



ADOA - ASET

Arizona Strategic Enterprise Technology

Project Investment Justification (PIJ)

*A Statewide Standard Document
for Information Technology Projects*

Project Title: Computer Aided Dispatch System

Agency Name: Arizona Department of Transportation

Date: 5/24/2013

Prepared By: Steve Kalina & Marc Forgang

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I. GENERAL INFORMATION

I.A General Information

Agency CIO:	Joe Throckmorton	Contact Phone:	
Agency Contact Name:	Jesse MacDonough	Contact Phone:	
Agency Contact Email:		Prepared Date:	5/23/2013

II. PROJECT OVERVIEW

II.A Management Summary

I. Problem Description

ADOT's Enforcement and Compliance Division (ECD) supports various activities including registration compliance, commercial vehicle inspections, commercial driver license validation, and both internal and external investigations involving theft and fraud. ADOT's Enforcement Officers perform compliance duties, lead commercial vehicle inspections at permit offices, 22 Ports of Entry (POEs), and often in partnership with others enforcement agencies, remotely across Arizona's state and interstate highway system.

Currently, ECD relies on radio communication to request driver or vehicle credentials and limited query capabilities from the laptop in the ECD vehicle. The radio room dispatchers must communicate with officers by radio or cell phone to determine their locations and whether they can support various enforcement activities as well as providing backup to requesting officers.

Determining officer and vehicle locations is instrumental in efficient and safe performance. Enforcement of state statutes relating to ADOT activities requires information to be readily available to all ECD staff and the ability to retrieve that information in the most efficient manner. ECD officers must also have the ability to query information from state and federal sources and communicate with dispatchers from the patrol vehicle or at POEs.

The current state of operations includes an inability to obtain timely information requiring too many manual steps and unnecessary paperwork that could be performed electronically in a fraction of the time.

II. Solution

Deployment of a Computer Aided Dispatch (CAD) System with the Automated Vehicle Location (AVL) feature will allow instantaneous communication between radio room dispatchers, officers in the field at remote locations, and personnel at POEs. ECD vehicles will be outfitted with Global Positioning System (GPS) antennas to determine proximity to a request on a Geographic Information System (GIS) map interface. The CAD System will provide the following components:

- Desktop and mobile dispatch interface,
- Desktop and web-based map interface to track vehicle locations and perform spatial queries,
- Officer activity dashboard to assess system and personnel performance, and
- Desktop and mobile query capabilities to check driver and vehicle credentials in ADOT systems, other Arizona and federal computerized systems.

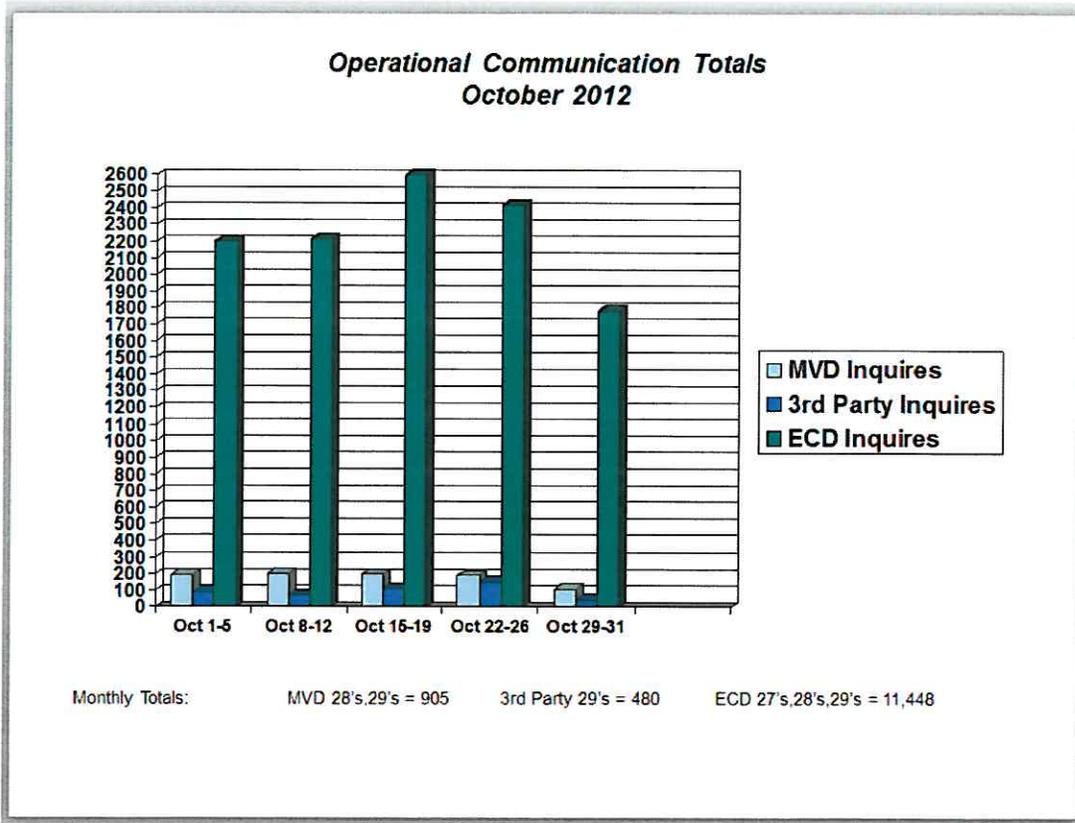
The CAD system will also provide performance statistics to allow ECD management to assess when and where personnel are needed across the state for planning purposes. This will help mitigate damage to highway infrastructure by allowing more targeted enforcement of vehicle weight laws.

Additionally, the CAD system will provide export capabilities to combine officer activity data with data from other systems associated with the Consolidated Enforcement Services Portal (CESP).

III. Quantified Justification

The deployment of a CAD system and the evolution of updated processes will result in a reduction in the amount of time it takes for officers to investigate vehicle and driver credentials at POEs or mobile commercial enforcement sites and perform non-commercial registration compliance activities by at least 25 percent, allowing officers to perform additional safety checks and registration compliance checks. This will result in increased revenue from vehicle registrations and citations for commercial vehicles that are not properly permitted or in compliance with state statutes.

Using the number of inquiries made to the Central Office Radio Room during the month of October 2012, each dispatcher responds to over 200 inquiries per day. Reducing the number of manual inquiries provides more time for dispatchers to conduct other activities.



Note: MVD 27s, 28s, and 29s are codes for inquiries made to the radio room involving vehicle registration and driver credentials. Third party inquiries would not be part of this effort and will be handled by MVD.

Typically, two radio room staff work a combined total of 55 hours each week. Working at a rate of \$20.00 an hour for 5.5 hours per day, an estimated 50% increase in efficiency would yield a savings of \$57,200 per year. Assuming roughly 40 officers conducting traffic stops, inspections and registration compliance at an hourly rate of \$20.00 at 8 hours per day, an estimated 25% increase in efficiency would yield over \$9,000 in efficiency savings per officer, per year for a total of approximately \$360,000 in potential savings.

II.B Existing Situation and Problem, "As Is"

The following ECD activities necessitate the acquisition of a CAD system.

Non-commercial vehicle registration compliance is currently a very time consuming effort. Officers must provide license plate and vehicle information to the central dispatch radio room and wait for a call from a dispatcher to receive registration information. The officer leaves a hand written notice on the vehicle and then must log the encounter at the end of the shift, since there is no way to log the action at the time the notice is issued.

Officer locations are not frequently updated to dispatchers or other personnel in the division which is a safety concern for officers requesting backup.

Roadside and rest area commercial inspections also require communication with the radio room to verify driver licenses, vehicle credentials, and to check for warrants. This requires officers to remain outside of patrol cars for extended periods of time, which is a safety concern. Due to the wait time needed for radio communications with dispatchers, officers spend more time than necessary for each inspection.

Most officer activity is logged manually at the end of each shift. For this reason, and because of mistakes in logging due to human error, officer activity statistics are not entirely accurate. As a result, ECD is not able to adequately track officer performance, even though such activity data is vital for determining personnel needs.

II.c Proposed Changes and Objectives, "To Be"

We are proposing the purchase of a Commercial Off-The-Shelf (COTS) product, the Spillman Computer Aided Dispatch System. This system will allow ECD to effectively track ECD vehicle locations, thus increasing officer safety. The system would also automate many of the processes required for officers to conduct normal business activities more efficiently while accurately capturing and reporting on those activities.

The following functionality will be included in the CAD system:

- Dispatch Interface - Mobile and desktop dispatch interface to request officers that are needed at CMV roadside inspection locations or at POEs and allow officers to request assistance from ECD personnel.
- Electronic Communications - Instant communication by mobile interface allows officers to request dispatch operators to further review vehicle credentials or query data from State or Federal sources. Alternatively, the officer can perform these activities from the mobile CAD interface.
- Query Capabilities – Desktop and mobile interfaces to ADOT systems, neighboring agency systems, NLETS, NCIC or other databases currently available and accessible by ECD.
- Dashboard - Track officer activities including registration compliance and stops for port violators and registration compliance in real time for reporting purposes including export capability for use by external systems.
- Map Interface - The GIS map interface provides ECD vehicle locations on the mobile web-based map and desktop map interfaces and also allows spatial queries.
- Vehicle Location - Track ECD vehicle locations using Global Positioning System (GPS) and Automated Vehicle Location (AVL) technology and store historical tracking data.
- Integrated Case Management – For the Office of the Inspector General, including evidence processing and control and report writing.
- XML Export – Data export capabilities to make data available to other ADOT systems.

Implementation of a CAD system will enable ECD to review business processes, allowing the replacement of manual paperwork with electronic query and electronic transfer of citations and warnings to the dispatch office.

Tracking of inspection and registration compliance activities allows the division to assess where and when activities have occurred to determine if the ECD staff are efficiently deployed throughout the state.

The project team and chosen vendor will also assess the future integration of License Plate Recognition (LPR) technology with the CAD System.

ADOT issued two RFIs to obtain information regarding CAD software and CAD vendors' ability to meet ADOT's needs. Additional due diligence was performed, such as collecting a list of leading CAD vendors, and identifying and evaluating CAD software functionality.

Spillman was found to be the leading CAD vendor and is installed in many Arizona police departments and in key Arizona agencies including DPS and Arizona Game and Fish Department. Using a CAD system that is widely deployed throughout Arizona allows the exchange of information among agencies.

The CAD System will require some customization and configuration in order to interface with existing ADOT systems. The data produced by the CAD system will include officer activities, vehicle locations and miles traveled, commercial vehicle inspections, and registration compliance activities. Subsets of this data will be exported to the Consolidated Enforcement Services Portal (CESP). The portal is currently being designed with a planned for deployment in early 2014. CESP will utilize CAD system data for various reporting to allow ECD to assess enforcement activities, assisting in the determination of future business process improvements.

III. PROJECT APPROACH

III.A Proposed Technology

Software Item	Description
CAD AVL System	COTS product to support dispatch communications, and GPS locations for tracking vehicles on a map interface
ArcGIS 9.3.1 SP2 or ArcGIS 10.0	ESRI desktop and web-based map display integrated with the CAD system.
.NET 4.0	Software framework for user interfaces, links to existing systems, usage statistics, and reports
IIS 7	Internet Information Services is a web server application and set of feature extension modules created by Microsoft for use with Microsoft Windows.

Hardware Item	Description
Server	VMware ESXi virtual servers running on HP blade servers
GIS Server	VMware ESXi virtual servers running on HP blade servers
Storage	Hitachi AMS 2500 disk storage array

III.B Other Alternatives Considered

ECD has a business need to more accurately and effectively track personnel activities, improve upon current processes and ensure officer safety. Other alternatives were assessed and it was determined that a COTS CAD system is the correct solution.

Other alternatives considered:

- Do nothing – This does not allow the division to accurately collect and analyze performance data to determine staffing needs and does not reduce security concerns. The highly manual processes reduce the capability for the division to inspect more commercial vehicles for safety, weight violations, and to validate vehicle registrations.
- Re-engineer manual processes – Enhancing the current manual processes will not allow ECD to achieve improved measurements. An improvement in technology is required to adequately capture metrics and improve business processes and efficiencies.
- Internally developed applications - The cost of developing applications that are already commercially available would increase the cost by at least 100 percent due the need to acquire development staff with the appropriate technical skills and the extensive design development and testing costs inherent in a new system development process.

III.c Major Deliverables and Outcomes

Deliverables:

1. CAD System providing desktop and web interfaces.
2. Data interfaces to ADOT systems and Federal systems including NLETS ACIC, and NCIC .
3. GPS device deployment in patrol vehicles to support AVL and map display functions.
4. Dashboard module which will display real-time officer activity data.

Outcomes:

1. Instantaneous communications between dispatchers and ECD officers and staff personnel.
2. Faster registration compliance and inspection checks.
3. Improved performance measurements for management review.
4. Improved officer safety by identifying vehicle locations in real time.
5. Improved efficiency in other ECD business processes.

IV. POLICIES, STANDARDS, & PROCEDURES

IV.A Enterprise Architecture

- Yes** **No** - Does this project meet all standards and policies for Network, Security, Platform, Software/Application, and/or Data/Information as defined in <http://aset.azdoa.gov/security/policies-standards-and-procedures> as applicable for this project?

If NO please describe NEW or EXCEPTIONS to Standards {Network, Security, Platform, Software/Application, and/or Data/Information}:

IV.B Service Oriented Architecture Planning and Implementation

- Yes** **No** - Does this project qualify as an SOA application by improving application delivery for technology reuse and/or application reuse and/or services reuse?

IV.c Disaster Recovery Plan and Business Continuity Plan

- Yes** **No** - Does this project require a Disaster Recovery Plan and Business Continuity Plan?

IV.D Project Operations

- Yes** **No** - Is there a written assessment of short-term and long-term effects the project will have on operations?

IV.E Web Development Initiative

Yes No - Is this a Web Development initiative? If YES, a Notice of Intent (NOI) must be provided.
 Link: <http://aset.azdoa.gov/node/15>

IV.F IT State Goals

Please check which goal the project is in support of; if more than one, indicate only the primary goal.

- Accelerate Statewide Enterprise Architecture Adoption
- Champion Governance, Transparency, and Communication
- Invest in Core Enterprise Capabilities
- Proactively Manage Enterprise Risk
- Implement a Continuous Improvement Culture
- Adopt Innovative Sustainability Models
- Reduce Total Cost of Ownership
- Improve Quality, Capacity and Velocity of Business Services
- Strengthen Statewide Program and Project Management
- Build Innovative and Engaged Teams
- Other:

V. ROLES AND RESPONSIBILITIES

V.A Project Roles & Responsibilities

Please Identify Project Roles & Responsibilities:

Role	Title	Responsibility
Terry Conner	Division Director, ECD	Project Sponsor
Cmd. Tim Lane	Asst. Division Director, ECD	Asst. Project Sponsor
Lt. Lori Knight	Motor Carrier Enforcement, ECD	SME
Sgt. Michael Lockhart	ECD Project Liaison	SME
Steve Kalina	Program Manager, ITG	Project Director
Marc Forgang	Sr. Business Analyst	Project Manager/Analyst
Rishi Malhotra	Technical Architect	System Architect

Please indicate Project Manager Certification:

The project manager assigned to the project is:

- Project Management Professional (PMP) Certified
- State of Arizona Certified
- PM Certification not required

VI. PROJECT BENEFITS

VI.A Benefits to the State

Score: 0=None, 1=Minor, 2=Moderate, 3=Considerable, 4=Substantial, 5=Extensive

Description	Score
Agency Performance: The extent to which duties and processes will improve or positively affect business functions. Consider reduced redundancy and improved consistency for the agency.	4

Productivity Increase: The improvements in quantity or timeliness of services or deliverables. Consider improved turnaround time or expanded capacity of key processes.	4
Operational Efficiency: Efficiencies based on improved use of resources, greater flexibility in agency responses to stakeholder requests, reduction or elimination of paperwork, legacy systems, or manual tasks.	4
Accomplishment Probability: The extent to which this project is expected to have a high level of success in completing all requirements for the division or agency.	4
Functional Integration: The impact the project will have in eliminating redundancy or improve consistency. Consider the impact of information sharing between departments, divisions, or agencies in the State.	4
Technology Sensitive: The implementation of the right types of technology to meet clear and defined goals and to support key functions. Consider technologies and systems already proven within the agency, division, or other similar organizations.	3
Total	23
Additional Information (provide details on Benefits that score > 3)	
<p>Agency Performance: Enforcement and Compliance officers and radio room staff will have the ability to request information in a timely manner and communicate more effectively.</p> <p>Productivity Increase: By minimizing manual paperwork and improving search capabilities, officers will be able to devote more time to enforcement and vehicle inspection activities.</p> <p>Operational Efficiency: ECD officer locations will be available to allow radio room staff to make requests to officers that are in proximity to the location being requested.</p> <p>Accomplishment Probability: By leveraging dispatch capabilities, vehicle locations, and interfacing with existing systems, the division will operate more efficiently beyond the requirements of this project.</p> <p>Functional Integration: The new system will consolidate and integrate new and existing functions to issue warnings, validate credentials, determine permit eligibility, improve officer safety, and interface with existing systems to measure performance improvements.</p>	

VI.B Value to the Public

Score: 0=None, 1=Minor, 2=Moderate, 3=Considerable, 4=Substantial, 5=Extensive

Description	Score
Client Satisfaction: Rate how stakeholders may respond to anticipated improvements. This could apply to health and welfare services, quality of life or life safety functions.	3
Customer Service: Rate anticipated improvements to internal and external customer service delivery. Give consideration to faster response, greater access to information, elimination or reduction in client complaints.	4
Life Safety Functions: Applies to public protection, health, environment, and safety. Consider how this project will reduce risk in these functions.	4
Public Service Functions: Applies to licensing, maintenance, payments, and tax. Consider how this project will enhance services in these functions.	3
Legal Requirements: Consideration should be given to projects mandated by federal or state law. Other consideration could be given if there are interfaces with other federal, state, or local entities.	2
Total	16
Additional Information (provide details on Value to the Public scores > 3)	
<p>Customer Service: By providing electronic query capabilities and data entry, officers can receive more accurate information and cite violations more accurately to reduce errors and improve the flow of commerce by processing violations more efficiently.</p> <p>Life Safety Functions: By having the capability to view officer locations, an officer in proximity can be called resulting in improved response times. Additionally, officer safety is improved allowing radio room personnel to dispatch backup for officers in need of assistance.</p>	

PIJ Project Classification & Risk Evaluation					
Risk Factor	Low (0)	Medium (1)	High (2)	Very High (3)	Score
Project Management Complexity					
Project Team Size (# of people)	1-5	6-10	11-15	> 15	1
Project Manager (PM) Experience	Deep experience in this type of project	Some experience in this type of project and able to leverage subject matter experts	Some experience in this type of project and has limited support from subject matter experts	New to this type of project	1
Team Member Availability	Dedicated staff for project activities only as assigned	Staff is in place, few interrupts for non project tasks are expected and have been accounted for	Available, some turnover expected, some interrupts for non project issues likely	Dedicated team not available; staff will be assigned based on capacity	1
# of Agencies involved in Development activity	1	2	3	> 3	0
Vendor (if used)	No Vendor required	Vendor has been used previously with success	Vendor has been used previously with some management support required	New Vendor and/or multiple vendors	2
Project Schedule	Schedule is flexible	Schedule can handle minor variations, but deadlines are somewhat firm	Scope or budget can handle minor variations, but deadlines are firm	Scope, Budget and Deadlines are fixed and cannot be changed	0
Project Scope	Scope is defined and approved	Scope is defined and pending approval	Scope being defined	High level definition only at this point	1
Budget Constraints	Funds allocated	Funds pending approval	Allocation of funds in doubt or subject to change without notice	No funding allocated	0
Project Methodology	Defined methodology	Defined methodology, no templates	High level methodology framework only	No formal methodology	0
IT Solution Complexity					
Product Maturity (if purchased)	Product implemented & working in > 1 state agency or business of similar size	Product implemented & working in 1 agency or business of similar size	Product implemented & working only in an agency or business of smaller size	Product not implemented in any agency or business	0
Solution Dependencies	No dependencies or interrelated projects	Some minor dependencies or interrelated projects but considered low risk	Some major dependencies or interrelated projects but considered medium risk	Major high-risk dependencies or interrelated projects	1
System Interface Profile	No other system interfaces	1-2 required interfaces	3-4 required interfaces	> 4 required interfaces	3
IT Architectural Impact	Follows State IT approved design; principles, practice & standards	New to the State but follows established industry standards	Evolving "industry standard"	No standards, leading edge technology	1
Deployment Impact					
Process Impact	No business process changes	Agency wide process changes	Multi-State Agency process changes	State-wide process changes	1
Scope of End User Impact	Department or Division level only	Multiple Division or Agency wide impacts	Multi-Agency impacts	State-wide impacts	0
Training Impact	No training is required	Minimal training is required	Considerable training is required	Extensive training is required	1
Total Risk Score					13

X. PROJECT APPROVALS

X.A CIO Review

Key Management Information	Yes	No
1. Is this project for a mission critical application system?	X	
2. Is this project referenced in your agency's Strategic IT plan?		X
3. Is this project consistent with agency and State policies, standards and procedures?	X	
4. Is this project in compliance with the Arizona Revised Statutes and GRRC rules?	X	
5. Is this project in compliance with the statewide policy regarding the Accessibility to Equipment and Information Technology for Citizens with Disabilities?	X	
6. Is this project mandated by law, court case or rule? If yes, cite the federal requirement, ARS Reference or Court Case.		X
Details: Provide details related to technology as part of the requirement.		

X.B Project Values

The following table contains summary information taken from the other sections of the PIJ document.

Description	Section	Significance
Economic Benefits	VI. Benefits to the State	23
Value Rating	VI. Value to the Public	16
Total Development Cost	VIII. Project Financials	\$1,455,783
Total Project Cost	VIII. Project Financials	\$1,946,169
FTE Hours	VIII. Project Financials	1,100
Project Risk Factors	IX. Risk Summary	13

X.c Project Approvals

Select One Pre PIJ Assessment Approval Only PIJ Project Approval

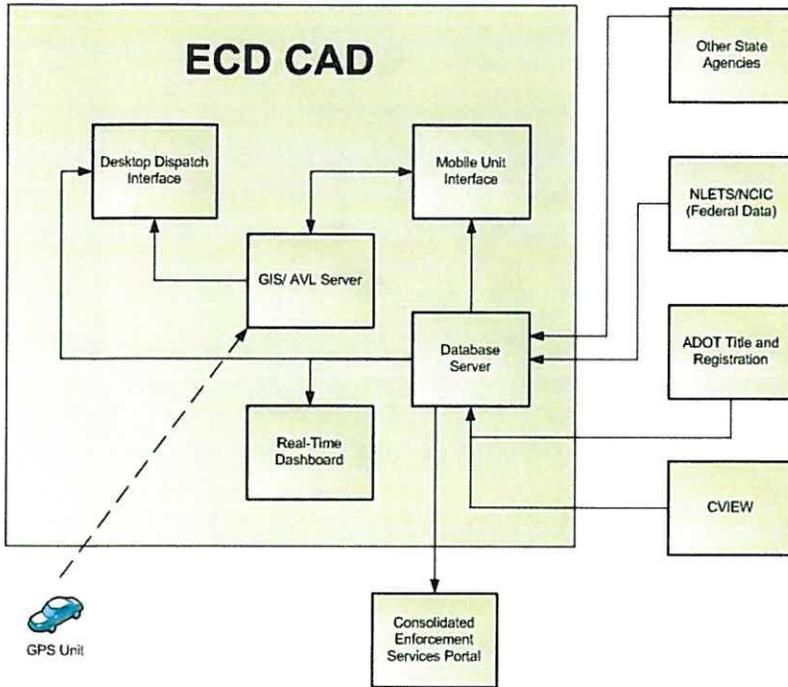
Project Title: Computer Aided Dispatch System

Responsibility	Printed Name	Approval Signature	Date
Project Manager:	Steve Kalina		
Agency CIO:	Joe Throckmorton		
Project Sponsor:	Terry Conner		
Agency Director:	John Halikowski		

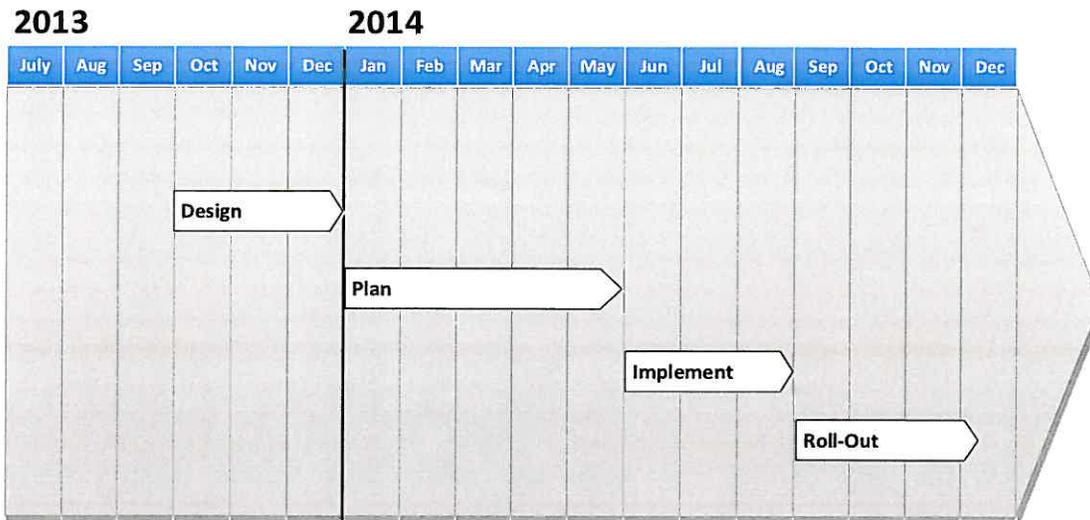
APPENDICES

B. Connectivity Diagram

The following diagram depicts the logical relationships between applications within the ECD CAD System and the external applications that will interact with the CAD system data.



C. Project Schedule - Gantt Chart or Project Management Timeline



Phase 1: Design

Develop design document and hardware plan

Phase 2: Plan

Develop test plan, deployment plan, and acquire hardware.

Phase 3: Implement

System implementation, testing, training, Go-Live

D. NOI (Web Projects Only)

A Notice of Intent will be included as a separate attachment after it is reviewed with the selected vendor.

GLOSSARY

Acronym	Description
ARMANI	Automated Revenue Management and Inventory System
AVL	Automated Vehicle Locator
CAD	Computer Aided Dispatch
CESP	Consolidated Enforcement Services Portal
CMV	Commercial Motor Vehicle
COTS	Commercial Off-The-Shelf system
CSR	Customer Service Representative
CVIEW	Arizona Commercial Vehicle Information Exchange Window
CVISN	Commercial Vehicle Information System and Networks
ECD	Enforcement and Compliance Division
ESRI	Company providing ADOT's GIS mapping software
FMCSA	Federal Motor Carrier Safety Administration
GIS	Geographic Information System
HCRS	Highway Condition Reporting System
IFTA	International Fuel Tax Agreement
IRP	International Registration Plan
MVD	Motor Vehicle Division
NCIC	National Crime Information Center
NLETS	National Law Enforcement Telecommunications System
OOS	Out of Service
OS/OW	Oversize and/or Overweight
POE	Port of Entry
RACF	Resource Access Control Facility security system
ROC	Roadside Operational Computer
TOC	Transportation Operations Center
XML	Extensible Markup Language

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