Managed lane projects have become an important tool for addressing congestion on the nation’s highway system. These projects incorporate the construction of new lanes or the conversion of existing lanes to facilitate enhanced traffic throughput in congested highway corridors. Managed lane projects are often technically challenging, as they typically involve the reconstruction of busy corridors that are located in densely populated urban centers. Managed lanes are also operationally complex, as they rely upon active traffic management operations, tolling, high occupancy vehicle (HOV), transit operations or a blend of these actions to optimize traffic flow and vehicular throughput.

Historically, variations of the managed lane concept have been developed by public sector entities using design-bid-build procurements and financed with traditional techniques and funded with toll revenues. Even using these conventional, well-understood project delivery methods, managed lane projects are challenging for public sponsors. In recent years, however, lack of available funds and the challenging construction requirements for major corridor rehabilitations are prompting many jurisdictions to consider public-private partnerships (PPP) as an alternative delivery model for managed lane projects. When implemented under a PPP approach, managed lane challenges take on added commercial and financial dimensions that can be difficult to navigate.

KPMG helped usher in the adoption of innovative PPP managed lanes projects in the United States by advising the Commonwealth of Virginia on the first successful managed lanes PPP transaction in 2008 – the Capital Beltway (495 Express Lanes) located in Northern Virginia. Since then, KPMG has advised public sector sponsors on 12 of the 13 PPP managed lane projects in the U.S. including:

<table>
<thead>
<tr>
<th>PPP Managed Lane Project</th>
<th>Location</th>
<th>Length (Miles)</th>
<th>Year of Transaction Closing</th>
<th>Capital Expenditure (USD Million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-495 (Capital Beltway)</td>
<td>Northern Virginia</td>
<td>14</td>
<td>2008</td>
<td>$1,512</td>
</tr>
<tr>
<td>North Tarrant Expressway (NTE)</td>
<td>Fort Worth, TX</td>
<td>13</td>
<td>2009</td>
<td>$1,456</td>
</tr>
<tr>
<td>LBJ Managed Lanes (LBJ)</td>
<td>Dallas, TX</td>
<td>16</td>
<td>2010</td>
<td>$2,091</td>
</tr>
<tr>
<td>I-95 HOT Lanes</td>
<td>Northern Virginia</td>
<td>29</td>
<td>2012</td>
<td>$691</td>
</tr>
<tr>
<td>Cesar Chavez (Loop 375) (Design Build Maintain)</td>
<td>El Paso, TX</td>
<td>9</td>
<td>2012</td>
<td>$750</td>
</tr>
<tr>
<td>IH 35E (Design Build Maintain)</td>
<td>Dallas, TX</td>
<td>29</td>
<td>2012</td>
<td>$1,500</td>
</tr>
<tr>
<td>NTE 3A and 3B</td>
<td>Fort Worth, TX</td>
<td>12</td>
<td>2013</td>
<td>$1,637</td>
</tr>
<tr>
<td>U6 36 – Phase 2</td>
<td>Denver, CO</td>
<td>5</td>
<td>2014</td>
<td>$180</td>
</tr>
<tr>
<td>I-4 Ultimate Project</td>
<td>Orlando, FL</td>
<td>21</td>
<td>2014</td>
<td>$2,300</td>
</tr>
<tr>
<td>SH 183 (Design Build Maintain)</td>
<td>Dallas, TX</td>
<td>14</td>
<td>2014</td>
<td>$700</td>
</tr>
<tr>
<td>SH 288 Toll Lanes</td>
<td>Houston, TX</td>
<td>10</td>
<td>2015</td>
<td>$800</td>
</tr>
<tr>
<td>I-77 HOT Lanes</td>
<td>Charlotte, NC</td>
<td>27</td>
<td>2015</td>
<td>$655</td>
</tr>
</tbody>
</table>

Through this market leading experience, KPMG has been at the forefront of shaping managed lanes PPP transactions, helping our clients create tailored approaches to move their projects from concept to financial close. This paper explores select aspects of the managed lane concept and successful strategies for delivery as a PPP.
Managed Lanes: Transaction Strategies from the PPP Forefront

Managed Lane PPP Transaction Strategies

Successful PPPs must strike a balance between meeting public policy objectives, delivering value for taxpayers and project users, and meeting the commercial requirements of private developers and investors. This challenge is amplified in managed lanes projects, which feature unique commercial and technical aspects as well as complicated risk allocation and credit considerations.

Finding workable commercial positions is critical to financing and delivering a managed lanes project as a PPP. The most common success factors for managed lane project PPP transactions are noted in the graphic below. In this paper, we will explore each of these factors and highlight how KPMG helped formulate winning approaches to enhance the commercial viability and value of successful managed lane PPP projects.

KPMG has developed and applied a PPP decision support framework that reflects our experience helping clients develop hundreds of projects throughout the United States. This framework has been successfully used to assess and inform project feasibility from initial concept to the execution of contract and financial close. This framework (as depicted below) is not only based on robust financial analysis, but also addresses key policy and project criteria.

Managed lane projects demand attention to all of these key factors, but several have proven to be especially important for PPPs:

- **Design and construction**: Because managed lane projects typically involve major reconstruction of existing congested facilities, design and construction considerations are paramount. PPP developers can often introduce schedule enhancements and design innovations that minimize ROW acquisition and impacts on existing traffic flows during construction. Because PPP developers typically have an equity interest in lowering project cost and initiating service as early as possible, these factors often drive project feasibility and must be evaluated with special diligence.

- **Operations and maintenance**: Managed lane projects often require complex design and technology solutions to set dynamic toll rates, manage traffic, provide information to motorists, prevent toll evasion, and manage incidents and HOV enforcement. Many PPP managed lane projects must meet these challenges immediately adjacent to publicly operated free lanes, which requires significant coordination with public authorities. Other operations and maintenance factors to consider include designing a system that also allows for smooth traffic operations. For example, decisions about the number of lanes per direction, the lane reversibility, and location of exit/entry points must be optimized. The ability to evaluate these factors upfront has long-term implications for project success.

- **Financial feasibility**: The decision to deliver a managed lane project as a PPP is often assessed using a value for money (VfM) framework, as depicted in the graphic below. This analytical approach, used widely in the United States and well-developed PPP markets around the world, evaluates whether the public sponsor receives value – on a risk adjusted, whole life basis – through the PPP alternative or if a more traditional project delivery and financing model offers better value.

1. **Establish a clear decision framework**

   One of the most prevalent challenges that stymies many managed lane developments is the ability and will to make defensible and transparent decisions on the key project choices.

   **Key Questions:**
   - What risks should public sponsors take?
   - What delivery method gives the project the best chance at success?
   - Is there value for money?

2. **Create innovative financial structures**

   The right approach to fill the funding gap for large managed lane projects has been a challenging journey for many jurisdictions.

   **Key Questions:**
   - Is the project financially feasible?
   - What is the right structure to deliver the project?
   - What tolling policy should be used for the project?

3. **Incentivize high performance infrastructure**

   Managed lane projects require special care and performance regimes to meet public requirements for mobility standards, aggressive project delivery schedules and long-term asset conditions.

   **Key Questions:**
   - Which objectives take priority?
   - How to balance toll and HOV pricing?
The KPMG framework was applied to evaluate financial and technical alternatives that might achieve the objectives of the project. By applying this framework, a sunken “cut-and-cover” trench concept and dynamic demand-based tolling was shown to reduce cost and achieve affordability. TxDOT's path forward for the project required less funding, freeing up critical funds for other Dallas/Fort Worth area transportation priorities while still achieving all public policy objectives and goals for the project.

Utilizing a detailed, clear and consistent framework for analyzing alternatives and selecting a project delivery approach supports defensible, well-informed decisions and allows public officials to communicate project benefits with confidence.

2
Strategy Two: Create innovative structures to fill the funding gap

All large infrastructure projects depend on a reliable funding plan—a particular challenge for managed lane PPPs, which in our experience are among the largest and most costly highway projects in the market. Most of these projects are tolled, and while toll revenues can be an important funding source, the very nature of managed lane deals makes their funding plans more difficult to analyze and structure. As a result, finding the right approach to fill the funding gap has been challenging for many jurisdictions.

Our experience suggests that successful managed lanes project funding plans must focus on three major elements:

- **Payment mechanisms**
- **Financial structuring,** and
- **Tolling policies.**

**Payment mechanisms**
Most managed lane PPP transactions have been pursued through a Design Build Finance Operate Maintain (DBFOM) structure to best leverage the variety of financing and funding tools that are available to private developers. The ultimate selection of payment mechanism, i.e., the form of payment that the private developer receives in a PPP, can have a decisive impact on value for money results. Two primary payment models prevail in the managed lane PPP market:

- **Toll concession.** The toll concession model transfers toll demand and revenue risk, design build, finance, operations and maintenance responsibilities to a private sector partner. This structure has been the predominant delivery model for PPP managed lane projects, reflecting the appetite by the private sector for control over toll revenues and the potential to achieve investment upside through strong operational management of the asset. Private developers generally require longer-term concession contracts (50+ years) to provide sufficient time for traffic demand to mature and generate the required longer-term cashflows.

- **Availability payment.** The availability payment model transfers the design, build, finance, operations and maintenance responsibilities to a private sector partner but not the demand and revenue risk, which are retained by the public sponsor. This payment structure may be preferred if the public sponsor wishes to include public financing during construction, other mid- to long-term financing during operations, and retain the toll revenue risk. Availability payments are typically spread over a shorter contract term (e.g. 30-35 years).

The selection of a payment mechanism depends on project funds available, the public sponsor’s policy objectives, and the private sector’s competitive appetite for each project. Some examples of how payment mechanisms have been structured to address funding constraints include:

- **Limited funds and toll revenue bond capacity.** DBFOM concession structures can increase financability by using more flexible forms of finance and equity contributions.
- **Insufficient funds today and the immediate future.** DBFOM concession can be used to reduce the upfront public subsidy or can be structured to meet affordability constraints. DBFOM Availability Payment structures are often used to match the affordability profile of available funds.
- **Insufficient funds today but money in the future.** The NTE toll concession project included a fixed price proposal for the maximum scope delivered. A unique pre-development agreement was established to expand the project as additional segments became viable.

Projects such as Capital Beltway, LBJ and NTE did not have sufficient funds and revenue bond capacity, but were financable when combined with TIFIA, PABS and private sector finance solutions.

The I-4 project in Florida was structured as an availability payment deal to match the funding available during construction, future funding and the projected toll revenue.
Financial structuring

One of the key advantages of PPPs is the ability to employ a wider array of financing tools to efficiently leverage project funding. The complexities of managed lane transactions require particular flexibility and creativity in financial structuring.

To address financing requirements and market limitations, the Transportation Infrastructure Finance and Innovation Act (TIFIA) program has been key for many projects. Obtaining TIFIA credit assistance has proven critical for a number of managed lanes projects because of the flexible terms offered. Predictable federal policy for the TIFIA program will be vital to many projects.

The private sector has also successfully combined the use of debt instruments, such as Private Activity Bonds (PABs) with more flexible sources of finance such as patient equity, lines of credit and short-term bank debt.

Where congestion patterns have been long established, some PPP managed lane projects have secured financing on demand forecasts alone, while others have required credit enhancement because the unproven nature of traffic patterns. Examples of how KPMG has helped drive market-based financing solutions and craft project credit enhancements for managed lanes projects include:

• The I-77 HOT Lanes Project in Charlotte, North Carolina recently achieved financial close which brought further financial innovation to the market. The Developer Ratio Adjustment Mechanism (DRAM) is a unique NCDOT contingent commitment that provides limited credit enhancement support to the Project, eliminating the need for a ramp-up reserve. Subject to annual and aggregate caps, the DRAM can be drawn to support the Project’s debt service requirements if toll revenues are insufficient to make scheduled payments. Furthermore, the DRAM can also cover certain project costs such as O&M and major maintenance.

• The I-95 managed lane project in Northern Virginia was able to commence construction early by utilizing a temporary bridge debt facility from the Commonwealth of Virginia while TIFIA financing was finalized.

• The US 36 project in Denver, Colorado combined a pre-existing TIFIA Financing for phase one of the project with a new TIFIA facility that leveraged revenues from the full US 36 managed lanes as well as the existing I-25 Express Lane toll revenues.

To further mitigate recent capital markets volatility, KPMG has worked with public sponsors to allow developers to advance uncommitted financing plans and to manage interest rate risks between commercial and financial closings. This flexibility has enabled proposers to provide a lower risk-adjusted price while carefully limiting the public sector’s exposure. Another financial structuring innovation was the bifurcation of financial and commercial close in the LBJ and NTE projects, which allowed private sector discussions with lenders and the TIFIA office to advance.

Tolling policies

The selection of the right tolling policy is paramount to the success of managed lane concepts, and this is especially true under PPP structures. Because PPPs are generally financed on a limited recourse basis, tolling policy directly impacts the ability of the project to generate funding, to obtain financing at affordable rates, and meet the capital needs of the project. In addition, tolling policy is one of the tools used to help managed lanes projects achieve their congestion management goals through HOV toll pricing and throughput requirements.

KPMG has supported our clients in maintaining an open feedback loop with public stakeholders, potential private sector partners and lenders to strike an appropriate balance between toll policy, public policy and commercial objectives.

Toll setting authority

An element that has helped the financial feasibility of DBFOM concession managed lane projects is establishing the clear authority to charge and raise toll rates. To clarify that the private sector PPP partner has the authority to charge toll rates that can be adjusted over time, regional managed lane toll policies were implemented in North Texas and Northern Virginia. These regional toll policies helped clarify the private sector’s ability to charge toll rates using a dynamic toll rate structure. The regional toll policy in North Texas went further to provide a toll rate cap that can only be raised if the private sector partner can demonstrate there is sufficient traffic and demand to charge a toll rate higher than the established cap.

HOV pricing

Many managed lanes facilities are High Occupancy Toll (HOT) lanes, which allow carpools, public buses and certain other transit classes to use the lanes for free or on a reduced basis while charging other drivers a toll. Managed lane projects such as the I-95 in Virginia were a conversion of HOT to HOV lanes, while other projects such as Capital Beltway, LBJ, NTE and US 36 were reconstructions with additional capacity that incorporated the HOV concept. Many PPP managed lanes projects include at least some conversion of existing HOV lanes to HOT lanes to use highway capacity more efficiently and improve enforcement. Managed lane projects also address a key tenet of HOV policy which is to drive maximum throughput in a corridor. At times, maximum throughput toll pricing can be at odds with a maximum toll pricing concept. Setting pricing policy for HOVs has significant implications for both revenue forecasts and for operation of the facility.

The HOV pricing strategies must address the conflicting incentives of the public sector (maximize HOV usage) and private investors (maximize the number of paying vehicles). These pricing strategies also have to consider local HOV policies and driver behavior patterns to achieve a financially feasible toll structure.

Examples of how HOV pricing has been applied include:

• HOV users in North Texas are given a 50% toll discount. To improve the financial feasibility of the HOV toll revenues the toll discount was guaranteed by the North Central Texas Council of Governments.

• In Northern Virginia, where commuters employ well-established ride sharing practices to qualify for HOV usage. Here, KPMG worked with VDOT to incorporate protections for the private partner against unexpectedly high HOV usage. The Capital Beltway commercial terms require VDOT to compensate the private developer for HOV traffic that exceeds agreed thresholds.
A significant challenge of many managed lane projects is that they include the rehabilitation of an existing, operating freeway alongside the development of new tolled managed lanes. One advantage of PPP structures is that they can create commercial incentives for private sector innovations which can drive down costs and improve asset performance. We have helped our clients work through a variety of these technical hurdles in PPP structures by developing risk transfer approaches that foster private sector creativity and value added solutions.

**Complex corridor constraints and traffic management**

The physical configuration of the existing roadway will influence the technical and engineering solutions in a given corridor. Because managed lanes are typically located in congested urban corridors, these projects often include a large number of elevated structures and narrow shoulders. These features make reconfiguration more challenging and construction more expensive. There is an important relationship between constructability and financial viability in managed lane PPP projects.

An example of this relationship is the Capital Beltway project, which employed an alternative technical concepts process to make the project viable by saving millions of dollars and avoiding hundreds of homes being taken for right of way.

An alternative approach used in the I-4 project in Florida delivered additional infrastructure and encouraged innovative alternative technical concepts above the base scope to fit under a maximum amount of project scope for a fixed public subsidy. For example, the NTE project near Fort Worth, Texas was structured to incentivize bidders to provide the maximum amount of project scope for a fixed public subsidy. All future project scope expansions will be completed through a pre-development agreement (PDA) based on prescribed expansion triggers and financial feasibility tests. The developer initially committed to building an agreed base scope, while a PDA governed future development responsibilities in the corridor. Within three years, the expansion triggers defined in the PDA led to delivery of two additional segments by the developer.

**Future project expansion needs**

Managed lane PPP contracts can be structured so that project scope can be expanded over time to meet additional capacity requirements. For example, the NTE project near Fort Worth, Texas was structured to incentivize bidders to provide the maximum amount of project scope for a fixed public subsidy. All future project scope expansions will be completed through a pre-development agreement (PDA) based on prescribed expansion triggers and financial feasibility tests. The developer initially committed to building an agreed base scope, while a PDA governed future development responsibilities in the corridor. Within three years, the expansion triggers defined in the PDA led to delivery of two additional segments by the developer.

The Florida Department of Transportation’s I-4 project addressed future project needs by incentivizing corridor throughput innovations from bidders. These incentives resulted in technical enhancements provided by the winning proposer that improved corridor operational performance aimed at specific traffic bottlenecks.

**Operational and asset performance**

In addition to the construction requirements of a PPP agreement, the operations and maintenance standards are key points of negotiation.

- The LBJ and NTE projects managed toll interoperability issues by creating an industry-first tolling services agreement (TSA) that leverages the existing toll operations and back office of the regional tolling authority, North Texas Tollway Authority. The US 36 project in Denver also included a TSA with the E-470 toll operations company.
- The I-4 transaction policy directive of traffic throughput maximization was distinctly at odds with revenue maximization of a toll concession transaction. An availability payment structure was better able to accommodate a throughput maximizing incentive structure while also providing FDOT significant cost and maintenance savings.
- The I-95 project in Virginia introduced speed degradation standards that link financial incentives to asset performance to help ensure HOV users would not experience deteriorated speed conditions in the managed lanes.

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**Strategy Three: Incentivize high performance infrastructure to achieve policy objectives**

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**Final Thoughts**

The Highway Trust Fund is chronically underfunded and heavily-travelled urban corridors are deteriorating at a rapid pace. All the while, public authorities are looking for new ways to manage congestion, optimize the use of limited capacity, and pay for necessary rehabilitation and expansion of existing roadway infrastructure. Managed lanes PPPs provide a promising alternative to meet many of these challenges.

Our experience has shown that PPP structures can provide good value and meet the policy objectives of public sponsors. However, the track record of completed PPP managed lane projects is limited and the financial performance of some completed projects has not yet met investor expectations. Over the next few years, several more managed lane PPPs are scheduled to open, and broader, deeper results will begin to inform the managed lane project development process.

When considering if a managed lane project could be developed as a PPP transaction, project owners need to understand the critical questions and structuring techniques that can help to strike the balance between public policy objectives and commercial considerations of the private sector. With all of the constraints that managed lane project sponsors face, public sector transportation authorities must find creative solutions to respond to the needs of their communities while providing value to users and meeting the commercial requirements of private developers and investors. Finding this balance is not easy, but KPMG’s experience demonstrates that the right blend of private sector creativity, innovation and risk transfer can deliver successful solutions.
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