



# SEEING IS BELIEVING:

## GEORGIA'S VIRTUAL REALITY EXPERIENCE FOR ATLANTA HIGHWAY EXPRESS LANE TRANSIT

NASCIO 2023 State IT Recognition Awards

**STATE:** Georgia

**AGENCY:** State Road and Tollway Authority (SRTA) and Atlanta-Region Transit Link Authority (ATL)

**AWARD CATEGORY:** Emerging & Innovative Technologies

**PROJECT BEGINNING DATE:** October 1, 2021

**PROJECT END DATE:** December 31, 2022

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## EXECUTIVE SUMMARY

Atlanta may not have invented the tortured commute. But drop in during rush hour and you'll find a snarling traffic tangle, void of all charm and Southern hospitality. Among the trouble spots, Atlanta's Interstate 285 that circles the city is too often a red zone. The northern stretch of this highway (aka "the top-end perimeter") is both overwhelmed and indispensable. No one argues that relief is needed for this main artery connecting key business centers. But obvious need hasn't produced quick consensus on what to do about it.



Georgia's State Road and Tollway Authority (SRTA) and the Atlanta-Region Transit Link Authority (ATL) partnered to demonstrate how transit might be integrated into express lanes as part of the solution. They undertook an I-285 top-end express lane transit virtual reality experience project in hopes of promoting effective communication of options. Communication that could help build consensus among local governments, the public, and other stakeholders. SRTA and ATL set out to illustrate a transit solution in a compelling way that dispelled potential misconceptions.

The I-285 road improvement idea itself is ambitious: adding two new express lanes, barrier-separated from regular traffic, in both directions of travel. They would span a stretch of highway that ranks among the nation's most heavily traveled and congested. And too, transit is incorporated in an innovative way. Taken all together, it holds potential to improve regional mobility, promote more predictable trip times and expand choices for people traveling through metro Atlanta. The kind of breakthrough transportation project Georgia has shown it's capable of delivering.

Equally ambitious though, the challenge of galvanizing support and providing a clear picture of what's envisioned. A vision that includes a novel option for the region called express lanes transit (ELT). Working together, SRTA and ATL answered the challenge with a life-like, immersive experience that puts you right there in the flow of traffic. That's their I-285 top-end express lane transit virtual reality experience, and it's paving the way toward improved travel.



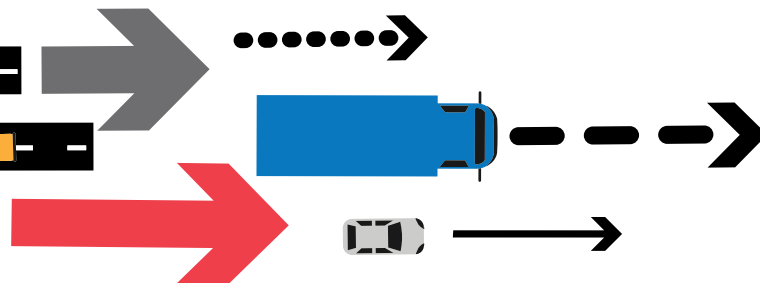
Atlanta's "top-end perimeter" highway (shown in purple) ranks among the nation's most congested



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## IDEA

### Let's paint a (motion) picture



The opportunity for I-285 top-end express lanes transit grew out of coordination among multiple organizations and governments. In addition to the State Road and Tollway Authority (SRTA) and Atlanta-Region Transit Link Authority (ATL), they include the Metropolitan Atlanta Rapid Transit Authority (MARTA), Atlanta Regional Commission (ARC), and Georgia Department of Transportation (GDOT). There are also DeKalb, Cobb and Fulton counties (each home to a portion of I-285's top-end roadway), and Gwinnett County (just a few car lengths away from one critical I-285 junction). Understandably, each participant is keen to see assurances that the considerable investment required for such a project earns maximum benefit. The SRTA/ATL virtual reality experience begins to address those concerns.

An immersive experience allows stakeholders to understand how certain aspects of the system work, not unlike what could be learned by visiting a facility in person. Transit concepts such as level boarding, train-like vehicles, and slip ramp stations are hard to describe with photos alone, but are easy to understand in an immersive virtual reality experience.

This experience is available online on both the SRTA and ATL websites, where stakeholders including the public can readily engage with the proposed transportation solution.

<https://atltransit.ga.gov/vr-tour/>

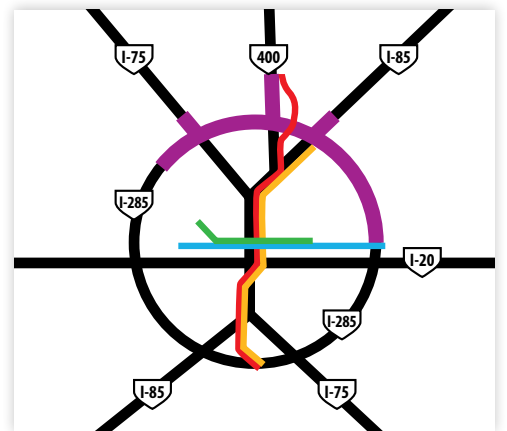
<https://peachpass.com/vr-tour/>



### These moving pictures tell a story



Connections to employment centers dotted along I-285's top end, as well as connection to the existing MARTA heavy rail system's north lines, could be enormously beneficial to the region. Construction of additional new commuter rail in this corridor has been considered, but it would be quite difficult and perhaps prohibitively expensive. Co-location of transit service in the form of bus rapid transit (BRT) with a planned expansion of express lanes emerges as a logical and viable alternative. But lack of familiarity with how BRT could be integrated into the transportation and transit system could stall the effort. Using the virtual reality experience to educate stakeholders and the public on the benefits of express lane transit (a form of BRT) promotes creation of new project champions, stakeholder support, and public buy-in.



Atlanta's MARTA commuter rail lines diverge as they depart city center and leave opportunity for better transit connections between non-adjacent stations

## IDEA (continued)

### This isn't your standard show-and-tell



This immersive virtual reality experience enables people to have the experience of riding the express lane transit system. They get a three-dimensional feel for how the system will function and how it integrates with its surroundings. That's more convincing than can be achieved with other two-dimensional representations. It's more like really being there.



### Ready for prime time



Virtual reality holds many advantages for the state of Georgia and could certainly be used by other states and government entities. It can provide stakeholders and collaborators an immersive experience of a real-world environment in real time. Traditionally, people often had to be face-to-face and onsite to experience a new project, work environment, site, facility, etc. Travel might've been involved to see a working system similar to what's being considered. Virtual reality delivers the experience directly to your screen, wherever you are. And, virtual reality allows sharing prototypes and new concepts before making a considerable investment in building out the concept.



## IMPLEMENTATION

### A roadmap for the virtual roadmap



SRTA and ATL used an Agile project management approach, with project managers, technical teams and executives all collaborating to achieve a successful outcome. During implementation, teams met weekly to address all issues. After implementation, the project team provided a demonstration of the virtual experience to staff, so any remaining bugs or glitches could be addressed.



The Map Room

### The cast list is long



The I-285 top-end express lane transit funding and collaboration memorandum of understanding (MOU) was signed May 11, 2022. ATL led the effort to study and plan for incorporating transit service into the GDOT-planned express lanes. They did so in coordination with MARTA, ARC, GDOT, and the counties of DeKalb, Cobb, Fulton and Gwinnett.

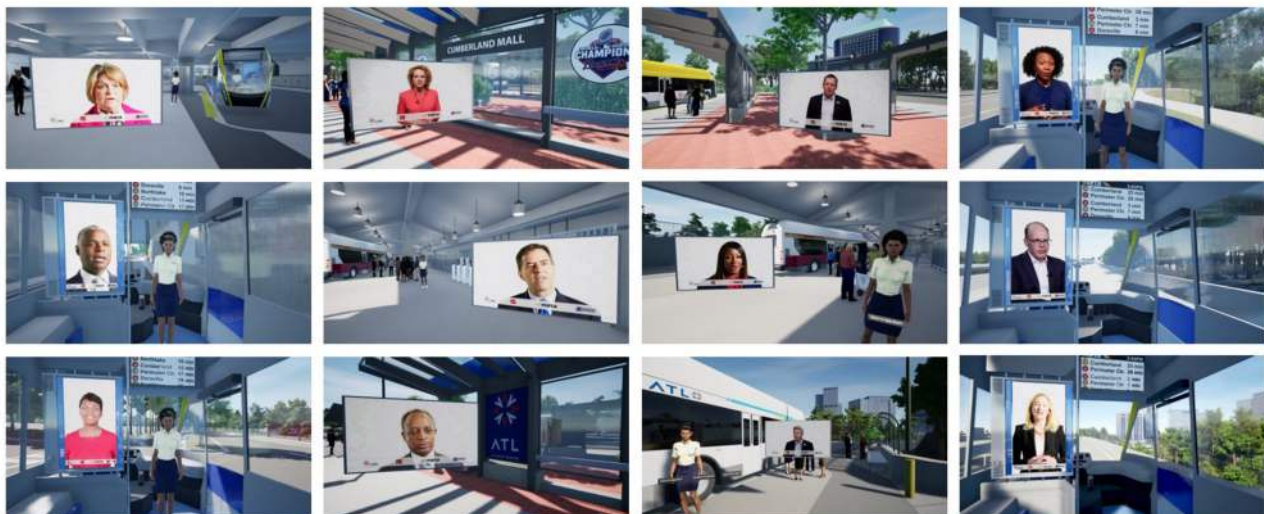
This agreement represents a historic collaboration among counties and key state and regional agencies to explore next-generation, multi-jurisdictional regional transit service that leverages the state's planned expansion of express lanes on I-285. A video (see link below) by SRTA and ATL of the I-285 top-end express lane transit virtual reality experience was shown at the MOU signing event to educate stakeholders on the system concept.



[https://www.dropbox.com/s/vmmaoohgce6gn9x/I-285\\_TopEndExpressLanesV2.mp4?dl=0](https://www.dropbox.com/s/vmmaoohgce6gn9x/I-285_TopEndExpressLanesV2.mp4?dl=0)



## STAKEHOLDER INTEGRATION





SRTA and ATL engaged engineering and professional services firm WSP to create the three-dimensional (3D) base model. That model was based on existing planning documents available for the I-285 top-end express lanes project, including preliminary design concepts for the express lanes and in-line and off-line bus rapid transit (BRT) station concepts. The team used a range of file types and modeling software to create the 3D base model, including the Unreal Engine, GIS data, photogrammetry, and existing 2D and 3D assets owned by WSP and/or SRTA/ATL.



UNREAL ENGINE



GIS DATA



PHOTOGRAMMETRY



2D AND 3D ASSETS

A macro 3D base model was created based on existing conditions and planned vehicular and transit infrastructure improvements for the I-285 top-end corridor. The macro 3D base model was intended to convey the extent and context of the I-285 top-end corridor and provide a virtual entry point for specific BRT station areas of the micro 3D base model. The macro 3D base model was created using simplified and easily understood layers, including vehicular and transit networks, BRT stations, open space and trail networks. Additional content included high-resolution screen captures, renderings and videos.

The team also created the micro 3D base model of existing conditions and planned vehicular and transit infrastructure improvements for the I-285 top-end corridor study area. In-detail vehicular and transit infrastructure, as well as existing buildings, public realm and vegetation, were modeled within the study area.

Multiple station models and both in-line and off-line BRT station conditions were developed within the model, including the animation of people and vehicles such as BRT and local/regional buses. The macro and micro 3D base models, station models and animated vignettes were provided in a downloadable, easy-to-install and self-contained application. A user interface was developed for virtual reality (VR) and desktop use. Both VR (using an appropriate VR headset) and a traditional desktop (monitor, mouse, and keyboard) interface are supported. The hardware required included two gaming computers optimized for virtual reality and two Meta virtual reality headsets.

## IMPACT

### Making the world a better place



The incorporation of express lanes transit into the GDOT top-end express lanes project has been championed by a coalition of cities and community improvement districts (CIDs) along the I-285 top-end corridor, among other voices. The project is expected to greatly reduce congestion in the region for motorists, while also increasing on-time transit performance and accessibility.

And, by providing an immersive virtual reality experience of the proposed solution, SRTA and ATL allow stakeholders to get a 3D feel for how the system will function. They can then make informed judgments before making a huge investment. Other 2D representations just don't hold the same sway.

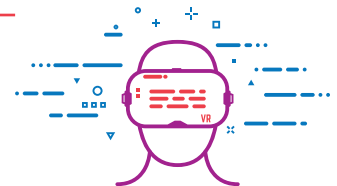


### Next step, visualizing more efficient travel



SRTA and ATL engaged external partner WSP to support any refinements that might become warranted to the virtual reality experience application as the I-285 project evolves. The longer-term plan is to continue to expand the virtual reality experience as new express lane corridors are established. New express lanes transit stations under consideration can be added to the models. And because open standards are used in creating the model, SRTA and ATL can engage any of an array of consultants to expand the model.

**Building a virtual reality experience like the I-285 top-end corridor model costs little when compared to the travel expense of putting stakeholders within eyesight of physical facilities in another city, region or even country.**



Sometimes, the simple volume of stakeholders or the nature of a transportation project takes onsite visits off the table entirely. The clear representation and ease of access brought by an immersive virtual reality experience can literally keep the wheels rolling on proposed complex transportation projects. So when consensus and unified support for an innovative transportation solution are what's needed, this becomes an effective way of keeping the road open. Seeing is believing.