

TASK:

Given traffic, population growth, and NAFTA trade truck traffic growth on IH 35, what are the most cost-effective transportation solutions to insure trade and motorist mobility by 2050 in the Austin-San Antonio Corridor?

RESPONSE:

The Austin-San Antonio Corridor along Interstate Highway 35 (IH-35) is a critical artery for trade and mobility in Texas, facing significant challenges from traffic congestion, rapid population growth, and increasing NAFTA-related truck traffic. By 2050, these pressures are expected to intensify, with projections estimating a combined population of eight million in the Austin and San Antonio metro areas and continued growth in freight movement tied to international trade. Identifying cost-effective transportation solutions requires balancing infrastructure investment, operational efficiency, and long-term sustainability while addressing the corridor's unique economic and demographic dynamics. Below are some of the most promising strategies based on current trends, regional plans, and expert insights.

1. Expand and Optimize IH-35 with Managed Lanes

Expanding IH-35 with managed lanes—such as High-Occupancy Vehicle (HOV) lanes, express lanes, and potentially reversible lanes—offers a cost-effective way to increase capacity without the prohibitive expense of entirely new highways. Projects like the IH-35 Northeast Expansion (NEX) and Capital Express South are already underway, adding non-tolled elevated lanes and HOV lanes to reduce congestion. For instance, the NEX Central segment is projected to cut travel times in half on certain stretches, enhancing mobility for both commuters and freight. By prioritizing HOV lanes, these expansions encourage carpooling and transit use, reducing the number of single-occupancy vehicles and stretching the utility of existing infrastructure. The cost-effectiveness stems from leveraging the current right-of-way, avoiding the need for extensive land acquisition, which is a major expense in urbanizing areas.

2. Shift Truck Traffic to SH-130 and Other Alternatives

Diverting NAFTA-related truck traffic from IH-35 to State Highway 130 (SH-130), a tolled bypass east of the corridor, can alleviate congestion and preserve IH-35 for local and passenger traffic. Currently, SH-130 carries only about 40,000 vehicles daily compared to IH-35's 220,000 in the Austin area, with trucks making up a small fraction of its volume. Incentives such as reduced toll rates for trucks during peak hours or subsidies for freight operators could make SH-130 more attractive. Studies from the Texas A&M Transportation Institute suggest that toll reductions could make SH-130 cost-competitive for trucks on certain routes, particularly during congested periods. This approach minimizes the need for additional IH-35 widening, which is both costly and disruptive, while maximizing the use of an underutilized asset.

3. Invest in Regional Rail for Freight and Passengers

Developing a robust regional rail system offers a dual benefit: reducing truck traffic for NAFTA trade and providing an alternative for commuters. The corridor's role as a NAFTA "superhighway" means a significant portion of IH-35 congestion comes from freight moving between Mexico, Texas, and the

Midwest. A freight rail line paralleling IH-35 could shift a portion of this load off highways, with studies indicating that rail can transport goods at a lower cost per ton-mile than trucks over long distances. For passengers, a commuter rail connecting San Antonio, New Braunfels, San Marcos, and Austin—potentially extending existing proposals like the Lone Star Rail—could reduce car dependency. While initial capital costs are high (e.g., billions for track and stations), the long-term savings from reduced road maintenance, fuel consumption, and congestion-related losses (estimated at over \$1 billion annually in the corridor) make rail a cost-effective option by 2050.

4. Promote Transit-Oriented Development and Demand Management

Encouraging transit-oriented development (TOD) alongside enhanced bus rapid transit (BRT) or light rail can curb the growth of vehicle miles traveled (VMT) as the population doubles. TOD focuses growth near transit hubs, reducing reliance on IH-35 for short trips. BRT systems, which are cheaper than rail (costing roughly \$10-20 million per mile versus \$100 million+ for light rail), could connect key nodes like San Marcos and Kyle to Austin and San Antonio, integrating with local bus networks. Demand management strategies—such as congestion pricing on IH-35, telecommuting incentives, and off-peak travel discounts—further stretch existing capacity. The Texas A&M Transportation Institute’s hybrid scenario for IH-35, which combined telework and mode shifts, showed significant congestion relief without massive construction, suggesting these measures could be highly cost-effective.

5. Leverage Technology and Intelligent Transportation Systems (ITS)

Implementing advanced ITS, such as dynamic lane management, real-time traffic rerouting, and connected vehicle technology, can optimize IH-35’s existing capacity at a fraction of the cost of physical expansion. For example, variable speed limits and ramp metering have proven effective in smoothing traffic flow, while truck platooning (enabled by vehicle-to-vehicle communication) could increase highway throughput for NAFTA freight. These solutions require moderate upfront investment—typically in the tens of millions rather than billions—and can be deployed incrementally, offering flexibility as traffic patterns evolve through 2050. The Texas Department of Transportation (TxDOT) has already used ITS successfully in other regions, like Laredo, to reroute truck traffic and reduce delays.

Comparative Cost-Effectiveness and Considerations

- **Managed Lanes on IH-35:** Moderate cost (\$1-3 billion for current projects), high immediate impact, but limited by available right-of-way and construction disruption.
- **SH-130 Diversion:** Low capital cost (toll adjustments in millions), relies on behavioral shifts, and may require ongoing subsidies.
- **Regional Rail:** High initial cost (\$5-10 billion), but long-term savings and capacity dwarf highway-only solutions; funding is a challenge.
- **Transit and TOD:** Moderate cost (hundreds of millions), scalable, and sustainable, though effectiveness depends on public adoption.
- **ITS:** Low to moderate cost (tens of millions), quick deployment, but benefits plateau without complementary infrastructure.

Recommended Approach

A hybrid strategy is likely the most cost-effective path to 2050. Prioritize completing IH-35 expansions with managed lanes to handle near-term growth, while aggressively incentivizing truck diversion to SH-130 to protect trade flows. Simultaneously, begin planning and securing funding for a regional rail system, starting with freight to ease NAFTA traffic and expanding to passengers as population grows. Complement these with BRT and ITS to maximize efficiency and minimize new construction. This approach balances upfront costs (spread across decades) with long-term savings, ensuring mobility for motorists and trade without betting solely on endless highway widening—which evidence suggests induces demand and fails to solve congestion permanently.

By integrating these solutions, the Austin-San Antonio Corridor can adapt to a future of 8 million residents and sustained NAFTA trade growth, leveraging both existing assets and strategic investments for maximum cost-effectiveness.