

1. Report No. FHWA/TX-98/1295-1		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle EVALUATION AND ENHANCEMENT OF TEXAS RAMP METERING STRATEGIES, COMPLIANCE, AND ALTERNATIVE ENFORCEMENT TECHNIQUES: GO WITH THE FLOW HOUSTON PUBLIC OUTREACH PLAN				5. Report Date August 1997 Revised: December 1997	
				6. Performing Organization Code	
7. Author(s) Susan Lancaster, Bernie Fette, Leslie Busler, Kim Miller, Carroll Messer, and Steve Wohlschlaeger				8. Performing Organization Report No. Research Report 1295-1	
9. Performing Organization Name and Address Texas Transportation Institute The Texas A&M University System College Station, Texas 77843-3135				10. Work Unit No. (TRAIS)	
				11. Contract or Grant No. Study No. 0-1295	
12. Sponsoring Agency Name and Address Texas Department of Transportation Research and Technology Transfer Office P. O. Box 5080 Austin, Texas 78763-5080				13. Type of Report and Period Covered Interim: September 1995-October 1996	
				14. Sponsoring Agency Code	
15. Supplementary Notes Research performed in cooperation with the Texas Department of Transportation and the U.S. Department of Transportation, Federal Highway Administration. Research Study Title: Evaluation and Enhancement of Texas Ramps					
16. Abstract This report describes the public outreach plan on the implementation of ramp meters along the Katy Freeway in Houston. Generally, ramp metering is neither beloved nor understood by the public. To gain public awareness, acceptance, compliance and continued support, ramp metering operations should be reinforced by a strong, ongoing public information and outreach campaign that communicates the need for and benefits of the program. Because the term "ramp metering" exhibits restrictions on the public, the phrase "Flow Signals" was developed to better describe the benefits of ramp metering: enhanced flow of traffic, fewer bottlenecks, and fewer trip delays. The logo, "Go with the Flow Houston," and a graphic identity were developed to help communicate the theme throughout the various media where both the primary and secondary messages are intended to reach 15 different audiences. These media will include: a PSA, both static and changeable message signs, a brochure, Internet web site information, letters to specific audiences and media relations efforts.					
17. Key Words Flow Signals, Ramp Metering, Public Outreach, Transportation			18. Distribution Statement No restrictions. This document is available to the public through NTIS: National Technical Information Service 5285 Port Royal Road Springfield, Virginia 22161		
19. Security Classif.(of this report) Unclassified		20. Security Classif.(of this page) Unclassified		21. No. of Pages 50	22. Price

**EVALUATION AND ENHANCEMENT OF TEXAS RAMP
METERING STRATEGIES, COMPLIANCE, AND ALTERNATIVE
ENFORCEMENT TECHNIQUES:
GO WITH THE FLOW HOUSTON PUBLIC OUTREACH PLAN**

by

**Susan Lancaster
Director**

Information & Technology Exchange Center, Texas Transportation Institute

**Bernie Fette
Assistant Head**

Information & Technology Exchange Center, Texas Transportation Institute

**Leslie Busler
Research Associate**

Information & Technology Exchange Center, Texas Transportation Institute

**Kim Miller
Graphics Specialist**

Information & Technology Exchange Center, Texas Transportation Institute

**Carroll Messer
Research Engineer
Texas Transportation Institute**

and

**Steve Wohlschlaeger
Assistant Research Scientist
Texas Transportation Institute**

**Research Report 1295-1
Research Study 0-1295
Research Study Title: Evaluation and Enhancement of Texas Ramps**

**Sponsored by the
Texas Department of Transportation
In Cooperation with the
U.S. Department of Transportation
Federal Highway Administration**

**August 1997
Revised: December 1997**

**TEXAS TRANSPORTATION INSTITUTE
The Texas A&M University System
College Station, Texas 77843-3135**

IMPLEMENTATION STATEMENT

The public outreach effort described in this report was developed in support of a research study designed to evaluate and enhance ramp metering strategies in Texas. The outreach campaign served to support the implementation of the engineering and operational elements of ramp metering in Houston beginning in late 1996. The success of the public outreach campaign prompted TxDOT officials in the Fort Worth District to apply the same outreach campaign strategy to support the use of flow signals on State Highway 360 in Arlington and Grand Prairie in late 1997 (see example 8 in the appendix). These examples suggest that similar efforts can be implemented in other cities where TxDOT officials determine flow signals are needed.

DISCLAIMER

The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official view or policies of the Texas Department of Transportation (TxDOT), or the Federal Highway Administration (FHWA). This report does not constitute a standard, specification or regulation.

ACKNOWLEDGMENT

The Information & Technology Exchange Center extends its sincere thanks to the Public Information Staff of the Texas Department of Transportation, Houston District. The success of the “Go With The Flow Houston” public outreach campaign is due in large measure to the receptive and responsive manner in which these professionals approached this effort. Special thanks go to Public Information Officer Janelle Gbur and Assistant PIOs Norm Wigginton and Victor Tsai. ITEC also extends its appreciation to Linc Wright, P.E., Cindy Smith, and Musa Misleh, who calibrated and timed the flow signals and also distributed brochures to thousands of motorists at freeway entrance ramps.

TABLE OF CONTENTS

Summary	xi
Chapter 1: Public Outreach Plan	1
Chapter 2: Implementation Tasks	7
Appendix: Answers to Anticipated Questions about Flow Signals and Public Outreach Materials	11

SUMMARY

Ramp metering is a proven traffic management practice, but though often successful, it is neither beloved nor well understood by the public. Evidence of negative motorist reactions to ramp metering is seen in the experiences of many transportation agencies across the country who have attempted it. Before reinstating ramp metering on selected Houston freeways in 1996, the Texas Department of Transportation (TxDOT) recognized that a strong, ongoing public information and outreach campaign was needed to enlist public acceptance of ramp metering and to encourage compliance with associated traffic laws.

The Information and Technology Exchange Center of the Texas Transportation Institute developed a public outreach campaign based in part on the repositioning of ramp meters as “flow signals.” The name “flow signals” was selected because it communicates the benefits of ramp metering: “flow” suggests smooth, uninterrupted movement and “signal” suggests helpful communication, and the name “flow signals” lends itself to a well-known phrase: “Go with the flow.”

The “Go With The Flow, Houston” campaign materials included: a brochure, television public service announcement, custom signage at flow signal locations, letters, videotape segments for television and media relations support. TxDOT concentrated its public information and outreach efforts in the days prior to the first phase of signal activation, and received no negative phone calls or letters after activation of the signals. From both an engineering and a public outreach perspective, “Go With The Flow, Houston” was a successful effort.

CHAPTER 1

PUBLIC OUTREACH PLAN

OPPORTUNITY

To improve traffic flow, the Texas Department of Transportation (TxDOT) is reinstating ramp metering on selected major Houston freeways. Along with monitoring traffic, encouraging high vehicle occupancy, and providing motorists with real-time information and assistance, managing freeway access is an important element of Houston's overall mobility and safety enhancement program. The ramp meters along the outbound lanes on the Katy Freeway will be the first Intelligent Transportation System (ITS) freeway access control devices activated in Houston. The lights will be operated from Houston's TranStar regional traffic management center.

Ramp metering is a proven traffic management technology. It has and is being used successfully on urban freeways around the country to improve mobility and traffic safety. But its success is sometimes its perceived failure, as noted in the following newspaper quotations:

- The Fresno Bee; HOME; section: Metro; page B3, 11-4-95
“After reading your article regarding the Freeway 41 on-ramp ‘metering’ light, I noted one recent Friday lineup on Herndon to enter southbound 41 was backed up nearly to Blackstone Avenue, and was creeping forward at a snail’s pace. I think it is clear what needs to be done. We need those stupid metering lights to be ripped out by their roots! I observed the same things being used in another city several years ago, and they were as useless as they are now. Traffic stacks up on the city streets while the freeway traffic benefits little if at all. In point of fact, the traffic on Freeway 41 was almost non-existent when we got on it Friday, but still the useless metering light was doing its obstructive thing. . . What we have here is a money-wasting boondoggle which never should have been installed in the first place!”

David Putnam, Pinedale

- Star Tribune Newspaper of the Twin Cities Mpls. St Paul; MSTN, Metro; section: News; page 24A. 2-12-95

“Your Jan. 29 story about cheating on Interstate Hwy. 394 ‘sane lanes’ touches only the tip of the iceberg with that highway’s serious problems. . . . These problems include the horrible congestion of all rush-hour traffic including car poolers traveling against the direction of the ‘sane lane’; lengthy waits at on-ramp meters, which add more time to trips than Hwy. 12 stoplights ever caused . . .”

Mike Dayton, Minneapolis

- Star Tribune Newspaper of the Twin Cities Mpls. St Paul; MSTN, Metro; section: news; page 10B. 4-28-96

“The frustrating thing is that you get there and there’s no traffic!”

Nancy Caputa, Minneapolis

Several citizens expressed still other questions or concerns:

- The Arizona Republic: Final Chaser; section: Valley and State; page B1. 5-25-95

“Whether there’s an opening or not, you’re going to (be forced to) go!”

Richard Padilla, Glendale

- Star Tribune Newspaper of the Twin Cities Mpls. St. Paul; MSTN, Metro; section: Variety; page 11E. 9-7-95

“The metered freeway ramps usually have signs that read ‘one car per green.’ But usually there is more than one set of signals per pedestal. When there are two green lights, does that mean two cars proceed? If not, why is there more than one green light at the ramp?”

Anonymous question

Michael James of Milwaukee noted in the Milwaukee Journal Sentinel that the meter on S. 27th Street onto Interstate 894 is “too close to the end of the ramp.” He says it doesn’t leave him enough time to accelerate to freeway speed between the time the light turns green and he has to merge onto the freeway. That limits his acceleration to 35 mph before he has to cross two lanes and exit several blocks west on northbound I-94.

MinnDOT’s recent survey on congestion pricing may be the most telling information of all. In a recent scientific survey of 1,000 Minnesota metro residents, only 39 percent (versus 59 percent opposed) supported general congestion pricing until they were asked if they would support this pricing if it meant removing ramp meters. Support increased to 49 percent!

In short, ramp metering is neither beloved nor well understood by the public. To gain public acceptance, compliance and continued support, ramp metering operations must be reinforced by a strong, ongoing public information and outreach campaign. Motorist perception is motorist reality!

Cities that have implemented ramp meters in the past realized the importance of garnering a positive image of ramp meters. Denver and Detroit launched public outreach campaigns, handing out brochures at ramps and advertising in newspapers, television, or radio. Denver held a press conference to generate interest and enforce the positive aspects of ramp metering. While such campaigns may not make communities embrace the technology, these efforts definitely help the public better understand the benefits of ramp metering

Seattle also conducted a more comprehensive campaign by producing brochures and posters and distributing them at neighborhood grocery stores near the ramps. They notified special-needs audiences and the media to ensure cooperation and communication. Signs with an information number were posted near the ramps, while others were posted to notify drivers of the date and time the meters would be turned on. Seattle’s latest campaign involves interactive kiosks, which are set up in professional-building lobbies, libraries, and stores, that visually illustrate the

benefits of ramp meters.

CAMPAIGN OBJECTIVE

The objective is to build public awareness, acceptance, compliance and continued support for Houston's ramp metering initiative, and to minimize negative feedback from motorists by developing and executing effective public information and outreach strategies to communicate to selected audiences the need for and benefits of the program.

CAMPAIGN THEME

In combination, the words ramp and meter have a negative connotation. The term ramp focuses on the means, the place where you sit and wait, not the end, where you join the stream of flowing traffic. Webster defines metering: "to supply in a measured or regulated amount." Regulated. Restricted. Ramp metering conveys all too well to the motorist how the system works by regulating their access to the freeway.

These words fail to communicate the primary benefits of ramp metering: enhanced flow of traffic, fewer bottlenecks, and fewer trip delays. To present this traffic management strategy to Houston motorists in a positive light, the Outreach Task Force decided a new term for ramp metering was needed. *Flow Signals* was selected to better convey the positive aspects of ramp metering:

- "Flow" suggests smooth, uninterrupted movement or mobility.
- "Signal" suggests helpful communication, signaling or letting you know what to do and when to do it.
- "Flow Signals" lends itself to a well-known phrase: "Go with the flow."
- "Go with the flow" implies multiple important messages: "Don't fight it," "Get on with it," and "Go with the flow" of traffic on the freeway.

IDENTITY

Every campaign needs a graphic identity to help communicate the theme through various media. The “Go With The Flow Houston” logo (see example 1 in the appendix) was designed to capture the “Go with the flow” slogan, combining graphically the concepts of traffic control, movement, and community to Houston drivers. The simple design makes it readable and identifiable from the road, and also allows it to be used easily in both color and black and white. Incorporation of a traffic signal into the graphic clearly signifies the traffic signals that drivers will encounter at entrance ramps.

AUDIENCES

The following were the target audiences for the campaign:

- Katy Freeway commuters and HOV users (handout, mass media, signs)
- Houston commuters (mass media, signs),
- Houston media (PSA, releases, signs),
- Houston District TxDOT employees (internal newsletter, mass media),
- Residents and business owners along the corridor (TxDOT MIS list) (mail-out, mass media, local newspaper, signs),
- Business groups, i.e., West Houston Association (direct mail, letter, mass media),
- Elected and appointed municipal officials (direct mail, letter, mass media),
- Area law enforcement agencies (letter, mass media),
- TranStar consortia members (letter, mass mail-out),
- AAA in Houston (letter, mass mail-out),
- TxDOT administration, commission, PIO in Austin (mail-out, plan, letter, briefings),
- TxDOT employees at TranStar,
- Motorist Assistance Program employees,
- Driver education programs (commercial and school-based) (mail-out, mass media),
- Ticket revocation programs (mail-out, mass media),
- Houston Automobile Dealers Association (mail-out, mass media), and
- Civic organizations (mail-out, mass media).

PRIMARY MESSAGES

- TxDOT is dedicated to enhancing mobility and traffic safety in Houston.
- Flow signals are a proven traffic management technology which will make travel times more consistent.
- Flow signals are part of Houston's Intelligent Transportation System.

SECONDARY MESSAGES

- Flow signals will lessen the rush-hour crash rates at freeway entrance ramps.
- Red means stop, yellow means caution, green means go and merge safely.
- Flow signals must be obeyed; compliance will be enforced.
- Flow signals are one of several traffic management technologies employed in Houston, including HOV lanes, traffic monitoring, variable message signs and motorist information and assistance, and incident removal programs.
- Flow signals will operate Monday through Friday, from 3:30 p.m. until 6:30 p.m., starting on July 30, 1996; operational changes may be made after a fine-tuning phase.

TOOLS

Tools needed to implement the "Go With The Flow Houston" campaign included the following:

- PSA (see example 2 in the appendix),
- Signs--static and changeable message (see example 3 in the appendix),
- Brochure (see example 4 in the appendix),
- Letters to special-need audiences (see example 5 in the appendix),
- Video B-roll (background footage for television),
- News release (see example 6 in the appendix), and
- Answers to anticipated questions (see example 7 in the appendix).

CHAPTER 2

IMPLEMENTATION TASKS

1. Design outreach campaign

TASK	RSPNSBL	DATE
Initial planning session	TTI/TxDOT	5-22-96
Develop theme, slogan, image, implementation plan	TTI	Ongoing

2. Outline operational issues related to public outreach

TASK	RSPNSBL	DATE
Determine activation date	TxDOT	7-3-96
Determine operational policies (time of day, fines, etc.)	TxDOT	7-9-96

3. Develop and distribute printed handout/brochure

TASK	RSPNSBL	DATE
Write and design the brochure	TTI	6-25-96
Print the brochure (15,000 copies on yellow paper)	TxDOT	7-1-96
Coordinate distribution of the brochure at selected ramps	TxDOT/METRO	7-23-25-96
Mail brochures / TxDOT list	TxDOT	7-18-96

4. Identify and contact special-need audiences

TASK	RSPNSBL	DATE
Municipalities and law enforcement agencies	TxDOT	7-15-96
TxDOT employees	TxDOT	---
Elected officials	TxDOT	---
TranStar employees	TxDOT	---

5. Develop and employ appropriate signage

TASK	RSPNSBL	DATE
Design supplemental sign with logo and theme	TTI	7-19-96
Produce supplemental signs with logo and theme	TxDOT	7-23-96
Install supplemental signs on route markers at each ramp (20 total)	TxDOT	7-23-96
Coordinate variable message signs	TxDOT	7-23-96
Determine message	TTI	7-23-96

6. Produce informational video

TASK	RSPNSBL	DATE
Location footage: before and after activation	TTI	8-31-96
Remaining footage; post-production	TTI	FY 97

7. Communicate flow signals objectives and schedule via the news media

TASK	RSPNSBL	DATE
Develop and distribute news releases/media advisories	TxDOT	7-23-96
Produce 30-second PSA for television; provide 13 Beta dubs	TTI	7-19-96
Contact Houston TV stations to request PSA air time	TxDOT	7-19-96
Produce B-roll of simulation model/Dr. Messer; 13 Beta dubs	TTI	7-19-96
Prepare progress reports to illustrate traffic improvements	TTI	Periodic
Respond to news media	TxDOT	Ongoing

8. Maintain direct communication with the public

TASK	RSPNSBL	DATE
Establish central phone number for flow signal information	TxDOT	6-21-96
Develop Q&A list to ensure consistency in public information	TTI	7-23-96
Develop Q&A distribution plan	TTI	7-23-96
Coordinate message center	TxDOT	7-25-96
Survey - DPS licensing office	TTI	FY 97

FOLLOW-UP

In the days prior to the first of four activation phases, TxDOT representatives distributed brochures at stop points on selected ramps of the Katy Freeway, and also mailed the brochures to residents and businesses located along the corridor. Go With The Flow Houston signs were mounted beneath I-10 route markers at each ramp where a flow signal was installed. In addition, PSAs were provided to all 13 television stations in the Houston area, and at least four of the stations aired the message prior to or immediately after signal activation. On July 31, 1996 the Department activated the first five signals on the outbound Katy Freeway. Department officials granted media interviews with the Houston Chronicle and several television and radio stations, resulting in substantial news coverage. The second group of outbound signals was activated on August 20. Signals on the first five inbound ramps were turned on November 6, when public information officers granted two more media interviews, and the last of four phases of signals was activated on November 20.

Public information officers for the Department determined that the degree of public understanding of flow signals after the Katy Freeway activation was sufficient to justify scaled-back public outreach efforts for activation on subsequent freeways. To support the activation of flow signals on Interstate 45 in Houston, Department representatives distributed brochures at stop points on selected ramps and distributed news releases December 1996. During the same month, the Department arranged media announcements when flow signals were turned on along the U.S. 290 Northwest Freeway.

EVALUATION

Although its volume is limited, motorist feedback suggests that "Go with the Flow Houston" was successful in its objective to build public awareness and limit negative feedback. In the weeks before the signals were activated on July 31, 1996, only two letters and a small number of phone calls complaining about TxDOT's plans to use the signals were received. After the July 31 activation, the Department received no negative calls or letters. Media coverage, often considered an accurate barometer of public opinion, was balanced in the days before and immediately following July 31. Although some motorists complained, many were clearly ready to give flow

signals a try. No formal measurement of post-activation awareness and understanding was taken. However, one well-established pattern of citizen behavior offers a reliable indication of the effort's effectiveness. Experience has shown that consumers of a public service — whether it is transportation or electricity or water service — are vocal only when they are upset or in some way disappointed in the quality or delivery of that service. When they are satisfied, they offer neither criticism nor praise. A complete lack of public reaction following activation of the flow signals, then, suggests strongly that the public was satisfied with the result. From both an engineering and a public outreach perspective, “Go With The Flow, Houston” was a successful effort.

APPENDIX:
ANSWERS TO ANTICIPATED QUESTIONS ABOUT FLOW SIGNALS
AND
PUBLIC OUTREACH MATERIALS

ANSWERS TO ANTICIPATED QUESTIONS ABOUT FLOW SIGNALS

Why do we need signals on the freeway ramps?

Traffic congestion is a problem on the Katy Freeway. We can't expand the freeway, because it's too expensive. So, the Department needs other ways to solve the problem. Flow signals offer a solution.

How do they work?

Flow signals admit one car at a time onto the freeway. Without the signals, several cars at a time enter the stream of traffic and this slows down or stops traffic altogether. By improving overall traffic conditions on the Katy Freeway, flow signals actually reduce your total travel time.

Hasn't Houston tried this before?

Yes. In the 1960s and 1970s, flow signals were used on the Gulf Freeway and on the Southwest Freeway. After reconstruction increased the capacity on both freeways, the signals were turned off because they weren't needed. But Houston has grown, and traffic on Houston freeways has reached a point that Flow Signals are needed again. Flow signals worked very well the last time they were used. We believe they'll work even better this time because the equipment is improved and we have better ways to operate them from TranStar, the area's traffic management center.

During what time of the day will the signals be on?

The signals will operate from 3:30 p.m. to 6:30 p.m. each weekday. That is the plan for the fine-tuning phase, something we expect to last several weeks. When this phase is complete, the signals may be turned on (or off) earlier, or later, each day depending on what schedule of operation offers the best traffic flow. If, between 3:30 p.m. and 6:30 p.m. the traffic demand goes beyond what the freeway should carry, the signals will be turned off briefly until the excess number of cars is off the freeway. Then, the signals will come back on until 6:30 p.m.

How many signals are being turned on?

The outbound entrance ramps come first. In the first phase, the Department is turning on signals at Silber, Antoine, Wirt, Blalock, Bunker Hill and Gessner. A few weeks later, they'll be turned on at Wilcrest, Kirkwood, Dairy Ashford, Eldridge and State Highway 6. After all of the outbound flow signals are operating, the Department will turn on those signals on the inbound side of the freeway.

What about the other freeways?

The North Freeway will be next on the list. Then, flow signals will be activated on other freeways over the next several months.

When the signal turns green, does that mean there will be a space for me in traffic?

The green light tells you that you should go, then look for a space, then merge safely into the traffic flow. There will be a space for you, but it may take a few moments to move into it.

What happens if someone ignores the light?

According to the law, flow signals are just like traffic signals. If someone ignores a traffic signal and runs a red light, that person might get a ticket from a police officer, and the fine can be more than \$120.

The recommended distribution for the Q&A list includes the following:

- TxDOT PIO staff,
- METRO community relations staff,
- TxDOT receptionists and secretaries,
- TxDOT traffic operations staff,
- TxDOT District Engineer office staff,
- TranStar executive committee,
- TranStar operations staff, and
- TranStar secretaries and receptionists.



Name



Frame 1

Ever have trouble fitting in?



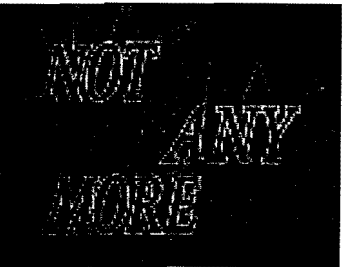
Frame 2

Getting your timing just right?



Frame 3

Making your move?



Frame 4

Not anymore!



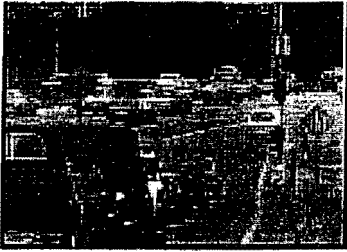
Frame 5

Houston has Flow Signals.



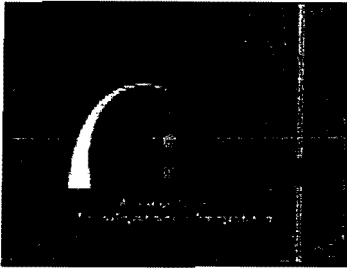
Frame 6

They let you know when to wait, and when to go.



Frame 7

They help keep traffic flowing.

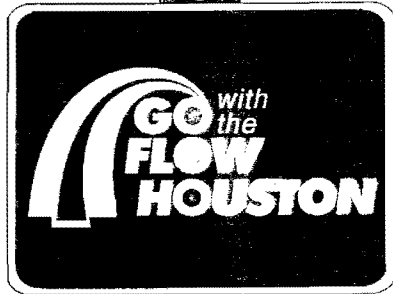


Frame 8

So watch for the new signals on the Katy Freeway. They'll help you Go With The Flow.

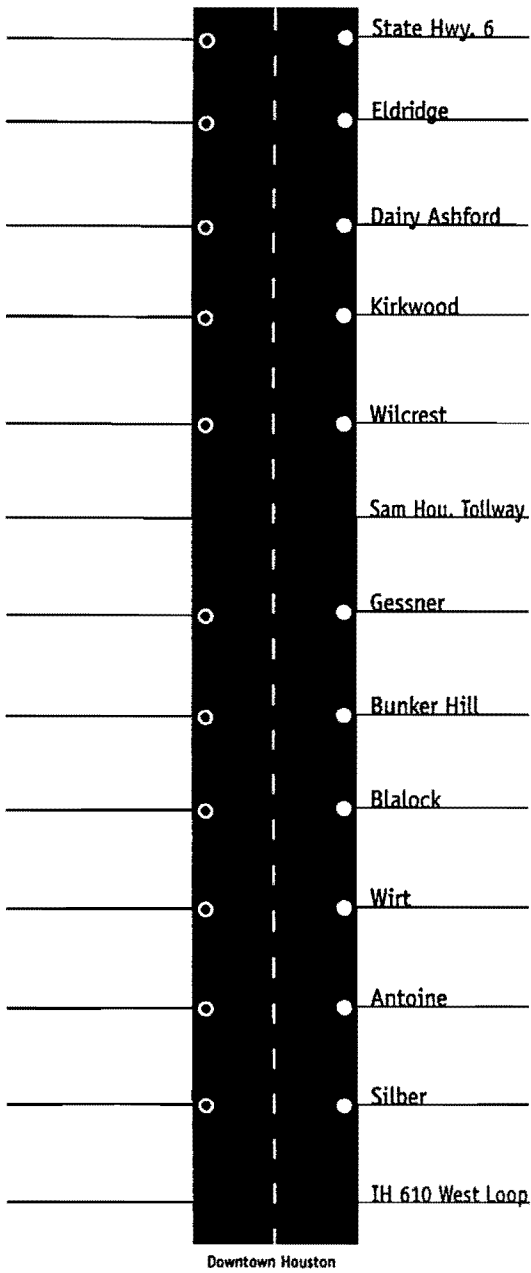


Standard size for route marker:
24" x 24"



Recommended size for FLOW:
24" x 18"

Katy Freeway (I-10)

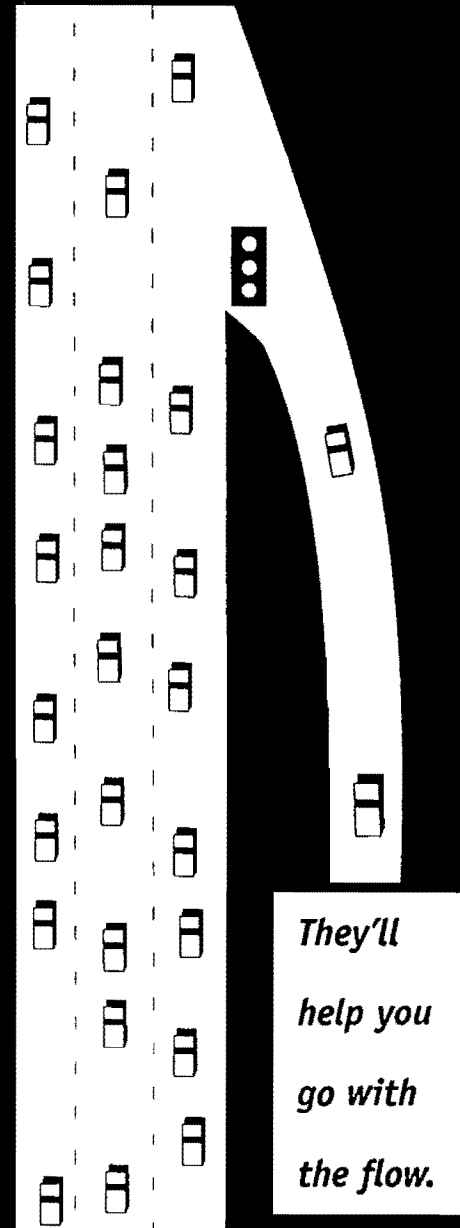


- Outbound, Flow Signals operational
- Inbound, Flow Signals in place, but not operational

Texas Department of Transportation
 7721 Washington Avenue
 Houston, TX 77007

Houston's Flow Signals

Katy Freeway



Your Texas Department of Transportation is working to solve freeway congestion problems. Part of the solution involves the traffic signals installed at 22 entrance ramps on the Katy Freeway. These traffic signals, called flow signals, will set the rate at which cars enter the freeway during peak hours. They will reduce the slow, stop-and-go traffic and make your travel time more consistent from day to day. These flow signals are just one part of Houston's intelligent transportation system.

❑ *Why do Houston freeways need flow signals?*

It's a matter of supply and demand, really. Traffic moves better when freeway demand is below capacity. As more cars enter freeways (demand), the supply of roadway space decreases. But money and space to build more freeways is limited, so we need to look for other ways to relieve congestion. Flow signals are one of those ways. Freeways can handle cars entering the flow of traffic one or two at a time, but when groups of cars attempt to merge, the even flow is interrupted. Because flow signals release one car at a time onto freeways, merging vehicles are less likely to slow down cars already on the freeways. The result: smoother traffic, more consistent travel time and fewer traffic-related accidents.

❑ *When/where will these be used?*

Beginning this summer, flow signals will be turned on first at all outbound entrance ramps on the IH-10 Katy Freeway. Eventually, flow signals will be operating at most of the entrance ramps on Houston's other major freeways.

❑ *Do flow signals really work?*

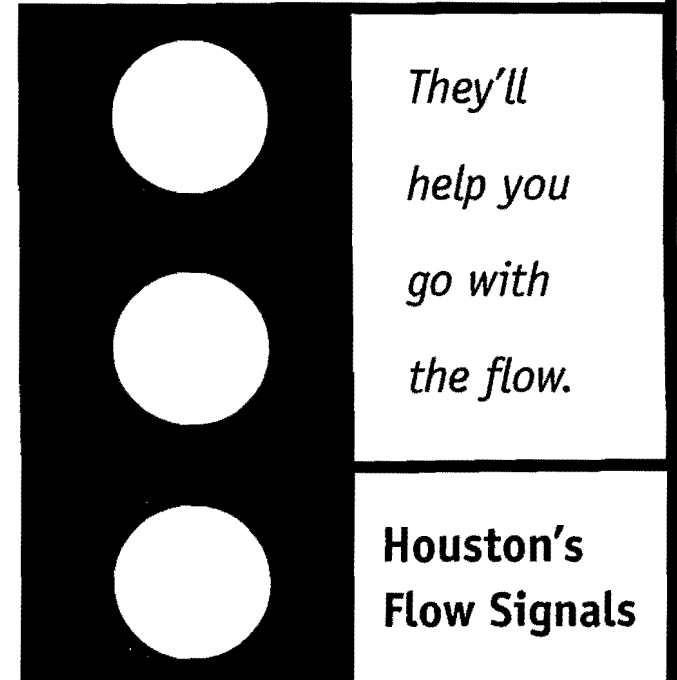
The use of flow signals to enhance mobility on freeways is not a new concept. Cities like Seattle, Minneapolis and Portland all have similar systems that have improved traffic flow. In Portland, studies showed that the use of signals at entrance ramps increased average freeway speeds in just 14 months from 16 mph to 41 mph. In Seattle, travel time averaged 22 minutes before signals were installed; travel time along the same freeway with signals in use was 11.5

minutes. Minneapolis experienced a 38 percent reduction in the peak-period accident rate after signals were installed.

❑ *How can we make this work for us?*

Success does take time. These cities did see improvement, but it didn't happen overnight. TxDOT will monitor freeway conditions, but the success of flow signals depends on you. To ensure success, be patient with your brief stop at the red light, and proceed cautiously when the light is green. Flow signals will be enforced just like regular traffic signals. Do your part by following the rules and waiting your turn. The end results will benefit us all.

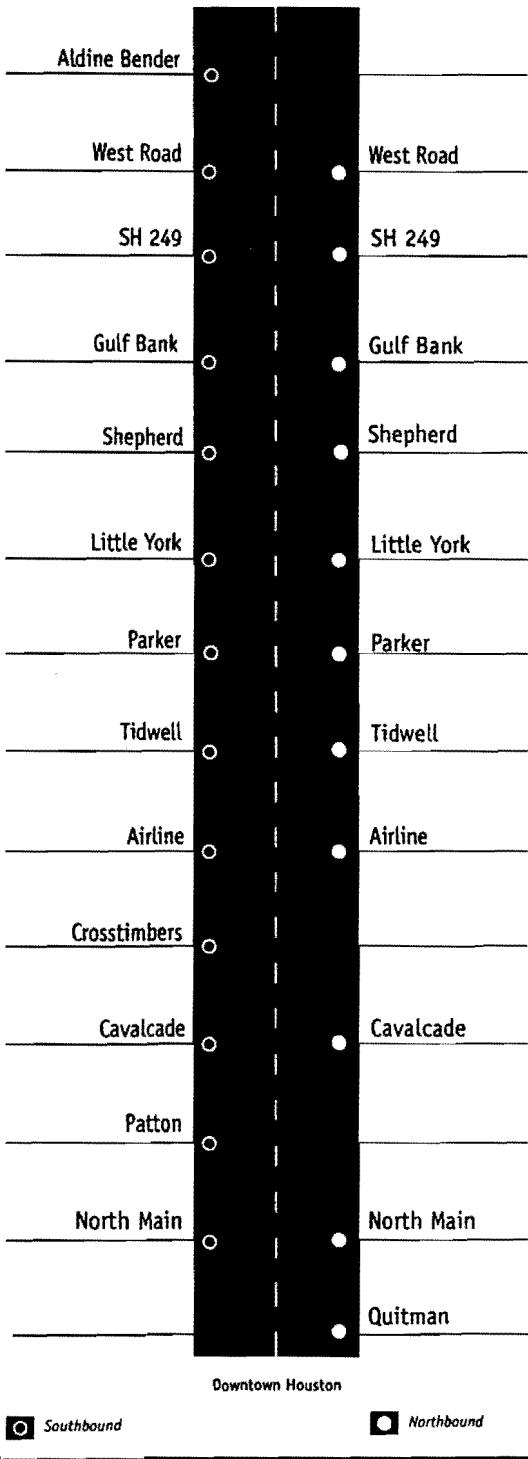
For more information call the Texas Department of Transportation at: 713-802-5076.



*They'll
help you
go with
the flow.*

**Houston's
Flow Signals**

North Freeway (I-45)

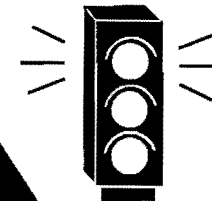


Texas Department of Transportation
 7721 Washington Avenue
 Houston, TX 77007

Houston's Flow Signals

North Freeway I-45

*They'll
 help you
 go with
 the flow.*



Your Texas Department of

Transportation (TxDOT) is working to solve freeway congestion problems.

Part of the solution involves the traffic signals installed at entrance ramps on

the IH45, North Freeway. These

traffic signals, called flow signals,

will set the rate at which cars enter

the freeway during peak hours. They

will reduce the slow, stop-and-go

traffic and make your travel time

more consistent from day to day.

Flow signals are part of Houston's

intelligent transportation system.

❑ Why do Houston freeways need flow signals?

It's a matter of supply and demand, really. Traffic moves better when freeway demand is below capacity. As more cars enter freeways (demand), the supply of roadway space decreases. But money and space to build more freeways are limited, so we need to look for other ways to relieve congestion. Flow signals are one of those ways. Freeways can handle cars entering the flow of traffic one or two at a time, but when groups of cars attempt to merge the even flow is interrupted. Because flow signals release one car at a time onto freeways, merging vehicles are less likely to slow down cars already on the freeways. The result: smoother traffic, more consistent travel time and fewer traffic-related accidents.

❑ When/where will these be used?

Flow signals were activated last summer on the IH10 West, Katy Freeway, with all signals operating by mid-November. Starting the second week in January, flow signals will be operating on the North Freeway. Eventually, they will be used at the entrance ramps of most of the major Houston freeways.

❑ Do flow signals really work?

Yes. Since the flow signals have been in use on the Katy Freeway, the mainlane speeds have increased 5 to 10 percent during certain periods of operation. For the average commuter on the Katy Freeway, this means a savings of 30 seconds per mile — a reduction of five minutes over a 10-mile trip. Other cities, like Seattle and Minneapolis, have experienced similar success. In Seattle, travel time averaged 22 minutes before signals were installed; travel time along

the same freeway with signals in use was 11.5 minutes. Minneapolis experienced a 38 percent reduction in the peak-period accident rate after signals were installed.

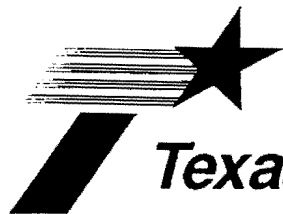
❑ How can we make this work for us?

Success does take time. These cities did see improvement, but it didn't happen overnight. TxDOT will monitor freeway conditions, but the success of flow signals depends on you. To ensure success, pull up to the stop line, be patient with your brief stop at the red light, and proceed cautiously when the light is green. Flow signals will be enforced just like regular traffic signals. Do your part by following the rules and waiting your turn. The end results will benefit us all.

For more information call the Texas Department of Transportation at 713-802-5076.



**Houston's
Flow Signals . . .** *They'll help
you "go with
the flow."*



Texas Department of Transportation

P.O. BOX 1386 • HOUSTON, TEXAS 77251-1386 • (713) 802-5000

July 16, 1996

CONTACT: GKT-PIO

The Honorable FIELD(NAME)
FIELD(TITLE)
FIELD(GROUP)
FIELD(ADDRESS)
FIELD(CITY) Texas FIELD(ZIP)

Dear FIELD(TITLE):

The Katy Freeway is Houston's most congested arterial. With an average daily traffic count of more than 217,000 vehicles, the Katy Freeway is the only state roadway in Houston that has not been expanded since the 1970s. With the possibility of improvements still years away, the present roadway must be managed more effectively.

Flow signals are one of the weapons in the arsenal of effective traffic management. Flow signals have demonstrated their effectiveness in other major metropolitan areas. In the Houston area they will be part of a larger effort to reduce congestion on the city's major freeways, including the North Freeway, Gulf Freeway, Southwest Freeway and the Katy Freeway. Beginning July 30, 1996, the six flow signals on the outbound (westbound) lanes of the Katy Freeway between IH 610 and the Sam Houston Tollway will be operational. The flow signals will regulate entry into the mainlanes of the freeway and will be enforced just like regular traffic signals.

Your cooperation and assistance is important to the success of this system. The enclosed brochure describes the important functions of the project and will be distributed to users prior to the implementation of the program. Through the leadership of elected officials, the residents of the communities adjacent to the Katy Freeway can contribute to the success of this new effort.

I want to thank you in advance for your support of this project. If you have any questions, please do not hesitate to contact the Public Information Office at (713) 802-5076. Thank you.

Sincerely,

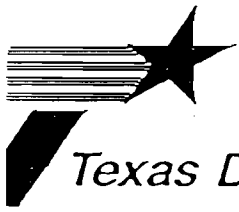
Gary K. Trietsch, P.E.
District Engineer
Houston District

AVI Participant:

The Real Time Information Program is going well. All 4,200 tags in phases 1 and 2 have been distributed. These, plus the EZ tags provide excellent data on the traffic conditions of the freeway system. On the high volume freeways (I-10, US-59, etc.) we are averaging 3 reads a minute at each reader station during the peak hours of operation. This allows personnel at the Houston TranStar (Houston's integrated traffic management center) to respond rapidly to any slowdown in traffic.

Because of your interest in traffic management programs we would like to make you aware of the latest program being introduced by the Houston District of the Texas Department of Transportation (TxDOT). The Program is titled Houston's Flow Signals. Flow signals will be used to direct the movement of traffic on selected entrance ramps throughout the freeway system. The program will begin on the I-10W (Katy Freeway) later this month and should be operational on the entire freeway system by the end of the year. The enclosed brochure describes the program in detail and identifies the success this type of program has had in other major cities.

Again, thank you for your participation in the Real Time Information Program.



Texas Department of Transportation

news

Houston District
P.O. Box 1386, Houston, Texas 77251-1386
713/802-5071
FAX 713/802-5075

96-50 July 18, 1996
Public Information Office

Houston
(713) 802-5072

FLOW SIGNALS READY FOR OUTBOUND KATY FREEWAY

The Texas Department of Transportation has installed "flow signals" on the ramps of IH 10 West, the Katy Freeway, to regulate entry onto the freeway during peak travel hours. Six of the new flow signals on the outbound lanes between IH 610 and the Sam Houston Tollway will be operational during the afternoon peak period on July 30, 1996. The flow signals have been installed to reduce congestion, provide more consistent travel time, and fewer traffic accidents.

Flow signals will be turned on at the six outbound entry ramps west of Silber, Antoine, Wirt, Blalock, Bunker Hill and Gessner. The flow signals will be turned on each day at 3:30 and will be monitored by TranStar, the traffic management center operated by the City of Houston, Harris County, METRO and TxDOT.

Traffic congestion on the Katy Freeway is caused by too many cars crowding a freeway exceeding its designed capacity. As a result of crowding, the speed drops and more and more vehicles become part of a slow-moving traffic jam. By allowing a single car to enter the freeway at a time without interrupting the flow of the mainlanes, flow signals contribute to the overall efficiency of the system.

Flow signals on the outbound ramps between the Sam Houston Tollway and SH 6 will be operational at a later date. Flow signals present on other freeways will be turned on and integrated into Houston's traffic management system over a period of time.

Highway officials hope stoplights will help drivers 'go with the flow'

By **DAN FELDSTEIN**
Houston Chronicle

An old weapon to fight freeway congestion will be reintroduced to Houston later this month, and area traffic officials have their fingers crossed that motorists will cooperate.

Flow signals — stoplights placed at freeway entrance ramps — will start operation July 31 on the westbound Katy Freeway.

With red, yellow and green bulbs just like any traffic signal, they tell motorists when to continue onto the freeway, or when to sit and wait on the ramp.

"The biggest thing is getting people to respect it," said Linc Wright, flow signal program manager for the Texas Department of Transportation.

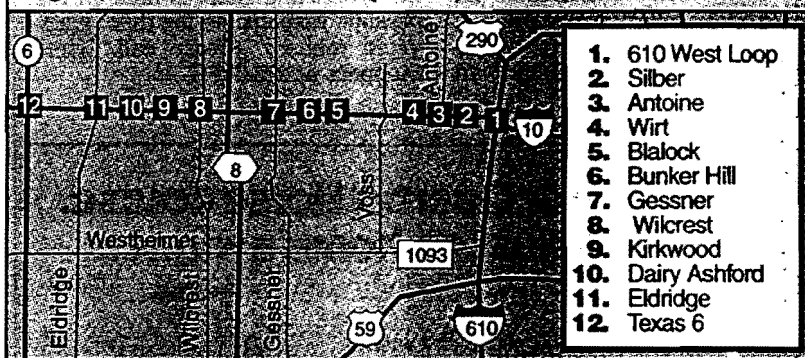
Wright and his colleagues may already score points with motorists for getting one thing right. With widening plans at least five years away, the Katy Freeway — Interstate 10 West — is the Houston highway most desperately in need of some magic.

Merging from four lanes at the West Loop into three past Antoine, westbound afternoon rush hour traffic averages 20 mph daily as it inches toward Beltway 8.

If flow signals can improve the speed to 30 mph, they will be a great success, Wright said. Getting near 40 mph would be a crowning triumph.

I-10 entrance ramp signals

"Flow signals" will be activated on the westbound Katy Freeway. Signals 1-7 will be turned on July 31 and 8-12 will follow in a few weeks.



Chronicle

The philosophy of flow signals is to keep a high-volume freeway moving smoothly, and not necessarily to quicken the time it takes any one person to get home, said Dick McCasland, a research engineer with the Texas Transportation Institute.

For instance, a freeway moving 55 mph isn't operating at peak volume because vehicles spread themselves out at higher speeds. The road isn't efficient at 20 mph, because too few vehicles can traverse it in a given period of time.

About 40 mph would be optimal for the Katy Freeway, McCasland said — getting the most possible people home in a given hour.

And that's where it gets touchy. Raising the rush hour flow to 40 mph on the Katy will mean restricting

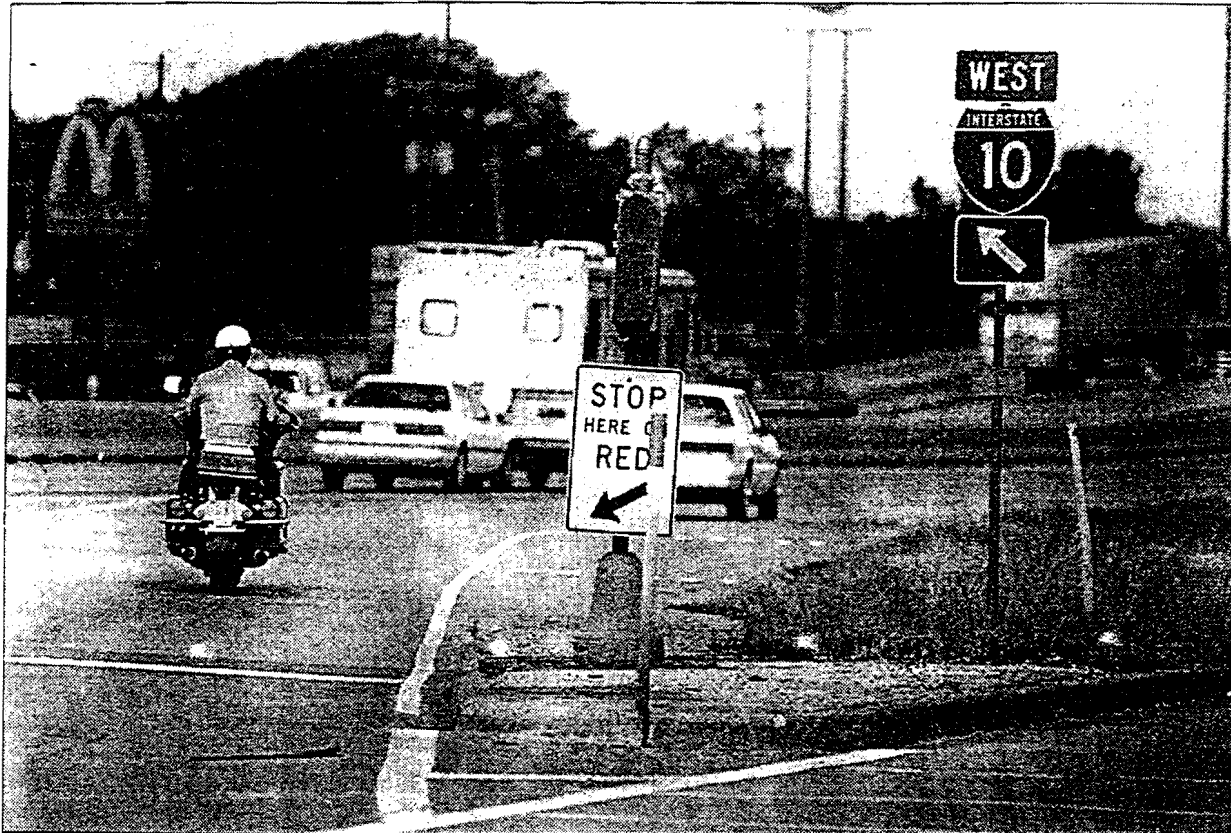
merging ramp traffic rather than letting it dump in.

In other words, at the height of rush hour, motorists could wait in line at some entrance ramps from a few seconds up to two or three minutes.

That may sound bad, McCasland said, but here's the selling point: Waiting a minute or two to enter a 40 mph flow would be much more desirable than being able to merge instantly into a 20 mph flow.

That's true especially if you plan to travel a longer distance on the freeway, he said. Waiting two minutes to merge would be a bad deal if you only wanted to go an exit or two, but that may convince some mo-

See RAMPS on Page 17A.



John Everett / Chronicle

Traffic officials said they are hoping the return of flow signals will help move things along on Houston roadways. The familiar signals will make their debut July 31 on the westbound side of Katy Freeway.

Ramps

Continued from Page 13A.

motorists to avoid the freeway for short trips, which would reduce traffic volume.

Houston had its first set of flow signals in the 1960s along the Gulf Freeway. The Southwest and North freeways have had them more recently. How effective they were depends upon whom you ask, Wright said.

The new ones have been timed with more sophisticated methods, and they will be monitored by Houston's freeway video system so they don't back traffic up into intersections, he said.

The Los Angeles area has more than 500 flow signals, McCasland said. Other cities with the systems

include Seattle, Minneapolis and Portland, Ore., and motorist compliance ranges from 90 percent to 95 percent, he said.

The systems also reduce accidents, because smoother traffic means fewer rear-end collisions when traffic stops and starts, McCasland said.

A flow signal is considered a lawful traffic signal, which means police can give you a ticket for running it.

Wright will activate the flow signals July 31 for westbound Katy Freeway entrance ramps from the West Loop to the Sam Houston Tollway/Beltway 8 — at Silber, Antoine, Wirt, Blalock, Bunker Hill and Gessner.

Westbound entrance ramps from the beltway to Texas 6 will follow a few weeks later — at Wilcrest, Kirkwood, Dairy Ashford, Eldridge and Texas 6.

Eastbound flow signals won't be turned on until westbound traffic has been studied closely. Other freeways eventually will have the signals, but their recent or current widenings mean they aren't in as dire need of help, Wright said.

Officials chose to start on the most congested freeway so any success with the signals would be as evident to the public as possible, said Janelle Gbur, public information officer with the state transportation department's Houston district.

Public reaction could make or break the program, she said. The district will launch a "Go with the Flow" information campaign, hoping to create positive feelings.

"Any time you start controlling people, they get concerned," McCasland said. "We're not trying to delay people for the fun of it. It's an effective traffic management tool."

Flow signals on Katy turn on this afternoon

By DAN FELDSTEIN
Houston Chronicle

When commuters entering the Katy Freeway see red this afternoon, state transportation officials are hoping it will be from the helpful glow of flow signals – and not the glare of anger.

The Texas Department of Transportation will activate small stoplights called flow signals on westbound entrance ramps to the freeway between the West Loop and Beltway 8.

The signals will flash red, yellow and green from 3:30-6:30 p.m. each weekday afternoon – in the hope of preventing entrance-ramp traffic from merging too quickly with the rush hour main lanes.

When they are respected by motorists, the signals dramatically improve the average speed on a freeway, said Linc Wright, Katy Freeway signal flow program manager. They do stall traffic on the entrance ramps, however, which upsets drivers who don't understand the concept or simply reject it, he said.

One of the area's most congested highways, the Katy Freeway averages 20 mph westbound in afternoon rush hour. With flow signals, officials hope to improve the road to 30 mph.

The philosophy of flow signals is not to speed up an individual motorist's trip, but move the highest volume of freeway traffic in a given hour, Wright said. That

See FLOW on Page 19A.

Flow

Continued from Page 15A.

may mean someone sits on a ramp for up to three minutes in the worst case, in exchange for entering a quicker stream of traffic, he said.

Several area freeways have used flow signals in past decades. Since publicity began for today's signal activation last week, phone calls from the public have run half in favor, half opposed, Wright said.

Supporters are thankful the state is trying to improve congestion on the Katy Freeway – Interstate 10 West. Critics are concerned that lines of traffic will back up from the entrance ramps onto the frontage road, causing rear-end collisions.

Wright said that shouldn't happen. He and other officials will be eagerly watching this afternoon to see how it goes.

Running a red flow signal is ille-

I-10 entrance ramp signals

"Flow signals" will be activated on the westbound Katy Freeway from 3:30 to 6:30 p.m. weekdays. Signals 1 – 7 will be turned on today and 8 – 12 will follow in a few weeks.

1. 610 West Loop
2. Silber
3. Antoine
4. Wirt
5. Blalock
6. Bunker Hill
7. Gessner
8. Wilcrest
9. Kirkwood
10. Dairy Ashford
11. Eldridge
12. Texas 6

Chronicle

gal, just like running a normal traffic light, he said.

The Transportation Department is starting the program on a small scale on purpose, with just seven

signals activated today.

If all goes well, five more westbound signals will be activated in several weeks between Beltway 8 and Texas 6.



Engineers pleased with drivers' compliance at flow signals

By DAN FELDSTEIN
Houston Chronicle

In a darkened room of video monitors on Old Katy Road, Texas A&M professor Carroll Messer was bouncing on his toes, yelling at a screen.

"There you go! GO! That's it," he said, cheering at a blue pickup truck entering the Katy Freeway near Silber on a ramp with the new "flow signals."

Messer and six other engineers and technicians at Houston's Transtar traffic facility sweated and paced Wednesday afternoon as they activated the signals on the west-bound freeway.

The small stoplights on entrance ramps, designed to smooth rush-hour congestion, were once used on several area freeways. They are making a new appearance on the Katy between the West Loop and Beltway 8 on weekday afternoons.

From 3:30-6:30 p.m. Wednesday, they flashed red, yellow and green, and compliance from motorists was decent but certainly not universal.

"It seems to be working pretty well, better than the first day of a football practice," Messer said.

Used in several cities across the country, ramp signals are generally credited with speeding rush hour freeway traffic by 10 to 15 mph. Officials here are braced for criticism, however, because drivers don't like waiting at ramps.

Katy Freeway drivers were especially concerned that ramps would back up onto the frontage road, blocking exit ramps from the freeway, officials said. The Texas Department of Transportation planned for that by using sensors that will turn off the signals if the line gets too long.

On Wednesday, lines never appeared to be more than a dozen cars long. Most were much shorter. It took about 50 seconds for the 12th car to make it to the front of the line — well within the two-minute maximum officials had set for the system.

After just one day of experience, officials said, it was impossible to tell if the signals smoothed traffic on the main freeway lanes. Between 5-6 p.m., traffic was stop-and-go at

the usual choke points.

"What's that, another TV camera-man? We'd probably be running 10 mph faster without all those cameramen out there," Messer said, peering at another monitor.

The engineers said they learned several things on the first day. For instance, many drivers were confused by the short green light, and it was hard to blame them. The green lasts only a second-and-a-half, meant for one vehicle to pass through. Some drivers missed two or three greens as they looked around or checked themselves out in their rear-view mirrors. Other drivers didn't pull close enough to the signal, so their car didn't trigger a green light and they just sat and waited.

The most noticeable problem, however, continues to be the "queue jumper" — the driver who takes an exit ramp and then zooms onto the next entrance ramp, hoping to cut in front of other motorists.

About 30 percent of motorists who exited at Antoine immediately reentered the freeway in an attempt to get ahead of about 10 cars. In the process, they created more merges on the main lanes, which just slows down the whole freeway.

Given time, flow signals should actually deter queue jumpers, because they now will face a traffic light on the entrance ramp, and will be at the end of a line of vehicles, said John Gaynor, manager of transportation management systems at Transtar.

The Texas Department of Transportation will spend three to four weeks adjusting the new signals. Then they will activate several more, farther west on the Katy from Beltway 8 to Texas 6.

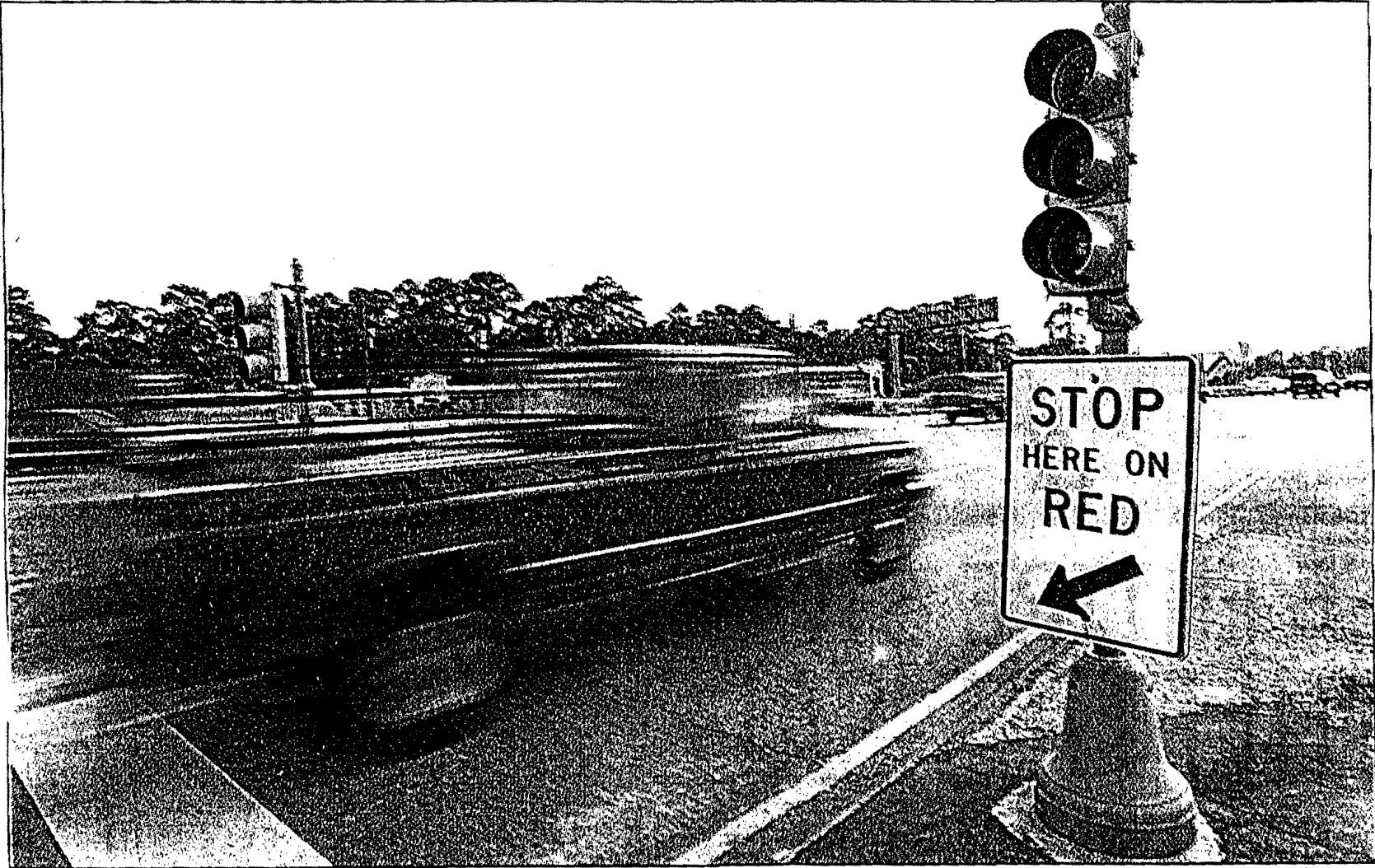
In a stack of papers in the monitor room, Gaynor had a Federal Transit Administration study tracking the success of other cities with ramp signals.

"An implementing agency should expect and be willing to accept some criticism for applying an unpopular control device," the report said.

"The problem is, if it works right, it'll appear as if it's not needed," said Wayne Jones, of the Texas Department of Transportation's Houston district. "Because the freeway will be flowing well."

Handwritten initials/signature

What stoplight?



Paul S. Howell / Chronicle

A few motorists — such as this one at the Antoine ramp — ignored the new lights designed to regulate westbound traffic entering the Katy Freeway between the Loop and Beltway 8. But officials said most

drivers made at least an attempt to comply with the new traffic system on Wednesday. The signals will be activated every weekday afternoon at rush hour. **Page 28A.**

I-10 drivers know when to stop, go

More than 90% follow flow signals

By **DAN FELDSTEIN**
Houston Chronicle

State transportation officials are giving Katy Freeway motorists an "A."

A spot check Thursday showed that 93.5 percent of vehicles obeyed the new flow signals on westbound entrance ramps to the freeway.

The Texas Department of Transportation activated the small stoplights Wednesday on the Katy from the West Loop to Beltway 8. They are designed to regulate traffic entering west Interstate 10 during rush hour, smoothing the flow of the main lanes.

Officials monitored the Silber entrance for the entire rush hour, from 3:30-6:30 p.m.

While the overall compliance was 93.5 percent, the worst behavior came from 4-4:15 p.m., when only 83.5 percent of motorists heeded the signal.

John Gaynor, a state supervisor of the project, said officials now have two tips for motorists, based on three days of operation.

First, they should even the front of their vehicles with the stoplight. Otherwise it will stay red.

Second, they should be ready for the signal to turn green quickly. A red-green-yellow cycle lasts only about 10 seconds, with the green lasting only about 1 1/2 seconds.

Gaynor was concerned that motorists had read they might wait for a minute or more on the ramps. That time includes a wait in line behind up to a dozen cars.

Metro police officers also will be watching the new flow signals.

Running a red flow signal will bring the same ticket as running any other red light, Gaynor said.

few
D A
[Handwritten signature]

Traffic accelerates to a crawl on Katy

Ramp signals help by about 5 mph

By **DAN FELDSTEIN**
Houston Chronicle

Noticing any improvement in afternoon rush hour on the Katy Freeway?

Texas Department of Transportation officials believe that new ramp signals have improved westbound speeds by about 5 mph at the earliest and latest parts of the rush hour.

Speeds have not improved from 5-6 p.m., but they're working on it, said Linc Wright, ramp signal program manager.

The stoplights on the entrance ramps are just one of several technologies that have popped up recently to help smooth Houston traffic.

For the past two weeks, some of the new changeable message signs posted around town to warn of accidents have also been used to post actual freeway speeds.

On the West Loop at Woodway, on the North Loop at Ella and on Interstate 10 near North Shepherd, the signs flash on from 3:30 p.m. to 6:30 p.m., estimating travel time on the westbound Katy Freeway from the West Loop to Beltway 8.

"Approximate time to Beltway

8, 15 minutes at 3:45 p.m.," the sign might say. They are updated every 15 minutes, Wright said, although a photographer found only one of three working Friday afternoon.

In the morning, eastbound signs are posted along the Katy Freeway at Texas 6 and Kirkwood, estimating the time from the signs' locations to the West Loop.

Wright said that motorists appreciate the warning of congestion ahead. If the sign said the freeway was too slow, some drivers might choose an alternate route, he said.

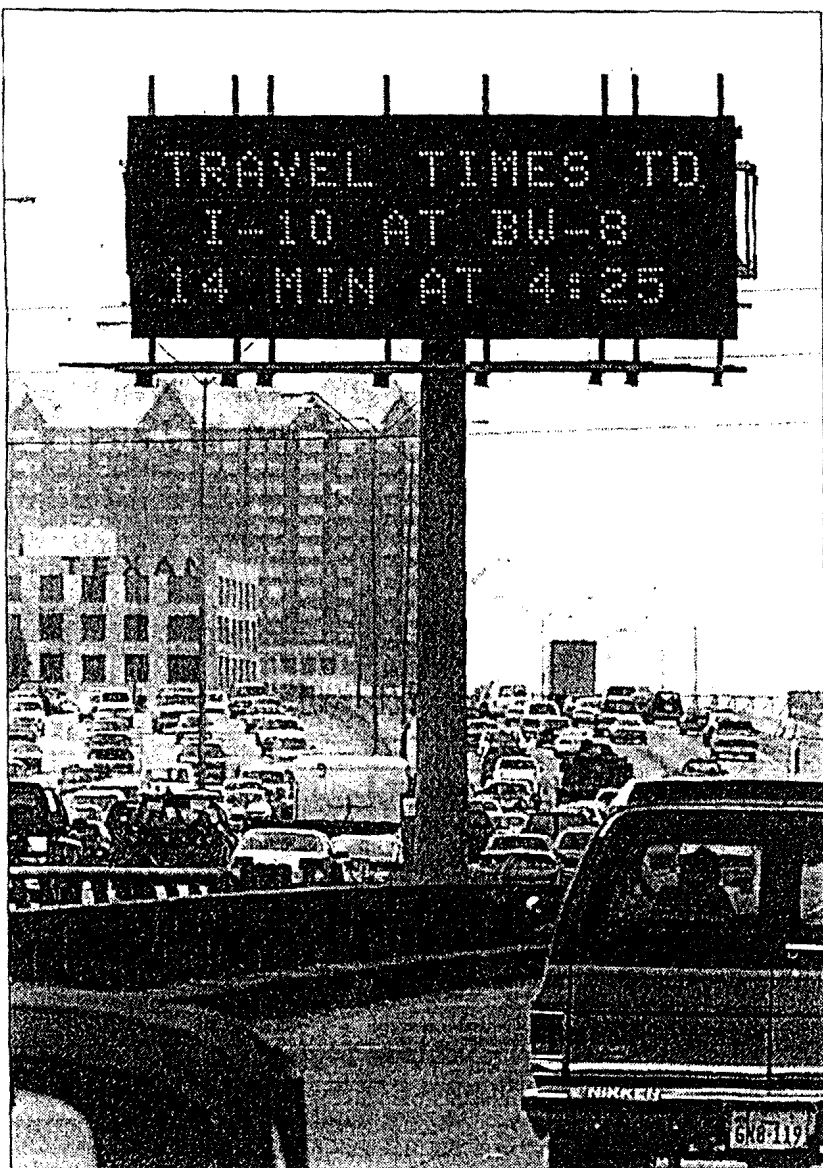
The outdoor warnings now complement a service enjoyed by motorists lucky enough to have Internet access at home or at work.

Houston Transtar, the nerve-center of the new technologies, has been posting a live traffic map for about one year with continuously updated average speeds for most area freeways.

During the next year, Transtar will fill in the missing pieces, including Texas 288, the East Loop, Interstate 10-East and parts of the Sam Houston Tollway.

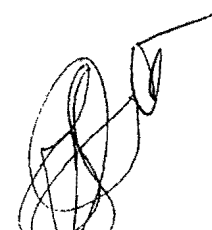
Within the past month, a new

See **TRAFFIC** on Page 30A.



Howard Castleberry / Chronicle

This sign on the northbound lanes of the West Loop at Woodway is one of several recent improvements that have helped ease Houston traffic. Such signs that estimate travel time are updated every 15 minutes, officials said.



Traffic

Continued from Page 29A.

feature has been added to the Internet site called "freeway route builder." A person who accesses the site can type in a regular commuting route and "bookmark" it. Then, whenever he wants, he can click his computer mouse and see how long his commute will be, always from live data.

"I've gotten a lot of feedback through electronic mail that people really like that one," said Dan Hickman, a research associate with the Texas Transportation Institute.

The Internet map site (<http://traffic.tamu.edu>) is accessed more than 120,000 times a month from 10,000 different computers, Hickman said. Some of those computers, belonging to major companies, may have dozens or hundreds of terminals being used by employees.

For the majority of drivers who don't have access to the Internet, more and more of the outdoor message signs will be working in the coming months, said Douglas Wiersig, Transtar executive director.

An employee must type each speed update from the Internet map onto a separate set of computers that control the outdoor message boards, he said. If an automatic link can be arranged, the system could flourish, Wiersig said.

The Transtar facility on Old Katy Road conducted its grand opening in April and is funded by the federal government, Texas Department of Transportation, Harris County, the city of Houston and Metro.

Also coming "on line" soon from Transtar will be the changeable lane signals that were hung recently on the frontage road of U.S. 290, also known as the Northwest Freeway.

During normal hours, the overhead directional signals might allow a left turn from two lanes. During a heavy rush hour or after an accident, with extra through-traffic attempting to use the frontage road, they might allow left turns from only one lane.

Back on the Katy, technicians plan to expand the ramp signal program westward next week. Westbound freeway entrance signals will be activated Tuesday at Wilcrest and Kirkwood. They will be activated Thursday at Dairy Ashford and Eldridge.

Signals at Wirt, Blalock and Gessner also will be running longer. They had been turned off in mid-rush hour, from 5 p.m. to 6 p.m., for fear that traffic would back up too far on those ramps.

Wright said that might help the jam on the main freeway lanes from 5 p.m. to 6 p.m., but won't solve it. He said the major culprit remains the crowded merge of the westbound Katy Freeway and traffic exiting the Sam Houston Tollway/Beltway 8.

Merge signals activated

The Texas Department of Transportation activated its "flow signals" Wednesday on the eastbound Katy Freeway between Beltway 8 and the West Loop.

The small stop lights on entrance ramps are meant to prevent more than one car at a time from entering the freeway, thus reducing main-lane backups caused by heavy merging.

Flow signals on westbound Katy Freeway entrance ramps were turned on in August, so far achieving only minor success at speeding up traffic.

The eastbound signals will be turned on 6:30-9:30 a.m. weekdays. The program will be expanded to eastbound signals between Beltway 8 and Texas 6 on Nov. 20.

Your Texas Department of Transportation (TxDOT) is working to solve freeway congestion problems. Part of the solution involves the traffic signals installed at some entrance ramps on State Highway 360. These traffic signals, called flow signals, will set the rate at which cars enter the freeway during peak hours. They will reduce the number of freeway accidents and shorten your daily travel time. Flow signals are part of our cities' intelligent transportation system.



When you see this sign at the entrance ramp of State Highway 360, observe the traffic signal.

● Why do we need flow signals?

Increased population and business activity along State Highway 360 are pushing the freeway to its limits of capacity. There's a limited supply of freeway space to meet the increasing demands of traffic, and the resulting congestion compromises safety along the northbound lanes, which average more than 100 accidents a year. Since both money and space to build more freeway lanes are also limited, we need other ways to lessen congestion. Flow signals offer one of those ways. Typically freeways allow drivers to merge into traffic one or two at a time, but when groups of cars try to merge, traffic can slow or stop altogether. Because flow signals admit one car at a time onto the freeway, merging cars are less likely to slow down the freeway traffic. The result—smoother traffic flow, shorter daily travel times and fewer traffic accidents.

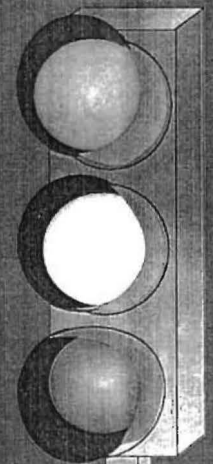
● When & where will flow signals be used?

TxDOT is installing the signals at five entrance ramps along northbound SH 360 at Mayfield, Arkansas, Spur 303, Park Row and Abram. The signals will be turned on in the summer of 1998. The signals will operate each weekday morning from 6:30 a.m. to 9:00 a.m. When the traffic volume lightens after those peak periods, the signals will shut off automatically.

● Do flow signals really work?

Yes. Other cities have seen significant improvements after putting flow signals to work. In Houston, commuters have been able to cut several minutes from their daily trip on one freeway, and in Seattle, travel times along a freeway were shortened by almost half. The signals have made a big difference for safety in Minneapolis, where freeway accidents were reduced by 38 percent after flow signals were introduced.

Success takes time. Houston, Seattle and Minneapolis all saw improvement, but it didn't happen overnight. TxDOT will monitor freeway conditions, but the success of flow signals depends a lot on you. To do your part to keep traffic flowing, pull up to the signal, be patient with your brief stop when the light is red, and proceed with caution when it turns green. Flow signals will be enforced just like regular traffic signals. Do your part by following the rules and waiting your turn. The end results will benefit us all.



For more information call the Texas Department of Transportation at 817-370-6500.

**State Highway 360
Northbound**

Abram

Park Row

Spur 303

Arkansas

Mayfield

Interstate Highway 20

Texas Department of Transportation
01 SW Loop 820
Ft Worth, TX 76115



**State Hwy 360
Flow Signals**

*they'll
help you
go with
the flow*

