



# I-77 HOT Lanes

January 2013



## Agenda

**I-77 Corridor Today**

**Economic Growth**

**HOT Lanes Benefits and Rationale**

**Cost Comparison of GP and HOT Lanes**





## Summary

- I-77 corridor is a unique transportation challenge
- NCDOT vision is to improve north-south mobility along I-77 corridor
- Corridor constraints limit the addition of new capacity to two lanes
- Congestion management demands single long term solution
- HOT lanes provides long term solution to the provision and management of additional capacity
- Equivalent GP lanes are not affordable until 2030<sup>1</sup>

<sup>1</sup> NCDOT to comment



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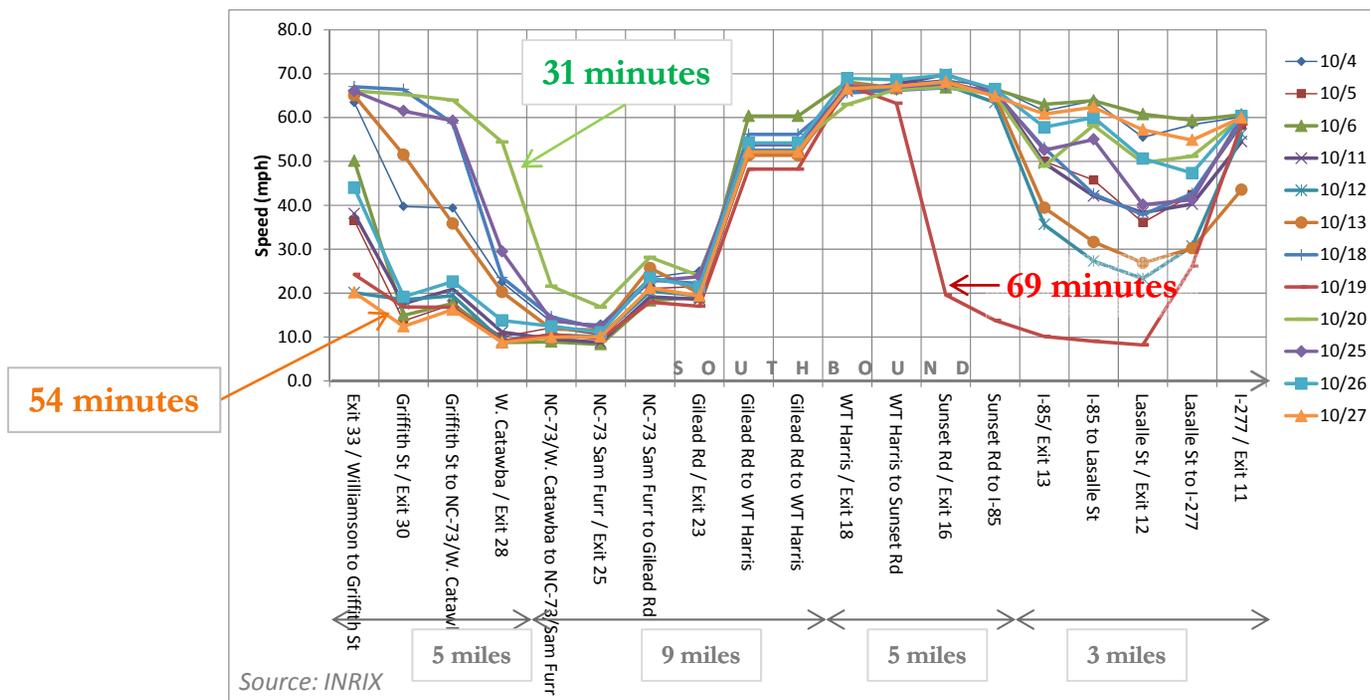
**Cost Comparison of GP and HOT Lanes**





## I-77 background today – peak time congestion

- I-77 Southbound Rush Hour 730-830AM on Weekdays (October 2011)
- Variable and unpredictable travel speeds and commute times
- Existing congestion at peak hours, delays of more than 45 minutes on worst travel days
- Bottlenecks reduce operation of current facility





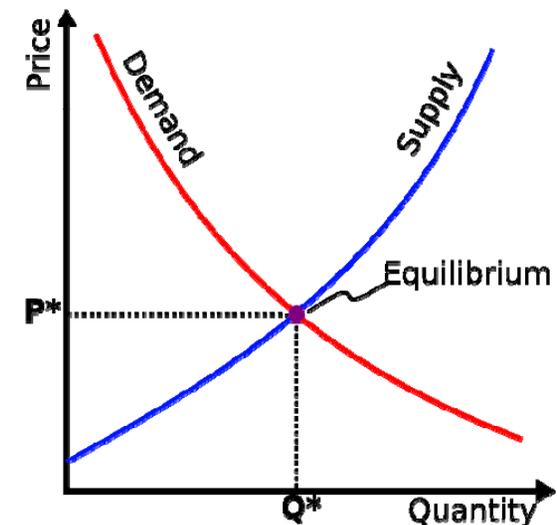
## I-77 transportation challenges

- Current users of I-77 are confronted with unpredictable travel times and travel speeds
- Strong forecast for economic and population growth in the region
- Further congestion if no capacity enhancements are made
- Additional GP lanes to provide new capacity are not affordable (without tolling)
- Project scope converts existing HOV to HOT and adds new capacity between uptown Charlotte and LKN



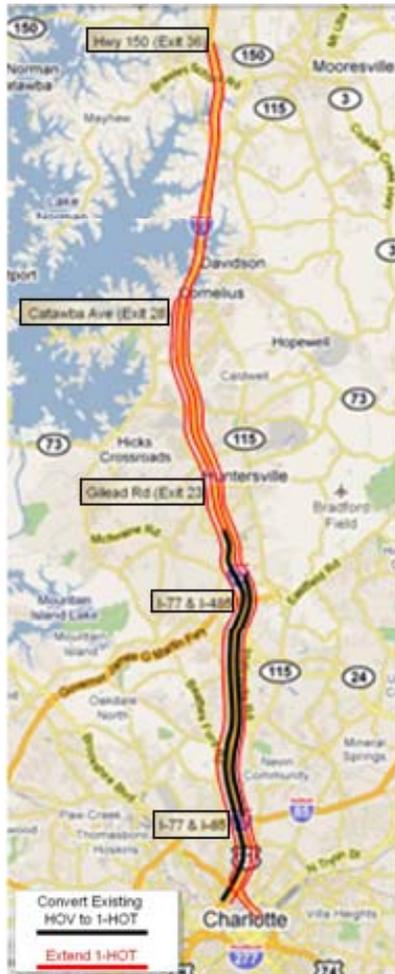
## Options to relieve congestion

- Build more general purpose lanes
  - Option is not viable until 2030
  - Practice shows congestion relief is temporary
  - Does not fix the fundamental imbalance between supply and demand brought on by unlimited demand
  - Cost to widen existing highways very expensive (greater burden on taxation)
- Reduce demand for travel
  - Combination of arbitrary rationing and voluntary trip avoidance
  - Requires viable alternatives to travel (e.g., transit, telework, shop-at-home, etc.)
  - Potentially impedes economic productivity and slows economic growth
- Use market economics to bring supply and demand into balance
  - Introduce pricing as the market mechanism to bring balance
  - Experience we use everyday (including how we pay for other goods and services)





## I-77 HOT lanes project scope



Section	HOT Lanes	Section Limits
South	2	2.5 miles on I-77 and 1.5 miles on I-277 with direct HOT lane connector to I-277
Central	2	15 miles from I-85 to Exit 28 (Catawba Avenue)
North	1	8 miles from Exit 28 to Exit 36 (NC 150)

- Proposed scope makes economic sense from a state and stakeholder perspective
- Southern section at the heart of the value proposition for the Project by providing critical direct access to I-277 and decreasing user travel time in and out of downtown Charlotte
- Transportation network more complete with northern section serving large and growing communities
- Potential to link future I-85 managed lanes to I-277 via the I-77 HOT lanes





## I-77 Corridor Today

## Economic Growth

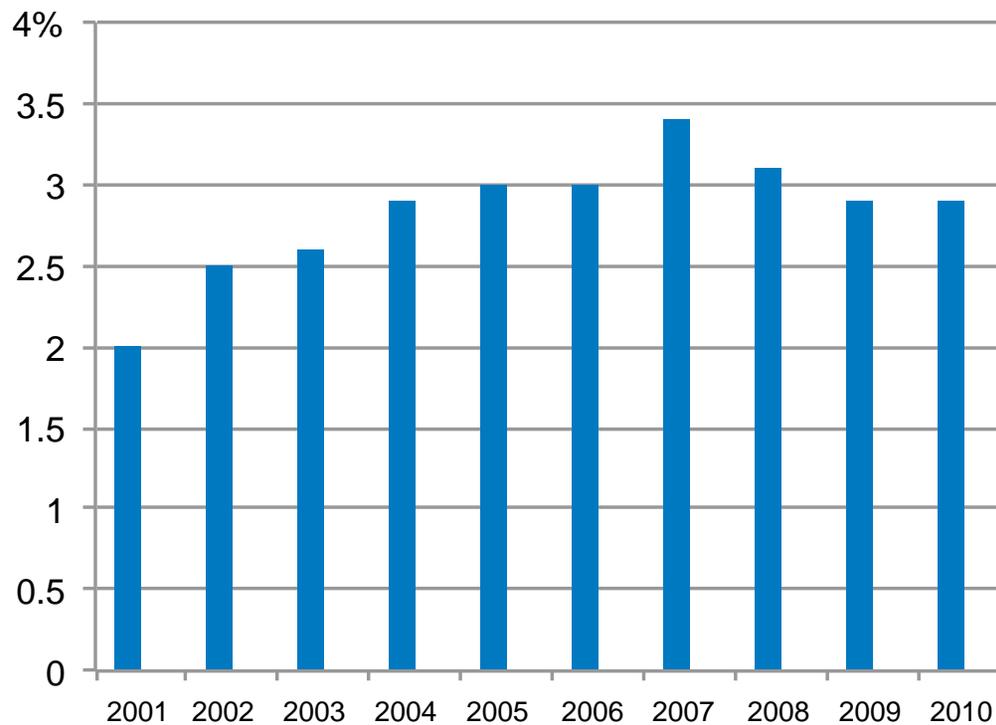
## HOT Lanes Rationale and Benefits

## Cost Comparison of GP and HOT Lanes



## Current landscape indicates strong future growth

- Mecklenburg has seen a 32% population growth between 2001 and 2010



Source: Charlotte Chamber of Commerce





## New and expanded businesses

6,873 new companies located between 2007 to 2012 have led to an increase of:

- 71,601 jobs
- \$9,037.2 million investment

Year	Firms	Jobs	Investment (\$mil)
2012	1,180	9,615	\$1,252.7
2011	1,089	8,850	\$669.4
2010	912	10,781	\$1,063.7
2009	1,029	15,542	\$1,451.7
2008	1,337	12,165	\$2,324.9
2007	1,326	14,648	\$2,274.8

Source: Charlotte Chamber of Commerce





## LKN development environment

- Iredell is one of the five lowest tax rate of 100 NC counties.
- Mooresville-Statesville is ranked as the fastest growing micropolitan region in the US, 8th time in past 10 years
- “Langtree at the Lake” - \$2 billion 380 acre mixed use development under construction, anticipated residents and retailers in by September 2013:
  - 300 luxury apartments, 850,000 square feet
  - 50,000 square feet of retail
  - 12 story skyscraper with 200,000 square feet of retail, office, hotel, residential





## Anticipated population growth

- City of Charlotte population is anticipated to grow approximately 70% between 2012 and 2030
- Mecklenburg County population is anticipated to grow approximately 75% between 2012 and 2030
- Iredell County population is anticipated to grow approximately 19% between 2012 and 2030
- Metropolitan Statistical Area (MSA) is anticipated to grow approximately 250% between 2102 and 2030

	2012	2030
City of Charlotte	772,627	1.3 million
Mecklenburg County	966,160	1.7 million
Iredell County	163,177	193,885
MSA*	1.9 million	4.8 million
Annual in-migration	50,000	130,000

Source: Charlotte Chamber of Commerce, NC Office of State Budget and Management

Includes: NC counties – Alexander, Anson, Cabarrus, Catawba, Cleveland, Gaston, Iredell, Lincoln, Mecklenburg, Rowan, Stanly, Union  
 SC counties – Chester, Chesterfield, Lancaster, York

*Confidential – For Discussion Purposes Only*





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## HOT lanes rationale

- Provide additional capacity where new lanes are added
- Provide new and enhanced mobility options for users on congested highway corridors
- Adds value and additional service to existing HOV facilities
- Provide reliable, uncongested service levels for non-HOV users willing to pay the price
- FHWA survey demonstrates that the four oldest existing HOT facilities are popular with local users
- **Provides new revenue sources to support the construction of additional (HOT lane) capacity**





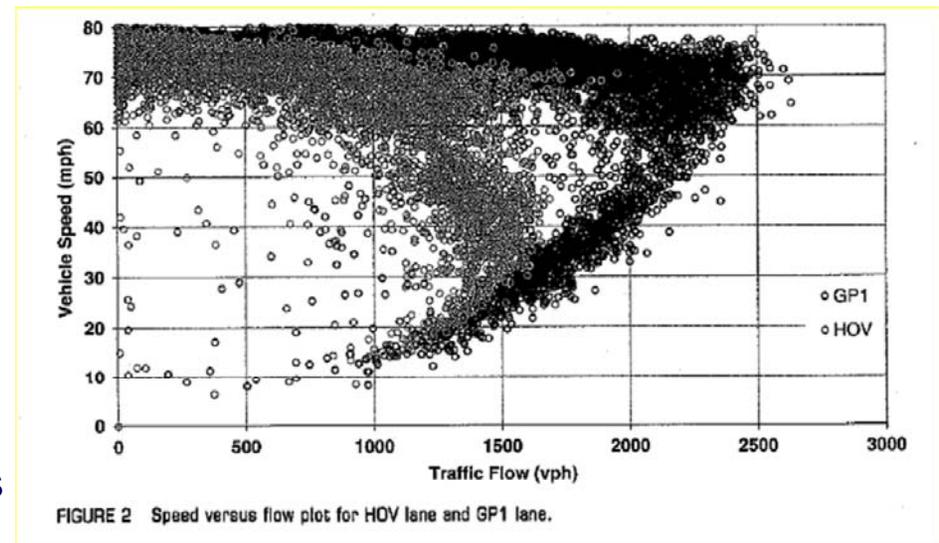
## HOT lanes rationale – a merger of approaches

- HOT lanes combine three concepts
  - Increases supply through the construction of new lanes
  - Provides demand management through incentives for transit and carpools
  - Fixes the market imbalance by using a price to use the lanes
- This approach provides a sustainable, long term benefit
  - Provides long term revenue source to afford more than what could otherwise be built and maintained without usage charges
    - Allows for more capacity to be built than otherwise affordable
  - Introduces market economics on the new lanes
  - Societal benefits of higher travel speeds accrue in medium and (especially) long term
  - Provides sustainable option over time
- Pricing allows management of volume to guarantee travel speed



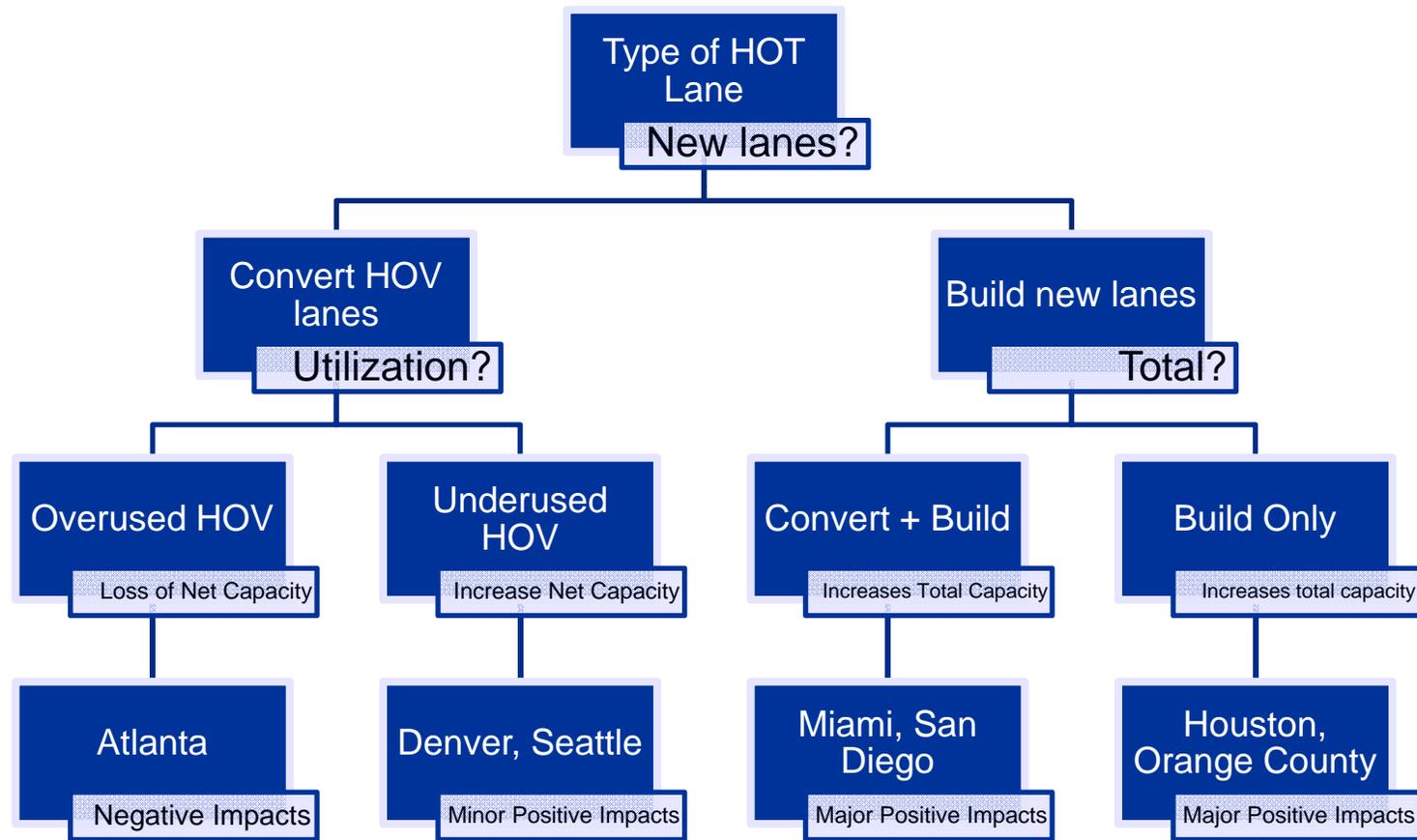
## Illustrative example of long-term benefits of pricing

- Fundamental understanding: the backward bending curve
  - A congested road does not push as many vehicles through as an uncongested one
  - At high speeds, each lane can carry up to 2200 vehicles per hour
  - Once demand goes beyond this point, congestion occurs and speeds decrease
    - 50 mph: max 2100 vehicle per hour
    - 40 mph: max 1900 vehicle per hour
    - 30 mph: max 1600 vehicle per hour
    - 20 mph: max 1300 vehicle per hour





# Not all HOT lanes are the same





## Risks are transferred to the private sector under P3 approach

- Design risk
- Construction risk
  - Delivery to time and cost
- Operations & maintenance risk
  - Cost
  - 50 year obligation
- Revenue risk
  - Driven by uncertainty in traffic volume
  - Significant risk and volatility in level of return
- Toll collection remains the responsibility of NCDOT





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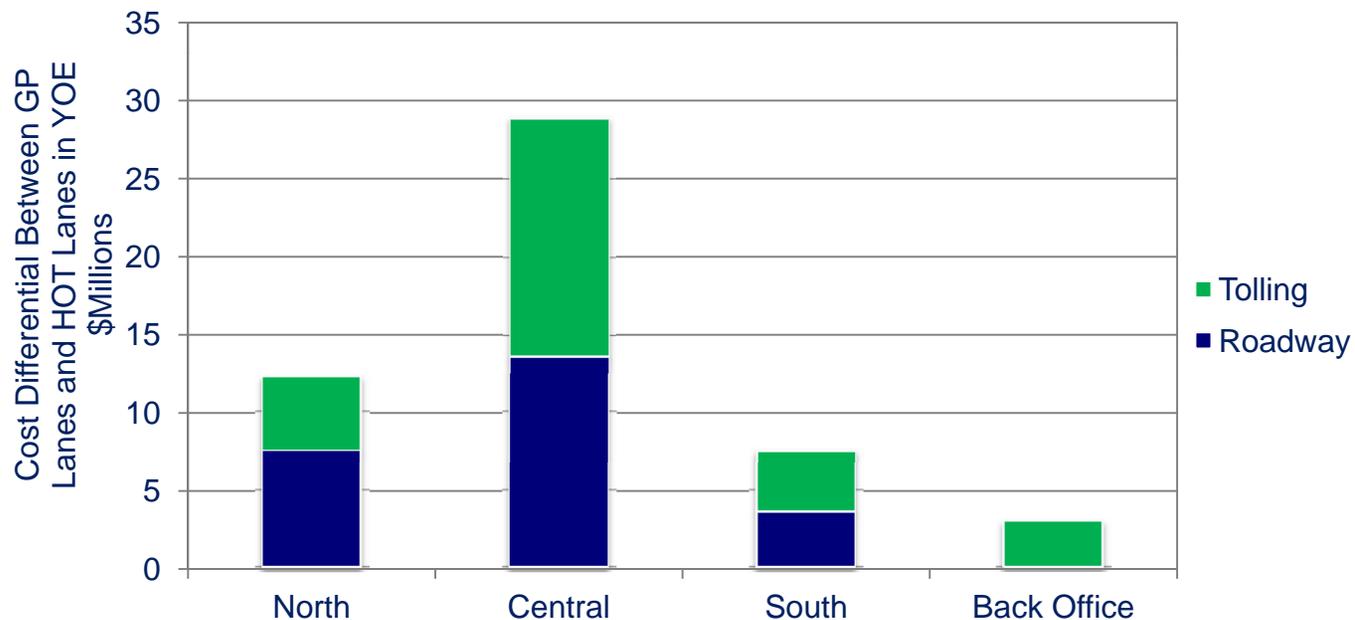
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## Incremental costs for HOT lanes

- HOT lanes construction approximately \$50m more in total than GP lanes
- Covers the cost of 4ft on additional buffer pavement and tolling systems



*... but also provides revenue*





## Leveraging finance for construction through tolling

- Direct NCDOT funding of HOT lane (or GP equivalent) construction cost is not affordable under the current TIP funding and not available until 2030
- NCDOT will cap HOT lane contribution up to \$170m
  - Private sector is incentivized to minimize NCDOT contribution through competition
- NCDOT funding of HOT lanes can leverage private sector finance on 1:2 basis funded through estimated toll revenues

