

Department of Transportation

**Allegations of Improprieties Involving Road Construction
and Railroad Crossing Upgrade Contracts**

November 1999

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The Honorable Don Sundquist, Governor
and

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and

The Honorable J. Bruce Saltsman, Sr., Commissioner
Department of Transportation
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Ladies and Gentlemen:

Transmitted herewith is a special report by the Division of State Audit of its review into allegations of improprieties involving Department of Transportation staff in connection with road construction contracts and railroad crossing upgrade contracts. The review was predicated upon information received from confidential sources. It was subsequently determined that the allegations were without specific facts and those related to construction contracts were based purely on speculation. Nevertheless, in light of the seriousness of the allegations, if true, it was decided that this office would review certain matters. The review focused on two central issues: 1) whether the department had appropriate bases for supplemental agreements to road construction contracts, and 2) whether a departmental employee had manipulated or disregarded the railroad project priority list to favor a certain railroad.

With regard to road construction contracts, it was alleged that some construction companies in Tennessee would submit unreasonably low bids for road construction contracts. After they were awarded the work, the companies would submit requests for additional work and fees. These fees would provide the company with a greater profit margin than the original "underbid" work. In this way, the companies could recover the profit they lost on the original bid, and the state would be paying a higher overall cost on what initially appeared to be a low bid.

This review revealed a need for greater documentation of decisions for supplemental agreements and incentive bonuses. We did not substantiate the speculation of intentional underbidding on contracts. However, our sample size was small and we were not given any specific contracts to review. Because of the large amount of funds involved in these projects, the department should review these issues and take corrective action to ensure that related decisions are founded on clear and reasonable facts, fully documented in the files, and subjected to appropriate review.

The lack of adequate documentation made it impossible to establish that the department had reasonable bases for entering supplemental agreements to road construction contracts. Such a lack of documentation to support management decisions calls into question the justification for supplemental agreements and raises concerns that the officials approving the transactions did not have all the necessary information before making the decision to approve the transactions.

With regard to the railroad safety program (Section 130 Program), it was alleged that because some railroad crossings within the state of Tennessee that were not upgraded had higher priorities for upgrades on the department's list of railroad crossings than crossings that were upgraded, the director manipulated or disregarded the priority list to favor three Tennessee Southern Railroad Company crossings.

This review revealed serious shortcomings in the way railroad crossing upgrade decisions are made. Although there is a need for better documentation of decisions, it is clear that some decisions were made that were unjustified and inappropriate. It does not appear that improved documentation would have prevented these erroneous actions.

The director's decision to upgrade the railroad crossing at Motivation Drive, located in Lawrenceburg, Tennessee, appeared unjustified and unnecessary in light of the information gathered in this review. Our review determined that although the director knew the Motivation Drive priority list ranking was inaccurate, his upgrade decision followed the current ranking. Under the actual facts regarding the conditions and history of that railroad crossing, it should not have been considered for any upgrades at the time. The director's lack of appreciation for a prior rehabilitation of Motivation Drive and his further actions based on information he knew was inaccurate continued even after the prior rehabilitation was brought to his attention by inspectors. The result of the director's decision led to expenditures of \$61,478 to upgrade this Tennessee Southern railroad crossing rather than upgrading other crossings with higher priority.

The director approved three railroad crossings for upgrades although the existing warning lights were working and of modern design. The cost of the equipment that was replaced unnecessarily totaled \$4,250. The Section 130 staff should document the existing warning devices during the diagnostic team's reviews and ensure that the department does not needlessly pay for the replacement of existing equipment that can be retained.

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This review also determined that three railroad crossings with high rankings on the 1997 priority list were overlooked. In addition, other upgrade project decisions for other railroad crossings were based on inaccurate data and supporting documentation for management's decisions was not always located in the respective files. Furthermore, previously upgraded railroad crossings were excluded from the current upgrade considerations, regardless of the number of subsequent accidents or their priority ranking.

The department should consider the recommendations contained in this report and take appropriate measures to address the issues above. These measures should include personnel actions, the implementation of effective management controls, and establishment of greater oversight of certain functions. Furthermore, the department's internal auditor should review any newly implemented controls to ensure they are adequate and effective.

Sincerely,

John G. Morgan
Comptroller of the Treasury

JGM/ct

State of Tennessee

Audit Highlights

Comptroller of the Treasury

Division of State Audit

Special Report
Department of Transportation
Allegations of Improprieties Involving Road Construction
and Railroad Crossing Upgrade Contracts

November 1999

REVIEW OBJECTIVES

The objectives of our review were to determine whether the department had appropriate reasons for supplemental agreements to road construction contracts; to determine whether a departmental employee had manipulated or disregarded the railroad project priority list to favor a certain railroad; and to report our findings to the Department of Transportation and recommend appropriate actions to correct any deficiencies.

RESULTS OF THE REVIEW

With regard to road construction contracts, it was alleged that some construction companies in Tennessee would submit unreasonably low bids for road construction contracts. After they were awarded the work, the companies would submit requests for additional work and fees. These fees would provide the company with a greater profit margin than the original "underbid" work. In this way, the companies could recover the profit they lost on the original bid, and the state would be paying a higher overall cost on what initially appeared to be a low bid.

This review revealed a need for greater documentation of decisions for supplemental agreements and incentive bonuses. We did not substantiate the speculation of intentional underbidding on contracts. However, our sample size was small and we were not given any specific contracts to review. Because of the large amount of funds involved in these projects, the department should review these issues and take corrective action to ensure that related decisions are founded on clear and reasonable facts, fully documented in the files, and subjected to appropriate review.

The lack of adequate documentation made it impossible to establish that the department had reasonable bases for entering supplemental agreements to road construction contracts. Such a

lack of documentation to support management decisions calls into question the justification for supplemental agreements and raises concerns that the officials approving the transactions did not have all the necessary information before making the decision to approve the transactions. Requiring documentation for critical decisions affecting the safety of citizens and the expenditure of a material amount of funds would appear prudent and would assist top management in the approval stages.

The following deficiencies were also noted in this review of road construction contracts:

- The department does not have written procedures regarding the review and approval of incentives. Because the use of incentive bonuses appears to be increasing (\$696,000 in 1997, \$1,075,850 in 1998, and \$1,921,175 in 1999), the promulgation of written procedures would appear prudent.
- Overruns on construction contracts in fiscal years 1997, 1998, and 1999 totaled approximately \$100 million. Because of the significant amount of overruns, the department should reevaluate the planning and implementation stages of road construction contracts. The department should develop a more effective means for estimating costs, for tightening negotiations with contractors during construction stages, and for analyzing past performance of contractors to determine possible abuses relating to overruns.

With regard to the railroad safety program (Section 130 Program), it was alleged that because some railroad crossings within the state of Tennessee that were not upgraded had higher priorities for upgrades on the department's list of railroad crossings than crossings that were upgraded, the director manipulated or disregarded the priority list to favor three Tennessee Southern Railroad Company crossings.

This review revealed serious shortcomings in the way railroad crossing upgrade decisions are made. Although there is a need for better documentation of decisions, it is clear that some decisions were made that were unjustified and inappropriate. It does not appear that improved documentation would have prevented these erroneous actions. The shortcomings effecting upgrade decisions were as follows:

- The director's decision to upgrade the railroad crossing at Motivation Drive located in Lawrenceburg, Tennessee, appeared unjustified and unnecessary in light of the information gathered in this review. Our review determined that although the director knew the Motivation Drive priority list ranking was inaccurate, his upgrade decision followed the current ranking. Under the actual facts regarding the conditions and history of that railroad crossing, it should not have been considered for any upgrades at the time. The director's lack of appreciation for the prior rehabilitation of Motivation Drive and his further actions based on information he knew was inaccurate continued even after the prior rehabilitation was brought to his attention by inspectors. The result of the director's decision led to expenditures of \$61,478 to upgrade this Tennessee Southern railroad crossing rather than upgrading other crossings with higher priority. Upper management of the department should consider this area one of high risk and should take appropriate actions to ensure a higher level

of program review and address the apparent lack of accuracy in the program data. Furthermore, upper management should coordinate the sharing of data between the Section 130 program and rehabilitation sections. The Section 130 staff should document the railroad crossing safety weaknesses determined through the diagnostic team visits. This information should be compared to the priority list data and changes should be made if necessary. Those railroad crossing projects under the diagnostic team's review should then be reevaluated based on the accurate data.

- The director approved three railroad crossings for upgrades although the existing warning lights were working and of modern design. The cost of the equipment that was replaced unnecessarily totaled \$4,250. The Section 130 staff should document the existing warning devices during the diagnostic team's reviews and ensure that the department does not needlessly pay for the replacement of existing equipment that can be retained.
- Three railroad crossings with high rankings on the 1997 priority list were overlooked. Under the circumstances noted in this review, written policies and procedures should be promulgated to ensure that the director's decisions for funding upgrade projects are subject to a higher level of review and that railroad crossings with high rankings are not overlooked.
- Other upgrade project decisions for other railroad crossings were based on inaccurate data and that supporting documentation for management's decisions was not always located in the respective files. Written policies and procedures should be promulgated to ensure that data collected to develop the priority list is accurate and up-to-date.
- Previously upgraded railroad crossings were excluded from the current upgrade considerations, regardless of the number of subsequent accidents or their priority ranking. The department should reevaluate this procedure to determine whether it is appropriate.

The department should consider the recommendations contained in this report and take the appropriate measures to address the issues above. These measures should include personnel actions, the implementation of effective management controls, and establishment of greater oversight of certain functions. Furthermore, the department's internal auditor should review any newly implemented controls to ensure they are adequate and effective.

"Audit Highlights" is a summary of the special report. To obtain the complete special report, please contact

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INTRODUCTION

ORIGIN OF THE REVIEW

In March 1999, our office received allegations of improprieties involving the Department of Transportation. The review was predicated upon information received from confidential sources. It was subsequently determined that the allegations were without specific facts and those related to construction contracts were based purely on speculation. Nevertheless, in light of the seriousness of the allegations, if true, it was decided that this office would review certain matters. The review focused on two central issues: 1) whether the department had appropriate bases for supplemental agreements to road construction contracts, and 2) whether a departmental employee had manipulated or disregarded the railroad project priority list to favor a certain railroad.

OBJECTIVES OF THE REVIEW

The objectives of the review were

1. to determine whether the department had appropriate reasons for supplemental agreements to road construction contracts;
2. to determine whether a departmental employee had manipulated or disregarded the railroad project priority list to favor a certain railroad; and
3. to report our findings to the Department of Transportation and recommend appropriate actions to correct any deficiencies.

DETAILS OF THE REVIEW

I. ROAD CONSTRUCTION CONTRACTS

It was alleged that some construction companies in Tennessee would submit unreasonably low bids for road construction contracts. After they were awarded the work, the companies

would submit requests for additional work and fees. These fees would provide the company with a greater profit margin than the original “underbid” work. In this way, the companies could recover the profit they lost on the original bid, and the state would be paying a higher overall cost on what initially appeared to be a low bid.

Although there were no allegations that any state employees were active participants in the alleged schemes, we were advised that it “was no problem” for a contractor to obtain a supplemental agreement.

Supplemental agreements and variations between the quantity of work specified in the original contract (the quantity estimated by department engineers) and the quantity of work actually needed to complete the job can cause cost overruns. The department often requires the contractor to perform any extra work due to these variations at the price per unit-of-work agreed upon in the original contract. Only when the conditions of the work change, the contractor and the department may agree on the price for the additional work, resulting in a supplemental agreement. In supplemental agreements, the price per unit-of-work is often higher than the price agreed upon in the original contract, if the contract contains an applicable unit price. Therefore, in light of the allegations, if true, it appears that the avenue the contractor would most likely have taken in regard to retroactively increasing his profit on a project would have involved a supplemental agreement.

Although cost overruns of specific road construction projects due to inaccurate estimates were not examined in this review, the overruns were significant. For the road construction contracts closed in fiscal years 1997, 1998, and 1999, the total overruns were approximately \$35 million (including \$15 million in supplemental agreements), \$35 million (including nearly \$10 million in supplemental agreements), and \$30 million (including \$6.5 million in supplemental agreements), respectively. Considering closed contracts totaled \$1,476,335,917 for the past three fiscal years, the average overrun on a construction contract amounted to 8 percent.

A. Lack of Documentation in Supplemental Agreements

Because of a lack of adequate documentation, it was not possible to establish that the department had reasonable bases for entering supplemental agreements to road construction contracts.

In the review of road construction contracts, it was determined that net supplemental agreements totaling \$32,101,676 were approved by the department for road construction contracts closed during fiscal years 1997, 1998, and 1999. These 1,419 supplemental agreements amounted to 2.2 percent of the \$1,476,335,917 in total expenditures for the closed contracts for the period. Since we were not referred to any particular contracts to review for irregularities, we reviewed a sample of the larger contracts having supplemental agreements. The total expenditures for this sample of seven contracts were \$21,783,697.

The review of the files relating to the sample of seven contracts chosen did not reveal any supplemental agreements without a stated basis for the additional work. These supplemental

agreements appeared to have been routed through the regular administrative processes. However, because of the lack of detailed documentation supporting some decisions made by department officials, it could not be determined whether the bases for all the supplemental agreements reviewed were appropriate. For example, one project in Sullivan County was originally designed to include a roadway through a rock embankment. However, after the initial excavation, it was determined that the rock was not stable. Therefore, the department changed the design to include an increase in the amount of area to be excavated to provide a sloped embankment. The department's specifications generally provided for the contractor to be paid 1.2 times the unit price bid for each cubic yard of additional excavation corresponding to the slope. After the contractor notified the department of additional costs beyond those covered by the 1.2 times the unit price provision, the department apparently performed an analysis of the costs and agreed to pay the contractor an additional \$517,500. This was approximately \$250,000 more than the payment would have been had the department's specifications of providing 1.2 times the unit price been followed. The department's analysis was apparently not retained in the project file and could not be provided by the department. Their analysis was apparently based on payroll records, equipment rates, and material invoices provided by the contractor and a subcontractor. However, only a portion of these documents was found in the file (certified payroll records) and the amount of work related to the additional excavation could not be distinguished from the work specified in the original contract.

Additionally, two supplemental agreements totaling \$143,452 to a contract in Knox County, originally in the amount of \$581,798, were approved for the overtime pay and additional costs of expediting the contractor's work. However, because the documentation supporting the necessity of the expedition and the deadline for this work was unavailable, it could not be determined whether these payments were justifiable.

From this review of supplemental agreements, it appears that management failed to adequately document these decisions. Such a lack of documentation to support management decisions calls into question the justification for supplemental agreements and raises concerns that the officials approving the transactions did not have all the necessary information before making the decision to approve the transactions.

B. Incentive Bonuses

The contractor's request for additional payment on the Knox County contract was initially presented as an incentive bonus by the contractor. We interviewed department officials about incentive bonuses offered to contractors. According to the Director of Construction, if incentive bonuses were justified, the department would include such offerings only in original contracts. The contractor would receive the bonus if the work was completed before a certain deadline. According to the director, these contracts also included a clause which would effect a monetary penalty against the contractor if the work was not completed by a certain date. In regard to the Knox County contract, department officials stated that because the need to expedite the work was not known until after the original contract was let, as a matter of procedure the payment for the expedition was effected through a supplemental agreement rather than through an incentive bonus. None of the other contracts we reviewed as part of our original sample contained an

incentive bonus. However, the director provided us with several contracts containing these provisions and clauses.

In interviewing department officials about incentive bonuses offered to contractors, it was determined that the department does not have written procedures regarding the review and approval of incentives. Because the use of incentive bonuses appears to be increasing (\$696,000 in 1997, \$1,075,850 in 1998, and \$1,921,175 in 1999), the promulgation of written procedures would appear prudent.

II. RAILROAD CROSSING UPGRADES

The department is responsible for administering the federal railroad crossing upgrade program (Title 23 United States Code, Section 130). This federal program mandates that each state will maintain a listing of all railroad crossings which may require protective devices and provides for the state to schedule upgrade projects to provide for safety at railroad crossings. The department maintains a priority listing ranking the approximately 3,400 railroad crossings throughout the state in terms of need for safety improvements.

It was alleged that because some railroad crossings within the state of Tennessee that were not upgraded had higher priorities for upgrades on the department's list of railroad crossings than crossings that were upgraded, the director manipulated or disregarded the priority list to favor three Tennessee Southern Railroad Company crossings. Our review determined that although the director knew the Motivation Drive priority list ranking was inaccurate, his upgrade decision followed the current ranking. The 1997 upgrade to the railroad crossing at Motivation Drive included the unnecessary replacement of 12-inch lights with 12-inch lights as well as other improvements. However, under the actual facts regarding the conditions and history of that railroad crossing, it should not have been considered for any upgrades at the time.

It was also alleged that the director of the Section 130 Program had approved the three railroad crossings for upgrades although the existing warning lights were working and of modern design. This allegation was confirmed although other improvements were also made at these crossings.

Upgrades on railroad crossings can involve many changes, such as improvements in warning lights, installation of motion detection devices, installation or replacement of the light and motion detector circuitry and batteries, work performed on the actual track area, and the installation of crossing gates, among other things.

The three railroad crossings in question were located at 1) Motivation Drive in Lawrenceburg, 2) Bennett Drive in Pulaski, and 3) Hampshire Road in Columbia, Tennessee. The department expenditures totaled \$194,885.90 to upgrade the three railroad crossings. The Tennessee Southern Railroad Company purchased all the materials and provided the labor and equipment for the upgrades and was reimbursed for all these costs by the department after the projects were completed.

A. Motivation Drive

The decisions to upgrade the three railroad crossings were made by the Section 130 Program director in 1997 after a diagnostic team (consisting of the director, a roadway specialist, and a transportation manager) visited approximately 45 prospective railroad crossings and recommended the three to be included in approximately 35 railroad crossings chosen to be upgraded. The director's decision to upgrade the railroad crossing at Motivation Drive appeared unreasonable and unnecessary in light of the information gathered in this review.

1. Background on Motivation Drive

The railroad crossing located at Motivation Drive in Lawrenceburg, Tennessee, had work performed twice in the past to provide for improvements in the safety of the crossing. Both of the safety improvement projects, which occurred in 1993 and 1997, were funded by the Department of Transportation. The existing warning devices at the crossing consisted of only crossbucks (railroad crossing signs) before any improvements were made. According to an accident report, on August 7, 1992, a train struck a vehicle crossing the tracks at Motivation Drive at 10:53 p.m. No fatalities were reported.

Approximately one year after the accident and through funding assistance from the Department of Transportation's rehabilitation section, the railroad operator equipped the railroad crossing with a warning system which included 12-inch lights, motion detectors, and housing for the batteries and related circuitry. The installation of this system was completed in March 1993. The department spent \$29,253 relative to the 1993 rehabilitation of the Motivation Drive railroad crossing.

The reported 1992 accident at the Motivation Drive railroad crossing was first indicated on the 1994 priority list because there is a lag time of approximately two years before the federal government releases accident data used by the department. The priority list is a compilation of factors for all public railroad crossings in Tennessee and is used by the department to determine the probability of future accidents. The Motivation Drive crossing was ranked 181st on the department's 1994 priority list. No further accidents at this crossing were reported. However, in 1997, department staff reviewed the crossing and determined it needed to be upgraded. The department incurred expenditures of \$61,478 to upgrade the crossing in late 1997.

2. Incorrect Data on Priority List

The railroad crossing located at Motivation Drive was ranked 130th on the department's calendar year 1997 priority list. However, this review determined that the related data compiled on the priority list, upon which this ranking was developed, contained out-of-date information. The most critical out-of-date information was the last year of upgrade for the railroad crossing. According to the 1997 priority list, the last year of upgrade for Motivation Drive occurred in 1981. However, there was no documentation to support the 1981 figure. Furthermore, documents from the department's rehabilitation section confirm that the railroad crossing had

actually been rehabilitated in 1993. The information regarding this upgrade was apparently not entered into the department's database.

Had the priority list indicated the year of the last upgrade as 1993 (actual) rather than 1981, this factor would have reduced the priority of the crossing from 130th to 1,278th, according to the Information Systems Analyst Supervisor. This reduction in priority would have placed the Motivation Drive railroad crossing substantially lower than the last railroad crossing considered in 1997 (385th). Thus, the railroad crossing would not have even been considered for an upgrade had accurate information been indicated on the priority list.

According to the Section 130 director, the rehabilitation project data should have been submitted to the information systems staff by the rehabilitation staff to be included in the database. In the alternative, the information should have been self-reported to the Section 130 staff by the railroad on an inventory update form that railroads are encouraged, but not required, to submit. However, according to the transportation manager of the rehabilitation section, rehabilitation project data are not shared with the information systems staff. The transportation manager stated that the information systems staff should have received the updated data from the Section 130 staff after the railroad had submitted an inventory update form to the Section 130 staff. In the alternative, the Section 130 staff should have noted any subsequent improvements during site visits before the upgrade projects were initiated.

3. The Director's Prior Knowledge About the Motivation Drive Crossing

Notwithstanding the inaccuracy in the department's database, which was carried forward on the priority list, the Section 130 director stated that he was independently aware that the crossing had been previously rehabilitated in 1993 at the time the 1997 decision was made to upgrade the Motivation Drive railroad crossing. He stated that the 1997 upgrade was approved because the Tennessee Southern's engineer had told him that the crossing had been rehabilitated with old parts. There was no documentation of this conversation. Although the company's engineer did not recall the conversation with the director, he stated that the prior lights at the Motivation Drive crossings had been obtained from the railroad company's inventory of used equipment.

4. Inspections of Motivation Drive Crossing Prior to the Upgrade

Not only did the director have knowledge of the 1993 work, but he had also inspected the railroad crossing at Motivation Drive in 1994 and determined that the crossing had adequate warning devices. A diagnostic team (of which the director was a member) visited the site in 1994 and determined that the crossing had adequate protection. Their determination appeared reasonable considering another section of the department (Rehabilitation Section) had paid for the placement of warning signals at the crossing in 1993 and no accidents were reported after the rehabilitation. Therefore, other than the aging of the equipment during the period between 1994 and 1997, we found no evidence that would support the need to upgrade this railroad crossing.

In 1997, the director and a diagnostic team again visited the railroad crossing site to evaluate the warning devices. The team members recommended an upgrade which included 12-inch warning lights. Some railroad crossings are equipped with smaller 8-inch warning lights. It would be understandable to “upgrade” 8-inch lights with 12-inch lights if the crossing was considered a high priority. However, the presently available information indicates that the crossing already had 12-inch warning lights which were allegedly working. When asked about why 12-inch lights would be replaced by 12-inch lights, the director and team members said that they had thought the railroad crossing had 8-inch lights at the time of their visit. However, after the initial decision by the director was made to upgrade the railroad crossing, two inspectors advised the director that the site already had 12-inch lights. Yet, the director went forward with the replacement of the lights. Considering that many other railroad crossings in Tennessee had no warning signals and considering the information above, it appears that the Section 130 director disregarded what appears to be relevant information in the decision to upgrade the crossing.

Besides the replacement of lights, the upgrade to the railroad crossing at Motivation Drive included the installation of constant warning time track circuitry (a type of motion detection system that activates the warning lights for a desired length of time regardless of the speed of an approaching train) and advance warning signs. These other 1997 improvements did not appear to duplicate the existing warning devices and would have appeared necessary had the actual ranking of the railroad warranted an upgrade.

5. Three Railroad Crossings Needing Upgrades That Were Overlooked

A comparison of railroad crossing factors for Motivation Drive (a crossing without an accident since the 1993 rehabilitation) with other railroad crossings ranked higher on the priority list revealed that even with the incorrect high ranking of the Motivation Drive crossing, three higher ranking railroad crossings were not chosen for an upgrade. The director had no explanation why several crossings with higher priority were skipped. The result of the director’s decision led to expenditures of \$61,478 to upgrade this Tennessee Southern railroad crossing rather than upgrading other crossings with higher priority.

B. Bennett Drive and Hampshire Road

1. Relative Rankings

On the 1997 priority list, the railroad crossings at Bennett Drive and at Hampshire Road were ranked 83rd and 62nd, respectively. It appeared that, with regard to relative rankings, these two railroad crossings were appropriately ranked.

Although the priority list data relative to these two crossings included information that was inaccurate, this review determined the inaccuracies were immaterial and did not significantly alter the respective rankings on the priority list. Such factors as reported accidents and the average volume of daily automobile traffic for these two railroad crossings were compared to factors and rankings for other crossings on the 1997 priority list. The comparisons did not

indicate the Tennessee Southern Railroad Company was shown any favoritism by department staff. Nor did it appear that the priority list had been manipulated to increase the rankings of the Bennett Drive or Hampshire Road railroad crossings or decrease other crossings on the list. The scope of the crossings evaluated in 1997 by the department ranged from number 1 (highest ranking) to 385. A large number of railroad crossings are not considered because an upgrade may already have been completed, be in-progress, or be authorized for work. Other railroad crossings are not considered because the department has determined that they contain adequate protection or already have the most protection available.

This review revealed that the railroad crossings at Bennett Drive and at Hampshire Road each had one accident recorded in 1995. The reported accident at Bennett Drive occurred on July 10, 1995. According to the accident report, at 2:30 p.m. a tractor-trailer was struck by a train at the crossing. The accident resulted in one injury but no fatalities. The reported accident at Hampshire Road occurred on September 7, 1995. According to the accident report, a tractor-trailer struck a train at 12:02 p.m. The report also indicated that the tractor hit the mounted warning lights at the crossing. No injuries or fatalities were reported. According to department officials, the 1995 accident information was the most up-to-date data available from the Federal Railroad Administration (FRA) at the time of their 1997 decision-making process regarding crossing upgrades. Therefore, under these circumstances, the department's need to evaluate these crossings as possible candidates for upgrades appears reasonable. Although other railroad crossings in Tennessee were without any warning lights and were not evaluated in 1997, the accidents at these two crossings brought the predicted value of another accident occurring at these sites above those with no recorded accidents and no warning lights.

2. Lights and Circuitry Boxes

In 1997, the department spent approximately \$4,250 to replace lights at Bennett Drive in Pulaski, Tennessee, and to replace lights and a circuitry box at Hampshire Road in Columbia, Tennessee, that apparently were not necessary. Presently available information indicates that even though the two crossings had modern 12-inch lights, which were allegedly in adequate working order, the department paid to replace the 12-inch lights with new 12-inch lights. The director and members of the diagnostic team initially had no explanation for replacing 12-inch lights with new 12-inch lights at these two crossings. In interviewing the diagnostic team members, it became apparent that the light size was the determining factor in deciding whether to replace crossing lights. The normal procedures followed by the diagnostic team were to consider 12-inch lights adequate and only recommend the replacement of the older 8-inch lights. In fact, these department officials stated that such a replacement would have been unnecessary and initially denied that such a replacement had occurred. After further review of railroad crossing files, the Section 130 director concurred that this replacement had erroneously occurred at the Hampshire Road railroad crossing. The related Hampshire Road project file contained a report of the condition of the warning devices as observed by the director before the upgrade. This report specifically indicated in handwritten notes by the director that the 12-inch lights and box containing the circuitry were to be retained. According to the director, during the transfer of his notes to a typed version of the report by another member of the diagnostic team, this information was erroneously excluded. With regard to the Bennett Drive railroad crossing, the director

stated that although he does not specifically recall whether the width of the prior lights was 8-inch or 12-inch, because 12-inch lights were recommended, he assumed that the prior lights were 8-inch models.

3. Other Improvements

Although warning lights play an important role in the safety of railroad crossings, they are only one component of the entire warning system provided in an upgrade. Warning lights cost approximately \$1,500 a set, one-twentieth of the average material costs associated with an upgrade. At the Bennett Drive and Hampshire Road crossings, the department also upgraded the motion detection systems and extended the existing crossing pad with a wider concrete pad or installed additional advance warning signs at a total cost of \$75,157.88 and \$58,249.86, respectively. The director stated that he based his decision to upgrade these two railroad crossings on his engineering judgment. According to the director, in making his decision, he considered the data indicated on the priority list, the condition of the existing lights and circuitry, the track condition (rust and decayed railroad ties), and the surface and width of the road in relationship to the railroad crossing. The director's decision making was not documented. Moreover, with regard to the extension of the concrete pad and installation of additional warning signs, it could not be determined whether these improvements were necessary in 1997 because of the lack of documentation.

C. Alleged Financial Benefit to the Railroad

The source of the allegations speculated that the Tennessee Southern Railroad Company may have been going through a financial crisis at the time and that the funding of this and other projects may have provided needed funds through allowable administrative fees paid to the railroad. As is the customary practice in such cases, the railroad retained a 5 percent handling fee on these projects and retained the old equipment. However, the administrative fees totaling \$4,769 (5% of material costs) received by the railroad in regard to these projects appeared relatively immaterial. Therefore, this speculation of financial rewards to the railroad through these projects did not appear plausible. The president of the Tennessee Southern Railroad Company stated he has made no payment or provided anything of value to any department employee. In addition, the director of the Section 130 Program and the other diagnostic team members denied receiving anything of value in regard to providing funds for the upgrade projects. Furthermore, nothing else came to our attention during our review regarding financial benefits to the railroad or to department employees in relationship to these three upgrade projects.

D. Other Upgrade Decisions Based on Inaccurate Data

Our review also determined that other upgrade project decisions for other railroad crossings were based on inaccurate data and that supporting documentation for management's decisions was not always maintained in the respective files. The review revealed inaccuracies in the amount of traffic using railroad crossings and inaccuracies in the number of relevant trains using the crossings and their speeds. The director or the diagnostic team failed to verify important information with the railroad operators and assumed that the traffic data collected by

the department's traffic section was up-to-date. Our review also revealed several other instances where the last date of upgrade for railroad crossings was inaccurate. The diagnostic team did recognize some of the upgrade inaccuracies and noted them on past priority lists. However, the inaccuracies were apparently never corrected in the database because they appeared on the following year's priority list. Furthermore, it was determined that information derived from third-parties (county and city officials) regarding projects related to railroad crossings under consideration for upgrades was not documented in the railroad crossing files. Therefore, in reviewing files, it could not be determined whether an upgrade project had been delayed because of a county or city road project, which took precedence over an upgrade, or whether the railroad crossing had been skipped because of a unilateral decision of the director.

E. Previously Upgraded Railroad Crossings Excluded from the Current Upgrades

In determining the railroad crossings to be upgraded, the director routinely excluded all railroad crossings which had been upgraded within the previous seven years. The previously upgraded crossings were excluded from an upgrade consideration regardless of the number of subsequent accidents or their priority ranking. The director stated that in order to better assess whether an upgrade project was providing adequate safety, the procedures he followed included waiting until five years of accident data were accumulated (seven years total because the delay in obtaining accident data was generally two years) before making an assessment. The director also stated that other states follow these procedures in assessing railroad crossing safety. Although this procedure may be followed by other states and may be an efficient method in dispersing a limited amount of allocated safety funds, the procedure appears flawed in that it eliminates railroads which are documented safety hazards from the scope of the safety program.

III. CONCLUSION AND RECOMMENDATIONS

With regard to road construction contracts, this review revealed a need for greater documentation of decisions for supplemental agreements and incentive bonuses. We did not substantiate the speculation of intentional underbidding on contracts. However, our sample size was small and we were not given any specific contracts to review. Because of the large amount of funds involved in these projects, the department should review these issues and take corrective action to ensure that related decisions are founded on clear and reasonable facts, fully documented in the files, and subjected to appropriate review.

The lack of adequate documentation made it impossible to establish that the department had reasonable bases for entering supplemental agreements to road construction contracts. Such a lack of documentation to support management decisions calls into question the justification for supplemental agreements and raises concerns that the officials approving the transactions did not have all the necessary information before making the decision to approve the transactions. Requiring documentation for critical decisions affecting the safety of citizens and the expenditure of a material amount of funds would appear prudent and would assist top management in the approval stages.

The following deficiencies were also noted in this review of road construction contracts:

- The department does not have written procedures regarding the review and approval of incentives. Because the use of incentive bonuses appears to be increasing (\$696,000 in 1997, \$1,075,850 in 1998, and \$1,921,175 in 1999), the promulgation of written procedures would appear prudent.
- Overruns on construction contracts in fiscal years 1997, 1998, and 1999, totaled approximately \$100 million. Because of the significant amount of overruns, the department should reevaluate the planning and implementation stages of road construction contracts. The department should develop a more effective means for estimating costs, for tightening negotiations with contractors during construction stages, and for analyzing past performance of contractors to determine possible abuses relating to overruns.

With regard to the railroad safety program (Section 130 Program), this review revealed serious shortcomings in the way railroad crossing upgrade decisions are made. Although there is a need for better documentation of decisions, it is clear that some decisions were made that were unjustified and inappropriate. It does not appear that improved documentation would have prevented these erroneous actions. The shortcomings effecting the upgrade decisions were as follows:

- The director's decision to upgrade the railroad crossing at Motivation Drive appeared unjustified and unnecessary in light of the information gathered in this review. Our review determined that although the director knew the Motivation Drive priority list ranking was inaccurate, his upgrade decision followed the current ranking. Under the actual facts regarding the conditions and history of that railroad crossing, it should not have been considered for any upgrades at the time. The director's lack of appreciation for the prior rehabilitation of Motivation Drive and his further actions based on information he knew was inaccurate continued even after the prior rehabilitation was brought to his attention by inspectors. The result of the director's decision led to expenditures of \$61,478 to upgrade this Tennessee Southern railroad crossing rather than upgrading other crossings with higher priority. Upper management of the department should consider this area one of high risk and should take appropriate actions to ensure a higher level of program review and address the apparent lack of accuracy in the program data. Furthermore, upper management should coordinate the sharing of data between the Section 130 program and rehabilitation sections. The Section 130 staff should document the railroad crossing safety weaknesses determined through the diagnostic team visits. This information should be compared to the priority list data and changes should be made if necessary. Those railroad crossing projects under the diagnostic team's review should then be reevaluated based on the accurate data.
- The director approved three railroad crossings for upgrades although the existing warning lights were working and of modern design. The cost of the equipment that was replaced unnecessarily totaled \$4,250. The Section 130 staff should document the existing warning devices during the diagnostic team's reviews and ensure that the department does not needlessly pay for the replacement of existing equipment that can be retained.

- Three railroad crossings with high rankings on the 1997 priority list were overlooked. Under the circumstances noted in this review, written policies and procedures should be promulgated to ensure that the director's decisions for funding upgrade projects are subject to a higher level of review and that railroad crossings with high rankings are not overlooked.
- Other upgrade project decisions for other railroad crossings were based on inaccurate data and that supporting documentation for management's decisions was not always located in the respective files. Written policies and procedures should be promulgated to ensure that data collected to develop the priority list is accurate and up-to-date.
- Previously upgraded railroad crossings were excluded from the current upgrade considerations, regardless of the number of subsequent accidents or their priority ranking. The department should reevaluate this procedure to determine whether it is appropriate.

The department should consider the recommendations contained in this report and take the appropriate measures to address the issues above. These measures should include personnel actions, the implementation of effective management controls, and establishment of greater oversight of certain functions. Furthermore, the department's internal auditor should review any newly implemented controls to ensure they are adequate and effective.