

# SafeClear Performance Report

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2005-2006



Robert Dahnke, Rice University  
Dr. Tim Lomax, Texas Transportation Institute  
Dr. Robert Stein, Rice University

April 2007

## Executive Summary

This report presents an analysis of city of Houston's SafeClear incident management program for removing disabled vehicles on Houston area freeways. Our analysis examines the operation of the SafeClear program, its impact on vehicle collisions on Houston area freeways and the origin of the program's impact on the incidence of freeway collisions. Our evaluation of the SafeClear program is based on several criteria: response time of tow operators to the scene of a disabled vehicle, clearance time, the time to remove the vehicle from the roadway and duration time, the entire time between when the operator arrives at the scene of a disabled vehicle and when the vehicle is removed from the freeway. Finally, the program is assessed for its impact on the number of vehicle collisions on Houston area freeways. Our evaluation covers the 24 months before and after the implementation of the SafeClear program i.e., January 2003 thru December 2006.

- In 2005 the average response time was 2:22. In 2006 the mean response time dropped to 1:54.
- Since 2005 there has been a 21% decline in the average response time.
- In 2005 approximately 86% of all tows were responded to within six minutes. In 2006 this figure rose to 90%.
- Duration and clearance times improved between 2005 and 2006 at the same rate.
- Between 2005 and 2006 the average response time declined on 28 of 29 freeway segments.
- The decline in response time on 22 of the programs 29 segments was statistically significant.
- Since the inception of the program in January 2005 we can attribute 112 fewer freeway collisions per month to the SafeClear program. This represents 2,688 fewer collisions on Houston freeways that would have occurred had the SafeClear program not been in operation.
- A one minute increase or decrease in daily response time increases or decreases the number of collisions per day by four collisions.

## Performance Overview

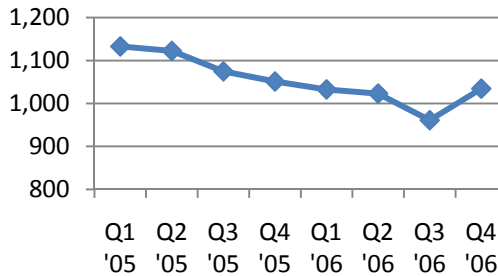
### Performance Summary

### Quarterly Data Graph

### Goal (dotted lines)

#### Collisions – any crash with an injury or major vehicle damage

Collisions have been reduced during the SafeClear program. The 10% reduction goal has been achieved. As the program has continued, further reductions in collisions have appeared.



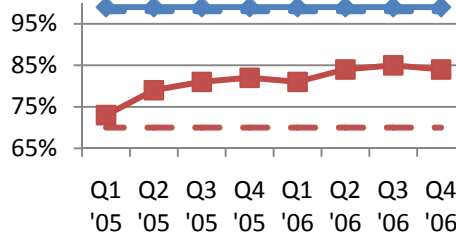
-10% reduction



Actual: 13.6%

#### Duration – time from notification of tow operator to removal of disabled vehicle

Almost all incidents lasted less than 90 minutes from the time they were identified. 81% of incidents lasted less than 20 minutes.



98% within 90 min.



Actual: 99.2%

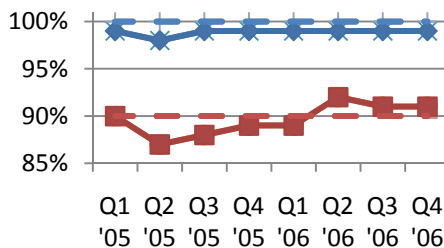
70% within 20 min.



Actual: 81.3%

#### Response Time – time from notification to tow operator to arrival at the disabled vehicle

The program is very close to meeting response goals. 98.8% were responded to within 20 minutes. 89.5% were responded to within 6 minutes.



100% within 20 min.



Actual: 98.8%

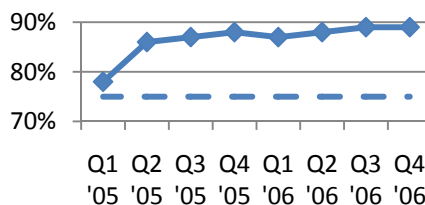
90% within 6 min.



Actual: 89.5%

#### Clearance Time – time from tow operator's arrival at disabled vehicle to removal of the vehicle

The program greatly exceeded the clearance time goal. 86.7% of incidents were cleared within 20 minutes of wrecker arrival.

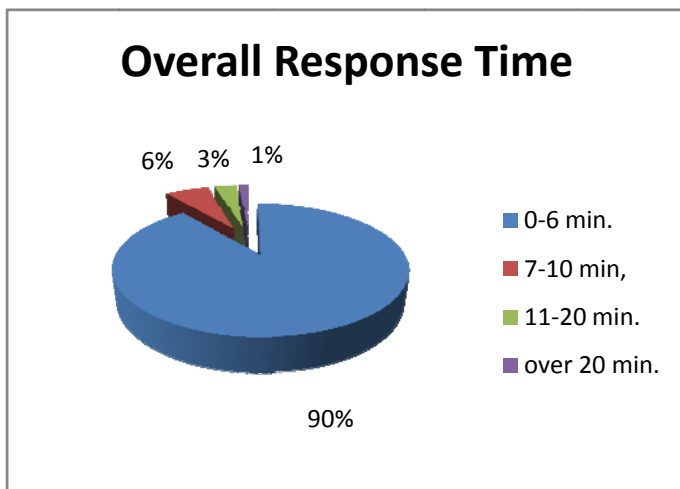
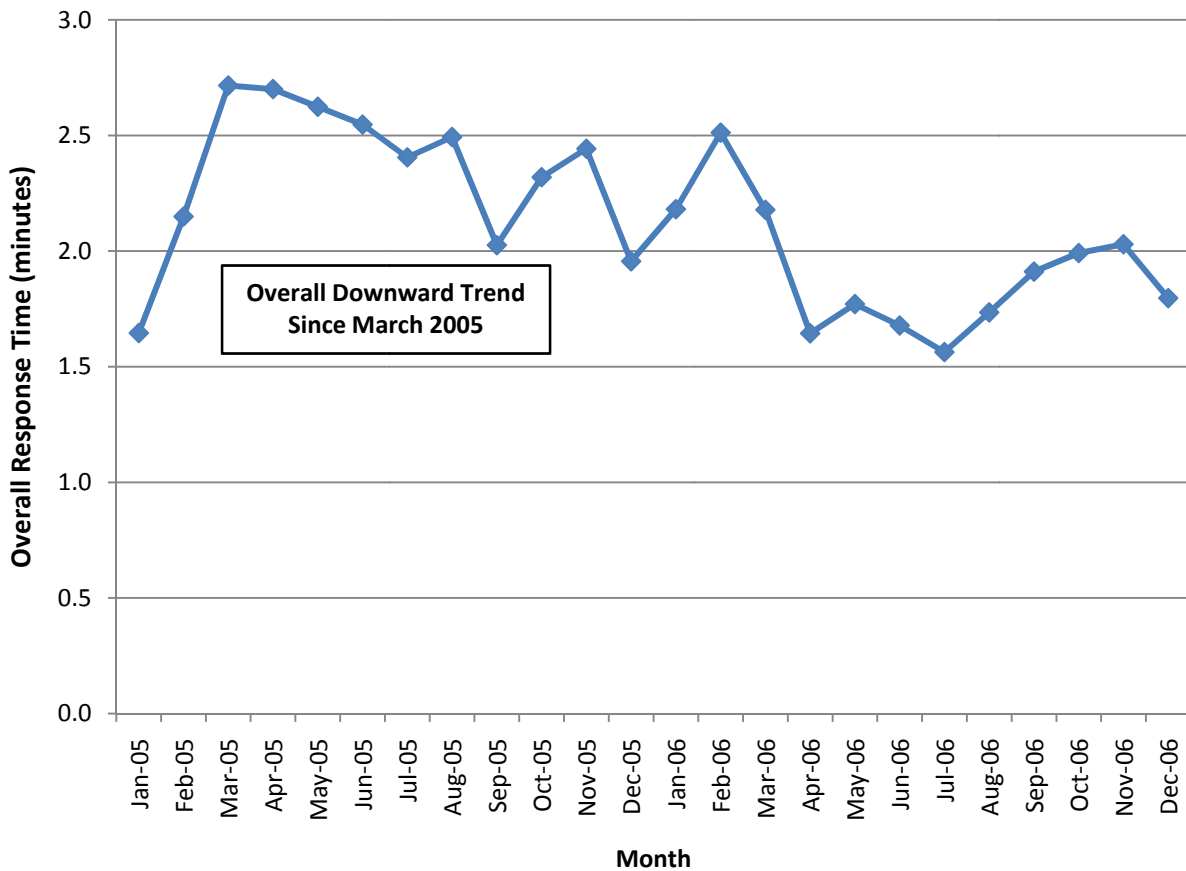


75% within 20 min.



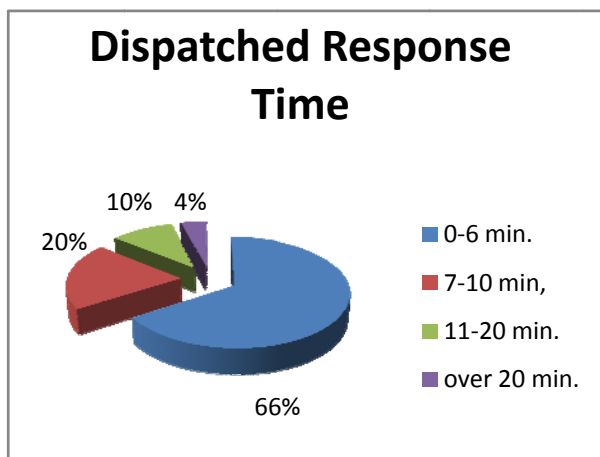
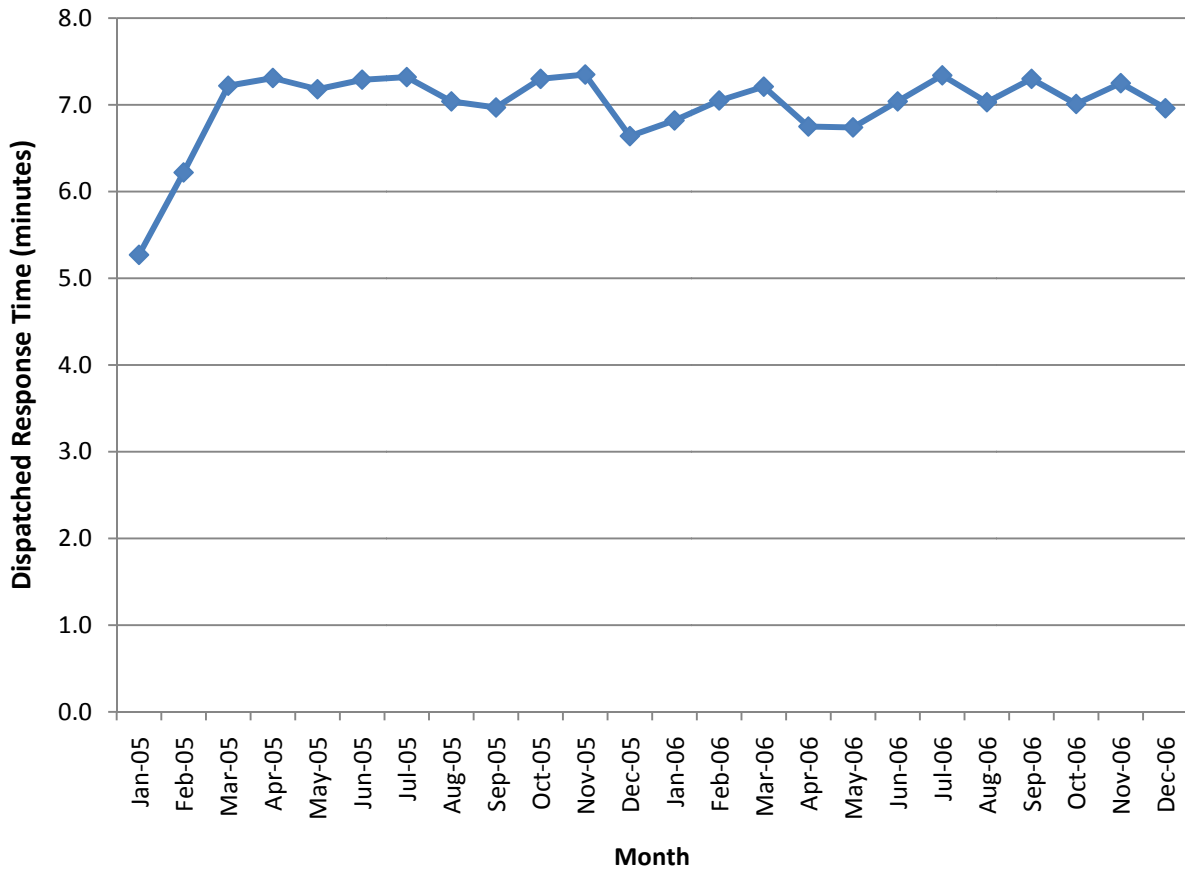
Actual: 86.7%

## Overall Response Time



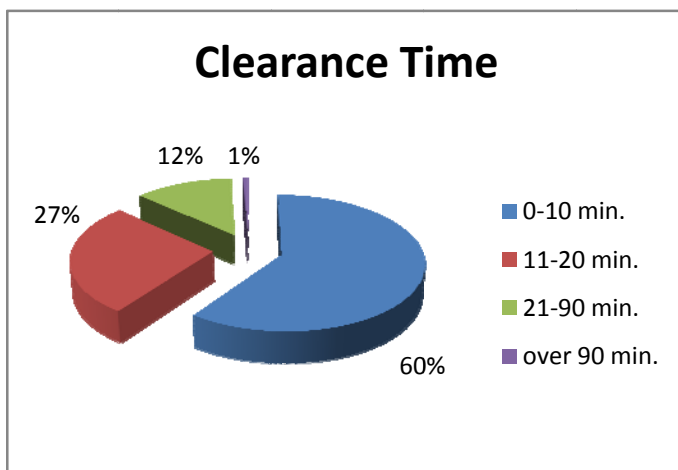
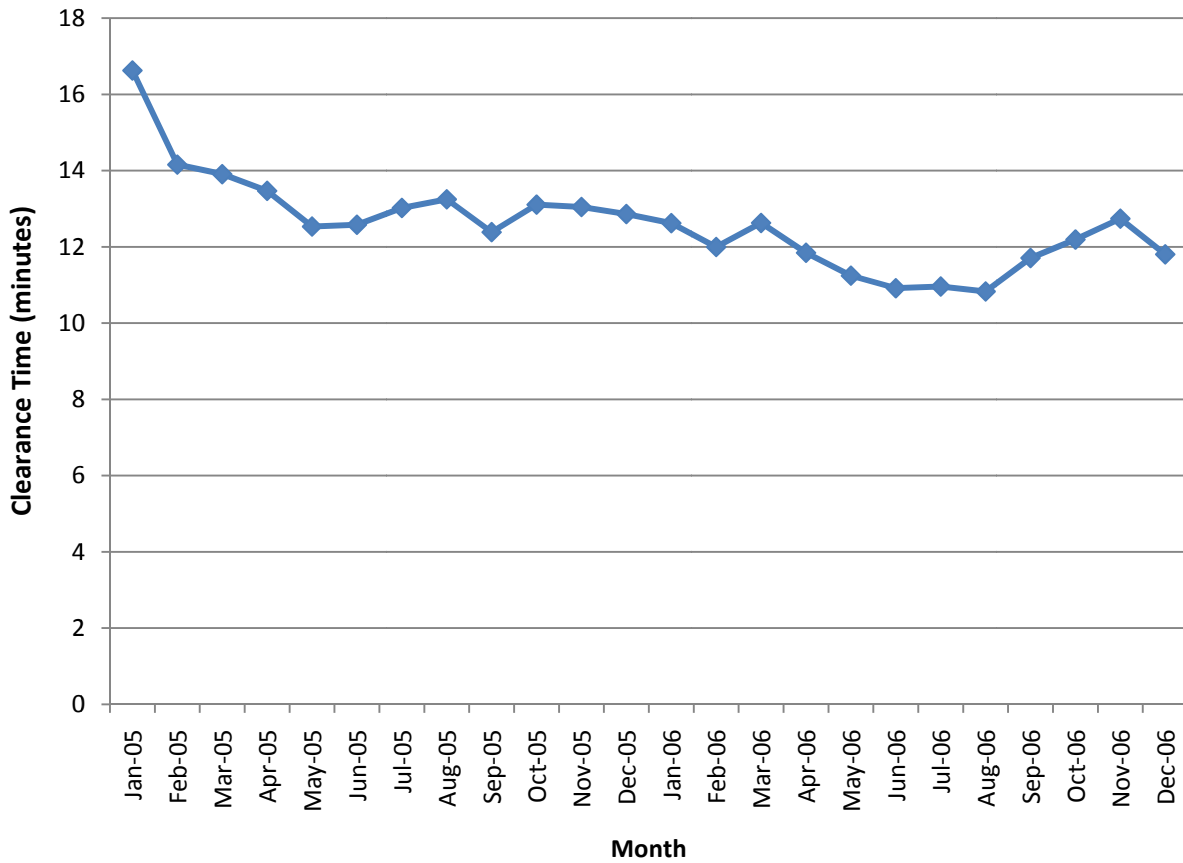
- Over 90% of all response times fall between 0 and 6 minutes
- Over time, the average response time has decreased
- Overall, fewer than 1% of all tows had response times over 20 minutes
- Vehicles identified by tow truck operators themselves represent 70% of all tows (these have a zero minute response time)

### Dispatched Response Time



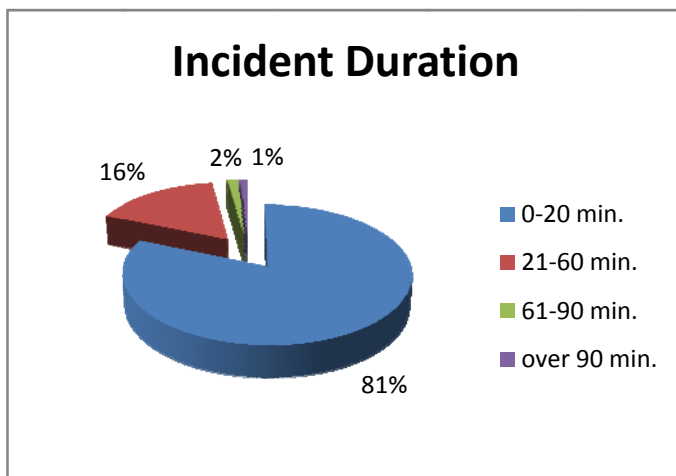
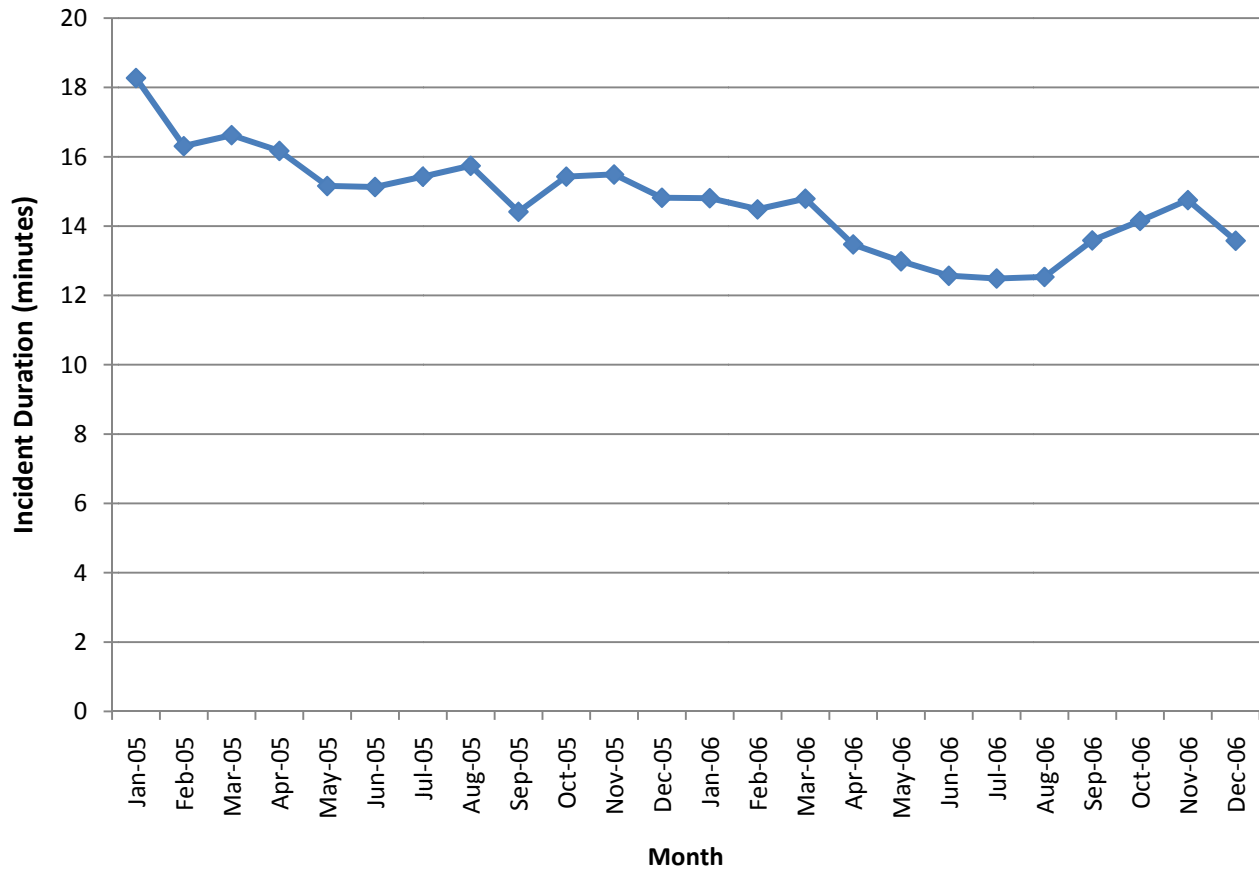
- Overall, 66% of dispatched tows are responded to within 6 minutes.
- Dispatched response times have remained relatively constant since the 3<sup>rd</sup> month of SafeClear.
- The decline in overall response times, therefore, is due to a larger percentage of disabled vehicles found by the tow operators.

## Clearance Time



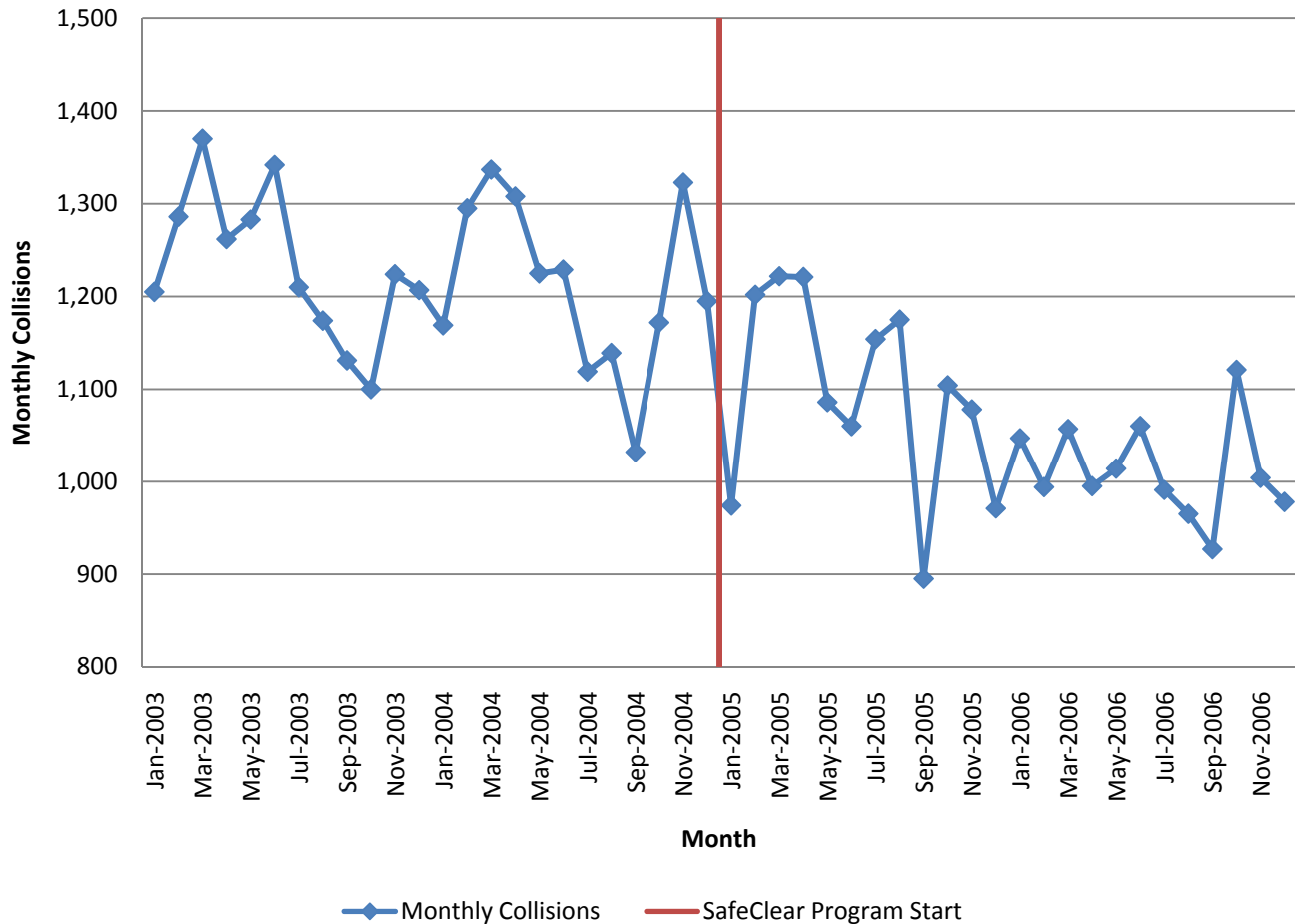
- 60% of all incidents are cleared within 10 minutes.
- Less than 1% of incidents require more than 90 minutes to clear.
- The proportion of vehicle breakdowns and collisions cleared in less than 20 minutes has increased over the two year period.

## Incident Duration



- 81% of all incidents are responded to and cleared within 20 minutes.
- The increased duration time over the last 4 months of 2006 is due to increased clearance time.
- Six months in 2006 saw average duration times less than 14 minutes; all months of 2005 had duration times more than 14 minutes.

## Collisions Overview



- There is a decline in the number of collisions since the inception of the SafeClear program.
- There were 15 months with more than 1200 collisions in 2003 and 2004; there have been only three such months since the SafeClear program began.
- The SafeClear program is a significant contributor to the overall reduction in collisions. Other factors such as variations in weather and traffic congestion have been examined. They explain only a small portion of the overall reduction in collisions.
- With a national average cost of \$26,530 per collision, SafeClear is providing an economic savings of over \$35 million per year in fewer injuries, lower wage loss, improved quality of life and decreased vehicle damage expenses.<sup>1</sup>
- The cost of the program, therefore, is returned to Houstonians many times over in the form of reduced collision costs.

<sup>1</sup> Source: *The Economic Impact of Motor Vehicle Crashes 2000*. National Highway Traffic Safety Administration. Property damage collision: \$2,500; Injury collision: \$33,000; Fatal collision: \$3.4 million. Average cost: \$27,360 minus \$827 in travel delay costs in the average collision. (Separate estimate of congestion trends developed by Rice/TTI).



## Does the SafeClear program reduce collisions?

To answer this question we analyzed the number of collisions per month on Houston area freeways for the period 2003-2006. The hypothesis tested is whether the number of freeway collisions per month declined with the introduction of the SafeClear program and its continued operation after January 2005. To control for alternative explanations of freeway collisions we have included in our model of freeway collisions factors thought to contribute to freeway collisions including: monthly rainfall, traffic volume (i.e., vehicle miles traveled) season (to control for period between August and December when collisions increase after summer vacations and during the fall and winter holiday season) and the price of a gallon of unleaded gasoline. Our model of freeway collisions confirms that the SafeClear program has a strong downward effect on the monthly number of freeway collisions. Since the inception of the program in January 2005 we can attribute 112 fewer freeway collisions per month to the SafeClear program. This represents 2,688 fewer collisions on Houston freeways that would have occurred had the SafeClear program not been in operation.

Variable <sup>2</sup>	Coefficient	Std. Error	T-Value	Significance
Constant	2884.1	4167.5	.692	.493
SafeClear <sup>3</sup>	-111.8	59.7	-1.87	.06
Rain days per month <sup>4</sup>	1.62	3.46	.469	.641
Gas Price <sup>5</sup>	-54.3	54.7	-.173	.328
Vehicle miles traveled <sup>6</sup>	-1341.7	3569.7	-.369	.709
Season <sup>7</sup>	-58.8	26.9	-.240	.035
<b>N = 48</b>				
<b>Adjusted R-Square = .542</b>				

<sup>2</sup> Dependent Variable: Monthly Collisions

<sup>3</sup> 1=24 months in 2005 and 2006 when SafeClear was in operation; 0=24 months in 2003 and 2004 when SafeClear had not been implemented

<sup>4</sup> Number of days of rain in the month

<sup>5</sup> Price of a gallon unleaded of gasoline

<sup>6</sup> Vehicle miles traveled per month

<sup>7</sup> 1=August through December; 0=January through July

## Does response time matter in the reduction of freeway collisions?

Recall that the underlying mechanism that enables the SafeClear program to reduce freeway collisions is rapid response times. The faster a wrecker operator can respond to a disabled vehicle the faster the vehicle can be removed from the freeway, reducing the likelihood of a secondary collision. To test this hypothesis we first estimated the average daily response time for all vehicle tows between January 2005 and December 2006. We used average daily response time to predict the number of daily collisions on Houston area freeways. We find that when the average daily response time increases, the number of collisions also increases. A one minute increase or decrease in daily response time increases or decreases the number of collisions per day by four collisions.

Variable <sup>8</sup>	Coefficient	Std. Error	T-Value	Significance
Constant	10.9	1.0	10.8	.000
Response Time <sup>9</sup>	4.26	.456	9.36	.000
<b>N = 729</b>				
<b>Adjusted R-Square = .106</b>				

<sup>8</sup> Dependent Variable: Daily Collisions

<sup>9</sup> Average Daily Response Time

## Collision Data Table

### Collisions on Houston Freeways – 2003-2006

	2003	2004	2005	2006
<b>Jan.</b>	1,205	1,169	974	1,047
<b>Feb.</b>	1,286	1,295	1,202	994
<b>Mar.</b>	1,370	1,337	1,222	1,057
<b>Apr.</b>	1,262	1,308	1,221	995
<b>May</b>	1,283	1,225	1,086	1,014
<b>Jun.</b>	1,342	1,229	1,060	1,060
<b>Jul.</b>	1,210	1,119	1,154	991
<b>Aug.</b>	1,174	1,139	1,175	965
<b>Sep.</b>	1,131	1,032	895	927
<b>Oct.</b>	1,100	1,172	1,104	1,121
<b>Nov.</b>	1,224	1,323	1,078	1,004
<b>Dec.</b>	1,207	1,195	971	978

*Source: Houston Police Department*