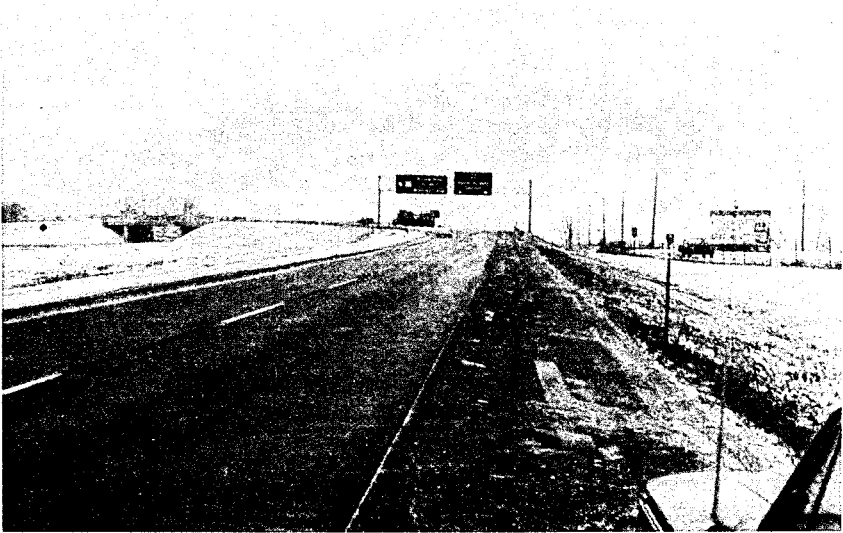


Notice that here is the edge of the roadway, and this setback is probably 10 feet or so [indicating], but this is a very inadequate design. There are many protuberances sticking out all along here. If you miss the first one, you have the second and the third.

This was built at the time that there had been publications in highway literature on a bridge rail design.

This is an expressway turnoff well marked, heavily signed. There is inadequate guardrailing around the base of the signpost. But 1 day the individual did make this turn, a 17-year-old young man driving his parents in a brand new car, and he swung a little wide. You cannot



really see it, but the road edge is right here [indicating], along here. He swung wide and got into this area



It had snowed during the night. He skidded along the guardrail, which performed like it should; it held, it kept him on track—but the thing is that a few of the legs in here [indicating], near this end, were loose. The car snagged on the guardrail. It then spun around and the left rear door hit the cement monolith, here at the end of the guardrail, crushing the door in, killing the father in the rear seat, and the mother in the rear seat was ejected out the opposite door and down this embankment. She suffered serious injuries.

Had we had these legs implanted more strongly so that it would not rock and snag the car, and possibly the overlap of guardrail over the end here [indicating], this possibly would not have been a fatal accident.

This is the side impact against the door next to which the father was seated.



I am standing under an overpass. This is an expressway again. This car (at right in photo) went out of control one early morning. He was



towing another vehicle. You can see the tracks as he came sliding sideways into the exposed end of this very short section of guardrail, which crushed in the door, killing the driver.

The passenger in the rear seat and the passenger in the front seat did not receive any injuries.

This was repaired in the identical manner to the way it had been set up before the impact.

And this is an overview from the overpass. Notice that he only took off about one or possibly two support legs, crumbling the guardrail.



Had this end been buried, this individual would not have sustained fatal injuries.

Here is an expressway, again a fairly nice clear area here [indicating], so that if you go off the roadway in this area, you have no trouble whatsoever. Beyond the truck there is a drainage ditch.



A vehicle knocked down a reflector sign, went straight on toward the ditch, and then hit this part (arrow) of the retainer wall—which flipped it up into the air. He completely catapulted across the ditch, landing on the top of the roof; then the car (circle) rolled over. He was killed.

There are data available to indicate the angle at which vehicles leave the roadway, especially expressway-type systems. Using that type of information, a more adequate guardrail could have been constructed



along here to prevent that very shallow approach from leaving the expressway.

Mr. W. MAY. You are suggesting that guardrail should have been extended toward us?

Dr. HUELKE. Yes, very definitely; because we see that this is a very shallow approach. This is a car that went out of control and almost left at right angles to the roadway. In fact, I have never seen an accident quite like that. But it appears many of the guardrails are put in with that in mind, that the car is going to come at right angles to the road system.

This is a very shallow angle at which this vehicle left, maybe 15° or so. If that is shown and the known speed of a vehicle—remember, it is legal along here to travel 70 miles an hour—we have to think of the deceleration distances and it is not adequate in this area.

Mr. W. MAY. As we travel in the country, we notice this is not an uncommon situation.

Mr. Prisk, do you have any idea why we so frequently see the guardrails really beginning too late to prevent the motorist from going down an embankment into a hazard?

Mr. PRISK. I suspect that some of these determinations as to guardrail locations may be based strictly upon the height of the fill at the point where the guardrail starts and not appropriately take into account the dynamics of the situation; the fact that in order to get behind the guardrail, you necessarily would leave the road at some distance ahead of the point where the fill becomes high.

Mr. W. MAY. Yes, that has been our observation. So frequently, they have certain warrants for the installation of guardrails, the slope is a certain height, a certain type slope; three to one, two to one, that calls for a piece of guardrail. But so frequently they begin the guardrail at that point where it meets the warrant instead of coming back here and beginning it long before the motorist is apt to reach the hazard.

Doctor, you may proceed.

Dr. HUELKE. This is the edge that he caught on to cause the car to flip over.



This is a very shallow creek, by the way, that passes underneath this location.

One of the concepts that has been advocated for an area like this is: Is it really necessary for drainage ditches that pass beneath expressway system to remain open? Why not enclose them for 30, 40, or possibly 50 feet away from the road edge? So that if this, for example, had been covered over and this individual had gone into the area, he would not have had the strong deceleration forces applied to the vehicle to cause it to flip over and for him to be killed.

This is what the car looked like.



Now, here we see a typical sign on the expressway system, at least in Michigan. These are 8-inch I-beams, support posts, imbedded firmly in concrete; and look at the guardrail we have adjacent to it.



First of all, this guardrail is so short in length that if you did crash into it by leaving the roadway, you could run over it and you could hit that left leg of the pole, anyway. But notice that even the right leg is not protected. And they say, "Well, we do not have to protect it because no one hits these things."

Well, here is a very extensive guardrail; this goes all the way along that curve. Look where the sign was placed for this, right at the be-



ginning of the guardrail, so the left leg is protected, but the right leg is not.

Now, this sign that was on here told us where the Flint exit was, and the Flint exit is about 2 miles away yet. So if this sign had been moved maybe 20 feet farther down the road, it would have been completely protected by the guardrail—but yet, here it is.

You see, this individual left the roadway, again at a very shallow angle, striking this reflector post. This is the right tire track leading to this guardrail leg.

A long shot shows you how shallow this angle was of his approach to the leg.



Here is the on-scene photograph. It is very difficult to explain what we have got here, but I will try. Behind the officer is the guardrail and



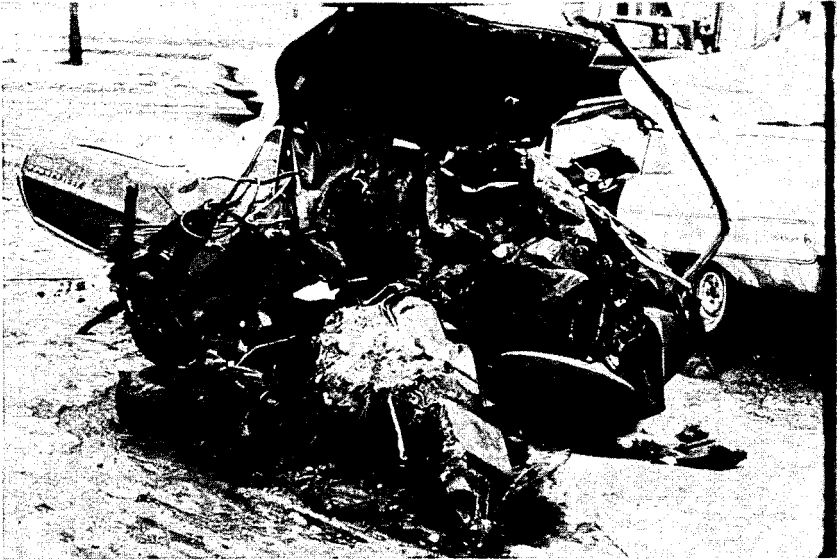
the road is beyond it. This is the engine area. This is a Pontiac convertible. The front bucket seat is fused to the rear seat. The post was knocked over at maybe—not even a 45-degree angle. The engine is 65 feet in front of the car. And the instrument panel is parallel with the left side of the car. The driver was found killed.

This is obviously an immovable object, which literally just sliced through the car, causing the death of the driver.

Had this sign been set back 20 to 30 feet, this individual would have gone down that relatively smooth embankment for a considerable distance, but it could have been a survivable, off-the-road situation.

This gives you a better idea of what the car looked like. Notice the front bucket seat here fused into the rear area, instrument panels all along this left side of the car.

A fatal accident. It is interesting to note that both of these sign legs were taken down and now we do not know where the Flint exit is any more, because they never bothered to replace it.



Here is a brand new expressway with a fairly tight curve in it. One night three boys went off the road here, nipped the end of the guard-rail (arrow), getting behind the guardrail, hit the very end of the bridge pillar, and the car then continued up in this V area and through it, and then rolled over. One boy was killed. But look at the direct line



that would take you into this heavy mud embankment, and note that the short segment of guardrail is not adequate for protection against that type of bridge pier.

Mr. W. MAY. Mr. Prisk, is that a proper installation of the guard-rail?

Mr. PRISK. Mr. May, I think that would be pretty hard to defend on the basis of the experience that has been had with short sections of guardrail and the fact that the end is exposed—that very definitely could easily be folded back into the bank and anchored so as to give a smooth transition.

Mr. McDONALD. Mr. Chairman?

Mr. KLUCZYNSKI. Yes, Mr. McDonald.

Mr. McDONALD. Mr. Prisk, who would determine whether or not that was a proper guardrail installation?

Mr. PRISK. That is one of the tasks that falls on our division engineer organization in the Bureau of Public Roads, to review State highway plans for construction. A review of details of this sort is sometimes sacrificed because of the volume of work going through.

I think also that there has been some lack of appreciation of the importance safetywise of appurtenances to the highway that do not cost very much money, but which do have an important operational effect.

Mr. McDONALD. Mr. Prisk, in the Bureau of Public Roads, is there any such division as a safety division that would just look at these plans when they are submitted to determine whether or not we are building hazards into the highway system?

Mr. PRISK. Not specifically for that purpose. Our engineering review is for a great many other factors in addition to safety, and there is no exclusive concern for safety in our review of highway plans.

Mr. McDONALD. Mr. Prisk, do you think that there should be a particular division or group that would look at these plans with having only the safety thought in mind in order to coordinate the work of the engineers, who are more interested, really, in seeing traffic move and perhaps have not given enough thought to the safety of the vehicle and the driver on the highway?

Mr. PRISK. I think that is a very good suggestion. The whole matter of an operational review of the plans, I am afraid, is not performed as well as it could be under the present circumstances.

A great deal of the attention is given to the structure of the highway and the construction process itself probably receives first attention.

Mr. McDONALD. Mr. Prisk, do you think it would be in line, perhaps, to require that each State, in the preparation of their plans for the highways, have a safety department or safety engineer to look over the plans; and then at the Federal level, the Bureau of Public Roads, to have a safety division to look over the plans for these new highways in order to determine whether or not the engineers have done a suitable job in construction of the highway as related to safety matters?

Mr. PRISK. I think this function that you are describing must be strengthened.

Mr. McDONALD. Well, let me ask the question again. Do you think each State should be required to have such a division or a safety engineer look over these plans? And do you feel, then, at the Bureau of Public Roads division level, we should have a safety division or safety engineers looking at the overall plan of highway design, keeping in mind safety only, coordinating the efforts of the other engineers?

Mr. PRISK. Part of this, I think, is perhaps a little more complex a task than seems to be evident on the surface, because there are so many different things that contribute to safety. I think that you need the wisdom of bridge engineers, for example, and some of the background from their discipline to get a fully safe highway.

We need some contribution from the maintenance engineer, who sees the highway in day-to-day use, and you certainly need the advice of the traffic engineer, who is concerned primarily with operating problems and the skills of the design engineer.

Whether you could wrap this all up in one man or one division, and have such a unit function in every State highway department and require that as a part of ongoing operations, I think perhaps would take a little more study. But I do agree that it is highly important that it be done, that we get on with the task of finding out how best to accomplish that particular job.

Mr. McDONALD. Mr. Prisk, it seems to me we have not done too good a job, from the testimony we have seen and heard today and that we have seen before, in our highway design, as far as the safety of vehicle and driver is concerned. I think we need someone at the State level to police this highway design.

Certainly, we can build very good bridges. We can see that in these photos, but unfortunately we have not given very much thought to what happens to a driver when we have these piers so close to the highway. I think we need some group or some people at the State or Federal level to police this safety when we design our highways.

Mr. PRISK. I agree.

Mr. McDONALD. Thank you, Mr. Chairman.

Mr. W. MAY. Doctor, you may resume.

Dr. HUELKE. Thank you. It is interesting to me that several laws specify that the automobile industry must show compliance, that their vehicles are safe and meet the law.

But we do not have anything about safety compliance, as such, for impact purposes on the design of bridge rails, guardrails, and other things of that sort. It is an idea.

This is the area where this car, as I was saying, went through. He got behind the guardrail, hit the first bridge here (arrow) then the car skidded up into that triangular area and out beyond, and then rolled over.

You cannot tell which end is which here, actually, the car was so badly deformed, but this is the left rear tire [indicating]. When a car strikes something like a bridge column or another relatively immovable object, the car deforms and usually what happens is collapse and compromise of the occupant space, and this is what kills the individuals.

This is a very interesting signing on I-94. You are driving along, you are a stranger, you never have been here before, and now all of a sudden you come up to this area. You are doing 70 miles an hour to keep up with traffic. And here it says "Huron River Drive Exit, 1



Mile"; "Haggerty Road." Which way do you go, to go through the area? Even I, being an experienced driver on this expressway, have at times taken this wrong one, which is not the through expressway. This is an exit ramp, to the right.

They knew there was such a confused area here, they have taken down this one sign that says "Huron River Drive." All you know now is "Haggerty Road," and you assume the other is the expressway.

But a little bit farther down, this is what they have done. Almost all the way in the area they have put the shield of the expressway system on the sign. Why did they not do that back half a mile?



But as we approach this area—see, "Expressway" here—you keep right to go on the expressway; but a quarter of a mile back, you had to keep left to keep on the freeway. This gets confusing.

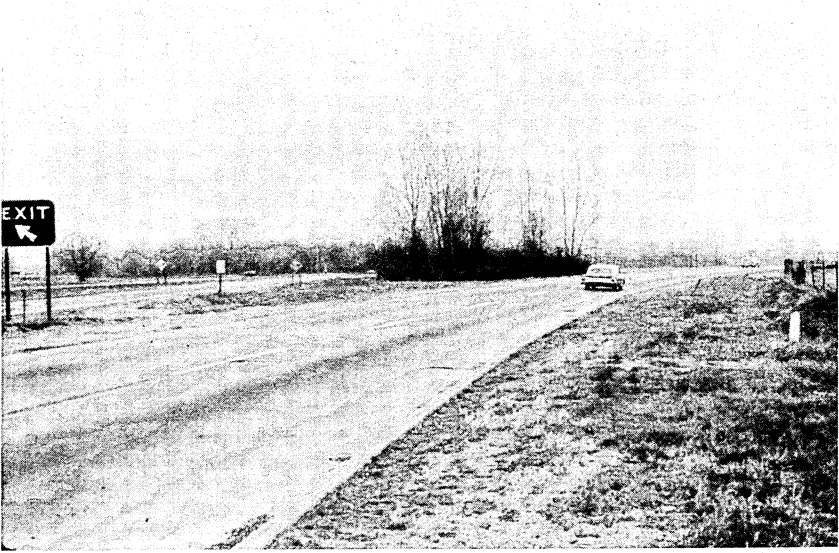
One day a man did get confused at this very point.

He was riding along on the left side as he had been doing, because it was a left-hand curve before. He realized he was going wrong and he cut across in front of this exit sign in here [indicating], but now his car was out of control. There is a curve along here. It is a curve at about a 45° angle, so it is like a ramp. When his car hit that, it was enough to flip the vehicle over.

You see there is very minor damage in comparison to some of the vehicles you have seen today involved in fatal accidents, but this man was ejected from his vehicle and was found with the left front tire on his chest, with the weight of the car on it, and he died of a crushed chest. This was witnessed by about five people.

Indecision. He did not know which way to go. He finally decided which way to go and he went that way, but the car was traveling too fast. He had a problem.

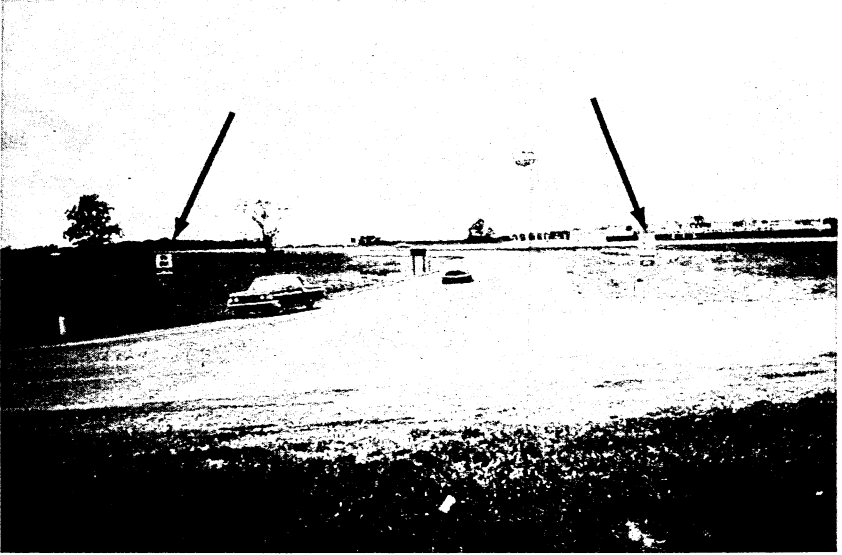
More adequate signing, I think, and proper signing there to alleviate the confusion would have been helpful.



Mr. W. MAY. Doctor, you have brought up another subject we are going to go into in some detail later in the hearing; the matter of signing, continuously advising the motorist, particularly which turn to make to stay on the throughway.



Dr. HUELKE. This is an expressway exit. You can see the cars coming off the expressway back here, and this is a very confusing area. There are about four or five different roads coming into this region and the only indication that a driver has that he should not go on this are these two signs [see arrows] on each side of the roadway which say "Do not enter—one way." There are one-way arrow signs, but they are placed so far away from this exit ramp that they are difficult to see.



One night a man came along here wanting to go toward Ann Arbor and he thought this was the road. He got onto the exit ramp and from this point on after he had missed these signs, there is no further indication that this is an exit, not an entrance; he accelerated, and by the time he had gotten up to the expressway, he was probably doing 60 to 70 miles an hour when he hit a car with teenagers in it here [indicating]. This was a quadruple fatality accident, wrong way on the expressway, and this is how he got on.

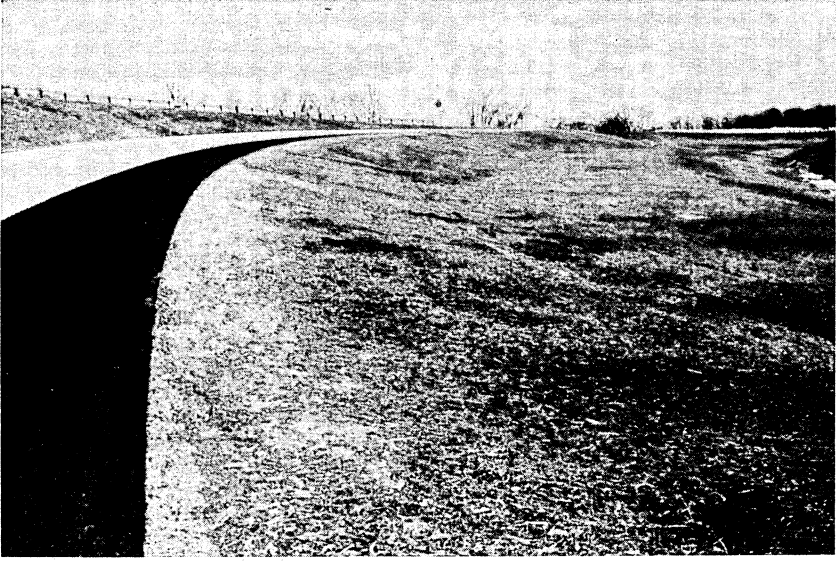
Notice there is a signpost here for the drivers who come off in this direction; another sign could have easily been placed here saying, "Stop, Wrong Way," or something like that. And maybe even another one on this side, giving him multiple chances to correct the mistake that he had made.

Mr. W. MAY. Is that the manner in which most of the interchanges are signed?

Dr. HUELKE. Yes, sir. We are lucky, even to have the "wrong way" sign here. Some of them do not have these.

Now, this is a brand new bypass expressway system around Ann Arbor, and I would like to show you that there is hope yet. It appears that thought is being seriously given to some of these areas.

Notice this broad, flat, smooth area extending for probably 200 feet off of the road area. This is a nice clean area if a vehicle would tend to leave the road surface and go off into here.



Farther on, on the same expressway, however, we get this. This is a gravel pit that was used when this road was being built. It is no longer being used to any extent, but yet it is there. There is a barricade over here so you cannot get through. But notice what would happen if a vehicle would go off into this clear area; notice the earthen embankment that the car could strike and the deceleration on the



vehicle would be the same as if the car would strike the bridge pier. These earthen embankments are serious.

Mr. W. MAY. Is it an interstate highway?

Dr. HUELKE. Yes; the bypass around Ann Arbor.

Mr. W. MAY. Mr. Prisk, this is a situation that should have been given attention. We are supposed to have controlled-access highways. When we allow temporary roads like this to remain in existence——

Mr. PRISK. Yes; it could be a violation of access. It appears from Dr. Huelke's photograph that there is a drainage culvert under that roadway also. I would expect that that entire slope could be graded to a safe section, safe cross section, with a little effort.

Mr. W. MAY. Thank you.



Dr. HUELKE. As we proceed farther on the roadway, we see that here the trees are fairly well cleared back. This is going back maybe 50 feet or so, but only a few hundred yards farther down the roadway, we see that the trees are very, very close to the road area. So here we have differences on the clearance of the trees; and these trees are, as I have shown before, quite hazardous.

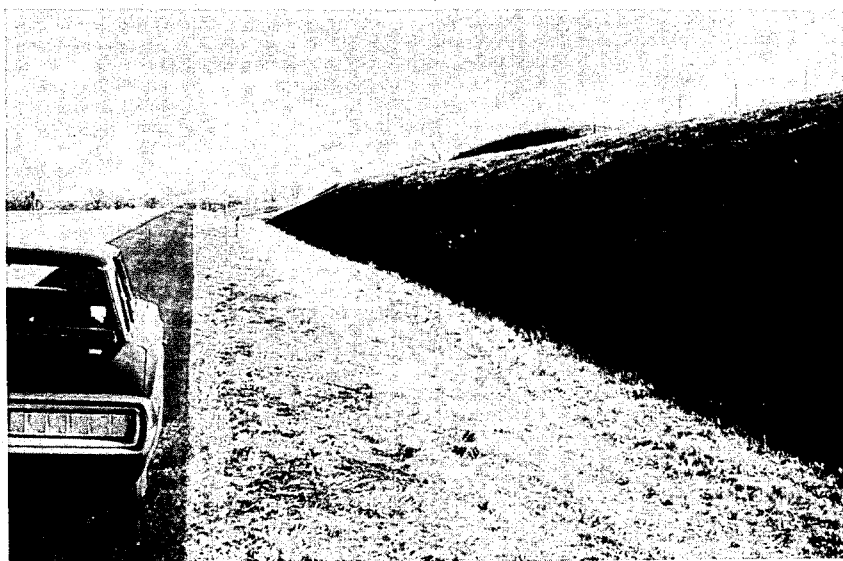
Here, again, we have a very clear offroad area, but look at that lone tree sitting out there, and that tree measures at least 28 feet from the edge of the road.

Mr. W. MAY. Mr. Prisk, that water we see, does that present a problem?

Mr. PRISK. Yes. A vehicle would not go through very much water without turning over or otherwise going through an abrupt deceleration, which could cause injury, at least.

Mr. W. MAY. Thank you.

Dr. HUELKE. Now here the road clearance—there are no trees, but notice the high earthen embankment that is less than 20 feet from



this edge of the offroad area [indicating]. And, again, whether it is trees or retainer walls, or what have you, this can be just as serious for impact, and obviously the proper grade is not there to allow a vehicle to go up that grade without striking directly onto it.

Mr. W. MAY. I see a fence at the top of that high slope. Would that indicate that is the end of the right-of-way line, Mr. Prisk?

Mr. PRISK. I would suspect so, yes; in which case it would be difficult to do much with that slope unless a slope easement was obtained.

Mr. W. MAY. This brings up another problem in another section of the highway fraternity that must come into play when they are attempting to design safe highways, the right-of-way section. Those people could determine how much right-of-way they want, into which the designers must build their road. If you buy only that much right-of-way and then force the designer to build within it, you may end up with something like this; right?

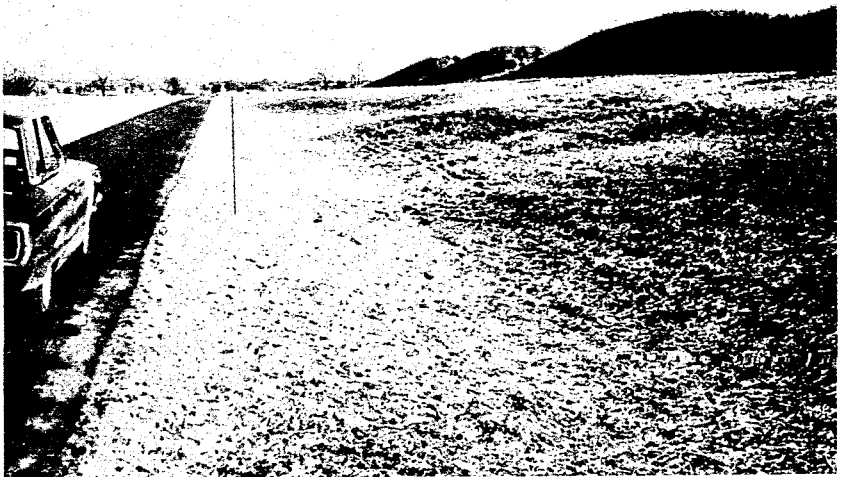
Mr. PRISK. Right.

Dr. HUELKE. A little bit farther on. Same roadway. We see we have a very nice, clear, flat area going quite a considerable distance away



from the road edge; but then again, if we get out here and do travel that far, the heavy earthen embankment beyond.

Here, however, less than a quarter of a mile down the roadway, is a perfect example of a clean offroad area. So this one stretch of roadway



in this area is only 5 miles long; it is a bypass system, and it has some beautiful offroad areas where serious concentrations, I think, were given; also right next to them are some of the worst hazards possible if you can say that.

Mr. W. MAY. Doctor, as I understand it, you have analyzed some 200 fatal accidents since November 1961?

Dr. HUELKE. Yes, sir.

Mr. W. MAY. In which 270 people were killed in those accidents?

Dr. HUELKE. Yes.

Mr. W. MAY. In addition to that, you have analyzed some 300 non-fatal accidents?

Dr. HUELKE. That is correct.

Mr. W. MAY. Were there injuries in each of those?

Dr. HUELKE. Yes. All injury accidents in those 300.

Mr. W. MAY. In your study as it existed up to and as of January 1, 1965, you made some analysis. You submitted a paper to the Highway Research Board?

Dr. HUELKE. Yes, sir.

Mr. W. MAY. I was struck with some sections of your report. You say:

As of January 1, 1965, we investigated 111 accidents in which 146 occupants were killed. No motorcyclists, trucks, or truck accidents were included in that.

Later you say:

If an individual is going to lose control of his vehicle for any reason, the roadway must be designed to prevent cross-median accidents and obstacles must be removed from the roadside so that serious or fatal injuries will not occur. In this study, 84 percent of the accidents were nonintersectional collisions, with a majority, 60 percent, being single-car, off-road collisions.

That is a pretty high percentage when you consider that the accidents that you have analyzed occurred on all types of roads?

Dr. HUELKE. Yes.

Mr. W. MAY. Expressways, rural type roads, primary type roads?

Dr. HUELKE. I think the point to emphasize here is that it is not always a two-car collision, but more frequently a single car off the road. And in this day and age with the traffic safety movement, I think that no matter how much or how many types of safety specifications Dr. Haddon gets through the legislature onto the vehicle, that many of these safety features will be useless when you put a car into a bridge pier or into a tree, or a retaining wall, that is close to the road edge.

If we are truly sincere in trying to save lives on the highway, we not only have to approach the vehicle, but we must do a concentrated effort on the highway system, lest the vehicle strike these things anyway.

(At this point Mr. McCarthy assumed the chair.)

Mr. W. MAY. Yes. Also as a point of interest, later in your report you mentioned, in 21 cases, more than one roadway hazard that should be considered important. Most obvious hazards are indicated in the first. However, other obstacles or design factors play an important part in fatal accidents. For example, you treat "ditch combination" situations which you showed earlier.

You have made a couple of tables captioned "Type of Fatal Accidents, Objects Causing Fatalities." These are all single-car collisions.

It is interesting to look at these statistics and analyze 111 accidents: Tree or utility pole, 35; bridge abutment, five; guardrail, four; earth embankment, four. You say "roll over due to ditch," eight; slope or embankment, six; lost control on roadway, five; subtotal of 67 in 111 accidents.

You talk of car-to-car collisions: Intersection, 18; cross median, 10; cross center line, 10; rear end, six; for a subtotal of 44.

Statistics can be meaningful. Mr. Kopecky made an analysis of your data and he analyzed the study the Bureau of Public Roads made of fatal accidents on the completed Interstate System during the third quarter of 1966, and took the study the Bureau of Public Roads made in the last 6 months of 1966 on the Interstate System, and California's freeway fatal studies made in 1961, 1962, 1964, and 1965.

We were struck with the similarity of the figures. For example, for single vehicles that ran off the road, the Bureau of Public Roads' third quarter study showed 59 percent; the Bureau's 6-month study, 57 percent; Dr. Huelke, 60 percent; California, 50 percent.

Second, a vehicle ran off the road and subsequently struck a fixed object: Bureau of Public Roads' third quarter, 73 percent; Bureau of Public Roads 6-month, 78 percent; Dr. Huelke, 72 percent; California, 67 percent.

Also type of fixed objects struck—guardrail: Bureau of Public Roads' third quarter, 34 percent; 6-month study, 33 percent; California, 25 percent.

Bridge abutment or a pier: 18 percent, 21 percent, 22 percent.

Sign support: 11 percent, 10 percent, 9 percent.

Tree: 4 percent, 3 percent, and 3 percent.

This covers various sections of the country, the interstate study of the total country; yet the percentages are quite comparable.

Dr. HUELKE. I think the important thing here is, we have seen this in other areas of the traffic safety movement.

For example, alcohol: So many people have done studies on drinking and driving, that there are more data than will ever be needed to show that alcohol is highly related to automobile accidents. Yet one of the States that I know of just last year had to run a whole series of the alcohol investigation program in their State because they did not believe the data from these other States.

Now, what I am getting at is that it looks like all these data you just mentioned on the highway design problems are in agreement across the country. I do not think there is need for continuing to get more and more data, making reams and reams of reports. We know it is a problem now. Let's get an action program going to do something about it.

Mr. McDONALD. Mr. Chairman?

Mr. MCCARTHY. Yes.

Mr. McDONALD. I would like to make a statement for the record. The Federal-aid highway program has been in existence for 51 years, without adequate attention being given to safety off the traveled roadway, which would indicate to me that the Congress may need to require appropriate review of the plans in this regard. Perhaps some action should be taken in the near future to see to it that this requirement is made part of the law.

Mr. McCARTHY. The Chair thanks the gentleman for his statement.

Doctor, I would like to ask you, you alluded to the ample data that are available on the problem of alcohol-driving accidents. Why do you think it is that this ample data did not result in appropriate legislation?

Dr. HUELKE. Because it has recently been shown, using our data no less, by Dr. Seltzer, a psychiatrist at the University of Michigan, that in the first hundred accidents, of the drivers that were at fault—if you are alone and go into a tree, he considers you at fault—50 percent of these people, from our data we know 50 percent had been drinking, 24 percent had not been drinking and 26 percent we do not know. So more than half of the drivers at fault in fatal accidents had been drinking.

He studied all of these drivers and found that 37 percent of them were alcoholics by psychiatric definition and that an additional 13 to 15 percent were prealcoholics. Prealcoholics are the young people, the teenagers and those in their early twenties who are developing such a drinking pattern that it looks like, if they keep it up, they are going to become alcoholics.

But studies have never been done on the progression of an alcoholic, especially in studies of alcoholism among teenagers, so they do not know. That is why they put these people in a prealcoholic category. Probably they are truly developing to be an alcoholic.

So what do we do with these people? This is a real problem. Throw them in the cooler for 10 days, and let them dry out? The first thing they do is walk across the street from the jail to the bar; these people are alcoholics. They are dependent on alcohol. Dr. Seltzer has found that alcohol is only a symptom of deep-seated psychological problems in every one of them, including suicidal tendencies in a good share, paranoiacs, schizophrenics, and that the alcohol just happens to be an obvious sign of their psychiatric problems.

These people need treatment. Now where do we put them? Where do we get all the psychiatrists to work in institutions to try and rehabilitate these people? If one gets into an alcohol retreat for a few months, that does not do a thing.

Mr. McCARTHY. Well, my question was why is it that these people are permitted to drive? I mean, I recognize the need for their rehabilitation, but I do not believe that is something that we can get into here.

Dr. HUELKE. Because if you take their license away, they are going to drive anyway. Studies have shown—

Mr. McCARTHY. They will drive anyway?

Dr. HUELKE. Yes.

Mr. McCARTHY. Without a license?

Dr. HUELKE. Sure. You are only caught once. You may not get caught again.

I think it would be interesting to find out how many people in this room have, in the last year, ever had to show their driver's license because they were driving an automobile.

You have to have some sort of offense before this happens, and most people hardly ever are caught; let's face it.

Mr. McCARTHY. Do you have any figures on the number of drivers in the United States without licenses?

Dr. HUELKE. No. This figure came through the Michigan area. Do you know that?

Mr. PRISK. I have forgotten. It is very high.

Dr. HUELKE. I think in Michigan it is 200,000.

Mr. McCARTHY. Out of how many drivers?

Dr. HUELKE. 4.5 million, is it, in Michigan?

Mr. PRISK. It must be at least that.

Dr. HUELKE. 4.5 or 5 million in Michigan, they think. It is a good guesstimate, but they are not sure.

Mr. McCARTHY. Well, this is a tangent, but it is something of great concern to this committee. The gentleman from Florida and I were involved in an amendment that will require a study of alcoholism.

But as you say, the data are available. It is due July 1.

From what you say, we should not have much difficulty in gathering the data. And once we have the recommendations for legislation which this study requires, I would hope that this committee could act on this, because this is a serious thing. I mean, I think if a person wants to get drunk and kill himself, well, it is a free country. But I think if he hits somebody else, that is our concern.

Dr. HUELKE. It is also interesting, in many areas—and I can only talk for Ann Arbor as a specific—a few years ago, the only way you could get liquor in Ann Arbor was by the pint or the fifth. You could not get just a small quantity. If you wanted to get alcohol, you had to get it big. They finally allowed liquor by the glass.

Of course, you cannot have it near the campus area because of the students. You know, Indians and firewater. So more of the bars, for the most part, are put out in the county area. They do not have bus service yet to get out there, so if you want to do any serious drinking in Ann Arbor, it almost requires you to drive. Yet there is a municipal ordinance that it is a misdemeanor to be driving after drinking.

So you talk about confusion, I think this is a prime example of one hand not knowing what the other hand is doing. I think it is obvious in some of the things today on the highway.

This is what we are concerned with today, and I think we should emphasize the fact that things have to be done. I believe that the reason that we see these things on the highway is not necessarily lack of concern by the highway designers, but the lack of education as to what an automobile accident is. And these data, these studies such as this, have really only been available for less than 10 years, these types of data.

There are only three groups in the United States collecting accident data firsthand now. At Michigan we are doing it; in Detroit, Professor Patrick at Wayne State is doing it; and Dr. Nahum and Mr. Segel at UCLA Medical School are doing it. And that is all.

Mr. ZION. Mr. Chairman.

Mr. McCARTHY. Yes.

Mr. ZION. I would like to ask Mr. Prisk and Dr. Huelke if they are aware of the studies showing impact on the multiflora rose hedge?

Mr. PRISK. Yes, the Bureau participated in the study on the multiflora rose hedge as a possible device for restraining vehicles that go out of control and off the pavement. We found it to be reasonably effective. It does have some disadvantages, in that once hit, it takes 3 or 4 years to grow the rose hedge back up to that point. So if you have a place, say at the outside of the curve, where cars with any frequency tend to leave the road, a multiflora rose is not a very effective thing except for one accident.

In addition to that, it is quite a trash catcher, to get to the esthetics of it.

It does do a pretty good job of stopping a vehicle; we know that.

Mr. ZION. I would like to make available for the committee members' inspection some pictures of the multiflora rose hedge as used in the State of Oregon. It is apparently quite attractive and does not show the trash-collecting capacity which you mentioned, although I am sure this is true.

Dr. Huelke, my wife and I were very well aware of your interest in preventive medicine at my alma mater. I can say that with my experience with Michigan and its capacity to prevent diseases and so forth, it has never been more vividly portrayed in activities, in preventing serious accidents, as this job you are doing now; and I would like to associate myself with the remarks that this is a wonderful service performed by you and by your alma mater. I think citizens of this country are most indebted to you for your work.

Dr. HUELKE. Thank you very much, sir.

Mr. McCARTHY. If there is no objection, I would like to request that these photographs be made available for reference by the committee.

Mr. ZION. Yes.

Mr. McCARTHY. Without objection, they will be marked as "Exhibit 1."

(The exhibit is retained in subcommittee files.)

Mr. McCARTHY. Mr. May.

Mr. W. MAY. Dr. Huelke, we had testimony in the previous 2 days from Mr. Joseph Linko, of New York. Mr. Linko stressed changes in design of construction that would call for, as Mr. Linko said, a sliding action of the vehicle. If it strikes the guardrail and if a guardrail were properly overlapping the bridge end post, you get a sliding action. The accidents you analyzed seem to stress situations where the vehicle came to an abrupt halt.

Is there not a relationship in the thinking of both of you?

Dr. HUELKE. This is the whole concept. It is not how fast you are going; it is how fast you stop that causes the injury. And you want to take that time period and go and go and go and go before you come to a stop; and never do it abruptly, because it is the abrupt stop that causes deformation of the vehicle and injury to the people.

Mr. W. MAY. While engaged in the inquiry a few months ago, we on the staff were impressed to read about Mr. Arfons, who was driving a test car going 580 miles an hour and lost control of the vehicle, and he lived. As a matter of fact, he was very slightly injured, which suggested to the staff at least, that a person can lose control of a vehicle and would come to a stop without serious injury if he continued to move, to slide, and gradually slow down.

Dr. HUELKE. That is just what he did in his car.

Mr. W. MAY. He did not strike a bridge abutment or a signpost.

Mr. Chairman, I would like to make Dr. Huelke's Highway Research Board paper, called "Nonintersection Body Fatalities—A Problem in Roadway Design," exhibit 2.

Mr. McCARTHY. Without objection, so ordered.

(Exhibit No. 2 is retained in subcommittee files.)

Mr. W. MAY. Do you have anything else to add, Dr. Huelke?

I have no further questions.

Dr. HUELKE. Nothing. Thank you.

Mr. W. MAY. I want to thank you very much for your help and your cooperation.

Mr. BLATNIK. Mr. Chairman.

Mr. MCCARTHY. Mr. Blatnik.

Mr. BLATNIK. I was impressed with the testimony this morning. I would like to be recognized to make a concluding statement and an announcement for further hearings.

We conclude today the third session of public hearings on the subject of the design and operational efficiency of our highways.

The testimony to date, as the story has unfolded, has been that of widespread and serious design deficiencies that have persisted over the years and throughout the country in the construction of our highways, roads, and streets.

One aspect which especially bothers me is the great gap that has been shown to exist between what we have learned from research and experience and its practical application in the designing and building of our new roads.

The reasons for many of our accidents have been well known for a long time; yet there appears to have existed a tremendous failure to translate that knowledge into positive, corrective action.

Again and again, we have found, for reasons that seem completely unaccountable, that the findings of research and experience are simply not being fully utilized by those who design and build our roads.

These hearings to date have clearly shown that a long, hard look at the whole area of highway design is in order. It will be the work of this subcommittee to explore further these matters in future hearings.

Before we close today's hearings, the first segment, I want to pay a well-deserved tribute to a gentleman, one of our witnesses during these past 3 days, who has provided invaluable service to our subcommittee in our inquiry.

The cooperation furnished us by the Bureau of Public Roads in previous investigations has been of the highest order. It has been continued in the matter now before us. The expert, specialized knowledge gained over a period of many years by Mr. Charles W. Prisk has been made available to us in preparation for the hearings and continually during the conduct of the hearings themselves.

Mr. Prisk was introduced as a witness on the first day of our hearings last Tuesday, but I would like to have the record again show Mr. Prisk is Deputy Director of the Office of Traffic Operations, Bureau of Public Roads, U.S. Department of Transportation. An eminently qualified engineer, he is recognized and respected in highway circles throughout the country as a specialist in the field of highway safety.

Over years past, Mr. Prisk has worked long and hard in the cause of improved road design safety. He is no stranger to the conditions that have been described to us by the testimony of Mr. Linko and Dr. Huelke. On the contrary, he has been untiring in his efforts over many years to bring about reforms in highway design, the needs for which have been so dramatically established by the testimony we have heard to date.

We are indeed fortunate to have available to us the expertise, the experience, the enthusiasm, frankness, straightforwardness, and forth-

rightness with which Mr. Prisk has made his presentations and responded to all inquiries raised in the course of the proceedings.

We look forward to his continued advice and counsel and further information as these hearings go forward; and so, Mr. Chairman, the public hearing for today is concluded.

Again, Dr. Huelke, our deepest appreciation. I hope you will not mind if the members of the staff, or the Chair, on behalf of the committee and members of the staff, keep in contact with you for further evaluation or interpretation of any other material and testimony which may come before us.

We commend you for your dedicated service, which obviously is far beyond the call of plain duty, and may very well result in the reduction of the type of accidents, type of fatalities, mutilations and injuries that have been so needlessly suffered in the past. We thank you, Doctor.

These hearings will now recess, subject to call at a future day to be announced later. Before we adjourn for the morning, I will be pleased to yield to the ranking minority leader, the gentleman from Florida, Mr. Cramer.

Mr. CRAMER. I have a couple of questions I wanted to ask before these witnesses leave.

Doctor, I understand that you showed some slides indicating trees planted, for instance, in the median strip. I gather it was your conclusion that, in many instances, those are traffic hazards and can cause accidents. Is that right?

Dr. HUELKE. Yes. No matter how close they are to the roadway, whether they are in the median or elsewhere, on the right side—I did not specifically show a film of trees in the median; but Michigan, especially the northern Michigan area, is notorious for this.

Mr. CRAMER. You say they are notorious for trees planted in the middle of the median strip?

Dr. HUELKE. Yes.

Mr. CRAMER. Now, is it your opinion that, as a general rule, the planting of trees in the median strip, so far as safety is concerned, is a mistake?

Dr. HUELKE. Yes. Especially if they are allowed to grow up. One concept I had one time, if I might interrupt—

Mr. CRAMER. You cannot keep it from growing up.

Dr. HUELKE. This is the concept. I was talking to one man from another county than ours, and he was complaining about trees in general, and one of their problems is they do not have enough tree-farm area. I said, "Well, your expressway in your region has a median that is so wide, why do you not use that for the tree farm? Also, these little saplings will be very good impact attenuation devices if you would happen to crash into the tree farm. Then when you need to move them, to put them in subdivisions, or wherever you would, take them out of the median." But you never allow them to grow there permanently.

Mr. CRAMER. I would be the last to suggest you are not fully aware of the esthetics and beauty and necessity of accomplishing beauty wherever possible. But, in your opinion, if it is a choice between beauty and planting trees in the median strip as relates to beauty and as compared to safety, you would recommend against it?

Dr. HUELKE. Not trees.

Mr. CRAMER. What?

Dr. HUELKE. Not trees in the median.

Mr. CRAMER. Right. And also not trees how far from the highway itself on the right or left side of the highways, the traveled roadway?

Mr. Prisk has indicated their regulations are 30 feet—which, incidentally, are not being lived up to, according to the pictures we have seen.

Dr. HUELKE. Yes. Now, we have found in our study, as indicated in the reprint that was submitted as part of the testimony that many of our cars do not travel too far to hit trees.

One of the big problems, as I was indicating before, is that once the people leave the roadway there is this steep embankment, or something of the sort, that takes them on the track down to this tree. If these areas are flattened, the individual can more easily recover without becoming panicky and striking objects.

Studies have been done, and I will read here at the end of the paper about roadside clearances studies. It has been shown in one study that if the roadsides are cleared of obstacles for 33 feet from the road edge, probably 80 percent of the accidents would not have occurred.

Mr. CRAMER. How many feet?

Dr. HUELKE. Thirty-three. Cornell, in their ACIR program, analyzed data that indicated 80 percent of the vehicles struck an object within 12 feet of the roadway. Again, the trees and abutments, and what have you, are so close, you go off a little way and you are there. So we do have to have a lot of clearing. And I think 33 feet would be good. But we have to think of the approaches to those trees, as I say. Are we talking about a flat area or a downhill?

Mr. CRAMER. Yes. If it is a downgrade area, the automobile would be channeled into it; then they should be farther than 33 feet; is that right?

Dr. HUELKE. Yes.

Mr. CRAMER. Now, Mr. Prisk, I am sure you are aware the present law, section 319(a) of title 23, United States Code, provides that the Secretary may approve, as part of the construction of Federal-aid highways, the costs of landscape and roadside development, including acquisition and development of public owned and controlled rest and recreation areas, and sanitary and other facilities, necessary to accommodate the traveling public. Therefore, the States are permitted to plant trees or other beautification items on the right-of-way and on the median strips. Is that not correct?

Mr. PRISK. Yes.

Mr. CRAMER. And in fact, many States are doing it; right?

Mr. PRISK. Yes.

Mr. CRAMER. And, as a matter of fact, I understand that recently in Honolulu they planted coconut trees about 2 feet from the traveled roadway.

Mr. PRISK. I am not aware of that.

Mr. CRAMER. On an Interstate highway.

Mr. PRISK. I am not aware of that. I think there has been an evolution in the instructions as far as safety is concerned, and these perhaps could more recently affect the situation you are citing.

Mr. CRAMER. So, in those instances, maybe we are overbeautifying and "undersafetyfying."

Mr. PRISK. If they are 2 feet away, they are.

Mr. CRAMER. It would be pretty obvious, would it not?

Mr. PRISK. It would be.

Mr. CRAMER. The reason I asked the question is it seems to me another instance where there is lack of coordination as it relates to planting trees, between the concept of safety and the concept of beauty, which we also saw the other day in the building of these walls, for instance, with the jagged edges sticking out for esthetic purposes.

Is there any hope that there will be coordination in the future and that safety will be properly upgraded? How is that going to come about in the future if it has not in the past?

Mr. PRISK. I think through improved recognition of the problem. This, of course, is the very first step in any betterment. From my seat in the executive branch, and knowing how people feel increasingly impressed with this recently evolving research, which as Dr. Huelke said, has only been available to us for a relatively short period of years, I believe there is a swing toward a great deal more emphasis on safety.

Mr. CRAMER. Well, it would seem to be about time.

It is a little disconcerting to me that there has not been adequate emphasis in the past, particularly in such obvious things as planting trees 2 feet from the traveled road.

This new agency, the National Highway Safety Bureau—incidentally, Mr. Chairman, or maybe I should ask counsel—are we going to have as witnesses anyone representing the National Highway Safety Bureau, headed by Dr. Haddon?

Mr. W. MAY. I would expect at the end of the first phase of these hearings, we would have Dr. Haddon.

(At this point, Mr. Blatnik resumed the chair.)

Mr. CRAMER. Some time at the end of the hearing?

Mr. W. MAY. At the end of the first phase, roadside hazards.

Mr. CRAMER. Maybe we can find out from Dr. Haddon what his thoughts or plans are relating to the safety aspects. The agency has been established for the purpose, as set out in the act, of establishing standards relating to safety.

I would hope that, with the Safety Act on the books and the Baldwin amendment passed a year or so before that, safety will be upgraded to a major consideration.

We are going to build these highways and supposedly save 8,000 lives a year on the Interstate System alone, which is one of the reasons for its being built. Then I think it is essential that adequate consideration be given to safety features and efforts to make the highways esthetically acceptable or beautiful should give way to safety considerations where it is obviously causing safety hazards.

You would not quarrel with that, would you, Mr. Prisk?

Mr. PRISK. Not at all, sir.

Mr. CRAMER. I hope we can get into that. Certainly there is a lack of coordination, and safety should be given primary consideration.

Mr. McDONALD. Mr. Chairman, may I make one point?

Mr. BLATNIK. The gentleman is recognized.

Mr. McDONALD. I would like to thank Dr. Huelke for his fine presentation. I think the slides point up the problem studied.

I looked beyond the traveled roadway and did observe the beautiful Michigan scenery. It made me homesick, Doctor.

I would hope, as these hearings continue, we keep in mind the possibility of enacting legislation through the Congress to require that review be made of the plans developed for highways, keeping in mind the safety factors.

In the last 51 years, it is evident we have not done this as much as we should have. I think perhaps some congressional action may be necessary to see to it that we do build safety into our highways.

Once again, Doctor, thank you very much.

Dr. HUELKE. Thank you.

Mr. BLATNIK. Thank you, gentlemen. No further questions? The hearings for today are adjourned, and further meetings will be set at the call of the Chair.

(Whereupon, at 12:05 p.m., the subcommittee was recessed, to reconvene at the call of the Chair.)

HIGHWAY SAFETY, DESIGN, AND OPERATIONS

Roadside Hazards

TUESDAY, JUNE 6, 1967

HOUSE OF REPRESENTATIVES,
SPECIAL SUBCOMMITTEE ON THE FEDERAL-AID HIGHWAY
PROGRAM OF THE COMMITTEE ON PUBLIC WORKS,
Washington, D.C.

The subcommittee met, pursuant to recess, at 10:10 a.m., in room 2167, Rayburn Building, Hon. John A. Blatnik (chairman) presiding.

Present: Messrs. Fallon (chairman), Blatnik (subcommittee chairman), Kluczynski, McCarthy, Howard, Cramer, Cleveland, Clausen, McEwen, Duncan, and McDonald.

Staff present: Same as previous day, and John P. Constandy, assistant chief counsel.

Mr. BLATNIK. The Special Subcommittee on the Federal-Aid Highway Program will please come to order.

Today we resume public hearings on the design and operational efficiency of our highways, roads, and streets.

The testimony we have received thus far has emphasized the roadside hazard problem. In that connection, the Chair would like to point out at this time results of a recent study of fatal accidents on certain sections of the Interstate System, which will be discussed at a greater length later on in the hearings. This study shows that approximately 60 percent of such accidents involved the single car, "ran off the road," category. In this group of accidents, vehicles left the traveled roadway and either overturned or, as in most cases, struck some type of fixed object, with fatal results.

With 53,000 Americans killed—men, women and children—in traffic accidents last year alone, in the year 1966, and another 1,900,000 injured, many of them crippled permanently for life, it becomes more important than ever that the causes of highway crashes be identified and corrected wherever possible and wherever they may be.

We are all aware of the danger that stems from the presence on our highways of the unskilled or reckless driver, sometimes referred to as the "nut behind the wheel." We are also aware of some deficiencies in the vehicle. We have two important factors, the driver and the vehicle. The testimony in these hearings has shown that rather little, if not far too little, attention has focused on the third source of danger; that is, the road itself.

It is not surprising to hear that many of our older roads which, like Topsy, "just grew" as the population grew, are a conglomeration of design deficiencies. It is understandable that many of these old roads, which date back many years, would require almost complete recon-

struction to meet present-day standards of design safety. However, it has been disappointing, to put it mildly, to learn that many of these design deficiencies persist even in some of our newest, most up to date, most modern federally aided primary roads. We have also learned that they are present on portions of our great Interstate System, and on a nationwide basis.

We resume this morning the testimony of Mr. Joseph Linko, a concerned citizen of the New York area, whose alertness and dedication have already been established by his testimony to date. His documented photographs have played a large part in our opening testimony.

We also continue to have the benefit of the skilled knowledge and experience of very many years of Mr. Charles W. Prisk, Deputy Director of the Office of Traffic Operations, U.S. Bureau of Public Roads. Mr. Prisk is well and favorably known in highway circles, having labored long in the cause of highway safety.

Both witnesses have been previously sworn and both witnesses are still under oath and they are here this morning. We welcome you, Mr. Prisk and Mr. Linko, to resume your testimony and presentation.

Mr. May.

Mr. W. MAY. Mr. Prisk, would you tell the committee how you first met Mr. Linko and what happened?

Mr. PRISK. This was in the fall of 1965 at the American Association of State Highway Officials' annual convention. Mr. Linko approached me with an interest in taking part in a program of the association, some part of the committee program. Later he talked to me about the subject matter that he had.

Mr. Williams was at that time Director of the Office of Highway Safety. He and I took Mr. Linko to our hotel room and saw some of the pictures, perhaps some of the same ones that we have all seen here since his testimony started. We were quite impressed with the pictures that we saw at that time. This was the first meeting.

Mr. W. MAY. Did you make arrangements then to have Mr. Linko's slides shown to other personnel of the Bureau of Public Roads?

Mr. PRISK. Yes, there was some free time on the following day and we prepared announcements to our division engineers of an informal meeting in the hotel and asked Mr. Linko if he would cooperate by showing his slides at that time. We also suggested to our division engineers that they might want to bring some State highway people with them. I think there were about 70 or 80 who attended that showing by Mr. Linko.

Mr. MAY. About how long did that presentation last?

Mr. PRISK. I would say 2 or 2½ hours. It was a very enthusiastic reception.

Mr. W. MAY. Fine. Mr. Chairman, for the record, so it may be clear, to show the enthusiasm of the Bureau of Public Roads to Mr. Linko's study, I will read at this point a Bureau memorandum. This is from the Washington office of the Bureau of Public Roads, a circular memorandum dated June 2, 1966. It is directed to all of the Bureau regional engineers from Mr. J. D. Lacy, Director of Highway Safety. Subject: "A Layman's Reaction to Roadside Hazards":

Mr. Joseph Linko, of New York City, a citizen with a strong public-minded interest in safety, showed a group of slides to an impromptu meeting of Bureau of Public Roads officials during the 1965 AASHO annual meeting. Although

Mr. Linko was not himself a highway professional, his photographs and commentary were judged by many to be highly effective as a basis for relieving potentially serious roadside hazards on current and future projects. His presentation relates to the beautification features as well as the engineering elements of the roadside. Arrangements were made with Mr. Linko to record his remarks and duplicate a number of his slides. A copy of his presentation which contains 68 slides and a narrative tape by Mr. Linko is being sent for use within each region.

The primary purpose is to stimulate increased attention to safety appurtenances among those which involve the highway administration, design and supervision. We urge that the slides be shown to those in your offices who review plans and specifications and be made available to the appropriate highway department personnel responsible for highway design and operation. Because no special arrangements were made for recording, you may have some difficulty in understanding all of the narrative, and you will notice slide 32 is omitted. However, valuable material is in the sincere and largely accurate analysis of roadside deficiencies reflected in Mr. Linko's remarks.

It is our hope that it will cause more attention to be given to the built-in hazards that may be eliminated and improvements of highway safety that are possible. Many hazards of the type shown will be eligible for correction through the Federal-Aid Highway Safety Improvement Program now underway and more fully described in PPM 21-16. We shall appreciate having the benefit of any substantive reactions that result from the use of this material.

Mr. Prisk, were there reactions to this material?

Mr. PRISK. Oh, very definitely. We made available, as this indicates, simply a very small sample of the illustrations Mr. Linko has, and responses came—I remember one from California, for example, indicating that over 500 employees of the Division of Highways, all of their design squads throughout the State, various district offices, had viewed this presentation, looked at the slides and listened to the commentary by Mr. Linko, and they had very favorable reaction.

Mr. W. MAY. Thank you. Mr. Linko, would you now proceed with your presentation.

Mr. LINKO. Yes.

FURTHER STATEMENT OF JOSEPH LINKO, NEW YORK CITY, AND CHARLES W. PRISK, DEPUTY DIRECTOR, OFFICE OF TRAFFIC OPERATIONS, BUREAU OF PUBLIC ROADS, U.S. DEPARTMENT OF TRANSPORTATION

Mr. LINKO. Yes, sir. This portion of the first 15 to 20 slides will be of Connecticut.

This happens to be on the border of New York. I strayed onto this Route 84 and I noticed that they were making mistakes like New York



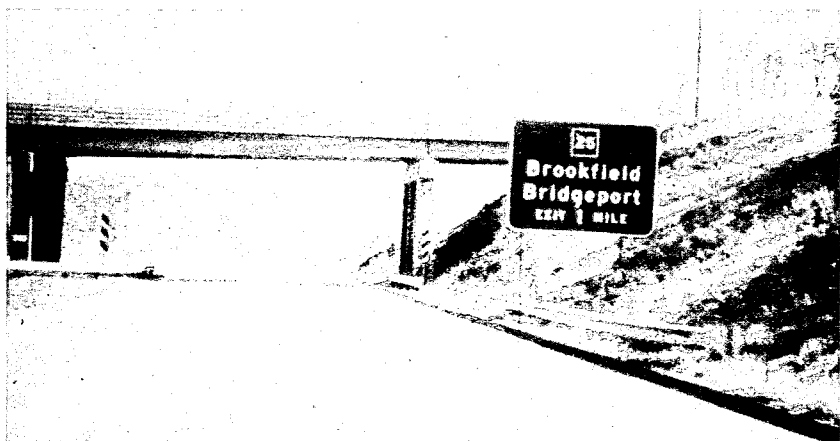
had been making. Here you can see that instead of putting this sign at the bridge abutment where there is a guardrail, they put it in advance and created a second hazard. It would have been less costly to put it at the bridge abutment and there would have been no damage there.

Mr. MAY. Excuse me. You had seen what you had considered to be mistakes over in New York, so you went to Connecticut to see how they were doing things?

Mr. LINKO. Yes, sir. I went to Connecticut and the border of New Jersey just to compare and see whether we were the only ones making mistakes, and I would like to compare these highways to the New York type, you see.

Mr. W. MAY. All right, thank you.

Mr. LINKO. Here also, you can see an unnecessary sign hazard that could have been put up ahead at the existing bridge abutment.

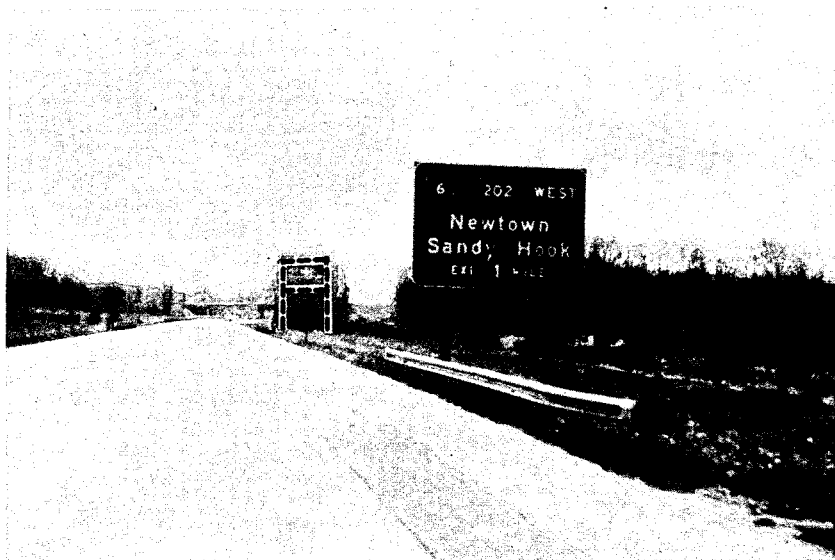


Here you have a double rail and the right leg of the sign is not being protected. It would be safer to bring this sign forward behind the guardrail. This happens to be on an outside turn, and that is where a car would be most likely to go.

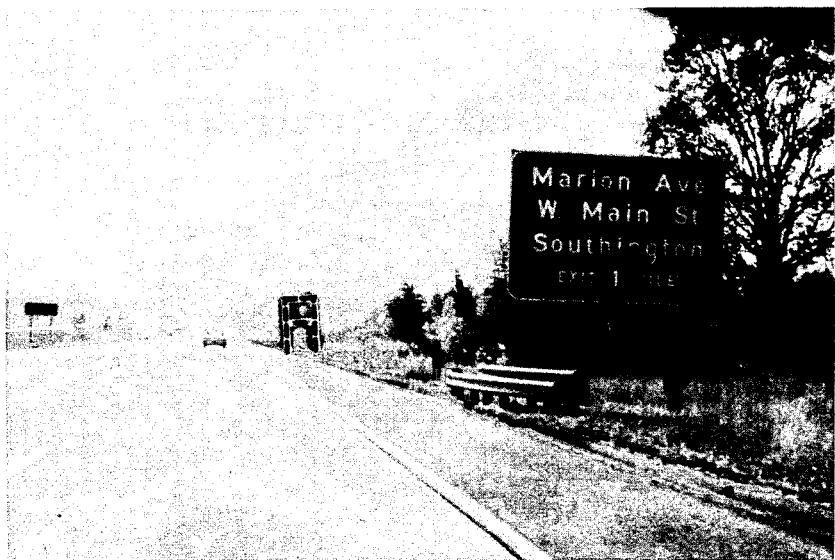


Mr. W. MAY. Are those steel beams?

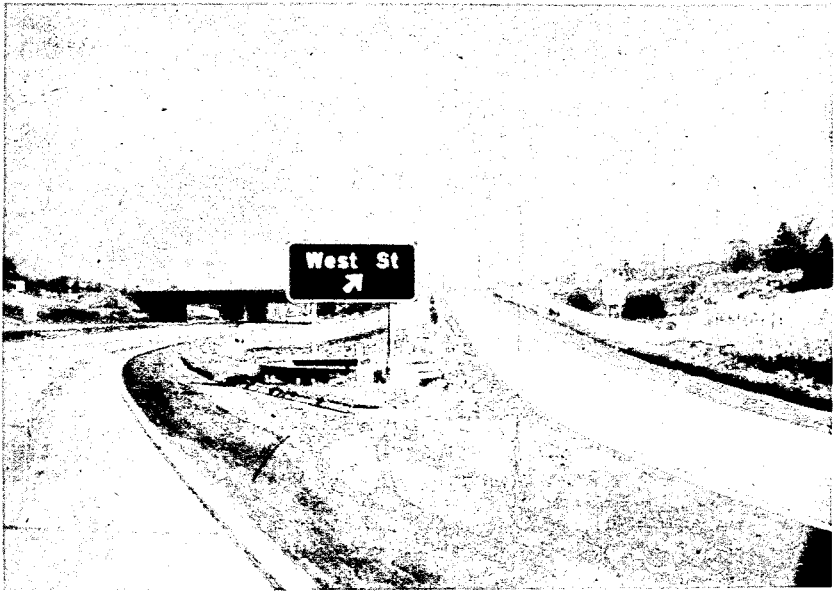
Mr. LINKO. Yes, sir, 8-inch or 6-inch. This probably is 8-inch from the size of this sign.



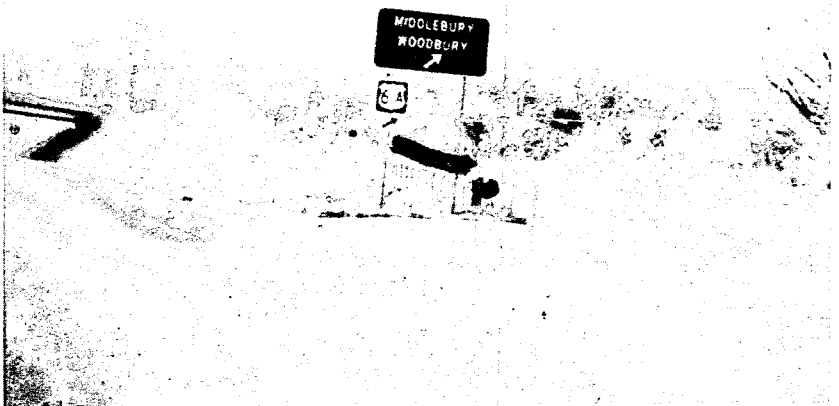
And here also you can see a 1-mile sign. It will not make any difference if you back these up behind that guardrail. You can put it at three-quarters of a mile rather than 1 mile, when that creates an unnecessary hazard.



Here you see you have not a single rail but a double rail in a clear gore area. It is going to cause a serious accident, and it is really not needed.



Here is a place where you have a clear gore area and a clear road with a nice shoulder, and they have about 200 or 300 feet of guardrail somebody might run into and which could be removed. I have a line there to mark the guardrail.



Here you can see where the sign could have been mounted on top of the overpass or back up where the guardrail is, where the marks are.



Mr. W. MAY. You mentioned, I believe, at the hearings last time that you might recommend a crash program on the part of the Bureau of Public Roads, No. 1, to get out there and remove unnecessary guardrails?

Mr. LINKO. That is right. Especially in the Greater New York area, there are hundreds of places, maybe thousands, where there is guardrail protecting easily knocked down signs, or there are concrete stanchions laying alongside the roadway doing nothing at all. I feel this does not even involve any money. The local highway department could go along and rip out this material.

Mr. W. MAY. This (figure 1-234) would be an example of where you consider a guardrail could be removed and you end up with a safer roadway?

Mr. LINKO. That is right. Somebody is bound to go through there sooner or later, because it is an exit. They are going to rip up their car for no good reason at all.

Mr. W. MAY. Mr. Prisk, how do you react to that?

Mr. PRISK. I think this is the kind of location, Mr. May, where that could be seriously considered. From what I see of the terrain there, I also fail to see the reason for the guardrail. It would seem to me that they probably had more guardrail than they need.

Mr. W. MAY. Yes. If they went into a crash program to remove this type of guardrail, unnecessary guardrail, they might consider, sometime, even regarding an area to make it more safe and then remove the guardrail; right?

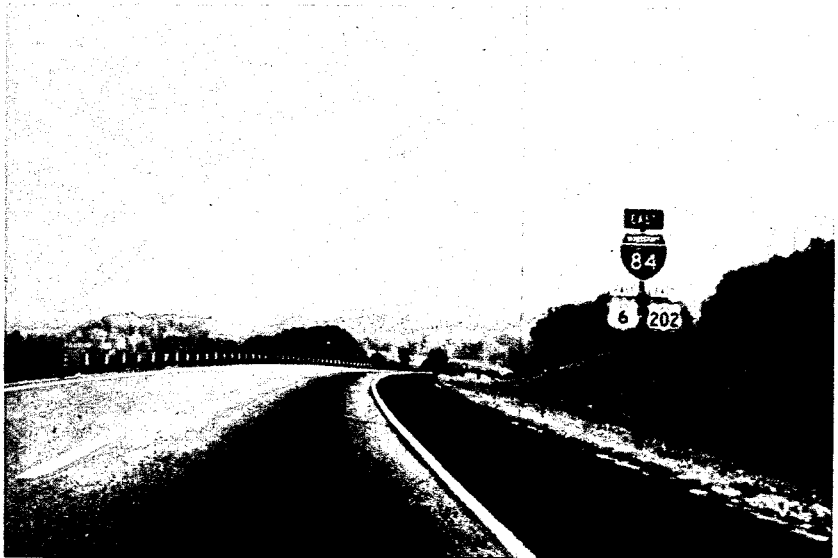
Mr. PRISK. Yes, this would be an important adjunct of taking the guardrail out.

Mr. W. MAY. Proceed, Mr. Linko.

Mr. LINKO. Yes.

In this particular case (figure 1-234), this is a perfect job of design engineering there. There is no grading needed here at all. I feel the motorist has a break if he makes a mistake; there is no ditch, it is a nice slope, he can recover his car.

I am even against this small sign. You might think I am picking on it, but even a sign like this is a hazard. You could be traveling along at 50 miles an hour and one of your tires might get in that ditch there. The average person approaching a small sign, or any kind of sign does not know if it is an easily knocked down sign. He will swing away and lose control of his car at 50 miles an hour, so that sign is considered a hazard.



Mr. W. MAY. Mr. Prisk, would you agree with that?

Mr. PRISK. It might be considered a hazard, but certainly not in the class with the I-beam structures. This appears to be a U-frame support. But there is a degree of hazard associated with it; yes, sir.

Mr. W. MAY. Yes. A very simple move is to place that sign behind the existing guardrail which is up ahead.

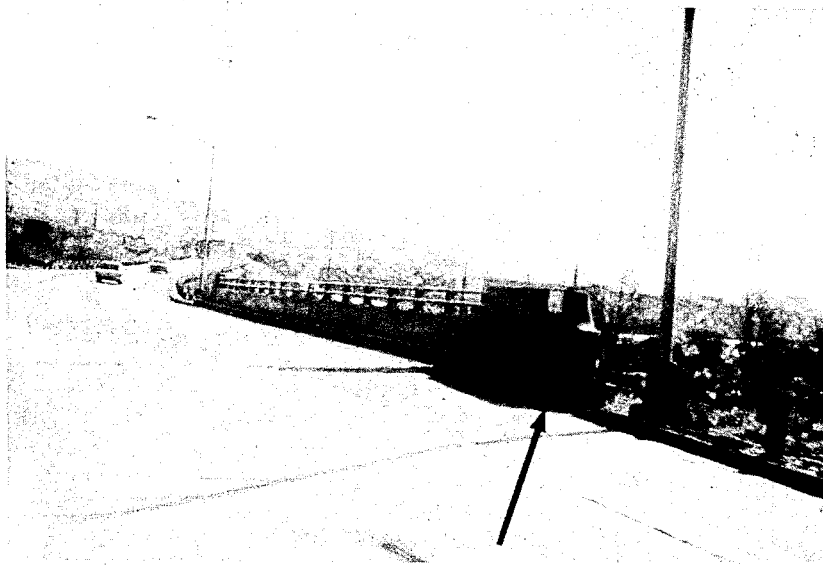
Mr. PRISK. And, of course, another possibility is to move it farther away from the roadway.

Mr. W. MAY. Yes.

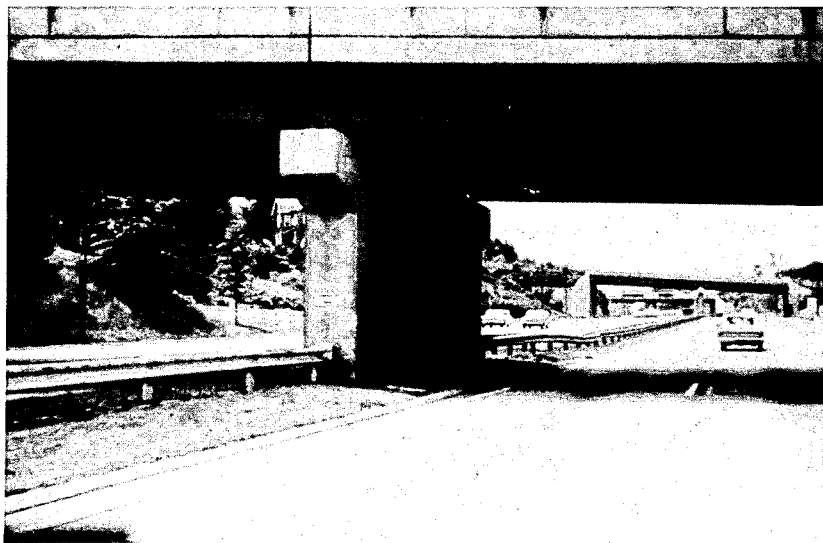
Mr. LINKO. In this particular case you do have a guardrail to put it behind. It does not have any mileage on it. What is the difference if you put it here or a few feet farther? It only tells you 84, 6, and 202.

You have to take into consideration these signs are constantly being knocked down. It cost a lot of money to maintain them. Behind the rail you would not have the maintenance.

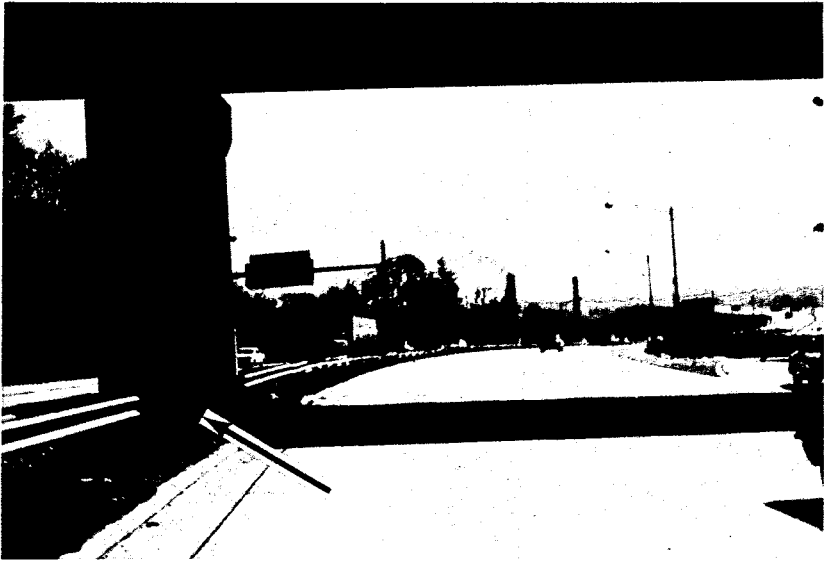
I found out they have the same problems we have in New York State with 10-inch and 12-inch curbs at bridges. The guardrail is generally lined up with the wall, and you can get into serious accidents for no good reason at all. If the guardrail is lined up with the curb, you can slide by.



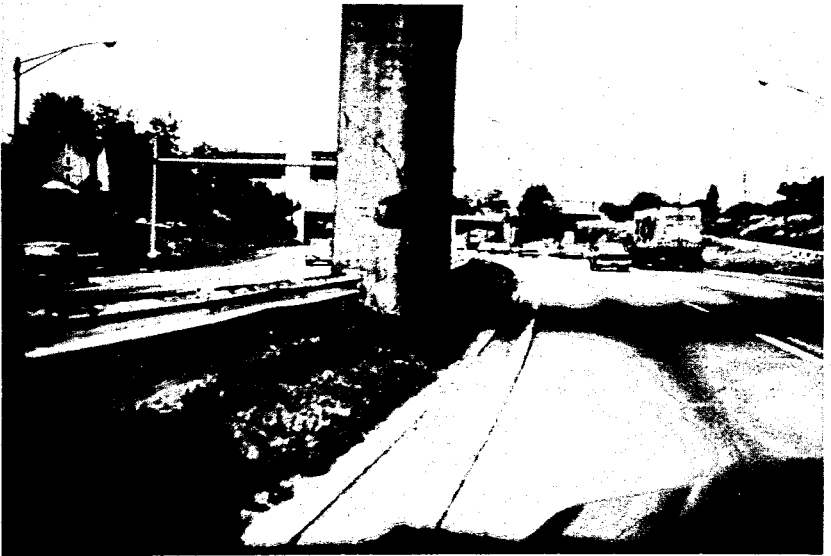
I noticed practically every curb on Interstate 84 constituted a hazard. Here is a picture where a marine died. He slid along the guardrail and went right into that abutment there. That was about 11 months ago.



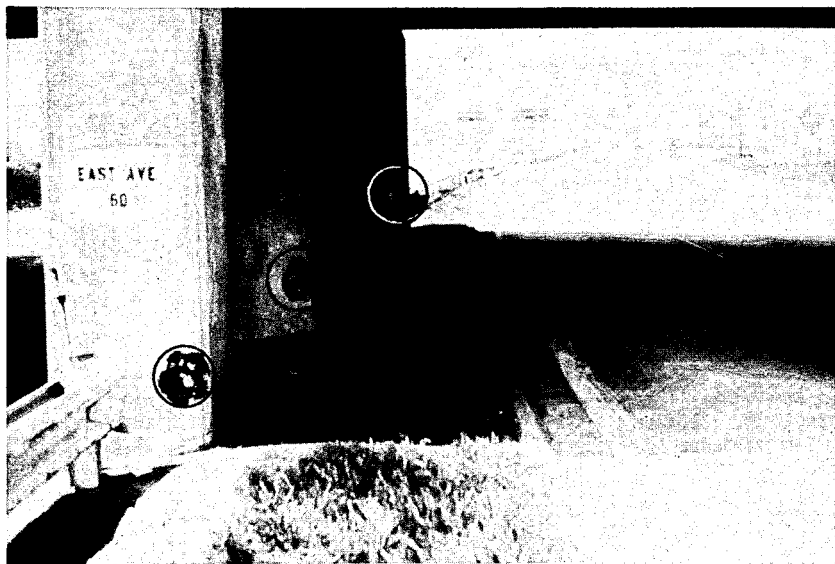
I went by this location the other day and I noticed they were putting guardrails around, but it took them 11 months to do it.



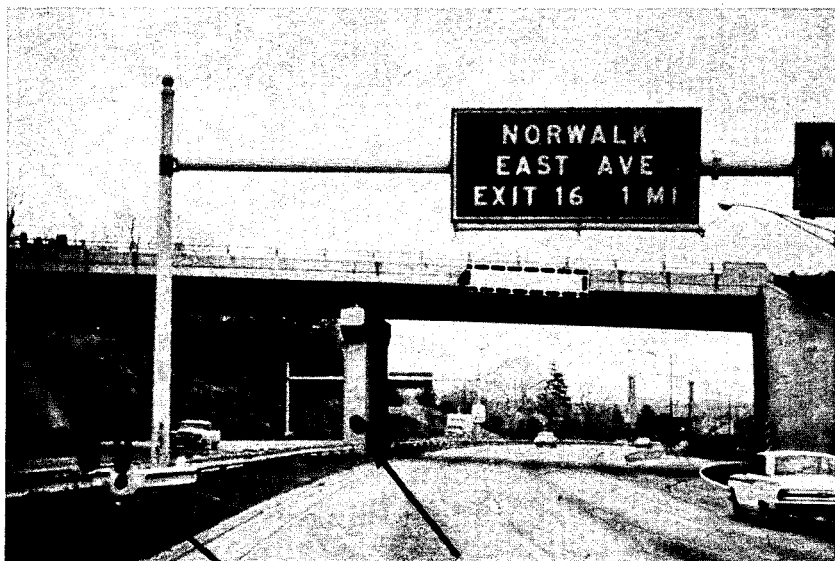
They did not get around to doing it on this one—or that one. Look at the many targets you have, and with a tapered curb you can ride up



nice and easy. I feel you need a crash program to get all these hazards off our roadways. It is an interstate highway and the speed is high here.



Here you can see the sign could be mounted on top of the overpass and the pole could be put inside the center divider. Every one of these places is an extra snag. Even at the bridge support, the guardrail does not go around it; it stops in the center.



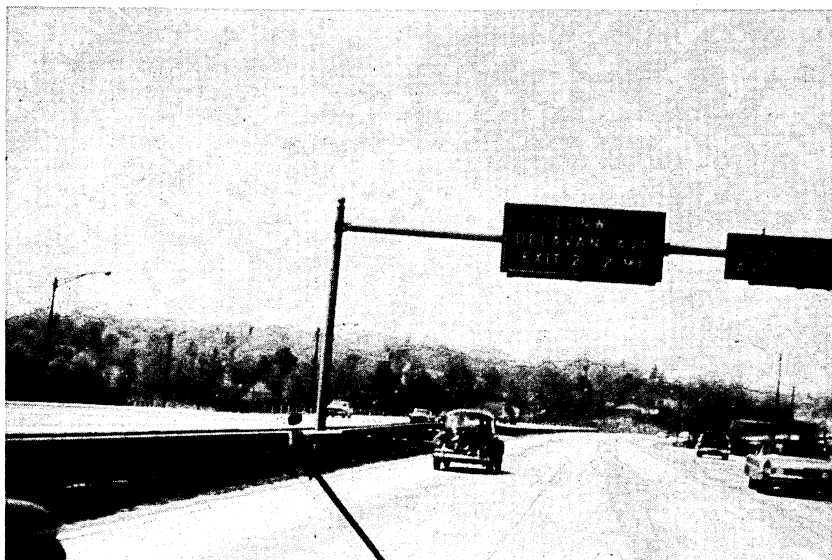
This is similar.



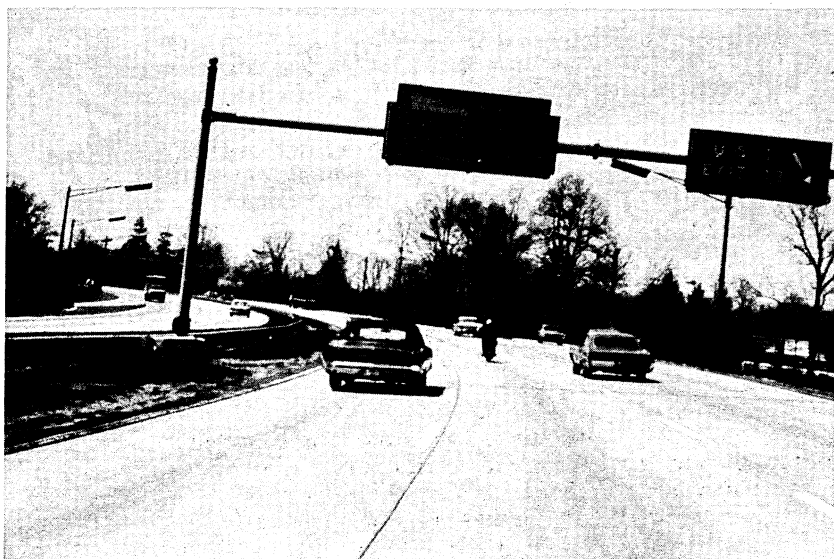
This one has been smashed into.



And that one has been hit.

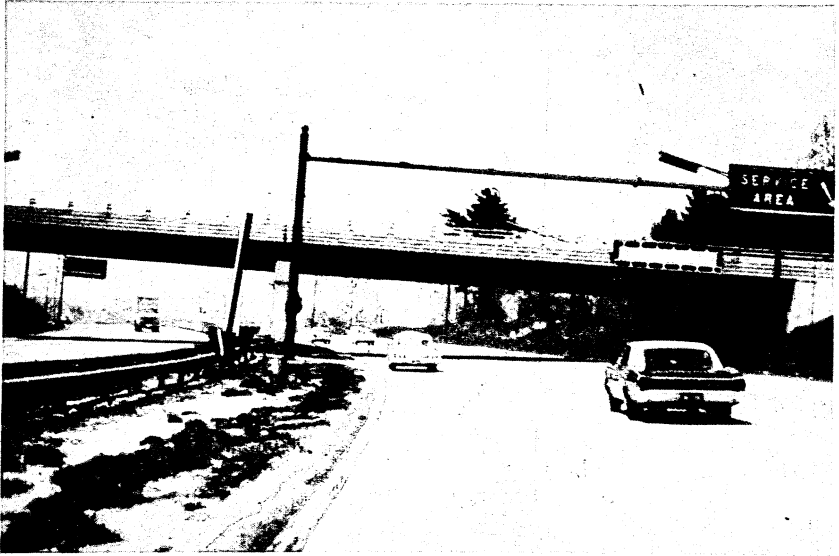


And that one has been smashed into. Where the dots are is where they have been smashed, because they are about 2 or 3 feet away from the rail.



Here you can see the rusty pole sticking up about where the arrow is. Someone ran right through this area and knocked down the pole and they replaced it with a rusty one.

I am trying to bring out the point it is a different color post from the crossbar, showing it was knocked down and someone went through there. The old one is on the ground, where the arrow points.



By the way, the center rail was a new rail. It was recently installed and they failed to protect these hazards. The least they could have done was install a few more feet of guardrail and phase it into the center rails.

I rode up this road and practically every one of these signs are not inside the center divide; they are away from it, sometimes 2 feet, sometimes 3 feet. I feel they should get something done there also.

In fact, in this one here, you could tear it out and put the sign on top of the overpass.

Mr. BLATNIK. Mr. Howard.

Mr. HOWARD. Thank you, Mr. Chairman. In a setup like this, could it be said or thought that possibly we are building these guardrails, these small ones, to protect the poles, rather than the people?

Mr. LINKO. The small section guardrail?

Mr. HOWARD. Yes.

Mr. LINKO. Well, it is true, they are trying to lessen the crash. As a simple solution, I would rip it up and put the sign on the top. But just in case somebody wanted the sign here, I would put it inside the center divider. Until they have done that, I would put 75 feet of guardrail and angle it off and bolt it right into that center divide, so that you have your sliding action.

Well, here they realized there were hazards.

Here they felt, well, somebody might run into it, so they put 75 feet of guardrail here. But you see, somebody running into that still has a problem; they did not solve the problem here.



This is a brand new rail. If I was doing the job, I would go around that hazard. But nobody had any intention of removing that hazard. They just put the guardrail up because somebody had it on paper.



Mr. CLEVELAND. Mr. Chairman.

Mr. BLATNIK. Mr. Cleveland.

Mr. CLEVELAND. Could a member of the staff tell me how much guardrail costs per foot, or would they describe the expense of guardrail?

Mr. W. MAY. Mr. Prisk, can you tell us?

Mr. PRISK. Somewhere between \$5 and \$7 a foot, lineal foot. That is the double rail. Single rail is \$3 to \$4 a foot.

Mr. CLEVELAND. Does that include the cost of installation?

Mr. PRISK. Yes, sir.

Mr. CLEVELAND. In some of these situations then, as I understand it, the public is paying for guardrail that is unnecessary. Do you concur with that observation?

Mr. PRISK. I think that there is unnecessary guardrail in place, yes, sir.

Mr. CLEVELAND. In other words, some of these guardrails are being put up to protect the foundations of signs that actually could be put on bridges and you would not need any foundation, and would not need to protect a foundation. Is that not a correct statement?

Mr. PRISK. It is pretty hard to generalize about it; but—

Mr. CLEVELAND. Could we go back to the previous slide?

Mr. PRISK. Maybe you could get a specific case.

Mr. CLEVELAND. Look at that. It shows two signs being supported by the two supports, and the bridge just ahead where those signs could be.

Now, if those signs were on the bridge, then we would not need, obviously, the abutments to support the signs. Would we need that guardrailing you see in there?

Mr. PRISK. No. The guardrail that is near the 50-mile-an-hour sign would not be needed.

Mr. CLEVELAND. There is a guardrail costing perhaps hundreds of dollars; that is actually unnecessary, is it not?

Mr. PRISK. That is true. And the rail on the right, the same thing can be said for that.

Mr. CLEVELAND. Although these hearings are primarily concerned with highway safety, there is also a savings, an economy feature then? That is a collateral issue here, is that not correct?

Mr. PRISK. Oh, very definitely. I think a good many times safety features will cost more, but it is also equally possible to arrive at a safer solution without spending any more money and in some cases actually saving money.

Mr. CLEVELAND. So we have the rather incredible situation where we not only are in some instances designing danger into the highways, but we are doing it at increased costs rather than less costs?

Mr. PRISK. It would cost something, of course, to put the signs on the structure. You do not just paste them up there. It requires some structural frame to support them.

Mr. CLEVELAND. Mr. Chairman, I think we have had evidence about this before, but I want to be sure it is in the record.

Taking the pictures we have with two large signs supported by a steel structure, what is the estimated cost of that type of installation?

Mr. W. MAY. Mr. Prisk?

Mr. PRISK. This type of design spanning three roadway lanes and the shoulder, typical cost would be about \$15,000 to \$18,000 for that overhead span.

Mr. CLEVELAND. But if you took those two signs, and fastened them to the bridge, that certainly would not cost any \$15,000 to \$18,000?

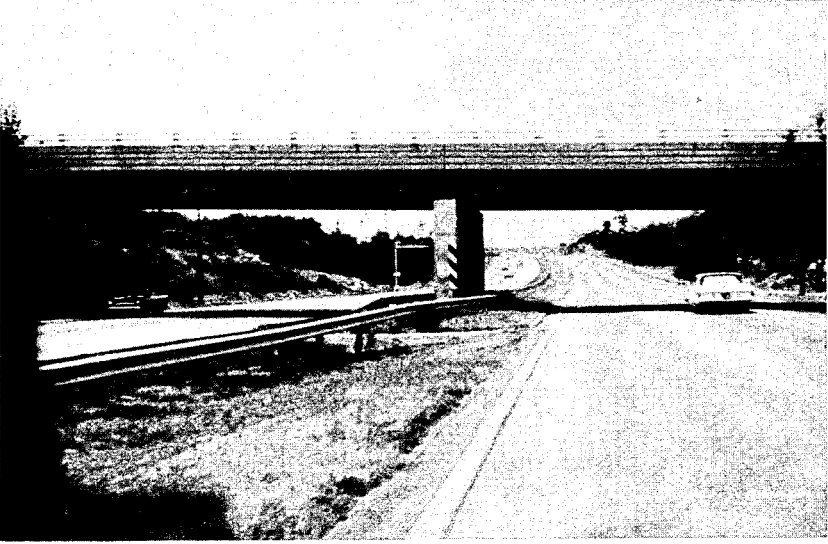
Mr. PRISK. No, sir.

Mr. CLEVELAND. So again I say we not only are designing danger into some of these situations, but we are doing so at unnecessary and increased costs. Is that not a true statement?

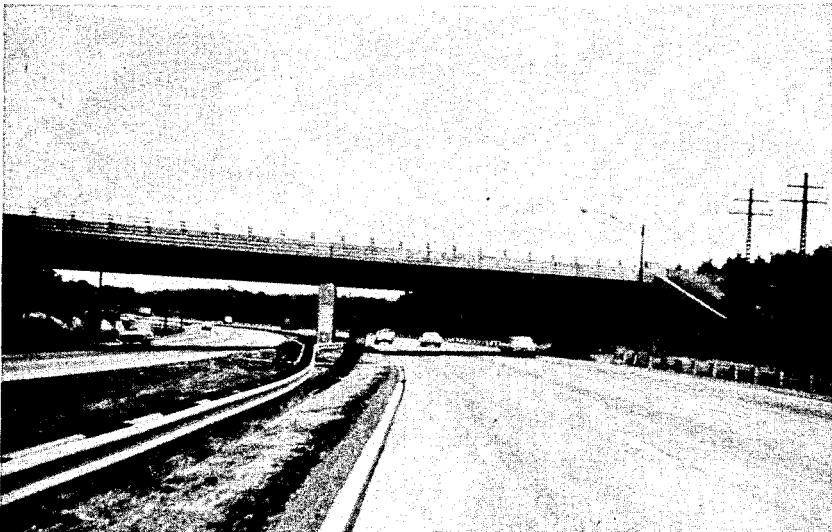
Mr. PRISK. Yes.

Mr. CLEVELAND. Thank you.

Mr. LINKO. Here you see a 20-inch block. Anyone riding along this rail will be guided into this 20-inch block and come to an abrupt stop. All passengers may go through the windshield.



Here again, by curving the guardrail in the center in the proper manner—like I show with the line—you still would have a good shoulder and nobody would be in danger. This way here, the block is exposed.



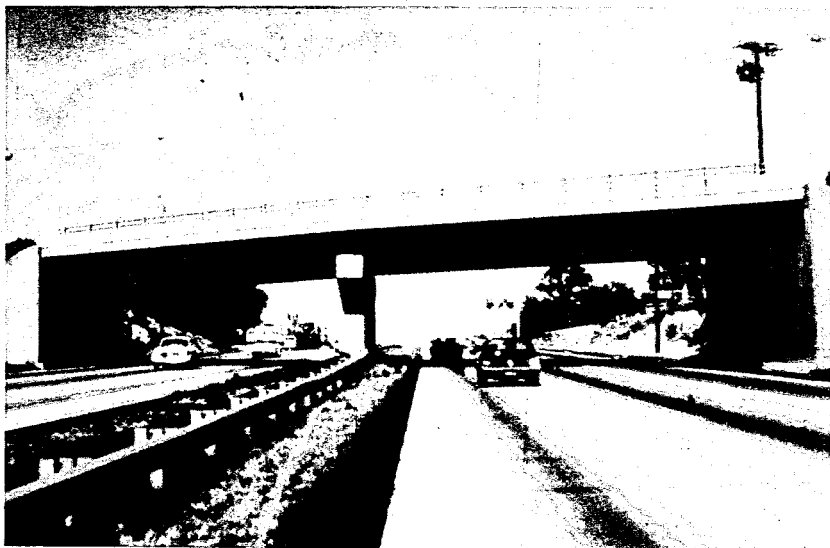
Maybe something like this.

Mr. W. MAY. In the previous slide, why is that curb there?

Mr. PRISK. It appears to be an old crossover. Since I'm not familiar with the exact location I can't answer that precisely.

Mr. MAY. It looks like it might be tapered.

Mr. PRISK. I think so. If that is concrete, it would take a little jack-hammer work.

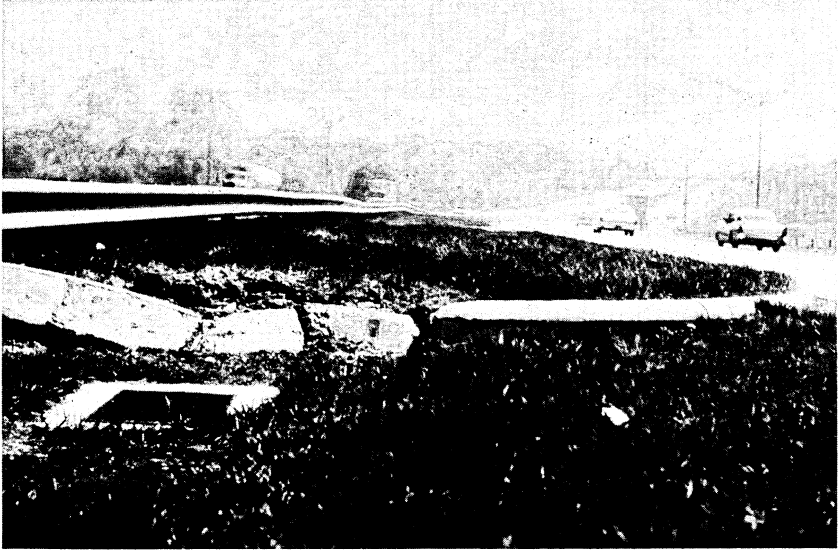


Here you have a tire track, which is hard to see, on the side. Somebody ran right along that guardrail and hit that block.



Here you can see it is all busted up, so he must have hit it pretty hard.

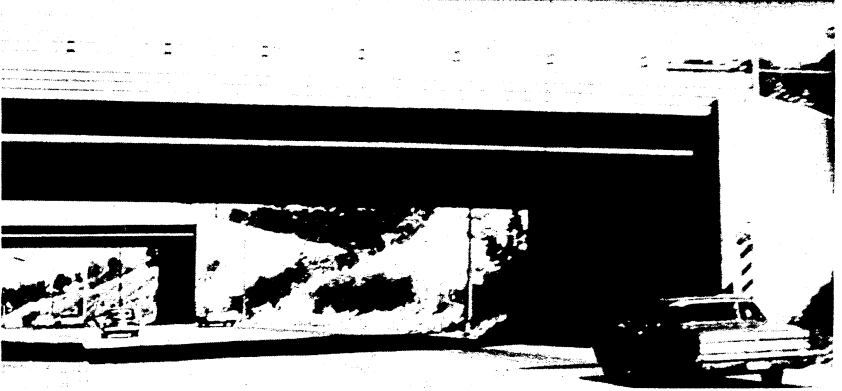
This is not really necessary. It is not even the curb at all; the curb is here at the right so why can't we guide that car past, give him the 10-foot shoulder.



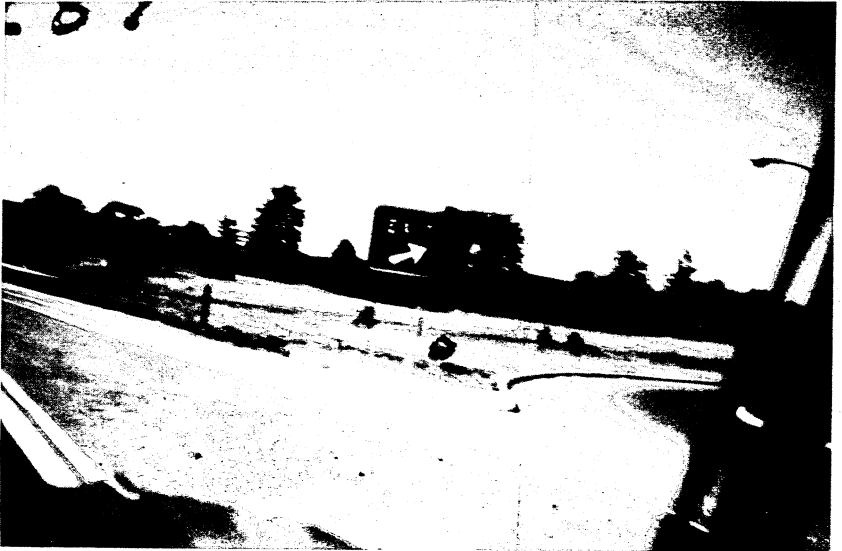
And here is another one; this is new work.



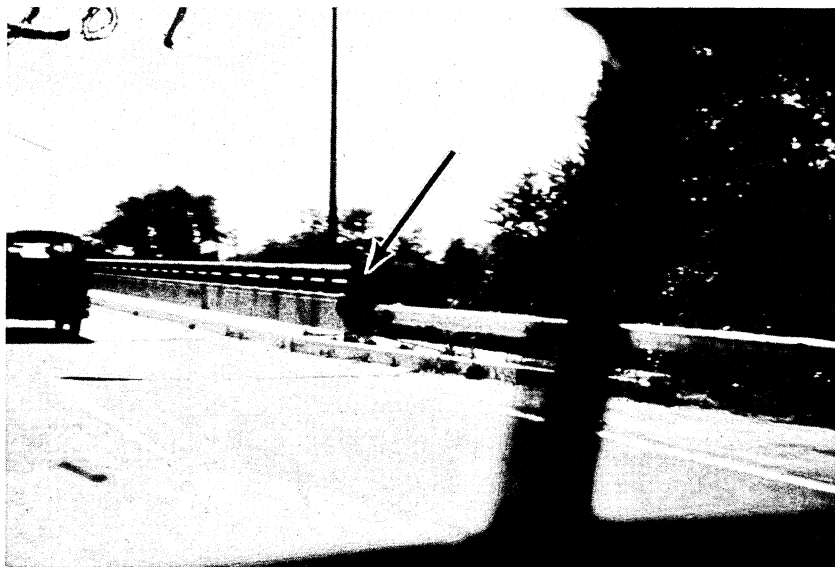
This is the last one on Connecticut and it points out we still have not got any guardrail at these bridge abutments, and I would like to know really what we are waiting for. We are still opening up brand-new Interstate highways and we are not putting any guardrail at these bridge abutments.



Now, here are a few slides of New Jersey. This is Interstate 87 showing they have the exit signs and the guardrails in the gore areas, which is an indecision point; and this should be avoided.

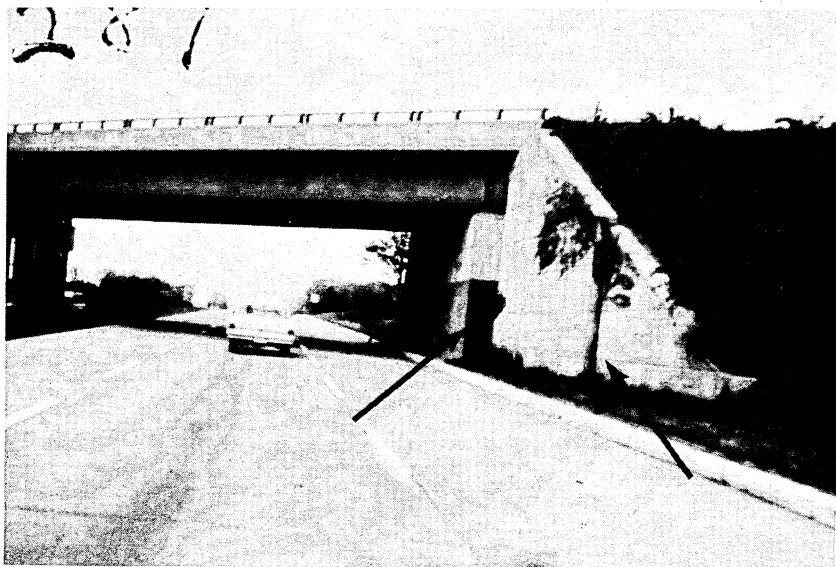


Here you see a guardrail back of this bridge abutment, where you probably would get hurt.



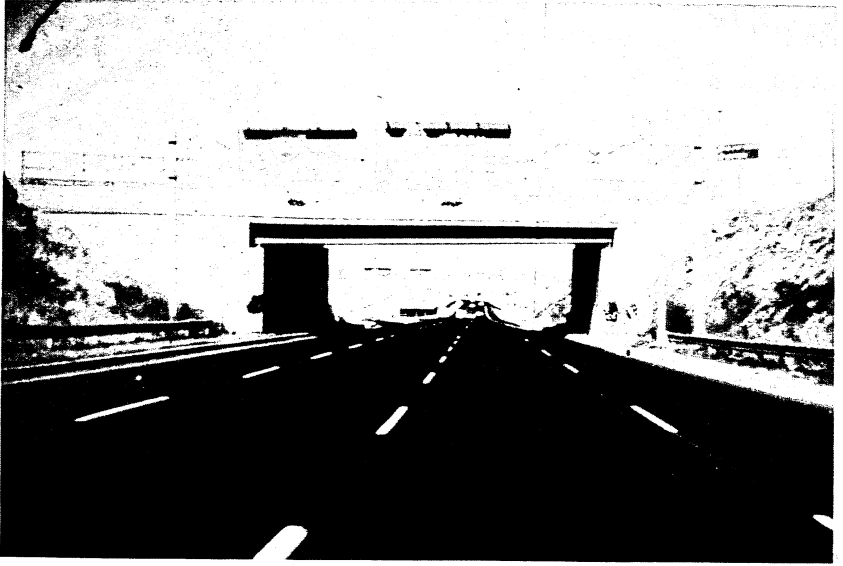
Here you see an unnecessary bridge abutment that could have been phased out with the wall if somebody had a mind to do it.

Here is Route 17, and that's an expensive installation. You could have the sign right in front of the bridge abutment. You have the proper length guardrail at this point, but the ends are not buried into the ground. The reason I am showing you this is because even if we had to put this bridge sign here, we could have killed two birds with



one stone; let's put it that way. Notice the bridge abutments are not protected. Everywhere I see the new work, it seems to be that they are only doing one thing at a time.

Here you can see you have four targets. You have the two rail ends and two bridge abutments.



And here you see a gore area really saturated. Not only did we put the concrete stanchion there, but we put three high voltage transformers there. Some big truck is going to run in there and damage that at



terrific cost to the taxpayer to replace. That is, if it does not kill someone.

I would like to say again this should be off limits, especially a clear gore area like this, where a guy should get a second chance after he makes a little mistake. He is not going to get a second chance here.

Notice the guardrail is not protecting the concrete stanchion base where the dot is. This is a widespread practice.

Mr. HOWARD. Would you say there is little chance of the transformers being bothered because nobody will get past the big concrete stanchion?

Mr. LINKO. He more than likely would not.

Mr. BLATNIK. Mr. Prisk, let me ask you about this slide. Why could those transformers not be to the right of the exit lane, behind the embankment, and out of the way? Can you think of any reason why the transformer could not be a few feet to the right?

Mr. PRISK. No, Mr. Chairman. I think that there generally is a great deal of room at interchanges to locate necessary transformers, such as these are, in a place where they will not be vulnerable or likely to be struck. The one argument for having them where they are perhaps is they are easily accessible for servicing.

Mr. LINKO. I would like to point out, they really need a lot of service if they are there, because they are going to be hit. I do not think they realize this is a danger zone. I think that is why they put it there.

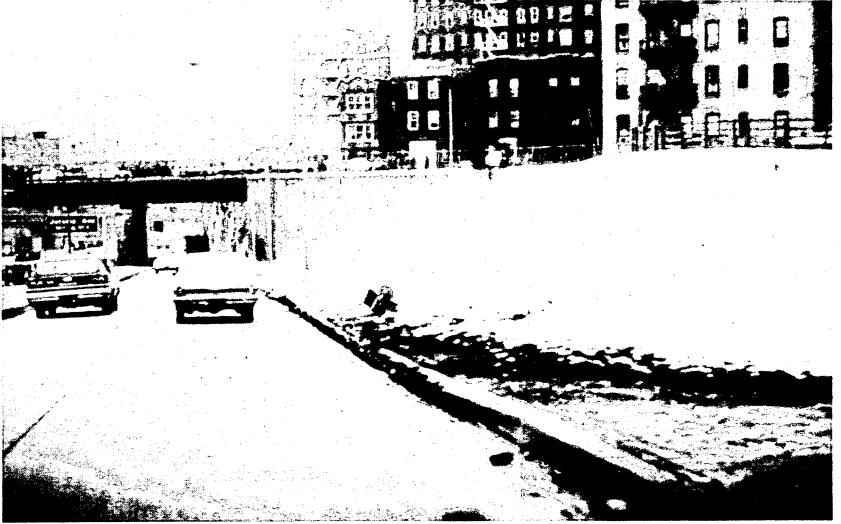
I hope, since I am spotlighting this particular area as a danger zone, they will make it off limits to anything. In fact, require special permission to put anything there. That will discourage them.

Here are a few slides on trees growing alongside the highway.

This is a good design on your right. You can see tire marks where a truck ran through there. He pulled over to the right-hand side, and that is the best place for him when he loses control of his truck or car. He recovered and had a second chance.



Here you see another car running by, barely missing a tree on the top. Now, in many places we have been planting these trees 2 and 3 feet off the shoulder, you see. He would not have gotten a second chance. I am trying to illustrate what happens to cars and trucks in their way back and forth to work.



MR. W. MAY. Mr. Linko, I notice when cars leave the roadway, sometimes they leave for a pretty good distance.

MR. LINKO. That is right. Sometimes 30 or 40 feet.

I feel the road belongs to the motorists. Actually they pay for it and I do not think it should be saturated.

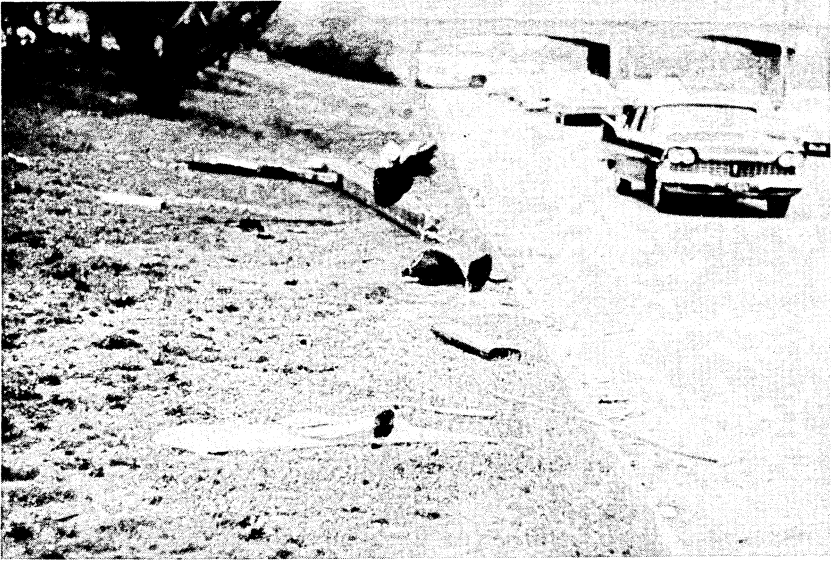
I would like to say that in the manual that tells you where to plant the trees, they tell you 25 or 30 feet from the edge of the pavement. That means only 15 feet from the edge of the shoulder and I do not think that is far enough. There should be different distances; for instance, on flatland, uphill, and downhill. Because when you start running down the hill, you can hit a tree 50 feet away.

And here you see that somebody lost control of his car and he approached this tree. He had two choices, to hit the tree or swerve away



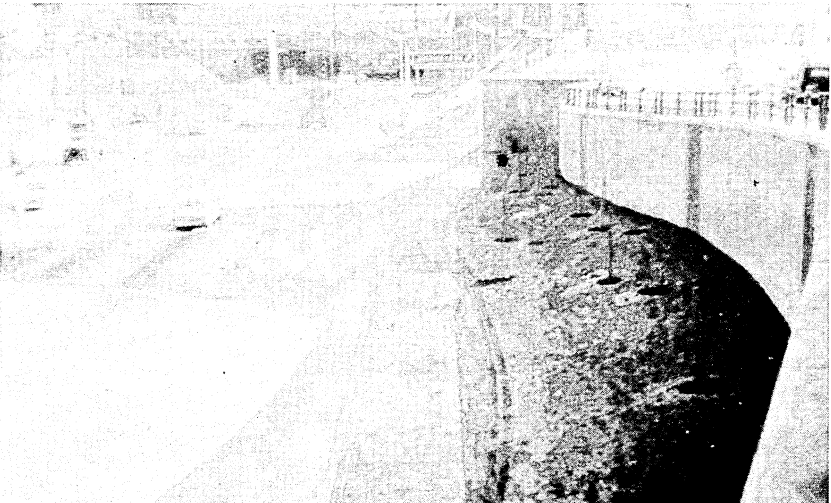
from it. Now, the average guy will not hit the tree. This guy went to the left, knocked down a light pole and ran into the guardrail. That is my car, on the grass. I do not really know what happened to him, but this is the 10" by 10" pole he knocked down.

If that tree was not there all he had to do was continue on his way and probably would have slowed down. But he was forced back on the highway. Under certain conditions, he could have caused a three- or a four-car accident.



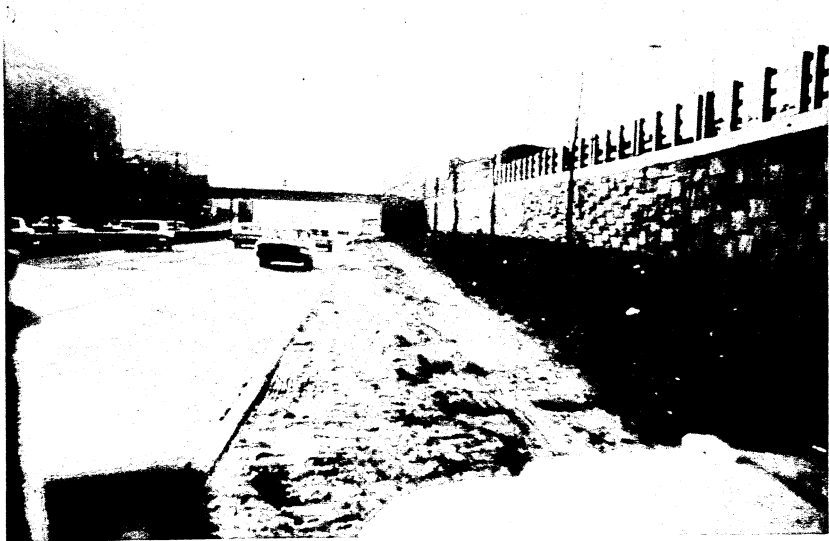
Today on our new planting on Interstate highways, we are planting these trees just about where this one is and we have not learned a lesson.

Here, you can see a tire track where somebody ran off the road and just skinned some trees.

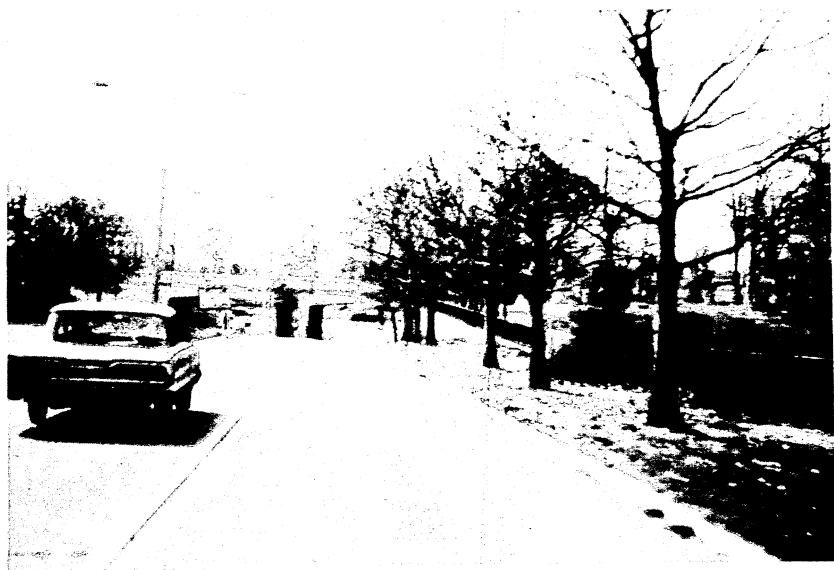


At this point they are not dangerous, but 15 to 20 years from now, we are going to have a condition like we just have seen.

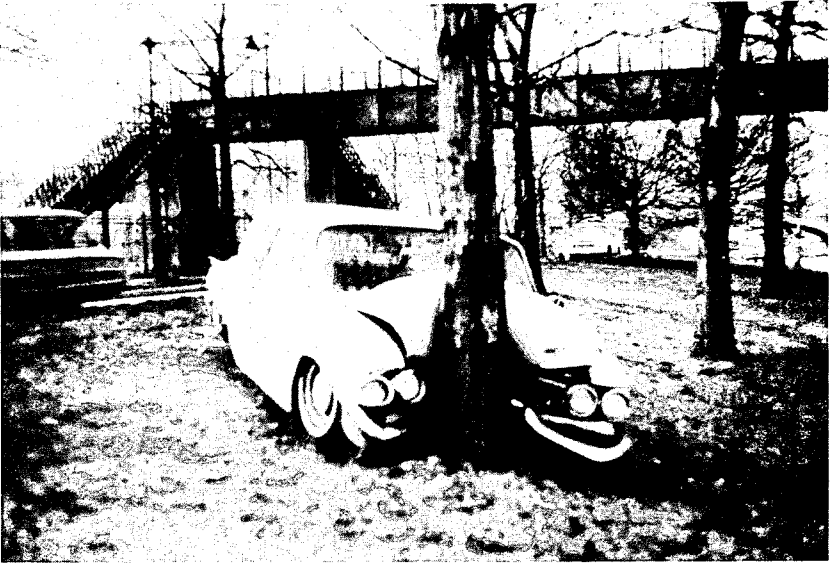
Here you see Interstate 95, and they are planting trees 2 feet off the shoulder. Other States are cutting them down 30 feet from the shoulder.



This is the way they are going to look in maybe 5, 10, or 15 years from now.



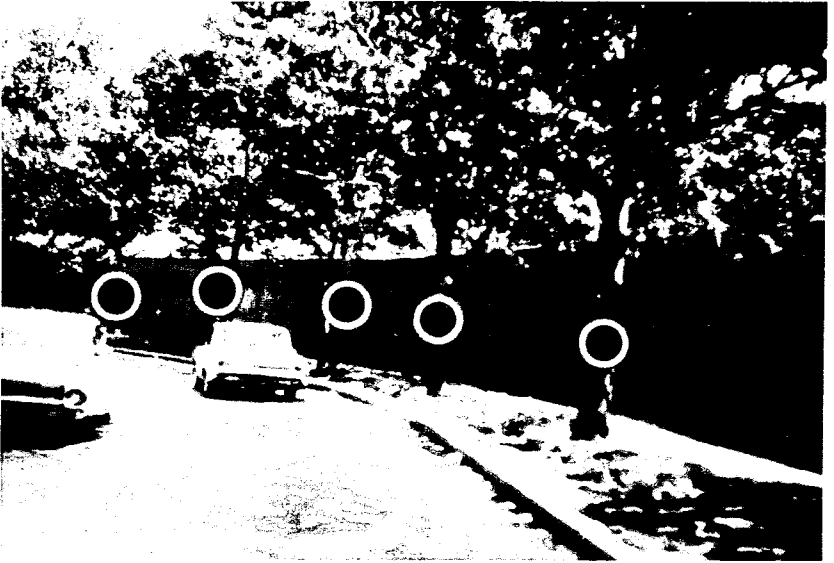
If we hit one of these, this is about what will happen—depending on the speed.



I am talking about brand new work. Here you see four of these trees on the left have been knocked down already and three on the right. If the others survive, they are going to be the killers of tomorrow. Also these trees cost a lot of money.



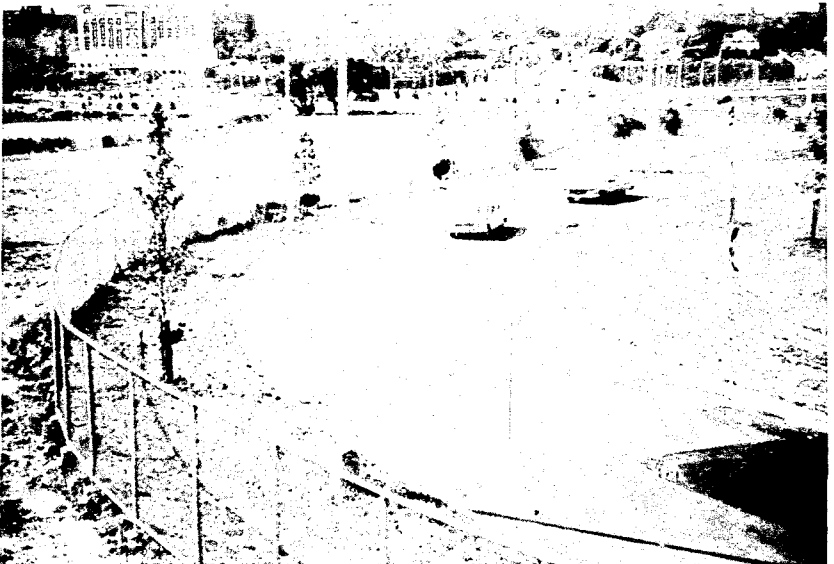
Here you see some of the old work where they have it on the outside turn. It is like an obstacle course.



Here you see some trees on an outside turn—the worst possible place to put it—there is a tapered shoulder, and there is a park on the other side of the fence. If they put it on the other side of the fence, they probably would not get any funds, so they put it in the shoulder.

Mr. W. MAY. Excuse me, what did you just say?

Mr. LINKO. Well, I feel that if they had put these trees on the other side of the fence, they probably would not get any money, this being an interstate highway.

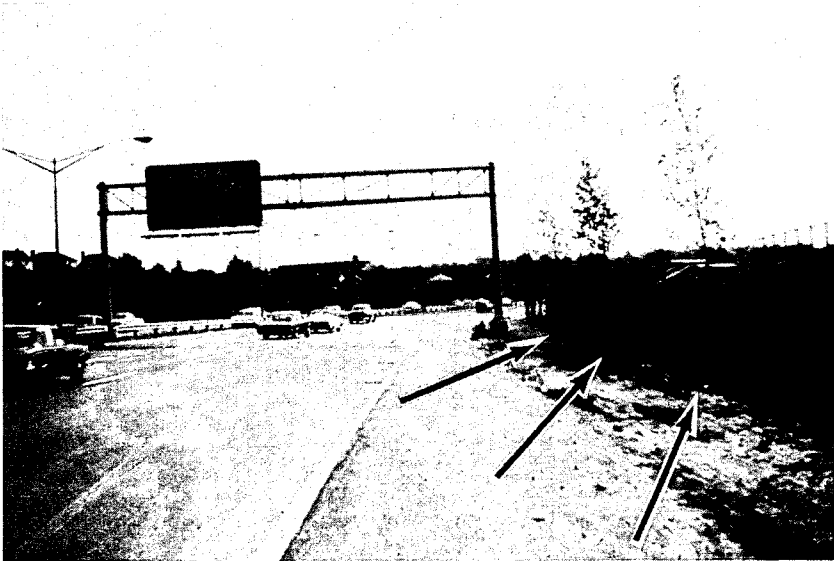


Mr. W. MAY. If they want to get highway money, they had better put the trees on the highway?

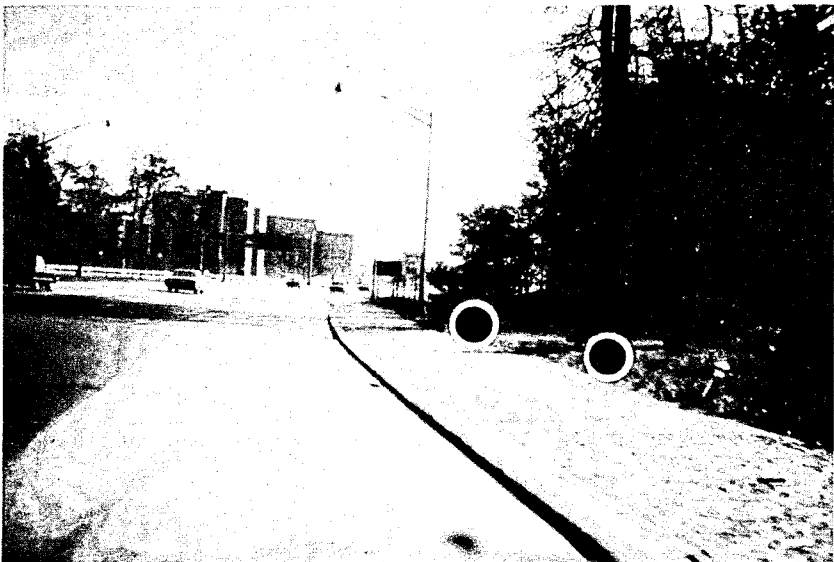
Mr. LINKO. I do not know; that is what I think.

Mr. BLATNIK. Inadvertently they are getting a bonus for building in potential hazards that will be there for a long time?

Mr. LINKO. That is the way it appears to me.



Here is a forest on the other side of the fence. You can see they are planting trees on this side of the fence. I am not against planting trees.

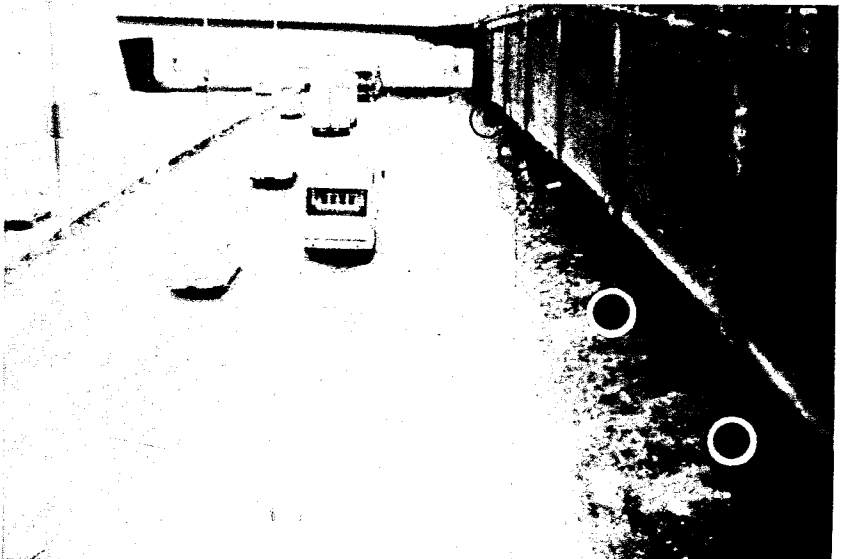


Somebody might think I am a tree hater by now, but I am not. I would like to see them survive. They cost about \$100 each, and if you put them behind guardrails, like this, I am for them.



There were some spots where they were going to plant trees. I notified key officials and I tried to stop this job about a year ago. There you see the trees are there. They are small now.

It was impossible to stop this work. I went through the regular channels, I notified everybody, but they keep on building these.





You can see they are not going to survive anyway.
All you have to do is look back at the record and see how many people
have been killed by trees every year in the past. We should have

learned a lesson. There must be thousands of people being killed by trees.



If somebody was to ask me what would I do with this tree—and I said I like trees—I would cut it down, because there are plenty of trees around here. The one on the right and the one on the left I would cut down. But if this was in Arizona and it was the only tree there, I would say install 300 or 400 feet of guardrail and protect that tree. But here there is no choice, no decision; the tree should be cut down.

I would like to see the Government help them do it, because locally they have not got the funds.



Here you see some guardrails protecting a brandnew light installation. This light pole is designed for easy shear-off. It has not even got a base. I do not think you can hit it, because it is behind the tree, and you see, there is a lot of expensive guardrail protecting that.



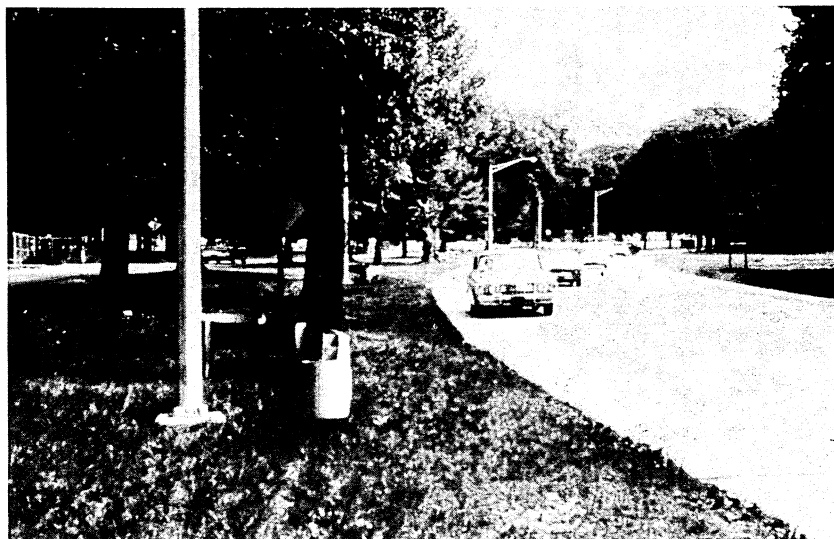
If you look at the end of that guardrail, you will see if anybody hits that guardrail, just hits it a little bit, he would slide right into that tree.

That tree has been scarred, hit many times, as you can see.

Mr. W. MAY. Farther down in the picture we see a piece of guardrail protecting that light pole. You say that is a breakaway light pole?

Mr. LINKO. Right. This one might show you a little better.

This is an aluminum pole and you just tap it; it will break off. It is designed for that purpose, you see. But as you saw in the previous



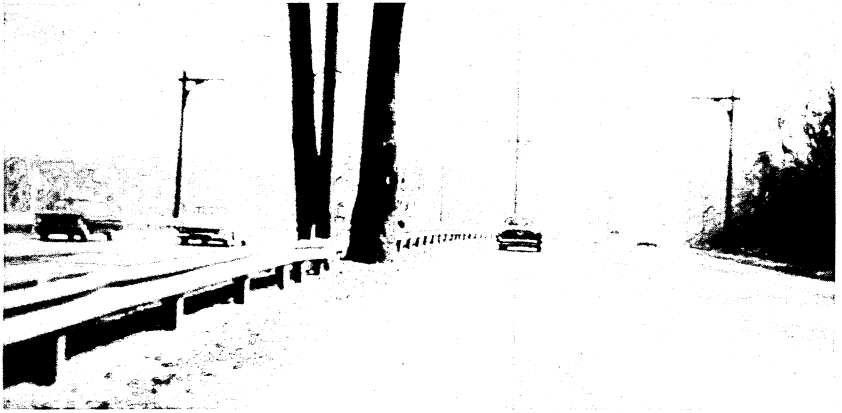
slide, there is plenty of guardrail to protect it. The guardrail is the hazard, not the aluminum light pole.

The reason I am showing you this picture is to suggest why could we not protect the tree also? You need a guardrail right down that line to protect all those trees. If you notice, this is an outside turn.

I would like to see the new money that we are spending now on guardrails used wisely.

Here you see a center divider. I feel when they put it here, they measured and put it exactly in the center. I think they could have gone around the tree. You can see the scar where it has been hit many times.

I did see the guardrail damaged and I saw the man replace it exactly where it was.

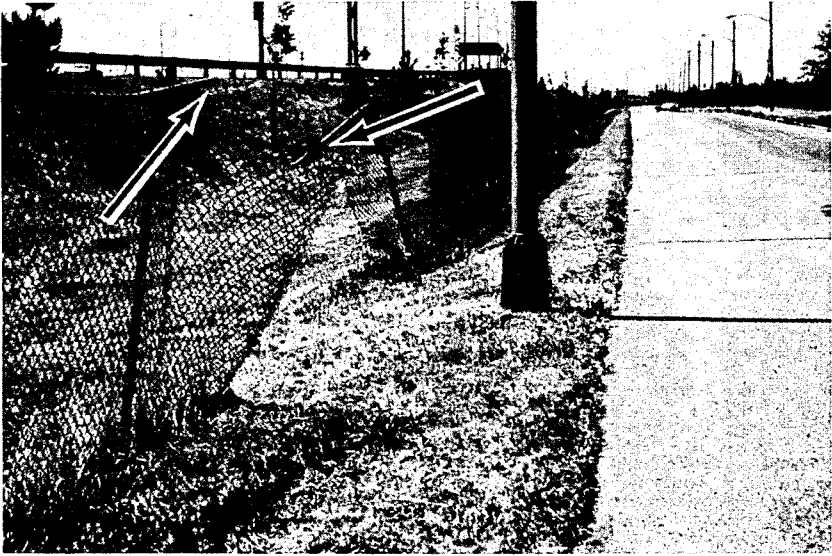


I want to bring out the point, even the new money we are providing for repair work or upgrading, we are using that either to do the job only half right, or again, are creating more hazards while we are doing it.

Here you see also trees in front of guardrails.



This is a picture of a fence—you notice here where the (arrow) pole is sticking out. If a car runs into this fence, that pole across the top of the fence is a hazard to the occupant of the car. It can go right through his windshield. It could impale the driver, let's say it that way.



And here you see where it did go into the driver.

Mr. BLATNIK. By the way, Mr. Linko, is that an accident at the site of the fence in the previous slide?

Mr. LINKO. No, it was a condition about the same, you see.

Mr. BLATNIK. The circumstances were the same, you say?



Impaled by Pipe, He Lives.

Yonkers police man took driver from his car with his pipe. Pipe went right through his chest and passed through rear of car. He was hospitalized.

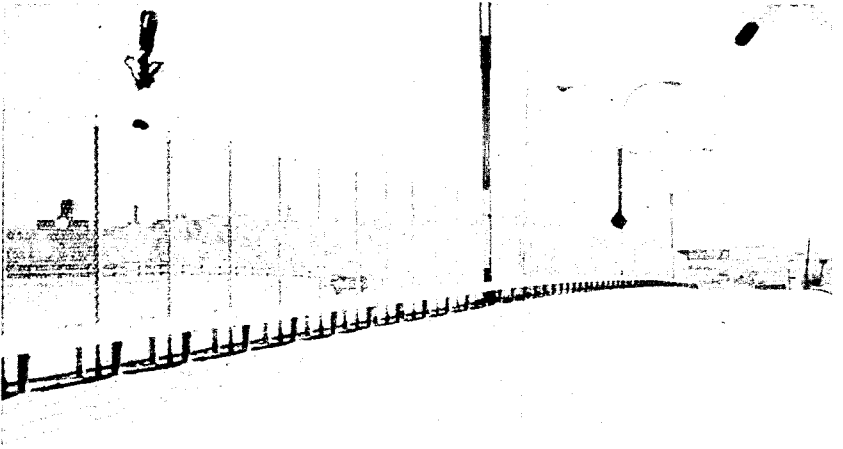
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Mr. LINKO. That is right. He was riding along there. When you put that fence in, if that pole is there, there is a very good chance it will go through you.

The point I am trying to get across here is this man really got impaled for nothing, because we do not need that pole across the top.

Here is a fence without a pole. The reason I am showing you this particular slide is we know how to do a good job, they might be doing a good job here. But I look at a different construction site and they are still putting the poles across the top there. I feel this information should go out all over the country, so they can know that we do not need that pole up there. We do not have to find out the hard way in every area individually.

I think it is even less costly. Not being an engineer, I cannot give you figures on it.



Here you see an easy-knocked-down aluminum light pole, which I recommend. Now, with this type of light pole, you can hit it at 50 or 60 miles an hour and usually nothing happens to you, and most of the time you can use the pole over again, you see.

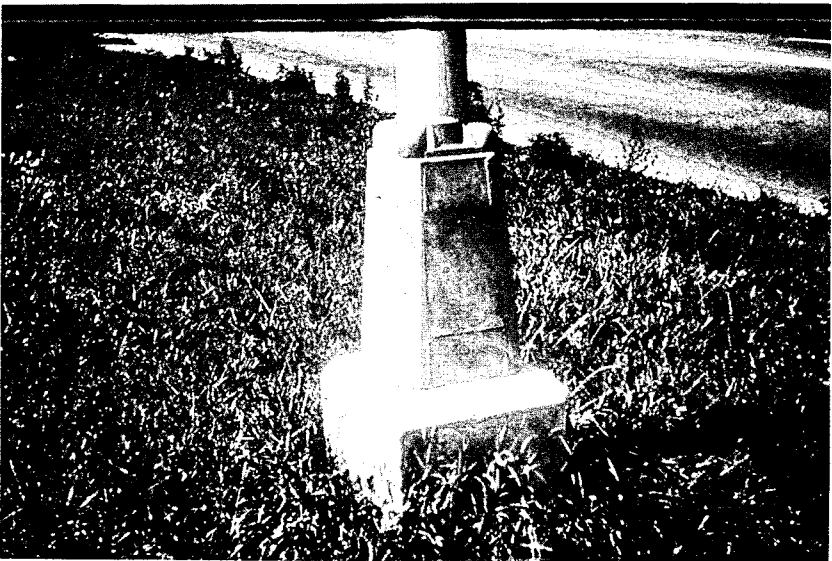


Here is a place where somebody snapped it off, and the aluminum shattered and there is a minimum of damage to your car. I feel we should consider this as standard equipment. In fact, we should make a standard on minimum shearoff on all poles along the highways. This way no unnecessary damage should be caused to an automobile. It is not more costly.

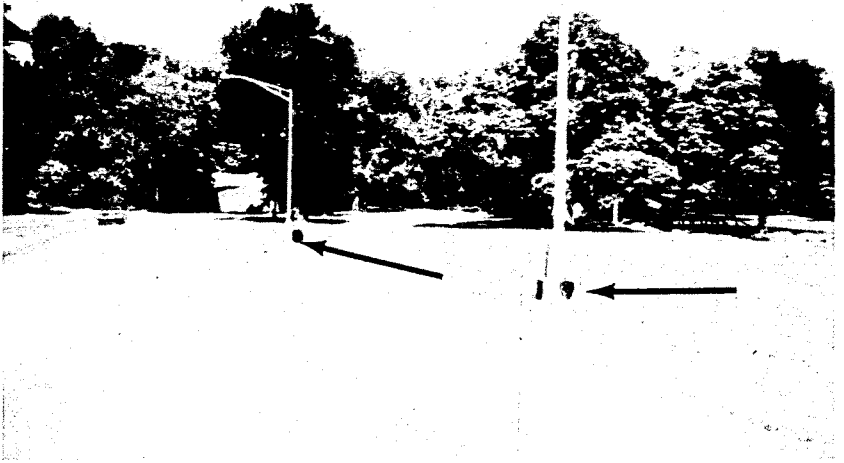


Here you see them defeating the purpose. They put a big concrete stanchion underneath these things.

Mr. W. MAY. This is an aluminum breakaway light pole put on a concrete pedestal?



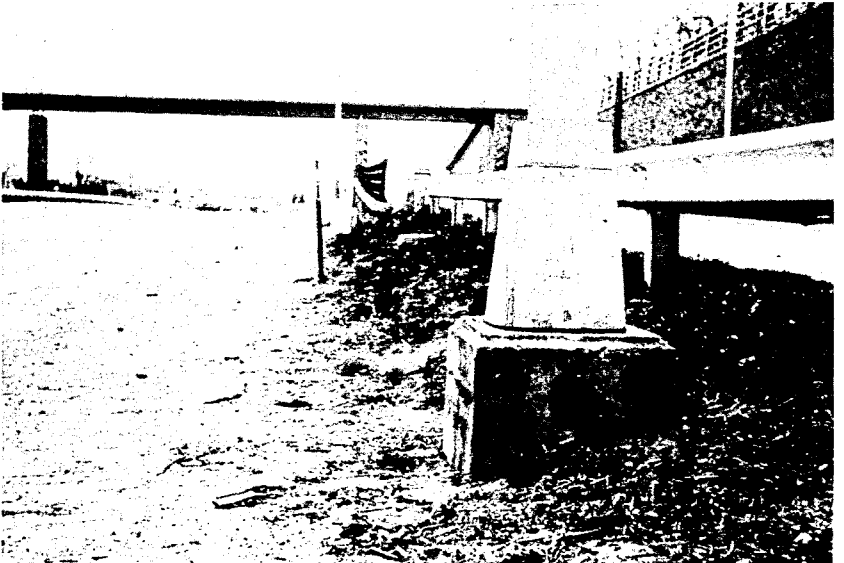
Mr. LINKO. I do not know if this particular one is, but this one is an aluminum breakaway type with a concrete pedestal. If you run into this, you are not going to go any farther; you are going to stop.



This is another one on an Interstate highway.

Mr. BLATNIK. Mr. Prisk, why would the concrete block, concrete foundation, be elevated that much beyond ground level? Is there any engineering, functional purpose, or other reason for it?

Mr. PRISK. I suspect, Mr. Chairman, that the reason is that the lights are being aligned vertically so that elevation of the luminaire above the



roadway will be the same at each pole location. In this case it took a footing coming a foot out of the ground, in order to get the standard length pole up to the right elevation.

Mr. BLATNIK. What is the reason for being at the so-called right elevation? Is it for appearances or better illumination? Would it make a difference if one pole were down a foot?

Mr. PRISK. A foot would not make any appreciable difference, no; so it would have to be appearance.

Mr. BLATNIK. Are you still continuing to do this, build a concrete block that much above the level?

Mr. PRISK. No. We are trying the best we can to get this reversed. Instructions have been issued to all of our offices to control concrete footings on design, and during construction to be sure they do not come above ground level.

Mr. BLATNIK. In a determination of this type, who has the final say, the safety man or the engineer on the job?

You say, "We are trying." That is why I raised the question.

Mr. PRISK. Well, the project engineer is likely to be the man who would determine just precisely where this footing would go, how high it projects above ground; because control on the job is necessary for grading and so on. In a good many cases, it would be possible to grade around these footings, even though they were maintained at that same elevation, and provide the surface around it that a car could ride and if he did hit the pole, he would strike the aluminum breakaway section of the base and not the concrete.

Mr. BLATNIK. Mr. Linko, when you talk about unnecessary hazards, these would be prime examples, would they not? Here you have solid concrete blocks spaced every few feet away for some distance. As far as we can see over the bridge, over the hill, you have lighting posts. Is that correct?

Mr. LINKO. That is correct. I feel these lights do not even belong here, you see, because most of the lights are inside the center divider anyway. It is hard to see, but if you look, you will see them. Once in a while they throw one to the right.

For the sake of safety, I feel they all belong there. This way you cannot hit them.

Mr. BLATNIK. So you have a double chance of safety. You say in the first place the pole should not be there to begin with.

Mr. LINKO. And maintenance problem.

Mr. BLATNIK. And if it needs to be there it does not need that block, obstacle?

Mr. LINKO. That is right. The pole was designed to be easily knocked down, so it would not damage the car. They are defeating the purpose here. Also, there is a problem of maintenance.

Now, these poles are knocked down by the hundreds and they cost a lot to maintain, so if it was inside the center divider, it would not be knocked down.

Mr. BLATNIK. Just one more question, Mr. Prisk. Do you have any statistics on the maintenance costs in replacing light poles, by States or across the country? Some indication as to frequency or magnitude?

Mr. PRISK. We do have figures as to knockdown rates on light poles at different distances from the edge of the pavement. The frequency of their being knocked down increases by about three times

as you move them from a location say 12 feet off the edge of the shoulder to a point just 2 or 3 feet off the edge of the shoulder. Experience has shown on several facilities in the Chicago area that the cost of replacement of these poles varies according to whether the pole itself was damaged. If the pole was damaged, you are in for \$200 to \$300 for a new pole plus the cost of the luminaire, possibly \$80 to \$100.

Mr. W. MAY. A rule-of-thumb figure might be around \$300 if the pole is damaged.

Mr. LINKO. I have counted these poles knocked down by the hundreds in 2 or 3 miles.

Mr. BLATNIK. Would you repeat that? You count them?

Mr. LINKO. By the hundreds.

Mr. BLATNIK. In what distance?

Mr. LINKO. In about a 2- or 3-mile area. They are constantly being knocked down and they cost a lot of dough.

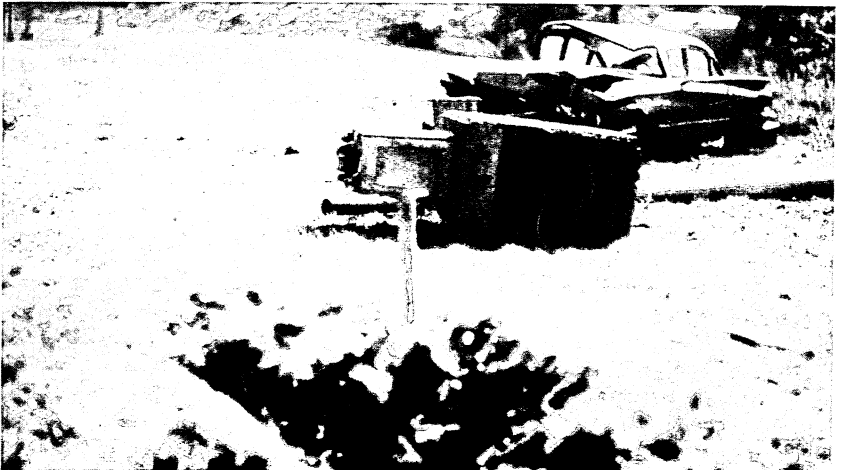
Here you see somebody managed to smash into this concrete stanchion.



You can see all the unnecessary damage to their car where he could have just sheared it off, like the first picture I showed you.

Mr. BLATNIK. It tore the concrete block right out of the ground.

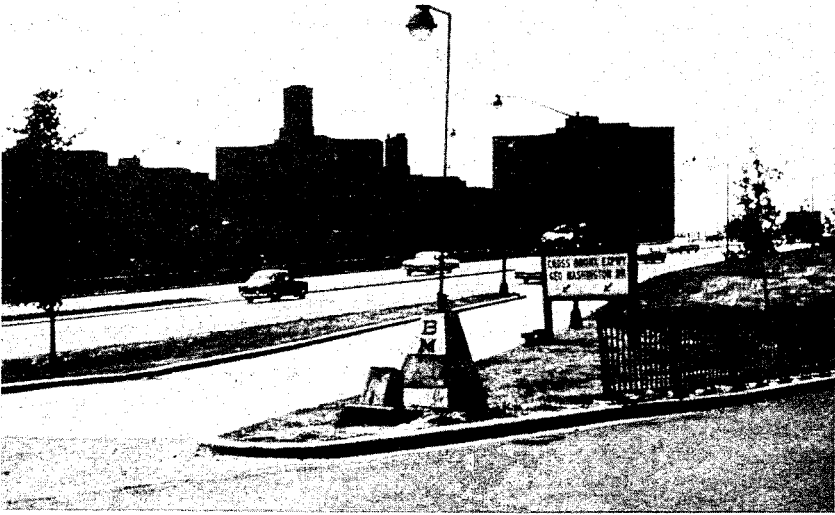
Mr. LINKO. Yes, right out of the ground on this. And all this unnecessary damage where he should have just got a bent fender.



Here also you see that on this particular highway, Interstate 95, the original installation was aluminum lights and I think the aluminum lights shear off easy because the material is brittle. When you hit it, it just snaps off. Now this is a steel base. This light has been down about eight times. So the first time it got hit, the city has a habit of taking down the aluminum light pole and putting up a steel replacement, and this is an Interstate highway and it is the general practice.

The second time somebody hit this, you can see they damaged the base and so the car got maximum damage.

I feel the city should not be allowed to replace these with a steel standard, heavy duty type like this. Not only do they damage the foundation, they also damage the cars unnecessarily.



Here you see another light base which is a hazard. It is right in the shoulder area. It has been chopping up the cars for years and nobody wants to do anything about it. It is hard to see, but that edge is chipped off and as the cars ride this particular guardrail, they just knock down this pole anyway, even though the base is there, and they chop up their cars unnecessarily.



Here, also, you see an easy knocked down pole with 24 feet of guardrail, and if you look farther down to where the spot is on the bridge abutment, there is where we need the guardrail; here it is creating a hazard.



Here you see they are in the process of relighting our highways which probably happens every 20 or 30 years. I feel they are doing it wrong, because from all the books I have managed to grab hold of and read, they say these lights should be put beyond the shoulder—that means about 10 feet—and 2 feet beyond. Here you see they are not putting them back 10 feet in the center.



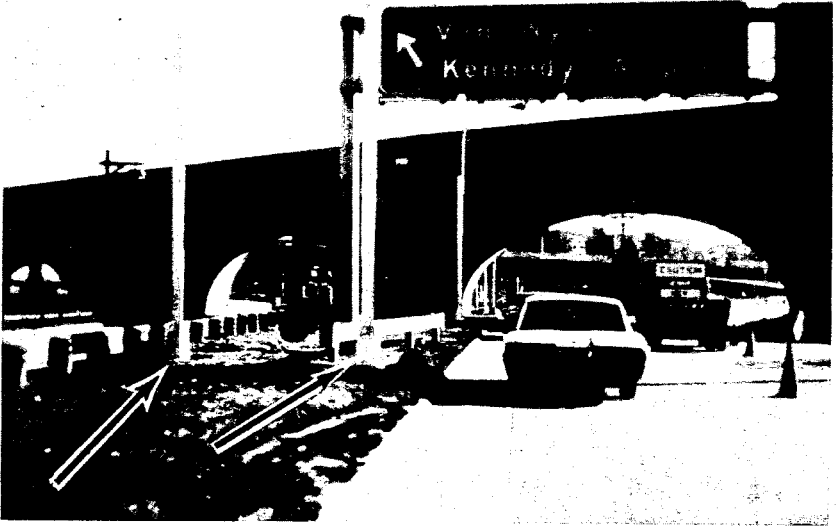
It should be done in a manner like this, giving you plenty of room to go by.

I will point out again that maybe it took us 20, 30 years to relight that other highway and we are doing it wrong.

These lights are constantly being knocked down, because of the way they are being put in. I feel if the Government has anything to do with this they should not pay for this job.



Here you see where they could use one pole and put an arm on either side, but they have two poles and they put one exactly where it is going to be hit, in front of the guardrail and right near the edge of the shoulder.



It made me mad as I watched them build this stuff. I read a book that tells them to put it 10 feet beyond the shoulder. Here they are putting it right back in the same old place. They are pouring a brand new foundation, not using the old base here. There is no excuse for it. They could have set these back. This is only a two-lane section, so they cannot say the luminaire arms are not long enough.



This is an Interstate section where you see them throwing it right in the shoulder. They are in the process of building this. This is one reason why I am here, because I told everybody else and nobody wants to listen.

Here you see a sign right in the shoulder area, and also a light base.



I have seen some memorandums that the Office of Highway Safety sent out. It says not to do this, but you see them doing it and we are paying for it.

Mr. W. MAY. That is not a sidewalk; that is supposed to be a usable shoulder?

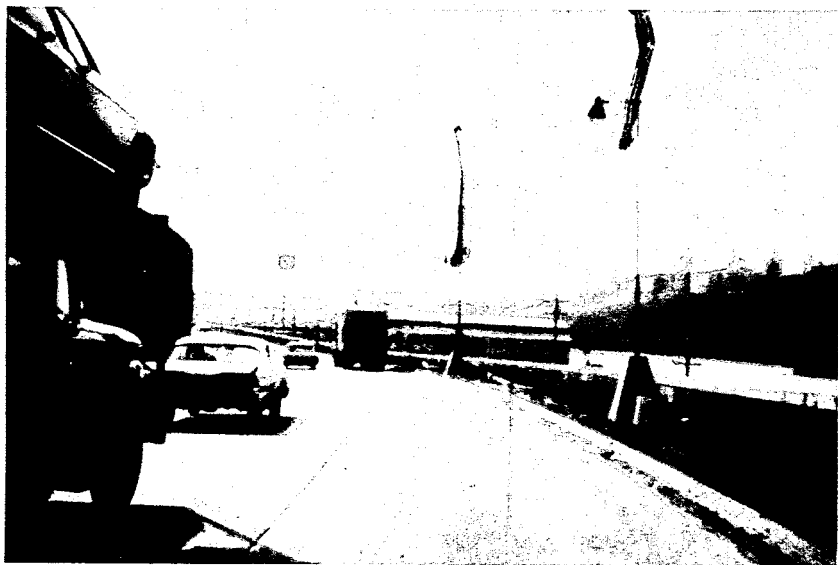


Mr. LINKO. That is right. This is not a four-lane highway where you need a long arm. You are right at the edge. There is no excuse for this. This is brand new work and it is part of the Interstate System.

Here you see a pole on the right that has been knocked down and going to be knocked down constantly. It is costing us a fortune, because we failed to put them in properly.



Here you see two that were hit at the same time.



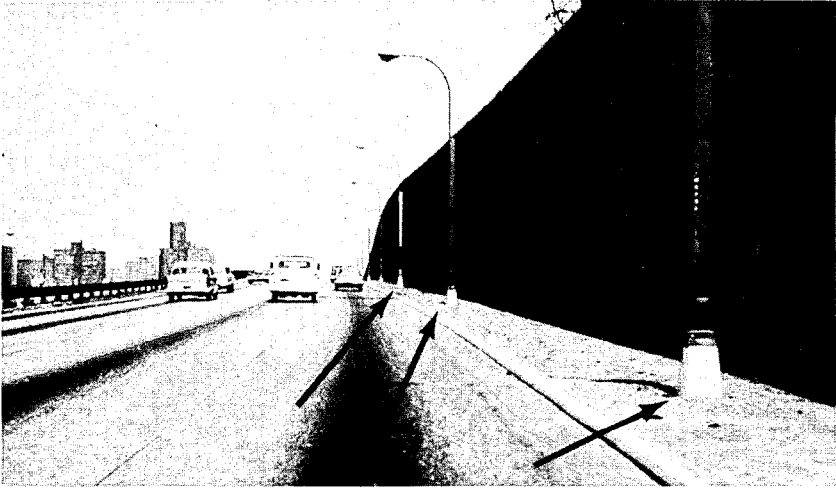
Here you see three that were down. Notice the brand new bases on them.

Mr. W. MAY. In these slides when we see that peculiar looking base, that means it is a temporary pole?

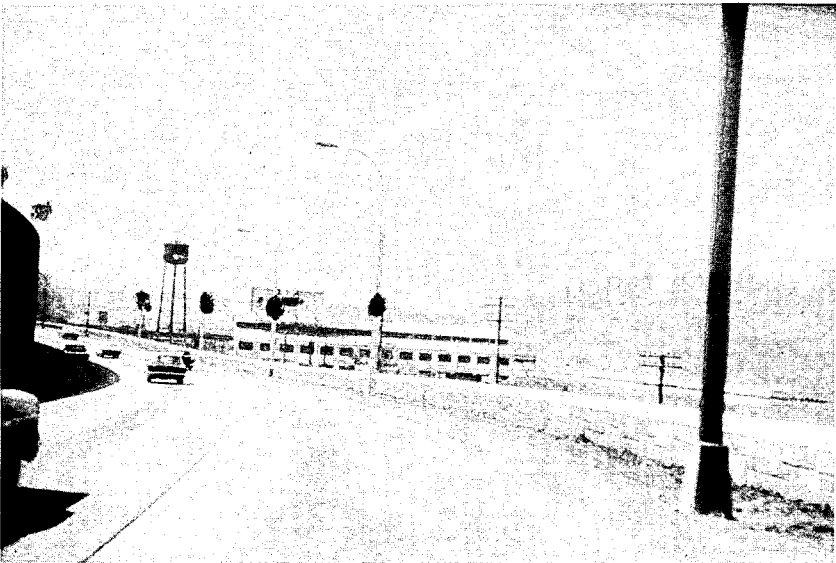
Mr. LINKO. That is right. Every time you see one of those, it means somebody ran through.

Let me point this out also, since you asked that question, we have very good repair on light poles. We repair them within 24 hours. But with guardrails, it takes about 2 or 3 years to repair them.

They have a contract with the lighting company and they do a good job. I would like to see the same kind of contract for guardrails.



Here is where four poles were knocked down by one truck, all at once. And you see a couple of dots on the left showing they could have been put on top of the wall.



In this manner, you see. Nobody would ever hit them up there. You can save a lot of money.



Here you see the 10'' by 10'' wood pole. New York City is tearing them down by the thousands and replacing them with aluminum poles. This is Long Island Parkway where they are installing them in front of guardrails.



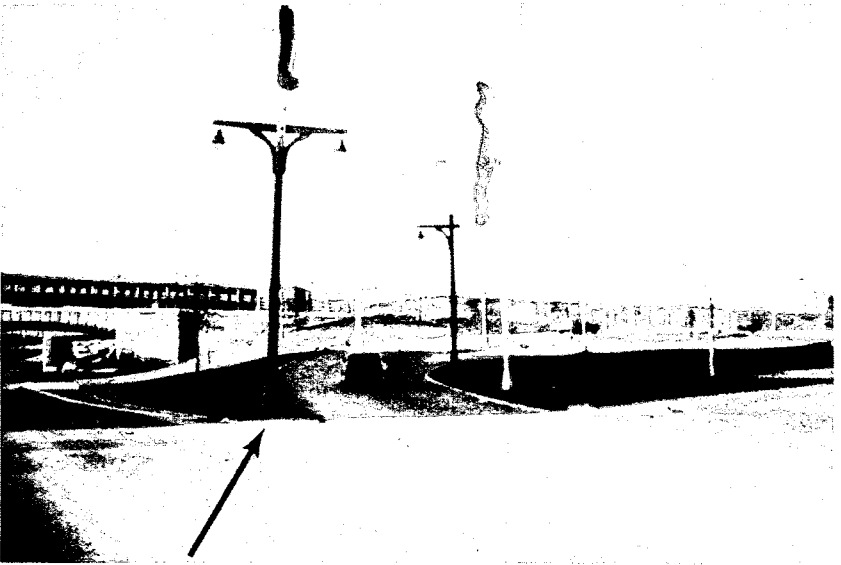
This is what happens when you hit one of these 10 x 10 poles. All this is unnecessary damage.



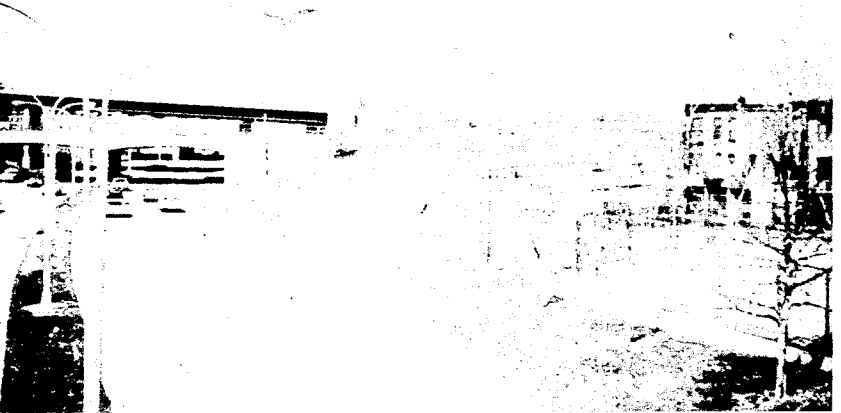
Here is another picture of the car, unnecessarily damaged.



Here you see a relighting project, which is going to be good. Notice the light pole in the gore area?



Now it is gone, and this is a fine job. You had a hazard in the gore area, an indecision point, and it was removed— and I was proud. In fact, I thought I had something to do with this, because I was squawking right along. But a couple of months later, I found them putting light poles right back in the gore areas again.

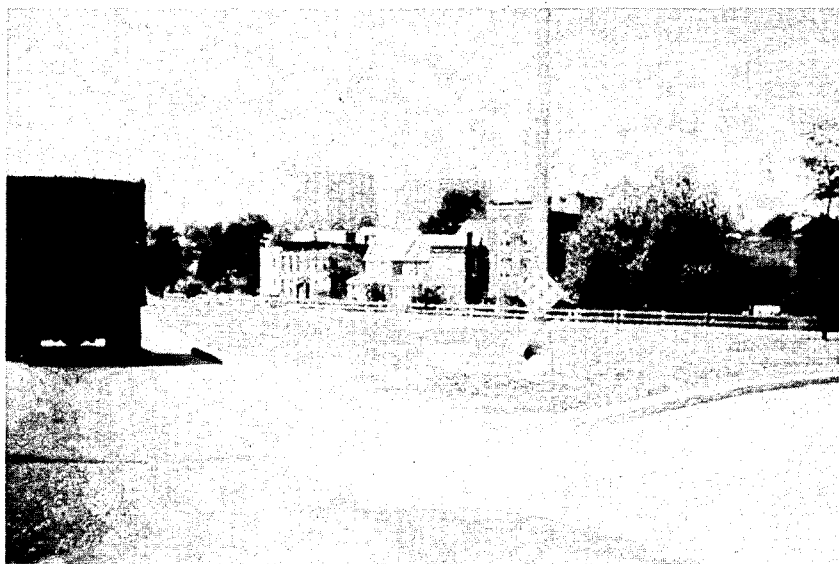


We could remove these things from the gore area.

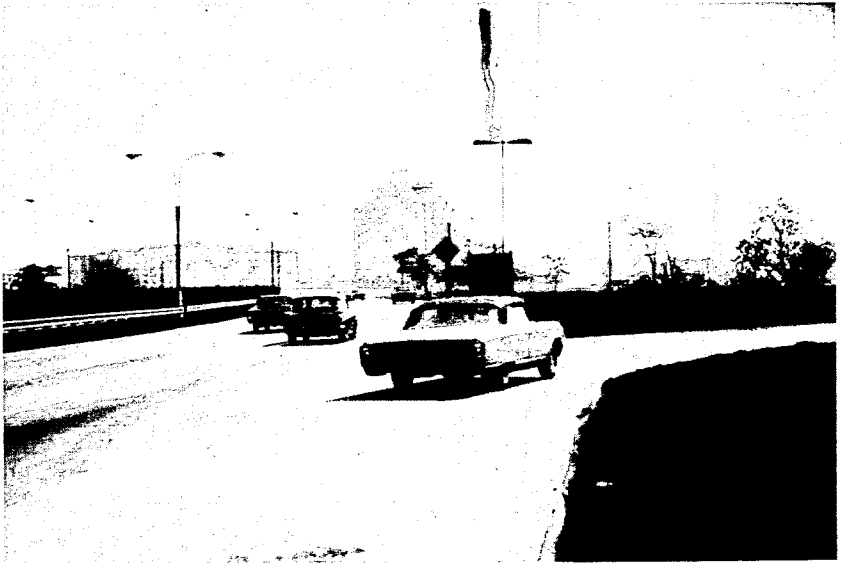
You can see that car aiming at that pole, see? If there is any ice he can turn his wheels all he wants, but he will hit the pole anyway.



They have been hit.



That one has been down.



This is all new work. If that is not bad enough, you see the 12 by 12 concrete poles protecting the light pole?

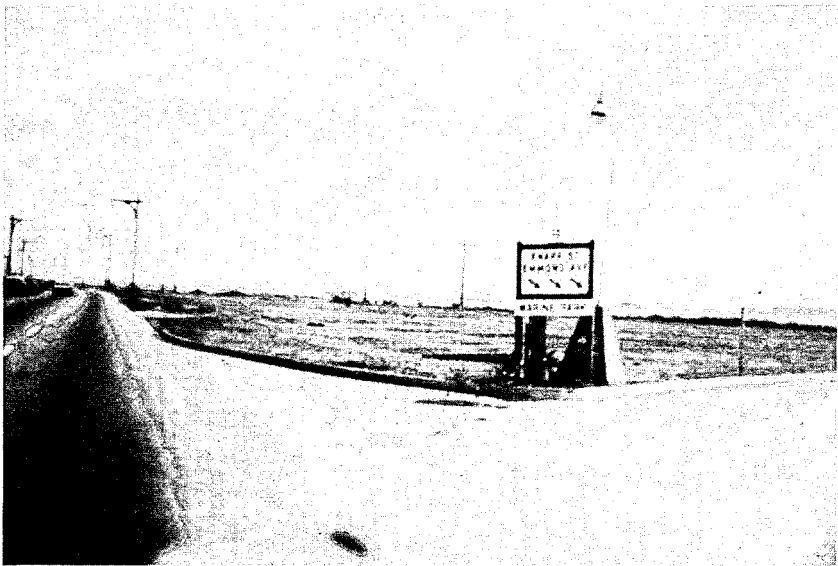


If someone goes through there, they chop up the poles anyway; the light goes down anyway.

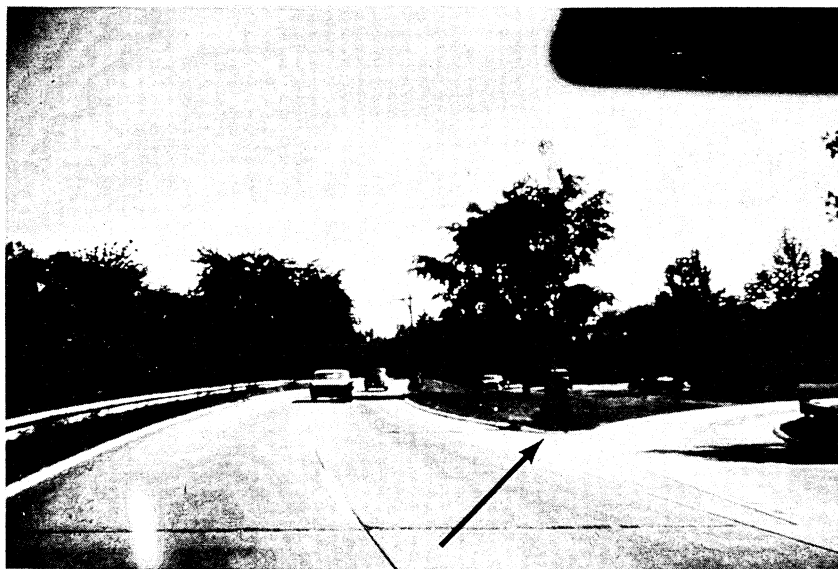
I talked to Mr. Prisk about this, having a demonstration project to remove all of these concrete barriers like this. They do not stop the

car from knocking the pole down anyway. They get through, damage the car, the passengers go through the windshield, and the light pole goes down anyway, as you can see here.

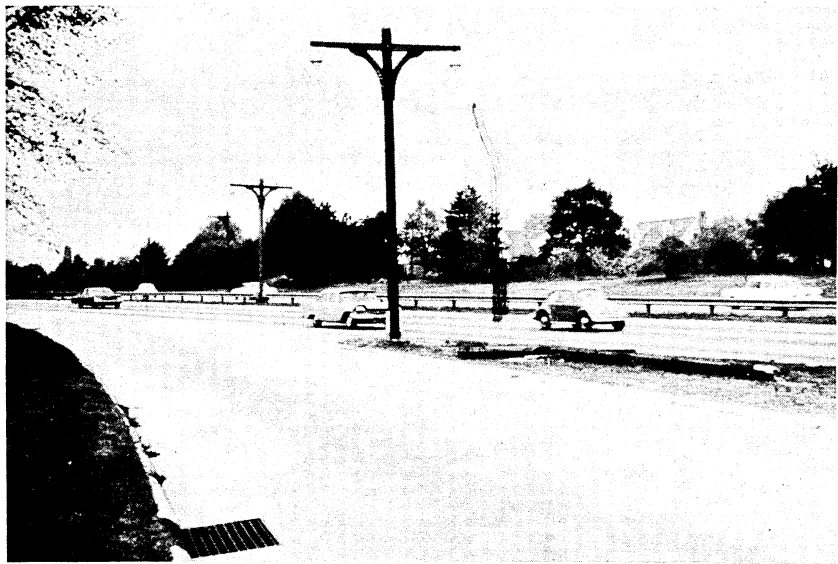
And I feel the least we can do is go back and rip all of this out. This is on an Interstate highway and I do not think you need it here.

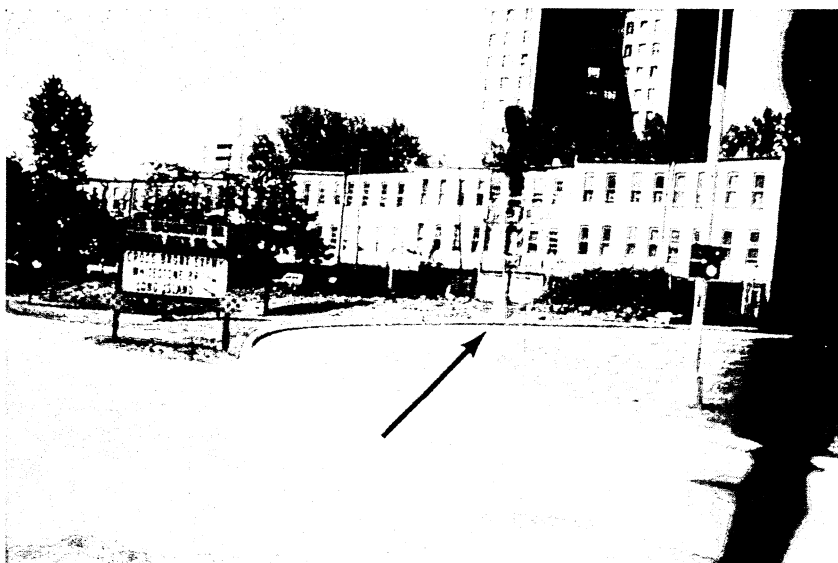


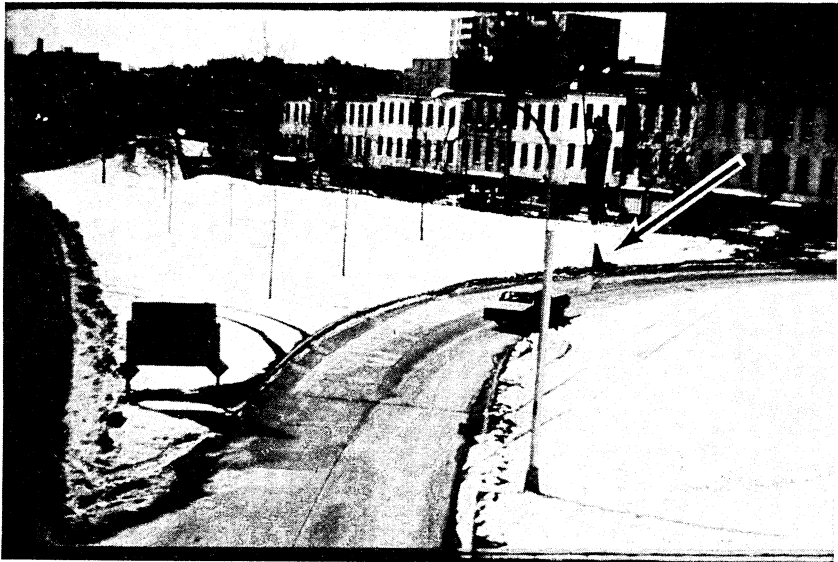


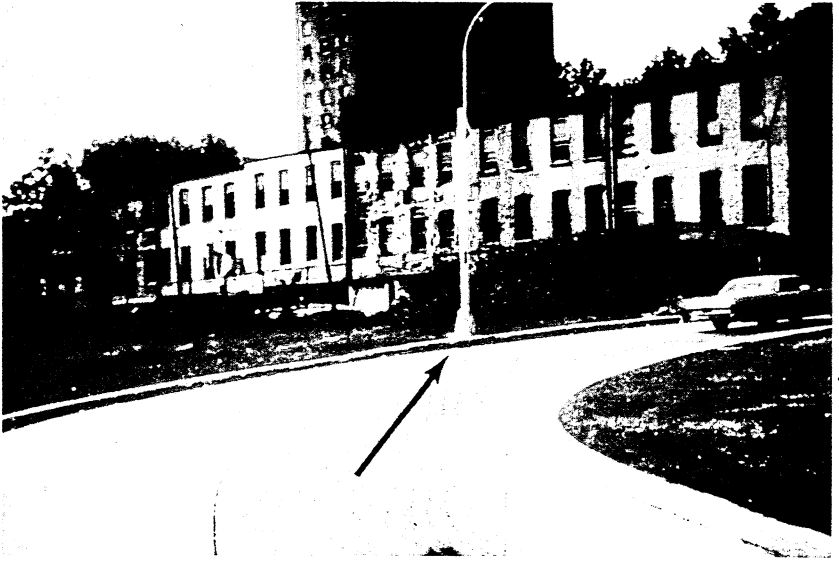


I have five different shots showing gore areas frequently hit.





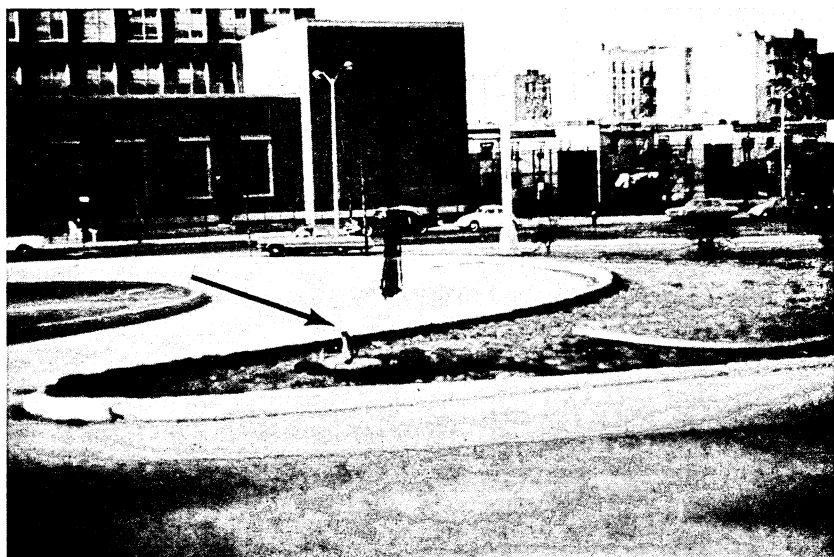
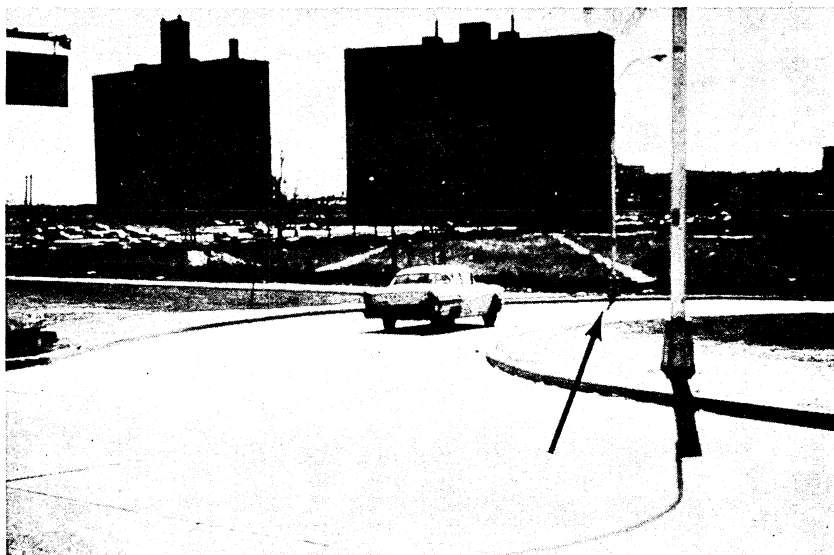




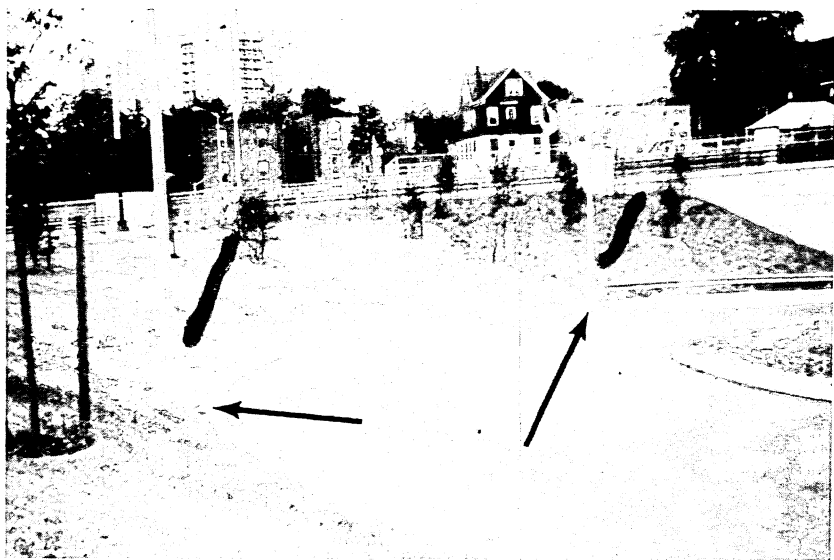
Here is a light placement on a curve. Now, this particular light has been down about 10 or 15 times. I have about six or seven photographs, and you can see the various types of poles that have been used here. It has been hit many times, but they would not move it. All they have to do is put it on the inside part of the curve and nobody will run over it there.

They are relighting highways and still installing lights on the outside turn. The faster they put them up, the faster they go down.



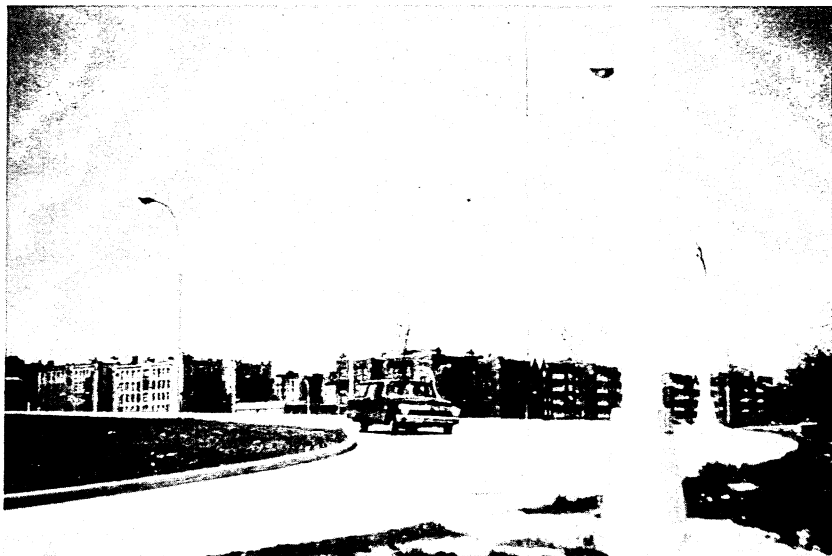


They really do not belong on the outside turn.

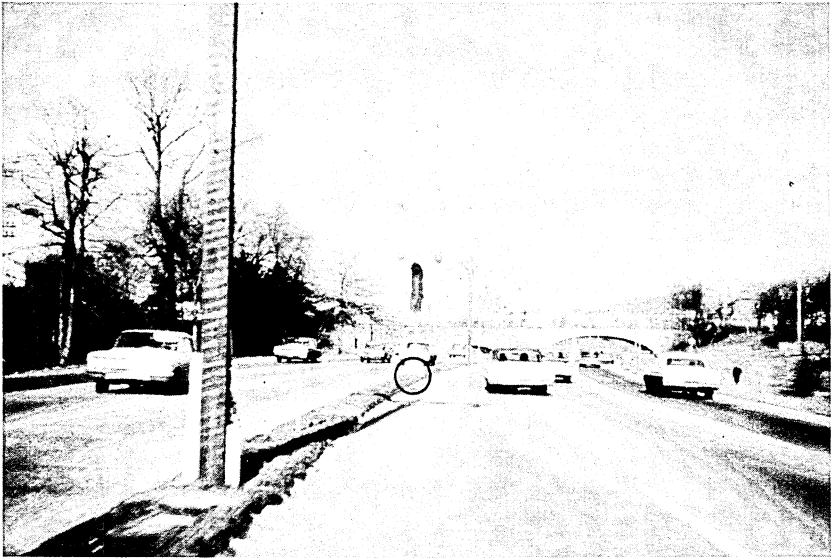


Now, a car cannot help pointing in that direction. It is downhill. You have an outside turn. Even if there is no ice on the ground, they manage to get into these lights.

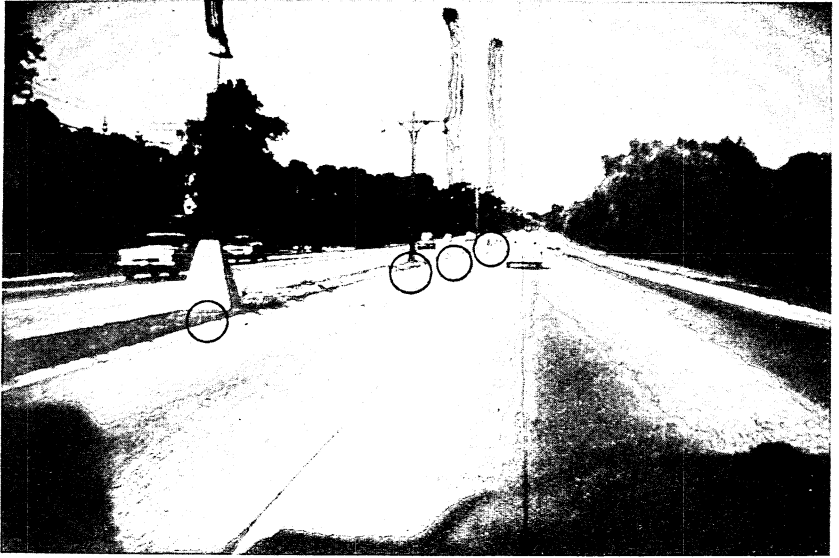
Next I will show you a series of pictures where it was decided to relight this median strip here. I took most of these pictures during the winter months primarily to show how often these lights get knocked down. It happens every year. No one groups them together so it does not look bad, so I did it.



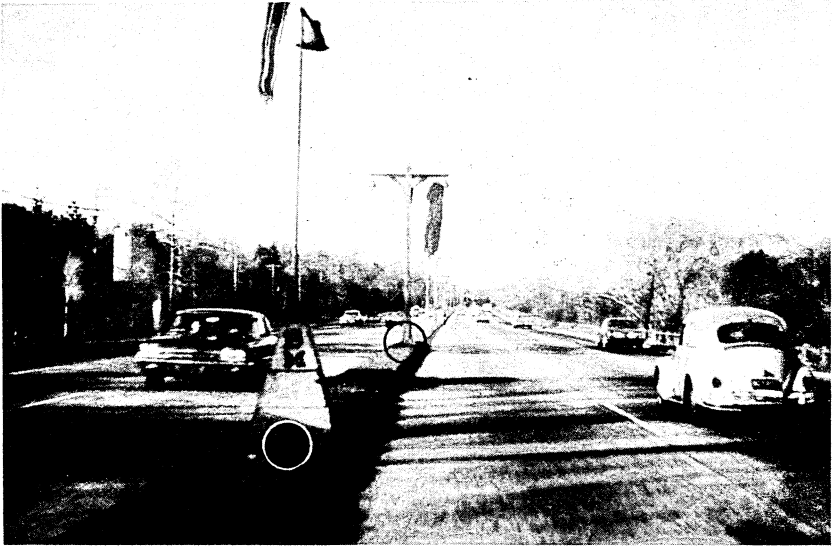
Look at the median strip and the curb in these slides. They have angles or tapers to the curbs, and yet there cannot be any parking along there. If they were to put in a 10-inch curb, half of these poles might be saved.



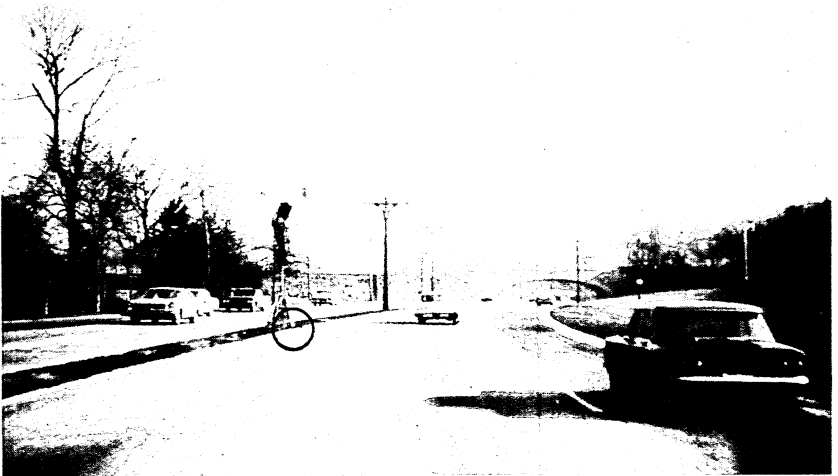
As fast as they put these brand new lights up, they get knocked down. These are all new lights just being installed.
(At this point, Mr. McCarthy assumed the chair.)



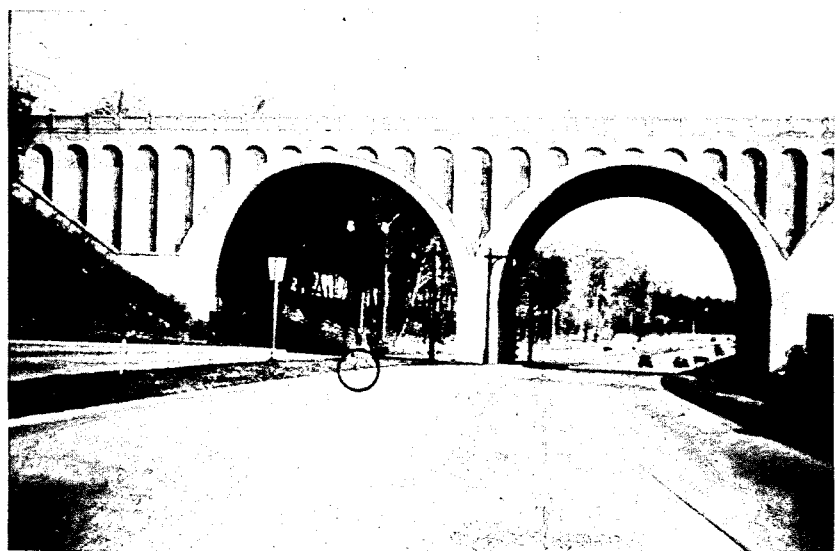
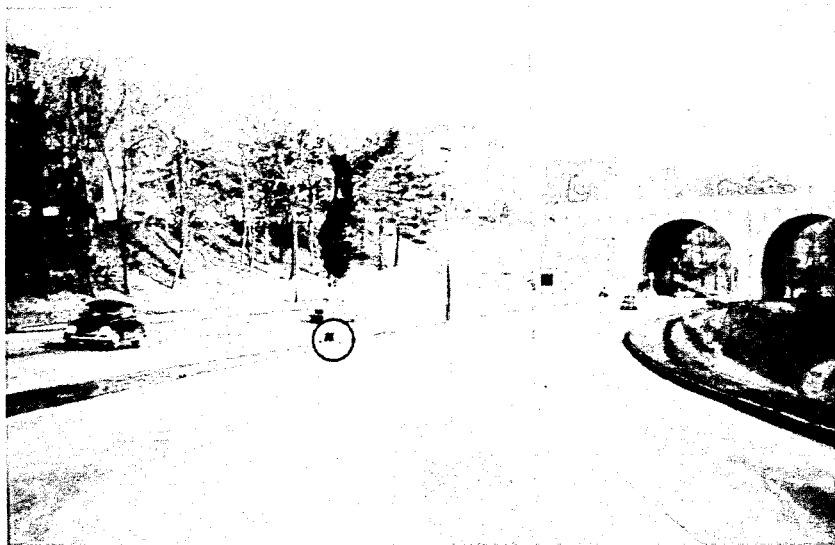
Mr. LINKO. I would like to say that if they install guardrails on this narrow shoulder no lights are knocked down. Just the fact that you are not replacing the lights, the money that you save could pay



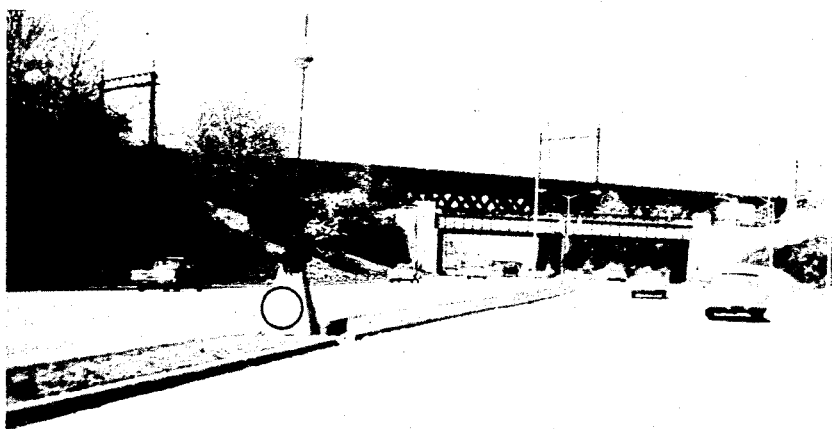
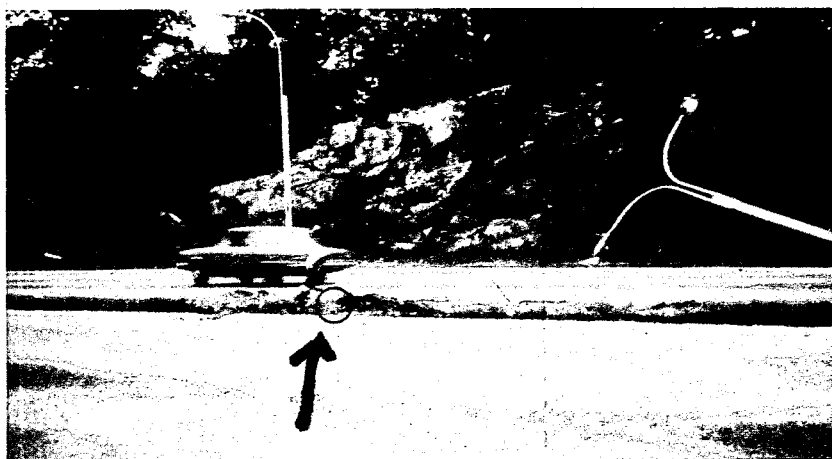
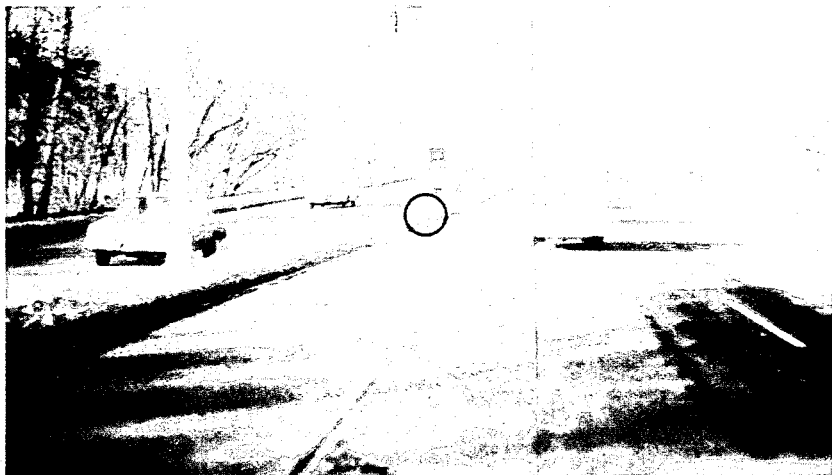
for the guardrails. The answer is install the guardrails and you would not have to replace the lights. It would not cost money in a few-year period, because it would pay for itself.



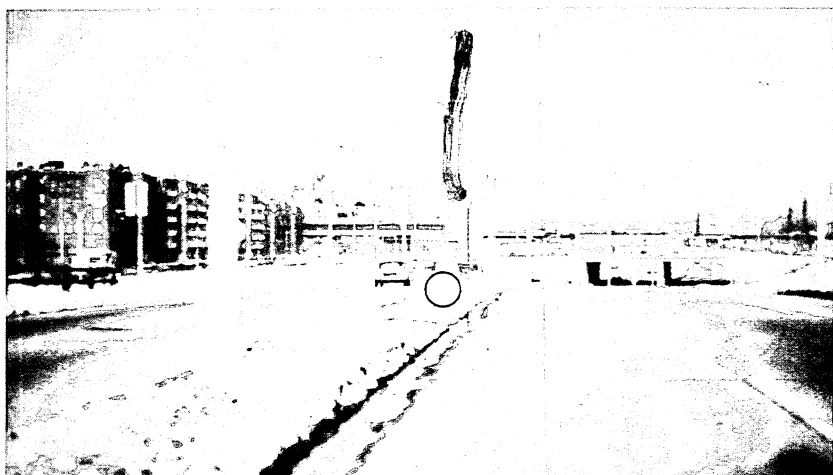
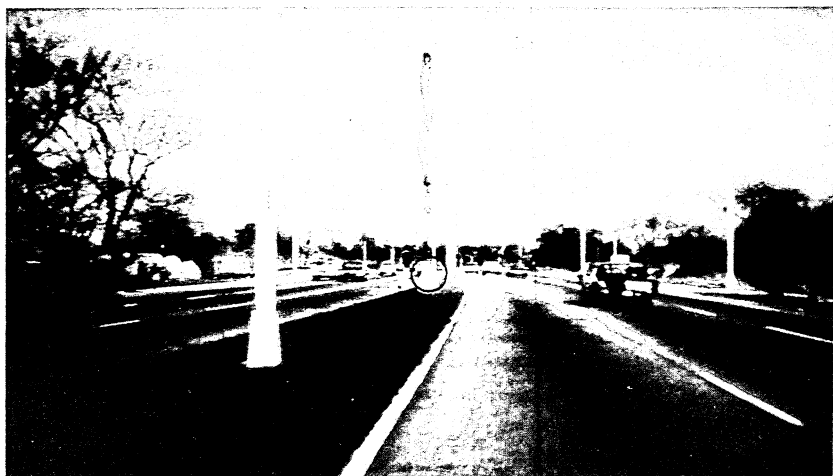


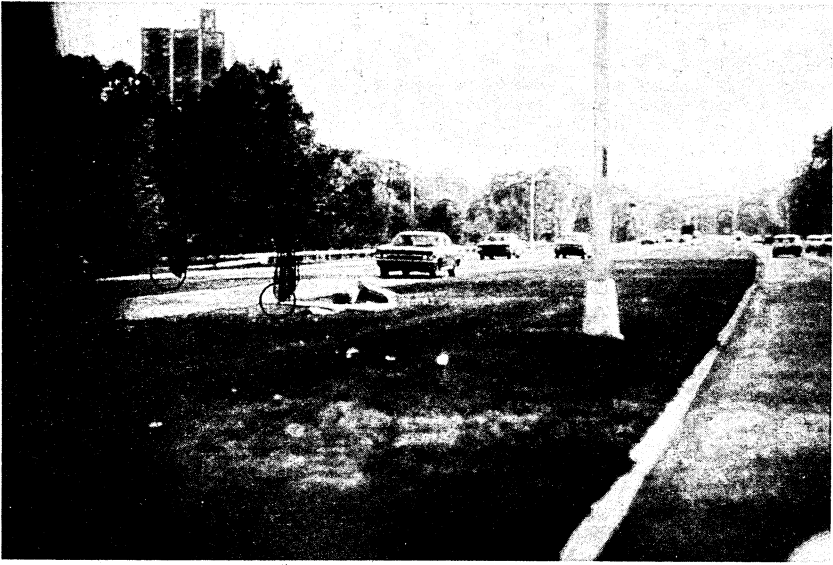




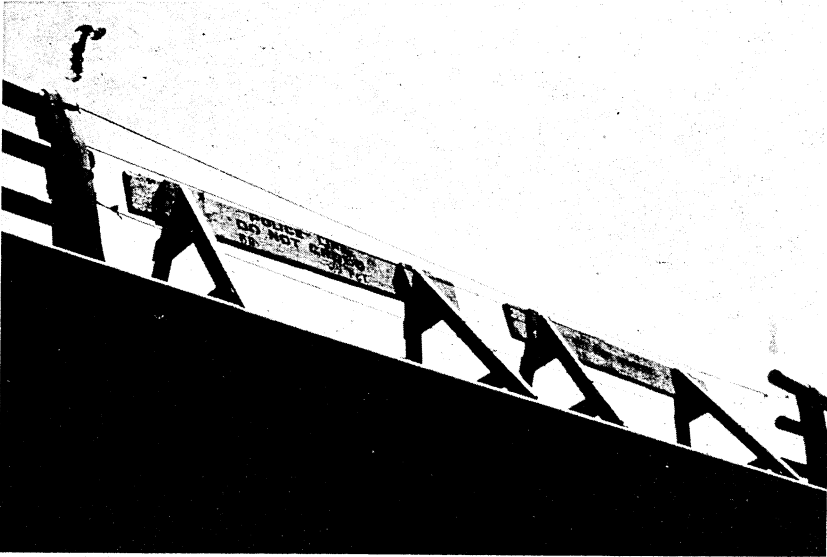








Here we start talking about bridge railings. Now, here you see a car ran through this bridge railing.



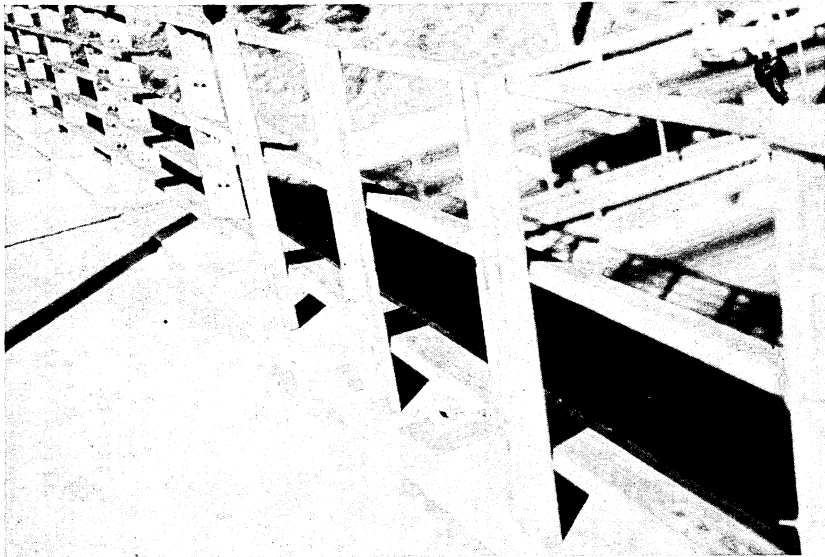
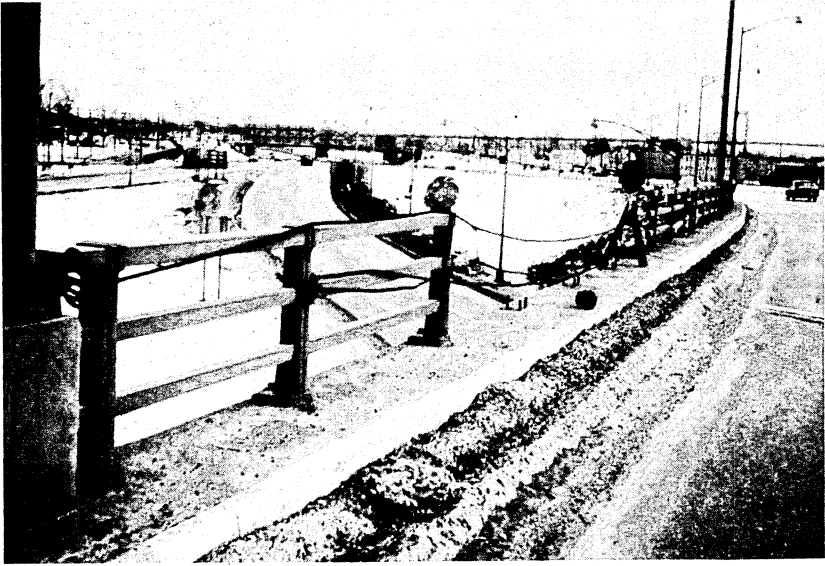
A car ran through this bridge railing and dropped about 30 feet. These particular bridge railings are made of aluminum alloy. I feel they have no business using this kind of material on a high-speed road.

Mr. W. MAY. These are different locations?

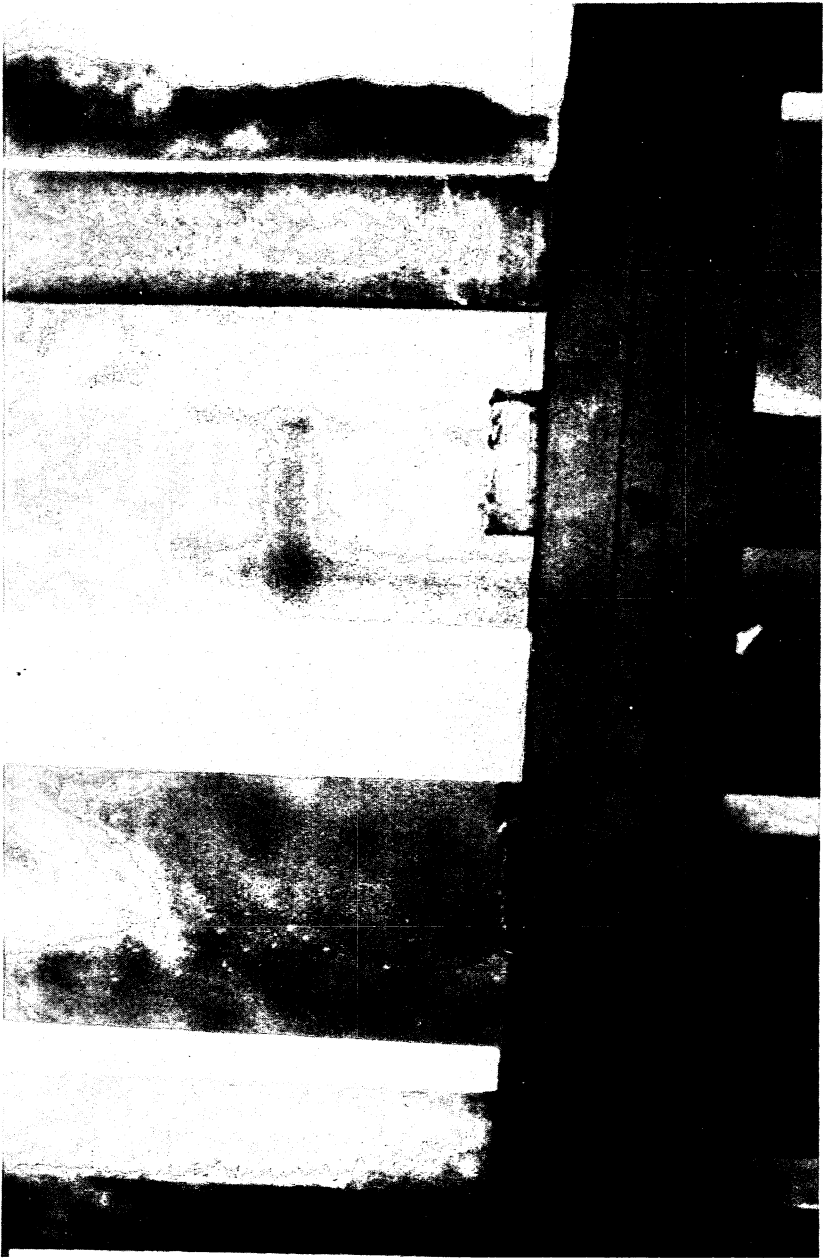
Mr. LINCO. Yes, many locations there.



Here, this particular location there, you see they have a rope there temporarily.

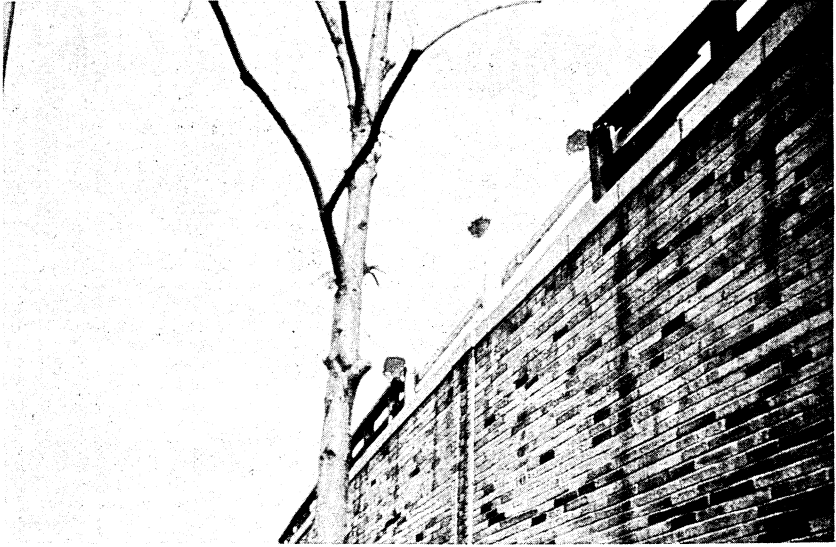


This is a different type of a guardrail. This is made out of aluminum also.

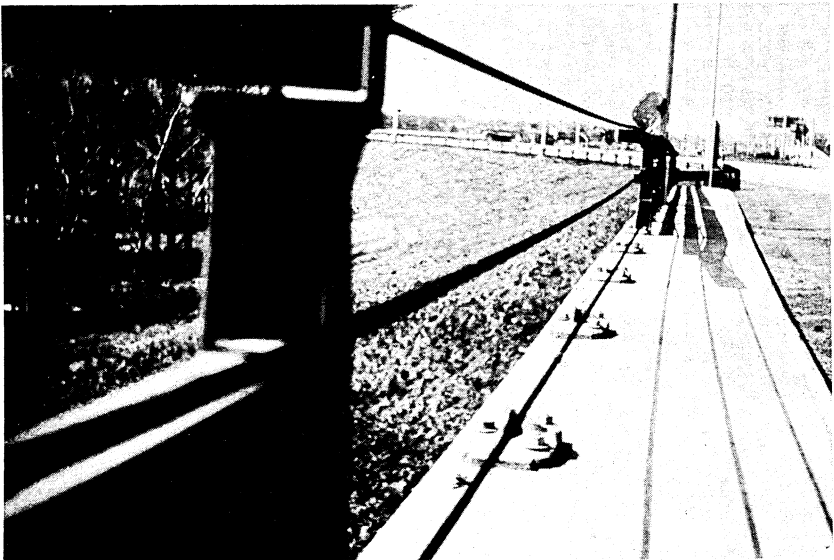


Here you see another place where somebody ran right through. You can look at the tree branches that broke off. I feel they made a serious mistake using this type of material on an Interstate highway. If cars can go through, so can trucks and buses, and you can have a disaster.

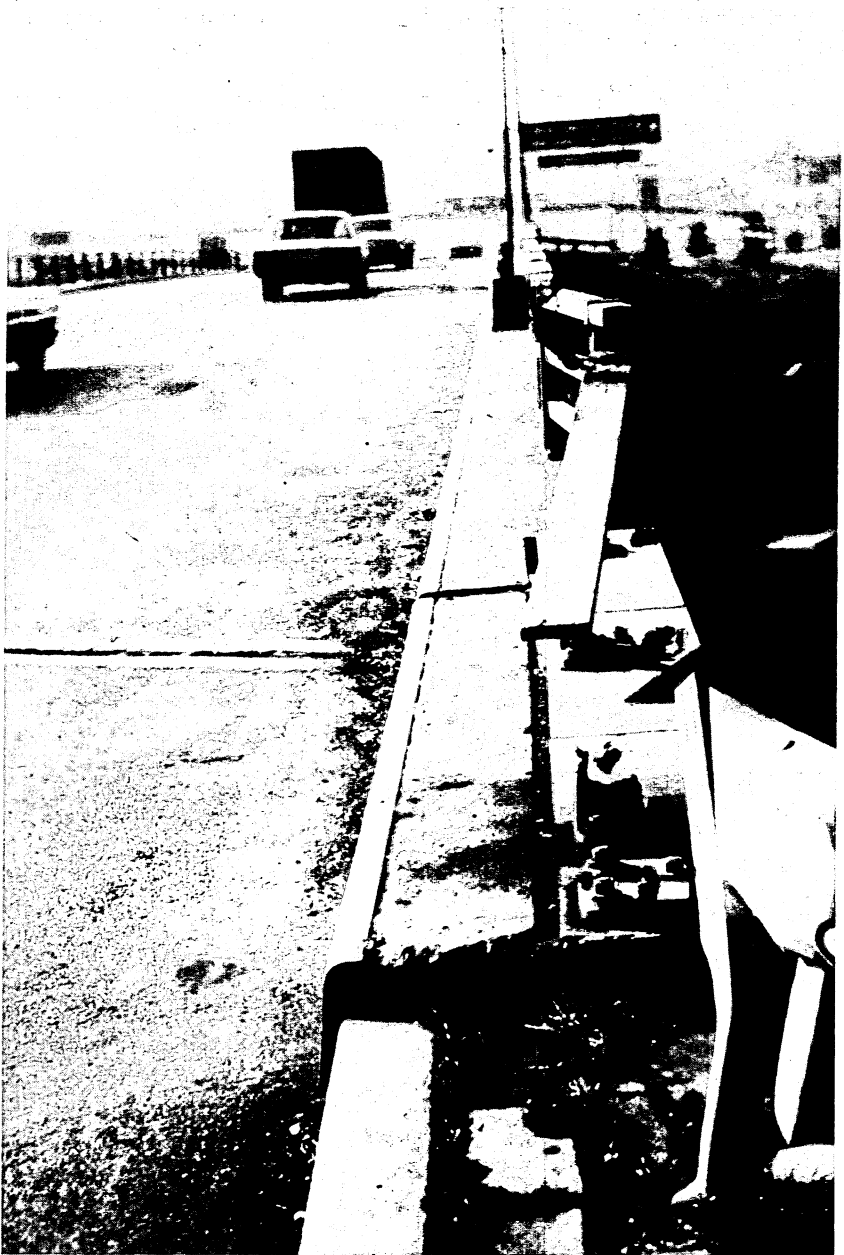
I feel we have an obligation and go back and strengthen these points as soon as possible before a gasoline truck or something goes through these railings.



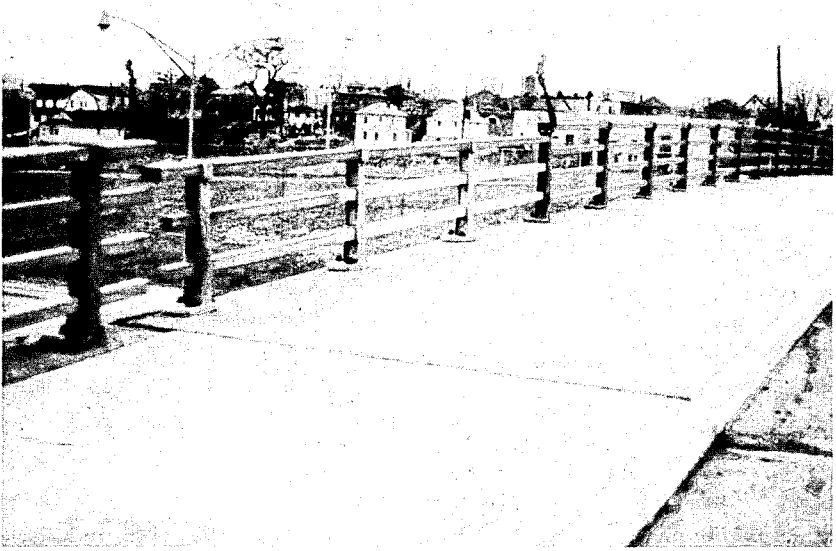
This is another aluminum installation. You can see it just snaps right off.



And this is another one.



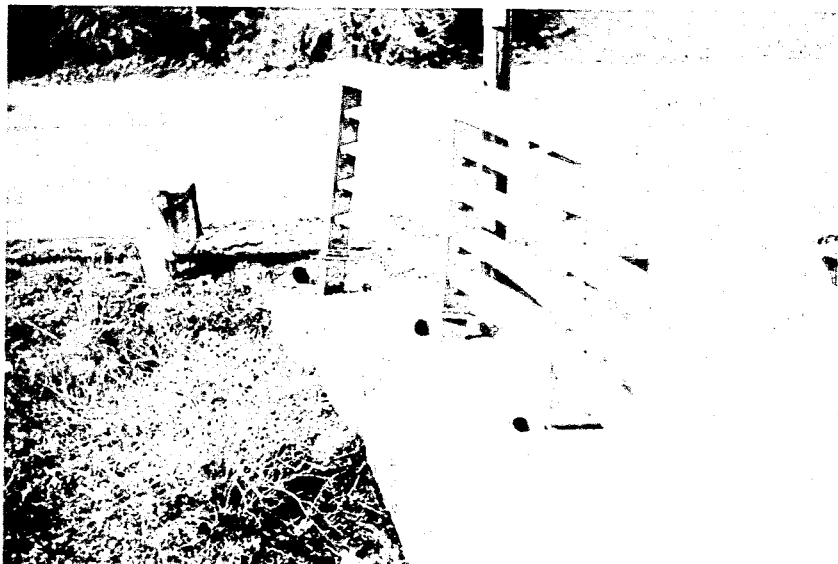
And here is a patched-up job where they put a section in there. Take a closeup look and you can see how they put it together. They are not even fastened. Kick it and it goes off.



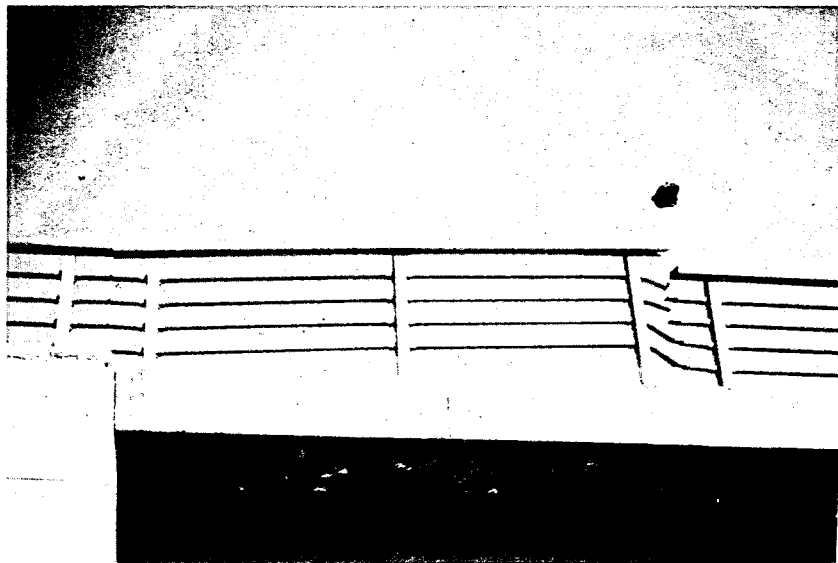
And here is another place that was struck and the rail gave way. There is a street below.



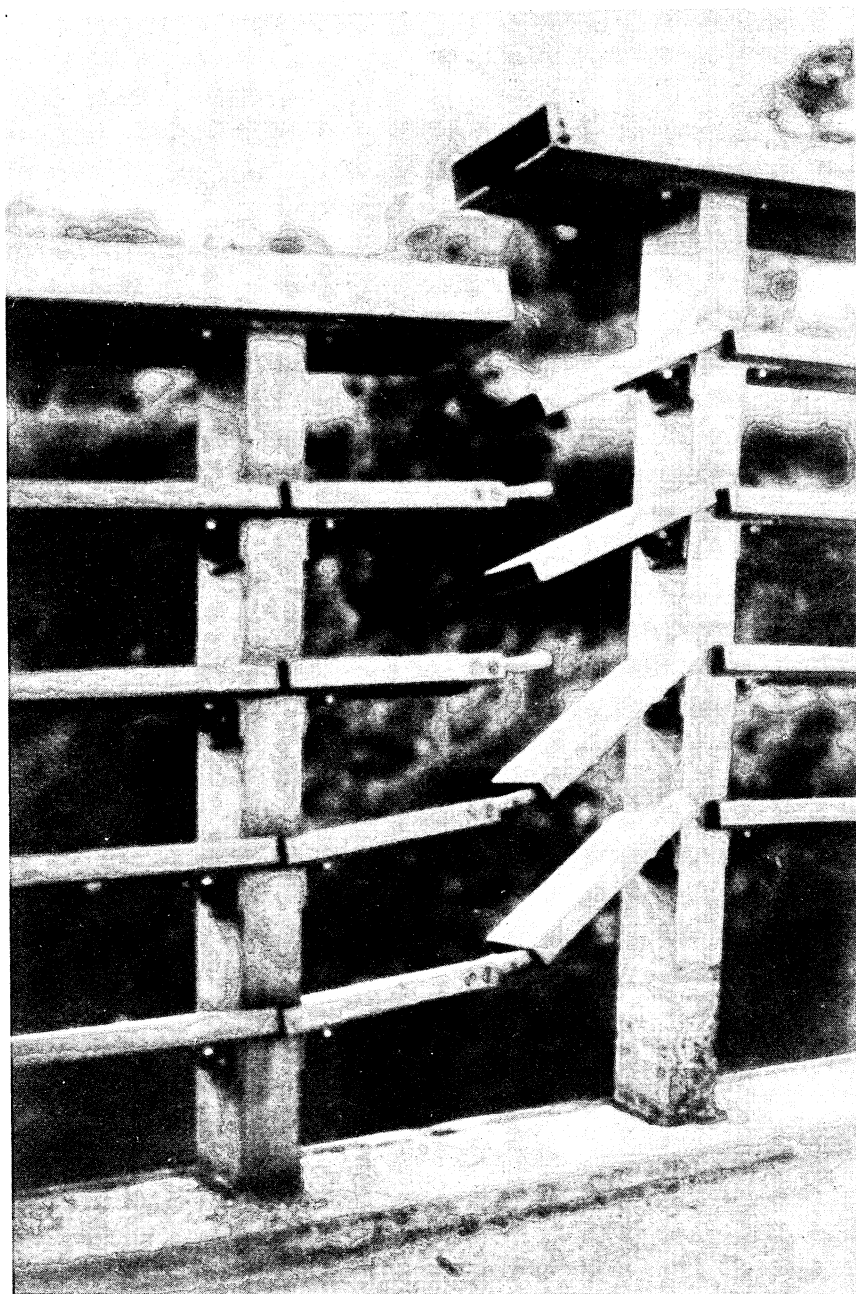
This is another aluminum installation. Nobody hit this particular installation. From expansion and contraction, this particular railing worked its way right out of the ground.



Here is another section here.



This is the type of aluminum railing.

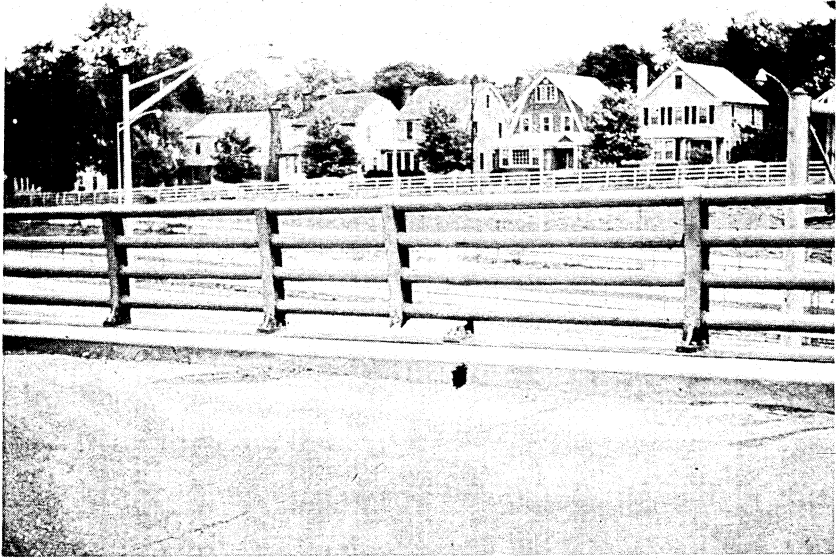


Here I would like to point out that this is a section of the aluminum railing I have been showing you. You can see one of these uprights has snapped completely off. There is not a mark on that railing. That means it could not have been hit hard. Aluminum alloy is not a strong alloy, so what they do is they temper it. In tempering it to make it hard, they also make it like glass. So if you just tap it, it just snaps right off. That is what happened here.



Just so you do not say this might be an isolated condition, here is another section in a different location showing there is no damage to that guardrail at all, but yet the part that is supposed to hold you from going through snapped right off.

I feel we have a serious condition here, because most of our Interstate highways in this area have this type of guardrail. If cars can go through so easily, what is going to happen when a truck goes through there? Or maybe a busload of children? Or a gasoline truck?

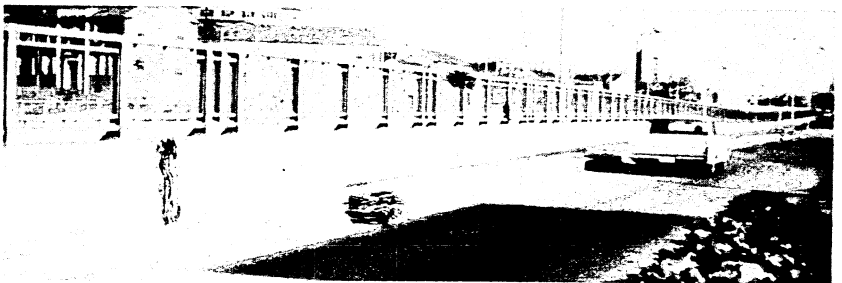
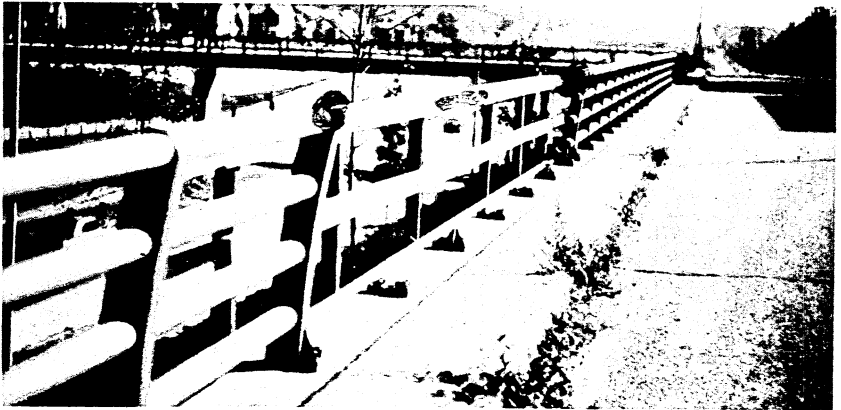


Now, here you see the aluminum guardrail protected with a barrier. This is in New Jersey. I guess they know it is not safe there, so they put a barrier there as a guardrail to keep the cars out.

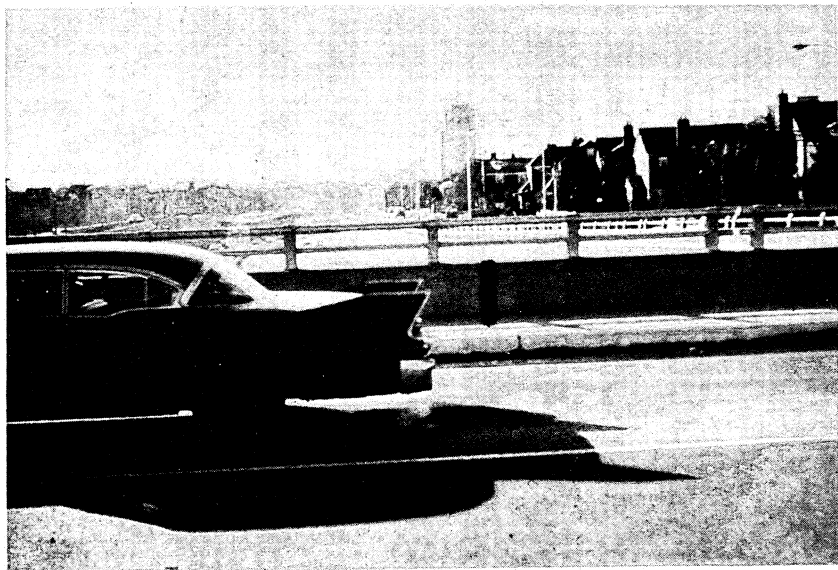


As you can see here we have trouble constantly. I am showing you all different locations so you cannot say it is only there.

I feel a simple solution, when you are pouring the concrete walls, is just to go up a couple of feet higher. I do not think it will cost much

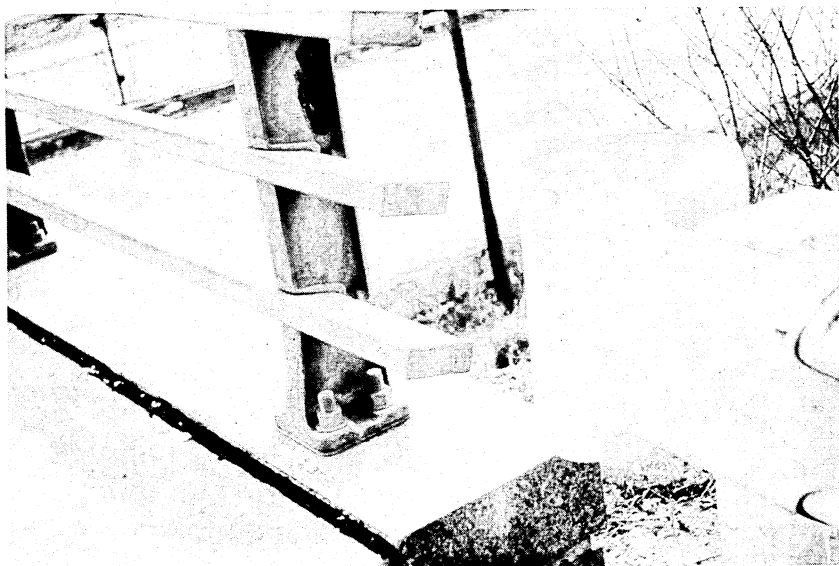


more money. Then you can put the handrail on top. The other type of railing, as you can see, even if it is steel sometimes, they do go through them.



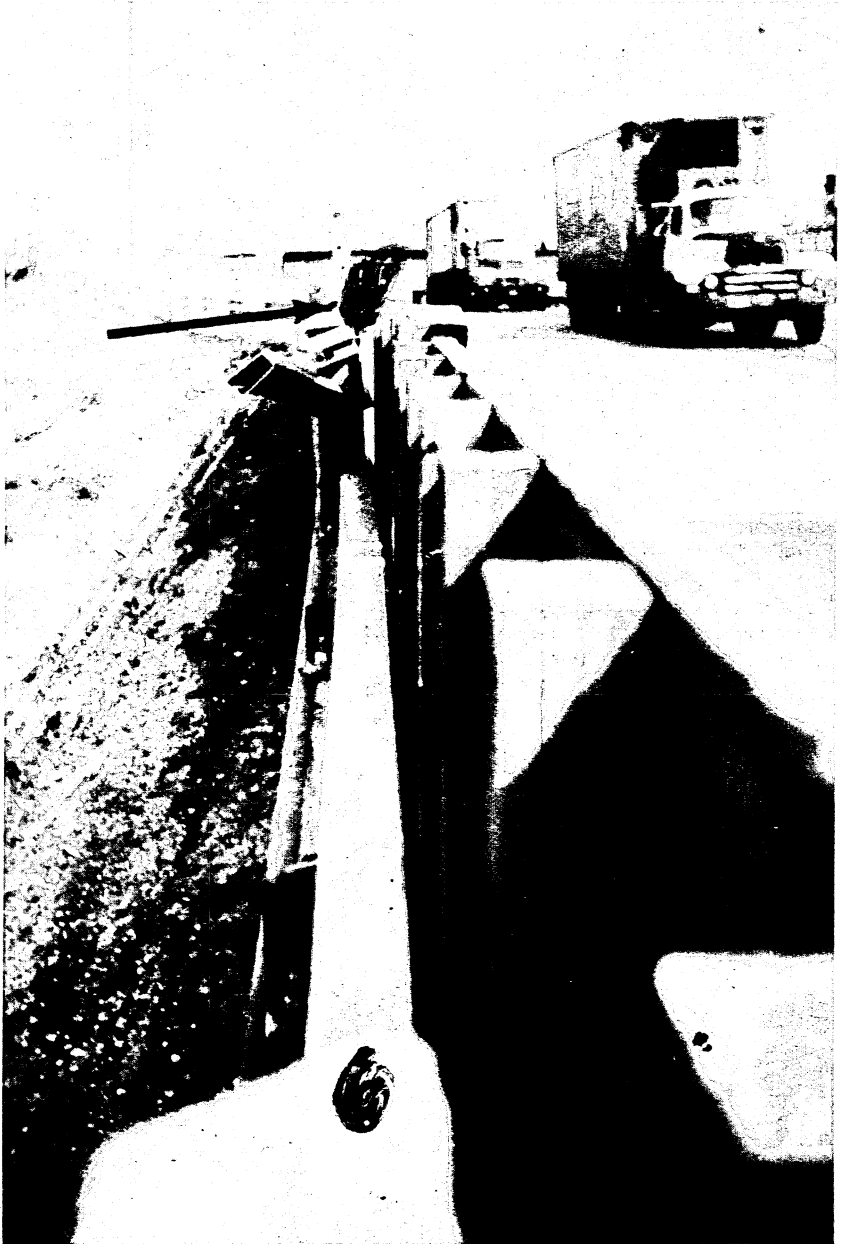
See? It could be a concrete wall, which I would recommend.

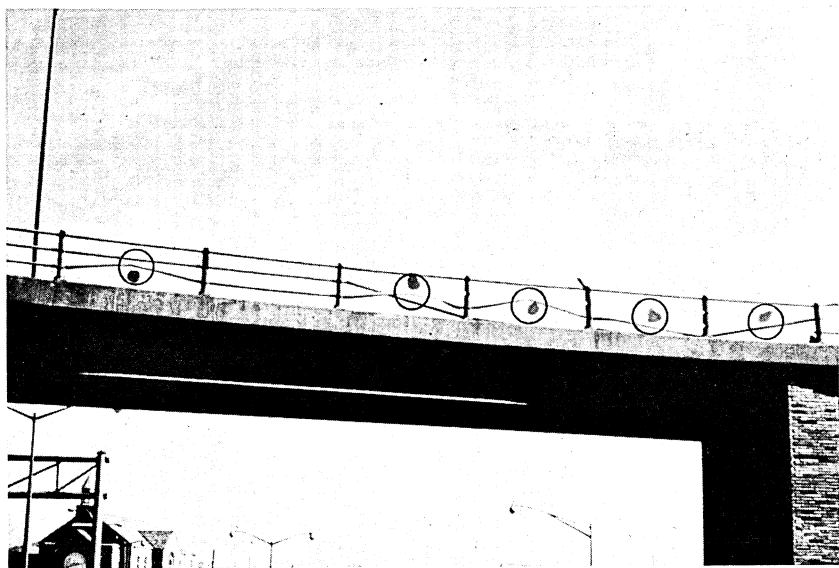
Here is a steel railing. You might think after all those things I said about aluminum, that I do not like the aluminum company; but that is not true. Here is steel rail, it has a poor design. Notice that the upright is about 5 inches wide, but they slotted it 3 inches, so actually



the upright is only 2 inches wide here. When somebody hits that, it will snap off right where the weak part is. In other words, you have 2-inch uprights holding this up. I am sure it cannot hold back cars.

And this shot proves it, because as soon as somebody tapped it, it broke off where the 2-inch section is.





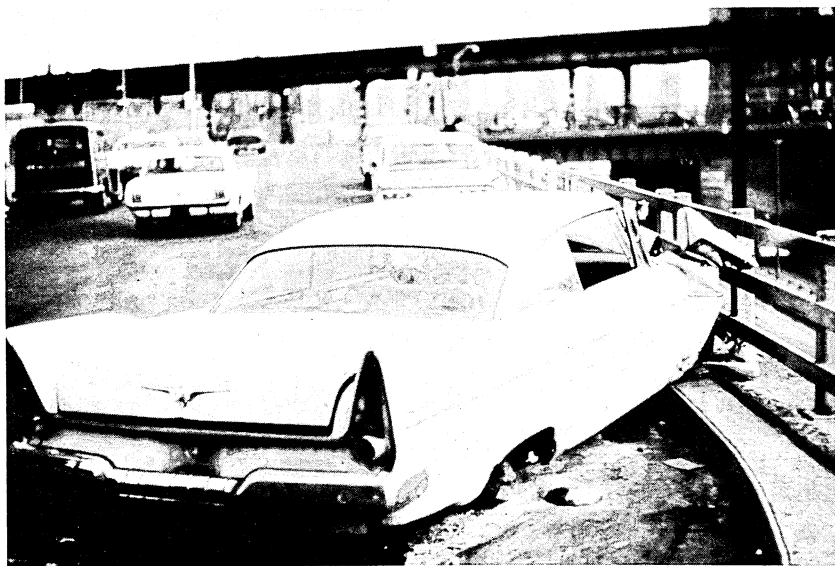
This is what happens when you just tap it lightly. If you hit it hard, you go right through.

Here is a good rail. This is solid steel, 4 inches wide by an inch and a half thick. If you hit this, the rail will not yield—this is the way it's designed.



The car gets banged up but while it may get banged up in this particular case, more important you do not want it to go through. If it ever did it would fall onto a heavy-volume road below. So it shows you do know how to do a good job.

Because we fail to build safe railings, cars have been going through in many hundreds of places. I am here to say mistakes have been made. Let's go back and fix what's wrong.



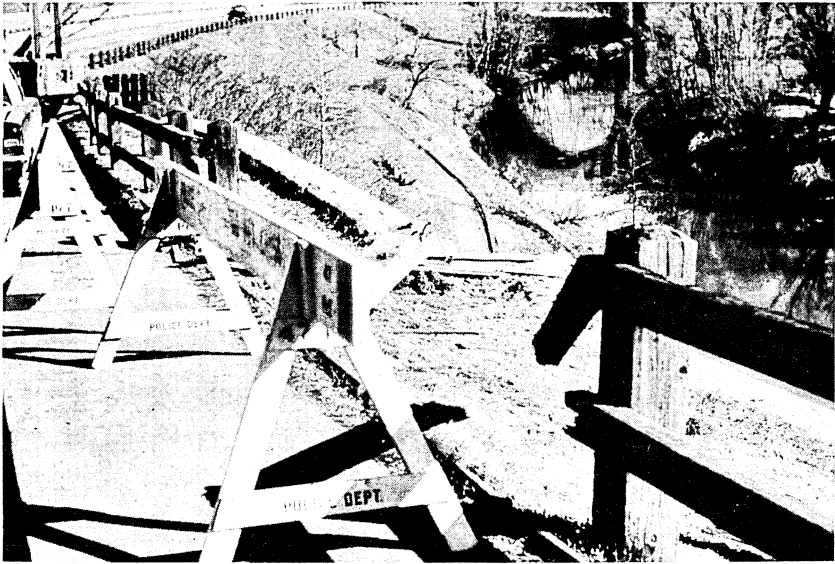
This is also a steel rail and I feel it is a pretty good rail if it was tied together. Here you see it was put up in sections. Now somebody hitting the thing just knocks out two sections and defeats the purpose of the good design in the rail, which is to be solid in the particular case. And I feel that you should go back to these points and maybe run a W-beam right through to provide a sliding action and to protect the rail from damage and keep the cars from smashing into the ends.

I feel we should do this pretty soon, because what are we waiting for?



This is the same location. Notice that W-beam there in the foreground and the bridge abutment is exposed.





Here is a wood railing protecting on a bridge. A car ran right through, as these two pictures show, and went into the water there and the driver drowned.



Here they are hoisting the car up. Take a close look at this wooden railing—this can't hold back moving cars. And these are in many dangerous places in heavy traffic. Also, you can see it is rotting away and it's not being maintained.



Here is a patch-up job on one of our parkways. They put a few boards up there and it will stay like that a couple of years. That is not a railing to hold back cars.



Here you see the railing on the left-hand side is rotting away. I do not know whose responsibility it is to maintain that, but it is not



being maintained. The point is if we have railings they should serve a purpose.

Here you see a chicken fence to keep cars from going through. This happens to be a railroad track and some car went right through that fence.



Here is the place where it went through. If you notice, you have a bridge railing there in advance, a solid railing on your left, on the bridge. But alongside, on the side road, they have just the chicken fence. They have high speed trains going by there every day.

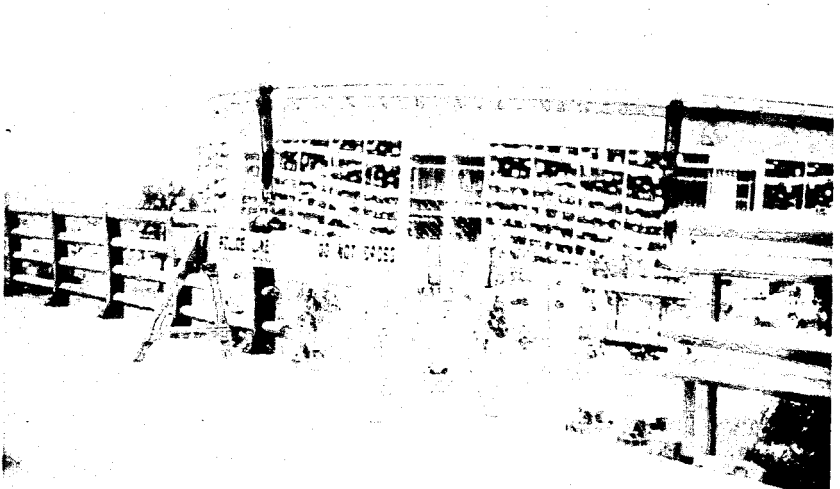
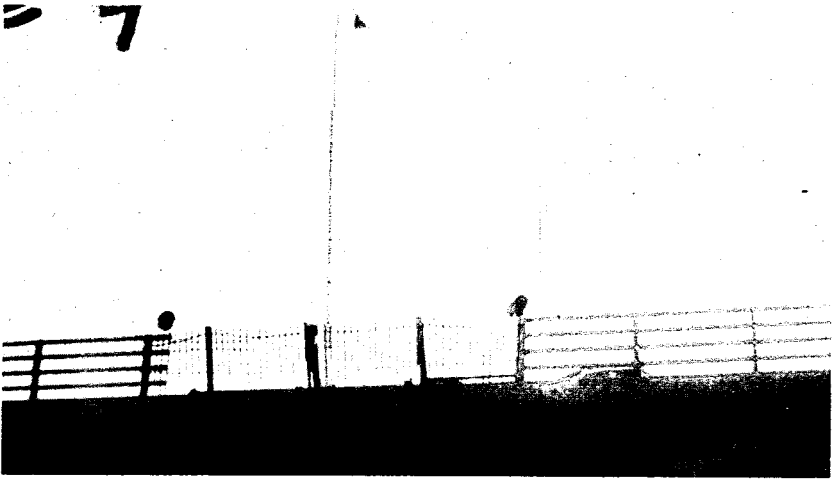
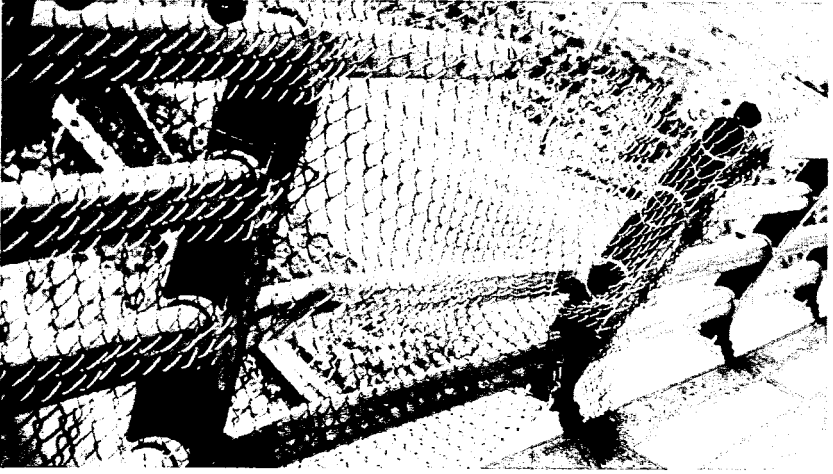


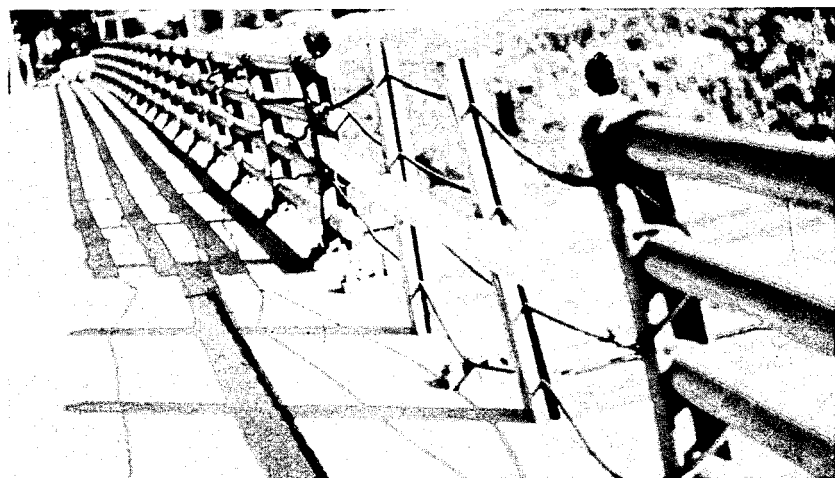
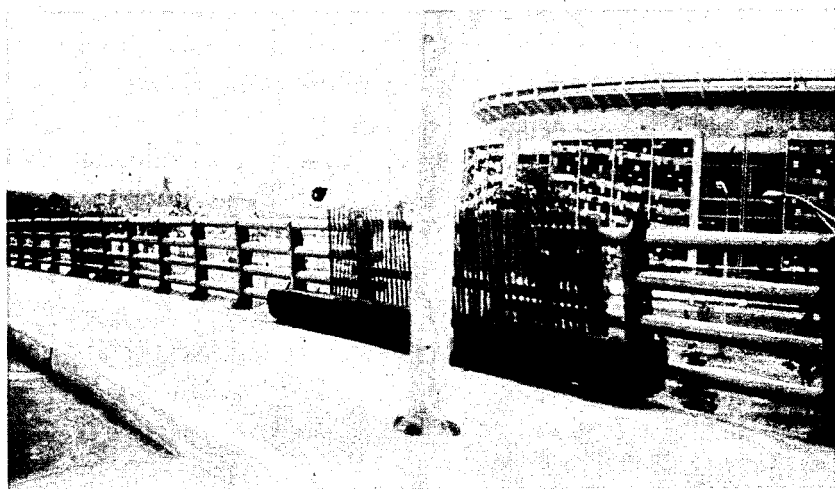
Here you can see where a couple of people got killed. Sometimes they are electrocuted, other times burned to death. Maybe 10 or 15 cars fell on these tracks in this area here. The city and the public service commissioners are arguing who should pay for the guardrail there, the railroad or the city, and they have been squabbling for years now.

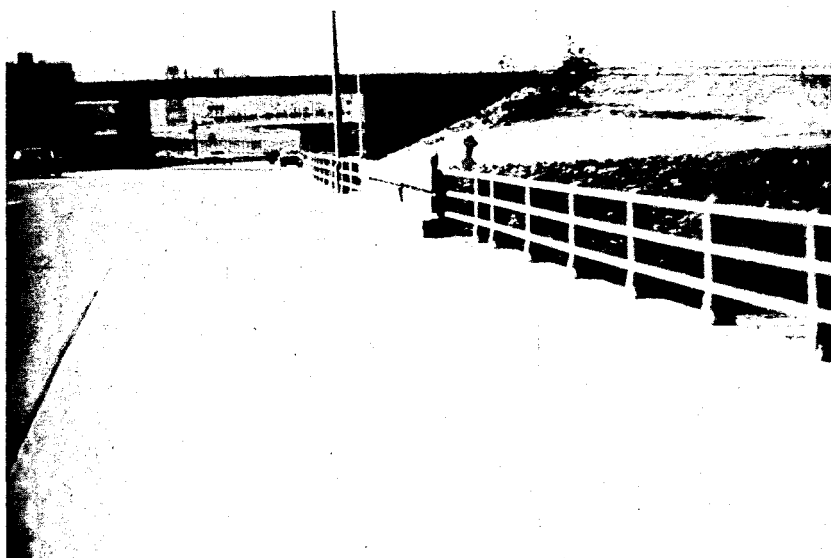
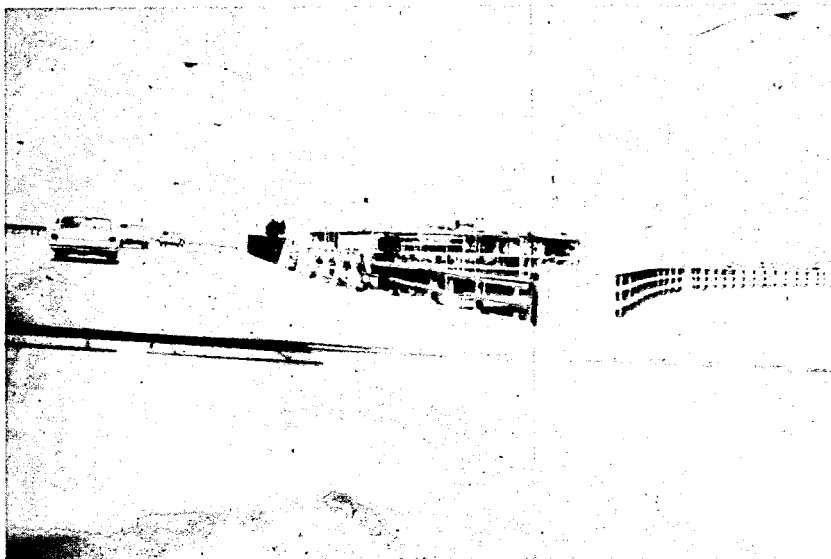
I feel maybe if a gasoline truck hits a train, they will hurry up the job—but then it will be too late. Next is a series of shots, which I will

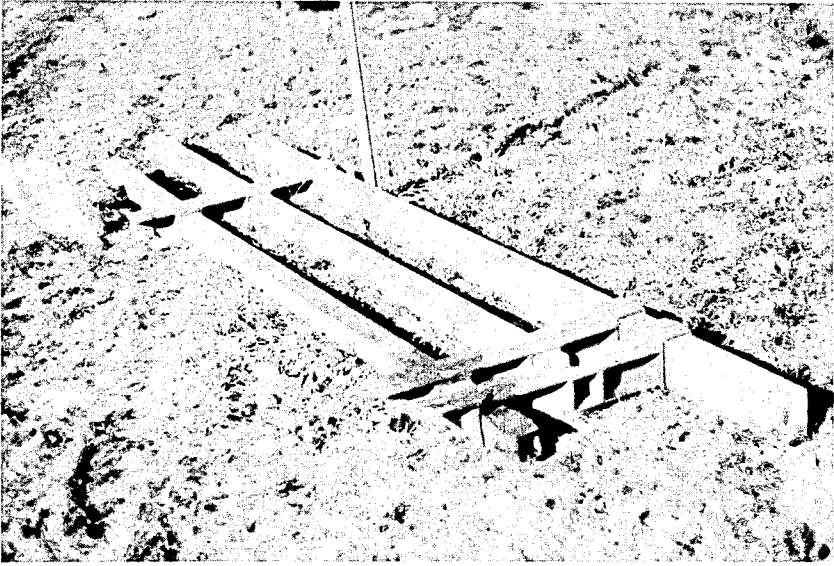
go through because they show there are many places being broken through.





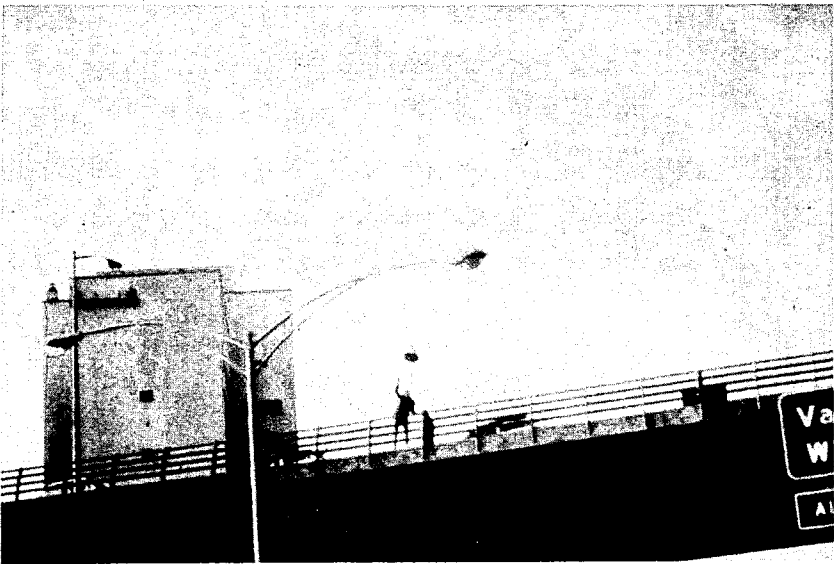




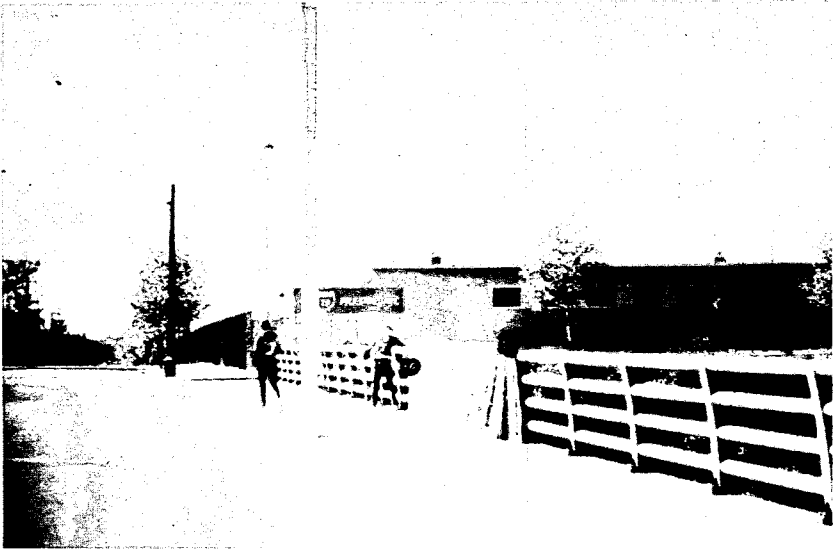


We have to live up to our responsibility and go back and strengthen these rails.

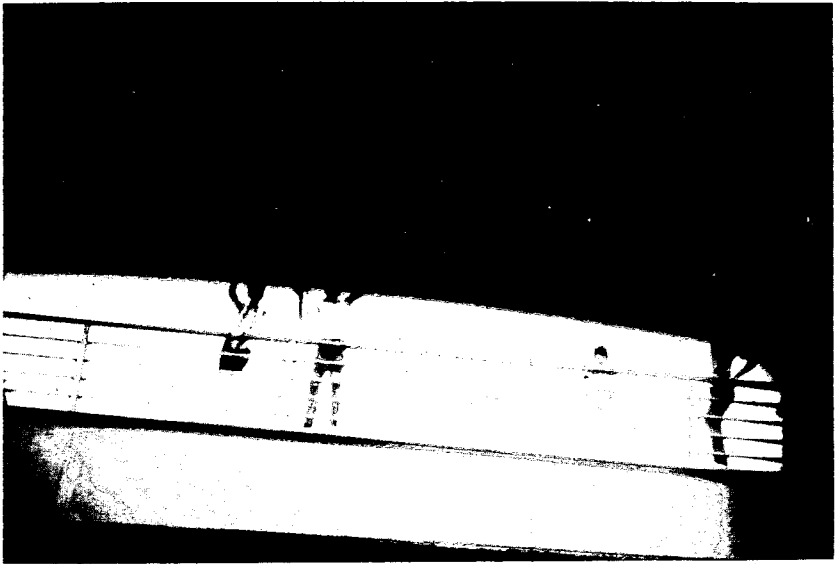
The way they are now, they are just handrails, not designed to keep the cars on the road. You can see in several cases there is nothing bent there at all; everything snapped off. That is because the stuff is hard and brittle, like glass.



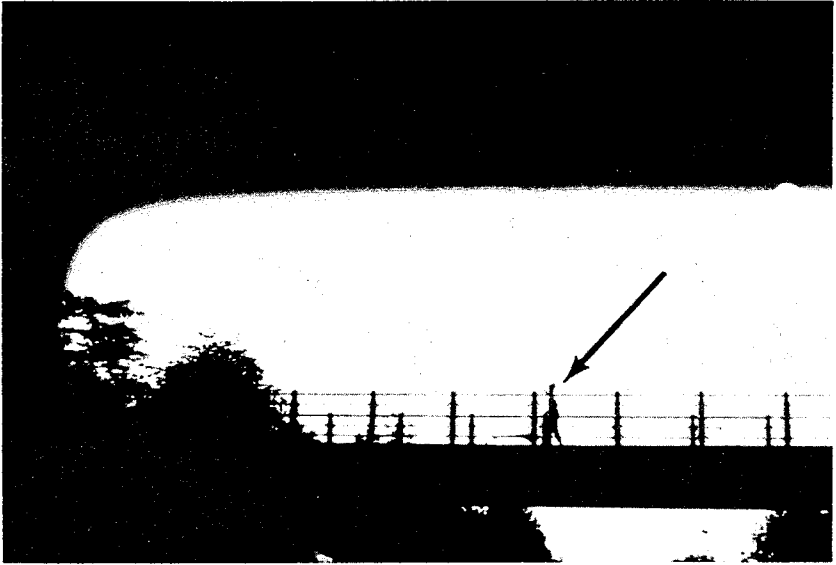
Here you see a child throwing something on top of cars as they go through an overpass. This is a common practice in our cities.



Here you see they do not have to throw it; they just drop it on top of cars, because we failed to put proper fences there.



These pictures are not hard to get, and only proves how frequently these things are happening. I take them as I drive.



This kid had about 15 stones and he was slinging them as fast as he could at my windshield as I was going by.



This one had nothing to throw, so he was spitting on the cars.



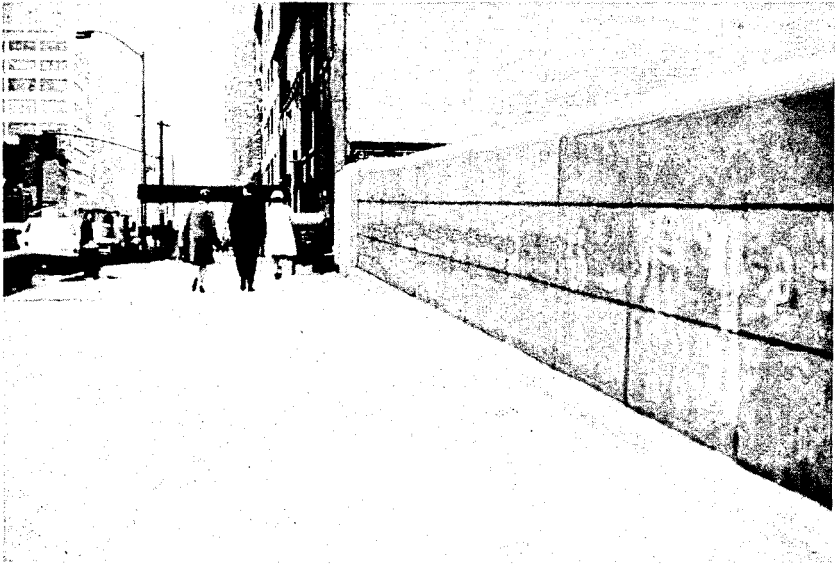
We have a serious problem here. In the city, hundreds of kids coming from school, and going back and forth, pass by these things and a kid could be a good kid but if he has something in his hand at the right moment he will throw it.

I feel we have to fence these as soon as possible.

Many of these locations I am showing you are on Interstate highways.



This particular person there is throwing a popsicle over the top.

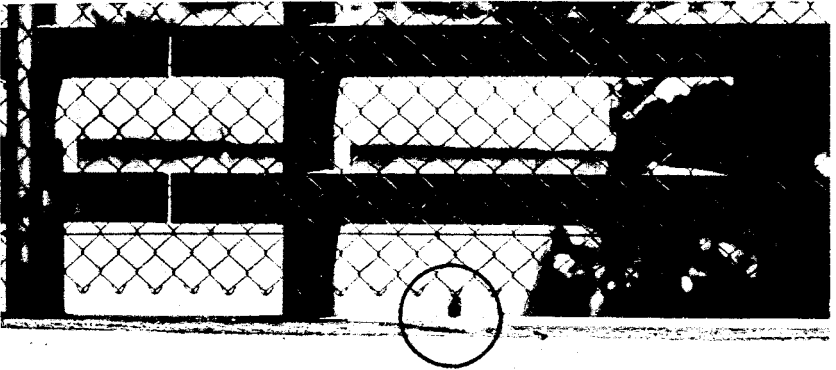


I feel we can use no-see-through fences like this. This is not an intersection, and there is no sight distance problem involved as far as safety in that respect is concerned. I think we should use no-see-through fences. The kids would not throw anything because they would not see themselves hitting the target. They have no satisfaction, you see. I feel we should use corrugated aluminum of some sort. Paint it a nice color; it does not have to look ugly. It would discourage people from throwing things on top of cars.

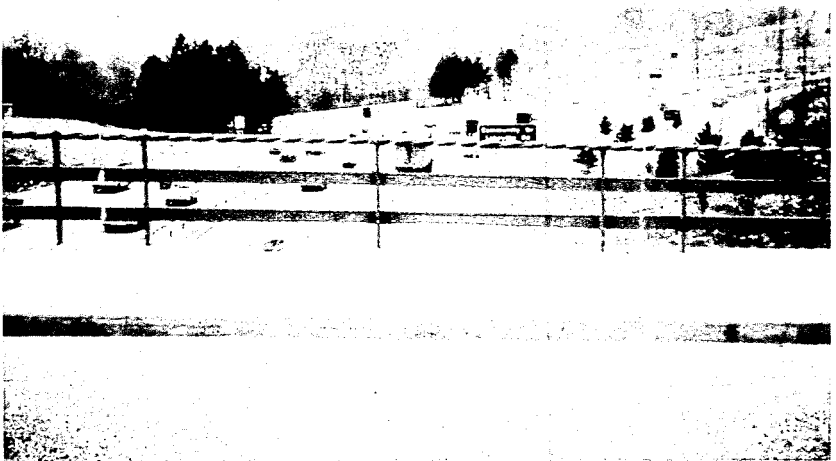


Let's take this particular location. It is not an intersection and if you had a no-see-through fence here, I think it would be an advantage. Also, take a look at the large space between the bottom rung and the edge of the walk; you do not have to do anything wrong here. Someone might have been shopping and the shopping bag could break and a Pepsi Cola bottle could fall on a moving car 40 feet below, smashing the windshield.

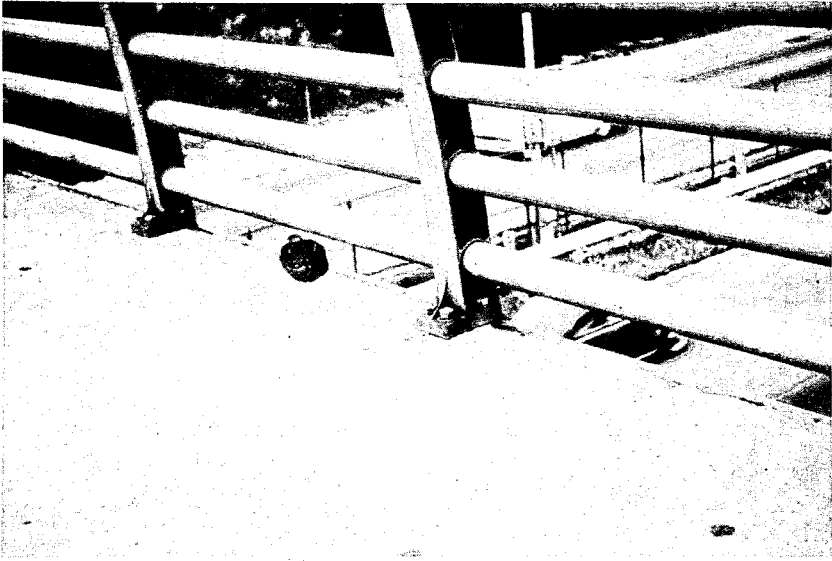
We should realize some of these problems and fence some of these things.



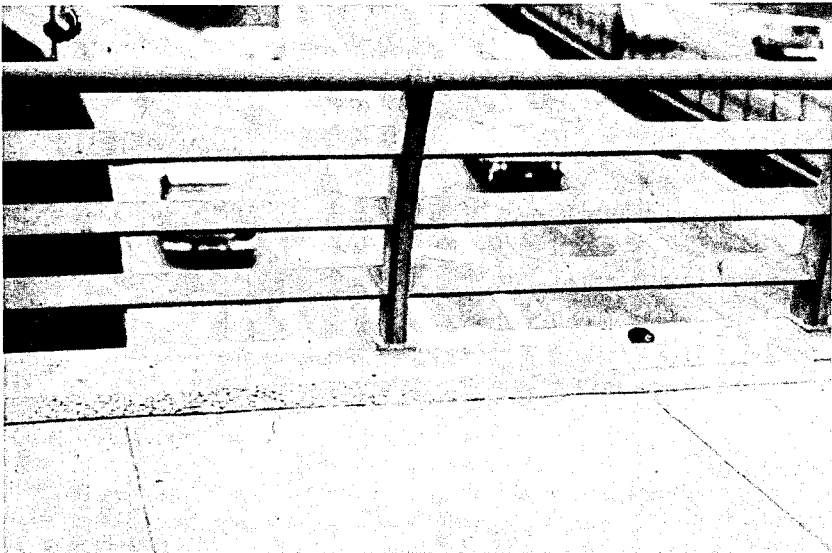
Even when we fence, we have done a halfway job. Here you see a whisky bottle laying where the spot is. I put it there myself because

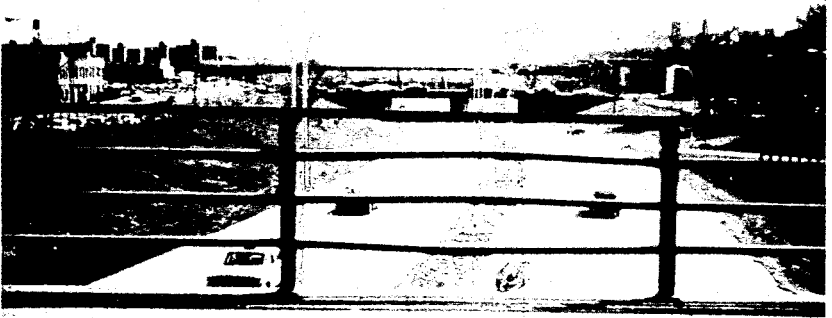


it was laying in the center of the street and I wanted to bring the thought to the attention of this committee. If it is laying in the center of the street, if some kid kicks it, it is going to slide right under there and may drop on a car anyway. We put the fence there but did not bring it down to the ground. There are many places where we did a half job.



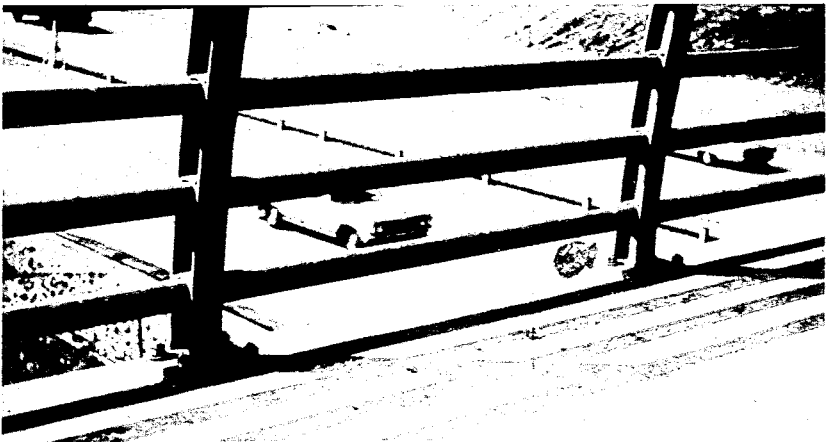
Here are two shots on Interstate highway where we failed to provide fencing or any curbing ledge below the rail. We have to get to these places and fence them before something serious happens.





The three foregoing pictures show that under the right conditions something could fall on the windshield of cars below and even cause a four- or five-car accident.

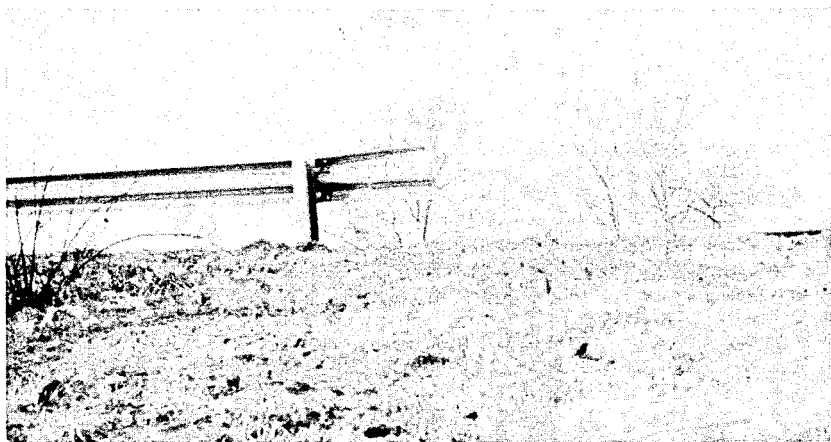
This covers some aluminum W-beams. I feel we made a serious mistake using this type of material. I favored aluminum before when I talked about use of it on our light poles and bases. I told you it had no strength and it snaps off and does no damage. That is exactly what it is doing here; it is snapping off.





Now you can see somebody tapped that. Instead of providing a sliding action, it snapped off and they ran right through.

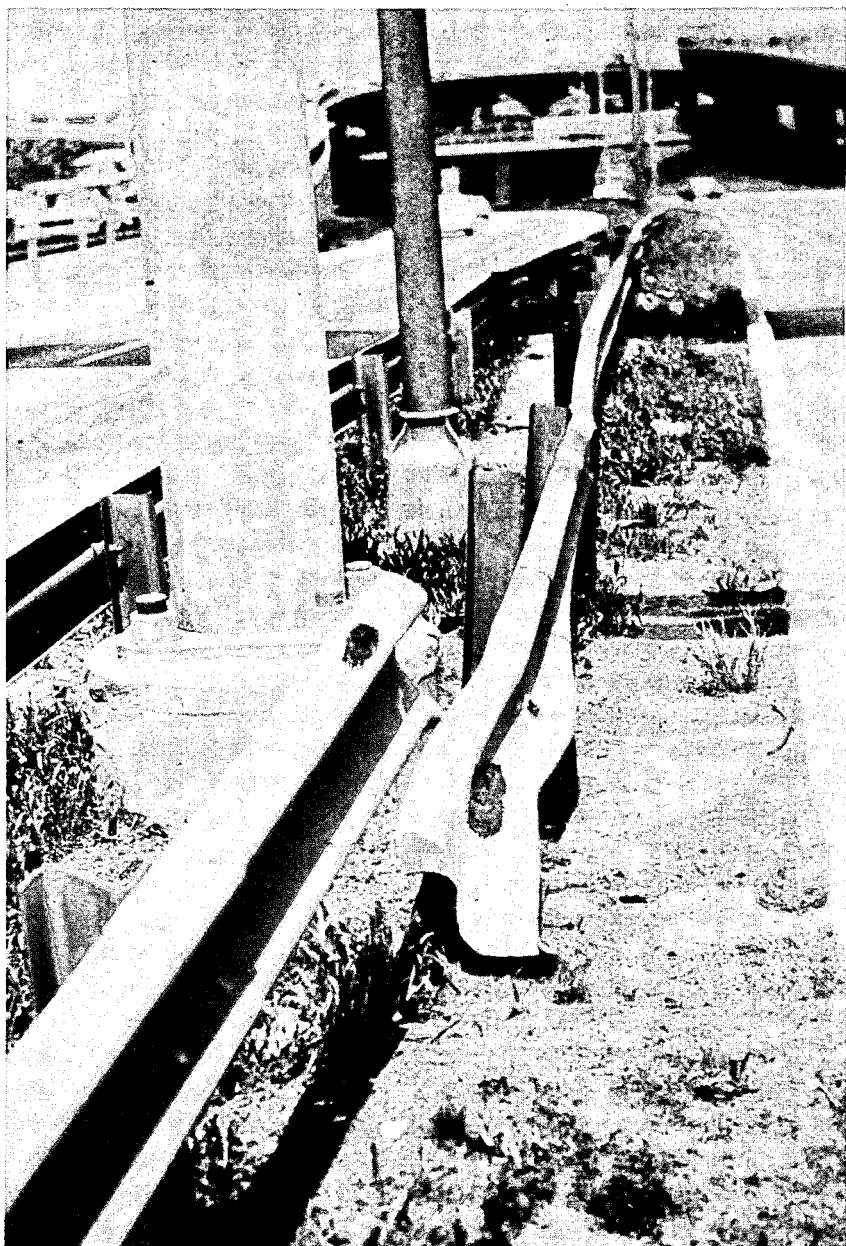
This is the same location as the previous one from a different angle.



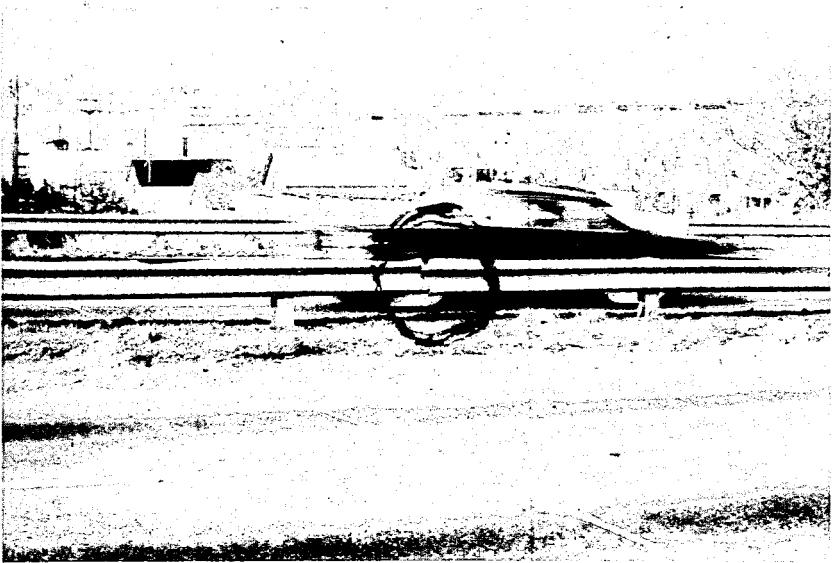
Here you can see that the guardrail is not even damaged, but yet the thing is snapped off. Some of the material has been used on our Interstate highways, too. If they cannot hold back cars, how do you expect them to hold back trucks?



There is practically no damage to the rail, but it snapped right in half.



Here is the ideal picture, there is not a dent in that rail. The rail is split, so the material just cannot be any good. Even at this late date—and I brought it to most people's attention—we had the nerve, just in 1966, to go back and use this type of material again on our Grand Central Parkway. All they had to do was look around and see the hundreds of places where the cars have broken through—not only through single rail but through double rail.



Here is a steel rail, somebody went right into it and I do not see any crack in there. It is just twisted, bent, and it held up and did the job.



But this is what happens to the aluminum rail; it just cracks and splits.



This is a constant problem; not only do we have constantly to maintain this at great cost, because all you have to do is tap it a little and it has to be fixed, but it is not serving the purpose. It is causing many headon crashes, and causing cars to go off the road. The material is there but it doesn't perform.



And here you see somebody ran along this curb, supposingly to slide past the abutment.



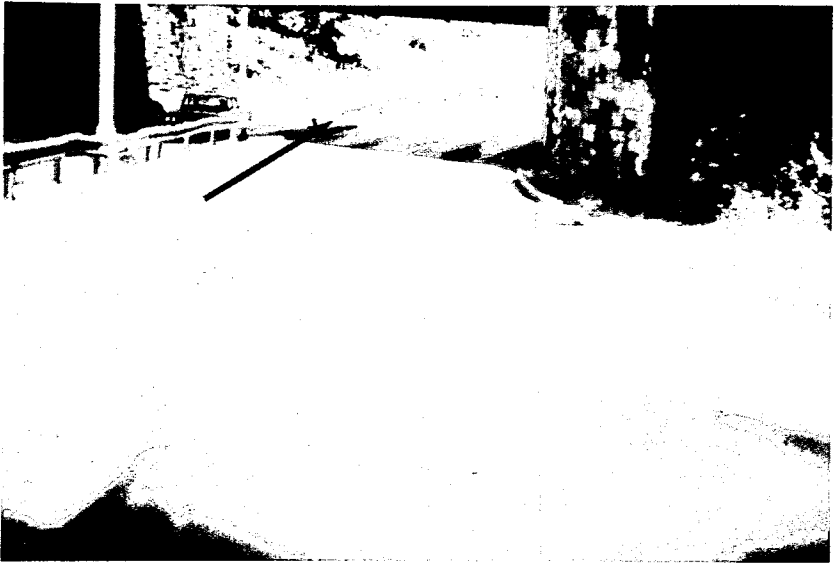
This shows it did not even crack where it was hit; it cracked somewhere else. The guy got in trouble for nothing.



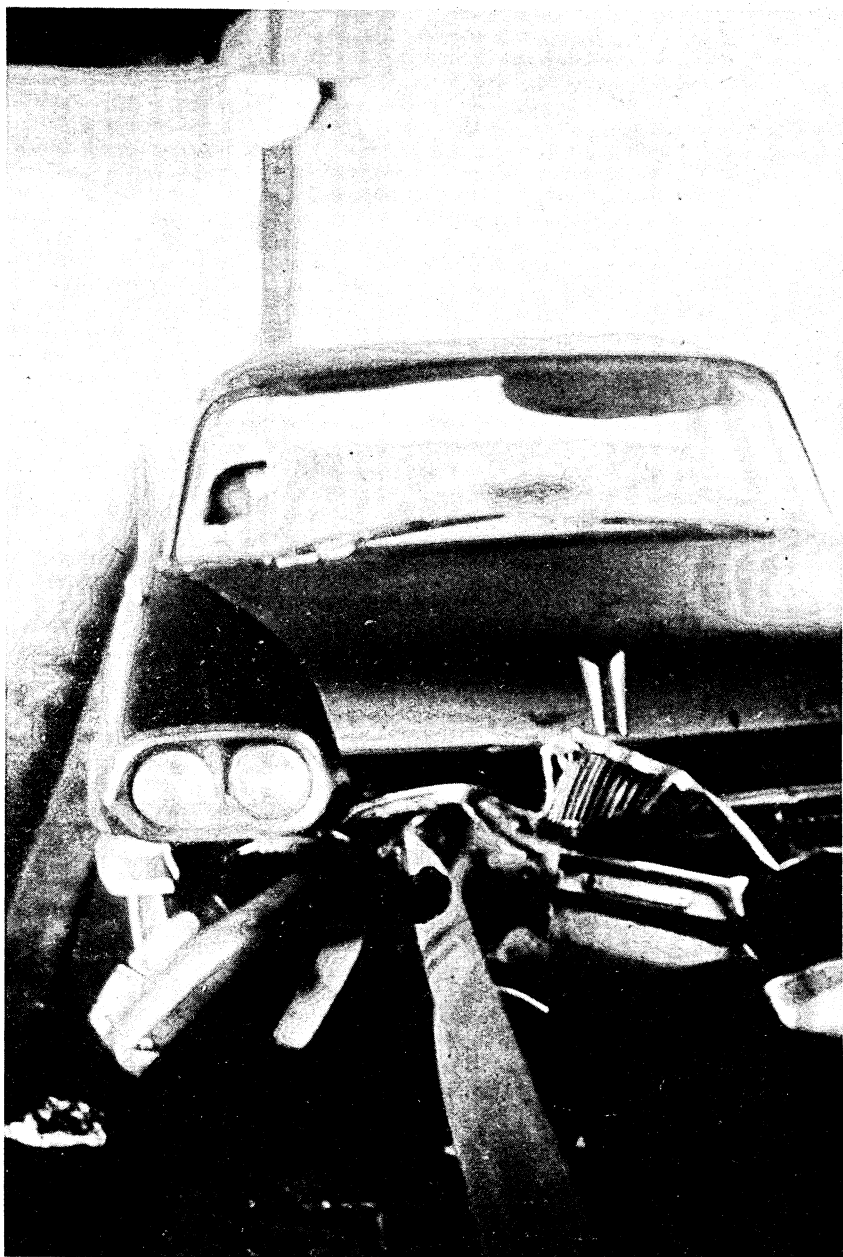
Here, it snapped off.



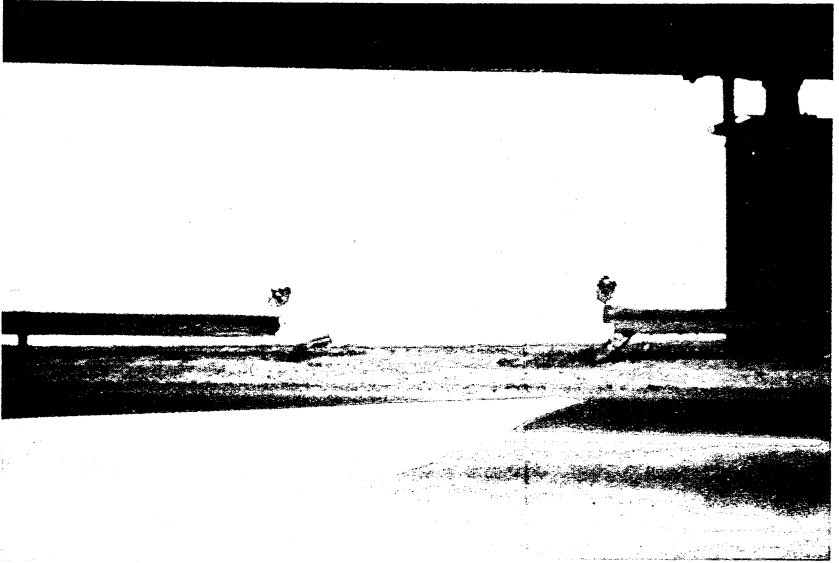
Here you can see where somebody went through a double rail. This is a downhill curve, right where you would expect.



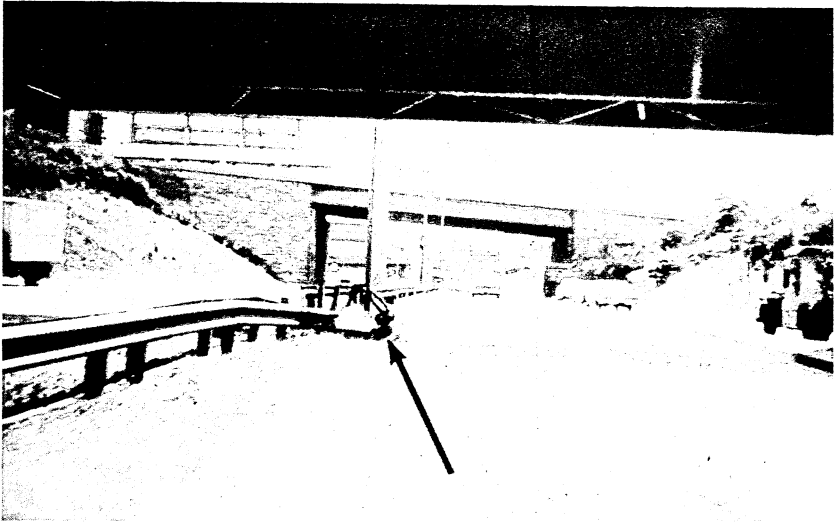
Here you can see that somebody broke through this rail and came through the windshield. All this unnecessary damage.



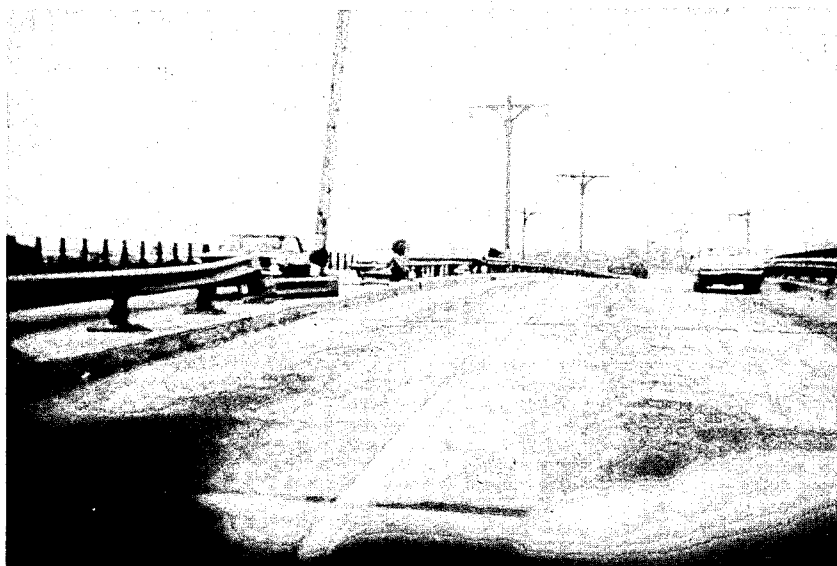
This is the same location; there was no sliding action, it broke off and they got all that damage.



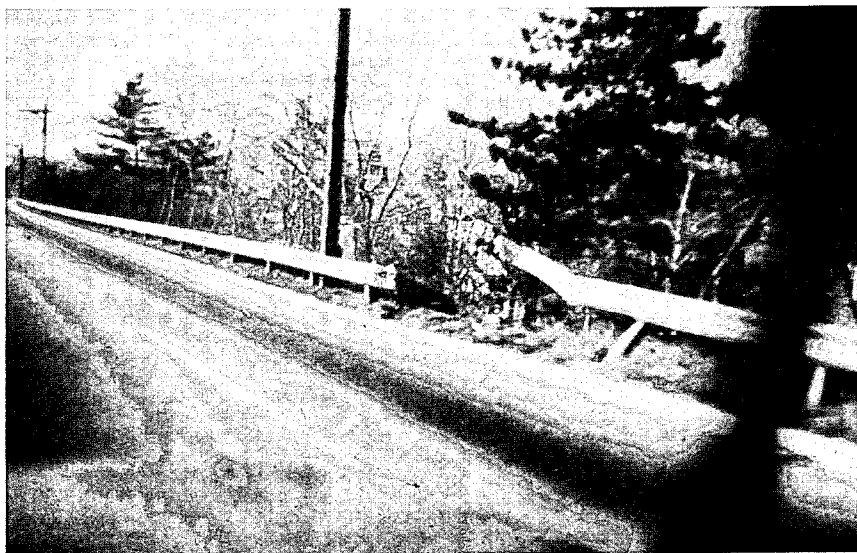
Here you can see where somebody came through also. The broken guardrail is pointing toward you, and that is a double rail. These are only cars coming through here, not trucks. This on an interstate highway.



Somebody died at this location here. The double rail is broken. These two show broken rails.

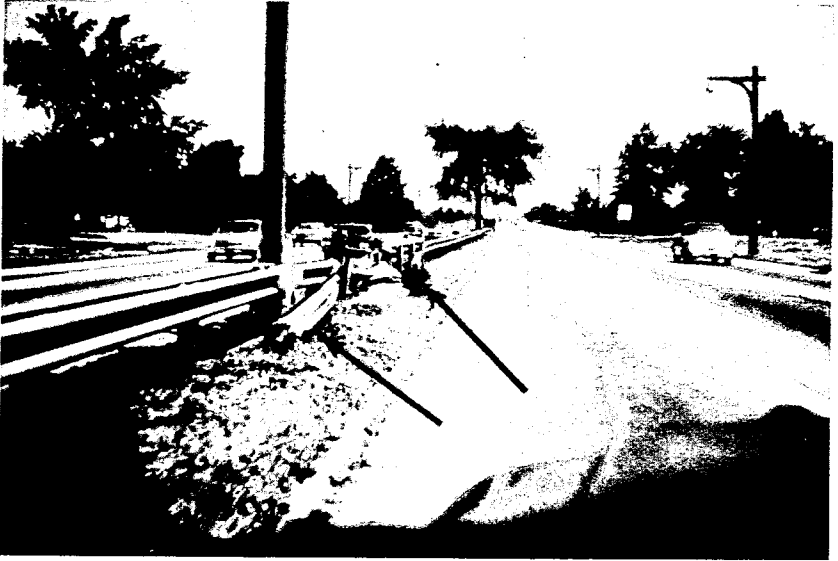


One day I looked at this newspaper and it says, "9 in an auto—all drowned." I said to myself "what kind of guardrail was here?" It's not near my area.



Mr. BLATNIK. What is the story in this case?

Mr. LINKO. I do not know what happened here. I read about this in the paper. After seeing all this inferior type of guardrail in an outdoor area, I said to myself, "I wonder what kind of guardrail was protecting this particular one?" They ran through a guardrail here. I just pointed this out, you can expect something like this to



happen. Suppose a bus goes through and wipes out 100 children in one shot? Or maybe a gasoline truck rolls over and hits a train or something like this?

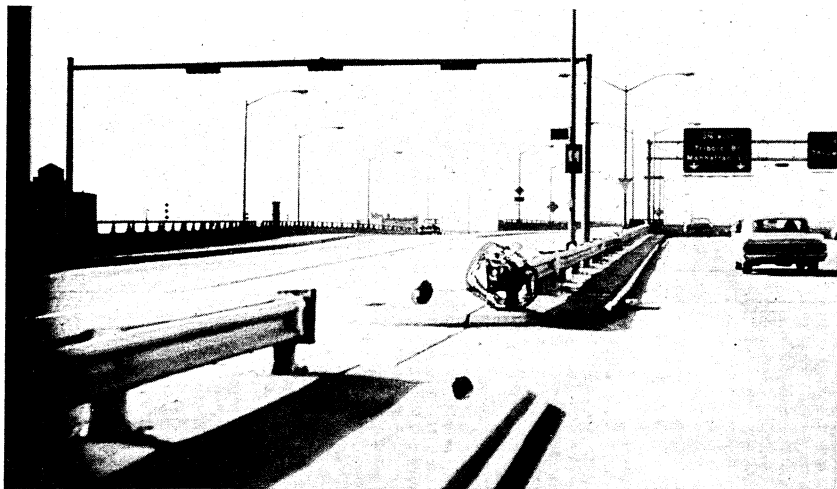


This is an urgent matter. I think we have to live up to our responsibility; go back to all these guardrails and bridge railings and fix them up so they can hold vehicles traveling these Interstate highways.

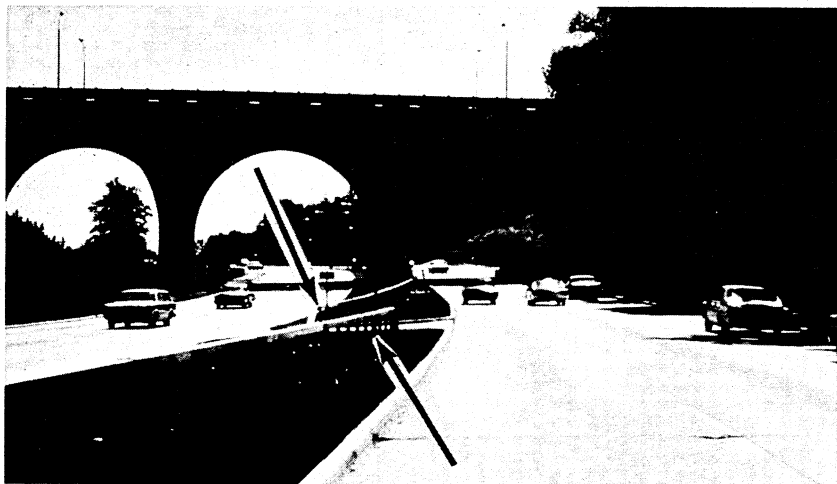
Mr. BLATNIK. In these recent pictures you have shown, was the bridge railing aluminum, as well as the guardrails?

Mr. LINKO. Yes, they were using aluminum bridge railings and they were using aluminum guard railings, aluminum W-rails. You can see they do not hold back cars.

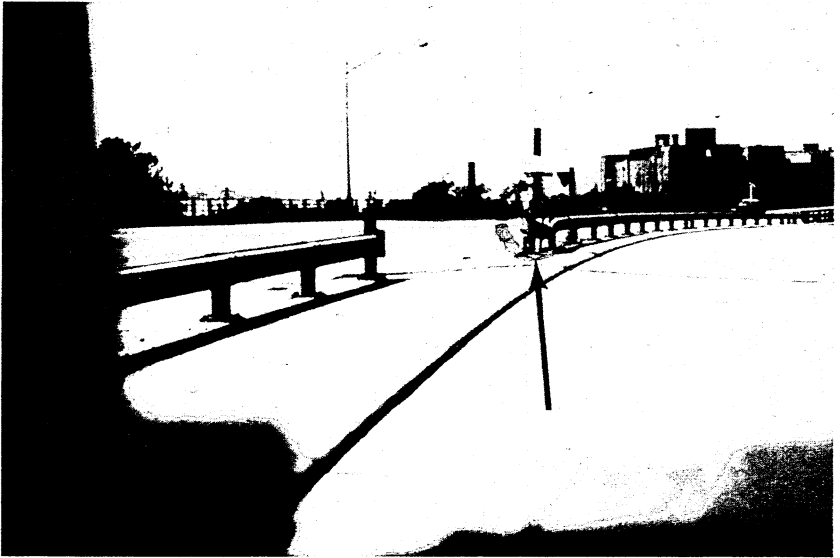
The timing is important. In most of the places where you have a bridge, there is another road underneath it. With proper timing—it could be a gasoline truck or bus full of children—you can have a disaster.



This points out improper installation of guardrails and anyone riding along this guardrail will smack headon into that other section. I feel that if you just reverse this guardrail where you see the dots, then it would be impossible to hit either end of the guardrail as is now possible. This is dangerous.

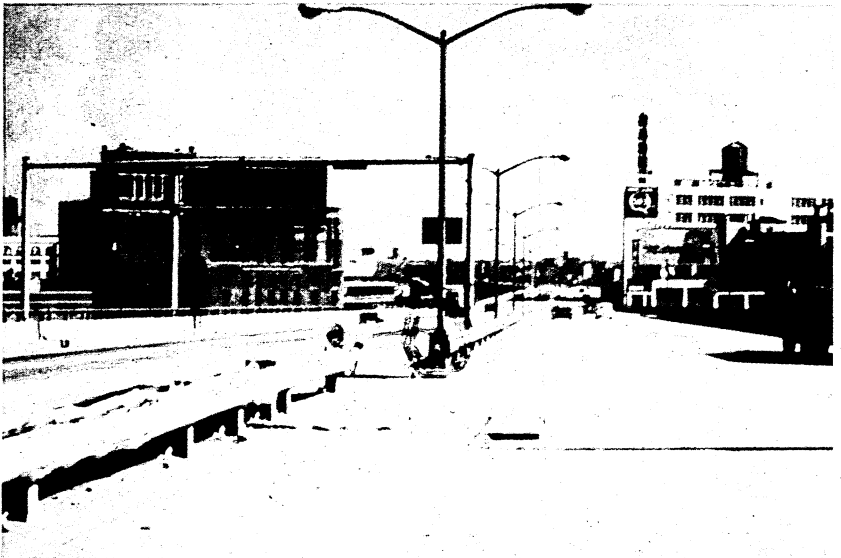


Here you can slide along there and it is impossible to hit the end of the opposite rail. They could have done the same thing at the other location, but no one was thinking.



Most of our highways are in this condition. You leave the road, slide along the guardrail, and you have run into the end of the next section of guardrail.

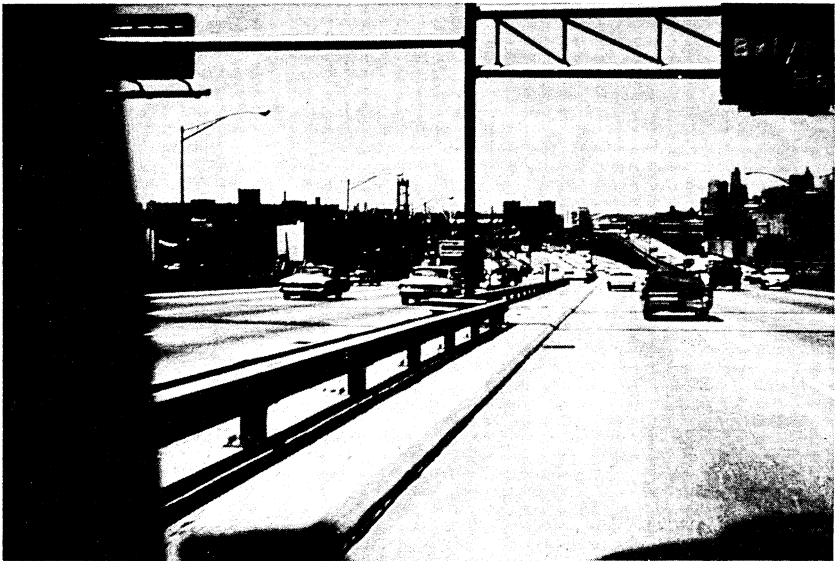
And this has been hit; sort of standard practice on highways in our area.



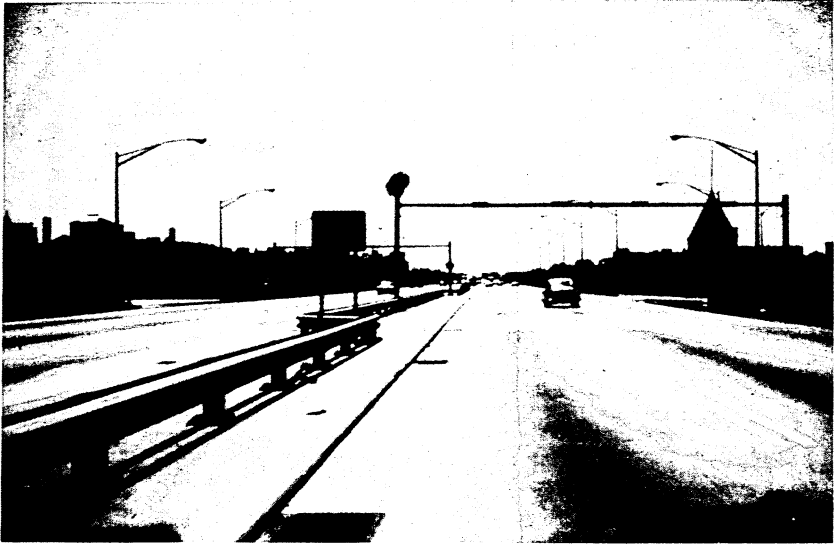
Here you see this pole right in the center of the median. Anyone sliding along this guardrail will slam right into that pole.



Here on this side you see it is impossible to hit this pole; you can slide past. But the opposite side is not sufficiently protected.



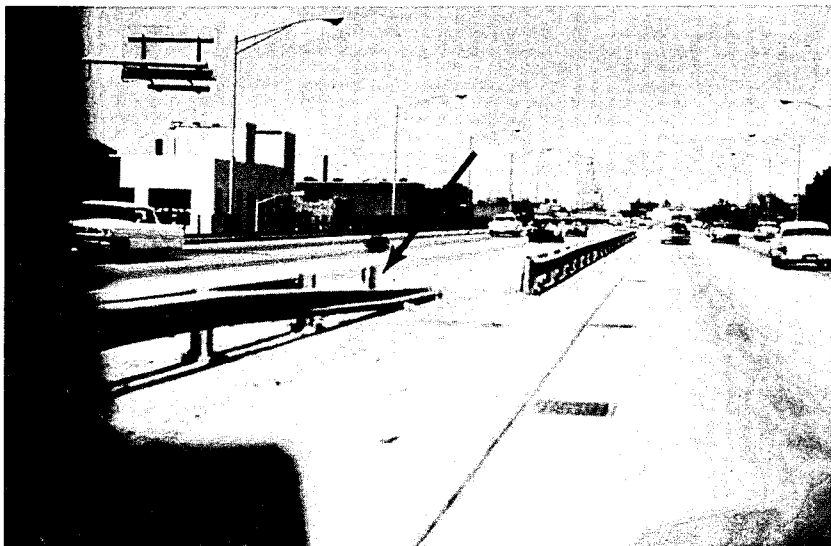
Or you had a choice of putting it inside the center, like this, where you have a sliding action on both sides. But most of our signs are not put in areas like this.



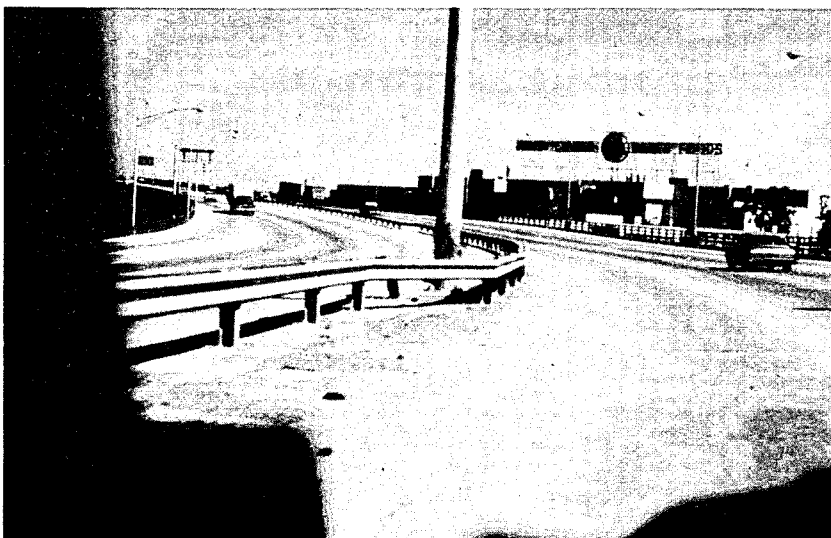
Even in a particular case like this, they should never angle it out at the severe angle that you see here, because if happens to slide along, that severe angle may throw you back into traffic. They should not angle that so you slide out into traffic.



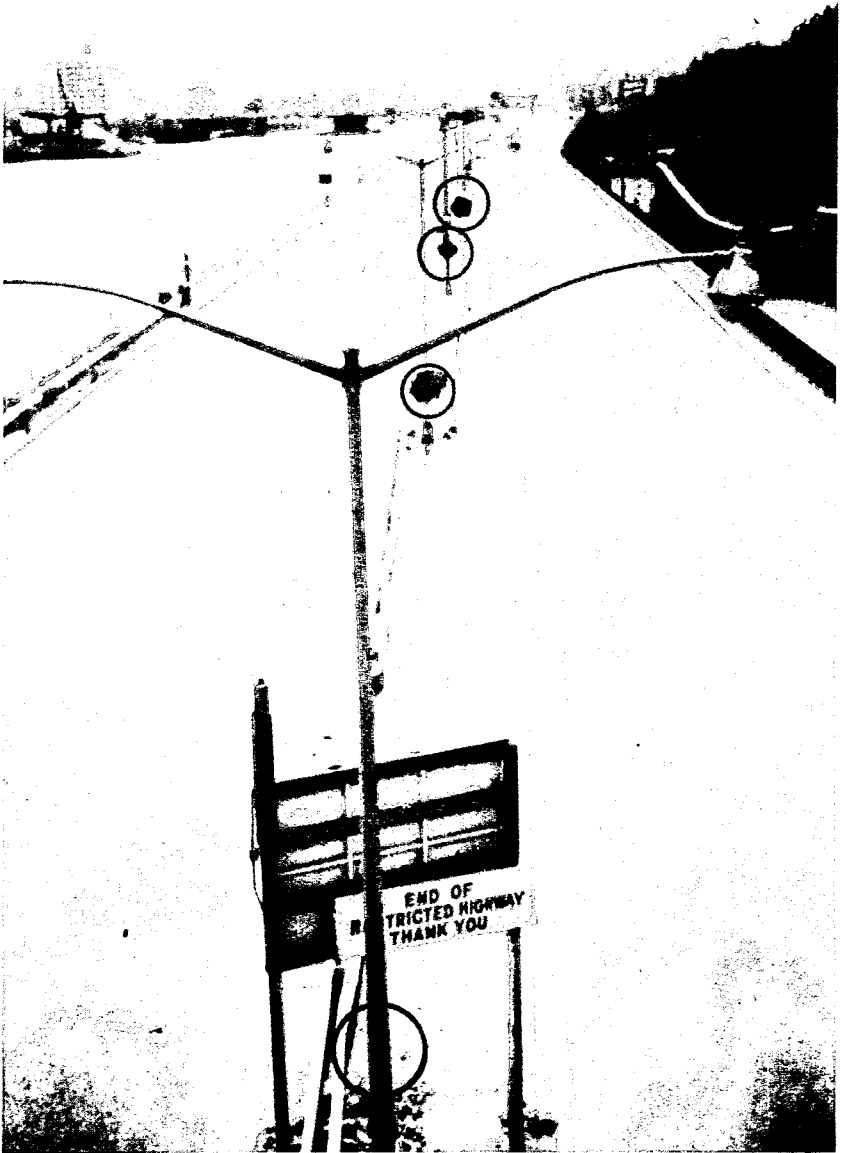
We have failed; this is the damage you see constantly; people running into this—unnecessary damage.



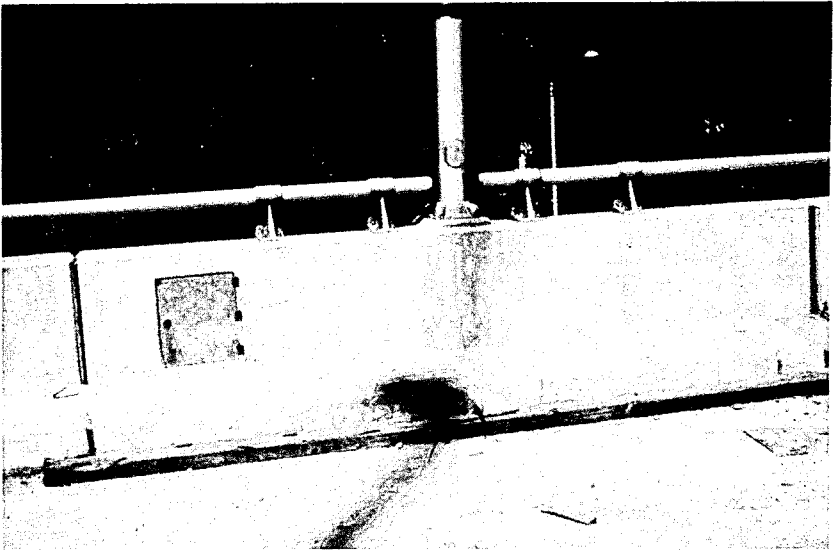
Here you see a pole. Notice the truck in the background. If he comes down and rides along that rail, it is impossible not to hit that pole. All the forces are against him. You have gravity, and centrifugal force to throw you right into that area. It is impossible to steer out of it. If the guardrail were installed properly here he could be guided right past it. We have failed in hundreds of locations on our highways to line up this guardrail properly. It would not cost any more; it is just that nobody is thinking about the problems created.



Here you see all these light poles are targets. They are sticking right out. Actually they are designed to be hit if you really look at them. You cannot help hitting them, because they have not been put inside of the center divider.



They should be put inside of the walls, or on the top like this. You cannot knock this down ; this is much better.



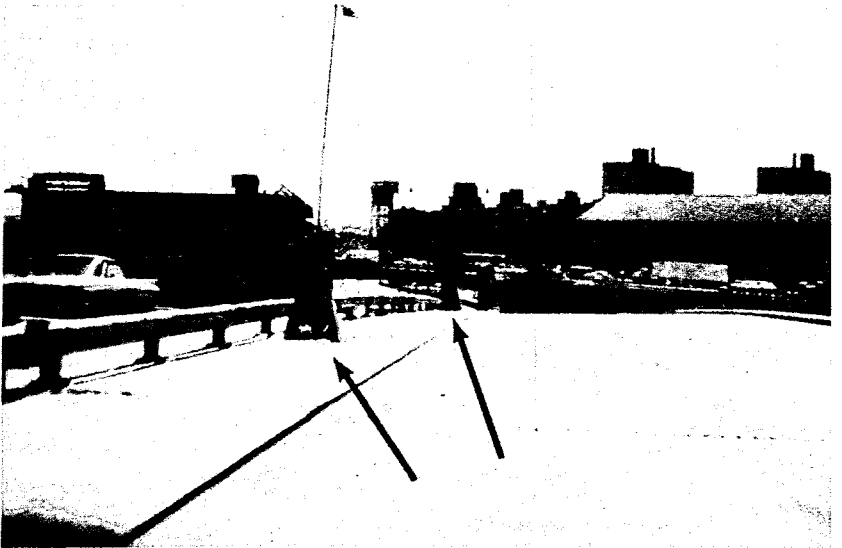
If you look on the right, you can see that is a good job. But on the left in the center this is what you will see. You have the lights lined outside



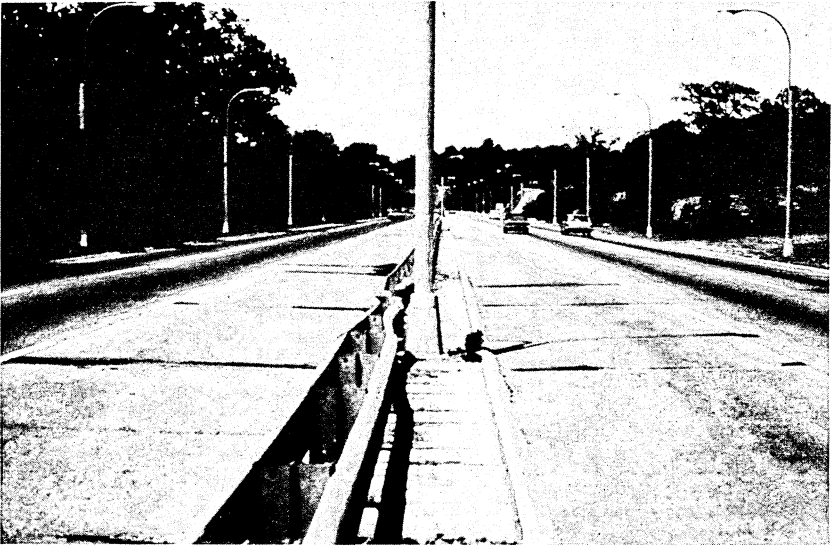
with the guardrail and these are the ones that I told you about. I counted hundreds of them hit every year; they are constantly being knocked down.



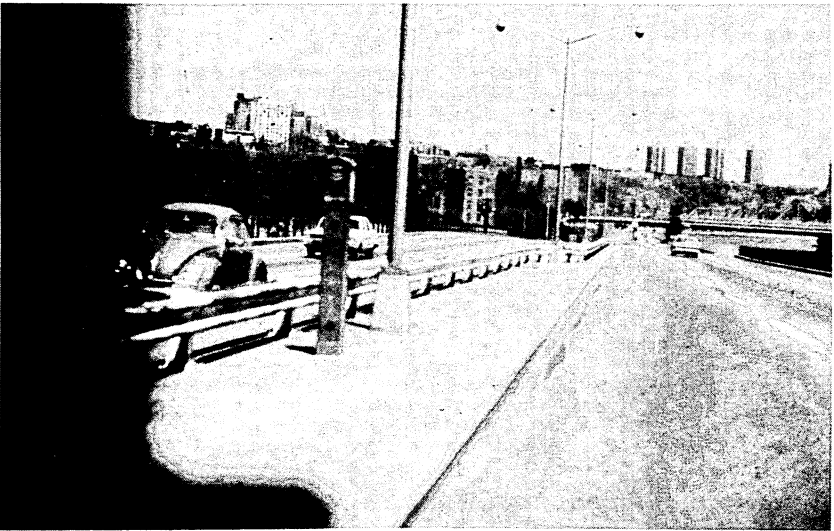
These have been knocked down; they have temporary bases.



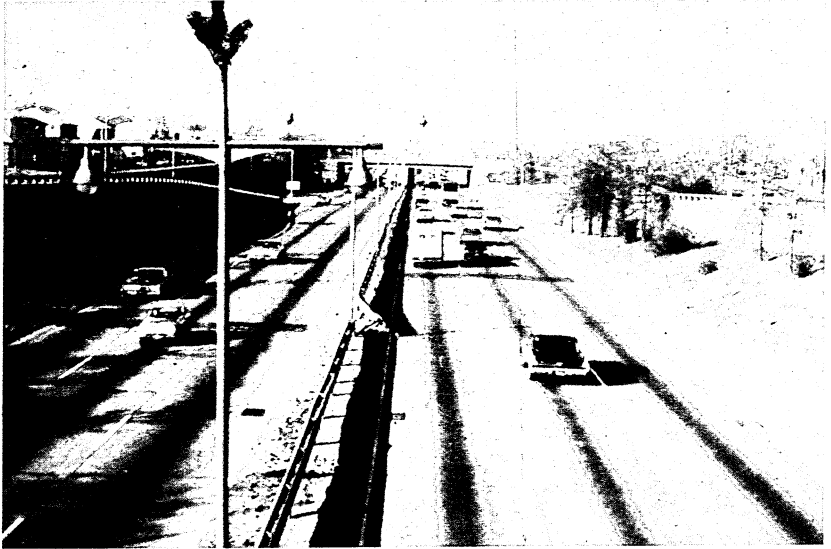
Here you can see half the job again.



Not only the lights; you have fire alarm boxes there also.



Here you can see, we do not tie the guardrails together but we leave open spaces between the lights. As a result we have constant damage to light poles and unnecessary damage to cars that hit these rail ends. You can see that rail end sticking out where the dot is, lined up for the next car. If one hits it, it is in serious trouble.



Here you see a rail that went right through a car. This is the typical result when a car hits the end of the guardrail.



Somebody pushed that in. With the height of that guardrail end the way it is the next guy who goes through there will have the rail go through his windshield. And as I said before, it takes them a long time, as much as 2 years, before they get around to repairing some of these. This is an invitation to death.



Maybe in a manner like this.

I have not the many pictures other people have; I just picked up what I could. But the guardrail could go through just like that.



Here are two more views of what you will see all over our highways. All you have to do is just tap these a little and they become great hazards. We should go back to every one of these locations, install a piece of guardrail, and bolt it to provide sliding action.

Mr. W. MAY. Mr. Linko, you suggested earlier that in New York, when a situation like this happens where the guardrail is pushed over and the light pole is knocked down, you get good service repairing the light pole; they come back and put the pole up?

Mr. LINKO. That is right.

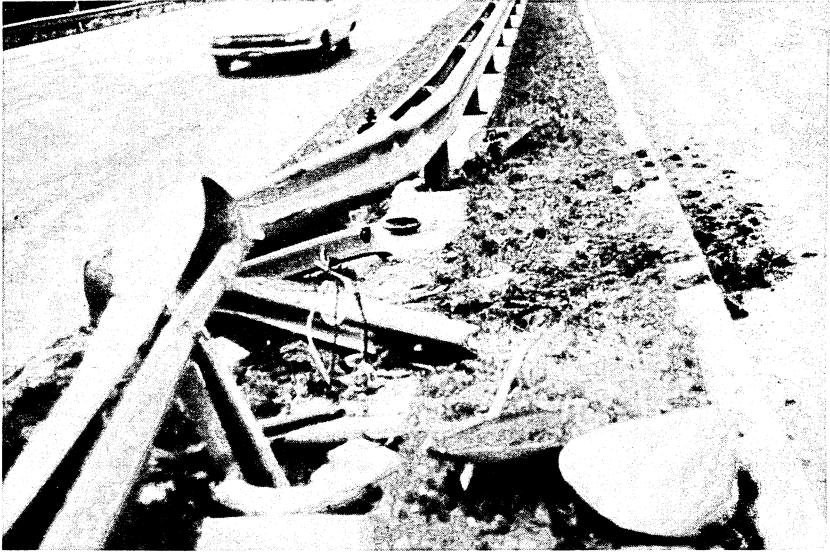
Mr. W. MAY. But the guardrail might stay in that twisted position for some time, and without timely maintenance?



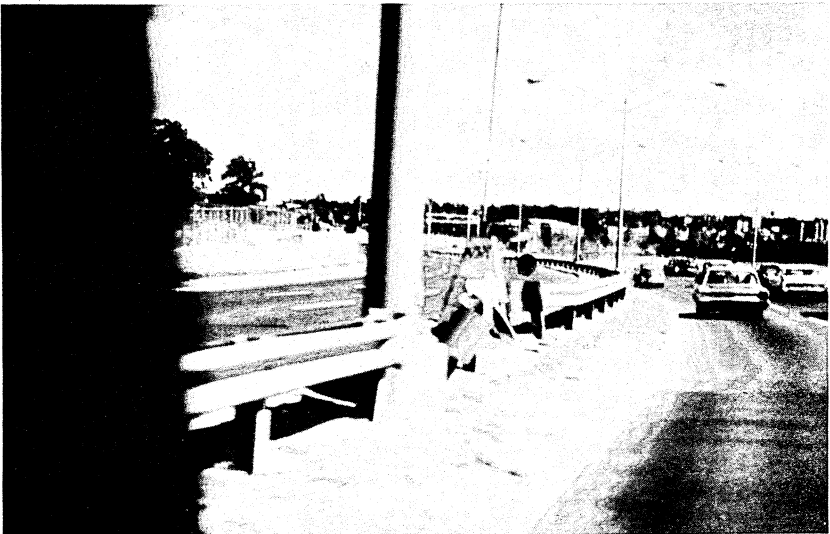
Mr. LINKO. In this particular case, it was only a week, but I have pictures pointing out where these guardrails have not been repaired for 2 or 3 years. They are dated ; I have proof.

A lot of guardrails have no service for 2 or 3 years. When there are enough of them around that have been banged up, a contract is awarded to do them all.

I feel it is more important to fix the guardrails at once than put the light poles up.

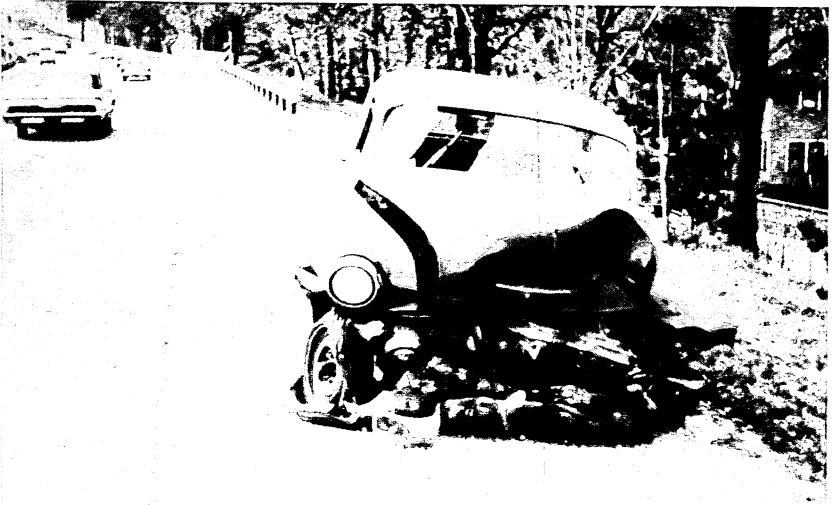
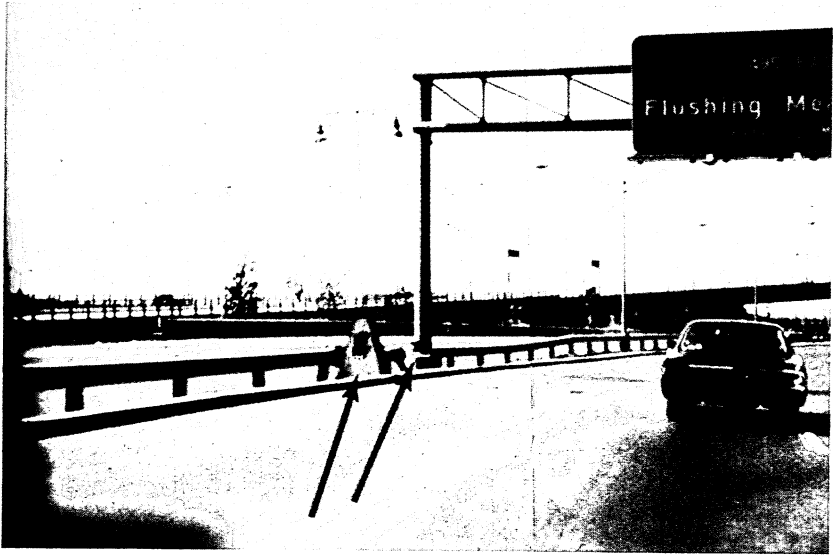


And this is what happens when these things are hit. The light pole will go down anyway and the guardrails are sticking out.



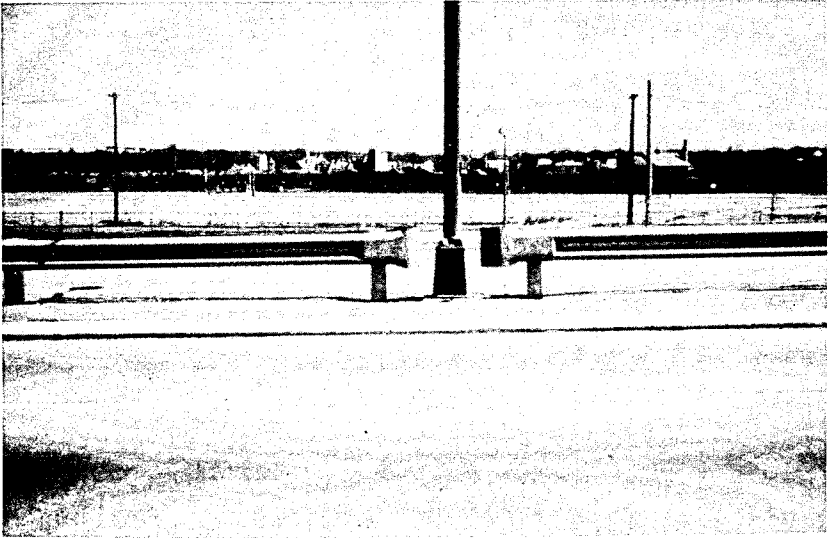
Here you have two targets. I feel we should go through all of these places and install another piece of rail on either side to provide sliding action. It might help save some light poles, and I am sure it will keep you from slamming into these ends and bases and give you serious damage.

Because these ends are not tied together, all of this unnecessary damage is caused. If it was done the right way you could have had a sliding action here.



And here you can see the base sticking out. The rail ends where the dot is. Someone slammed into that and knocked down a light pole.

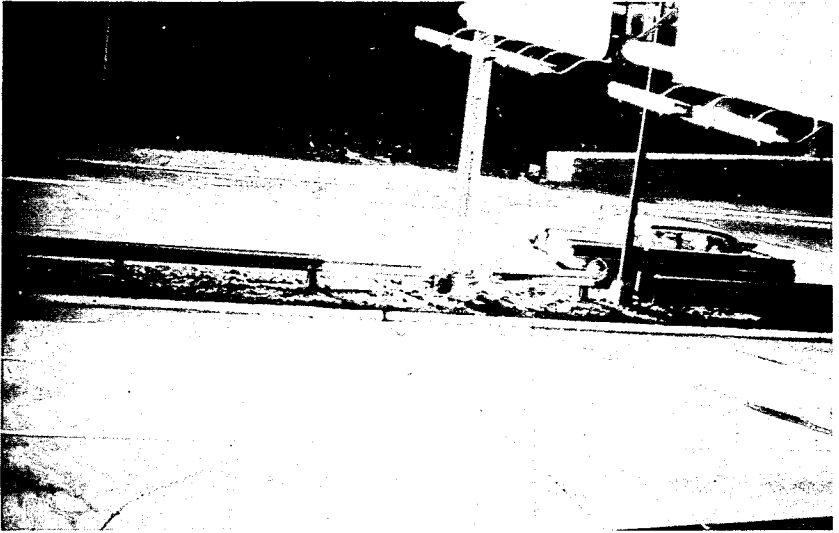
Because you do not have continuous rail to utilize the full strength of the steel railing, we get a lot of unnecessary damage and the light poles are going down anyway.



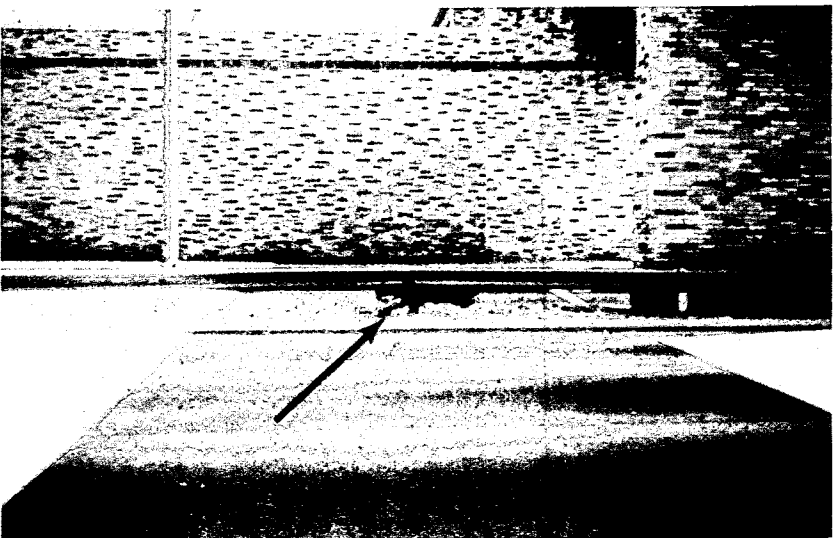
This is what I am talking about, you see. That seems to be the standard installation.



What makes me mad is when I see this. This is a repair job. The rail was damaged and they came by and patched this thing up. All right, so they made mistakes in the past. They did not know any better let's say. But this is what they are doing now, see? This is a brand new work and it is brand new money, and they put it up in sections. Anyone riding along that rail will hit that concrete stanchion, or guardrail end, or light pole because they are still sticking out. I feel it is inexcusable to do things like this.



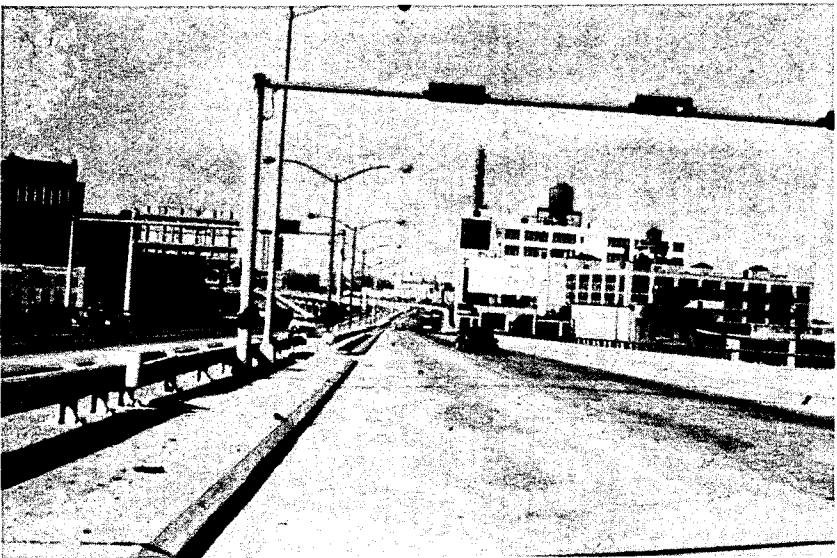
Here you see a part of a bumper ripped out on one of these posts which hold up the guardrail, because they did not block the rail out from the posts and the car got snagged.



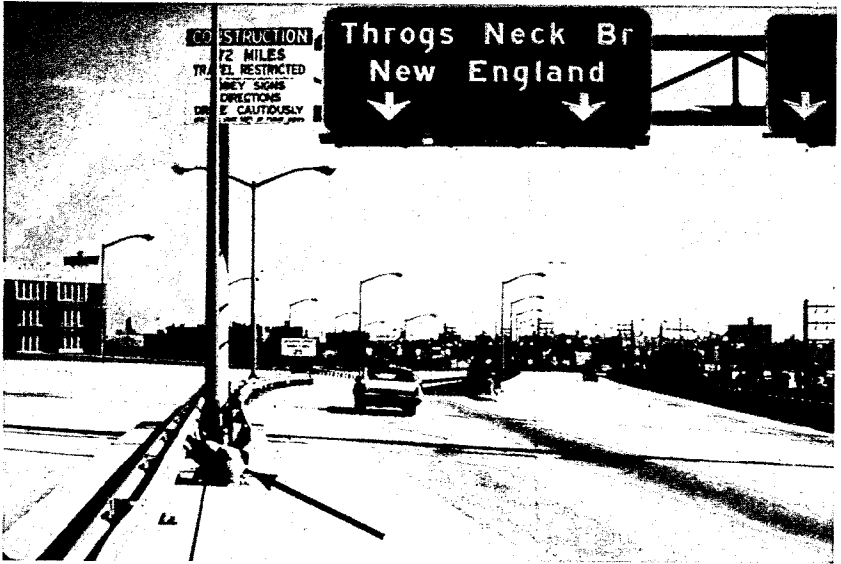
Now, this is the proper way to install these lights inside the center guardrail. This shows we know how to do it. We have to get to it. Wherever we messed up in the past, in some way the money has now got to be supplied fast. Actually it will pay for itself because of the current damage to these poles and the constant knockdowns.



Here you see, on the left side you have a heavy sign support that can stop you dead and split your car in half. Beyond it is a light pole on this side. These could have been placed inside the center rail and the hazards eliminated.



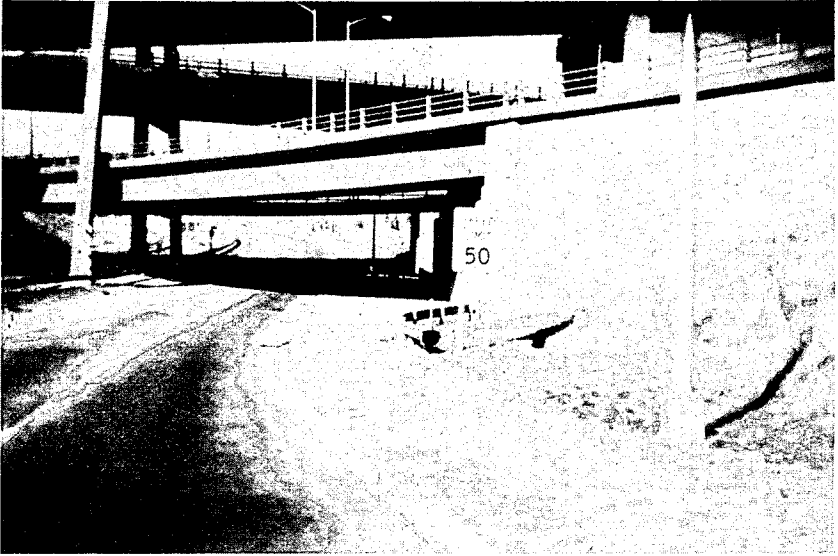
Here also it was not bolted to the railing. Even though it was near it, that means nothing. You have to phase it out, and bolt it to the railing. Instead of getting a scratched fender, a car is badly damaged.



This is what you see. The material is there, but installed wrong.



Here you can see on the right-hand side where we robbed 15 feet of the shoulder area that could be used by the motorist, if needed. As it is anybody can get behind this guardrail. The guardrail is there to protect the bridge abutment, but you can ride behind and slide right into the wall. The guardrail is installed wrong and is using up some of the space that belongs to the motorist.



Here you see a guardrail that could have been phased right to the wall to provide sliding action, but this seems to be standard practice in New York to leave that section there to hook onto.

(At this point, Mr. Blatnik resumed the chair.)



Mr. LINKO. Everywhere we look we have failed to provide sliding action. We are wrecking cars, rather than scratching fenders.

Up ahead at the underpass you can see where the rail was phased into the wall. However, see on the right where they didn't protect another hazard.

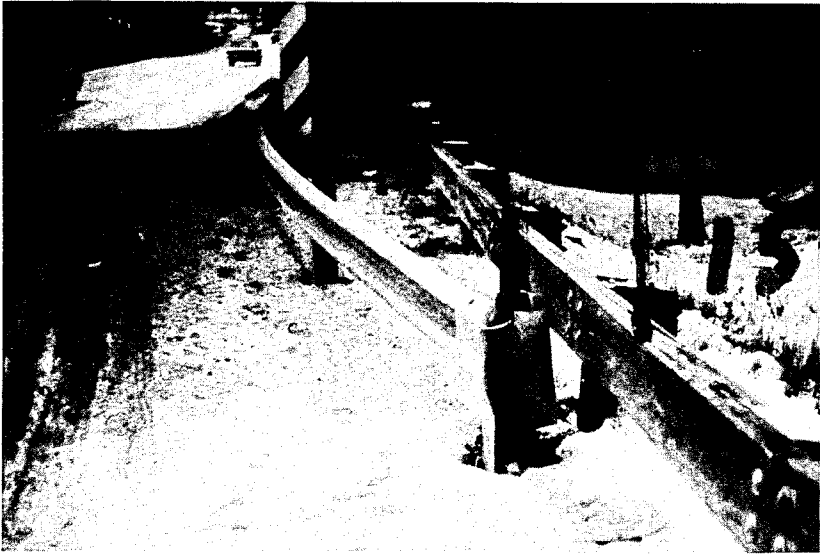


Here you see a place that has been hit. It could have been a scratch, but because of this it wasn't.

By the way, this particular installation has not been repaired for about 6 to 8 months. Once you hit it, it lays around until a big contract is given for an entire section.

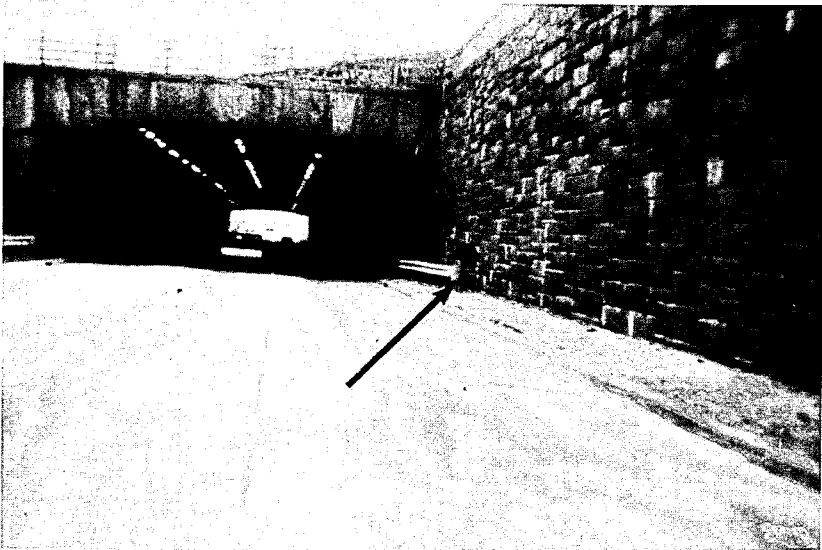


This points out if you bolted this end to the board, a car could slide by. But that 15 inches is enough to grab it.

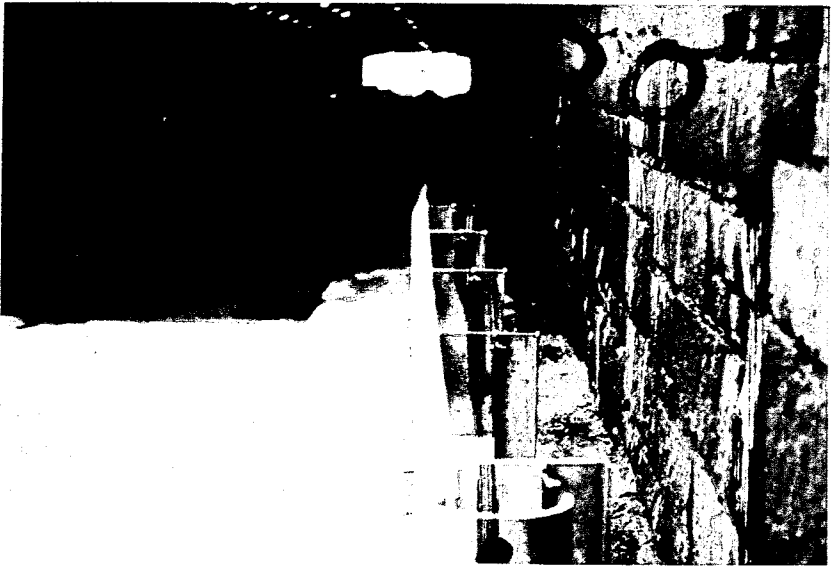


If you look at this, riding along you think it is a good job; but I went up and took a close view of this.

First, let me point out there is an offset, or bridge abutment, that is not needed. This is a depressed highway and you should not need or have such abutments on depressed highways.



In trying to make up for and protect a 15-inch abutment, the guard-rail put there doubled the target; now it is 30 inches out. There is a lot of guardrail that cost a lot of money there, and actually there is more chance of grabbing onto it than you had to begin with.



These are half jobs and I am trying to spotlight them so we can get on the right track and do it right.

A hazard like this should be phased out into the wall, and bolted to it so you do not have damage and can keep going.

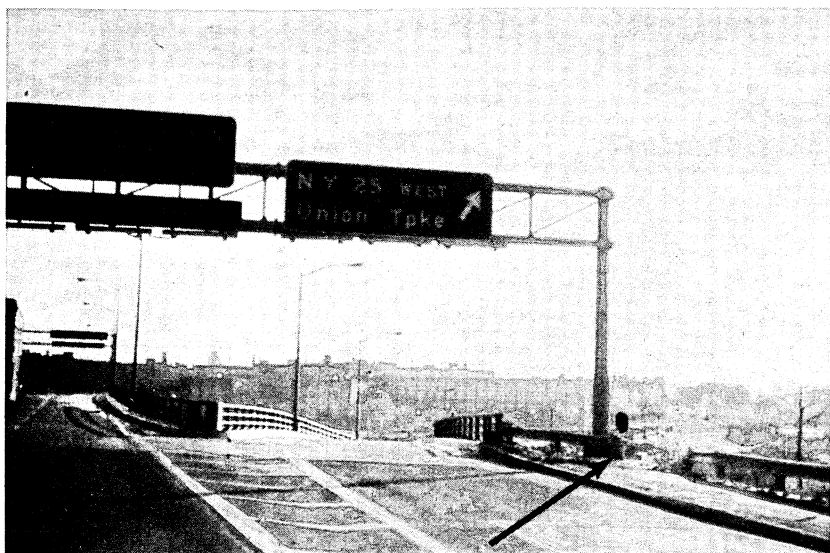
Everywhere you look, you will see where we have no sliding action. Look at the end of this guardrail staring at you. Also there was a



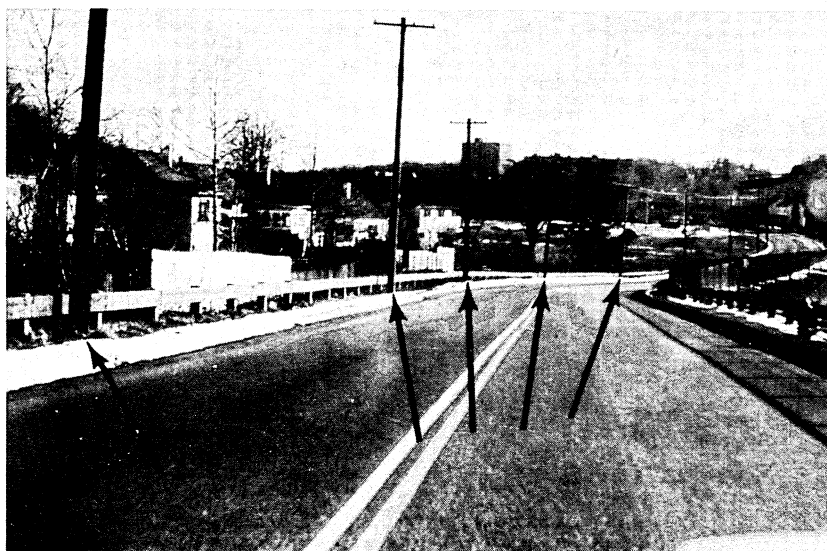
gap between the rails up by the light pole and they came along and put a short piece in behind the existing rail—what good is that?

On the right, somebody busted right through there, because there were two pieces of rail which were not tied together. There should have been one continuous stretch.

Here you see some telephone poles in front of guardrails. You can say why did somebody do that? It looks silly. Someone might say



that maybe the property behind that guardrail belongs to people who do not want them there. Well, I thought of that, so I took this picture. There are many poles here.



The property on the other side of these poles belongs to the State, so that is a poor excuse. They just are not thinking. Anybody sliding along these rails will come to a dead stop.

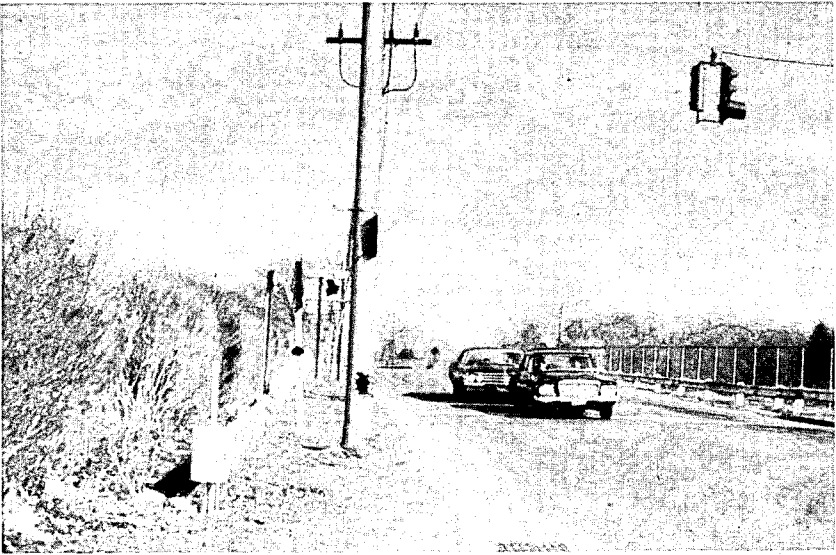
Thousands of people are being killed and injured every year running into telephone poles and light poles. All you have to do is read the papers. And we are doing brand new jobs just like this. We have the material there to do the right job but we are putting the poles in front of the guardrails.



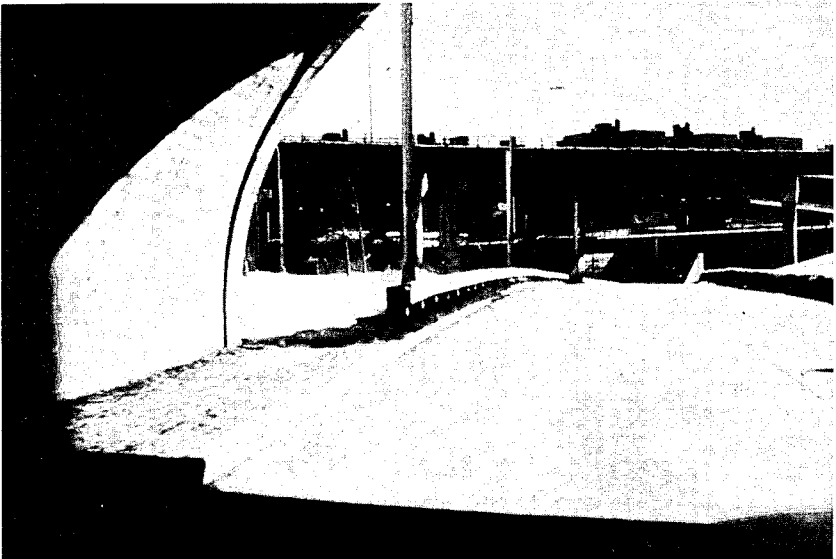
There is another location. This is silly.



Now, this is a steel pole, 14 inches in diameter, that will split you in half. There is a guardrail on the left and there is a whole bunch of trees back further in the picture, but you barely see them. Every one of these is in front of the guardrail.

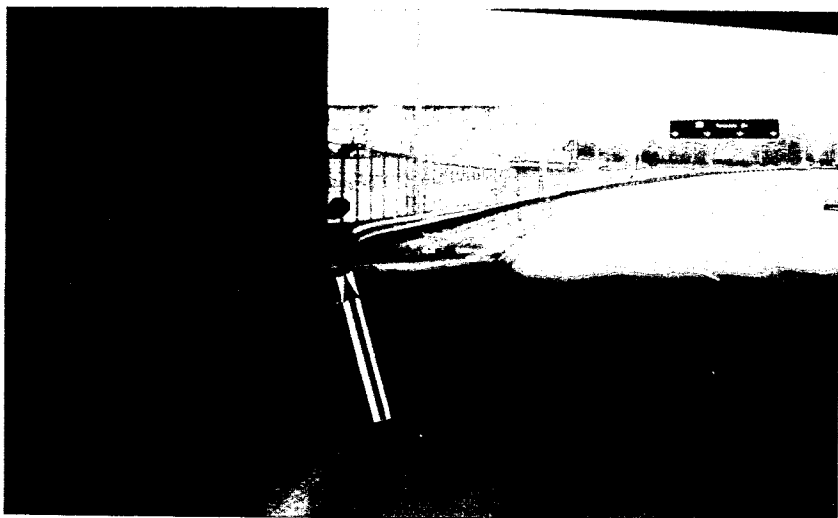


There must be something wrong when you see things like this on the highway, especially on new highways. All of these guardrails are installed wrong.

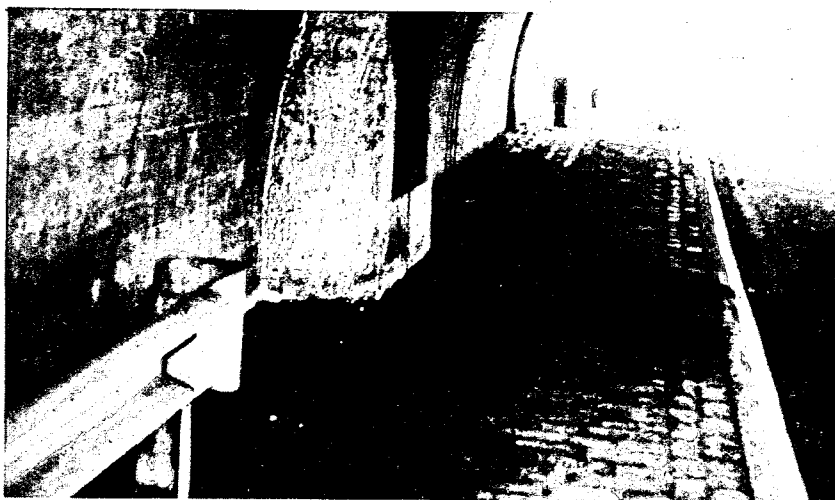


To provide a sliding action, that rail should have been behind the wall instead of the end sticking out. These are just plain wrong and are going to chop up cars for no good reason at all. The material is there to do the right job.

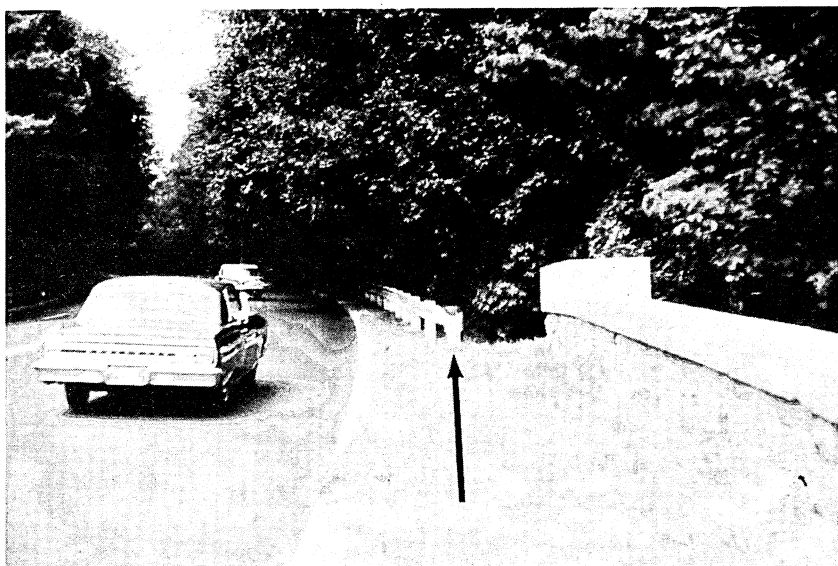
I want to say again, 90 percent of the stuff I am showing you has nothing to do with money at all. It costs less money to do it, so it has nothing to do with money, and that is an important point. This should be behind the wall so you cannot hit it.

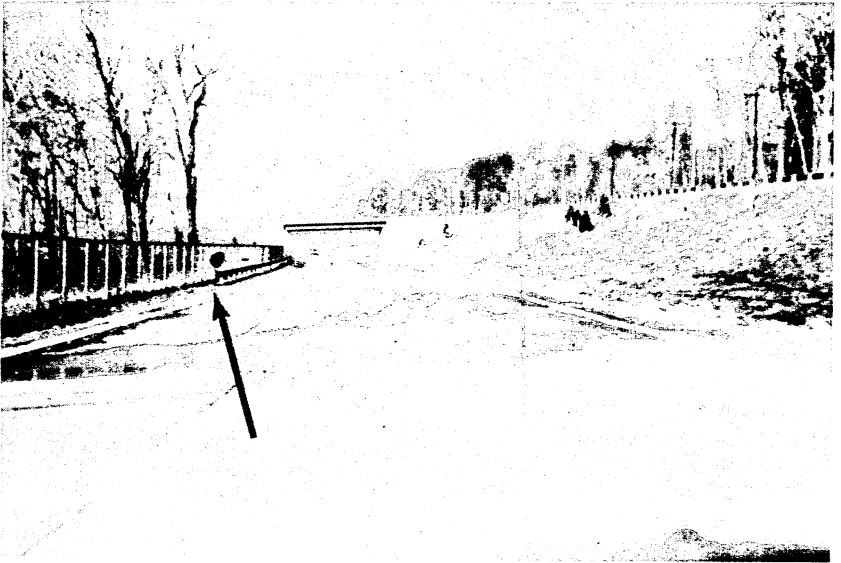


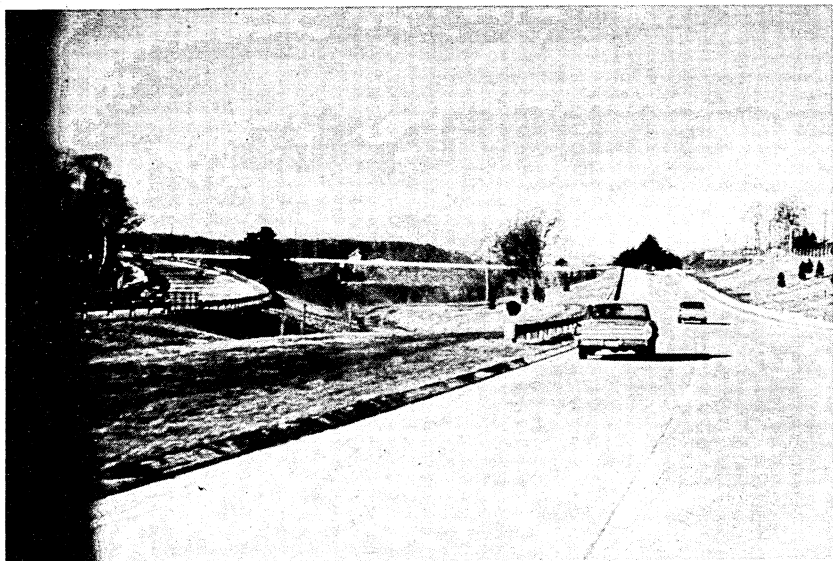
This should be behind the wall. These are designed to stop you. Not only do you damage your car, you damage the rail, and we have to pay, pay, pay—for no good reason at all. Next I have a series of slides on rail ends.



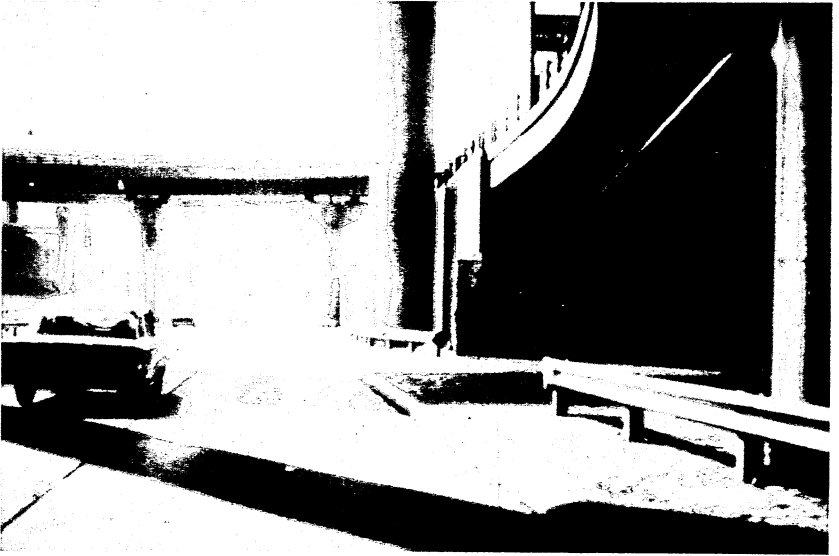
All these rail ends should be buried; these are dangerous.



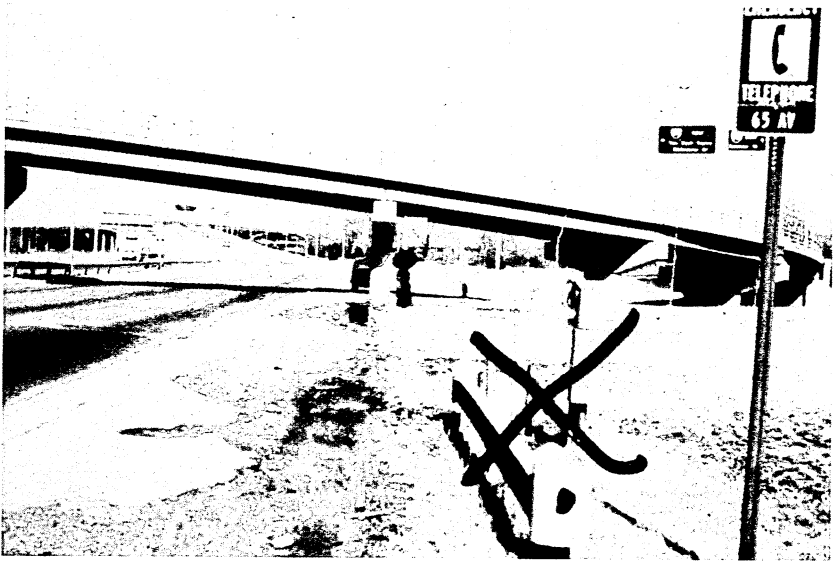




Here you see they stopped the guardrail where you needed it the most, right at the bridge abutment.



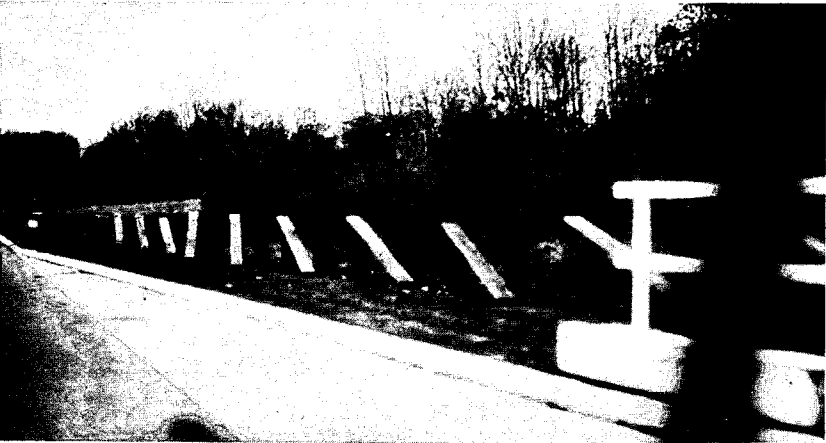
Here you can see the guardrail protecting a firebox that could have been put at the bridge abutment there. You can use that guardrail to protect the bridge abutment. There is none there.



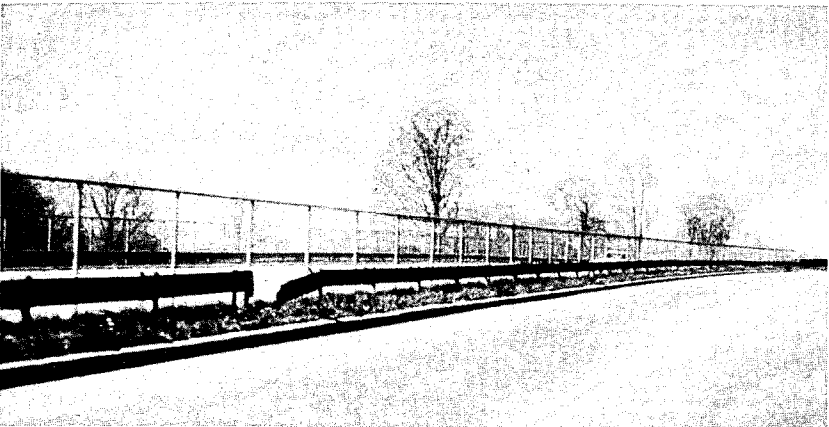
This rail is too high ; it will go right through your windshield.



Here, wooden planks are being used on a brand new parkway in our area. This is 1966 or 1967. The speed limit here is 50 miles an hour. These wooden planks cannot hold back a car.



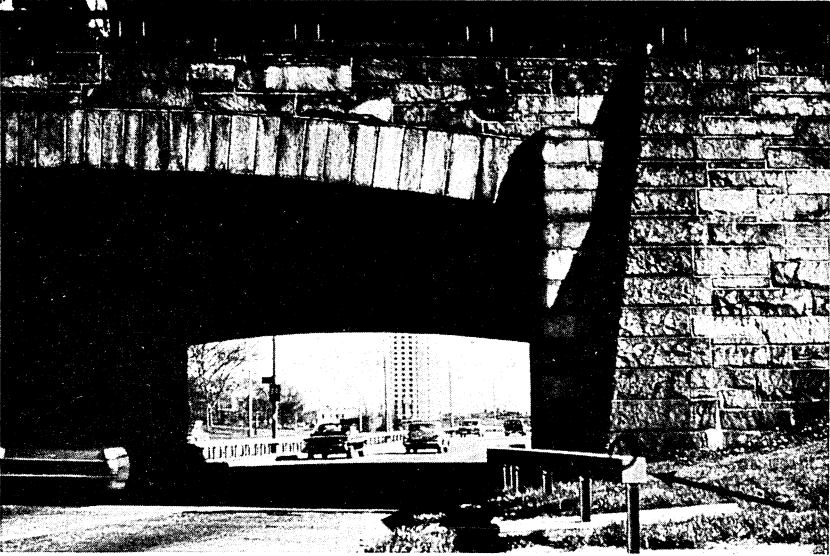
They will split off. If you do not believe me, here you see one.



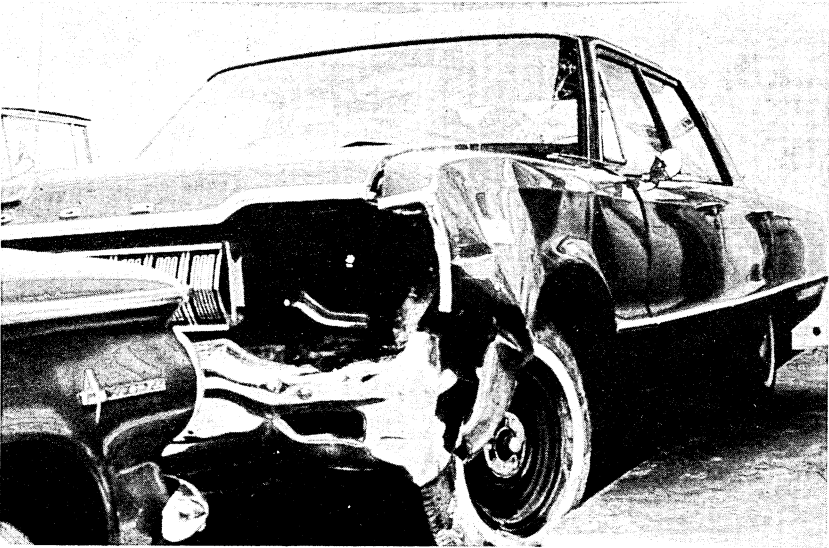
Here you see a post that is 15 inches in diameter. Disregard the rotten pole, the second one. You should put a weaker one in the front there to give a guy a chance to knock it down instead of stopping him dead.

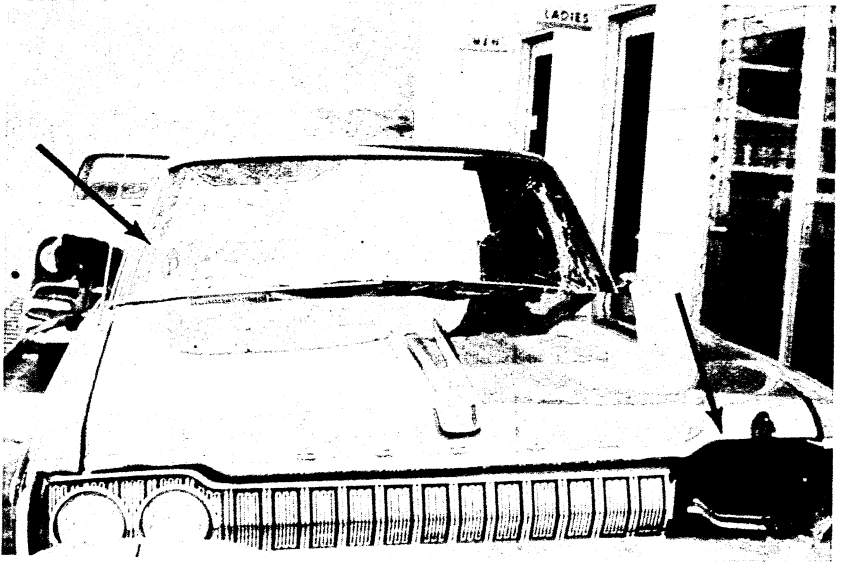


Here you see the brandnew square-type box beam, the best rail we have and I think it is good. They call for burying the end, but because the end is sticking up like that, a car can run right through it.

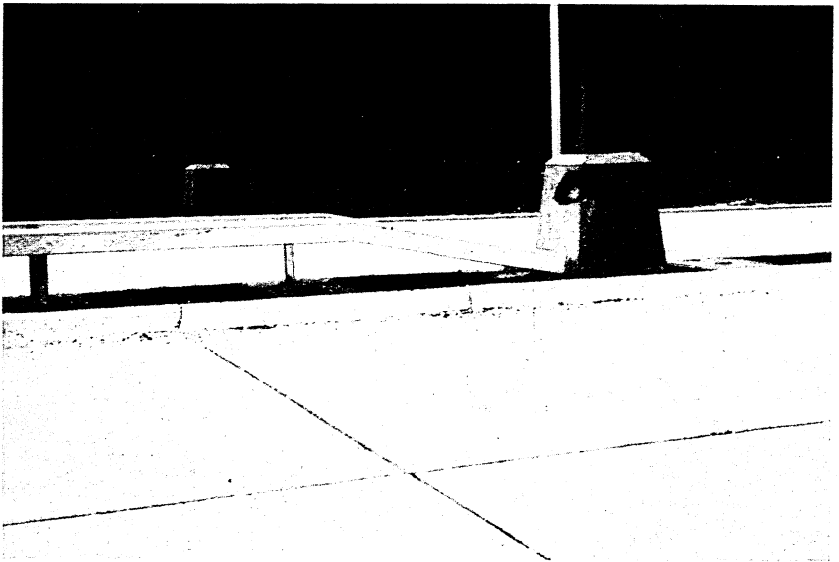


Here you can see where a square beam went right through this car and came out on the other side. This driver was lucky; it went right by him. Maybe it will go through the next guy. And this is very new work.

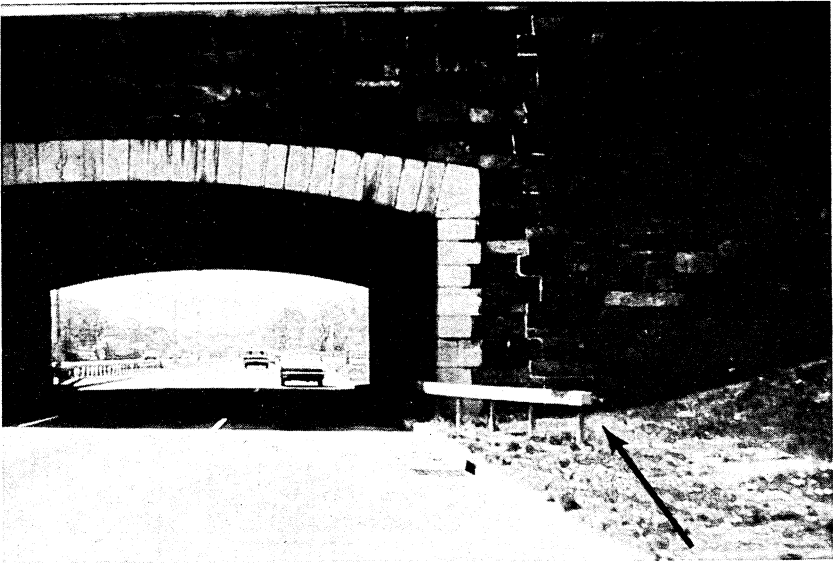




When are we going to learn? Here, they tapered the box beam rail down to the ground which is what they should do ordinarily, but not at this location. If you drive along this rail, you are going to hit this base.



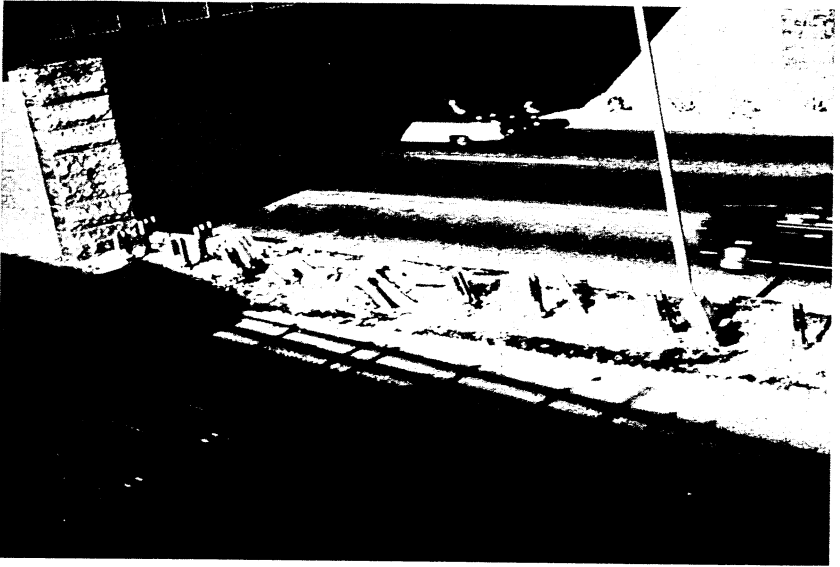
This is what I am talking about. If you get up on that shoulder, you will head toward that abutment, but you will never reach it. You will be killed first by that railend.



This is about maintenance. There never used to be a guardrail at all of these abutments so they later decided to put in a guardrail. But it takes many months and I feel it takes too long to finish the job. There should be more consideration for the motorist. Here you see where they started to install a new center rail.



As fast as they put up the material, before they even finish the job, the cars are running through and damaging it.



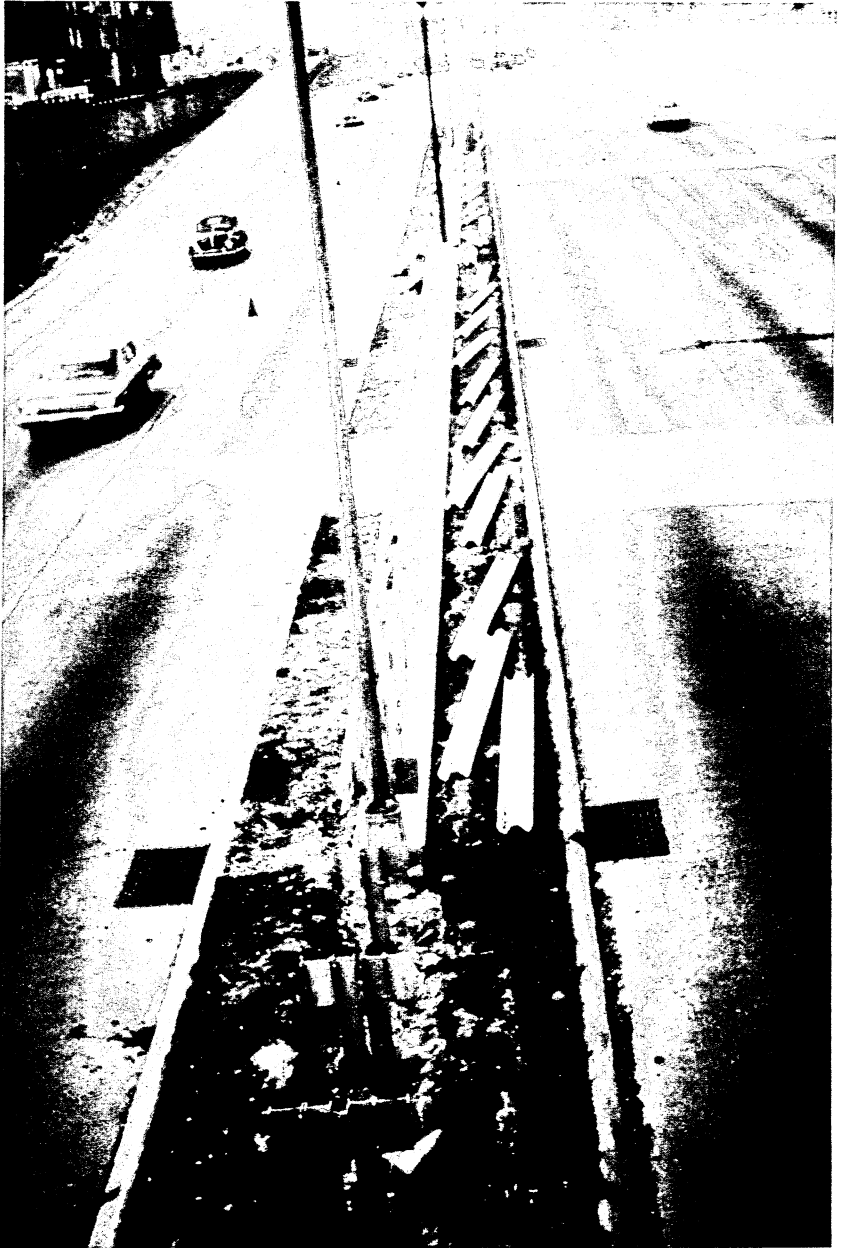
Here's another area where they are breaking right through.



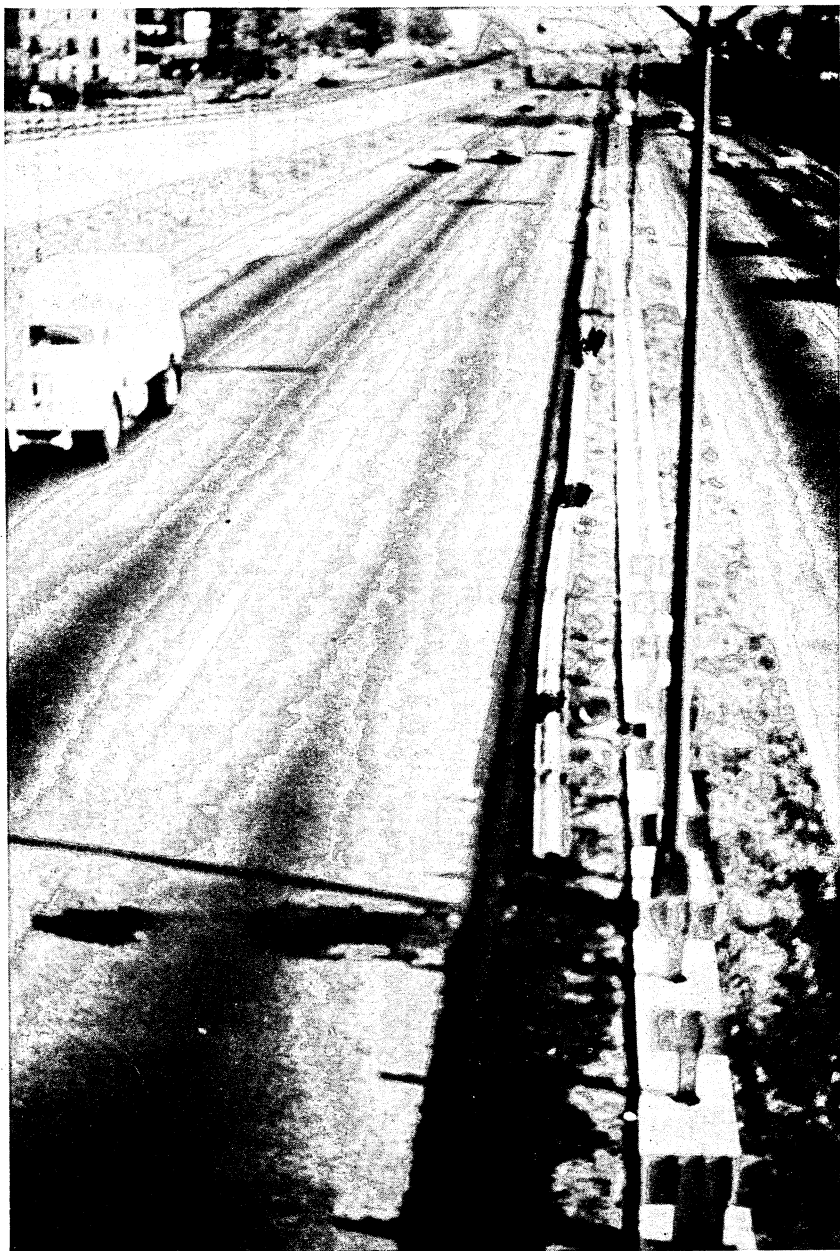
This shows the urgency where these guardrails are needed. The maintenance people are getting mad. They are knocking down the posts before they can install the guardrail.

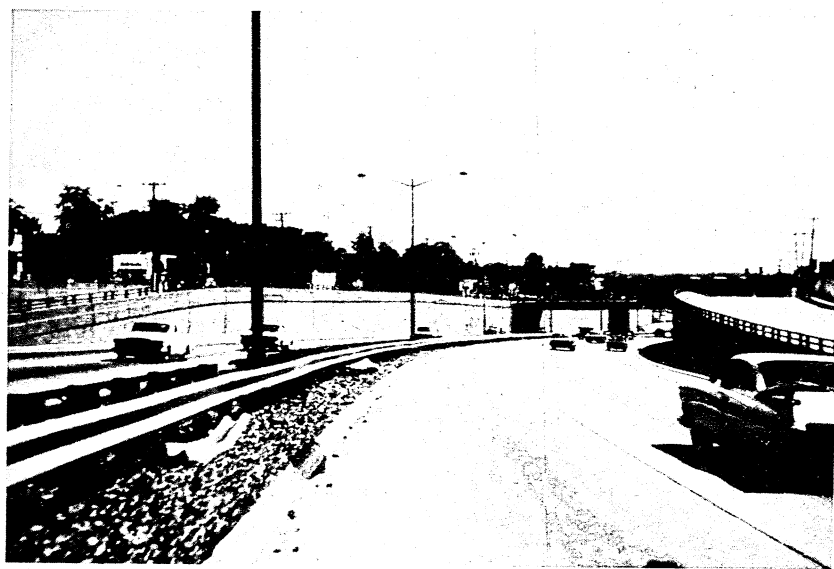


What they do, they place the beams along the side— to discourage the people. If you get tangled with these, you get in trouble, but they want to keep you off there. They are not really thinking.

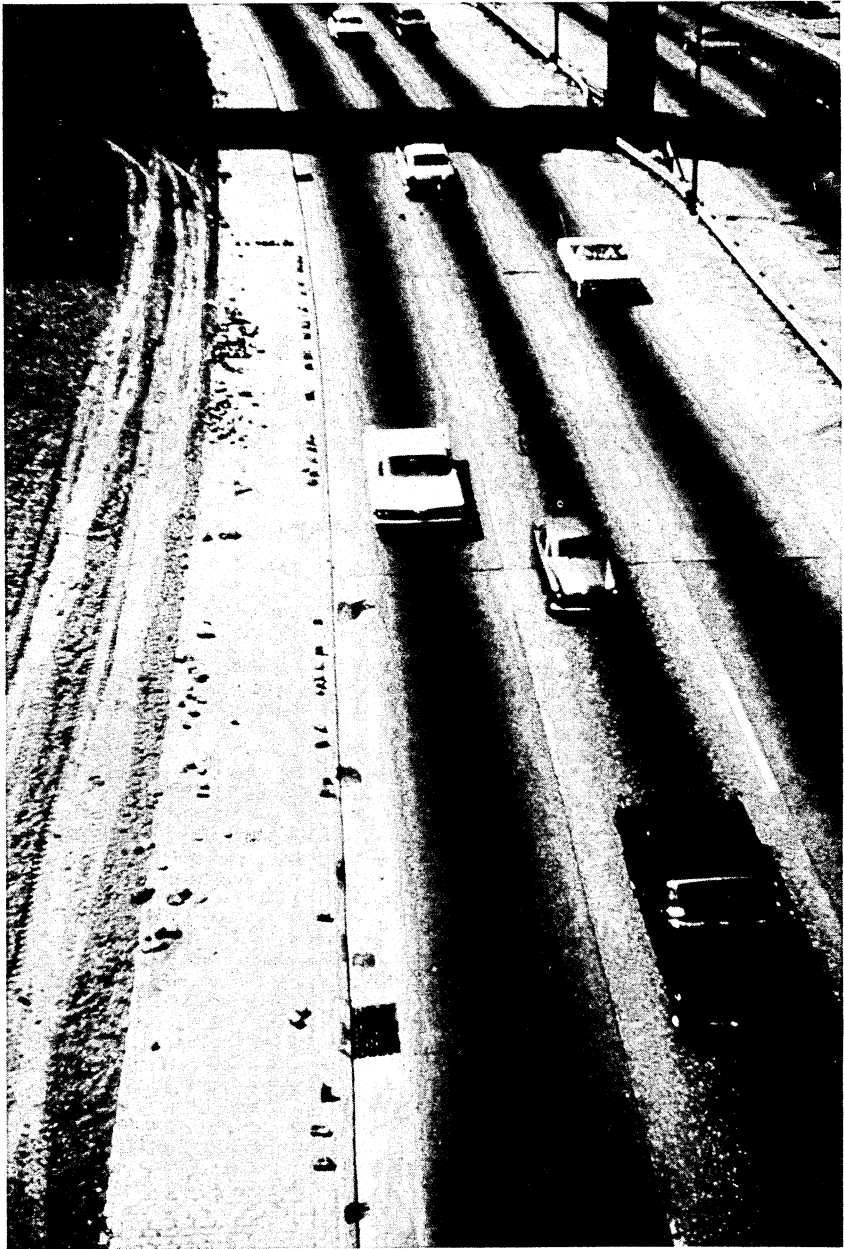


These are hazards when you tangle into them. I feel we should regulate construction jobs to cut out these unnecessary hazards.





Here you see these small bricks or cobblestones. They measure 8 inches by 7 by 6 inches, and they are used to divert traffic. That is exactly why they are using them on this job here.





You can see that if some car hit that area just right it could blow out a tire. This is the way they attempt to keep traffic out of these areas. This is a standard practice.



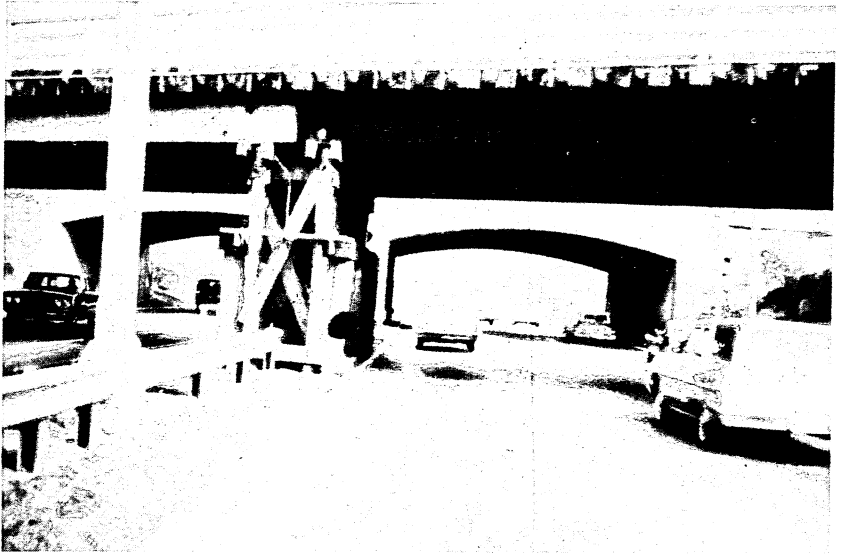
Here you see a job where they have a temporary overpass. The guardrail has been installed properly and a car can slide by this particular obstacle. This is good.



But others are not. Some of these stand like this for 2 or 3 months and provide no protection, they are hazards. There is more hazard now than before they started. They are not using this particular location, this area here; they leave it over the weekend. They should replace this guardrail here to give the motorist a break.



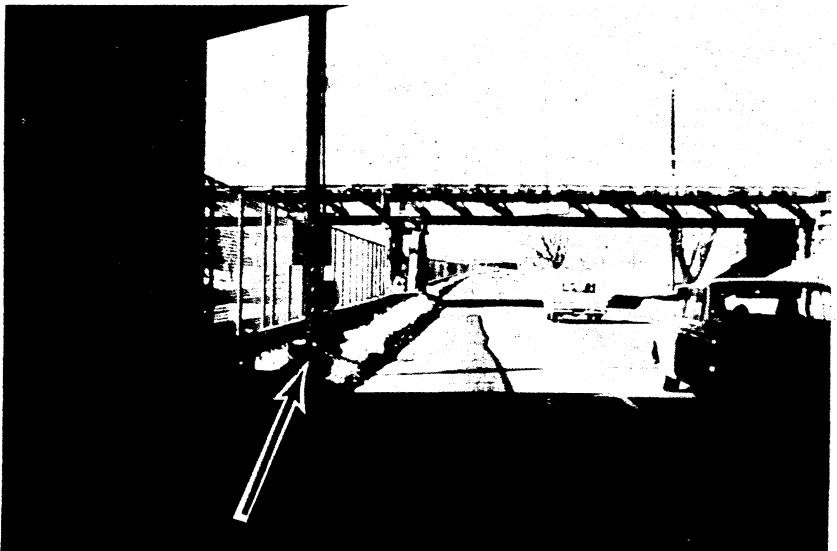
As you see, that is a target right at the edge of the road. All you have to do is deviate a few inches and you hit an abutment.



Here you see a telephone pole, but no marking, no reflector, no nothing.

Here you see a rock that has been there for almost 2 years. The only reason I think it stays there, I don't think one guy can lift it to put it on the truck. But it is a serious matter.

That is a big stone there. Any car running into that is going to have a serious problem. This is an Interstate highway. I understand the

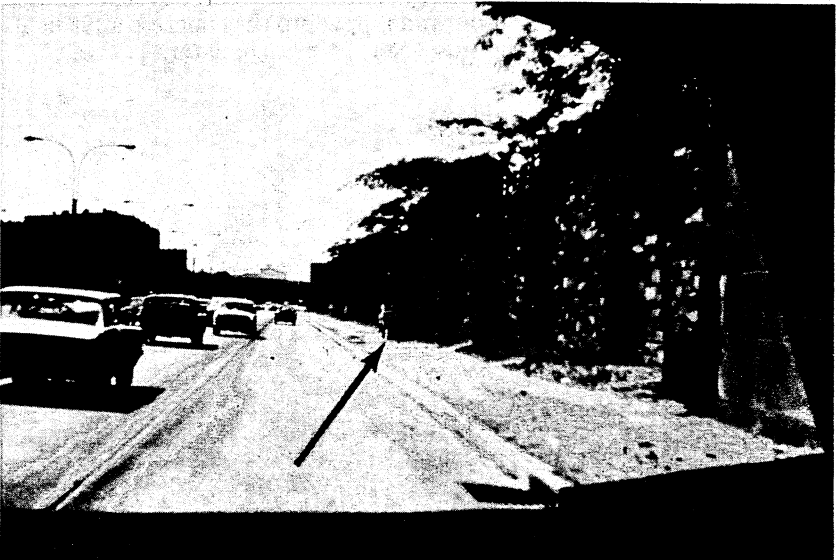


State is responsible for maintenance. But the city is doing the job and the State is not overseeing it.

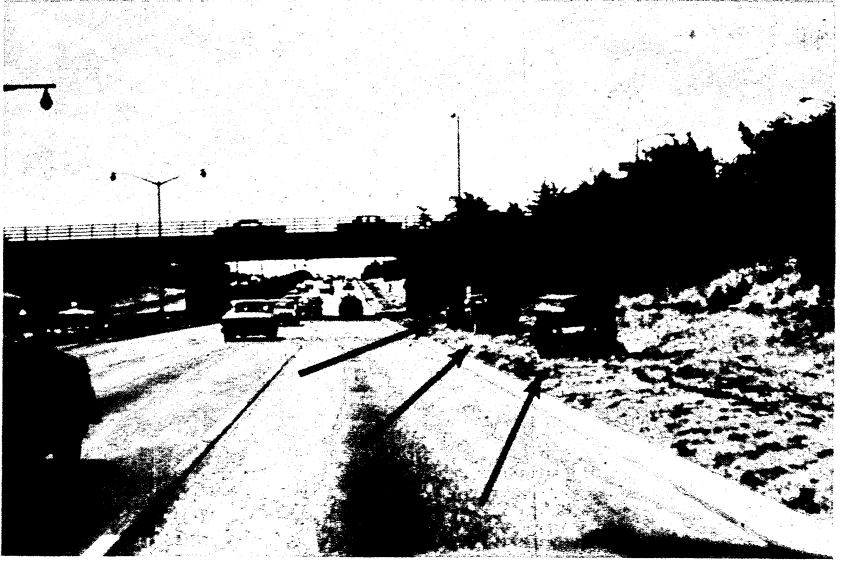
The guardrails are broken and they are never repaired. My slides are dated to prove it. Rocks are laying in the shoulder.



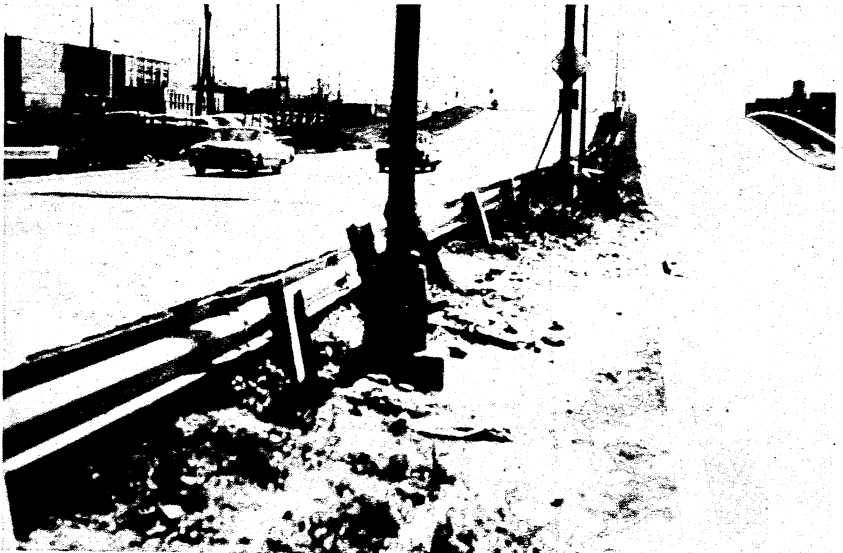
Here you see a steamroller left on the side of the road over the weekend with no markings or anything. Somebody could run into that and get wiped out.



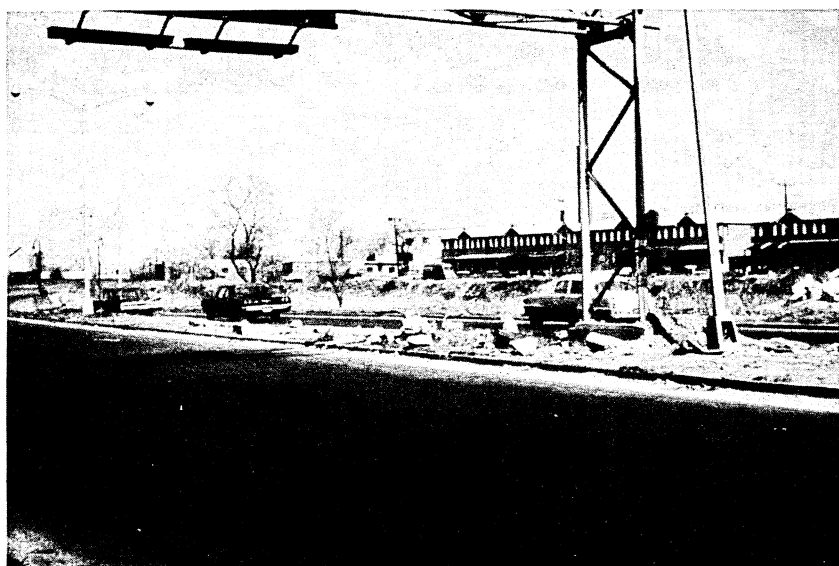
Here you have three separate pieces of equipment left on the road. The least they could do is put them all together. You would have one target. Here you have three separate targets. In fact, the right way is to take them up in front of the bridge abutment and put them behind there so you cannot hit them.



This guardrail is broken—has been for 2 years—and never replaced. Finally somebody came by and replaced it, but forgot to make a double rail and put the guardrail on this side for sliding action. The day they put it up somebody came by and wiped out the section there. They knocked down the light pole and ripped up the concrete abutment up farther. And it is the same way today, 4 months later.

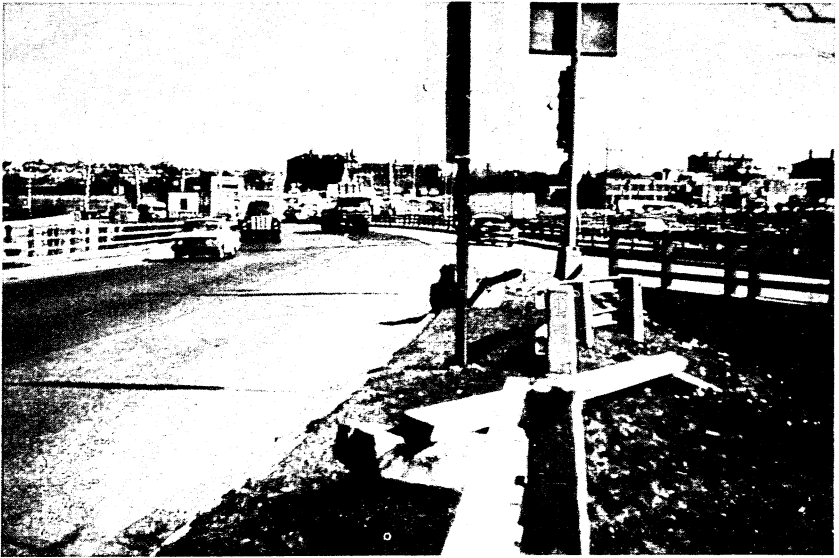


There used to be a guardrail here also until it got chopped up. It has been laying like this for 2 years.



That concrete stump was there for 2 years. They just recently took it away.

I am trying to point out we do not have needed maintenance on this highway. It is in the law that we are supposed to have maintenance. The State is responsible and the money should be withheld; any Interstate money should be withheld from the State unless it oversees this job.



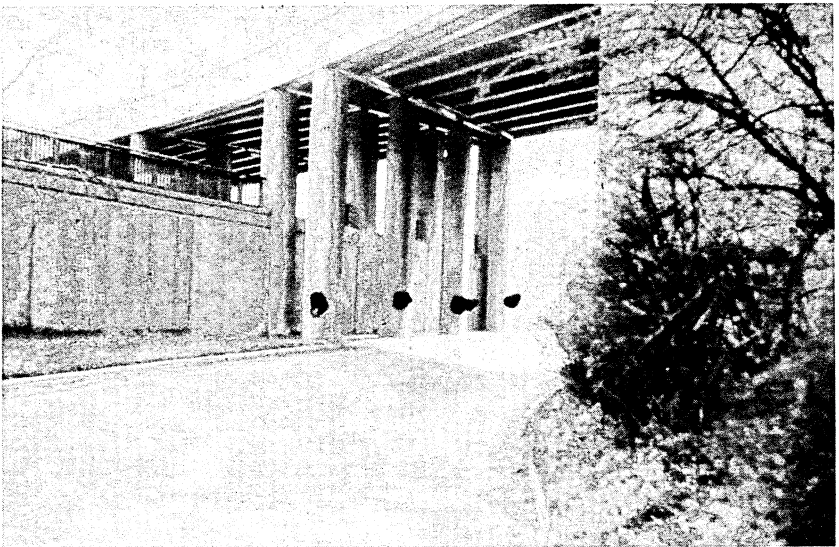
Here you see a pole protected only from one side. It was hit from the unprotected side.

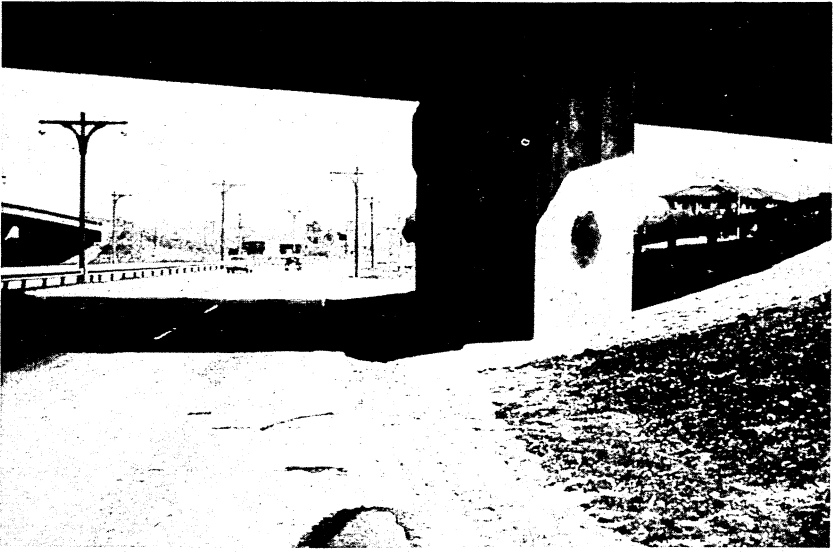


This happens to be underneath an Interstate highway. I feel we created an unnecessary hazard here. Here you see a low curb and many thousands of cars go by here every day. It is a commercial highway and it is in the city. And any car or truck that goes by here, all it has to do is go over that very low curb and it could hit any one of those targets all the way down the line. There are hundreds of them. A 12-inch curb there would give you some protection. The idea is to design the curb originally so you cannot jump it.

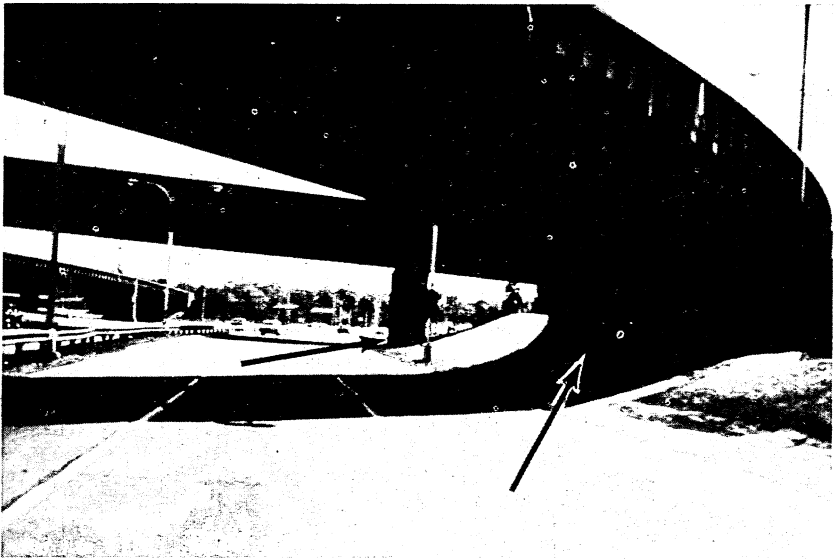


This used to be a safe highway until they put this new highway over it. Now you have the targets on the outside turn.

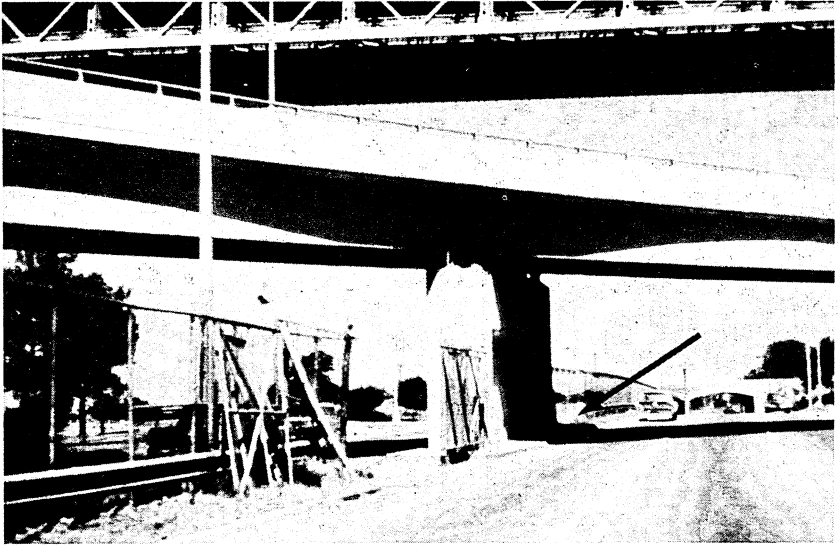




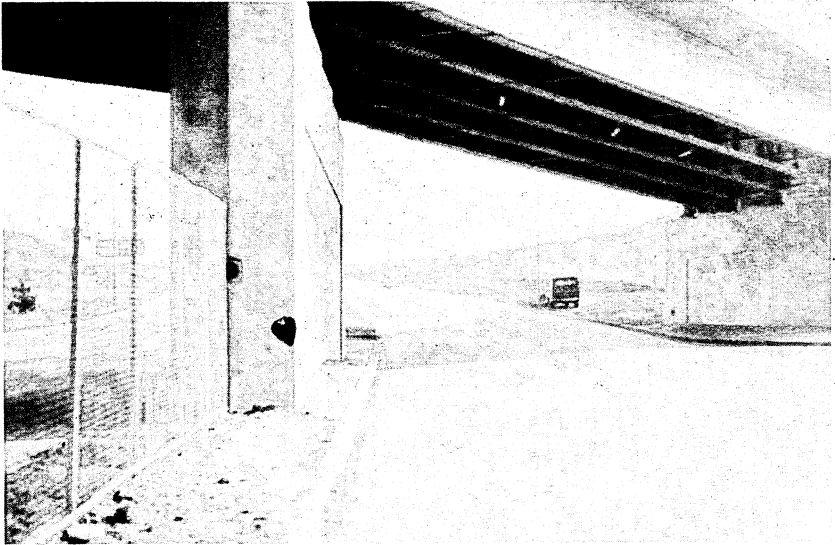
And these. This is new work, and when they do the new work the old road is overlooked.



Here you see a line in the fence in the background. This is a new bridge that is being built on top here.



There is the finished job. There used to be a guardrail here, but now that they have finished the job you have an unprotected abutment. This is a serious matter. If we do any new work, we are going to have to protect it.



Here you see many targets with low curbs.



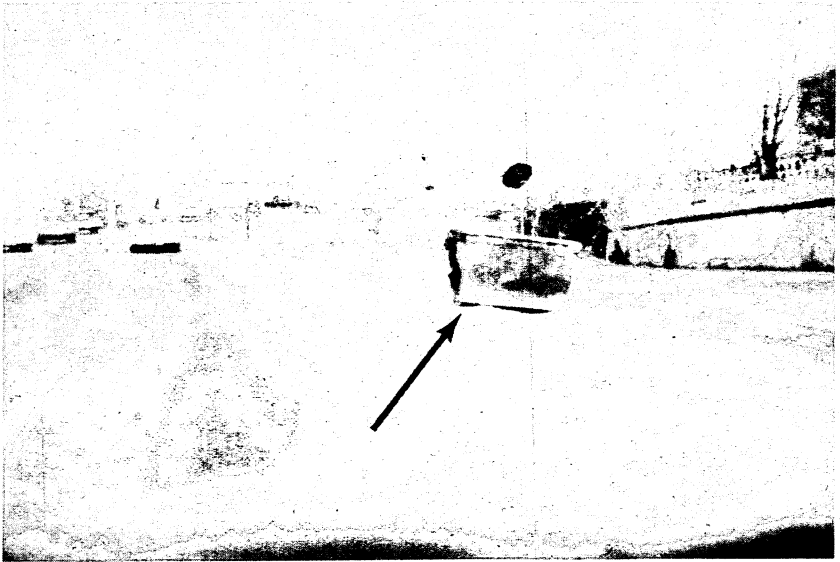
This has something to do with maintenance. See the sand barrel sticking right on the shoulder area?



Anyone riding along here gets unnecessary damage because the sand barrels could be put over on the side.



Here you see a large box of sand every year, right in that shoulder area. If you hit that, you stop dead. But they do it every year.



Here you see tire tracks of a car going behind that guardrail, smashing into the wall and killing the driver. The guardrail was not long enough and it didn't curve back.

