

CITY OF HENDERSON

MAS TRANSITION REQUIREMENTS

IBM Maximo 7.6.1.3 → MAS 9.x Upgrade

On-Premises + Managed Services Deployment

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1. PURPOSE AND SCOPE

This document defines the functional and technical requirements for transitioning the City of Henderson's IBM Maximo Asset Management environment from version 7.6.1.3 to IBM Maximo Application Suite (MAS) 9.x under an On-Premises using Managed Services deployment model.

The document consolidates the requirements necessary to redesign existing integrations, replace Java customizations with Automation Scripts, and address DocLinks/attachment storage for the target MAS environment. It serves as the primary reference for planning, executing, and validating the transition.

This document is complemented by the MAS Integration Requirements Matrix, which details each individual requirement and associates it with the function it supports for use during Unit Testing.

2. CURRENT STATE (AS-IS)

2.1 Environment Summary

Attribute	Current State
Maximo Version	7.6.1.3
Database Platform	Oracle
Production DB Size	~350 GB
DocLinks Storage	~400 GB
Active Users (PROD)	435
AppPoints	1,382
Concurrent Users	~400
Current Licensing	CapEx – Perpetual Licenses
Environments	Production, Test, Development
Active Integrations	13 (see Section 4)

2.2 Integration Landscape Summary

The City currently operates 13 active integrations spanning customer information, metering, financial systems, GIS, mobile workforce, citizen request management, reporting, and identity management. Several integrations rely on direct database connectivity (DBLINK, PL/SQL, direct DB queries) which are preserved under the on-premises deployment model.

2.3 Java Customizations

The current environment includes a limited number of Java customizations. The primary customization allows users to attach files to multiple assets and locations from the List tab within the Assets and Locations applications. Beginning with MAS, IBM recommends replacing Java customizations with Automation Scripts.

3. TARGET STATE (TO-BE)

3.1 Deployment Model: On-Premises + Managed Services

Under this deployment model, the MAS 9.x infrastructure is hosted on-premises within the City's data center, with a managed services vendor responsible for infrastructure operations, including Red Hat Enterprise Linux (RHEL) and OpenShift management, security patching, and platform maintenance. The City retains control over upgrade scheduling and database administration.

Attribute	Target State
MAS Version	9.x (latest GA release)
MAS Application	Maximo Manage with Maximo Spatial Add-on
Database Platform	Oracle (retained)
Deployment	On-Premises, City Data Center
Infrastructure Mgmt	Managed Services Vendor (OS, OpenShift, patching)
Upgrade Control	City controls patch/upgrade scheduling
Database Access	City retains full DBA access
DocLinks Storage	NFS (Kubernetes PV) or S3-compatible on-prem storage
Identity Management	Microsoft Entra ID (SAML 2.0 / OIDC)
AppPoints Monitoring	MAS Suite License Service (SLS)

3.2 Key Advantages of On-Prem Deployment

- All existing database-level integrations (DBLINK, PL/SQL, direct DB queries) can be retained with minimal changes
- City retains full database access for DBA operations, reporting, and data extraction
- Lower integration redesign effort compared to cloud deployment
- City controls upgrade scheduling and patching cadence
- Security perimeter remains within the City's firewall

3.3 Infrastructure Requirements

The on-premises deployment requires the addition of compute, memory, and storage resources to the City's data center to support the MAS 9.x platform on Red Hat OpenShift. Per the IBM infrastructure calculator, a minimum of 50 CPUs, 237 GiB of memory, and 1,050 GiB of storage is required. These values must be validated by the managed services vendor.

4. INTEGRATION TRANSITION REQUIREMENTS

This section describes each integration, its current architecture, the transition approach for the on-premises deployment model, and the high-level requirements. Detailed requirements are captured in the companion MAS Integration Requirements Matrix.

4.1 Cayenta CIS

Attribute	Details
Current Architecture	<ul style="list-style-type: none"> Database Link (DBLINK) from Cayenta Oracle DB to Maximo Oracle DB. ~10 PL/SQL stored procedures on Cayenta side. Interface tables for inbound/outbound. PHP page queries Maximo DB directly. Database views on WO table via DBLINK.
Transition Approach	Maintain current DBLINK architecture as-is. The on-premises deployment preserves direct database connectivity between Cayenta and Maximo Oracle databases.

Requirements:

- Validate all 10 PL/SQL stored procedures function correctly against MAS 9.x Maximo Manage database schema
- Verify interface tables are migrated and schema-compatible with MAS 9.x
- Confirm DB views on the Maximo WO table via DBLINK remain functional
- Update PHP page connection strings to point to MAS 9.x Maximo database
- Test bi-directional WO flow: Cayenta-created WOs inbound, closed WO status outbound via publish channels
- Validate publish channel configurations in MAS 9.x Integration Framework

4.2 AMI / SmartWorks MDMS

Attribute	Details
Current Architecture	<ul style="list-style-type: none"> Indirect integration: SmartWorks (cloud) → Cayenta → Maximo. Two WO flows (stuck check, meter check). Python script calls Maximo REST API. Mass Meter Exchange (MME) uses TOAD ETL pulling CSV from Maximo DB.

Transition Approach	Preserve existing Cayenta-routed WO flows. Retain Python REST API script. Maintain TOAD/ETL direct DB access for MME since on-prem DB remains accessible.
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Requirements:

- Validate Python script REST API calls against MAS 9.x endpoints (URL structure, authentication changes)
- Confirm TOAD ETL tool connectivity to MAS 9.x Oracle database for MME CSV extraction
- Test stuck-check and meter-check WO creation flows end-to-end through Cayenta
- Verify account location data synchronization between SmartWorks and Maximo
- Document future-state architecture for permanent API-based integration (SmartWorks APIs + Maximo APIs)

4.3 Comcate

Attribute	Details
Current Architecture	<ul style="list-style-type: none"> • Comcate pushes Service Requests to Maximo via reverse proxy. • Maximo sends status updates back via web services. • Token-based authentication refreshed every 4 hours via automation script, stored in database.
Transition Approach	Update authentication to use API Key method compatible with MAS 9.x. Reverse proxy and web service architecture remain largely unchanged.

Requirements:

- Migrate token-based authentication to API Key authentication for MAS 9.x compatibility
- Validate reverse proxy configuration for MAS 9.x endpoint URLs
- Test SR creation flow: Comcate supervisor button triggers SR in Maximo
- Verify status-update web services from Maximo to Comcate (closing status resolves Comcate case)
- Review automation script for token handling; consider storing token in system property
- Note: Comcate upgrade/replacement discussion expected April 2027

4.4 PeopleSoft

Attribute	Details
Current Architecture	<ul style="list-style-type: none"> DB-to-DB integration. Maximo queries PeopleSoft via PL/SQL on the Maximo Oracle DB. Data stored in a custom Maximo table (no interface tables). Weekly frequency.
Transition Approach	Retain the current PL/SQL-based approach since on-prem deployment maintains direct database access. However, direct insert into base tables should be reviewed.

Requirements:

- Validate PL/SQL scripts against MAS 9.x Maximo Manage database schema changes
- Verify custom table structure is preserved through the upgrade
- Confirm Vendor, GL Component, and GL Account data sync operates correctly
- Review direct inserts into Maximo base tables; assess risk and recommend best practice (interface tables or MIF)
- Design for extensibility: plan for future craft and labor code data exchange

4.5 ArcadisGen (Asset Planning & Forecasting)

Attribute	Details
Current Architecture	<ul style="list-style-type: none"> SQL statements pull WO data from Maximo Oracle DB to a staging table on a separate on-premises database. ArcadisGen (SaaS) consumes from staging table.
Transition Approach	Retain current SQL-based data extraction from Maximo DB to staging table. On-prem deployment preserves this two-hop architecture.

Requirements:

- Validate SQL extraction scripts against MAS 9.x database schema
- Confirm staging table population continues to function post-upgrade
- Verify ArcadisGen SaaS can consume data from the staging table without changes
- Test WO data completeness and accuracy for condition assessment and forecasting use cases

4.6 GIS (Geographic Information System)

Attribute	Details
Current Architecture	<ul style="list-style-type: none"> • Bi-directional sync using GeoWorx Sync (GIP) for some feature classes and Maximo Spatial data sync for others. • 33-35 asset feature classes, ~13 location feature classes. On-premise GIS. Whitelist-based map security.
Transition Approach	No major changes required. On-premise GIS connectivity to on-premise MAS is preserved. Maximo Spatial add-on must be deployed.

Requirements:

- Deploy and configure Maximo Spatial add-on in MAS 9.x
- Validate GIS map rendering and layer access in MAS 9.x Spatial interface
- Confirm all 10-12 asset and 2 location feature classes sync correctly
- Review whitelist-based map security; evaluate migration to HTTPS + token-based security for MAS 9.x
- Test bi-directional data sync for both GeoWorx-managed and Spatial-config-managed feature classes
- For the Work Order and Service Request layers, the Maximo Spatial configuration must be updated to align with the MAS version of Maximo Spatial, which no longer supports multiple layers using the same GIS Object in Map Manager. Each layer must be configured with a unique GIS Object. Maximo will require a script to update the record's GIS Object when the status changes from open to closed.

4.7 GeoNexus GIP (GIS/Maximo Data Synchronization)

Attribute	Details
Current Architecture	Uses versioned geodatabase (geoDB) connection to synchronize data between GIS and Maximo. Bi-directional.
Transition Approach	Maintain current architecture using Maximo REST endpoints. On-prem deployment supports versioned geoDB connection.

Requirements:

- Validate GIP connectivity to MAS 9.x Maximo REST endpoints
- Validate bi-directional sync for all GIP-managed feature classes

4.8 LDAP / Active Directory Authentication

Attribute	Details
Current Architecture	LDAPSYNC cron task synchronizes user accounts from Active Directory into Maximo.
Transition Approach	Migrate from LDAPSYNC to MAS 9.x identity management using Entra ID (Azure AD). MAS 9.x supports SAML 2.0/OIDC for authentication and SCIM 2.0 for user provisioning.

Requirements:

- Configure MAS 9.x Suite-level identity provider integration with Microsoft Entra ID
- Define SAML 2.0 or OIDC authentication flow between Entra ID and MAS 9.x
- Implement user provisioning via SCIM 2.0 or pull-based LDAP sync as appropriate
- Map existing AD security groups to MAS 9.x security groups and roles
- Ensure seamless user authentication continuity during cutover (no disruption to 435 active users)
- Test SSO login flow, group-based role assignment, and new user provisioning

4.9 Reports & Business Intelligence

Attribute	Details
Current Architecture	<ul style="list-style-type: none"> • Power BI with direct DB connection and Data Warehouse. • Azure Data Lake pipeline reads from Maximo and PeopleSoft weekly. • City wants semantic models in Power BI.
Transition Approach	On-prem deployment preserves direct database connections for Power BI and Azure Data Lake. City can continue current approach while building toward semantic model architecture.

Requirements:

- Validate Power BI direct database connections against MAS 9.x Oracle database
- Confirm Azure Data Lake weekly data pipeline reads from correct schema post-upgrade
- Assess the feasibility of a weekly DB backup/replica for dedicated reporting use
- Validate Data Warehouse refresh processes if applicable
- Plan for semantic model creation in Power BI against MAS 9.x data sources

- Verify all BIRT reports function correctly in MAS 9.x (schema and report server changes)

4.10 EAM360 Mobile (Technician Application)

Attribute	Details
Current Architecture	Third-party mobile solution with local data storage on devices (zip file). Includes a map package interacting with GIS layers.
Transition Approach	Follow EAM360 vendor-prescribed MAS upgrade process.

Requirements:

- Confirm EAM360 version compatibility with MAS 9.x
- Follow EAM360 MAS upgrade/migration procedure per vendor documentation
- Validate map package functionality with MAS 9.x and GIS layers
- Test field technician workflows end-to-end on mobile devices

4.11 Asset Cost Rollup

Attribute	Details
Current Architecture	PL/SQL scripts executed directly on the Maximo Oracle database.
Transition Approach	Retain the current PL/SQL approach since on-prem deployment maintains direct Oracle DB access.

Requirements:

- Validate PL/SQL rollup scripts against MAS 9.x database schema
- Assess whether automation script replacement is advisable for long-term maintainability

4.12 DocLinks / File Servers (Attachment Storage)

Attribute	Details
Current Architecture	~400 GB of attached documents in the current DocLinks storage.
Transition Approach	Migrate to NFS-based storage using Kubernetes persistent volumes (recommended for on-prem). Evaluate S3-compatible on-prem object storage as alternative.

Requirements:

- Select storage architecture: NFS (Kubernetes PV) or S3-compatible on-premises object storage
- Develop a migration plan for ~400 GB of existing DocLinks content

- Configure MAS 9.x DocLinks to point to the new storage location
- Validate document access, upload, and retrieval post-migration
- Address performance, backup/recovery, and access control for the chosen storage option
- Verify the Java customization for multi-asset/location file attachment is replaced

4.13 SharePoint Links

Attribute	Details
Current Architecture	O&M Manuals, map files, and documents stored in SharePoint are referenced in Maximo via links.
Transition Approach	Ensure SharePoint URL references remain functional in MAS 9.x DocLinks configuration.

Requirements:

- Validate MAS 9.x DocLinks configuration supports SharePoint URL references
- Test link resolution and document access from MAS 9.x interface
- Address any URL pattern changes or authentication changes (SSO/token) in MAS 9.x

5. JAVA CUSTOMIZATION REPLACEMENT REQUIREMENTS

IBM recommends replacing all Java customizations with Automation Scripts beginning with MAS. The City's primary Java customization enables users to attach files to multiple assets and locations from the List tab in the Assets and Locations applications.

5.1 Functional Requirements

- Users must be able to attach files to multiple assets simultaneously from the Assets List tab
- Users must be able to attach files to multiple locations simultaneously from the Locations List tab
- The attachment workflow must replicate the current user experience as closely as possible
- Attached files must be stored in the target DocLinks storage (NFS or S3)

5.2 Technical Requirements

- Develop an Automation Script to replace the Java customization
- The script must leverage the MAS 9.x Maximo Manage API for DocLinks operations
- The script must handle bulk operations efficiently without performance degradation
- The script must be compatible with MAS 9.x security and role-based access controls
- Unit tests must validate: single attachment, multiple attachments, large file handling, error handling

6. DOCLINKS AND ATTACHMENT STORAGE REQUIREMENTS

MAS 9.x supports two storage options for attached documents: NFS using Kubernetes persistent volumes, or S3-compatible cloud object storage. For on-premises deployment, both options are viable.

6.1 Storage Decision Criteria

Criterion	NFS (Kubernetes PV)	S3-Compatible (On-Prem)
Complexity	Lower; standard NFS mount	Higher; requires S3 compatible library
Scalability	Limited by NFS infrastructure	Highly scalable object storage
Backup/Recovery	Standard NFS backup tools	Built-in replication/versioning
Performance	Good for sequential access	Good for concurrent access
Cost	Existing infrastructure	Additional storage cost

6.2 Migration Requirements

- Migrate ~400 GB of existing DocLinks content to the selected storage target
- Update DocLinks configuration in MAS 9.x to point to the new storage location
- Validate document access, upload, download, and deletion post-migration
- Ensure SharePoint URL references continue to resolve correctly (see Section 4.13)
- Verify backup/recovery procedures for the new storage architecture

7. AUTHENTICATION AND IDENTITY MANAGEMENT REQUIREMENTS

MAS 9.x uses a fundamentally different identity management architecture than Maximo 7.6.x. The City intends to use Microsoft Entra ID (formerly Azure AD) as the identity provider.

- Configure MAS 9.x to use Entra ID as the identity provider via SAML 2.0 or OIDC
- Implement user provisioning via SCIM 2.0 or configure pull-based LDAP synchronization
- Map existing Active Directory security groups to MAS 9.x security groups and application roles
- Define role-based access for all MAS 9.x applications (Manage, Spatial, Administration)
- Test SSO authentication flow for all users
- Plan for zero-downtime authentication cutover during go-live

8. DATABASE REQUIREMENTS

Oracle will be retained as the database platform through the upgrade. The City retains full DBA access under the on-premises deployment model.

- Confirm minimum Oracle version required for MAS 9.x and apply any necessary patches
- Execute database schema migration as part of the MAS 9.x upgrade process
- Validate all database objects (tables, views, indexes, stored procedures) post-upgrade
- Assess the feasibility of a database replica for dedicated reporting use
- Ensure database backup and disaster recovery procedures are valid for MAS 9.x

9. ADDITIONAL MAXIMO SPATIAL CONFIGURATION

In addition to the defined transition requirements, the Maximo Spatial configuration must be expanded to include seven (7) additional GIS layers, each corresponding to a new GIS object. This expansion must incorporate all required configuration components, including endpoints, object relationships, and security settings.

The new configuration must also ensure compatibility and testing with GeoNexus GIP to support data synchronization in a manner consistent with the existing GIS layers.

Configuration activities within the GeoNexus GIP platform itself are outside the scope of this effort.

10. ASSUMPTIONS AND DEPENDENCIES

The requirements described in this document are based on the following assumptions and dependencies.

10.1 Assumptions

- The City provides access to appropriate stakeholders for each integration
- Doc Attachments refers to Maximo DocLinks
- The managed services vendor is responsible for Red Hat OS and OpenShift infrastructure
- Oracle database licensing is addressed separately by the City
- The City's data center has sufficient capacity for the additional infrastructure requirements
- EAM360 vendor provides a supported MAS 9.x upgrade path

10.2 Dependencies

- Cayenta internal discussions regarding REST API approach must be resolved
- Comcate upgrade/replacement decision (April 2026) may affect integration scope
- EAM360 vendor must confirm MAS 9.x compatibility
- Managed services vendor must validate IBM infrastructure calculator sizing estimates