

## Can You Hear Me Now? Problems with the OCTA Mobile Communications System

### 1. Summary

In 1997 the Orange County Transportation Authority (OCTA) contracted for an integrated transit communications system. State-of-the-art voice and data transmission plus key management information, including automatic vehicle location and route schedule adherence, was promised. After eight years, \$12.7 million, and three project managers, OCTA has a system that:

- provides some data transmission and poor voice transmission
- provides fair vehicle location
- frequently drops calls or fails altogether
- frustrates dispatchers, coach operators, field supervisors, transit police—virtually everyone who uses the system on a regular basis

In addition, there is an atmosphere where some employees fear voicing their concerns to management. Therefore, continuing problems with the system are not reported or fixed.

### 2. Purpose of the Study

The purpose of the study is to investigate the practical operation of the OCTA integrated transportation communication system to determine:

- whether there was appropriate oversight of the project
- whether the allegations of garbled transmission, dead spots, inoperative equipment and poor program management are valid

### 3. Method of Study

To conduct this study, the grand jury:

- interviewed OCTA employees and board members, contractors, and other county employees,

#### Acronyms & Abbreviations in this Report

<b>OCTA</b>	Orange County Transportation Authority
<b>PM</b>	Project Manager
<b>RFP</b>	Request for Proposal

- reviewed documents, including the contract and contract amendments, news articles, the 2002 OCTA internal audit report, system fault logs, incident reports, internal and interagency letters and memoranda, and
- observed the radio system in operation, both at the dispatch center and on board OCTA buses.

## 4. Background

### 4.1 Contract Development

On April 4, 1997, Orange County Transportation Authority sent out a request for proposal for an ITCS (integrated transit communication system). The project called for a state-of-the-art wireless digital voice/data mobile radio system, consisting of three subsystems: 1) a digital radio frequency communications subsystem with 800-megahertz frequency, using two microwave towers, 2) a computer-aided dispatching subsystem, and 3) a vehicle subsystem.

The system was to provide route schedule adherence and automatic vehicle locator functions to automatically display the location of each bus and graphically depict whether it was meeting its route schedule.

The system was to be installed in three phases:

- **Phase I:** Base radio system to provide voice and data communications to the fixed route vehicles and voice communications to the support vehicles.
- **Phase II:** Automatic vehicle locator
- **Phase III:** Paratransit system (transportation for special needs)

Three bids were received. A “best and final” offer was accepted by OCTA on September 22, 1997. Completion of Phase I was scheduled for December 12, 1999. The first project manager (PM1) was appointed.

Between acceptance of the contract and December of 2001, the contract was amended four times, as follows:

1. **August 24, 1998:** Combined Phases I and II, with a revised completion date of November 2000.
2. **February 12, 1999:** The amendment changed the name of the contractor to reflect a change in organization of the contractor.
3. **November 13, 2000:** Added additional microwave relay sites to improve coverage, and added an automatic passenger counter and fleet expansion program to the system.
4. **June 20, 2001:** Extended the delivery date, deleted the automatic passenger counter and reduced the requirement for mobile and portable handsets called for in the original contract.

## 4.2 Initial Contract Performance

Beginning with the initiation of the contract in September 1997, PM1 oversaw the project in addition to his other duties. No joint meetings were held with the contractors, management, and users of the system. No problems with the contract were reported to the OCTA board. A management change in 2001 resulted in a request for audit and a change in project management

On October 8, 2002, five years after the contract was signed, a 12-page audit report was produced. The report found that more than \$11 million of the \$12.6 million contract price had been disbursed, in return for a system that:

as it stands currently, is unreliable, does not meet the original intent or goal of the system, does not meet the contract specifications and requires significant changes to the management structure of the project by both [the prime contractor] and by the Authority. **In our opinion**, the system does not meet, or satisfy, the critical needs of the fixed route system. Dispatchers regularly have difficulty communicating with Coach Operators, and this could result in safety issues for the Coach Operators and the Authority.

At that time, auditors found the system experienced:

- frequent rebooting of the onboard computers
- almost daily failure of the system backbone, without reliable back-up
- frequent dropped calls and distorted or unintelligible voice communications
- erratic/unreliable automatic vehicle locating, reporting vehicles off their routes
- no availability of the route schedule adherence function, because using it overloaded the system

The report recommended: 1) replacing the project manager with a project team, 2) enforcing the liquidated damages provision of the contract, and 3) listing several specific criteria which needed to be met before conducting the system acceptance testing.

The project manager was immediately replaced by a project team, consisting of a new project manager (PM2), a contract manager, and legal counsel. The team was directed to keep OCTA management and the board informed of any problems with the contract and to determine whether the system could be made to work or should be scrapped and legal remedies pursued against the contractor.

The new project team conducted group meetings with dispatch, Freeway Service Patrol, the system assurance contractor, and other stakeholders, encouraging them to report problems.

## 4.3 Contract Compliance Efforts

In 2003, the project team traveled to Maryland for a serious contract compliance discussion with the prime contractor. The team indicated to the contractor that OCTA had

not managed the project in an effective way, but stressed that the contractor needed to either make the system work, or forfeit the \$10 million performance bond and face a potential lawsuit.

Over the next two years, all parties involved agree that the prime contractor exerted an impressive effort to improve system operation and reliability. In November 2004, a 720-hour reliability test was performed, the system was accepted, and the project team was disbanded.

However, during this two-year period from issuance of the internal audit report to the performance of the reliability test:

- The system assurance contractor was terminated because they, "...wanted to keep talking about past problems."
- The Freeway Service Patrol was removed from the system after complaints of the system, "...not performing as designed or promised."
- A manager was reassigned after remarking that the system, "...would be great if it worked," in front of the prime contractor and a prospective client of the prime contractor who were touring the dispatch facility.
- Numerous incident reports were filed by drivers who were unable to communicate with dispatchers during emergencies.
- Fault logs recorded by the dispatchers chronicled continuing problems with voice quality, dropped calls, "dead zones," automatic vehicle locator inaccuracies, etc.
- Transit Service Police complained that the system was so bad, they left the OCTA radios in their vehicles turned off.

OCTA says the system, "...isn't perfect, but it's a good system. We didn't pay for perfect." OCTA claims the remaining problems with the system can be attributed to interference with Nextel cellular sites and lack of driver training in using the system. While there have been problems with Nextel sites interfering with public safety radio systems throughout the country (the Federal Communications Commission has moved up the timetable for Nextel to change frequencies to remove the interference by 2008), calls are dropped at random locations, many of which are not apparently traceable to Nextel sites. Also, there is no correlation of radio difficulties with particular drivers. Even seasoned drivers have difficulty communicating, indicating that training would not solve these problems.

In the last six months, PM2 has left OCTA. The system is now in a maintenance phase, and a new manager (MM) has been appointed. OCTA issued a request for proposal for a consultant to determine if the radio system meets industry standards and to give suggestions for improvement. They have signed a contract and are awaiting a report.

In recognition of the difficulties encountered in managing the contract, OCTA has changed its technology project management to allow project managers to focus full time on project implementation, rather than try to integrate project management with other

duties. There is a technical review committee to propose new technology. If sufficient information systems expertise is not available, they will delay system upgrades.

#### **4.4 Current System Problems**

The grand jury observed the system in operation and interviewed its users. Four months after contract acceptance, the following problems still exist:

- The computer system, including its backup, crashes periodically (twice in recent months: January 12, 2005, and February 15, 2005).
- The automatic vehicle locator system continues to give intermittent erroneous reports of bus location, in part because the system cannot handle polling the location of vehicles more often than once every two minutes. When polling is in a “dead zone,” there is a four-minute gap, etc.
- The silent alarm sometimes does not work and sometimes is tripped by accident. Often the covert microphone does not work when the alarm is tripped. (Many microphones were recently discovered to be inoperative and have been repaired.) Turning on the covert microphone disables handset communication.
- Voice communication is very spotty, leading to frustration and miscommunication. A 15-25% “bad call” rate was reported by dispatchers; the percentage was confirmed through observation.
- A text message sent to all buses cannot be acknowledged by all drivers without overloading the system.
- When more than one dispatcher picks up a call at the same time, the call is dropped and the queue of open calls on the dispatcher’s board is lost.
- The maintenance and troubleshooting of the system is perceived by system users to be far inferior to the service received from the system assurance contractor.
- In March 2005, the Transit System Police, field supervisors, and mobile maintenance units migrated to another system.

MM has assumed responsibility for maintenance of the system and is making improvement efforts, such as:

- Sending technicians to the contractor for training.
- Reducing the load on the system. For example, fare box reporting is purposefully limited to “extraordinary event,” only, reporting.
- Plotting the location of dropped calls and poor voice quality from fault logs. Mapping these areas may indicate where an additional tower would improve transmission coverage.

#### **4.5 Suppression of Problem Reporting**

There is a distinct feeling of frustration and perceived intimidation among the users of the system. After seven years, the communication system has not been fixed or replaced,

leading to such frustration that many users no longer bother to report problems with the system. Dispatchers maintain fault logs, but there is never any feedback about the problems reported. Although MM says users are informed about system issues, users have indicated their input is not solicited or considered.

Intimidation is perceived because the users believe that the system assurance contractor was terminated, the dispatch manager was reassigned, and a dispatcher was reprimanded for voicing concerns about the system. The grand jury believes that this perception discourages users from reporting problems.

## 5. Findings

Under California Penal Code Sections 933 and 933.05, responses are required to all findings. The 2004-2005 Orange County Grand Jury has arrived at the following findings:

- 5.1 Inadequate project management:** The project management was inadequate:
- The automatic passenger counter was added and deleted in a matter of months.
  - Originally, project manager was required to oversee this project in addition to his other duties.
  - It took five years of problems with the contract before an audit was performed.
- 5.2 Unreliable system:** The communication system is not reliable. (See bullets, Section 4.4.)
- 5.3 System maintenance is inadequate:** The technical maintenance of the system is inadequate. (See bullets, Section 4.4.)
- 5.4 System users excluded from problem resolution:** It is not in OCTA's best interests to exclude system users from plans to improve the system or discourage them from reporting problems with the system.

**Responses to *Findings 5.1 through 5.4* are required from the OCTA Board of Directors.**

## 6. Recommendations

In accordance with California Penal Code sections 933 and 933.05, each recommendation will be responded to by the government entity to which it is addressed. The responses are to be submitted to the Presiding Officer of the Superior Court. Based on the findings, the 2004-2005 Orange County Grand Jury makes the following recommendations:

- 6.1** *Project managers*: Project managers should be dedicated solely to the project and have system expertise. (See Finding 5. 1.)
- 6.2** *Internal audit*: Internal audit should monitor contract implementation to ensure payment follows performance. (See Finding 5. 1.)
- 6.3** *Independent consultant*: Hire an independent consultant to analyze the system and make recommendations for improvement. (See Finding 5. 2.)
- 6.4** *Implement the recommendations*: Implement the recommendations of the independent consultant to improve the system. (See Finding 5. 2.)
- 6.5** *Training and maintenance*: Continue training of technicians as planned, and consider hiring an independent firm with knowledge of this system to perform maintenance. (See Findings 5. 2 and 5. 3.)
- 6.6** *Include system users*: Include system users in meetings where the system is being analyzed and recommendations are being made. (See Finding 5. 4.)
- 6.7** *Correct the perception*: Take steps to correct the perception by some users that reporting system problems could hurt their OCTA careers. (See Finding 5. 4.)

**Responses to *Recommendations 6.1 through 6.7* are required from the OCTA Board of Directors.**