Effective Solutions to Oahu's Traffic Congestion Problems

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August 2007

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Why do we have congestion?

Reality Check . . .

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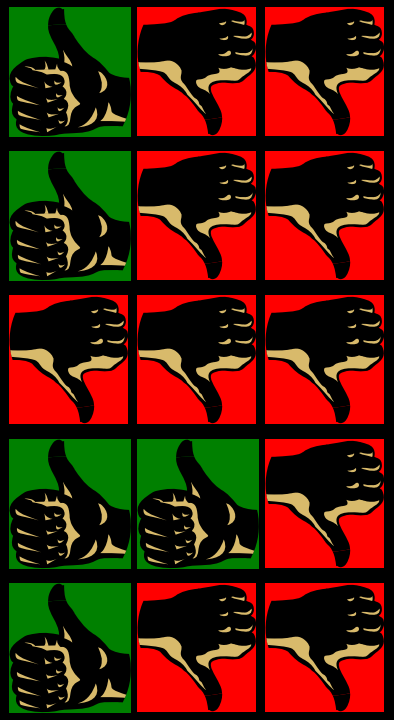
Major parts of traffic operations

- Freeway operations and FMS
- Arterial / urban operations and UTC
- Incident and accident management
- Intelligent transport systems, ITS
- Agencies, institutions, cooperation



Large (500,000+) Urbanized Areas with the Most and Least per Capita Travel in 2001

RANK	URBANIZED AREA NAME	STATE LOCATION	MILES OF ROADWAY PER 1,000 PERSONS	TOTAL DVMT PER CAPITA	AVERAGE DAILY TRAFFIC/ FREEWAY LANE
1	Houston	TX	6.1	37.6	18,174
2	Atlanta	GA	4.7	35.6	19,031
3	Birmingham	AL	6.9	34.8	12,847
4	Nashville	TN	4.4	34.3	13,763
5	Indianapolis	IN	4.7	33.6	16,911
6	Austin	TX	5.2	32.9	16,424
46	**Los Angeles**	**CA**	**2.1**	**22.2**	**23,123**
65	Philadelphia	PA	3.1	18.4	14,656
66	**Honolulu**	**HI**	**1.5**	**16.8**	**14,014**
67	New York-Northeastern NJ	NY	2.2	15.7	15,329
68	New Orleans	LA	3.1	14.4	13,478
69	San Juan	PR	2.2	13.4	15,557

Source: Highway Statistics, 2002

POOR CHOICES & BAD POLICIES

Metro area trips in the U.S.: Auto = 75.9%
Public Transit = 4.5%

Freeway growth: 3,066 lane miles in 1966
64 lane miles in 2004

1993→2003 increase in rail miles = 27%
increase in hwy miles = 3%

Public transit gets 20% of all federal, state, regional and local surface transportation expenditures to serve less than 5% of the trips!

Historical trends in national highways

	Expenditures, billion 2001 $	Hwy. travel in billion vehicle-miles	Hwy. funds per 10 miles (one veh. trip)
1961	**52**	**700**	**$ 0.7**
1971	**75**	**1200**	**$ 0.6**
1981	**71**	**1600**	**$ 0.4**
1991	**90**	**2200**	**$ 0.4**
2001	**123**	**2800**	**$ 0.4**
2004	**128**	**3000**	**$ 0.4**

Source: FHWA

Historical trends in national transit

	Expenditures, billion 2001 $	Passenger trips, billion	Cost per trip
1961	**7.4**	**8.8**	**$ 0.8**
1971	**8.0**	**6.8**	**$ 1.2**
1981	**22.2**	**8.3**	**$ 2.7**
1991	**27.0**	**8.6**	**$ 3.1**
2001	**36.7**	**9.7**	**$ 3.8**
2003	**39.8**	**9.4**	**$ 4.2**

Source: APTA

(1) In over 40 years the U.S. doubled in population but transit trips remained the same. Funding for these trips grew 5.3 times.

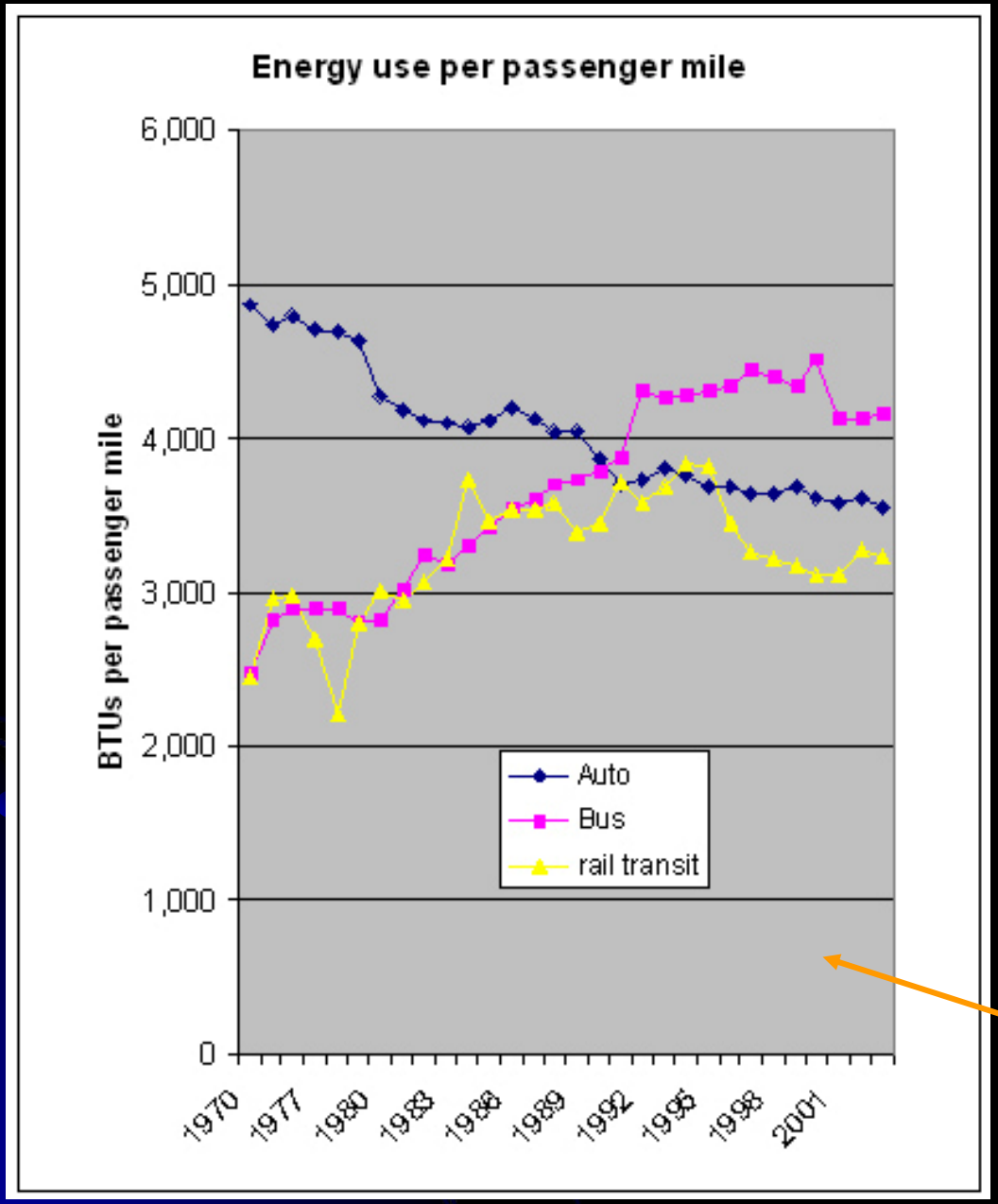
(2) At the same time, highway use increased 4.2 times, but funding grew only 2.5 times.

(3) Average trip by transit costs 10 times more.

Urban trip rail usage in US: 2.01%

TABLE 3-14 Modal Usage by Age and Gender

Mode	Total	Male	Female
	Percent		
Drive alone	75.73	76.17	75.22
Carpool	12.18	12.21	12.15
2-person	9.43	9.31	9.57
3-person	1.68	1.68	1.69
4-person+	1.07	1.22	0.89
Transit	4.55	4.11	5.07
Bus	2.51	2.10	2.98
Streetcar	0.05	0.05	0.05
Subway	1.45	1.36	1.56
Railroad	0.51	0.57	0.45
Ferry	0.04	0.04	0.03
Taxi	0.16	0.14	0.18
Motorcycle	0.12	0.20	0.02
Bike	0.38	0.57	0.16
Walk	2.93	2.90	2.96
Work at home	3.27	2.88	3.72
Other	0.69	0.83	0.53



Rail is not green!

A large power plant is needed for rail alone and there will be diesel generators at each station.

A car pollutes only during the 30-90 minutes of use per day. Rail pollutes 24X7.

Rail is 19th century power-hungry technology → We'll not take advantage of fuel cells, bio-diesel and other alternatives with rail transit.

E.P.A. data

The bottom line is:

- **Nationally rail is a costly underachiever**

- **Rail has distinct advantages only in dense places with huge populations (Paris, London, Tokyo, …), physical access challenges (Manhattan, San Francisco), and extremely limited parking supply (most old cities).**

- **Rail won't solve any traffic problem on Oahu**

- **Let's see what will …**

Near-Term Solutions: **Improvements to H-1 freeway**

Objective: Remove bottlenecks
Result: 30% reduction in travel time

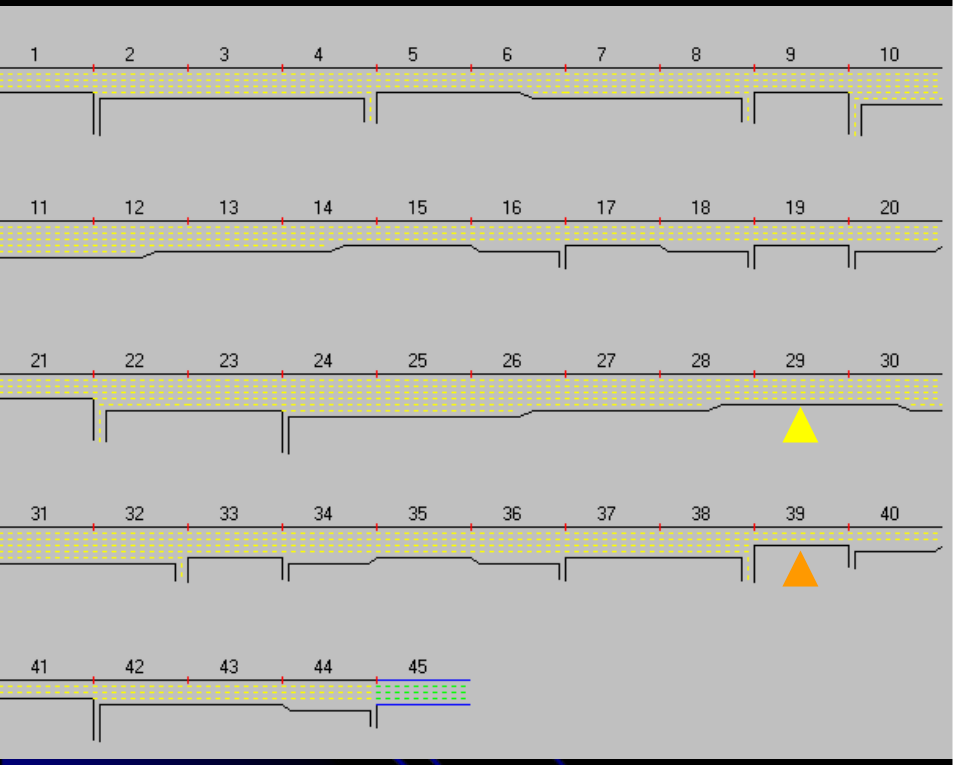
- Add a lane to the Kalihi St. “choker” on both directions
- ✓ Add lane between Liliha St. on ramp and Pali Hwy. off-ramp
- ✓ Lunalilo St. on-ramp rerouting
- 4-lane viaduct past Vineyard and Ward on-ramps
- Selective ramp metering
- ✓ Waimalu widening
- PM zipper lane (Aloha Stadium to Mililani)

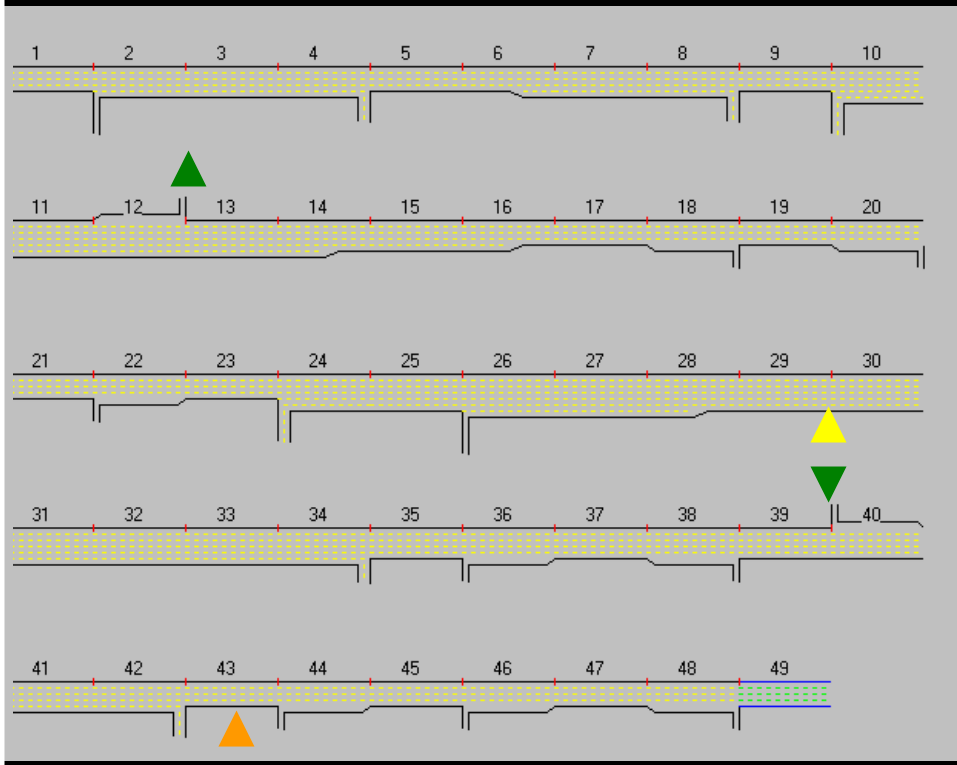
Near-Term Solutions: Other Actions

- Contraflow along Dillingham Blvd.
- Improve traffic light timing and coordination
- Encourage 4x10 work shifts for a 5% to 10% reduction in peak traffic
- Shift start time of some schools to reduce peak traffic: High schools and UH-Manoa: 9 am
- Clear accidents much faster: 45 minutes instead of 4.5 hours

H-1 airport to Waikele

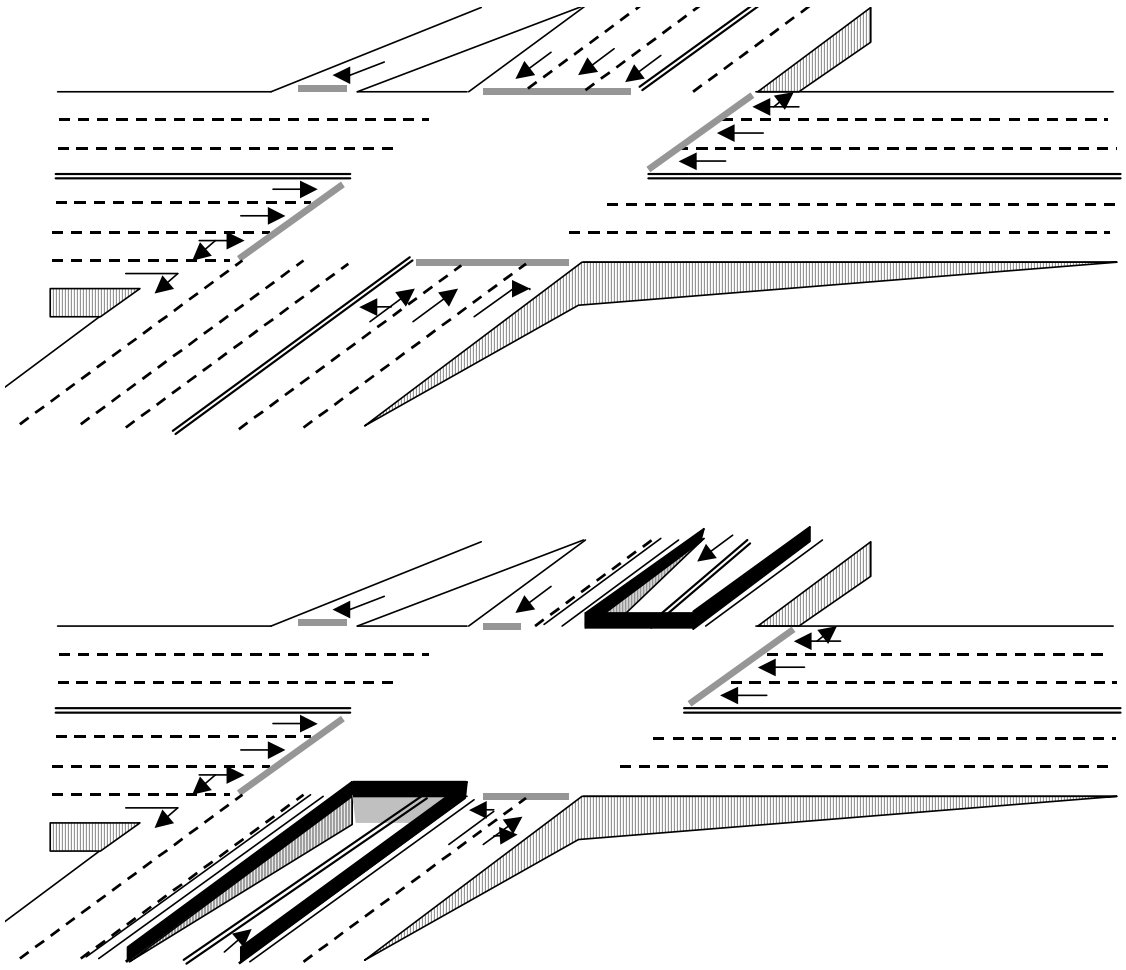
WW + W4 + Z_{PM} = -31%





Grade separation at “maxed out” intersections

- A left turn underpass from Nimitz Hwy. to Alakea St.
- Punchbowl St. through traffic going under Vineyard Blvd.
- Pali Hwy. through traffic going under Vineyard Blvd.
- Left turn from Ala Moana Blvd. onto Atkinson Dr.
- Kalakaua Ave. through traffic going under Kapiolani Blvd.
- Kapiolani Blvd. through traffic going under Date St.
- University Ave. through traffic going under King St.



- Kapiolani and Kalakaua intersection
- Expected cost: $5 million (2001)
- Underpasses are win-win, for both intersecting streets.
- Their benefit in terms of delay saved (valued at minimum wage) surpasses their cost in 3 to 5 years.
- Friendlier and safer pedestrian environment -- much traffic goes under and away from surface crossings.

- All the above are cost-effective
- Can be completed in 5 to 10 years
- Will provide actual and immediate reduction in congestion
- Have a maximum total cost of $1B
- Most are eligible for 80% federal funds for a total local cost (tax) of under $350M

What about them HOT lanes?

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Tampa's State-of-the-Art Solution

to LOS=F Traffic Congestion:

Reversible Expressway Lanes

… and what it means for Honolulu

The Author at the Authority's Headquarters' in Tampa, FL

REL has sections that are 2 or 3 lanes wide

REL = Reversible Express Lanes

Sample of a 3-lane wide section

Compared to 2 lanes, 3 lanes provide 50% more capacity at a 15% additional cost, so most of Tampa's REL is 3 lanes wide

Express bus, and vanpool joins the REL from an on-ramp

REL easily rises to a 3rd level to straddle an existing interchange

Ending on Meridian Ave. near Tampa's harbor

Continuous flow right turns and multiple coordinated left turn lights quickly discharge REL volume onto downtown Tampa which has a terrific traffic signal plan

Smooth ending from elevated to at-grade

The access at suburb Brandon is new and nicely landscaped. Similar could be made for our Farrington Hwy. access.

REL has no trouble following curvy medians

Notice the openness – REL never feels like a “doubledecker”

The facility is carefully monitored at a traffic control center

Multiple cameras and electronics guarantee safety and smooth traffic flow – all technology is American

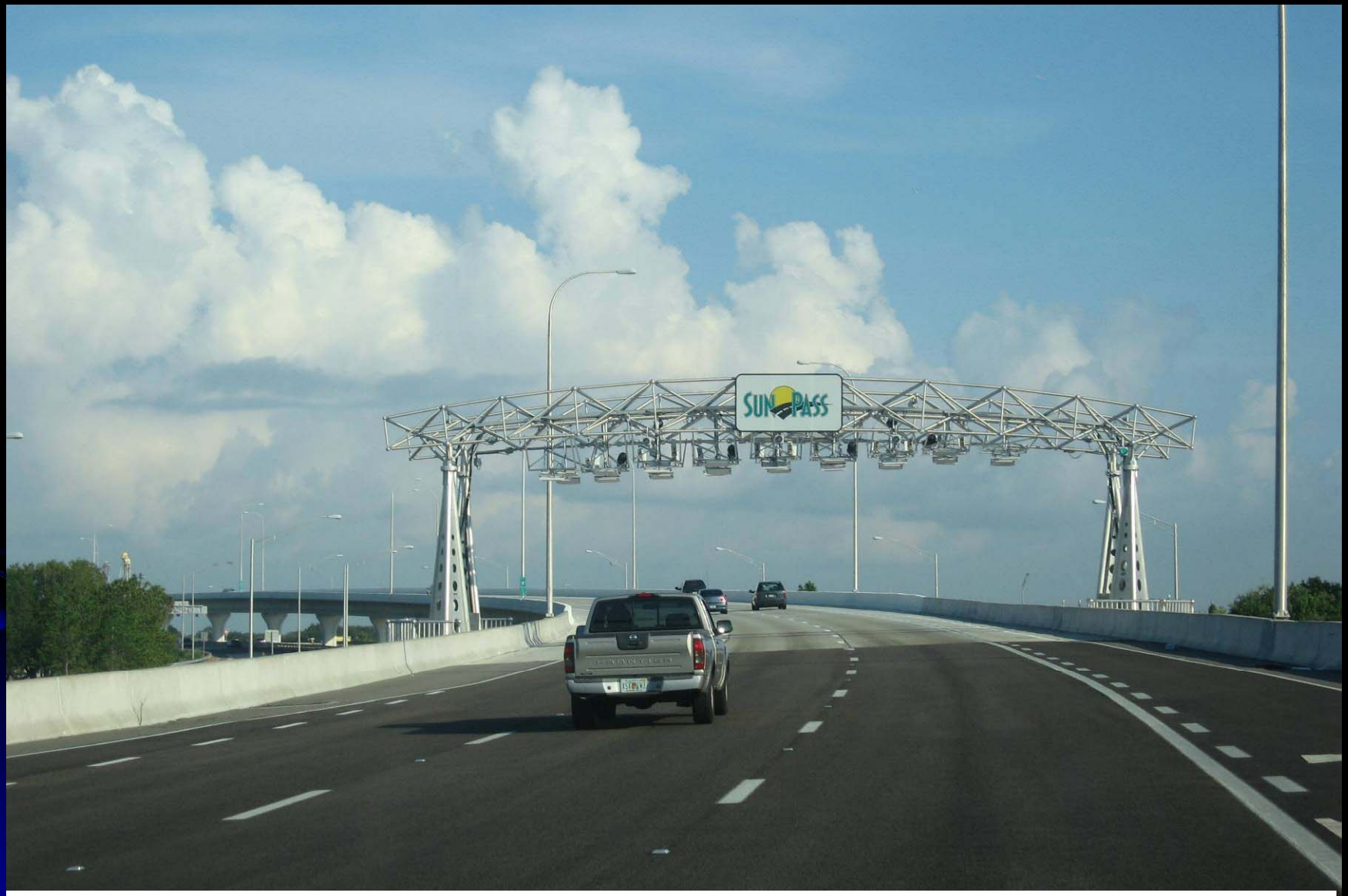
6,000 vehicles per hour can be served with a 6 ft median!

REL technology by FIGG Engineering allows the REL to be built from the top with no disruption to traffic below → see next slide

Building on top, with multiple levels below open to traffic

On REL the traffic is free-flowing.
This makes Express Buses an attractive alternative!

Toll gantry from Brandon to Tampa …



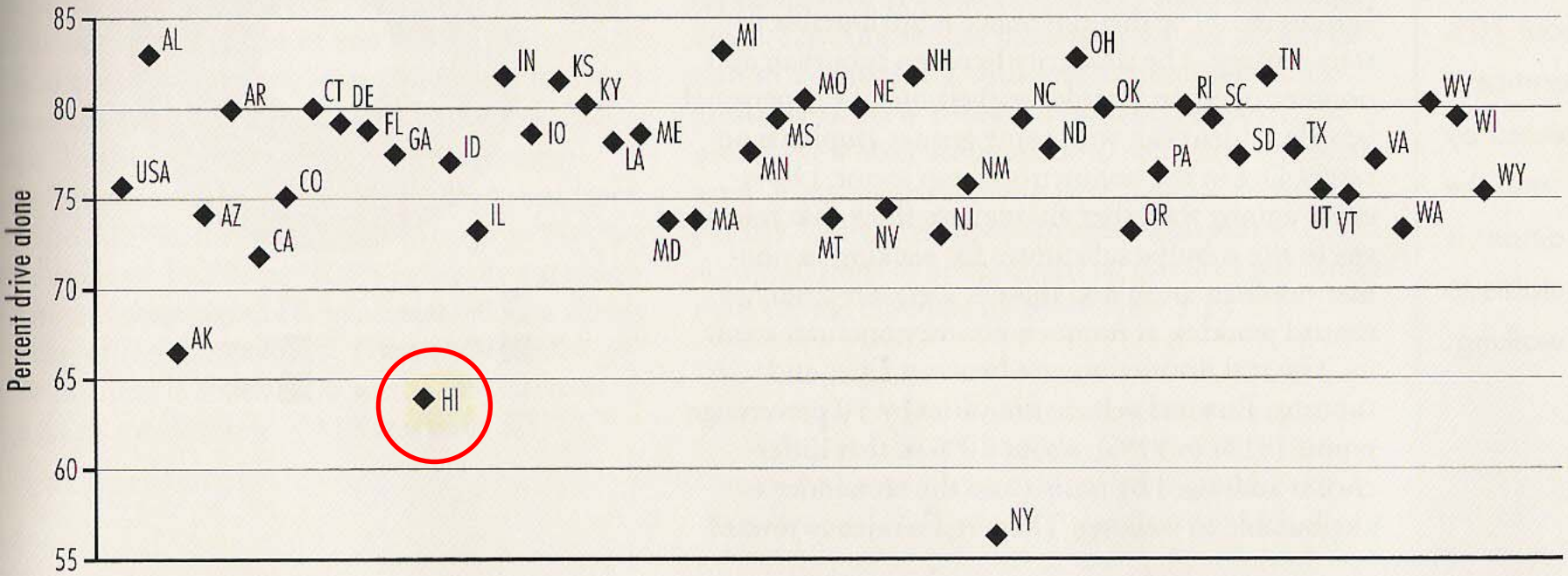
Electronics collect $1.50 toll at freeway speeds!

… and the same toll gantry from Tampa to Brandon!

REL provides 3 lanes in the morning, and 3 in the afternoon for half the cost of a 6-lane facility

Smart transport investment capitalizes on existing travel behavior: *TheBus* and carpools → HOT lanes

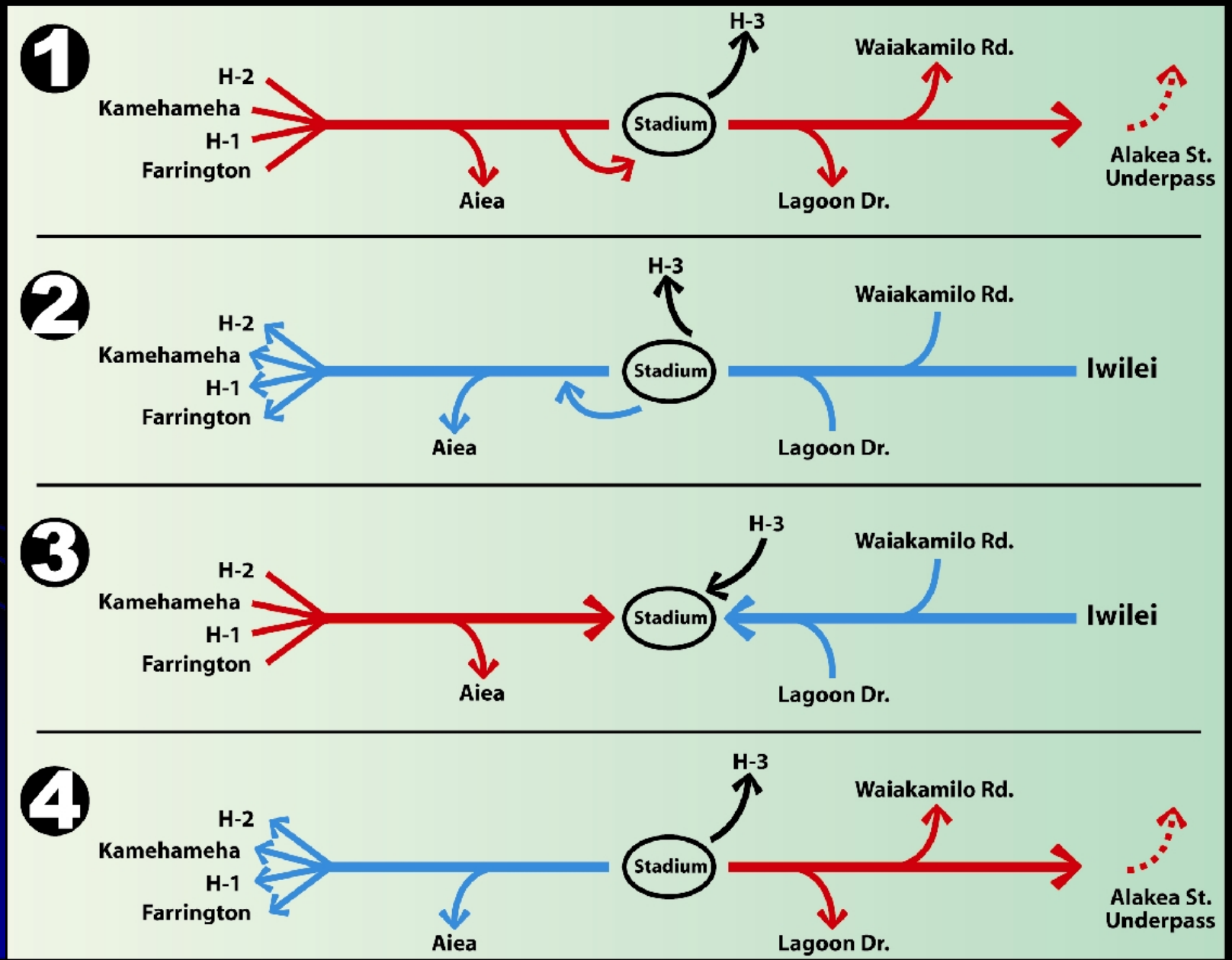
FIGURE 3-34 Drive Alone Shares by State, 2000



Note: States appear in alphabetical order.

HOT design for Honolulu

HOT Expressway Functions



- Tampa's REL cost $300M
- Similar REL in Honolulu will cost under $900M
- Can be completed in 6-7 years
- Will solve congestion by removing traffic from H-1
- Kapolei←→Iwilei trip in 15 minutes for express buses and vanpools
- Can receive 80% FHWA subsidy
- Or funds from private investors (PPP)

SUMMARY

1. Lots of traffic fixes can yield big benefits → if we do enough of them quickly and correctly.

2. We must learn from the lessons of failing rail systems in the nation, and the successful tollways and HOT lanes in U.S. and abroad.

3. These proposed solutions for Oahu cost under $1 B in local taxes – a minimal rail segment requires at least $3.6 B.

HOT = ~~freeway~~ = high capacity transit

Epilogue

HOT = win^4 → transit, commuters, freight, taxpayers

RAIL = depends heavily on those who don't use it to pay for it!
= useless for freight, deliveries, emergencies
= least capable in getting people out of welfare

Smart Growth = social engineering – *Commuting in America III* says that it does <u>not</u> work

TOD = subsidized housing for the upper middle class
= free money for developers (follow the money!)

Thanks!

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