Unit Three: Elements of a World-Class SCM Model: Logistics, Disposal, Risk And Performance Management

1. LEARNING OUTCOMES

1.1. AT THE END OF THIS MODULE THE LEARNER WILL:

1.1.1. Be able to identify and understand the key processes involved in municipal logistics management;

1.1.2. Have knowledge of Inventory Systems that can be utilised to increase efficiency and effectiveness of logistics;

1.1.3. Understand the key considerations to be taken into account in warehouse management including optimal utilisation of storage space, and safety and security.

1.1.4. Understand the processes required in terms of the MFMA in order to dispose of any asset of a municipality;

1.1.5. Understand and be able to suggest the most applicable disposal strategy for a variety of asset types;

1.1.6. Identify the eight key components of the risk management process and how these can be applied to SCM in identifying potential and actual risks;

1.1.7. List the key areas in which supply chain performance management should be undertaken, the manner in which each can be accomplished as well as the benefits of performance management to the municipality;

1.1.8. Have knowledge of the required internal and external supply chain management reporting requirements.

2. KEY CONCEPTS

2.1. Logistics Management; Codifying Items; Product Usage and Trends; Inventory Management and Assessment of Inventory Levels; JIT System; Warehousing; Storage of Items; Stocktaking; Disposal Management; Asset Management; Depreciation; Obsolescence Planning; Database of Redundant Material; Disposal Strategy for Assets; Risk Management Framework; Components of Risk Management; Risk Identification, Assessment and Strategy; Risk Mitigation; Supply Chain Performance Management; Contract Management and Supplier Performance Management; National SCM Policy and Strategic Objectives; Supply Chain Management Implementation Checklist; Monthly Reporting Questionnaire; Irregular Expenditure.

3. INTRODUCTION/OVERVIEW

3.1. Unit Two introduced the key elements of government's supply chain management model and discussed the first two components of the model, i.e.:

3.1.1. **demand management** which is the beginning of the supply chain where:

- a proper needs assessment is undertaken of required goods, works and / or services;
- specifications are determined;
- the industry is analysed; and
- requirements are linked to the budget.and

3.1.2. **acquisition management** which is the management of procurement by a municipality / municipal entity:

- to decide on the manner in which the market will be approached;
- to establish the total cost of ownership of a particular type of asset;
- to ensure that bid documentation is complete, including evaluation criteria;
- to evaluate bids in accordance with published criteria; and
- to ensure that proper contract documents are signed.

3.1.3. Unit Three continues to explain the model, detailing;
logistics management which is the aspect of SCM that addresses:
- the setting of inventory levels;
- receiving and distribution of material;
- stores, warehouse and transport management; and
- the review of vendor performance.;

3.1.4. disposal management which is the aspect concerned with should be given to:
- obsolescence planning;
- maintaining a data base of redundant material;
- inspecting material for potential re-use;
- determining a disposal strategy; and
- executing the physical disposal process:

3.1.5. risk management which involves the identification, consideration and avoidance of potential risks and

3.1.6. supply chain performance management which is the monitoring process, undertaking a retrospective analysis to determine whether the proper processes have been followed and whether the desired objectives were achieved. Some of the issues that may be reviewed are:
- compliance to policy objectives;
- cost efficiency of SCM process (i.e. the cost of the process itself); and
- whether supply chain practices are consistent with Government's broader policy focus; and
- whether there are means to improve the system

4. LEARNING ASSUMED TO BE IN PLACE

4.1. Communication at level 4

4.2. Mathematical literacy at level 4

5. UNIT CONTENT

5.1. THE UNIT COVERS THE FOLLOWING:

5.1.1. Unit 3.1: Logistics Management

5.1.1.1. Coding of items

5.1.1.2. Inventory Management and Setting of Inventory Levels

5.1.1.3. Placing of orders and receiving of goods

5.1.1.4. Stores, Warehousing and Transport Management

5.1.2. Unit 3.2: Disposal Management

5.1.2.1. Asset Management over the Useful Life of an Asset, Depreciation and Obsolescence Planning

5.1.2.2. Maintaining a Database of Redundant Material

5.1.2.3. Disposal Strategy for Assets

5.1.3. Unit 3.3: Risk and Performance Management

5.1.3.1. Risk Management: Components of Risk Management & SCM Risk Management

5.1.3.2. SCM Performance Management

5.1.3.3. Contract Management and Supplier Performance Management

5.1.3.4. Performance Management of SCM Project-Related Work

5.1.3.5. Internal Service Delivery Performance Management

5.1.3.6. Implementation of National SCM Policy and Strategic Objectives

5.1.3.7. External Reporting Requirements

5.1.4. Conclusion: Unit Three

6. UNIT 3.1: LOGISTICS MANAGEMENT

6.1. STOCK OR INVENTORY MANAGEMENT INCLUDES, INTER ALIA, THE FOLLOWING FUNCTIONS:

6.1.1. Coding of items;

6.1.2. Analysing product usage and trends;

6.1.3. Setting inventory levels;

6.1.4. Placing and expediting orders;

6.1.5. Receiving and distributing material timeously and accurately;

6.1.6. Stores, warehousing and transport management functions;

6.1.7. Minimisation of potential redundant material through thorough purchasing planning and analysis aligned to changes in the municipality and the industry as well as technological changes;

6.1.8. Generation of timeous payments to suppliers/contractors/service providers;

6.1.9. Continuous review of vendor performance to ensure timeous, efficient and effective delivery of services throughout the municipality.

6.2. A similar process occurs for fixed capital items (purchase of movable assets, construction and roads projects): appropriate classification, additions to asset and property registers, valuation, assessment of main use, etc. This component is discussed further under Unit 3.2.

6.3. Efficient municipal logistics management can assist in reducing costs in the supply chain while meeting and even exceeding departmental requirements. The management of logistics should be directly linked to planning for demand, the acquisition phase as well as the disposal phase of the supply chain.

6.4. CODING OF ITEMS

6.4.1. Coding of inventory and assets is a key component of logistics management. Ultimately, it would be ideal for all three spheres of government to utilise one coding system. National Treasury is currently investigating this possibility at a National and Provincial level and recommendations will be presented in the future.

6.4.2. Municipalities are required to implement a suitable coding structure that will, inter alia, assist with benchmarking of items; spend analysis and standardisation of products; market share analysis; organising and finding items in catalogues.

6.4.3. An international coding system that is managed as a free and open system (i.e. it may be utilised by any organisation without any direct cost), is the United Nations Standard Products and Services Code (UNSPSC). The system consists of a five-level hierarchical classification. Each level consists of a two-character numerical value and a textual description as indicated below:

6.4.3.1. XX - **Segment**: The logical aggregation of families for analytical purposes
6.4.3.2. XX - **Family**: A commonly recognised group of inter-related commodity categories
6.4.3.3. XX - **Class**: A group of commodities sharing a common use or function
6.4.3.4. XX - **Commodity**: A group of substitutable products or services
6.4.3.5. XX - **Business Function**: The function performed by the organisation in support of the commodity.

6.4.4. The above classification can be further expanded by adding 2 more digits after the commodity number which indicate the business relationship to the supplier e.g. wholesale, rental, lease etc.

6.4.5. Further information on the system and how it can be utilised can found on the UNSPSC website at http://www.unspsc.org/unspsc_resources.asp.

6.5. INVENTORY MANAGEMENT AND SETTING OF INVENTORY LEVELS

6.5.1. Efficient inventory management requires finding a balance between a large inventory, capable of continuously providing needs for speedy service delivery, and a small inventory, keeping costs as low as possible. The calculation of optimal stock levels should lead to the minimisation of inventory holding costs, economic usage of storage space, avoidance of stock becoming obsolete while at the same time ensuring availability of strategic items. Due consideration should thus be given to

6.5.1.1. Which items and quantities of items to be kept in stock;

6.5.1.2. Minimum/maximum quantities of stock based on consumption figures and inputs from user departments with regard to future needs;

6.5.1.3. A safety margin added to the minimum level (normally about 20%) in order to cover unforeseen circumstances.

6.5.2. **Identifying the real reason for holding inventory**. The major reasons are to ensure the availability of specific and specialised items of stock; protracted lead-times; and the need to ensure a continuous supply of inventory for ongoing daily processes and service delivery. Other considerations include:

6.5.2.1. Seasonal fluctuations with regard to certain municipal functions which may require higher stock holdings during peak periods throughout the year. Synchronisation between the demand-and-supply sequences is therefore crucial to the SCM function.

6.5.2.2. Utilisation of quantity discounts and transport in bulk to obtain total cost savings.

6.5.2.3. Protection against supply uncertainties and sudden price increases by suppliers as well as against unexpected events such as strikes and natural disasters.

6.5.3. **Differentiating between contract methods and procedures for purchasing inventories**: Most items of inventory are able to be grouped and categorised, and bids issued for medium-term supply contracts (from one to three years). Standing orders can then be placed against these contracts with particular suppliers to deliver goods over an agreed period of time at a fixed price, or at a pre-determined escalation rate. This normally includes a minimum quantity of goods ordered over a specific time period and is aimed at avoiding the cost of a large amount of small orders for standard requirements. Benefits include reduction in documentation; stock-keeping is done by suppliers; availability is assured; purchasing staff are freed up to accomplish more critical tasks; purchasing power is consolidated.

6.5.3.1. Inventory techniques and systems continue to evolve in order to devise the best solution to deal with an ever-changing environment. Requirements planning (MRP - Materials Requirements Planning, and ERP - Enterprise Resource Planning) as well as JIT (Just-in-Time) are two of the most recent techniques. Though requirement-planning techniques had many benefits, in general they tended to be very expensive, difficult to implement and required the assistance of consultants to provide extensive training and ongoing assistance in implementation. Due to this, many organisations turned their focus to the JIT system as an alternative solution.

6.5.4. **JIT Inventory System** - In line with this trend internationally, the NT guidelines identify **JIT purchasing** as a potential system for implementation. JIT has the advantages of lower inventory levels, smaller buffer stocks; reduced purchasing quantities; increased quality awareness; development of the human resources base and promotion of multi-skilling, and a continuous learning culture among

staff resulting ultimately in cost savings to the municipality. With the JIT system, stock is ordered just-in-time to have continuous stock, taking the lead-time of the particular item into account. It is critical to have an accurate demand rate calculated as well as a predictable lead-time. Most municipalities would need to significantly improve their supply chain management processes before JIT could be successfully implemented with the system depending on short and reliable delivery times, high quality standards and extremely reliable workers and suppliers. The absence of any of these elements could lead to poor service delivery and reduce productivity.

6.5.5. **ABC analysis (Pareto Analysis) –** According to Christopher, the ABC Analysis is mainly aimed at providing management with information on the importance of different inventory items in terms of monetary value. Successful implementation of this technique requires a thorough analysis of price, demand for the different items of inventory, delivery times and any specific critical issues or problems relating to the purchase of the various inventory items. (Christopher 2005:72).

6.5.5.1. This technique is based on the 80:20 rule (Pareto principle). In the case of inventory management, a general rule that applies is that 80% of the total value of issues of stock items in any year can be linked to 20% of the items held in stock. Using this rule of thumb, one can begin to categorise stock items:

- **Category A**: Small in number, but high in usage value (this is critical from a financial perspective). This category represents approximately 10% of the total number of items, but about 70% of the total rand value demand.

- **Category B**: Medium number and medium value, representing about 40% of the total number of items, but only about 20% of the total rand value demand.

- **Category C**: High number, low usage value. This category represents approximately 50% of the total number of items, but only about 10% of the total rand value demand.

6.5.5.2. In conducting an ABC analysis, Van Rooyen suggests that one should follow a 7-step process:

- ❒ List every inventory item on the basis of the stock item number.
- ❒ Determine the annual consumption and rand value of every item.
- ❒ Multiply every item's annual consumption by its rand value.
- ❒ Calculate, in rand, every item's percentage share of the total inventory in terms of annual consumption.
- ❒ Choose the top 10% of all items, in terms of the highest rand percentage, and classify them as Category A items.
- ❒ Choose the next 20% of all items, in terms of the highest rand percentage, and classify them as Category B items.
- ❒ The remaining 70% of all items would be classified as Category C items i.e. the lowest rand percentages.

6.5.5.3. The above process may seem extremely onerous, but may be simplified, with only a slight loss of accuracy, by sampling the usage values of the inventory items and plotting them on an ABC curve by using usage values at fixed intervals from the cumulative usage value table instead of plotting each inventory item. (Jessop and Morrison 1994:158)

6.5.5.4. *Control of the different categories*: According to the categorisation of the specific inventory item, the impact of a stockout and therefore the level of detail of control will differ. The following tables reflect the various aspects:

6.5.5.5. Differential Approach to 9 categories of stock

A: High usage value	**B: Medium usage value**	**C: Low usage value**	
AV	BV	CV	V – Vital. Stockout could be disastrous.
AI	BI	CI	I – Important. A stockout is highly undesirable.
AN	BN	CN	N – Normal. Ideally stocks should be available, temporary shortage acceptable.

Category	Approach to control	Frequency of stock check	Safety stock level
AV	Closely monitored control	High	Low
BV	Closely monitored control	High	Medium
CV	Automatic control	Medium	High
AI	Closely monitored control	High	Nil
BI	Supervised automatic control	Medium	Medium
CI	Automatic control	Low	Medium
AN	Closely monitored control	High	Nil
BN	Automatic control	Medium	Medium
CN	Automatic control	Low	Low

(Jessop and Morrison: 1994: 159)

6.5.5.6. The tables above should not imply that Category C items are unimportant. The supply of Category C items can, however, be supplied through high service levels and sufficient safety stocks at a lower cost than Category A items. Precise control is mandatory for Category A items, especially those with high unit and usage value, in order to ensure an economical and feasible approach and to reduce potential supply risks.

6.6. PLACING AND EXPEDITING ORDERS

6.6.1. An efficient, timeous system for the placing of orders is critical in any municipality. Orders are generated either when a particular stock item reaches the minimum stock level or where a request is received from a department for an item which is not held in stock. Where an existing contract exists, the order should be placed against the contract. Where no contract exists, the estimated price of the purchase should be estimated and if below R200 000, quotations should be requested from the database of accredited suppliers. If the estimated purchase value is above R200 000, an open competitive bidding process should be followed. It should be stressed that one should not only consider individual purchases, but also the cumulative value of anticipated purchases of the particular good or service (or category of good or service) over a financial year. The development of Procurement Plans per department as well as for the municipality as a whole would also assist in this regard. In addition, each

municipality should develop and approve a clear Supply Chain Management Procedure Manual in order to avoid any difference in opinion with regard to implementation of the SCM Policy.

GOODS AND SERVICES MAY NOT BE DELIBERATELY SPLIT INTO PARTS OR ITEMS OF A LESSER VALUE MERELY TO AVOID COMPLYING WITH THE REQUIREMENTS OF THE SCM POLICY
ESPECIALLY WITH REGARD TO THE COMPETITIVE BIDDING PROCESS.

6.6.2. Expediting orders which are not timeously received, or where the order is not fully complied with (e.g. part-delivery), is critical to ensure high quality service is delivered to the departments of the municipality. If adequately addressed throughout the financial year, the pressure at financial year end in following up outstanding orders on the financial system will be greatly reduced.

6.7. RECEIVING AND DISTRIBUTING ITEMS TIMEOUSLY

6.7.1. The receipt and distribution of items can be either centralised (normally in smaller municipalities), or decentralised in larger municipalities. There are, however, basic principles that apply in both approaches.

6.7.2. The stores system must be a fully integrated into the financial management system of the municipality in order to ensure timeous payments are made after verification of the correct goods and services received. On receipt of the goods, the quantity, quality and price must be verified against the order placed and any discrepancies immediately noted for corrective action to be taken. Full records of all orders placed, delivery notes, and final authorised invoices must be maintained for audit purposes. The goods must then be coded and stored until required for usage in service delivery of the municipality. In certain cases, the delivery of goods may be made directly to the department which placed the order. In this case it is even more critical to ensure that all the required documentation is received centrally by the Finance Department as well as user departments being fully aware of their responsibilities in ensuring the correct goods are received and verified.

6.7.3. An issue voucher should be produced before any item is issued from the stores. This will be linked to the accounting code reflecting the use of the specific item e.g. stationery or against the project on which it will be used e.g. Repairs and Maintenance of Street Lights. Consumable items are not tracked after issue from the store. However, fixed assets must be recorded from purchase to disposal and tracked throughout the useful life.

6.8. STORES, WAREHOUSING AND TRANSPORT MANAGEMENT

6.8.1. Although minimising the holding of large stock is best practice, in reality most municipalities are not yet at the point of integrated supplier networks and just-in-time procurement. In the interim, it is critical to maintain stores/stock and an efficient, effective and safe storage system. This also has certain advantages, some of which were mentioned previously in this section:

6.8.1.1. Creates time utility by making goods available when required;

6.8.1.2. Makes bulk transport possible which in turn should reduce the unit cost of the goods delivered;

6.8.1.3. Financial advantages may be gained through bulk purchasing discounts and to a certain extent price rises may be counteracted;

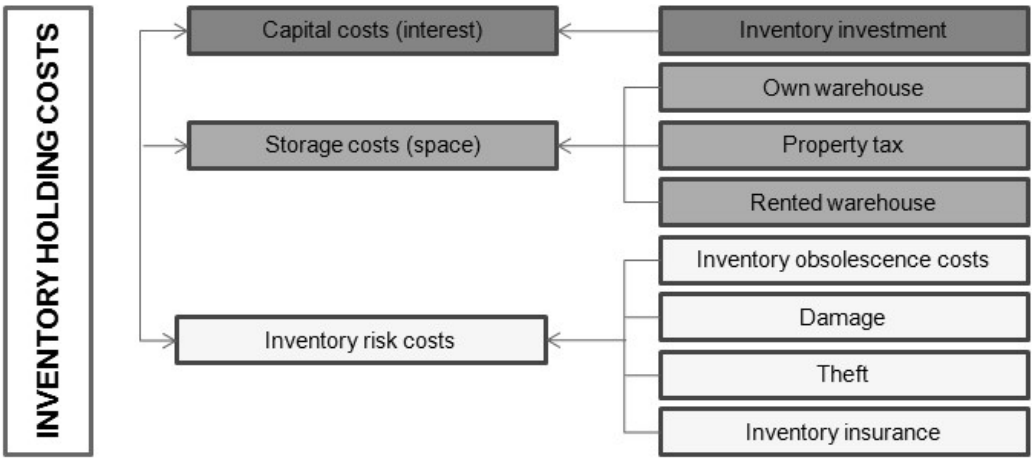
6.8.1.4. In certain cases bulk storage may be required for seasonal supply of materials and products; while usage is spread throughout the year; and

6.8.1.5. Storage protects an organisation against contingencies such as transport delays, stock shortages and strikes among suppliers.

6.8.1.6. Storage of goods has 2 main components:

- ❒ inventory-holding costs; and
- ❒ warehousing.

6.8.1.7. Components of municipal inventory-holding costs: In order to reduce the cost of inventory, it is necessary to concentrate on reducing the cost components indicated in the following diagram (Van Rooyen et al (2007: 175)):



6.8.1.8. **Warehousing**: The following trends have affected warehouse management:

- ❒ **JIT and reduced inventory**: storage of goods is reduced to transferring the goods from one form of transport to another and immediately dispatching the required goods to the required end destination;
- ❒ **E-commerce and advances in information technology**: warehouse management systems integrate the various functions, processes and activities. This provides management with an immediate insight into the movement and allocation of inventory in the warehouse;
- ❒ **Bar-coding and scanning technology**: This assists in the identification and monitoring of the movement of inventory in a warehouse. Reduces paperwork by utilising automatic downloads of scanned data directly to the warehouse management system;
- ❒ **Efficiency and customer service**: Warehouses are nodes in the supply chain and must provide efficient and effective service to departments and to suppliers in order to enhance service delivery;
- ❒ **New technology**: Modern warehousing requires automation, computerisation and new methods of communication to be able to provide

speed and efficiency, which are key requirements in the modern government and business environment.

- ❒ Though JIT is still the way to move in the future, until municipalities and other governmental organisations (and business) are ready for such systems, enhanced efficiency and effectiveness of warehousing is critical.

6.8.1.9. **Design and layout of stores**: In most cases municipalities are faced with stores/ warehouses which have been in existence for many years. However, if a municipality is seriously trying to improve its warehouse management, it would be a useful exercise to reconsider the existing warehouse based on the following processes.

- ❒ In order to design the best layout for the warehouse, a reliable forecast of the types of product and the quantity to be utilised is required. Planning should then be based on the annual usage estimates, issues per item, minimum quantity levels and safety stock per item. The extent of the stock requirement must be converted to cubic metre requirements, with consideration being given to packaging of goods. These forecasts must also take into account anticipated growth requirements of the organisation. Besides the storage space requirements, cognisance must also be taken of the aisle requirements which would depend on the usage of specific material-handling equipment. Additional space in the overall design must be given for receipt and inspection, dispatch, office facilities, restrooms and canteen facilities where appropriate. Van Rooyen et al (2007: 203) discuss additional principles for the layout of warehouse space as follows:
  - Single-storey buildings normally provide more useable space per rand invested;
  - Use a straight line or direct flow of goods to and from the store i.e. stores should be designed in an L- or T-shape;
  - Use effective materials-handling equipment which can be utilised in the respective design of the warehouse to increase efficient handling of materials;
  - Ensure that the storage plan of the stores allows for the most optimal usage of the space available;

- Keep passage space to a minimum, while allowing sufficient room for the efficient utilisation of equipment;
- Make maximum use of height of the building (cubic volume) as efficiently as possible;
- Offer the necessary protection for products by introducing special precautions necessary for storage of explosives, combustibles, fragile goods and those requiring refrigeration;
- Utilise the space in the best way to keep labour and handling costs to a minimum. Use inventory analysis to ensure that goods with a high turnover are stored in the most accessible area. The same applies to large and heavy goods that are difficult to handle, which should be stored close to the point of consumption.

6.8.1.10. **Safety and security in the warehouse**: Apart from ensuring that specific goods requiring special storage are handled and stored appropriately, as indicated above, various other considerations are critical:

- ❒ Safety of the workers (suitable protective clothing, training for usage of e.g. equipment, OHAS training etc.);
- ❒ Elimination of repetitive and/or manual handling of heavy goods which would also further prevent damage to materials.

- ❒ Through the implementation of the above, higher productivity can be achieved, worker morale improved as well as insurance costs reduced through minimisation of damage to goods.

6.8.1.11. **Stocktaking**: A proper record of all municipal assets (stock items, movable and immovable assets) should be maintained by the AO. All inventory and capital assets must be counted and confirmed through a stock-take at least once a year (preferably twice a year). Fixed Assets must be confirmed against the asset register. Stock is counted and confirmed against the inventory stock records. Any differences are required to be accounted for and if deficiencies are found, approval must be obtained from the Accounting Officer (if delegated authority by Council) to write off the differences.

6.8.1.12. **Transport Management**: Ensuring that the products or materials are received on time at the place where they are required and in a usable condition. Critical to manage due to the large costs involved (often 10% or more of the product cost). Consideration of suitable modes of transport i.e. road, shipping, air-freight or rail, depending on the goods required to be purchased.

- ❒ In addition, strong management of the internal usage of municipal motor vehicles is required. Logbooks should be maintained for all council fleet as well as ongoing maintenance as required in order to keep the vehicles in efficient working order and thus preserve their useful life.

ELIMINATION OF THEFT, LOSSES, WASTAGE AND MISUSE OF ASSETS should be considered throughout the above processes.

This can be done through ensuring that all damage and losses are accounted for; investigations are undertaken to advise whether recovery can be made; surpluses are immediately taken into account as an increase to assets.

HEALTH AND SAFETY ISSUES:

Safety of the workers (suitable protective clothing, training for usage of e.g. equipment, OHAS training etc.); elimination of repetitive and/or manual handling of heavy goods which would also further prevent injuries and damage to materials.