

**Procedure:** 13-6 - IT Development Procedures  
**Section:** Information Technology Procedures  
**Office/Department:** IT Applications

**Reports To:** 020DivInformation Technology  
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### IT Development Procedures

- GDOT will provide a Hyper-V virtual/SharePoint Developer Environment (SPD) for the development activity to occur within. The SPD can reside in the consultants/contractors environment.
- Contractors will be responsible for providing licenses within their IT environment
- GDOT will be responsible for providing licenses within the GDOT IT environment
- GDOT's IT will be engaged on system requirements, system design/architecture, development, integration, and GDOT IT support of the various components/deliverables
- Consultants will gather/document Requirements (functional and non-functional/technical/system requirements)
  - Based on business requirement specifications the consultant shall identify the potential risks or issues that need to be mitigated in the Architectural Design.
  - Expected levels of service, high availability architecture needs, business continuity (BC), and Disaster Recovery (DR) requirements shall be documented.
  - Open Records/Freedom of Information Act (FOIA) and information security requirements (e.g. data encryption) shall be documented.
  - Consultants will work with the business steward to assess the risk of unauthorized alteration, unauthorized disclosure, or loss of the data for which the business steward is responsible and ensure, through the use of monitoring systems, that the GDOT is protected from damage, monetary or otherwise.
- Consultants will provide Business Requirements to GDOT for review/approval. This review/approval from GDOT will include Sponsoring Business Offices and the Division of Information Technology
- Within 10 business days after Requirements have been provided to GDOT a preliminary architectural discussion can occur. This discussion will be a general approach based upon the Requirements, GDOT's Technical Standards, Current Department applications; this discussion must occur prior to commencement of any development activities. GDOT's IT Enterprise Architects must attend this discussion.
- Consultants will develop an Architectural Design for this development effort and present this Architectural Design to the GDOT IT Enterprise Architects for review/approval
- Development activities can commence after GDOT approval of the Architectural Design.
- The consultant shall provide logical and physical database schemas (as entity relationship diagrams), data dictionaries, and any data migration workflows to enterprise architects and DBA's for review/approval.
- Data migration shall be documented using GDOT's data mapping template and guidelines to indicate all source tables and columns which are or are not to be migrated and their corresponding target tables and columns. All tables and columns in the source and target shall be accounted for in the documentation. Look-up table values and or geodatabase domains shall also be identified from source to target in data mapping documentation.
- All documentation shall be updated to match final/accepted deployed physical product implemented at GDOT. Documentation is expected to be complete and correct as per GDOT specification.

- Consultants will not have direct access to testing/QA or production database schemas or objects. All objects, tables, etc., that need to be created/alterd should be scripted and provided to GDOT's database resource assigned to the project for implementation within GDOT.
- Consultant may perform Unit/System development in the GDOT IT "sandbox" development environment provided.
- GDOT will perform UAT, QA/QC in GDOT's Testing/QA environments to ensure the application will work within GDOT's Environment; Coordination must occur to deploy the application to GDOT's Testing/QA environments. Deployment to GDOT's QA environments can only be accomplished by GDOT personnel. QA deployments can occur within pre-production environments.
- User Acceptance Testing will also occur within GDOT's QA Environments. Deployment to GDOT's QA environments can only be accomplished by GDOT personnel.
- User Training will occur within GDOT's Training Environment. Deployment to GDOT's Training environment can only be accomplished by GDOT personnel.
- Deployment to Production. Deployment to GDOT's Production environment can only be accomplished by GDOT personnel and must be scheduled in advance. GDOT requests at least one week of notice for deployments to production (unless it is a support issue/bug fix). GDOT IT shall indicate if deployment or upgrade will occur during business operation hours or if it must be performed after business operation hours.
- Business Continuity (BC)/Disaster Recovery (DR) will occur within GDOT's Business Continuity/Disaster Recovery Environments. Systems are expected to use storage based replication to GDOT's Business Continuity/Disaster Recovery Environments which can only be accomplished by GDOT personnel.

#### Expected Deliverables\*

- Business Requirements Document (BRD)
  - Each requirement (e.g., hardware, software, user, operator interface, and safety) identified in the design specification shall be evaluated for accuracy, completeness, consistency, testability, and correctness. Design document shall be evaluated to verify that:
    - There are no internal inconsistencies among requirements;
    - Requirements compatibility with existing systems and systems integration;
    - All of the performance requirements for the system have been spelled out;
    - Fault tolerance, safety, and security requirements are complete and correct;
    - Allocation of software functions are accurate and complete; and
    - All requirements are expressed in terms that are measurable or objectively verifiable.
  - A system requirements traceability analysis shall be provided to trace software requirements to (and from) the user interface.
  - Documented business unit data owners and business unit data maintenance responsibilities
  - Documented data retention policy
  - Report Description: Description of each report. Included are reporting requirements, all input parameters and sample output.
  - Training Requirements: Description of what training materials are to be produced and degree of online or classroom training to be implemented
- Architectural Design Document (ADD)
  - System Design Overview: Includes program specifications developed in the planning phase of the project and description of the system/subsystem functions, and the logic flow of the entire system/subsystem in the form of a diagram.
  - Operational Environment: Includes operations, equipment, support software and interfaces.

- Object Reference: Identifies and describes all program (sub-program) objects developed.
- Database Models: High level description of database design and schema
- Entity Relationship Diagrams: Shows data relationships for tables/objects in the database
- Database Normalization: Description of normalization implementation
- Stored Procedure Reference: All stored procedures, database links, and custom procedures are defined and described.
- Data Dictionary: All table layouts are defined with appropriate information such as data types, length, and size; identifying primary and foreign keys with all indexes. Document describing all fields by field name with description of information to be stored in data field.
- Data Mapping Reference: Detailed mapping of source to target database; indicates disposition of all legacy fields (retired, migrated, etc.); validation that all source data is accounted for in target such as cross-table references, data relationships, look-up tables, constraints, or geographic domains
- Integration with other GDOT and external data sources: Describe the implementation of the system with the other departmental or external data sources. This includes logical descriptions of program functionality.
- Data history, audit trails, user tracking, and archiving
- Security Reference: Define the security model utilized for the system, data source and users.
- Application (Code)
  - Programming Language Source Code: All source code of the system divided by module.
  - Stored Procedure Source Code: All transact SQL source code for all procedures, divided by procedure.
  - SQL Script Printout: All transact SQL source code for all scripts.
  - All scripts needed to build the database schema, procedures, and user permissions
  - Installation executables will be stored within GDOT Software Repository/ClearCase source code repository.
- Datasets/Databases (as per GDOT policy/standards)
  - Scripts to build/alter database and associated objects and installation instructions
  - Entity Relationship diagrams (logical and physical)
  - Data Dictionary (logical and physical)
  - Metadata Registry (see GDOT Metadata Registry policy)
  - Deliverable datasets/databases
- Application Support Document (ASD)
  - Overview: Detailed technician level instruction for supporting the developed system.
  - Dependencies: Description of all required support software by operating system, operating system version, support software, support software version, and software location on server. Also includes all database, data warehouse, Geographic Information System (GIS), and web service dependencies.
  - Support roles, responsibilities, and procedures
  - Service/system performance and alert monitoring (e.g. MOM/SCOM, SCCM) parameters for server and database administrators
  - Web application usage monitoring agents (e.g. Google Analytics)
  - System backup, restore, and non-production database refresh procedures
  - Security protocols
- Training Materials
  - Quick Reference Guides (QRG)
  - Administrator Manuals, User Manuals, and Instructor Guides
  - Web Based Training (WBT) or Videos
  - Rebrand training materials to GDOT context

- All soft-copy of help/user-manuals must be in editable non-proprietary format
- Deployment Document
  - Installation, configuration, and deployment instructions
  - Scripts for automated deployment within databases and web/application servers

\*During architectural discussions, GDOT and the Consultant may agree on the expected deliverables, application specifications, and versions of hardware/software to be used. Any changes must be discussed and approved by GDOT IT Change Control Board (CCB).

#### Web Applications

- Web applications deployed on GDOT websites will support mobile device browsing and interaction within SharePoint

#### SmartPhone Applications

- Currently GDOT uses Verizon as its cell phone carrier. No application will be developed which requires a cell phone that Verizon does not carry.
- For SmartPhone Applications which GDOT pursues it is assumed that the application will only work when the SmartPhone is within the carrier's coverage area.
- For SmartPhone Applications which are web browser based, it will use HTML 5 and not the native operating system for the SmartPhone.
- For SmartPhone Applications that need native phone OS capabilities, the corresponding Mobile OS SDK will be used.

### **References:**

None

### **History:**

corrected office name: 09/21/18;

updated logo: 08/21/18;

added to Publications: 10/24/12