Traffic Congestion

TRAFFIC CONGESTION IN HAMPTON ROADS: IDENTIFYING AND MEASURING OUR BOTTLENECKS

If you're looking for a bright side to the past year's economic woes, take a drive on I-64 or any of our region's other interstate highways. In Hampton Roads and throughout the United States, traffic congestion decreased by nearly one-third between 2007 and 2008. This is the startling conclusion presented by the traffic information provider Inrix in its National Traffic Scorecard of 2008 (available at www.inrix.com). **The hours of weekly congestion on Hampton Roads' busiest stretches of interstate highway decreased by 10 percent, while drivers' average speeds at these bottlenecks (when congested) rose from 14.2 to 15.9 miles per hour.**

Such a significant drop in traffic volume is unprecedented in recent history. As longtime residents of Hampton Roads should easily recognize, traffic volume tends to rise from year to year, along with the population and size of the economy. But 2008 was no ordinary year, in Hampton Roads or elsewhere. The first half of the year witnessed a steady increase in U.S. fuel prices – from $3.11 per gallon in January to $4.11 in July ($2.54 to $3.53 in Virginia). Inrix data demonstrate that the rising cost of fuel had a direct and immediate effect on urban traffic congestion, as drivers sought to economize by scaling back their time on the road. Gasoline prices then plunged below $2 per gallon in the final weeks of 2008, as the global recession became fully apparent. Unemployment figures rose steadily throughout 2008, ending at a high of 7.2 percent in December. Unemployment in Hampton Roads increased at a similar rate, though ended the year much lower at 5.5 percent. Despite lower fuel prices at the year's end, fewer people traveling to and from jobs eased traffic congestion further, particularly during morning and afternoon peak travel hours.

Not all metropolitan areas experienced these trends in the same way. Although virtually all of the 100 most populous U.S. metropolitan areas witnessed a decline in traffic congestion (Baton Rouge, La., with a 6 percent increase, is the sole exception), the rates of this decline vary considerably. Smaller metro areas with fewer than 1 million residents often saw larger drops in congestion, since their traffic woes were typically less intense to begin with. (Toledo, Ohio, had the most dramatic decline in peak hour traffic, at 76 percent.) A notable exception is the Riverside, Calif., metro area, which claims more than 4 million residents – and one of the nation's highest foreclosure rates. Riverside's traffic congestion fell dramatically by 57 percent, the 7th-largest decrease among U.S. metro areas. Table 1 supplies comparative information on traffic congestion in Hampton Roads and other metropolitan areas.

Hampton Roads experienced a 29 percent decline in traffic congestion in 2008, matching precisely the average rate of decline among the 100 largest metro areas. In other respects, however, our traffic patterns deviate significantly from national averages. In this chapter, we'll take a closer look at Hampton Roads' rankings in the Inrix National Traffic Scorecard. We'll explore where and when our traffic congestion is at its worst – and how this has changed between 2007 and 2008. Finally, we'll suggest what implications the Inrix data might have for regional transportation policy.

TABLE 1

METROPOLITIAN RANKINGS — HOW WE COMPARE

				Peak Hour Congestion					Peak Hour Travel Time Index					Worst Hour			Congestion, All Hours/Days					
Metropolitan Area	Population Rank	Approx. Population (000)	Road Miles Analyzed	Congestion Rank	% Congested Compared to Worst (LA)	2007 Congestion Rank	Change in Rank, 2008 vs. 2007	% Change in Congestion, 2008 vs. 2007	Travel Time Index (TTI) Rank	Travel Time Index (TTI)	2007 Travel Time Index (TTI) Rank	Change in TTI Rank, 2008 vs. 2007	% Change in TTI, 2008 vs. 2007	Worst Hour (Day/Hr)	Worst Hour TTI	Worst Hour TTI Rank	Off Peak Congestion Rank	% Off Peak Congestion Compared to Worst (NY)	All Hours/Days Congestion Rank	% Total Congestion Compared to Worst (LA)	% of Total Congestion from Peak Hours	% of Total Congestion from Off Peak Hours
Summary Top 100 Markets		197,281	47,029					-29%		1.09			-3.5%	F 5pm	1.20						60%	40%
5 Most Congested Metro Areas																						
Los Angeles/Long Beach CA	2	12,876	1,560	**1**	100%	1	0	-24%	1	1.33	2	1	-8.2%	Th 5pm	1.63	2	2	82%	1	100%	68%	32%
NY/Northern NJ/Long Island	1	18,816	2,073	**2**	87%	2	0	-25%	5	1.22	5	0	-5.8%	F 5pm	1.48	5	1	100%	2	98%	60%	40%
Chicago-Naperville-Joliet IL-IN-WI	3	9,525	1,320	**3**	48%	3	0	-17%	9	1.19	10	1	-3.4%	Th 5pm	1.36	9	3	45%	3	50%	66%	34%
Dallas-Fort Worth-Arlington TX	4	6,145	1,618	**4**	39%	5	1	-13%	18	1.12	22	4	-2.4%	F 5pm	1.31	17	5	29%	4	38%	70%	30%
Wash DC Metro Area	8	5,307	903	**5**	36%	4	-1	-26%	7	1.20	8	1	-5.9%	Th 5pm	1.42	8	4	30%	5	36%	67%	33%
Hampton Roads and Other Southern Metro Areas																						
Charlotte-Gastonia-Concord NC-SC	35	1,652	444	**27**	8%	28	1	-25%	23	1.1	26	3	-3.0%	F 5pm	1.24	24	25	11%	24	10%	56%	44%
Hampton Roads	34	1,659	305	**32**	6%	32	0	-29%	20	1.11	21	1	-3.7%	F 4pm	1.32	14	46	6%	35	7%	65%	35%
Jacksonville FL	40	1,301	475	**44**	5%	34	-10	-47%	43	1.05	41	-2	-4.0%	T 5pm	1.10	53	32	8%	37	6%	50%	50%
Raleigh-Cary NC	49	1,048	295	**51**	3%	60	9	-26%	48	1.05	57	9	-1.6%	Th 5pm	1.12	45	64	4%	59	3%	53%	47%
Richmond VA	43	1,213	625	**60**	2%	56	-4	-47%	91	1.02	87	-4	-1.4%	Th 5pm	1.04	92	49	6%	54	4%	38%	62%
Charleston-North Charleston SC	81	630	90	**71**	1%	71	0	-45%	34	1.08	27	-7	-4.7%	Th 5pm	1.20	29	98	1%	89	1%	63%	37%

Source: Inrix National Traffic Scorecard: 2008 Annual Report

How Inrix Keeps Score

Inrix is a private, Seattle-area corporation that was established by former Microsoft executives Bryan Mistele and Craig Chapman in 2004. Inrix monitors traffic conditions on more than 800,000 miles of U.S. roads, using a data collection network composed of "hundreds of public and private sources, including traditional road sensors and the company's unique network of nearly a million GPS-enabled vehicles and cellular probes." Inrix works with Clear Channel Radio, Total Traffic Network and other partners to provide real-time traffic information for an array of different users, including the broadcast media and owners of portable navigation devices. The billions of data points collected by Inrix inform the National Traffic Scorecards of 2007 and 2008, which assess congestion on the major highways of the country's 100 largest metropolitan areas.

A key scorecard concept is the Travel Time Index (TTI), which can be defined as the "ratio of peak period travel time to free flow travel time." In other words, TTI expresses the average amount of extra time it takes to complete a trip during the busiest driving hours of the day, relative to overnight hours when traffic is freely flowing. (Inrix identifies peak travel hours as 6-10 a.m. and 3-7 p.m., Monday through Friday.) Hampton Roads' TTI is 1.11, which means that a trip during peak hours is likely to take 11 percent longer than when traffic flows freely. This means you'll take an extra 3.3 minutes to complete an otherwise 30-minute drive between Portsmouth and Virginia Beach at peak hours. Inrix has determined that Hampton Roads traffic is at its heaviest between 4-5 p.m. on Friday, when our "Worst Hour" TTI climbs to 1.32. Get in the car then, and you'll need an additional 9.6 minutes for the same drive.

Inrix determines the TTI for an entire metro area by aggregating the individual TTIs for each of the area's road segments. Road segments typically include "the interchange and the portion of linear road leading up to the interchange across all lanes in a single direction of traffic." Each segment is identified by a standardized location code. According to the 2008 Scorecard, Hampton Roads' worst bottleneck is "City Hall Ave./Exit 10" on westbound I-264, the final exit before the Downtown Tunnel. Only .15 miles long, this road segment is congested during 28 of 40 peak driving hours, with a sluggish average speed of 8.9 mph when congested. Inrix considers the TTI as well as length of all road segments such as this when calculating the overall congestion of a given metro area.

How Hampton Roads Measures Up

Unsurprisingly, Inrix identifies Los Angeles highways as the most congested in the United States, followed closely by those in and around New York City. Compared to these two metropolises, traffic congestion elsewhere seems minimal. Sixty-seven of the 100 most populous metro areas have a rate of congestion that is 5 percent or less that of Los Angeles. Hampton Roads (at 6 percent) doesn't quite make this cutoff, which places us within the top third of the most congested metro areas around the country. Given the size of Hampton Roads, our position on the scorecard is not unexpected. We are the 34th most populous metro area, and we rank 32nd in congestion.

A closer look at the Scorecard (see Graph 1), however, reveals some important idiosyncrasies about Hampton Roads traffic patterns. To begin, 65 percent of our total congestion derives from peak driving hours. (The national average is 60 percent.) Thus, our region's TTI – and particularly our Worst Hour TTI – is comparatively high. At 1.32, our Worst Hour TTI is, in fact, the 14th-highest in the country. By contrast, we rank only 46th in off-peak congestion. Together these figures suggest that a majority of our traffic woes are compressed into a few hours of intense congestion at particularly stubborn bottlenecks – a conclusion that should surprise few Hampton Roads residents who rely upon the Downtown Tunnel and Hampton Roads Bridge-Tunnel for their daily commutes.

In 2008 (as in 2007), our region's top 13 bottlenecks were located on either side of these two tunnels. Graph 2 illustrates this reality. Last year's most congested road segments were on westbound I-264 at the City Hall Avenue and

Waterside Drive exits, as well as on the Berkley Bridge just before the Downtown Tunnel. Eastbound I-264 at Effingham Street came in fourth place, followed by eastbound I-64 at the two exits immediately preceding the Hampton Roads Bridge-Tunnel. Table 2 lists the top 15 traffic bottlenecks in the region.

Our region's top six bottlenecks range between the 165th and 301st most congested nationwide. For a metro area of our size, this is a dubious distinction. Outside of the top seven most congested metro areas (all of which claim more than 4 million residents) only Seattle, Honolulu and Austin, Texas, have a larger number of the nation's 350 worst bottlenecks.

Thus, even by national standards, traffic conditions at the Downtown Tunnel and Hampton Roads Bridge-Tunnel are quite poor. What's more, our tunnel traffic has worsened relative to other bottlenecks around the country. Although both hours of weekly congestion and average driving speed when congested improved at our region's worst bottlenecks between 2007 and 2008, most of these bottlenecks also received a higher (which is to say, less favorable) congestion ranking in 2008. Congestion declined almost everywhere, but it declined less at the Downtown and Midtown tunnels than at other traffic hot spots around the country.

GRAPH 1

OVERALL CONGESTION

Congestion Compared to

2007: -28.6%

Worst Metro Area (L.A.): 6%

Travel Time Index (TTI)[1]

TTI: 1.11

National TTI Rank: 20

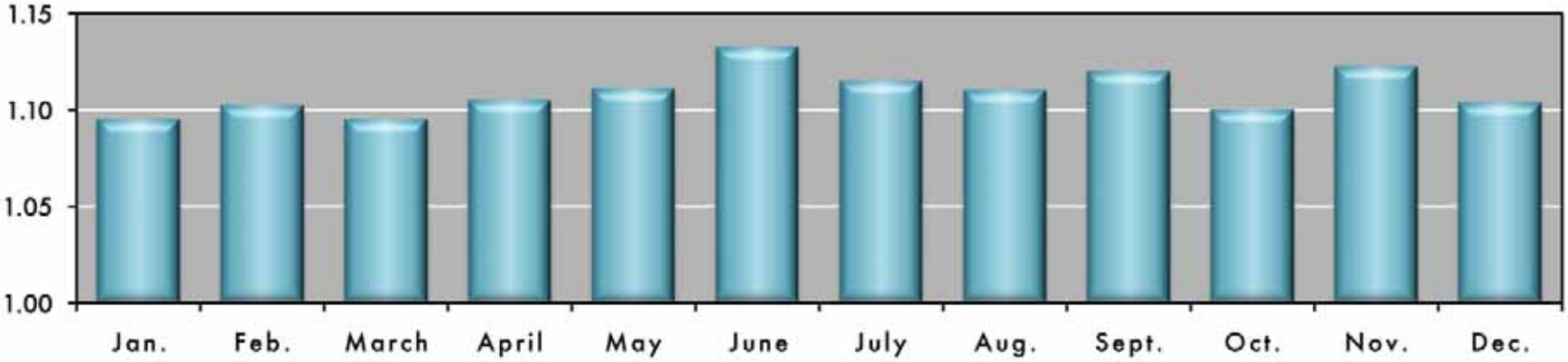
Compared to 2007: -3.7%

Peak Travel Hour[2]

2008 Worst: Friday, 4-5 PM (TTI=1.32)

2007 Worst: Friday, 4-5 PM (TTI=1.38)

TRAVEL TIME INDEX[1] BY MONTH



[1] TTI is the ratio of actual to uncongested travel time. A ratio of 1.10 means 10 percent additional trip time due to congestion.
[2] Peak hours are Monday to Friday, 6 to 10 a.m. and 3 to 7 p.m.

Source: Inrix National Traffic Scorecard: 2008 Annual Report

GRAPH 2

CBSA: VIRGINIA BEACH-NORFOLK-NEWPORT NEWS VA-NC

Source: Inrix National Traffic Scorecard: 2008 Annual Report

TABLE 2

HAMPTON ROADS' WORST BOTTLENECKS[3]

Regional Ranking		National Ranking		Road / Direction	Segment / Interchange	City	Length (Mi)	Hours of Congestion Per Week		Average Speed When Congested (mph)	
2008	2007	2008	2007					2008	2007	2008	2007
1	3	165	220	I 264 WB	CITY HALL AVE / EXIT 10	Norfolk	0.15	28	27	8.9	7.7
2	2	175	204	I 264 WB	WATERSIDE DR / EXIT 9	Norfolk	0.62	26	21	11.0	7.4
3	5	228	305	Berkley Brg / I 264 WB	BERKLEY BRG	Norfolk	0.39	31	32	12.6	11.9
4	4	231	258	I 264 EB	HWY 141 / EFFINGHAM ST / EXIT 7	Portsmouth	0.92	26	34	12.1	13.4
5	6	238	350	Hampton Roads Brg Tnl / I 64 EB	MALLORY ST / EXIT 268	Hampton	0.58	34	30	17.6	15.0
6	1	301	188	I 64 EB	US 60 / HWY 143 / EXIT 267	Hampton	1.79	27	35	16.7	13.6
7	7	687	580	I 64 WB	4TH VIEW ST / EXIT 273	Norfolk	1.25	20	21	20.2	14.8
8	8	917	1039	I 264 EB	DES MOINES AVE / EXIT 6	Portsmouth	0.67	9	13	10.5	12.0
9	9	1084	1057	I 64 WB	PATROL RD	Norfolk	0.63	12	13	16.5	12.7
10	11	1268	1801	I 264 WB	CLAIBORNE AVE / EXIT 11	Norfolk	0.09	8	8	11.3	10.4
11	12	1629	1916	Hampton Roads Brg Tnl / I 64 EB	HAMPTON ROADS BRG TNL (HAMPTON)	Hampton	0.77	14	17	23.8	22.4
12	10	1779	1526	I 64 WB	OCEAN AVE / EXIT 274	Norfolk	0.85	10	16	20.5	19.3
13	13	2146	1943	I 64 WB	OCEAN VIEW AVE / EXIT 272	Norfolk	1.61	10	17	24.7	24.5
14	14	2212	3939	I 64 WB	I 564/US 460/GRANBY ST/EXIT 276	Norfolk	0.46	7	10	18.3	21.0
15	15	2255	3891	I 664 SB	US 60/25TH ST/26 ST/EXIT 6	Newport News	0.17	6	9	15.6	18.1
								Total Hours of Congestion Per Week		Total Average Speed When Congested (mph)	
								268	303	16.0	14.9

[3] Bottleneck "congestion" is defined as times when average hourly speed is half or less than the uncongested speed for that road segment.
Source: Inrix National Traffic Scorecard: 2008 Annual Report

Implications for the Future

"While we all should cheer the reduction in congestion in 2008," conclude the authors of the Inrix Scorecard, "we should be under no illusion that this is permanent." Assuming that the economy gradually revives and fuel prices remain moderate in upcoming months, traffic congestion is likely to return to 2007 levels (and eventually to outstrip them). Last year's respite to our traffic woes should in no way discourage the development of a smart, proactive transportation policy that can help to alleviate congestion on our busiest roadways – something that our region and others in the Commonwealth of Virginia sorely need.

The following conclusions from the Inrix Scorecard are particularly pertinent for Hampton Roads:

SMALL CHANGES IN TRAFFIC VOLUME CAN HAVE A BIG IMPACT ON CONGESTION.

The 29 percent decline in peak hour congestion from 2007 to 2008 does not mean that there were 29 percent fewer vehicles on the road. Rather, the Federal Highway Administration estimates that total traffic volume on urban interstates decreased by a mere 3 percent in 2008. Because so many of our nation's major commuting roads operate at maximum capacity during peak travel hours, even a small reduction in vehicles eases traffic flow substantially. Thus, we should take care not to underestimate the positive effect that one or more of the much-discussed proposals to alleviate tunnel congestion might have on regional commuting times. Adding lanes to our existing tunnels, creating a "third crossing" or expanding public transportation all have the potential to reduce peak hour congestion dramatically.

THINGS CAN GET WORSE BEFORE THEY GET BETTER.

Major construction and road improvement projects make congestion worse in the short term. This should be readily apparent to anyone who drives in or near downtown Norfolk, where construction on the city's new light rail system has been under way for several months. The 2008 Scorecard reveals a clear linkage between work zones and bottlenecks, underscoring "the need to focus on managing work zones in ways that mitigate congestion." The current intensity of congestion at the Midtown, Downtown and Hampton Roads Bridge-Tunnels means that any future expansion or improvement projects at these sites must be undertaken with great care. It seems likely that some degree of increased congestion in the short term will be necessary to make our region's worst bottlenecks more drivable in the years to come.