Appendix B – Proposed Implementation Approach

1. Introduction

The implementation of the OMS within the WWD is envisioned as a multi-phase roll-out with each phase corresponding to a primary business operational unit. The first phase (Phase 1) will focus on Water Services Division, Distribution Branch Operations, with following phases focusing on other business units within the department. A tentative sequencing of subsequent phases may be as follows:

Phase 1 - Water Services

Phase 2 - Wastewater Local Collections Branch Operations

Phase 3 – Water Services – Aqueduct Inspections and Maintenance

Planning for Phases 2 and beyond will be performed at a later date, after discussions with business stakeholder groups and consideration of future WWD strategic and operational needs.

2. Phase 1 Implementation

Water Services Division of WWD is responsible for the supply, storage, treatment, pumping, distribution and metering of potable water in order to ensure a safe and adequate supply of water for residential and commercial use. Phase 1 of the OMS project will focus on the implementation of the OMS for the Distribution branch of the Water Services Division.

The vast majority of daily work performed by the Distribution Branch generally falls into one of the following categories:

Service Requests – generally originate from the Corporate 311 system and are automatically registered within current work order management system (OWAM/Synergen). Service requests (SR) generally represent an investigation or short-running, task that is required to address a problem or complaint. Depending on the nature of the problem, the SR may spawn the creation of Work Order to remedy the particular problem, such as a water main leak or damaged hydrant.

Corrective Maintenance (CM) Work – work orders representing corrective work to be performed are created and managed within the work order management system. Such work is typically required to address a deficiency to some component of the operations and/or disruption to normal operations (e.g. water main leak, frozen or damaged hydrant, etc.). Corrective maintenance is the tasks performed to identify, isolate, and rectify a fault so that the failed equipment, machine, or system can be restored to an operational condition within the tolerances or limits for in-service operations.

Preventative Maintenance (CM) Programs – various “annual programs” exist within Water Services operational division to ensure quality of service is maintained and reduce risk / impact of potential failures. Activities, such as water main flushing, hydrant painting, and valve exercising, are planned out and then entered recorded as work orders within the work order system.

Scheduled Inspections – Similar to PM Programs, the WS branch performs annual inspections of all hydrants, twice per year. These inspections are performed as a basic but work is not recorded within the work order system.

A complete list Use Cases representing the functional areas of Water Services operations is contained in Appendix E Water Services Use Cases.

As noted previously in E3.9, the scope of Phase 1 is proposed to be delivered in a series of three (3) "stages", each designed to provide discrete functional capability and value to the business, in an incremental and timely fashion. The scope of each stage is:

(a) Stage 1 – Visualization of Incidents and Work Locations

(b) Stage 2 – Management of Service Requests and Operational Status

(c) Stage 3 – Management of Work Orders and Asset Maintenance

A more detailed description of each stage is provided in the following sections. In order to provide context for each stage, the first section introduces a description of the "current state" operations as it pertains to Service and Work Order management within the division and systems that support it.

3. Current State of Operations Management - Water Services, Distribution Branch

The following is a short description of the current state of operations management for Water Services Division, Distribution Branch. Visual representations of these processes are shown in Figure 1.

1) Daily work plans are organized through the creation of work orders in OWAM / Synergen. Once organized, paper-based work orders are printed on paper and distributed to field crews by Yard Clerks (WS Staff) at the beginning of each work day (shift). These work orders and other paper-based forms are used by crews to record details about the work (status, time, resources, etc), which are later re-keyed into the OWAM by a clerk.
2) Throughout the day, non-planned "service requests" are received within WOS automatically from the 311 Call Center system. Yard Clerks monitor the WOS for new SRs and based on current crew workloads and severity of problem, dispatch work to field-crews via mobile phone. Field crews record information regarding SRs on their paper time-sheets and submitted to the back office at the end of shift.
3) Special "Locations of Interest" represent incidents that are currently being investigated and/or managed by Water Services division. These incident locations are updated manually throughout the day by Yard Clerks within dedicated Sharepoint lists, such that they can be viewed by external departments (e.g. 311 Call Center operators).
4) A physical White-Board is maintained within the main operational area (Plinguet Road) which lists the current water main leaks and their state of repair. This information represents the most accurate and up-to-date status for all water main repairs.
5) Other custom applications and spreadsheets are used to manage other activities, not contained within the scope of the current WOS. This includes annual Hydrant Inspections and Water Main Flushing locations.

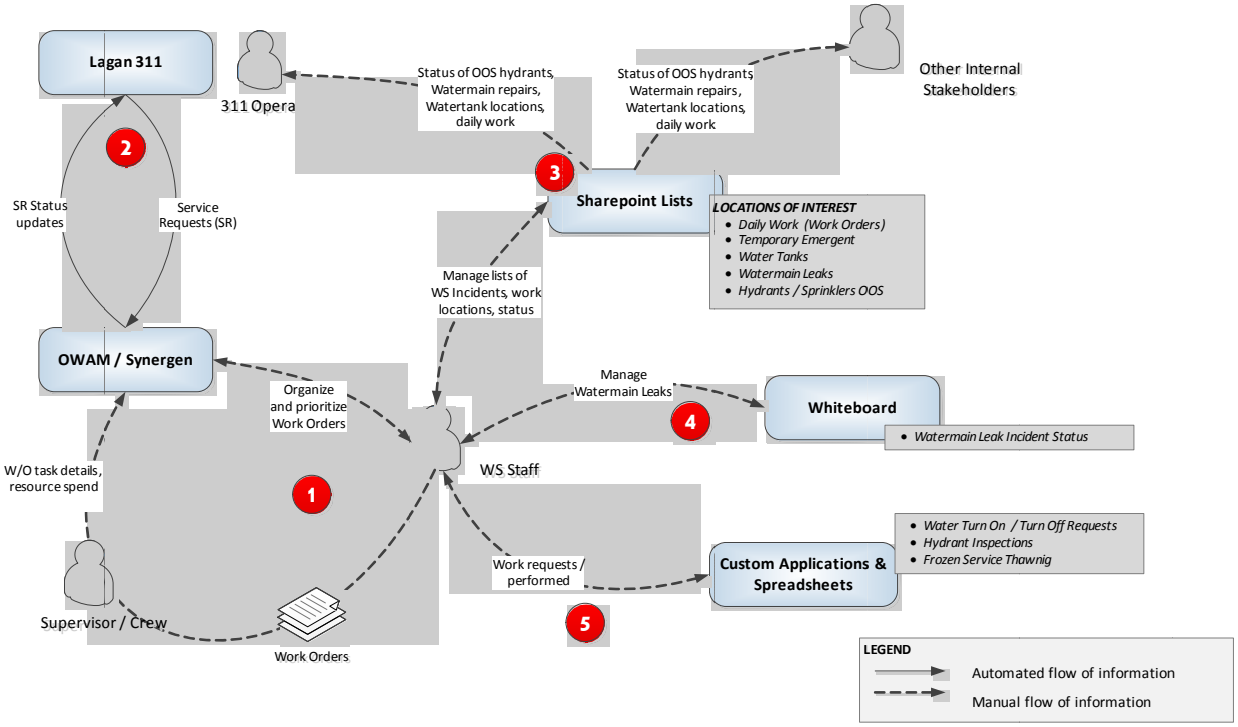

Figure 1 – Current State – Water Services Operations Management

Challenges with Current State

Interviews with Water Services division have identified a number of operational challenges and/or deficiencies associated with the current state, including:

- Distributed representations of the complete picture of operational activities and incidents;
- Duplicate data entry required to share information across business units;
- No visual (map) representation of work locations and/or incidents;
- Paper-based collection of work order status and related information and;
- Inability to track work activities and resource costs to assets.

4. Stage 1 - Visualization of Incidents and Work Locations

The first stage of the implementation is intended to provide operational insight into all operational incidents and activities of the branch and their respective locations. A conceptual view of this stage is shown in Figure 2.

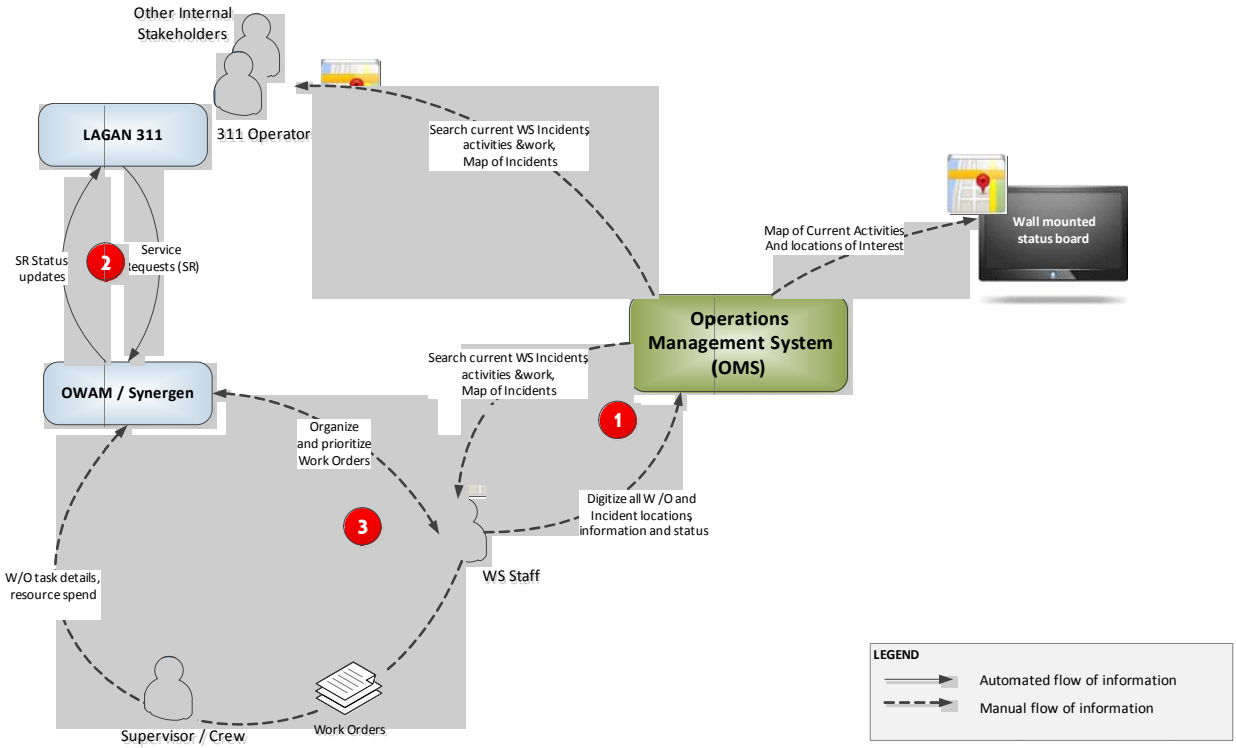

Figure 2 - Visualization of Incidents and Work Locations (Stage 1)

The key value propositions of this stage to the business stakeholders are as follows:

- Introduction of map-based view for spatial visualization of emergent incidents and work locations;
- Single point for updating and sharing status of various categories of location-based service requests and incidents with other departments.

This stage will deliver the following changes relative to the current state:

1) All incidents and CM/PM activities are centrally recorded within the OMS by back-office staff;
2) SharePoint lists and whiteboard are replaced with map-based (and grid-based) views of all Water Services activities and incidents;
3) Provide Read Only access to 311 Operators and other Water and Waste Division stakeholders for searching/lookup of Water Services incidents and work
4) Provide simple status tracking and reference to LAGAN Case ID and WOS service requests.

Assumptions & Limitations

- There are no automated interfaces between legacy systems (311 Call Center, Work Order System, etc). Just as staff manually maintain sharepoint list in current state, staff will use the OMS to serve as central location for recording all work activities and incidents.
- During stage 1, all work and incidents will be referenced by location only. Reference to assets will be introduced later in Stage 2.

5. Stage 2 - Management of Service Requests and Operational Status

The second stage of the implementation is focused on the central management of all service requests and operational status of assets into the OMS.

The key value propositions of this stage to the business stakeholders are as follows:

- Coordination of all service requests within the OMS.
- Ability to manage “state” (on/off, open/closed) of operational assets from the field.
- Ability to track / display operational status of valves and hydrants on a map.
- Ability to update SR status and notes from the field.
- Ability to associate SRs to assets where applicable.

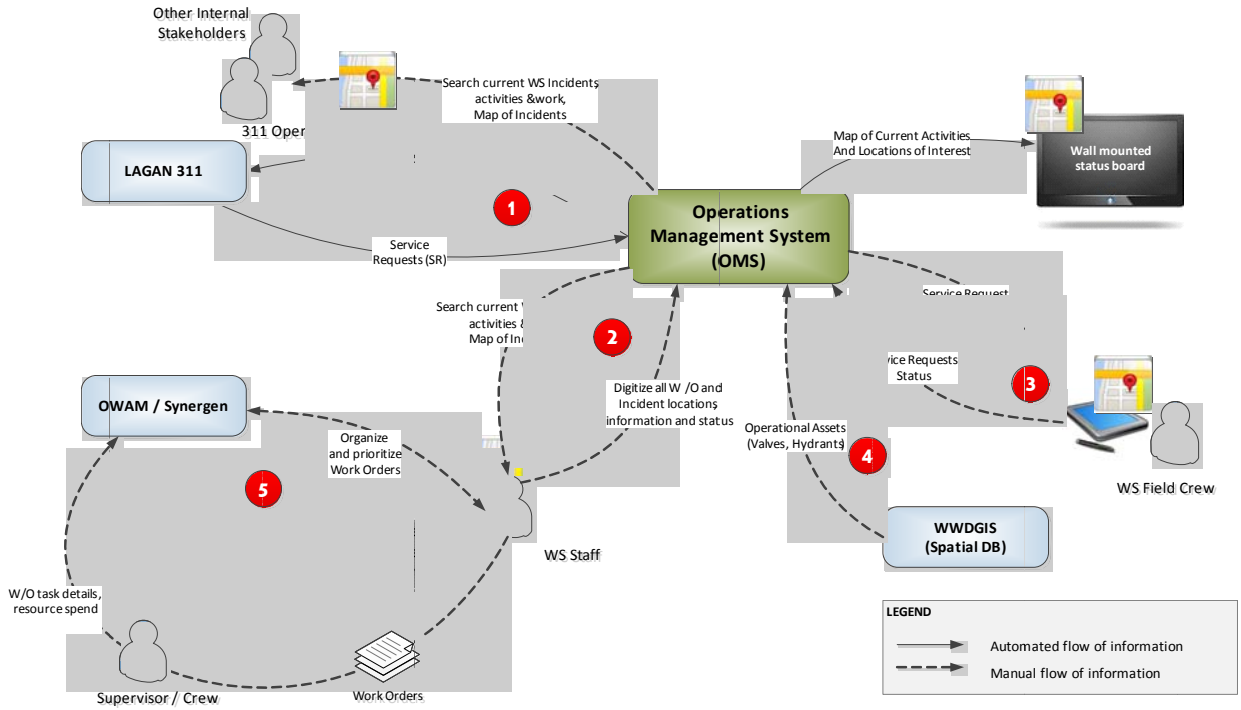

Figure 3 - Management of Service Requests and Operational Status (Stage 2)

In order to accomplish this state, the following changes are envisioned for the scope of Stage 2.

1) Existing bi-directional Service Requests interface from Lagan 311 to OWAM / Synergen is redirected to interface with the OMS.
2) All Service Requests (from Lagan 311 or elsewhere) are managed from beginning to end within the OMS. OMS used to centrally co-ordinate Water Services events and reconcile multiple Service Requests per incident.
3) Remote access to the OMS by Water Services staff working in the field via tablet / mobile devices. Transition from the use of paper-based forms in the field to capture status and incident information directly into the OMS.
4) Introduction of Water Distribution assets (Water mains, Valves and Hydrants) into the OMS for operational status tracking (valve open /close, hydrant in/out of service, etc) and asset pertinent reference information. Operational status of relevant assets will be tracked within the OMS.
5) OWAM / Synergen continues to be used for management of work orders involving complex work flows and/or resource allocation.

Assumptions & Limitations

1) The scope of Stage 2 involves Services Requests only.
2) Work Orders will continue to be created and managed in OWAM per current work practices.
3) Existing paper-based work orders are used per current state.

6. Stage 3 - Management of Work Orders and Asset Maintenance Activities

The third and final stage of the implementation will complete the transition of all work order and asset management activities and processes to the OMS.

The key value propositions of this stage to the business stakeholders are as follows:

- Central recording and coordination of all operational branch activities within the OMS.
- Operational insight into all activities, with spatial context.
- Tracking of all maintenance activities, incidents and associated costs to assets.

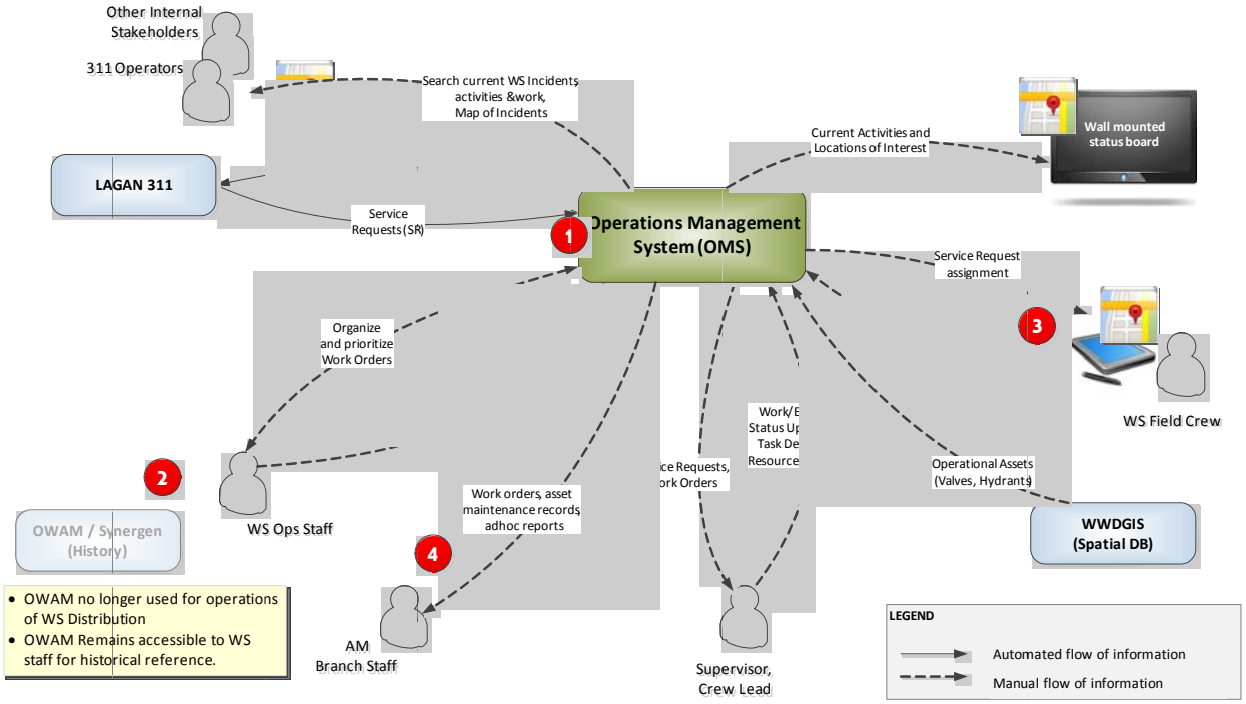

Figure 4 - Management of Work Orders and Asset Maintenance Activities (Stage 3)

During this stage, the following changes will occur relative to the previous stage:

1) Business unit is completely transitioned to OMS for managing all Corrective Maintenance and Preventative Maintenance activities of water assets.
2) Legacy work order management is available for historical reference only.
3) Replacement of all paper-based Work Order records keeping with mobile devices and/or computer workstations accessing the OMS directly.
4) Records related to asset maintenance history and other operational incidents are made available for trending analysis and reporting by external systems and stakeholders.

Assumptions & Limitations

1) Conversion of data from the existing OWAM system will not be transitioned into the OMS.
2) The OWAM system will be available for Water Services to reference historical records.