

How Safe Is Light Rail?

A Review of the Federal Transit Administration's

State Safety Oversight Program

Annual Report for 1999

by the FTA Office of Safety and Security



An Independent Review by:

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INTRODUCTION

Mass transportation safety has not received much serious attention in the news media during the public debate about the proposed light rail system for Phoenix. This lack of serious attention by the news media might lead some to think that public safety has been given a full and proper consideration by those planning for and advocating light rail for Phoenix and concluded that transportation safety is not an issue. But would such thinking be correct?

One does not have to be a transportation expert to understand basic safety principles as they apply to light rail transportation systems. One only needs common sense and a general knowledge of human nature. Recently, I contacted the Texas Transportation Institute and asked where I might get the best and most current and most objective information on light rail safety. I was referred to the Federal Transit Administration's (FTA) State Safety Oversight Program (SSOP) Annual Report for 1999. In the following narrative, I review that document. I make many references to safety related data collected, reported, and analyzed by the FTA, I include many of their data charts, tables and other safety related comments in my review. I include many of their specific quotes and statements related to the data and try to keep all such quotes within their intended meaning and context. This analysis does not include commentary regarding the comparative safety of other transportation systems because those other systems exist already and do not constitute a new source of transportation risk.

My review of these data and analyses will have few surprises to those who are critical thinkers and those who can maintain an objective view of the data. The FTA report contains about 140 pages, but I will try to distill the pertinent information down in the form of an Executive Summary of 10 pages or less. It should be noted by the reader that the data contained in this FTA report probably understates the magnitude of safety issues because the SSOP reporting requirements have relatively high thresholds before a mandatory safety related report is required to be reported. These thresholds will be discussed below. Graphics used are from the federal report except as noted. I underline or **bold print** some words for my emphasis.

EXECUTIVE SUMMARY

The Federal Transit Administration's State Safety Oversight Program (SSOP) issued an annual report in September, 2000 that contained national rail safety data gathered for the year 1999 by their Office of Safety and Security (<http://transit-safety.volpe.dot>).

This report contained data and analyses related to rail safety issues that have been broken down into a variety of safety related categories in an attempt to determine where the real safety issues exist and how safety might be improved. One critical point that readers need to keep in mind is that when it comes to safety data on passenger rail transportation, there are two major reporting categories – heavy rail and light rail. Nationally, in 1999, heavy rail had about “8 times as many passenger trips as light rail operations” but “experienced 25 fewer fatalities related to collisions and rail grade crossings as light operations.”

This means when advocates of light rail cite rail safety statistics, the public needs to make sure that the light rail advocates have not improperly combined the statistics of both heavy rail and light rail to make light rail appear to be safer than it really is. In 1999, heavy rail accounted for about 13.7 billion passenger miles and light rail accounted for about 1.2 billion passenger miles. That means that light rail carried had about 11.6 times less passenger miles. Yet, when examined on an unlinked passenger trip basis, “a collision on light rail service was 18 times more likely

than on heavy rail service and a collision on light rail service was more likely to result in a fatality or serious injury.”

The reasons for this are obvious. Heavy rail systems “operate largely within an exclusive right-of-way” while “the majority of light rail transit systems operate portions of their systems within an unrestricted right-of-way on city streets, in mixed traffic, within median strips, and in pedestrian malls. This situation results in numerous, and sometimes continuous, roadway-light rail grade crossings”. That means that the probability of two objects attempting to occupy the same space at the same time are much greater for the majority of light rail systems. Does this sound like a situation that will be commonplace in the Phoenix light rail system? Phoenix already has a reputation for having a high rate of red light running – can we expect that to set the stage for collisions with light rail? If the data in the SSOP report is correct, the answer is: YES!

The SSOP report for 1999 stated that “rail grade crossings and intermingling with street traffic create an operating environment for light rail transportation wrought with the potential for catastrophic occurrences”.

In any transportation safety analysis, it is important that everyone understand exactly what kinds of rail systems the data describes and what the threshold for reporting incidents applies to the data. The kinds of rail systems that the data include was collected under the following SSOP reporting criteria:

- “Any light, heavy or rapid rail system, monorail, inclined plane, funicular, trolley, or automated guideway that is included in FTA’s calculation of fixed guideway route miles or receives funding under FTA’s formula program for urbanized areas and is not regulated by the Federal Railroad Administration (FRA).”
- “In 1999, FTA’s State Safety Oversight Program affected 32 Rail Fixed Guideway Systems (RFGS) located in urban areas throughout the country. In total, these agencies operated 12 heavy rail systems, 20 light rail systems, 1 cable car system, 4 automated guideways, and 3 inclined planes
- Reportable accidents, which “means any event involving the revenue service operation of a rail fixed guideway system if as a result, 1) An individual dies; 2) An individual suffers bodily injury and immediately receives medical treatment away from the scene of the accident; or 3) A collision, derailment, or fire causes property damage in excess of \$100,000.

The above criteria mean that the data collected does apply to the kind of light rail that Phoenix anticipates building. It also means that if the accident resulted in only a minor injury or injuries that were treated “immediately” at the scene (with or without the aid of emergency personnel), and/or if the accident did not cause more than \$100,000 in damage, then it might not have been reported. To place this statement in commonly understood language, to me this means that if a red light running automobile skids fifty feet across the intersection and then collides with a light rail vehicle resulting in only \$10,000 worth of damage to the automobile and even less damage to the light rail vehicle, and, if nobody got injured, or if injuries were so minor and treated at the scene (or were discovered and treated later at a medical facility), then no report would be required and the data for such an accident(s) cannot be expected to have been included in the 1999 report.

It is therefore important to note that the information related above and most of the data shown below, unless otherwise indicated, is based on the lenient SSOP reporting requirements and has the potential to significantly under-represent the real transportation safety risks associated with light rail systems. Absent other specific and reliable information, it would be hard to accurately ascertain the magnitude of the number of unreported accidents. However, some insight can be gained by looking at some composite accident data reported under the guidelines of the National Transit Database (NTD) Reporting System. I will discuss that data when it is reflected in tables included in this review.

Under the NTD reporting guidelines, “safety incidents that meet the following definition must be reported: 1)Involve property damage exceeding \$1,000; 2) Require medical treatment of a passenger or an employee, either on-site or in a hospital; and, 3) Result in a fatality within 30 days.

To demonstrate the effect on reporting of incidents, I will provided a few tables and charts. For the same 32 Rail Fixed Guideway Systems (RFGS) reporting data under the SSOP guidelines, the following data was compiled in 1998, under the NTD guidelines but not broken down between Heavy Rail and Light Rail passenger service:

	NTD Reporting Guideline Data (for 1998)	SSOP Reporting Guideline Data (for 1999)
Total Incidents	14,277	2,839
Total Fatalities	77	112
Total Injuries	12,135	2,542
Total Collisions	570	100
Total Derailments	51	6
Total Rail Grade Crossing Incidents	69	67
Total Fires	2,896	5

(Data from Pages 29 and 75 of SSOP 1999 report)

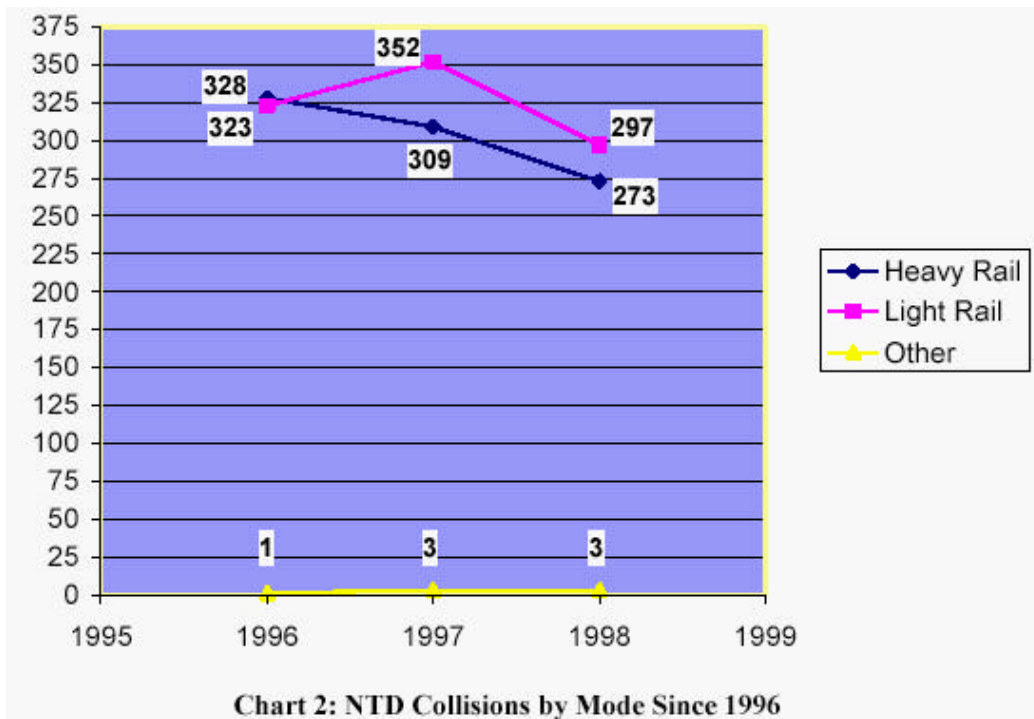
The important thing to notice in the above table is the magnitude of incidents that do not get reported under the SSOP reporting guidelines.

The next table and chart specifically relate to data gathered regarding reported collisions. Table 12 shows SSOP reported rail collision data in 1999. Chart 2 shows similar information through 1998. Again note the difference in magnitude in the number of collision incidents reported.

Mode	Number of Reported Occurrences	Fatalities	Injuries
Heavy Rail	29	8	29
Light Rail	66	10	89
Other	5	3	20

Table 12: 1999 Reported Rail Collisions

(From page 31 of SSOP 1999 report)



(From page 32 of SSOP 1999 report)

The next table and chart specifically relate to data gathered regarding reported rail grade crossing accidents and fatalities. Table 14 shows SSOP reported rail collision data in 1999. Chart 4 shows the trend in SSOP reported rail grade crossing fatalities from 1995 through 1999 for light rail.

Mode	Number of Reported Occurrences	Fatalities	Injuries
Heavy Rail	2	0	3
Light Rail	65	18	94
Other	0	0	0

Table 14: 1999 Reported Rail Grade Crossing Accidents

(From page 33 of SSOP 1999 report)

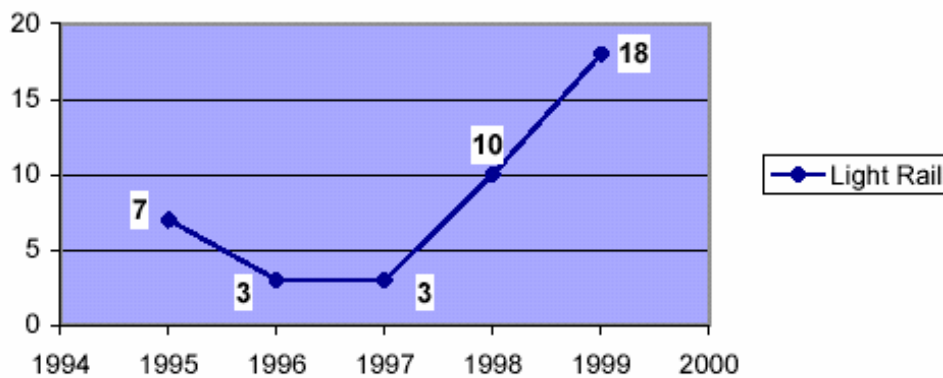
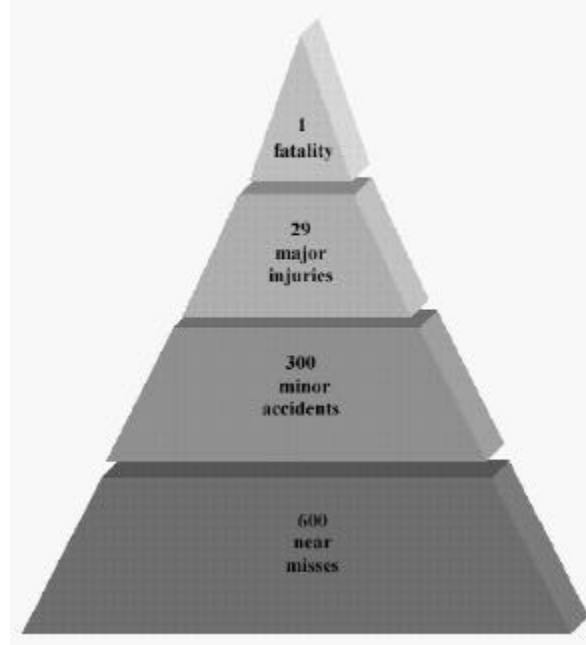


Chart 4: 1995-1999 Rail Grade Crossing Fatalities - Light Rail

(From page 34 of SSOP 1999 report)

The non-safety professional may be wondering why the above tables and charts are important when considering the safety of the design of Phoenix Light Rail. The simple answer is that the Heinrich Ratio

prediction on fatalities likely to occur probably applies to this situation. In fact, with the high rate of red light running in Phoenix, the Heinrich Ratio probably underestimates the number of fatalities likely.



The Heinrich Ratio is a useful tool for safety managers and others concerned with assessing the impacts of safety incidents on transit operations. According to the SSOP 1999 report, transit safety experts believe that the use of the Heinrich Ratio is applicable when attempting to quantify the relationship between accidents and near misses in transit service. “This ratio states that for every serious accident there are tens of major injuries, hundreds of minor injuries, and 600 near misses. Each accident reflects only a minor percentage of the total costs associated with the occurrence.”

“Most transit safety experts agree that unsafe practices and conditions are responsible for the vast majority of accidents resulting in serious consequences. Although the exact proportions vary, depending on the findings of particular studies, most experts agree that the proportions identified in the Heinrich Ratio generally hold true. The Heinrich Ratio demonstrates that efforts to reduce unsafe practices and conditions will have a proportional impact on the number of serious accidents to occur.”

So how does this apply to the Phoenix Light Rail?

First, let us examine what constitutes safety hazards and what is there about the Phoenix Light Rail that creates such hazards. The FTA defines hazard analysis as “a process for utilizing all known safety data on a system (1) to identify all possible hazards, (2) to develop controls that mitigate or eliminate the hazards, and (3) to verify that selected controls actually will reduce the dangers associated with the hazards to an acceptable level.”

“FTA’s Hazard Analysis guidelines encourage the following view of the hazard identification and resolution process:

1. A hazard is a condition
2. An accident occurs when that hazard is present and some stimulus also occurs
3. Hence: Accident = Hazard + Stimulus
4. Risk is the probability of occurrence of that accident multiplied by the consequences of that accident
5. Hence: Risk = Probability of Accident x Consequence of Accident (often in dollars)
6. Hazard Identification and Resolution recommends controls that will **reduce** the probability of the accident and the consequences of the accident (should it occur) to a level of risk (again often quantified in terms of dollars) acceptable to management.”

Two of the key findings from data submitted by States for 1999 follow:

- Collisions - States reported 100 collisions in 1999, resulting in 21 fatalities and 138 injuries requiring medical attention away from the scene.
- Rail Grade Crossings - Sixty-seven accidents at rail grade crossings resulted in 18 fatalities and 97 injuries requiring medical treatment away from the scene in 1999.

The following table lists the number of Rail Fixed Guideway Systems (RFGS) rail grade crossings for each of the cities with light rail data in the SSOP 1999 report.

Rail Transit Agency	Total Number of Rail Grade Crossings	Protected Rail Grade Crossings	Shared Use Operations	Shared Corridor Operations	FRA Waiver Obtained for Light rail Operations
Light Rail Operations					
MTA (Baltimore)	42	37	Yes	No	Yes
MBTA (Boston)	67	0	No	No	No
NFTA (Buffalo)	0	0	No	No	No
GCRTA (Cleveland)	26	1	No	Yes	No
DART (Dallas)	57	39	No	Yes	No
RTD (Denver)	2	2	No	Yes	No
Island Transit (Galveston)	151	0	No	No	No
NJ Transit (Hudson-Bergen)	12	2	No	No	No
LACMTA (Los Angeles)	100	28	No	Yes	No
MATA (Memphis)	12	12	No	Yes	No
RTA (New Orleans)	98	22	No	Yes	No
NJ Transit (Newark)	1	1	No	No	No
SEPTA (Philadelphia)	45	5	No	No	No
PA Transit (Pittsburgh)	36	36	No	No	No
Portland Tri-Met (Portland)	100	29	No	Yes	No
RTD (Sacramento)	101	37	No	Yes	No
UTA (Salt Lake City)	33	33	Yes	No	Yes
Bi-State (St. Louis)	12+8	12	No	No	No
SDTI (San Diego)	86	86	Yes	Yes	Yes
Muni (San Francisco)	0	0	No	Yes	No
Santa Clara VTA (San Jose)	26	26	No	Yes	No
King Co. DOT (Seattle)	17	4	No	Yes	No
Heavy Rail Operations					
CTA (Chicago)	25	25	No	No	No

Table 20: RFGS Rail Grade Crossings (From page 43 of SSOP 1999 report)

Implications of RFGS Data for Light Rail Systems

“Analysis of RFGS safety data reported by the States for 1999 indicates the following findings for those incidents categorized as collisions, derailments, rail grade crossing accidents and fires:

- **94 percent** of these accidents were collisions and grade crossing accidents
- Collisions and grade crossing accidents occurred predominantly on light rail systems (**78 percent**)
- Light rail transit experienced **72 percent** of the fatalities resulting from collisions and rail grade crossings accidents
- Light rail experienced **63 percent** of the injuries from collisions, grade crossing accidents, derailments, and fires”

Table 19 below identifies findings resulting from analysis of State data for 1999:

Mode	Finding	Implications for Safety Improvements
HR	Heavy rail systems experience the vast majority of suicides in rail transit (68 in 1999).	<ul style="list-style-type: none"> • Awareness training • Fencing • Platform edge detection
LR	In 1999, based on the number of unlinked passenger trips, a collision on light rail service was 18 times more likely than on heavy rail service and a collision on light rail service was more likely to result in a fatality or serious injury.	<ul style="list-style-type: none"> • Increased operator supervision and observation • Dedicated refresher training programs • Dispatcher training and observation • Discipline and rule enforcement • Drug and alcohol awareness • Proficiency training
LR	Though low in total number, light rail systems are more than 50 times as likely to have a derailment meeting FTA’s definition as heavy rail systems.	<ul style="list-style-type: none"> • Rail yard work rules and procedures • Automatic speed controls • Vehicle maintenance and inspections • Proficiency training
LR	In 1999, light rail operations experienced 65 rail grade crossing accidents meeting FTA’s definition, resulting in 18 fatalities and 94 injuries requiring medical treatment away from the scene.	<ul style="list-style-type: none"> • Rail grade protection and design standards • Elimination of rail grade crossings • Coordination with State DOT/highway authorities • Public education • Operation Lifesaver
HR	Heavy rail systems are 1.6 times more likely to experience an incident resulting in a passenger injury meeting FTA’s definition than light rail systems.	<ul style="list-style-type: none"> • Station design standards and materials selection • Car door spring-back mechanisms • Lighting • Signage • Passenger awareness campaigns
ALL	Human factors represent roughly fifty percent of the probable causes for all collisions, derailments, rail grade crossing accidents and fires.	<ul style="list-style-type: none"> • Training and Discipline • Safety observations and testing • Safety management culture • Drug and alcohol awareness
ALL	When probable cause is determined as “human factors,” more than seventy-five percent of these probable cause determinations are due to rules and procedures violations.	<ul style="list-style-type: none"> • SSPP and policy revisions • Operator bulletins • Discipline and rules enforcement • Safety management culture • Public education campaigns
ALL	The predominant probable cause for single-person injuries in the rail transit environment is slips, trips, and falls.	<ul style="list-style-type: none"> • Escalator design • Signs and markings • Housekeeping and maintenance • Station announcements • Data analysis

Table 19: Practices for Addressing Safety Concerns (From page 41 of SSOP 1999 report)

Special Issue: Rail Grade Crossing Safety

“Data submitted by States, as well as reports made to the National Transit Database by the rail transit agencies, indicate that, since 1995, rail grade crossing accidents have been responsible for 80 fatalities and over 600 injuries meeting the NTD definition. This category of accident is by far

the most significant safety problem in public transportation. Light rail transit (LRT) service provided in mixed use traffic conditions, involving automobiles, motorcycles, bicycles, and pedestrians, adds a disparate element to the traffic stream that must be addressed by system design, signage, and signaling to protect the driving, walking, and riding public.”

Light rail advocates tend to claim that Light Rail systems are safer than other modes of travel. However, I believe that it depends on how you measure the risk. If you look at Light Rail as a separate and distinct system, it could be that as a “stand alone system” it is safer by some objective measures. However, if you look at the whole, integrated transportation system with Light Rail as a sub-system along with automobile, bus, truck, bicycle, and pedestrian, then I believe that the issue is whether or not the total system is safer with or without the presence of the Light Rail sub-system.

“Police reports and LRT incident reports indicate these accidents are caused primarily by motorist and pedestrian inattention, disobedience of traffic laws, and confusion about the meaning of LRT traffic control devices. These causes are also clearly reflected in the data submitted by the States in their Annual Reports to FTA.

Motorist/pedestrian inattention and violation of traffic rules must be addressed by public education campaigns, such as Operation Lifesaver, and law enforcement. In addition, appropriate action must be taken in system planning, design, and traffic engineering to minimize confusion and facilitate the correct decision-making process for motorists and pedestrians encountering rail grade crossings. DOT is currently considering the development of uniform traffic control system standards and application guidelines for LRT service ...”.

“FRA is also investigating the application of Intelligent Transportation Systems (ITS) technology to rail grade crossings and to supporting design standards for grade crossings on shared use track. Light rail transit (LRT) service provided in mixed-use traffic conditions, involving automobiles, motorcycles, bicycles, and pedestrians, adds a disparate element to the traffic stream that must be addressed through hazard analysis to determine system design, signage, and signaling to protect the driving, walking, and riding public.”

“Rail Grade Crossing Accidents. Current RFGS data collected by States for rail grade crossing accidents does not permit the classification of accidents by rail grade crossing characteristics. FTA is currently developing a classification system that will permit such future analysis.” However, a study by Korve Engineering for the Transportation Research Board (TRB) examined the safety hazard experiences of 10 selected light rail agencies. That “report makes following observations based on an evaluation of rail grade crossing accidents meeting NTD definitions:

- The average for LRV accidents per year per mainline track mile in shared rights-of-way generally indicates that, as the proportion of route miles in shared rights-of-way increases, so does the proportion of LRV collisions per million revenue vehicle miles
- The most common type of collision in most cities involved vehicles turning in front of LRVs. These collisions accounted for 86 percent of all accidents in Baltimore, 64 percent in San Jose, 59 percent in Sacramento, 56 percent in Los Angeles, and 41 percent in Portland.
- Pedestrian accidents accounted for up to 27 percent of the total accidents. Although the percentages for pedestrian accidents are less than those for auto-turn accidents, the pedestrian accidents are more severe.
- Right-angle collisions were significant in several systems, notably in San Francisco, Boston and Portland.
- The table below, excerpted from the Korve study, indicates that LRV accidents in shared rights-of-way account for the largest proportion of each of the 10 surveyed system’s accidents, even though this type of alignment generally constitutes the smallest proportion of route miles.

Light rail vehicle accidents in shared rights-of-way account for the largest proportion of accidents for each of the 10 systems surveyed for the TRB study, even though this type of alignment generally constitutes the smallest proportion of route miles at each surveyed agency.”

LRT SYSTEM	Shared Right-of-Way Under 35 MPH (1)	
	Percent of Mainline Track Miles	Percent of Total Accidents
Baltimore	18	89
Boston	32	100
Buffalo	20	100
Calgary	7	71
Los Angeles	23	79
Portland	52	90
Sacramento	26	85
San Diego	11	75
San Francisco	70	100
San Jose	44	98
(1) Integration of Light Rail Transit into City Streets (Hans Korve, Jose Farran and Douglas Mansel; Washington, D.C.: Transportation Cooperative Research Program, 1996).		

Table 21: LRT Shared Right-of-Way (From page 44 of SSOP 1999 report)

Detailed review of accidents at these 10 Light Rail Systems produced ranking of safety problems associated with the incidents reported. “The study determined the most common safety-related problems, ranked in order of decreasing severity:”

Severity Ranking	Safety Problems Ranked by Severity (2)
1	Pedestrians trespassing on side-aligned LRT rights-of-way where there are no sidewalks
2	Pedestrians jaywalking across LRT/transit mall rights-of-way after receiving unclear messages about crossing legality
3	Inadequate pedestrian queuing areas and safety zones
4	Two-way or contra-flow side-aligned LRT operations
5	Motorists making illegal left turns across the LRT right-of-way immediately after termination of their protected left-turn phase
6	Motorists violating traffic signals with long red time extensions resulting from LRV preemptions
7	Motorists violating red left-turn arrow indications when the leading left-turn signal phase is preempted by an approaching LRV
8	Motorists failing to stop on a cross street after the green traffic signal indication has been preempted by an LRV
9	Motorists violating active and passive NO LEFT/RIGHT TURN signs where turns were previously allowed, prior to LRT construction
10	Motorists confusing LRT signals, especially left-turn signals, with traffic signals
11	Motorists confusing LRT switch signals (colored ball aspects) with traffic signals
12	Motorists driving on LRT rights-of-way that are delineated by striping
13	Motorists violating traffic signals at cross streets, especially where LRVs operate at low speeds
14	Complex intersection geometry resulting in motorist and pedestrian judgment
(2) Integration of Light Rail Transit into City Streets (Hans Korve, Jose Farran and Douglas Mansel; Washington, D.C.: Transportation Cooperative Research Program, 1996), pp. 4-6.	

Table 22: Safety Problems Ranked By Severity (From page 45 of SSOP 1999 report)

“Findings from the NTSB support this analysis. An NTSB safety study of accidents at active rail grade crossings determined that “many of the accidents at active crossings have involved highway vehicle drivers who did not comply with train-activated warning devices installed at the crossings. This failure to comply often includes driver actions resulting from a deliberate decision, such as driving around a lowered crossing gate or ignoring flashing lights.” (NTSB, “Safety at this Passive Grade Crossings, 1998, pg. 2.) Changing the decision-making patterns of motorists and pedestrians at active rail grade crossings is a top priority in any program designed to reduce accidents.”

“To address this priority, the Korve study identifies 5 basic principles to guide LRV system planning and selection of traffic control devices:

1. Respect the existing urban environment
2. Comply with motorist, pedestrian and PRV operator expectancies
3. Strive to simplify decisions and minimize road-user confusion
4. Clearly transmit the level of risk associated with the surrounding environment
5. Provide recovery opportunities for errant pedestrians and motorists

Sound LRT alignment decisions during the planning stages and good design geometry are essential to the safe operation of an LRT system. As described in the Korve study, the five basic principles identified above translate into the following guidelines for roadway geometry and traffic control devices:

Unless a specific urban design change is desired (e.g., converting a street to a pedestrian mall), attempt to maintain existing traffic and travel patterns

- If LRT operates within a street right-of-way, locate the LRT trackway in the median of a two-way street where possible. If LRT is designed to operate on a one-way street, LRVs should operate in the direction of parallel motor vehicle traffic, and all unsignalized midblock access points (such as driveways) should be closed (it follows that two-way LRT operations on one-way streets, especially contra flow, should be avoided wherever possible). Further, where LRT is side-aligned, conflicting LRV and motorist vehicle movements should be signalized to minimize motor vehicles stopping on the LRT alignment, as well as general motorist confusion
- If LRT operates within a street right-of-way, separate LRT operations from motor vehicles by a more substantial element (e.g., low-profile pavement bars, rumble strips, contrasting pavement texture, or mountable curbs) than painting or striping
- Provide LRT signals that are clearly distinguishable from traffic signals in design and placement, and whose indications are meaningless to motorists and pedestrians without the provision of supplemental signs
- Coordinate traffic signal phasing and timing to preclude cross-street traffic from stopping on and blocking these tracks
- Use traffic signal turn arrows or active, internally illuminated signs to actively control motor vehicle turns in conflict with LRV operations
- Provide adequate storage areas (turn bays or pockets) for turning traffic wherever possible
- Provide separate turn signal indications to avoid conflicts. The motor vehicle left-turn phase should follow, not precede, the LRV phase
- Use flashing, internally illuminated signs displaying the front view LRV symbol or the side view LRV symbol to warn motorists making conflicting turns of the hazards involved in violating traffic signals
- Create separate, distinct pedestrian crossings by providing refuge areas between roadways and parallel LRT tracks
- Channel pedestrian flows to minimize errant or random crossings

- At unsignalized crossings, use pedestrian gates and/or barriers to make pedestrians more alert when they cross LRT tracks and direct pedestrians crossing the tracks to walk in the direction of the approaching LRV
- Maximize the visual impact (conspicuity) of LRVs
- For on-street operations, load or unload LRV passengers from or onto the sidewalk or a protected, raised median platform and not the roadway itself

The NTSB supports these basic parameters for the design of active grade crossings in LRT service, and, in its 1998 Safety Study entitled “Safety at Passive Grade Crossings,” recommends that, wherever possible, passive grade crossings (those crossings with only traffic control devices, such as crossbucks, stops signs, or pavement markings) be eliminated, consolidated (through separation and closure), or equipped with active warning devices. In the event that these actions are infeasible, NTSB recommends that passive crossings be equipped with stop signs (at a minimum), and that standards for ITS warning systems be developed in a timely manner to ensure eventual application of an alert system for motorists and pedestrians. “

Conclusion

After reading the Federal Transit Administration’s (FTA) State Safety Oversight Program (SSOP) Annual Report for 1999, and reviewing the design of the proposed Phoenix Light Rail project as described in the newspapers and by statements made by the MAG mayors and other proponents, I can only conclude that those people responsible for the design of the project and the approval of the funding for the project have either not read and understood the SSOP report and taken actions in support of the Light Rail Project; or, they do not care about increased safety risk posed by the introduction of Light Rail traffic on the streets of Phoenix, Tempe, and Mesa.

In either case, from a safety perspective, poor public policy is being promoted, with the greater public not being made aware of just how dangerous Light Rail will be and how it represents an unnecessary increased safety risk to the streets of Phoenix, Tempe, and Mesa.

I fully expect that there will be significant news media publicity about the kind of Light Rail safety issues I have described above, after the fact, meaning after the first few fatalities have happened. The public will then ask, how could this have happened. I am asking now: Why should Light Rail be funded at all?

I also fully expect that local attorneys who specialize in “Personal Injury Litigation” will be able to read and understand these same FTA light rail safety reports that the city transit officials and mayors on the Maricopa Area Government (MAG) are apparently disregarding, and these attorneys will be able to successfully convince juries to award damages in the millions of dollars.