Section	Title	Content
2	Project Organization and Management	Describe the project's structure.
2.1	Organization	Provide a detailed description of the project's organization and the management approach that will be used. Explain why each was selected.
2.2	Reporting Relationships	Define procedures for reporting, monitoring, and control.
2.3	Unit/Staff Responsibilities	Define responsibilities for all key positions.

Section	Title	Content
3	Resources	For each of the categories in the subsections listed below, identify and describe in detail all resources required to complete the project. Indicate sources, timing requirements, and any anticipated shortfalls. 3.1 Personnel 3.1.1 Skill Mix 3.1.2 Manpower Loading 3.1.3 In-House/Contractor Support 3.2 ADP Equipment 3.3 Facilities 3.4 Other Resources

Section	Title	Content
4	Project Execution (by Phase)	Describe the key milestones for the project. Include a detailed Gantt chart or similar graphic description of the entire project.
4.1	Task Descriptions	Provide a detailed work breakdown for each task. If automated systems are being used to manage the project, system output such as charts and task lists may be used if they are detailed enough to be self-explanatory. Otherwise they should be supplemented by additional text.
4.2	Task Dependencies	Explain how the tasks relate to one another. Explain which tasks can be performed concurrently and those that cannot begin until another task is completed. Explain the effects of delays in completing tasks.
4.3	Products To Be Delivered	Based on approved items from the configuration identification process, describe the products that will result from each task.

Section	Title	Content
5	Project Costs (by Phase)	For each of the categories in the subsections listed below, provide a summary of costs by project phase. 5.1 Equipment 5.2 In-House Staff 5.3 Contractor Staff 5.4 Operations

Section	Title	Content
6	Project Execution Feedback	Provide information about activities to take place after the new system or enhancement is operational.
6.1	Evaluating Project Execution	Describe methods and procedures for evaluating how well the plan accomplishes its goals. Consider adherence to schedules, effectiveness and availability of resources, and user feedback (with respect to the quality of products or accomplishments and the effectiveness of project direction.
6.2	Enhancement Evaluation Plan	Describe methods and procedures for evaluating requested enhancements. Include procedures for requests, evaluation, and approval.
6.3	Configuration Management Transition Plan	Describe the procedures for updating the Project Management Plan based upon changes to project scope or schedule. Include procedures for ongoing plan maintenance and procedures for changes resulting from significant project enhancements. Include approval/evaluation procedures and identify associated individuals and responsibilities, as appropriate.

QUALITY ASSURANCE PLAN
(1.2.10 on OSM Documentation Requirements List)

Purpose

The Quality Assurance Plan provides the standards against which a new system or an enhancement to an existing system will be evaluated. It also details how these standards are to be implemented and applied both in the system's development phase and when the system becomes operational. Standards are determined through analysis of requirements and applicable directives, guidelines, and policy.

Contractors assisting in development activities must be aware that some quality assurance activities (for example, reviews of deliverables) are the sole responsibility of the government while others (such as design reviews and walkthroughs) are joint activities. Thus the Quality Assurance Plan needs to be prepared in conjunction with the OSM QA staff assigned to the project, and it must be approved and incorporated into OSM management activities.
A preliminary Quality Assurance Plan and schedule of activities is prepared during the project initiation phase. It is updated in succeeding phases as more information becomes available.

Content

The Quality Assurance Plan outlines specific quality assurance activities that will verify the integrity of software products during each phase of the life cycle of a new system or an enhancement to an existing system. Specific quality assurance review activities to be accomplished during the mission analysis, system design, system construction and acquisition, and user acceptance stages of the project are outlined. These include preliminary design reviews, software design walkthroughs, final design reviews, and system plan reviews. Review of documentation is also incorporated into the plan.

The plan also identifies the Quality Assurance Coordinator for the project, as well as the ad hoc quality assurance team. The QA team is responsible for ensuring that the quality assurance activities are accomplished.

Figure A–8 summarizes the information required in the Quality Assurance Plan by presenting the document's table of contents. Detailed explanations of the material that each section should contain are then found in the pages that follow.

Figure A–8
TABLE OF CONTENTS FOR QUALITY ASSURANCE PLAN
(1.2.10 on OSM Documentation Requirements List)

1. Introduction

    1.1 Background
    1.2 Scope
    1.3 Assumptions and Constraints
    1.4 Summary of the Quality Assurance Plan
    1.5 References

2. Quality Assurance Reviews

    2.1 Deliverables

        2.1.1 Deliverable 1
        2.1.n Deliverable n

    2.2 Milestones

        2.2.1 Milestone 1
        2.2.n Milestone n

    2.3 Structured Walkthroughs

        2.3.1 Structured Walkthrough 1
        2.3.n Structured Walkthrough n

    2.4 Testing

        2.4.1 Unit Tests
        2.4.2 System Tests
        2.4.3 Integration Tests
        2.4.4 Acceptance Tests

    2.5 Inspections

        2.5.1 Inspection 1
        2.5.n Inspection n

3. Quality Assurance Review Schedule

4. Summary of Results

Quality Assurance Plan

Section	Title	Content
1	Introduction	Provide appropriate background and summary information.
1.1	Background	Provide a brief overview of the system development project and why it is being conducted.
1.2	Scope	Explain why the Quality Assurance Plan is needed, provide a brief overview of its organization, and indicate system-related topics that have been included in the document or excluded from consideration.
1.3	Assumptions and Constraints	Describe any factors that may affect the activities and schedules described in the Quality Assurance Plan.
1.4	Summary of the Quality Assurance Plan	Provide a brief summary of the most important information in the Quality Assurance Plan.
1.5	References	List pertinent project documentation and any other materials used to prepare the Quality Assurance Plan.

Section	Title	Content
2	Quality Assurance Reviews	Describe the various quality assurance activities that will take place throughout the life cycle of the new system or enhancement.
2.1	Deliverables	Describe the steps to be taken to transmit, review, comment on, and revise all project documentation in a separate subsection for each deliverable. For example: 2.1.1 Deliverable 1 2.1.n Deliverable n Include the material to be reviewed, the person(s) responsible, the anticipated schedule, and evaluation criteria.
2.2	Milestones	Describe the steps to be taken to prepare for, conduct, and respond to all milestone reviews in a separate subsection for each milestone. For example: 2.2.1 Milestone 1 2.2.n Milestone n Include the person(s) responsible for conducting the review, attendees, materials to be reviewed, material that should be read prior to the review, the anticipated schedule, and evaluation criteria.
2.3	Structured Walkthroughs	Describe the steps to be taken to prepare for, conduct, and respond to all structured walkthroughs in a separate subsection for each walkthrough. For example: 2.3.1 Structured Walkthrough 1 2.3.n Structured Walkthrough n Include the person(s) responsible for conducting the review, attendees, materials to be reviewed, material that should be read prior to the review, the anticipated schedule, and evaluation criteria.

Section	Title	Content
2.4	Testing	Because detailed information on testing activities is provided in other documentation, the Quality Assurance Plan needs only to identify the tests and the anticipated schedules. Include a separate subsection for each test. For example: 2.4.1 Unit Tests 2.4.2 System Tests 2.4.3 Integration Tests 2.4.4 Acceptance Tests
2.5	Inspections	Identify all the steps involved in conducting and responding to quality assurance inspections in a separate subsection for each inspection. For example: 2.5.1 Inspection 1 2.5.n Inspection n Include the person(s) responsible for the inspection, the anticipated schedule, and evaluation criteria.

Section	Title	Content
3	Quality Assurance Review Schedule	Provide a complete schedule of all quality assurance activities.

Section	Title	Content
4	Summary of Results	As each quality assurance activity is completed, provide a summary of the results of the test and responsibilities for any required actions.

COST/BENEFIT ANALYSIS
(1.2.11 on OSM Documentation Requirements List)

Purpose — OSM managers and the information systems staff use the Cost/Benefit Analysis to analyze and evaluate alternative approaches to developing and implementing a new system or an enhancement to an existing system. In conjunction with the Feasibility Study, it provides information needed to ensure that the proper alternative has been selected and that continued development of the new system or enhancement is warranted.

Content — The Cost/Benefit Analysis can be included as an appendix to the Feasibility Study or documented separately. It details the costs required to develop and operate each alternative as well as the costs of continued operation of the existing system. It summarizes the benefits, both quantifiable and nonquantifiable, of each alternative. A comparison of the costs and benefits and an analysis of their sensitivity to key factors lead to a recommendation.

Figure A–9 summarizes the information required in the Cost/Benefit Analysis by presenting the document's table of contents. Detailed explanations of the material that each section should contain are then found in the pages that follow.

Section	Title	Content
1	Introduction	Provide appropriate background and summary information.
1.1	Background	Provide a brief overview of the project and why it is being conducted.
1.2	Scope	Explain why the analysis was conducted and provide a summary of the document's organization. Include a brief description of the alternatives that were evaluated the major cost factors that were considered, as well a system-related topics that were excluded from consideration.
1.3	Performance and Characteristics	Briefly describe the requirements and objectives for the new system or enhancement. Include operational requirements, system life expectancy, and workload.
1.4	Assumptions and Constraints	Describe any factors that affect the conclusions of the analysis. Possibilities include: • Operational life of the proposed system • Period of time allowed for comparison of alternatives • Financial constraints • Legislative/policy constraints • Availability of information and resources.
1.5	Methodology	Provide a detailed description of how the analysis was conducted. Include the techniques used to estimate and compute costs.
1.6	Evaluation Criteria	Identify the factors that were used to evaluate the alternatives. Possibilities include organizational objectives, operational efficiency, and reduced operating costs.

Section	Title	Content
1.7	Summary of Recommendations	Summarize the results of the analysis, including the recommended alternative. The summary can be supplemented by a table as shown in Figure A–10.
1.8	References	List pertinent standards, guidance, documentation, and any other materials used to prepare the Cost/Benefit Analysis. Include vendor-supplied materials; project documentation; other in-house documentation; and Federal, departmental, agency, and industry standards and guidelines.

Figure A–10
COMPARATIVE COST/BENEFIT ANALYSIS SUMMARY
(Alternatives 1 Through n)

Comparative Cost/Benefit Analysis Summary					
	Alternative 1	Alternative 2			Alternative n
System Life Cost					
Present Value Cost					
Residual Value					
Discounted Residual Value					
Adjusted Cost					
System Life Benefit					
Present Value Benefit					
Net Present Value					
Benefit/Cost Ratio					
Payback Period					

Notes:

Section	Title	Content
2	Description of Alternatives	Provide a brief description of the technical and operational characteristics of the proposed new system or enhancement, the alternatives that were considered, and the existing system. If no alternatives were considered, explain why. The section should be organized with a subsection for each alternative. For example: 2.1 Existing System 2.2 Proposed System 2.3 Alternative System 1 2.n Alternative System n

Section	Title	Content
3	Costs	Detail the costs of developing and operating each of the alternatives. Include the costs of operating the existing system. Where applicable, compare the costs of a system developed, operated, or maintained in-house with those developed, operated, or maintained by contractors. Formats for a cost analysis and a cost analysis worksheet are shown in Figures A–11 and A–12.
3.1	Nonrecurring Costs	Present the nonrecurring costs for each alternative over the life of the system, broken down into capital investment and other nonrecurring costs.
3.1.1	Capital Investment	Capital investment includes acquisition, development, and installation costs for any of the following: • Site and facility • Data processing • Data communications • Environmental conditioning • Security and privacy • Software • Data base.
3.1.2	Other Nonrecurring Costs	Examples of other nonrecurring costs include • Requirements and design studies • Procurement activities • Data base preparation • Software conversion • Reviews and testing • Technical/management overhead • Personnel (training and travel, but not salary and benefits) • Involuntary retirement, severance, relocation, etc. • Contractual, interagency, or other direct support services • Incremental or additional overhead costs.

Figure A–11
COST ANALYSIS (Alternative x)

Cost Analysis for Alternative _____

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Nonrecurring Costs: Capital: Site/Facility Equipment ADPE Telecommunications Other Software Other: Studies Procurement Conversion/Parallel Operations Training/Travel							
Subtotal							
Recurring Costs: Equipment Software Data Communications Personnel Support Services Travel and Training Space Occupancy Supplies and Utilities Security and Privacy Services Overhead							
Subtotal							
Total Costs							
System Life Cost							
Present Value Cost							

Figure A–12
COST ANALYSIS WORKSHEET (Alternative x, Year n)

Alternative _____ **Year** _____

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual Totals
Nonrecurring Costs[1]:													
Subtotal													
Recurring Costs:													
Subtotal													
Total													
Present Value Factor[2]													
Present Value Cost													

[1]If timing is known, insert cost in appropriate month; otherwise, insert in last month of Fiscal Year.
[2]Refer to OMB Circular A–94.

Section	Title	Content
3.2	Recurring Costs	Present the monthly and/or quarterly recurring costs of operating and maintaining each alternative over the life of the system. Include the following: • Equipment lease, rental, and in-house maintenance • Software lease, rental, and in-house maintenance • Data communications lease, rental, and in-house maintenance • Personnel salaries and benefits • Direct support services (intra-agency services) • Travel and training • Space occupancy • Supplies and utilities • Security and privacy • Contractual and interagency services (for example, ADP services, data communications, software, technical support, other support) • Overhead that represents additional or incremental expenses attributable to the alternative.

Section	Title	Content
4	Benefits	Describe the benefits that can be attained by developing and implementing each alternative, in terms of quantifiable (recurring and nonrecurring) and nonquantifiable benefits that relate to organizational objectives, goals, missions, functions, and operating environments. Formats for a benefits analysis and a benefits analysis worksheet are shown in Figures A–13 and A–14.
4.1	Nonrecurring Benefits	Present the nonrecurring benefits in terms of data processing, users, administration, and support, broken down into three categories.
4.1.1	Cost Reduction	Include cost reductions that are a result of improved system operations. Possibilities include: • Reduced resource requirements • Improved operating efficiency • Improved entry, storage, and retrieval of data • System performance monitoring • Software conversion or optimization • Data compression techniques • Centralized or decentralized processing.
4.1.2	Value Enhancement	Include benefits that enhance the value of the system. Possibilities include: • Improved use of resources • More effective operations and administration • Fewer errors
4.1.3	Other Nonrecurring Benefits	Include any additional benefits. Possibilities include: • Offsetting receipts • Costs avoided • Value of excess equipment.

Figure A–13
BENEFIT ANALYSIS (Alternative x)

Benefit Analysis for Alternative _____

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Nonrecurring Benefits:							
Offsets:							
Cost Reduction							
Value Enhancement							
Other (Including Cost Avoidance)							
Subtotal							
Recurring Benefits:							
Cost Reduction:							
Equipment							
Software							
Data Communications							
Personnel							
Support Services							
Travel and Training							
Space Occupancy							
Supplies and Utilities							
Security and Privacy							
Services							
Overhead							
Other (Including Cost Avoidance)							
Subtotal							
Total Costs							
System Life Cost							
Present Value Cost							

Figure A–14
BENEFIT ANALYSIS WORKSHEET (Alternative x, Year n)

Alternative _____ **Year** _____

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual Totals
Nonrecurring Benefits[1]:													
Subtotal													
Recurring Benefits:													
Subtotal													
Total													
Present Value Factor[2]													
Present Value Benefit													

[1]If timing is known, insert value of benefit in appropriate month; otherwise, insert in last month of Fiscal Year.
[2]Refer to OMB Circular A–94.

Section	Title	Content
4.2	Recurring Benefits	Present the monthly and/or quarterly recurring benefits of operating and maintaining each alternative over the life of the system. Include the following: • Equipment lease, rental, and in-house maintenance • Software lease, rental, and in-house maintenance • Data communications lease, rental, and in-house maintenance • Personnel salaries and benefits • Direct support services (intra-agency services) • Travel and training • Space occupancy • Supplies and utilities • Security and privacy • Contractual and interagency services (for example, ADP services, data communications, software, technical support, other support • Overhead that represents additional or incremental expenses attributable to the alternative • Costs avoided through improvements in operational flexibility, information handling, and response to requirements.
4.3	Nonquantifiable Benefits	Describe benefits which cannot be quantified in terms of direct dollar values. Possibilities include: • Improved service • Reduced risk of error • Improved information handling • Enhanced organizational image. Intangible benefits can sometimes be assigned values in terms of estimates and tradeoffs. If possible, include boundary (best case and worst case) estimates to justify the alternative or cite tradeoffs where intangible benefits are gained at the expense of reduced potential for tangible benefits.

Section	Title	Content
5	Comparative Cost/Benefit Summary	Based on the data presented in Sections 3 and 4, compare the costs and benefits of each alternative. Provide supporting documentation as required for validation and management review. A format and instructions for preparing a cost/benefit summary can be found in Figure A–15.
5.1	Sensitivity Considerations	Sensitivity analysis is a tool used to assess the extent to which costs and benefits can be affected by factors such as • Length of system life, either shorter or longer • Variations in the estimated volume, mix, or pattern of workload • Changes in requirements resulting from either legislative mandate or changes in functional or organizational structure • Changes in the configuration of hardware, software, data communications, or other facilities • Changes in objectives, requirements, or operations • Changes in inflation rate or residual value of equipment, facilities, and software • Delays in completion of the project. Conducted on different configurations of the alternatives, the sensitivity analysis provides a range of costs and benefits that are likely to be a better guide than a single estimate. Explain the approach used to conduct the sensitivity analysis and explain the factors used and how they were selected. Present the results in a table as shown in Figure A–16, then conclude with a summary of key points and an evaluation of the validity and implications of the analysis.

Figure A-15
COST/BENEFIT ANALYSIS OVER SYSTEM LIFE (Alternative x)

Alternative _____

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Total Costs							
System Life Cost							
Present Value Cost							
Residual Value[1]							
Present Value Factor							
Discounted Residual Value							
Adjusted Cost[2]							
Total Tangible Benefits							
System Life Benefit							
Present Value Benefits							
Net Present Value							
Benefit/Cost Ratio							
Cumulative Benefits							
Cumulative Costs							
Payback (difference)							
Payback Period[3]							

[1]Remaining economic value of ownership of ADP resources in the last month of system life.
[2]Difference between present value cost and discounted residual value in the last month of system life.
[3]Point at which total benefits exceed total costs, excluding present values.

Figure A-16
SENSITIVITY ANALYSIS
(Alternatives 1 Through n, Factors 1 Through n)

Comparative Cost/Benefit Summary						
	Factor 1, **Useful Life** Range: 3, 5, 7 Years	Factor 2, **Volume of Work** Range: 3, 5, 7 Years				Factor n, **(name)** Range: (range)
Alternative 1 (name)						
Alternative 2 (name)						
Alternative 3 (name)						
Alternative n (name)						

Section	Title	Content
6	Recommendation	Select the most desirable alternative in terms of costs and benefits and justify the selection.

DETAILED FUNCTIONAL REQUIREMENTS
(2.1.2 on OSM Documentation Requirements List)

Purpose The Detailed Functional Requirements document provides a basis of understanding as to the function(s) to be performed by a new system or an enhancement to an existing system; specific hardware/software and performance requirements for the new system or enhancement; and additional considerations related to the operating environment of the new system or enhancement (interfaces, facilities, personnel, security, etc.). It is usually developed after an analysis of existing procedures and the needs of prospective users.

Content The Detailed Functional Requirements document describes the existing system and the deficiencies and limitations that led to the request for a new system or enhancement. It explains what the users require of the new system or enhancement from their perspective; thus it contains quantitative processing requirements in terms of work and data flow and deadlines and constraints. Interfaces with other systems, security and privacy, and audits and controls are also described.

Figure A–17 summarizes the information required in the Detailed Functional Requirements by presenting the document's table of contents. Detailed explanations of the material that each section should contain are then presented in the pages that follow.

Figure A–17
TABLE OF CONTENTS FOR DETAILED FUNCTIONAL REQUIREMENTS
(2.1.2 on OSM Documentation Requirements List)

1. Introduction

    1.1 Background
    1.2 Scope
    1.3 Methodology
    1.4 Assumptions and Constraints
    1.5 Summary of the Detailed Functional Requirements
    1.6 References

2. Overview of Existing Methods and Procedures

    2.1 Organization/Personnel
    2.2 Equipment
    2.3 Inputs and Outputs
    2.4 Deficiencies and Limitations
    2.5 Pertinent Cost Considerations

3. Requirements

    3.1 Overview of Functions
    3.2 Relationships Among Functions
    3.3 Functional Requirements

        3.3.1 Function 1
        3.3.n Function n

4. External Considerations

    4.1 Organization/Personnel
    4.2 Design Standards and Constraints

        4.2.1 Facilities
        4.2.2 Hardware
        4.2.3 Software

    4.3 Interface Requirements

        4.3.1 Internal
        4.3.2 External

    4.4 Audits and Controls
    4.5 Security and Privacy
    4.6 Cost

Figure A–17 (Continued)
TABLE OF CONTENTS FOR DETAILED FUNCTIONAL REQUIREMENTS
(2.1.2 on OSM Documentation Requirements List)

Detailed Functional Requirements

Section	Title	Content
1	Introduction	Provide appropriate background and summary information.
1.1	Background	Provide a brief overview of the system development project and why it is being conducted.
1.2	Scope	Explain why the Functional Requirements document is needed, provide a brief overview of its organization, and indicate system-related topics that have been included in the document or excluded from consideration.
1.3	Methodology	Provide a detailed description of how the functional requirements analysis was conducted.
1.4	Assumptions and Constraints	Describe any factors that may affect the requirements discussed in the document.
1.5	Summary of the Detailed Functional Requirements	Provide a brief summary of the most important information in the document.
1.6	References	List pertinent standards, guidance, documentation, and any other materials used to prepare the document. Include vendor-supplied materials; project documentation; other in-house documentation; and Federal, departmental, agency, and industry standards and guidelines.

Section	Title	Content
2	Overview of Existing Methods and Procedures	Describe the system that is to be replaced or enhanced. Illustrate the data flow from data acquisition through processing and output and include interfaces with other systems. Explain how users perform operational functions.
2.1	Organization/ Personnel	Describe the organization and responsibilities of the people who work with the existing system.
2.2	Equipment	Describe all hardware used with the existing system.
2.3	Inputs and Outputs	Explain the type of data used as input to and the data output from the existing system. Include the media (diskette, tape, etc.), format, range of values, accuracy, volume and frequency, and other pertinent information. Describe and show examples of any hard-copy reports or graphics.
2.4	Deficiencies and Limitations	Explain the deficiencies and limitations that have led to the proposed new system or enhancement.
2.5	Pertinent Cost Considerations	Provide an overview of the cost of operating the existing system.

Section	Title	Content
3	Requirements	Describe the requirements for the new system or enhancement.
3.1	Overview of Functions	Describe the new system or enhancement, including an overview of the information processing requirements, performance requirements, inputs, and outputs of each major function. Identify techniques and procedures that will be incorporated from other systems or applications.
3.2	Relationships Among Functions	Describe the structure of the new system or enhancement and the relationships between each major function. This section should combine hierarchy charts with text.
3.3	Functional Requirements	Describe in detail the functional and performance requirements for each major function to be supported by the new system or enhancement. Include a separate subsection for each major function. For example: 3.3.1 Function 1 3.3.n Function n Describe functions in quantitative and qualitative terms. Describe how they satisfy performance objectives. Describe performance requirements in terms of the following criteria: • Accuracy — Describe data accuracy, including mathematical, logical, legal, and transmission requirements. • Validation — Describe data validation requirements. • Timing — Describe timing requirements for system response, update processing, data transfer and transmission, and throughput.

Section	Title	Content
		• Flexibility — Describe the new system or enhancement's capability for adapting to changes in requirements such as modes of operation, operating environment, interfaces with other systems and applications, accuracy and validation timing, and planned changes or improvements. Describe and show examples of data input. Specify the media, format, range of values, accuracy, etc. Describe and show examples of data output. Describe the characteristics of individual and composite data elements. Discuss size and scheduling considerations. Specify possible failures, the consequences, and actions that can minimize impact. Include backup, fallback, and recovery capabilities. Use visual representations of data flow where appropriate.

Section	Title	Content
4	External Considerations	Describe the operating environment of the new system or enhancement. Include any constraints imposed by the operating environment.
4.1	Organization/ Personnel	Describe the organization and responsibilities of the people who will work with the new system or enhancement.
4.2	Design Standards and Constraints	Describe facility, equipment, and support software requirements. Include constraints that any of these may impose.
4.2.1	Facilities	Describe the facilities required for the new system or enhancement. Include any new facilities required and relate them to specific functions or requirements.
4.2.2	Hardware	Identify the equipment required for the new system or enhancement. Include any new equipment required and relate it to specific functions or requirements. At a minimum, the following should be discussed: • Processor and size of internal storage • Online and offline storage, including media, format, and devices • Input and output devices, online and offline • Data communications and transmission devices.
4.2.3	Software	Identify the support software and describe any test or commercial software that will be used with the new system or enhancement. If the operation of the software depends on changes to existing support software, identify the nature of these changes and when they will take effect, and relate the changes to specific functions or requirements.

Section	Title	Content
4.3	Interface Requirements	Describe interfaces with other systems and software. Include a separate subsection for internal and external interfaces: 4.3.1 Internal — Interfaces between functions 4.3.2 External — Interfaces between systems
4.4	Audits and Controls	Describe operational audits and controls imposed on the new system or enhancement. Identify the sources of these controls.
4.5	Security and Privacy	Describe the overall security and privacy requirements for the new system or enhancement.
4.6	Cost	Provide an overview of the cost of operating the new system or enhancement.

Section	Title	Content
5	Improvements and Impacts	Summarize the improvements to be obtained and the anticipated impact of the new system or enhancement.
5.1	Improvements	Describe new capabilities, upgraded capabilities, deficiencies eliminated, improved response time and processing time, and capabilities eliminated or reduced.
5.2	Impacts	Describe impacts as they relate to the following: • Equipment — Changes to current equipment, new equipment, building requirements • Software — Additions or modifications required for existing applications or support software • Organization — Reorganization of functions and responsibilities, increase or decrease in staff level, upgrade or downgrade of staff skills • Operations — Staff and operations procedures — Relationship between operations center and users — Operations center procedures — Data sources and media; volume and time considerations — Data retention and retrieval procedures — Reporting methods — Consequences of system failure; recovery procedures — Computer processing time requirements • Development — Specific activities to be conducted by users in support of the development activity — Resources required to develop the data base — Computer processing resources required to develop and test the new system or enhancement.

DATA REQUIREMENTS
(2.1.3 on OSM Documentation Requirements List)

Purpose The Data Requirements document provides a description of and technical information about the data base used by a new system or an enhancement to an existing system. It is used during the analysis stage of a software development project as a starting point in determining how the data base should be structured and how it will be used.

Content The Data Requirements document contains detailed information about data relationships, the system environment, security, data volume considerations, and expected usage patterns.

Figure A–18 summarizes the information required in the Data Requirements by presenting the document's table of contents. Detailed explanations of the material that each section should contain are then found in the pages that follow.

Figure A–18
TABLE OF CONTENTS FOR DATA REQUIREMENTS
(2.1.3 on OSM Documentation Requirements List)

1. Introduction

    1.1 Background
    1.2 Scope
    1.3 Assumptions and Constraints
    1.4 Summary of the Data Requirements
    1.5 References

2. Logical Data Model

    2.1 Entity Relationships
    2.2 Data Definitions

        2.2.1 Entity Relationships
        2.2.2 Entity Attribute Lists
        2.2.3 Attribute Descriptions
        2.2.4 Other Definitions

3. Environment

4. Data Security Requirements

5. Data Volume and Usage Patterns

Section	Title	Content
1	Introduction	Provide appropriate background information.
1.1	Background	Provide a brief overview of the new system or enhancement and why it is being implemented.
1.2	Scope	Explain why the Data Requirements document is needed, provide a brief overview of its organization, and indicate system-related topics that have been included in the document or excluded from consideration.
1.3	Assumptions and Constraints	Describe factors which may impact the accuracy or applicability of the Data Requirements document.
1.4	Summary of the Data Requirements Document	Summarize the most significant information included in the Data Requirements document.
1.5	References	List pertinent standards, guidance, documentation, and any other materials used to prepare the Data Requirements document. Include vendor-supplied materials; project documentation; other in-house documentation; and Federal, departmental, agency, and industry standards and guidance.

Section	Title	Content
2	Logical Data Model	Provide a detailed description of the logical data model.
2.1	Entity Relationships	Include diagrams and/or descriptions which identify logical data groups (entities) and the relationships among the groups (that is, entity-relationship diagrams).
2.2	Data Definitions	Provide a detailed description of the data. Include, or provide reference to, the Data Dictionary.
2.2.1	Entity Definitions	Define and describe the logical data groups.
2.2.2	Entity Attribute Lists	List the attributes (data elements) associated with each entity or logical data group. For each entity, identify candidate keys and the relationship of the attribute to the entity (for example, each Permit entity has one and only one Permit Number; each Violation entity has zero or one Abatement-Date attribute).
2.2.3	Attribute Descriptions	Describe each attribute and identify characteristics (type, length, allowable range, critical values, scale of measurement, conversion factors).
2.2.4	Other Definitions	Depending upon the methodology used, other definitions may be required; for example, data flow definitions, report definitions, input document definitions, data store definitions, and business function/entity relationships.

Section	Title	Content
3	Environment	Describe the operating environment of data base, if known. Include any pertinent information that may affect the operating environment; for example, hardware, software, data collection procedures, timing for required reports, backup requirements, etc.

Section	Title	Content
4	Data Security Requirements	Identify security and privacy requirements. Highlight any vulnerabilities or other considerations and identify particularly sensitive information and required Privacy Act precautions.

Section	Title	Content
5	Data Volume and Usage Patterns	Provide data volume estimates and associated backup volume estimates (both assumptions and calculations). Identify transaction frequencies and data update authorities.

UNIT TEST PLAN
(2.3.1.1 on OSM Documentation Requirements List)

Purpose

Unit, or module, testing is the process of testing the individual subroutines, routines, or procedures that make up a larger program. It is aimed at the smallest component of the software product so that a "building block" approach can be used in developing a new system or an enhancement to an existing system.

Because it occurs first in the overall process of testing, unit testing is critical in terms of detecting errors. When designing test cases for a unit test, the specification for the module, which describes its input and output parameters and its processing logic, must be taken into consideration. It is also necessary to have the source code.

Unit testing is centered on techniques that will uncover errors in the program's logic. This testing quickly becomes more difficult as the size of the test increases; therefore, unit testing provides the best opportunity to focus on the program's internal validity and efficiency.

The Unit Test Plan must be reviewed and approved before the actual testing can begin.

Content

Because the development of each system is unique, the outline of the Unit Test Plan should be customized to reflect the components of the specific entities being tested. It should contain detailed testing procedures for each unit or module, as well as a proposed schedule for each test. Each test plan should contain as Section 1 an overview that provides background information, the scope of the plan, any assumptions or constraints that affected test plan development, a brief summary of the proposed testing, and applicable references.

INTEGRATION TEST PLAN
(2.3.1.2 on OSM Documentation Requirements List)

Purpose

The purpose of integration testing is to ensure that all related units or modules in a new system or an enhancement to an existing system work together as specified in development plans. Testing in this area is aimed at data compatibility, module interface problems, and functional performance requirements. Its scope includes all programs that comprise a discrete function within the new system or enhancement. Normally, integration testing is conducted in an incremented manner.

Content

The Integration Test Plan expands upon the Unit Test Plan in defining testing procedures for the system. Because the development of each system is unique, its outline should be customized to reflect the components of the specific entities being tested. It should contain detailed testing procedures for each unit or module, as well as a proposed schedule for each test. Each test plan should contain as Section 1 an overview that provides background information, the scope of the plan, any assumptions or constraints that affected test plan development, an explanation of how the integration testing builds on the unit testing, a brief summary of the proposed testing, and applicable references.