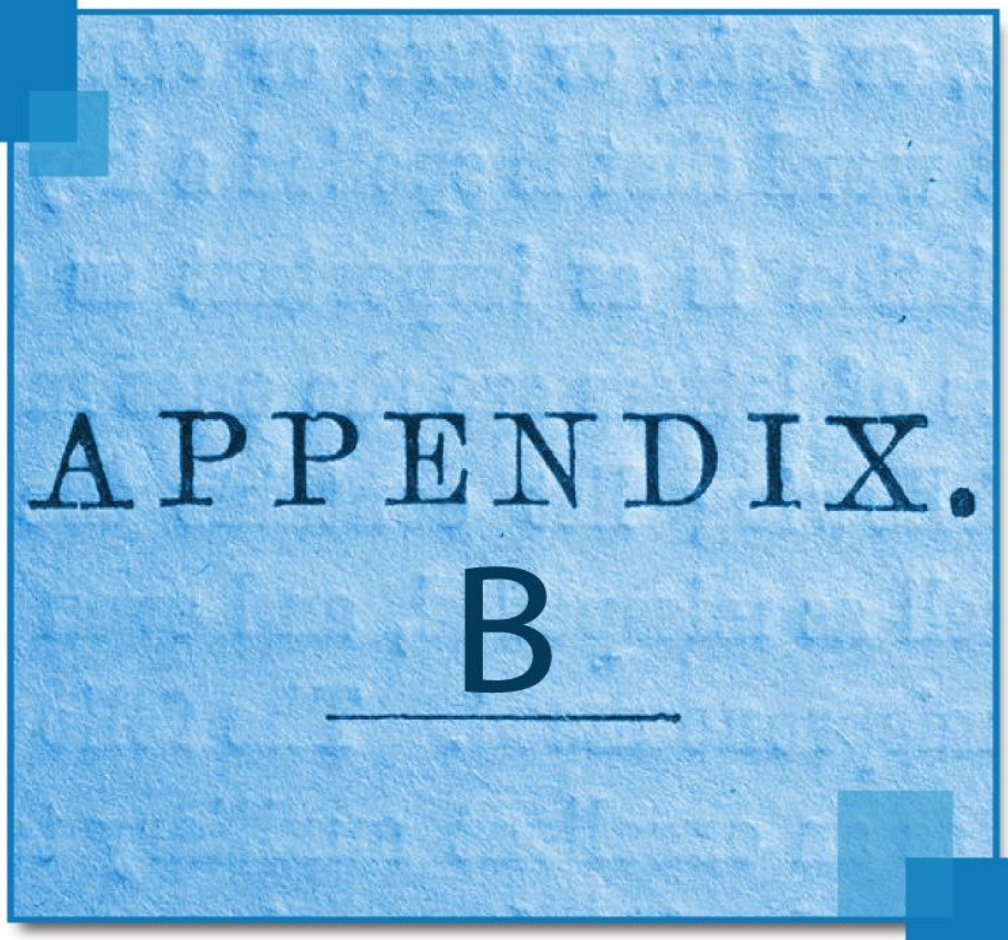
GATEWAYS

Exclusive	The values of the process are examined to determine which path to take	

9 Appendix A: Business Process Modeling Notation Reference

Inclusive	Each branch will be evaluated and will not stop when one branch condition becomes true.	
Parallel	Provides a mechanism to synchronise parallel flow and to create parallel flow.	

Appendix B: Chain of Infection



10 Appendix B: Chain of Infection

In order to control or prevent infection it is essential to understand that transmission stages of a pathogen resulting in infection requires the six vital links (Refer to the table below).

Each link mentioned below must be present for infection or colonization to proceed, and breaking any of the links can prevent the infection.

The section below details out the six stages:

Stage	Link	Description
1	Infectious Agent	Any disease-causing microorganism (pathogen)
2	The Reservoir Host	The organism in which the infectious microbes reside
3	The Portal of Exit	Route of escape of the pathogen from the reservoir.
4	The Route of Transmission	Method by which the pathogen gets from the reservoir to the new host
5	The Portal of Entry	Route through which the pathogen enters its new host
6	The Susceptible Host	The organism that accepts the pathogen

Link 1: Infectious Agent

The causative agent for infection is any microorganism capable of producing disease. Microorganisms responsible for infectious diseases include bacteria, viruses, rickettsiae, fungi, and protozoa. Sometimes, microorganisms are part of patient's own body flora and can cause infection in the immunocompromised host. These infections are called endogenous infections. Infections which are acquired from external sources are called exogenous infections.

Link 2: Reservoir Host

The second link in the chain of infection is the reservoir, i.e. the environment or object in or on which a microorganism can survive and, in some cases, multiply. Inanimate objects, human beings, and animals can all serve as reservoirs, providing the essential requirements for a microorganism to survive at specific stages in its life cycle.

10 Appendix B: Chain of Infection

Infectious reservoirs abound in health care settings, and may include everything from patients, visitors, and staff members to furniture, medical equipment, medications, food, water, and blood.

Link 3: Portal of Exit

The portal of exit is the path by which an infectious agent leaves its reservoir. Usually, this portal is the site where the microorganism grows. Common portals of exit associated with human reservoirs include the respiratory, genitourinary, and gastrointestinal tracts, the skin and mucous membranes and the placenta (transmission from mother to fetus)

Link 4: Route of Transmission

The microorganism can be acquired by inhalation (through respiratory tract), ingestion (through gastrointestinal tract), inoculation (through accidental sharp injury or bites), contact (during sexual intercourse) and transplacental transmission (microbes may cross placenta from the mother to fetus). It is important to remember that some microorganisms use more than one transmission route to get from the reservoir to a new host.

Of the six links in the chain of infection, the mode of transmission is the easiest link to break and is key to control of cross-infection in hospitals.

Link 5: The Portal of Entry

The portal of entry is the path by which an infectious agent invades a susceptible host. Usually, this path is the same as the portal of exit. For example, the portal of entry for tuberculosis and diphtheria is through the respiratory tract, hepatitis B and Human Immunodeficiency Virus enter through the bloodstream or body fluids and Salmonella enters through the gastrointestinal tract. In addition, each invasive device, e.g. intravenous line, creates an additional portal of entry into a patient's body thus increasing the chance of developing an infection.

Link 6: The Susceptible host

The final link in the chain of infection is the susceptible host. The human body has many defense mechanisms for resisting the entry and multiplication of pathogens. When these mechanisms function normally, infection does not occur. However, in immunocompromised patients, where the body defenses are weakened, infectious agents are more likely to invade the body and cause an infectious disease. In addition, the very young and the very old are at higher risk for infection because in the very young the immune system does not fully develop until about age 6 months, while old age is associated with declining immune system function as well as with chronic diseases that weaken host defenses.