



Peer Review of U.S. Managed Lanes

Attribute Assessments and Ratings

April 2018

Analysts

Tanya Langman
+1 212 908-0716
tanya.langman@fitchratings.com

Scott Monroe
+1 415 732-5618
scott.monroe@fitchratings.com

Anne Tricerri
+1 646 582-4676
anne.tricerri@fitchratings.com

Jennie Mu
+1 646 582-4748
jennie.mu@fitchratings.com

Editorial Advisers

Executive
Paul Taylor
Chief Executive Officer

Editorial
Carrie A. Peinado, Associate Director
Amanda Muller, Senior Desktop Publishing Specialist

Publisher
John Forde, Managing Director

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Related Research

[U.S. Managed Lanes — 2018 Sector Briefing \(March 2018\)](#)
[Peer Review of U.S. Toll Roads \(Attribute Assessments, Metrics and Ratings\) \(September 2017\)](#)
[Peer Review of U.S. Managed Lanes \(Attribute Assessments and Ratings\) \(March 2017\)](#)
[U.S. Managed Lanes: Sector Update \(June 2015\)](#)
[U.S. Managed Lanes: Empirical Data Steers Credit Analysis \(November 2013\)](#)

Related Criteria

[Toll Roads, Bridges and Tunnels Rating Criteria \(February 2018\)](#)
[Rating Criteria for Infrastructure and Project Finance \(August 2017\)](#)

Summary

- The 2018 Peer Review of U.S. Managed Lanes (ML) provides an annual snapshot of the Fitch-rated U.S. ML portfolio, including key rating factors (KRFs) for each rated project.
- ML projects included in this report are financed with debt primarily secured by ML net revenues. Fitch Ratings currently maintains ratings on 13 debt-financed ML projects in the U.S., five of which are operated by public sector entities and eight are privately operated under long-term concession agreements. Of these 13 projects, one has been operational for over 20 years; six are currently in various stages of ramp up, all having opened within the last five years; and six are under construction. Fitch maintains a private rating on one ML project.
- MLs are a subset of the toll road sector and are rated by Fitch under the *Toll Roads, Bridges and Tunnels Rating Criteria* (February 2018) with the ML-specific elements laid out in *Appendix B* of the criteria. As part of its criteria, Fitch focuses on six KRFs: Completion Risk; Revenue Risk – Volume; Revenue Risk – Price; Infrastructure Development and Renewal; Debt Structure; and Debt Service Risk. Between them, they address the main qualitative and quantitative aspects of the operating and financial profiles for most projects and reflect an assessment of both past performance and future expectations.
- The report focuses on working examples of the application of the toll road criteria to Fitch-rated ML projects, providing examples of what constitutes a “stronger,” “midrange” or “weaker” assessment for each KRF. These examples include certain unique features of MLs assessed as part of revenue risk factors under Revenue Risk – Volume, as set out in the *Appendix B* of the toll road criteria.

Key Rating Factors Overview

Fitch’s rating criteria identifies six KRFs implicit in all ML ratings:

- Completion: risk related to construction of the ML (if relevant).
- Volume: traffic demand characteristics, firstly considering the volume characteristics of the corridor as a whole (including free access general purpose lanes [GPLs]), before separately considering aspects of the MLs (including historical demand, price elasticity of users, access policy and configuration).
- Price: the legal and political flexibility to increase tolls if required.
- Infrastructure development and renewal: the approach to maintaining and improving its infrastructure base.
- Debt structure: financial risk associated with the capital structure.

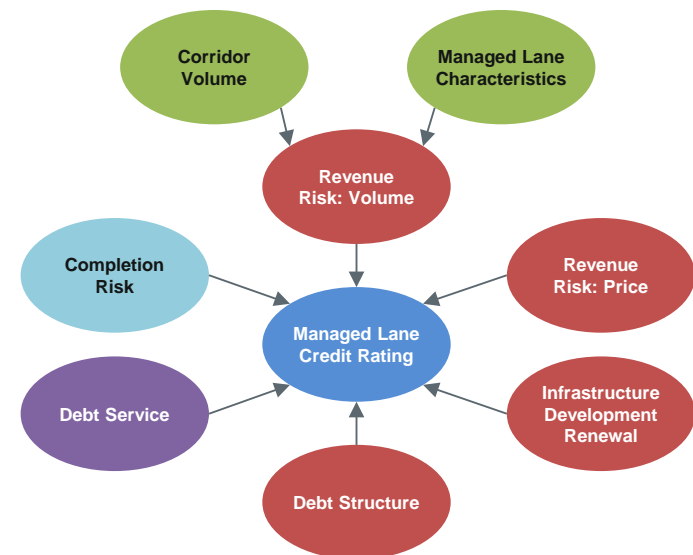
- Debt service: the level of financial flexibility.

For the first five KRFs, Fitch assigns an assessment of either stronger, midrange, or weaker. The sixth KRF, debt service, considers debt service coverage, leverage and liquidity in the context of the overall risk profile determined by review of the other KRFs.

Comparability of Ratings

ML projects face some unique challenges compared with standard toll roads, so a more diverse range of attributes is taken into consideration as part of Fitch’s revenue risk

Managed Lanes: Key Rating Factors



Source: Fitch Ratings.

analysis under the volume KRF described in detail in this report. The report also seeks to provide an indication of the relative importance of the rating factors, explaining conditions that may lead to one KRF outweighing others, resulting in a higher or lower rating than may otherwise be expected.

- KRF attribute assessments help frame ML credit ratings, providing a standardized approach for comparing U.S. MLs and other infrastructure assets across Fitch’s global portfolio.

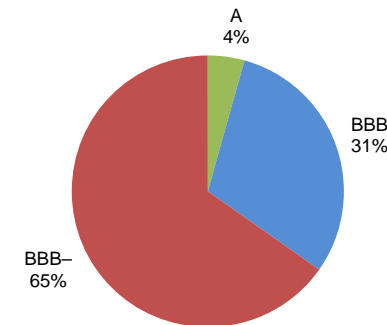
- Particular emphasis is also placed on key features of the ML project's debt structure including flexibility and liquidity, which are important given the inherent volatility and difficulty in forecasting. All rated transactions benefit from structural flexibility providing added protection against weaker ramp up.
- Most ML projects are rated in the 'BBB' category reflecting the leveraged structures employed. Given the relatively acute competition risks faced by ML facilities, it is highly unlikely that ratings above the 'A' category would be assigned, regardless of leverage or any other KRF assessments.
- Ratings below investment grade typically reflect projects with high completion risks, or those experiencing sustained underperformance and/or are significantly over leveraged, in Fitch's view.

Rating Activity

Since the 2017 publication of the *Peer Review of U.S. Managed Lanes (Attribute, Assessments and Ratings)*, Fitch added three new projects, made one Outlook revision and upgraded one project rating.

- New Credits in 2017: Colorado High Performance Transportation Enterprise (HPTE) for the C-470 express toll lane (C-470) project in the southern Denver area; I-66 Express Mobility Partners' I-66 express lanes (I-66) outside the beltway in the N. Virginia/Washington D.C area; and Riverside County Transportation Commissions' I-15 express lanes (RCTC I-15) in Southern California.
- New Credits in 2018: Fitch assigned ratings to the debt issued by Texas Private Activity Bond Surface Transportation Corporation for North Tarrant Expressway Segments 3 A and B express lanes (NTE 3A&B) in the Dallas-Fort Worth region.
- Rating Actions: The senior/Transportation Infrastructure Finance and Innovation Act (TIFIA) ratings for I-95 Express Lanes LLC in Northern Virginia (95 Express) were upgraded to 'BBB'/BBB'/Stable from 'BBB-'/BBB-'/Positive on account of continued strong financial performance and expectations that stronger metrics will be maintained even when including additional parity debt for the I-395 express lanes extension project. Fitch also rated the project's subordinate Virginia Transportation Infrastructure Bank Loan (VTIB) at 'BBB'/Stable.
- The rating Outlook for California's Orange County Transportation Authority's SR-91 ML (OCTA SR-91 or OCTA) senior bonds was revised to Positive from Stable as the effect of the connection to the newly opened Riverside County Transportation

Managed Lanes Ratings



Note: Publicly rated managed lane facilities.
Source: Fitch Ratings.

Commission SR-91 MLs in California (RCTC SR-91) was an immediate and significant boost to OCTA's revenues.

- All other Fitch-rated ML facilities currently maintain Stable Outlooks. Rating changes in the near term are generally unlikely as most projects are in various stages of construction or ramp up.
- Positive rating movements will hinge on continuation of strong growth trends through the end of ramp up and a sustained stable growth post ramp up.

Performance Highlights

Projects in Construction

NTE 3A&B; I-77 Mobility Partners LLC (I-77, Charlotte, NC); Blueridge Transportation Group, LLC (SH 288, Houston area, TX); C-470; RCTC I-15; and I-66 are currently in various phases of construction. All projects have ratings in the 'BBB' category on their respective senior lien bonds and TIFIA loans reflecting relatively high current leverage and construction that has progressed, for the most part, in line with expectations.

Construction Completion Dates

Project	Scheduled Completion Date
Riverside County Transportation Commission (SR-91, CA)	Completed March 2017
Texas Department of Transportation (IH-35E MLs, TX)	Completed May 2017
North Tarrant Expressway (Segments 3 A and B, TX) ^a	September 2018
I-77 Mobility Partners LLC (NC)	December 2018
BlueRidge Transportation Group (SH-288 MLs, TX)	December 2019
High Performance Transportation Enterprise (HPTE, C-470 Express Lanes Project, CO)	July 2019
Riverside County Transportation Commission (I-15, CA)	July 2020
I-66 Express Mobility Partners LLC (I-66 Outside the Beltway Express Lanes, VA)	November 2022

^aOnly segment 3A is still under construction. Segment 3B was completed in July 2017. MLs – Managed lanes.
Note: Scheduled completion dates refer to completion of major construction works and service commencement.
Source: Issuers.

Projects in Operation

RCTC SR-91 and Texas Department of Transportation (TxDOT) IH-35E MLs (IH-35E) in the Dallas-Fort Worth region opened in March 2017 and May 2017, respectively. Performance over the first several months since opening was very strong relative to the respective sponsors' and Fitch cases. Fitch also rates the respective senior lien bonds and TIFIA loans of four recently opened private sector projects: Plenary Roads Denver, LLC (PRD, U.S. 36 Phases I, II and I-25 MLs); LBJ Infrastructure Group, LLC in Dallas (LBJ, I-635 MLs); North Tarrant Express Mobility Partners LLC in Fort Worth, TX Segments 1 and 2 (NTE 1&2); and I-95 Express Lanes LLC in Northern Virginia (95 Express). Low investment-grade ratings for these projects reflect the uncertainty around ramp up and their highly leveraged, back-loaded capital structures. In Fitch's view, it is still too early in the ramp-up stage to draw any conclusions about traffic and revenue trends.

- For PRD, Fitch continues to monitor the transition to high-occupancy vehicles with three or more passengers (HOV3+) from the two or more passengers (HOV2+) policy for the MLs (commenced in January 2017) to evaluate how the transition affects the project.
 - In 2017, the first full year post-transition, total revenues of \$14 million were slightly higher than Fitch's rating case revenues of \$12 million.
- Both NTE 1&2 and 95 Express projects opened to traffic in late 2014, and ML ramp-up performance supported initial assumptions for both projects.
 - 95 Express total revenues of approximately \$89 million reported for the 2017 calendar year were in line with the sponsor's original forecast at financing. Total revenues compared favorably with Fitch's more conservative rating case assumptions of \$52 million.

- NTE 1&2 reported its third full calendar year of operations with total revenues of approximately \$92 million, which compared favorably with Fitch's rating case at financing of about \$79 million for 2017. Actual revenues were right on top of the original forecast for that year.

- LBJ completed construction of its final segment (segment two) in September 2015 and the road is now fully operational (sections 3 and 1 opened on schedule in December 2013 and July 2014, respectively).
 - Total revenues of approximately \$100 million in the second full year of operations were above Fitch's rating case expectations of \$87 million for the year, but below the original equity case of \$135 million in nominal revenues that were based on stronger inflation growth assumptions. Finally, Fitch rates OCTA SR-91 ML senior bonds in the 'A' category, reflecting the project's low leverage profile and long operating history that, although somewhat volatile as would be expected, demonstrated consistent and well-understood revenue-generating capability.
- The chart on page 5 provides an illustration of the ability of an ML project to support its debt obligations. The debt is scaled against the fully ramped-up year's gross revenues under Fitch's rating case. Projects with higher debt per lane mile are expected to generate higher revenues to support their debt obligations, as illustrated in the chart. For example, LBJ's more than \$24 million in debt per lane mile is higher than other projects in Fitch's portfolio. At the same time, LBJ is viewed by Fitch as a stronger asset that is more likely to have the ability to produce more revenue per lane mile to support its debt.

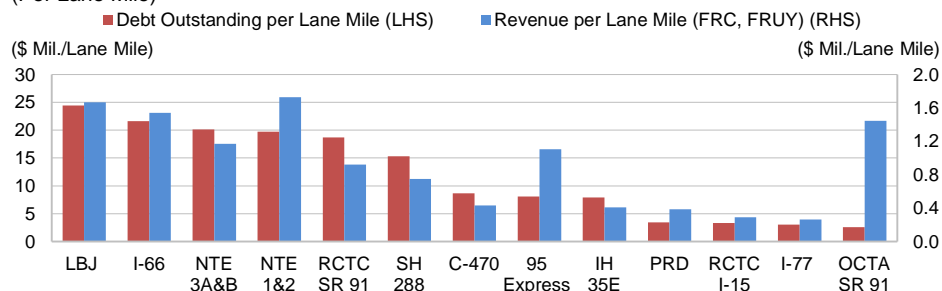
Selected Performance Statistics — Total Revenues

Project	2015		2016		2017	
	Actual	Rating Case	Actual	Rating Case	Actual	Rating Case
95 Express Lanes LLC (VA)	59.0	34.0	78.0	46.0	89.0	52.0
LBJ Infrastructure Group (TX)	N.A.	N.A.	75.0	82.0 ^a	100.0	87.0 ^a
North Tarrant Express Mobility Partners (NTE 1 and 2; TX)	52.0	40.0	73.0	62.0	92.0	79.0
Plenary Roads Denver (US36 Phases 1 and 2 and I-25, CO)	N.A.	N.A.	10.0	8.0	14.0	12.0
Riverside County Transportation Commission SR-91 (CA)	N.A.	N.A.	N.A.	N.A.	10.0 ^{b,c}	4.0 ^b
Texas Department of Transportation (IH-35E MLs)	N.A.	N.A.	N.A.	N.A.	8.7 ^d	3.8 ^d

^aAdditional Fitch stress case at time of financing had assumed a one-year completion delay to 2017. ^bBased on partial fiscal year ending June. ^cProject opened two months later than under the rating case. ^dRevenues reflect first half of fiscal 2018 only, from June 1 to Nov. 30, 2017. N.A. – Not applicable.
Source: Issuers, Fitch Ratings.

Debt and Fitch Rating Case for FRUY Revenue

(Per Lane Mile)



FRUY – Fully ramped up year. Note: OCTA FRUY revenues are based on fiscal 2017 actual revenues since there is no ramp up. 95 Express revenues are based on calendar-year 2016 estimates assuming ramp up is complete.

Source: Fitch Ratings.

Conclusion

Fitch's criteria for toll roads provide a structured, analytical approach with a focus on key rating drivers. Fitch conducted a detailed portfolio review of its rated U.S. MLs to determine attribute assessments for each category. Reviews of all MLs are conducted at least once annually. Fitch will assign attribute assessments for each new ML facility rating and will similarly monitor existing attribute assessments as part of its ongoing rating surveillance. Attribute assessments are published in Fitch's rating action commentary for each ML project. To the extent an adjustment to an existing assessment is determined to be appropriate, Fitch likewise publishes the change as part of its rating action commentary. In some cases, attribute assessment adjustments may lead to rating actions, depending on the underlying reasons for the change and the relative significance of the attribute being adjusted.

For a detailed description of the attribute drivers, see *Attribute Assessment* section; for attribute assessments by ML facility, see *Appendix C*; and for key statistics, see *Appendix D*.

Attribute Assessments

Completion Risk: Complexity, Contractor Strength and Security Package Provisions

The Completion Risk assessment is determined based on mostly relatively objective considerations, such as the financial strength of the contractor, its experience with

similar projects, analysis of protections included in construction contract terms and the performance security package.

- All the facilities included in this peer study that are currently in various stages of construction have completion risk assessments of midrange, primarily reflecting the financial strength of most contractors in the field combined with fixed-price, date certain terms and supportive performance security, as well as relatively straightforward construction characteristics.
- It would be unlikely that a project facing completion risk would be able to achieve an investment-grade rating with a weaker completion risk attribute assessment.

Revenue Risk Overview

As outlined in Fitch's toll roads criteria, Revenue Risk – Volume and Revenue Risk – Price are the two KRFs that generally have the most direct influence on operating toll road ratings. In the case of ML projects, the inherent volatility and uncertainty around traffic and revenue levels make a careful understanding of these risks particularly important.

Consistent with its broader toll roads portfolio, toll road revenue risk is determined through a combination of volume and price assessments. However, although traffic demand in the corridor as a whole may be fairly predictable and its analysis is similar to conventional toll roads, ML traffic demand and revenue tend to be much more volatile than for other toll road types, given acute competition they face from adjacent free lanes.

Some of the unique characteristics of ML projects, including lane configuration, toll-setting mechanisms and free-access policies, have meaningful implications on potential revenue generation for ML projects. In order to take into account these unique features and to facilitate a tailored approach for analyzing each facet relative to peers, the appendix to the toll roads criteria was included to evaluate the two separate components of the Revenue Risk – Volume KRF relevant to ML corridor volume and characteristics.

- For each rated ML facility, Fitch assessed the role of the corridor in the relevant regional transportation network and certain factors that describe the strength of the MLs within the applicable corridor. Fitch assigned individual attribute assessments of stronger, midrange and weaker to each of the subcomponents of volume, which helped it arrive at the project's overall Revenue Risk – Volume assessments.

- While the corridor assessment has a high influence on the overall volume assessment as the demand for a ML stems from the corridor it serves, in certain instances, ML characteristics may drive the overall volume assessment.

The report also lays out conditions that may lead to one of the three assessments for the second revenue risk KRF: Revenue Risk – Price. Together, Revenue Risk – Volume and Revenue Risk – Price assessments represent the franchise strength of a given project.

Revenue Risk — Volume

Corridor Volume: Traffic Base, Service Area and Competition

When analyzing ML projects, Fitch analyzes the underlying traffic demand for the corridor as a whole and the historic volatility of such demand over time. It considers factors such as the nature of the area the road serves and its role in the wider regional transportation network, the level of competition it faces, regional economic and demographic trends, user travel/origin and destination patterns, and carpooling activity.

MLs are typically constructed along corridors that have strong traffic demand characteristics reflecting dominant positions in servicing commuter populations in large, important and growing urban areas.

The corridor volume on these road facilities, unlike the MLs themselves, would typically be expected to demonstrate little volatility in traffic demand over time, with relatively quick recoveries observed after any cyclical shocks. The majority of these facilities have a mix of stronger and midrange corridor assessments, reflecting the importance of their corridors in their respective regional transportation networks.

- LBJ is viewed as having a stronger corridor assessment due to its location on a highly congested ring road just north of Dallas with a resilient and diverse traffic base and heavy levels of congestion throughout the day. NTE, 95 Express and I-66 also have stronger corridor characteristics as all facilities serve resilient service areas with high wealth levels and limited viable alternatives for commuters, with severe congestion during peak and peak-shoulder periods.
- While SR-91 (both OCTA and RCTC segments) exhibits some midrange corridor traits, with moderate softening during the most recent recession and lower income levels in its primary Riverside County service area compared with those in neighboring counties, a stronger corridor volume assessment is ultimately

supported by its distinct “land-bridge” configuration with no real alternatives, making it an essential link between Orange and Riverside Counties.

- Fitch’s midrange corridor volume assessments for both the I-77 and the PRD projects reflects some historical volatility and moderate dependence on suburban development that is, in the case of both corridors, partially mitigated by the respective areas’ diverse employment bases and strong wealth levels.
- SH 288 corridor volume assessment of midrange reflects the project’s strategic location in a growing commuter corridor with some dependence on further population and employment growth, particularly in Brazoria County, TX. The local economy has some concentration in the oil and gas sector, which historically contributed to a considerable share of the region’s economic growth, although Harris County saw increased diversification in employment over the years.
- IH 35E MLs benefits from its strategic location in a congested commuting corridor serving the Dallas-Fort Worth metropolitan area. While the MSA is robust with strong socioeconomic factors, moderate corridor traffic base volatility and some reliance on suburban growth, particularly the northern section of the corridor supports the midrange assessment.
- The C-470 project corridor is located in a growing southern Denver service area and is well situated for traffic stability due to its connectivity to I-25 and E-470 supporting stronger assessment.
- RCTC’s I-15 project corridor exhibits midrange traits with volatility in the most recent economic downturn and lower income levels in the Riverside County service area compared with neighboring counties.
- Corridors with a large presence of commercial traffic may incentivize a higher shift of passenger traffic and possibly truck traffic, where permitted, to the MLs. However, evidence of that is still very limited and commercial traffic tends to be more volatile in general. Fitch will review historical traffic volatility to assess resiliency of truck traffic demand in the corridor. While corridors that are part of the North American Free Trade Agreement (NAFTA) routes typically carry a high number of trucks, given the current political environment, these corridors have a heightened exposure to any material changes in federal trade policies.
- In Fitch’s view, a weaker corridor assessment would imply significant doubt as to the road’s ability to generate the consistent levels of congestion needed to create pricing power and would likely constrain resulting ratings to the sub-investment-grade level given the correlation between the underlying corridor characteristics and the degree of essentiality of the MLs, unless leverage is minimal.

ML Characteristics: Demand, Elasticity, Access Policy and Configuration

The second component of the Revenue Risk – Volume KRF, ML characteristics, addresses ramp-up risk and the degree of volatility of the ML traffic base, the effects of lane configuration, capacity enhancements, time savings, average trip lengths, speed advantage, the ability to capture tolled traffic and price elasticity of demand to toll rate changes. ML projects tend to display midrange or weaker traffic demand profiles, reflecting the acute competition they, by definition, face.

Historical Demand and Price Elasticity

- Rate-making authority may be constrained if price elasticity of road users in a given corridor is considered to be high, implying limited room for further toll increases without ultimately harming revenue. Even though price elasticity of demand has not been adequately tested for the various tolling methodologies in use, Fitch generally assumes that private operators will raise rates to maximize revenues, implying that they are unlikely to have any flexibility to raise rates to mitigate the effect of economic shocks, while public sector operators may have more of this flexibility in the peak-shoulder and inter-peak periods if tolls are set under a throughput maximization policy.
- The only rated project with meaningful performance history is OCTA's SR-91 MLs, supporting an ML characteristics assessment of midrange. The assessment reflects the expected relatively high level of volatility through the most recent economic recession, which was further exacerbated by travel time improvements on the GPLs resulting from free-lane capacity expansion. Nevertheless, volume and toll rates recovered well with traffic and revenue experiencing a CAGR between the first fully ramped-up year in 1998 and 2016 of approximately 2.3% and 6%, respectively.
- Currently, all other Fitch-rated projects have weaker ML characteristics assessments as these are either in construction or in the very early stages of ramp up and, therefore, ML volatility for these projects is still uncertain. Similarly, the elasticity of demand for toll increases has not been adequately tested yet. While some of the projects exhibit midrange individual ML characteristics (described in more detail below), these are outweighed by the lack of demand history, unproven ramp up and untested price elasticity of demand, resulting in a weaker ML characteristics assessment. The assessments could migrate upwards post-ramp up and once a level of demand is demonstrated through an economic cycle.

- Ramp Up: Generally, traffic and revenue ramp up progressed rapidly in areas with previously operating MLs, especially where the new lanes connected into an existing system. One prime example is the SR-91 in Riverside County connecting with Orange County SR-91 MLs. Quicker ramp up was evident in the regions where drivers are familiar with both the ML and toll road concept (VA, TX and CO). Reportedly, customer education and proactive outreach all helped accelerate ramp up.
- Trucks: NTE 1&2 and LBJ both demonstrated positive experience with light truck (2-axle) and heavy truck (3-axle+) utilization so far. I-66 will also permit trucks on its MLs. Given limited history and only regional experience to date, there is a high level of uncertainty regarding heavy truck utilization on MLs. There is generally less research available on heavy truck value of time (VOT), which is likely influenced by a wider range of factors than cars or even light truck VOT. Fitch will continue to monitor truck utilization rates as more data becomes available; a level of conservatism has been included in our cases.

Congestion

- Facilities with consistent, demonstrated, acute congestion over extended periods during the day beyond just the peak hours (heavy two-directional peaks, peak-shoulder and inter-peak periods), as evidenced by high density levels and low speeds in the GPLs and resulting in high capture rates, are viewed as having the highest degree of congestion. Conversely, low levels of congestion even in the peak periods and minimal capture rates would be assessed as weaker.
- One example on the weaker end of the spectrum is I-77, where excess capacity in parts of the project corridor leads to a relatively narrow revenue-generating profile. In Fitch's view, the I-77 ML project's ability to generate significant revenue will initially be driven largely by the identified bottlenecks in the central and northern sections until congestion in the corridor increases as the service area population grows over forthcoming years. Similarly, PRD ML revenue generation is expected from narrow peak windows of meaningful congestion on part of the project's facilities only. Another such example is RCTC's I-15, where congestion is limited to isolated choke points and improvements at nearby alternatives are anticipated to divert traffic. The project is somewhat dependent on suburban development, but the area is expected to experience growth, particularly in rural areas.

- RCTC's SR-91 MLs are expected to benefit from similar commuting patterns as OCTA; congestion in the corridor may be somewhat alleviated with the addition of a free GPL per direction, although additional traffic is expected to divert to SR-91 given expanded capacity.
- Initial free capacity expansion on the IH 35E ML project segment, with one additional GPL per direction, may reduce traffic pressures in peaks.
- Corresponding to congestion levels, highest pricing power and consequently revenue potential occurs during peak periods for most ML projects. Off-peak price is generally a fraction of the peak toll and even shoulder pricing can be significantly less than the core of the peak. Fitch expects most MLs to generate 70%–90% of their revenue during peak and peak-shoulder periods, and, so far, this has been demonstrated by all Fitch-rated operating facilities.
- With a large majority of revenues coming from peak periods, Fitch focuses on average peak period toll rates for an average trip distance in its analysis of toll rates and tolling practices.
- ML peak period toll rates are generally high compared with other toll roads as, unlike other sectors, these are derived via a congestion-relieving pricing mechanism by their very definition. Whereas high current toll rates on a normal toll road may indicate limited economic flexibility to implement further increases if needed, ML projects that generate higher average peak tolls while optimizing revenues and achieving strong tolled capture rates are viewed as having a stronger pricing power.
- Fitch believes that facilities with relatively stronger characteristics should, in the medium term, build up high pricing power and be in a position to levy relatively high toll rates of over \$0.70 per mile (real) in peak periods, on average. Facilities with moderate-high pricing power are likely to achieve average peak period tolls of \$0.50–\$0.80 per mile, while those with weaker congestion characteristics may be able to levy tolls in the range of \$0.30–\$0.60 per mile on average in the peak of the peak periods.
 - NTE 1&2's typical maximum weekday passenger car toll rate was about \$0.70/mile in the peak period, peak direction as of mid-2016.
 - 95 Express average peak period toll rates averaged \$0.80–\$0.90 per mile in 2017.
 - Facilities that permit trucks derived about 30% of revenues from truck traffic.

Free Access Policy

- One of the most important factors assessed under the ML characteristics component is the HOV policy and other policies governing free access to MLs. Different approaches to access policies make careful comparison essential. The nature of free access policies for HOVs and transit vehicles have a direct impact on tolled capture rates and revenue generation on MLs. In most cases, free access policies for HOV2+ will prove problematic over time as nontolled vehicles crowd out paying drivers. In Fitch's view, the exclusion of HOV2+ from free access is generally a minimum requirement for an ML facility in order for it to have adequate revenue generation capability.
- Projects that feature a policy allowing HOV3+ to access MLs for free generally display much more moderate untolled usership, as discussed below. HOV3+ penetration may evolve over time as carpooling behavior changes in various corridors. Fitch will continue to monitor projects where the increasing trend of toll-free HOV3+ traffic is observed and its impact on project finances.
- An exceptionally high share of untolled vehicles may lead to high congestion levels on the MLs, causing a decrease in their value to toll-paying drivers. With free-access vehicles crowding out MLs, the use of high tolls to limit demand and meet minimum travel speed requirements will thereby push out paying users and, consequently, limit revenue potential.
 - The tolling policy on PRD's I-25 MLs was converted to free access for HOV3+ on both I-25 and U.S. 36 in January 2017 from an HOV2+ free-access policy. However, there is some uncertainty as to demand after the transition process, although no material public opposition has been observed. In addition, the requirement that peak-period toll rates are no less than the regional transportation district's (RTD) express bus fare could limit revenue maximization for this project.
 - The policy with respect to I-77 will allow free HOV3+ access. The effect of an HOV3+ free-access policy is expected to be more limited on the project initially as the bulk of ML traffic is anticipated from shorter distance trips in the central and northern sections of the project where carpooling is not prevalent. However, the long-term effect of the HOV3+ free-access policy will depend on whether such a policy results in significantly increased carpooling in the service area to avoid tolls, as congestion increases. As the capability and use

of ride-sharing technology increases, free access to HOV3+ in certain corridors may pose a greater risk.

- 95 Express preserved the same HOV3+ policy that was in place before the lanes were converted from HOV lanes. However, evidence suggests that carpooling became highly prevalent between the Northern Virginia and Washington D.C. areas. Currently, untolled HOV3+ traffic on the 95 Express is broadly in line with projections, representing approximately 30%–35% of ML volume in peak hours. This level of HOV3+ traffic is high compared with other projects with HOV3+ free-access policy. However, risk is partially mitigated by provisions requiring the grantor to partially compensate the project company for toll losses resulting from high HOV3+ penetration rates when certain thresholds are exceeded. When completed, the I-395 project will have heightened exposure to HOV3+ vehicles, with compensation being triggered only when HOV volumes exceed 60% in the early years, stepping up to 65% by 2041. Fitch included sensitivities to reflect this exposure in its cases.
- Unlike the other rated ML facilities in the region, the I-66 project does not include protection to the developer should HOV3+ utilization exceed forecast negatively affecting revenues. The project road's diversified O&D traffic patterns indicate that a dramatic increase in HOV3+ utilization is unlikely. Nevertheless, in order to quantify this exposed risk, Fitch incorporated substantially higher HOV3+ utilization in its base and rating cases.
- On the flip side, both NTE 1&2 and NTE 3A&B projects (NTE projects) and the LBJ project are not exposed to material revenue risk resulting from free-access policies as discounts (not free access) for HOV2+ vehicles are subsidized by the grantor and the discounts include a sunset provision.
- The policy with respect to the SH 288 and C-470 MLs will not allow free access to HOVs, which Fitch views as supportive of revenue generation.
- In the case of both OCTA and RCTC's SR-91, HOV3+ are free at all times except from 4 p.m. to 6 p.m. on weekdays in the eastbound direction only when HOV3+ are tolled at 50% of the single occupancy rate helping them achieve higher revenues during the most congested hours. RCTC's I-15 will have a more conservative policy permitting HOV3+ at a 50% discount throughout the day (no free access).

Configuration

- Limited available data prevents precise measurements of the effects of varying configurations. Still, Fitch qualitatively evaluates how well the project's configuration corresponds with time periods and directionality of heavy congestion.
 - For example, 95 Express' reversible configuration may be more efficient for this facility's needs due to its one-directional peak and shoulder-peak commuting pattern; users are familiar with this type of lane reversibility as this configuration was in place prior to lane conversion. Conversely, NTE's ability to capture counter-directional traffic in the peak hours seems intuitive given its two-directional traffic patterns.
 - IH 35E project's two reversible MLs will be separated by a concrete barrier, which Fitch believes will increase user value by removing the possibility of traffic weaving directly from GPLs. Although traffic is generally heavier in the commuting direction during peak periods, some bi-directionality has been noted. It is not yet clear if the reversible nature of the lanes will mean a material amount of missed revenue from the counter-directional commute.

Configuration: Pros and Cons

Configuration Feature	Pros	Cons
Multiple Access Points	<ul style="list-style-type: none"> • Flexibility • Higher Capture Potential 	<ul style="list-style-type: none"> • Shorter Trips • Weaving • Confusing for Users
Single Access Point	<ul style="list-style-type: none"> • Predictable Usage • Easy to Understand 	<ul style="list-style-type: none"> • Inflexible
Continuous Access	—	<ul style="list-style-type: none"> • Operationally Problematic
Concrete Barriers	<ul style="list-style-type: none"> • Perception of Safety • Reduced Violation Rates 	<ul style="list-style-type: none"> • Costly to Implement • Inflexible
Plastic Pylon Separators	<ul style="list-style-type: none"> • Cost Efficient 	<ul style="list-style-type: none"> • Some Weaving Possible • Adverse Effect on Speed
Line Separation	<ul style="list-style-type: none"> • Very Cheap 	<ul style="list-style-type: none"> • Weaving • Slower Driving Speed
Increased Shoulder	<ul style="list-style-type: none"> • Fewer Lane Closures • Higher Perception of Safety 	—

Source: Fitch Ratings.

- On I-66, pylon dividers are considered inferior to concrete barriers given a relative lack of perceived safety by drivers who may travel at lower speeds. This concern is partially mitigated by a 12-foot shoulder, which is sufficiently wide to improve traffic flow.
- OCTA's and RCTC's respective portions of the SR-91 MLs offer single access point configurations that correspond well with the land-bridge nature of the road, enabling full distance trips for each of the two separate projects.
- As for LBJ, NTE projects, I-77 and 95 Express, multiple access points along the road and direct access ramps provide drivers with more access to MLs, but also offer more opportunity to leave, potentially resulting in shorter, average trip distances. In addition, ramp up may be negatively influenced by the complexity of traffic movements associated with multiple entry and exit points.
- SH 288 will feature two MLs per direction with four entry/four exit points along the mainline. In addition, there will be direct connector ramps at two major interchanges, which is one of the key features of the project as they provide road users with a paid alternative to bypass queuing on ramps.
- Fitch believes that single-lane ML facilities are likely to prove less attractive to potential users given the possibility of being stuck behind slow-moving traffic or a traffic incident without the ability to pass.
 - While the northernmost section of I-77 will have one lane in each direction, given the low current congestion levels, revenue expectations from this section are low. The single lane in each section on U.S. 36 coupled with RTD use could limit desirability for the ML. On the other hand, the user's familiarity with the existing reversible I-25 MLs (that corresponds well with the morning/evening commuting patterns of this corridor) will likely benefit ramp up.
 - The single-lane feature for a majority of the C-470 express lane segments and three single lane sections on RCTC I-15 may become a limiting factor operationally. Multiple access points will allow movement in and out of the lanes at certain locations.
- Many of the projects will eventually link into ML networks and, in Fitch's view, while such interconnectivity could result in better accessibility and improved traffic demand profile for some segments in the network, other possibly less congested

ML segments could become adversely affected as drivers have more options to choose across their entire journey.

- ML configuration (in terms of entry and exit points, access ramps, reversibility and barriers) that inefficiently correlates with congestion points and traffic patterns, underutilizes highway connections and ultimately disincentivizes usage and/or encourages violations could adversely affect a project's rating. This includes additional free capacity enhancements that result in significantly improved GPL traffic flow that would likely cause lower traffic shift to MLs.
 - In Fitch's view, ML configurations that have continuous access from GPLs would be one example of an extremely ineffective configuration. Fitch does not currently rate any ML projects with continuous access.

Revenue Risk — Volume: Overall Assessments

As described in the prior sections related to volume risk, when assessing volume risk for MLs, Fitch first looks at those factors that describe the strength of the corridor and then considers those factors that better describe the strength of the MLs versus GPLs within the corridor. The combination of the corridor volume and ML characteristics assessments determine the overall Revenue Risk – Volume assessment for these projects.

As noted previously, the ML characteristics assessments for facilities under construction or those currently in various stages of ramp up are constrained to weaker given heightened uncertainty due to a lack of demand history. To provide more clarity behind the assessments, volume assessments are outlined in the *Revenue Risk – Volume Assessments* table.

- The combination of stronger corridor volume and weaker ML characteristics (due mainly to a lack of demand history) for 95 Express, LBJ, NTE projects, I-66, C-470 and RCTC SR-91 (weak ML assessment primarily weighed down by lack of demand history) resulted in the overall Revenue Risk – Volume assessments of midrange.
- In the case of OCTA, the overall Revenue Risk – Volume remained at midrange given the inherent volatility of MLs due to adjacent competition.
- For I-77, the overall volume assessment of weaker reflects a combination of a midrange corridor volume assessment and a weaker ML characteristics assessment. In this case, the weaker assessment reflects not only the lack of demand history but also the congestion characteristics of the project with excess capacity in parts of the

project corridor closest to downtown and reliance on congestion from developing suburban regions, all contributing to the overall weaker assessment.

- The overall volume assessment for PRD and RCTC I-15 are also weaker reflecting a combination of a midrange corridor volume assessment and a weaker ML characteristics assessment. In addition to lack of demand history, the weaker volume assessments for both projects reflect the risks associated with isolated congestion points and efficiency limitations of a single-lane operation. This is further exacerbated on PRD with potential elevated elasticity to higher tolls, particularly due to required toll increases to match RTD's express bus fares. In the case of I-15, historical volatility of the asset and reliance on pricing power from short segments and narrow time periods of meaningful congestion amplifies volume risk.
- Both SH 288 and IH 35E have an overall volume assessment of midrange, reflecting their respective midrange corridor assessments and weaker ML characteristics due to the fact that both projects are still in construction phases with uncertainty related to future ramp up.

Revenue Risk — Price: Legal and Political Rate-Making Flexibility

This attribute is primarily concerned with the price-setting framework within which an ML operator operates, and the degree to which it would be legally and politically able to protect its revenue profile from traffic volatility by raising toll rates to the degree necessary. While unlimited rate-making authority would be considered a stronger feature, it may be constrained if the toll road operates in a politically charged environment. It should be noted that all Fitch-rated ML projects are required to adjust toll rates to maintain minimum specified speed levels.

Most ML projects have a combination of stronger and midrange assessments for legal and political rate-making flexibility. Fitch considers the choice of a toll-pricing mechanism as well as the extent to which residents in the area are familiar with tolling in general and area users' familiarity with ML tolling, and the extent to which it could lead to heightened political risk with public disapproval and impact ramp up.

- ML pricing power is expected to rise as driving conditions deteriorate on the corridor, leading to the ability to generate sustained above-inflationary increases in toll rates. However, at some point, as rates significantly increase, public sector facilities may come under increased pressure to hold rates lower than necessary to ensure required travel speeds. Public authorities will have less flexibility to change

Revenue Risk — Volume Assessments

Project	Corridor Volume	Managed Lane Characteristics	Revenue Risk: Overall Volume
95 Express Lanes LLC (I-95/I-395 Express Lanes Project, VA)	Stronger	Weaker	Midrange
BlueRidge Transportation Group (SH-288 MLs, TX)	Midrange	Weaker	Midrange
Colorado High Performance Transportation Enterprise (HPTE, C-470 Express Lanes Project, CO)	Stronger	Weaker	Midrange
I-66 Express Mobility Partners (VA)	Stronger	Weaker	Midrange
I-77 Mobility Partners LLC	Midrange	Weaker	Weaker
LBJ Infrastructure Group LLC (TX)	Stronger	Weaker	Midrange
North Tarrant Express Mobility Partners (NTE 1 and 2, TX)	Stronger	Weaker	Midrange
North Tarrant Expressway (Segments 3 A and B, TX)	Stronger	Weaker	Midrange
Orange County Transportation Authority (SR 91, CA)	Stronger	Midrange	Midrange
Plenary Roads Denver, LLC (US 36 MLs Phases I and 2 and I-25 MLs, CO)	Midrange	Weaker	Weaker
Riverside County Transportation Commission (I-15, CA)	Midrange	Weaker	Weaker
Riverside County Transportation Commission (SR 91, CA)	Stronger	Weaker	Midrange
Texas Department of Transportation (IH-35E MLs, TX)	Midrange	Weaker	Midrange

MLs – Managed lanes.

Source: Fitch Ratings.

policy with respect to private projects operated under a concession and may face public outcry in response to inefficient congestion management.

- NTE projects, LBJ and SH 288 project concession agreements allow for revenue maximization up to a soft cap on toll rates. Rates may only be increased beyond this cap if the concessionaire is unable to maintain minimum travel speeds in the MLs, implying a switch to throughput maximization at these levels.
- Toll rates on publicly operated IH 35E will be also subject to a soft cap. While the soft cap structure limits some of the operator's legal pricing flexibility, it may also help offset some political risk in a scenario of high congestion (low-moderate political risk offsets limited legal rate-making flexibility).
- In theory, the operator can adjust the cap during times of deteriorating performance, but given limited history on such increases with facilities having been open only for a short time, there is little evidence of them being able to adjust the cap in practice with material flexibility; therefore, price risk assessments for all four projects is midrange.
- While caps can serve to limit rate-making flexibility, minimum toll rate requirements (or toll rate floors) could have a detrimental effect on revenue generation.

- PRD's price risk assessment is midrange. The midrange assessment reflects some limitations on the operator's legal and political flexibility to increase rates, given that any such rate increases are subject to an approval by the board. In addition, the toll rate floor also serves to limit the operator's legal rate-making flexibility.
- C-470 price risk is also assessed at midrange. While no formal toll policy exists, future toll hikes require HPTE board approval, which will be linked to congestion levels and revenue generation.
- Given the differences in the various toll-setting mechanisms being implemented (fully dynamic versus variable, distance-based versus flat rates, etc.), benchmarking between various ML projects and comparisons to other toll road types may result in erroneous conclusions. Despite these complexities, as more operating evidence is becoming available, Fitch believes it is possible to form a view on proposed tolling practices for a given project. Fitch also considers users' familiarity with and acceptance of tolling in the area.
 - In the case of I-77, Revenue Risk – Price is midrange. Although there are no toll caps or minimum tolling requirements and the project company has unlimited legal and theoretically political flexibility to increase tolls in excess of inflation, there remains a great deal of uncertainty as to the willingness to use the MLs in the service area with the lack of any other toll roads in the region. In Fitch's view, toll rate ramp up for this facility is likely to take longer as people in the area get used to the MLs and the dynamic, all-electronic tolling mechanism, and as transponder use grows in popularity. This risk is somewhat exacerbated by continuing significant public opposition of this project.
 - As for 95 Express, I-66, OCTA and RCTC (both SR-91 and I-15), the price risk is assessed at stronger with all projects benefiting from unlimited rate-making flexibility and good familiarity with electronic tolling and MLs in the area.

Infrastructure Development/Renewal: Capital Improvement Planning and Funding Sources

Except in cases where a project's infrastructure is in particularly poor condition with no clear finance plan for remediation, the Infrastructure Development and Renewal Risk attribute tends to have a lower impact on a project's rating.

In the vast majority of cases, Fitch-rated ML projects have adequate or good remediation works-planning procedures to address ongoing needs when they arise. Plans in place to tackle identified near- and medium-term required works are generally sufficiently thought through and detailed to ensure issues are adequately rectified, with funding sources identified and factored into financial projections to ensure that the financial impact of such works is transparently set out for creditors. Furthermore, mechanisms that ensure cash is reserved in advance for expected works, where they exist, provide additional comfort to Fitch.

- All but one Fitch-rated MLs have an assessment of stronger reflecting 10 out of 11 brand new (or to be constructed) facilities. For most projects, their contractual framework requires independent engineers validating renewal and replacement expenditures and full recovery of expenditures from cash flows via forward-looking reserving mechanisms. In addition, all projects have considerable debt-free tails following debt maturities mitigating asset reinvestment risk.
- OCTA's stronger attribute assessment reflects a successful track record of implementing capital works on time and on budget in the past and limited capital requirements over the medium term.

Debt Structure: Risk Derived from Financing Profile

Fitch's MLs portfolio is not exposed to refinancing risk with all publicly rated U.S. ML projects employing fixed-rate, amortizing back-loaded debt structures. Part or all of the debt financing used by all of the projects, with the exception of OCTA, was provided in the form of TIFIA federal loans, including significant amounts of deferrable debt service, particularly in the early years of project operations.

- In Fitch's view, this level of flexibility in the debt structure helps mitigate some concerns surrounding the opening year traffic and length of the ramp-up period in the early years of operations.
- Access to additional liquidity for debt service support, such as the developer ratio adjustment mechanism in the I-77 project, can provide support to project's investment-grade rating.

Most TIFIA loan facilities were granted on a "springing" subordinate lien under which the loan ranks subordinate to senior debt unless a bankruptcy event occurs, after which it ranks pari passu with any senior debt outstanding. Since a bankruptcy event has a relatively wide definition, including items such as payment default extending beyond 12 months on the TIFIA loan, Fitch takes the view that in most scenarios involving an

impairment of the TIFIA loan, a cross-default of the senior lien would occur and, therefore, one combined Debt Structure assessment for both liens — the senior lien and the subordinate TIFIA loan — is assigned.

- OCTA has a Debt Structure score of stronger reflecting a fixed-rate senior debt lien with level debt service requirements.
- RCTC I-15 also has a stronger Debt Structure assessment reflecting senior lien TIFIA position with relatively strong legal provisions and a mandatory TIFIA prepayment requirement using 50% of surplus revenue to propel debt amortization. The transaction also benefits from structural reserves and RCTC's significant financial commitment to the project from the Measure A sales tax funds.
- All other publicly rated ML projects have a Debt Structure assessment of midrange on both senior lien and subordinate TIFIA debt reflecting the back-loaded nature of their respective debt service schedules, which may become exacerbated by any scheduled TIFIA deferral in the event that performance falls short of expectations. The assessments also reflect adequate structural features with cash-funded debt service reserves and satisfactory covenant packages.
- A weaker debt structure assessment on the 95 Express' VTIB loan reflects its deeply subordinated repayment terms.

Debt Service: Risk Associated With Debt Burden

This attribute evaluates an ML's ability to service debt and its financial flexibility to respond to cyclical economic shocks or temporary shifts in asset utilization. Fitch primarily considers some combination of leverage, typically defined as being net debt to cash flow available for debt service, and coverage is usually expressed as the debt service coverage ratio.

As per criteria, Fitch does not assess this risk factor stronger, midrange or weaker, since the assessment of whether a set of metrics would be considered stronger, midrange or weaker for a given ML facility would entirely depend on the other five KRF assessments.

- For example, PRD's relatively low leverage and flexible debt structure allows it to achieve an investment-grade rating with the combination of weaker Revenue Risk – Volume score and midrange Revenue Risk – Price assessment.
- OCTA demonstrates significantly stronger metrics than peers or indicative criteria guidance. However, the rating is constrained in the 'A' category due to the idiosyncratic risks and the inherent volatility associated with this asset class.

Gross Pledge: C-470 debt is secured by a gross revenue pledge with operating expenses truly subordinate within the project waterfall following debt service and reserves.

Appendix A

Key Rating Driver Assessments for Toll Roads, Bridges and Tunnels

	Revenue Risk – Volume	Revenue Risk – Price	Infrastructure Development/Renewal	Debt Structure
Description	<ul style="list-style-type: none"> Resilience of traffic volumes to macroeconomic stress, competition and other event risks. Current toll rates relative to peers and distance to perceived revenue maximization point. 	<ul style="list-style-type: none"> Demonstrated willingness and ability to increase tolls. Nature of any caps (statutory, contractual or political). 	<ul style="list-style-type: none"> Approach to the ongoing capital program and maintenance, including planning, funding, management. Adequacy and appropriateness of investment scope. 	<ul style="list-style-type: none"> Fixed-/variable-rate debt maturity profile. Amortization profile, refinancing risk. Flow of funds, distribution test and reserves.
Stronger	<ul style="list-style-type: none"> Proven resilient traffic base with relatively low volatility. Includes facilities with near monopolistic characteristics (i.e. an essential road with a large commuter base, limited competing roads or other modes of transportation). Low elasticity. Low toll rates. 	<ul style="list-style-type: none"> Legal or contractual flexibility to increase rates in excess of inflation. Minimal legislative or political interference. In practice, rates can be, and historically have been, increased with material flexibility above inflation. 	<ul style="list-style-type: none"> Highly developed and detailed capital and maintenance plan. Annual inspections with objective and quantitative measures. Additional leverage needs are limited to less than 50% of future capital spending requirements. Concession framework provides for full recovery of expenditure via adjustment in rates. Road capacity well above medium-term traffic forecasts. 	<ul style="list-style-type: none"> Senior debt. High percentage of fixed-rate debt. Limited refinancing risk or fully amortizing debt. Strong covenant package and reserves. Sweep of significant portion of excess cash flow to repay debt. Level-to-decreasing debt service profile.
Midrange	<ul style="list-style-type: none"> Proven traffic base with relatively moderate volatility. Includes facilities with a larger percentage of commercial or discretionary traffic; an essential road facing some degree of competition from competing roads or other modes of transportation. Price elasticity of demand to toll increases is low to moderate. Moderate toll rates. 	<ul style="list-style-type: none"> Legal or contractual framework allows periodic rate increases that track inflation. Some legislative or political interference. In practice, rates historically have been increased at around inflation. 	<ul style="list-style-type: none"> Moderately developed capital and maintenance plan. Additional leverage needs generally represent 50%–75% of future capital spending requirements. Concession framework provides for adequate recovery of expenditure via adjustment in rates. Road needs some expansion or rehabilitation to accommodate medium-term traffic forecasts. 	<ul style="list-style-type: none"> Junior debt with limited subordination. Some variable-rate risk present. Moderate use of bullet maturities or large issuer with established market access and active management of several bullet maturities. Some imbalance from swaps/derivatives. Adequate covenant package and liquidity reserves. Some back-loading of debt.
Weaker	<ul style="list-style-type: none"> Traffic with limited or no history; relatively high volatility. Includes facilities with high discretionary traffic, meaningful competition or greenfield projects. Untested or high price elasticity of demand. High toll rates. 	<ul style="list-style-type: none"> Legal and contractual framework limits periodic rate increases well below inflation. Considerable legislative or political interference. Limited history of toll rate increases. 	<ul style="list-style-type: none"> Weak planning mechanisms and history of deferred maintenance. Future spending requirements will be primarily debt funded. Concession framework doesn't provide for a significant recovery of expenditure via adjustment in rates. Road capacity significantly below medium-term traffic forecasts. 	<ul style="list-style-type: none"> Deeply subordinated debt exposed to or negatively affected by protective features of the senior debt. High percentage of variable-rate debt. Significant use of bullet maturities. Use of derivatives resulting in imbalanced exposure. Loose covenant package and liquidity reserves. Significant back-loading of debt.
Relevant Metrics	<ul style="list-style-type: none"> Local and regional economic data. Type of corridor. Traffic volume volatility over time. Traffic composition. Competing roads/alternative transportation modes. Elasticity and toll rate per kilometer/mile. Value of time. 	<ul style="list-style-type: none"> Toll rate relative to any cap. 	<ul style="list-style-type: none"> Asset quality. CIP program specifics. 	<ul style="list-style-type: none"> Percentage of fixed-/variable-rate debt. Percentage subject to refinancing risk. Rate covenant. Level of reserves. Distribution test. Amortizing debt or bullets. Debt service CAGR.
Debt Service	This key rating driver considers metrics for liquidity, debt service coverage and leverage in the context of the overall risk profile determined by review of the other key rating drivers. For example, a large, mature, toll road network with predominantly midrange and stronger characteristics could be rated in the 'A' category with debt service coverage ratios of between 1.40x–1.50x in the rating case. Moreover, a project's rating may be constrained by a weaker assessment on a key rating driver notwithstanding coverage ratios that may otherwise suggest a higher rating. This is discussed more fully under the <i>Debt Service</i> section below.			
Completion Risk	When present, this key risk factor is assessed using the analytical framework described generally in this report and in more detail in the <i>Appendix</i> of the master criteria report, <i>Rating Criteria for Infrastructure and Project Finance</i> , published in August 2017. The framework is used to derive the maximum possible rating during completion phase, based on complexity and scale, contractors and implementation plan, ability to replace contractor, and core contractual terms, as well as liquidity available to support a project in case of contractor default.			
Relative Importance of Key Rating Drivers	Revenue risk (Price and Volume) key rating factors generally have the most direct influence on operating toll roads ratings. This is because toll road operators usually have a relatively rigid cost base and, therefore, a lower than expected revenue flow could materially affect the projected cash flow generation and relevant coverage and leverage metrics. The Infrastructure Development/Renewal attribute often has a relatively lower importance to the rating analysis as project's maintenance and expansionary investments are usually regularly overseen and controlled by the concession grantor/public authorities. Debt Structure has a relative higher influence on rating analysis as covenants, security and other protective features embedded in the debt structure enhance creditors' protection.			

CIP – Capital improvement program.
Source: Fitch Ratings.

Appendix B

Managed Lanes' Revenue Volume Risk Factors

Assessment	Revenue Risk — Corridor Volume	Revenue Risk — Managed Lanes Characteristics
Stronger	<ul style="list-style-type: none"> Proven resilient corridor traffic base with relatively low volatility. Near monopolistic characteristics (e.g. an essential road with a large commuter base, limited competing roads, or other modes of transportation). Large and robust MSA with strong socioeconomic trends. 	<ul style="list-style-type: none"> Inherent volatility in ML traffic and revenue is inconsistent with a stronger risk assessment.
Midrange	<ul style="list-style-type: none"> Proven corridor traffic base with moderate volatility. A relatively large percentage of commercial or discretionary traffic; an essential road facing some degree of competition from competing roads or other modes of transportation. Midsized MSA with solid economic underpinnings. Moderate growth area or growing region with some dependence on future development. 	<ul style="list-style-type: none"> Proven ML traffic base with relatively moderate volatility. Price elasticity of demand of toll increases is demonstrably low to moderate. Moderate exposure to exempt vehicles (including scenarios in which compensation is received for exempt vehicles). Moderate to high levels of congestion during peak commuting periods (including shoulder periods), but relatively free flowing conditions during other time periods. Limited two-directional congestion. Efficient configuration. Moderate capture rates considering the configuration of the road. Moderate average trip distances as compared with the full length of the project.
Weaker	<ul style="list-style-type: none"> Corridor traffic with limited or no history; relatively high volatility. A large percentage of leisure or single purpose traffic, meaningful competition or expansion of competing facilities, or greenfield projects. Small MSA with below-average wealth levels and stagnant to decreasing socioeconomic trends. 	<ul style="list-style-type: none"> Lack of demand history. Unproven or prolonged weak ramp-up period. Elevated volatility to economic shocks and relatively high seasonal volatility. Untested or demonstrably high price elasticity of demand. Loose free access and other policies governing access to MLs that prevents pricing as an effective means of control of access to MLs and limit revenue potential. Configuration (in terms of entry/exit points and ramps/reversibility and barriers) that inefficiently correlates with congestion points and traffic patterns, underutilizes highway connections and ultimately discourages usage and/or encourages violations. Increase in free GPL capacity that would meaningfully improve GPL flow eliminating congestion levels over a medium to longer term. Low levels of congestion even in the peak periods. Low capture rates considering the configuration of the road. Very low average trip distances as compared to the full length of the project.

ML – Managed lane. GPL – General purpose lane.

Source: Fitch Ratings.

Appendix C

Managed Lanes Ratings and Attributes

Project	Senior Lien Rating	Subordinate Lien Rating	Outlook	Completion Risk	Revenue Risk — Volume	Revenue Risk — Price	Infrastructure Development/ Renewal	Debt Structure
95 Express Lanes LLC (I-95/I-395 Express Lanes Project, VA)	BBB	BBB	Stable	N.A.	Midrange	Stronger	Stronger	Midrange ^a / Weaker ^b
BlueRidge Transportation Group (SH-288 MLs, TX)	BBB-	BBB-	Stable	Midrange	Midrange	Midrange	Stronger	Midrange
Colorado High Performance Transportation Enterprise (HPTE, C-470 Express Lanes Project, CO)	BBB	BBB	Stable	Midrange	Midrange	Midrange	Stronger	Midrange
I-66 Express Mobility Partners LLC (VA)	BBB	BBB	Stable	Midrange	Midrange	Stronger	Stronger	Midrange
I-77 Mobility Partners LLC (NC)	BBB-	BBB-	Stable	Midrange	Weaker	Midrange	Stronger	Midrange
LBJ Infrastructure Group LLC (TX)	BBB-	BBB-	Stable	N.A.	Midrange	Midrange	Stronger	Midrange
North Tarrant Express Mobility Partners (NTE 1 and 2, TX)	BBB-	BBB-	Stable	N.A.	Midrange	Midrange	Stronger	Midrange
North Tarrant Expressway (Segments 3 A and B, TX)	BBB-	BBB-	Stable	Midrange	Midrange	Midrange	Midrange	Midrange
Orange County Transportation Authority (SR-91, CA)	A	N.A.	Positive	N.A.	Midrange	Stronger	Stronger	Stronger
Plenary Roads Denver, LLC (US 36 MLs Phases 1 and 2 and I-25 Managed Lanes, CO)	BBB-	BBB-	Stable	N.A.	Weaker	Midrange	Stronger	Midrange
Riverside County Transportation Commission (I-15, CA)	BBB- ^c	N.A.	Stable	Midrange	Weaker	Stronger	Stronger	Stronger
Riverside County Transportation Commission (SR-91, CA)	BBB-	BBB-	Stable	N.A.	Midrange	Stronger	Stronger	Midrange
Texas Department of Transportation (IH-35 Managed Lanes, TX)	N.A.	BBB	Stable	N.A.	Midrange	Midrange	Stronger	Midrange

^aMidrange debt assessment for senior private activity bonds and subordinate Transportation Infrastructure Finance and Innovation Act (TIFIA) loan. ^bWeaker debt assessment for junior Virginia Transportation Infrastructure Bank (VTIB) debt only. ^cSenior TIFIA loan rating. N.A. – Not applicable.

Source: Fitch Ratings.

Revenue Risk — Volume Assessments

Project	Corridor Volume	Managed Lane Characteristics	Revenue Risk — Overall Volume
95 Express Lanes LLC (I-95/I-395 Express Lanes Project, VA)	Stronger	Weaker	Midrange
BlueRidge Transportation Group (SH-288 Managed Lanes, TX)	Midrange	Weaker	Midrange
Colorado High Performance Transportation Enterprise (HPTE, C-470 Express Lanes Project, CO)	Stronger	Weaker	Midrange
I-66 Express Mobility Partners (VA)	Stronger	Weaker	Midrange
I-77 Mobility Partners LLC	Midrange	Weaker	Weaker
LBJ Infrastructure Group LLC (TX)	Stronger	Weaker	Midrange
North Tarrant Express Mobility Partners (NTE 1 and 2, TX)	Stronger	Weaker	Midrange
North Tarrant Expressway (Segments 3 A and B, TX)	Stronger	Weaker	Midrange
Orange County Transportation Authority (SR 91, CA)	Stronger	Midrange	Midrange
Plenary Roads Denver, LLC (US 36 MLs Phases 1 and 2 and I-25 Managed Lanes, CO)	Midrange	Weaker	Weaker
Riverside County Transportation Commission (I-15, CA)	Midrange	Weaker	Weaker
Riverside County Transportation Commission (SR 91, CA)	Stronger	Weaker	Midrange
Texas Department of Transportation (IH-35E Managed Lanes, TX)	Midrange	Weaker	Midrange

Source: Fitch Ratings.

Appendix D

Operating Managed Lane Facilities

	Orange County Transp. Authority (SR 91, CA)	95 Express Lanes LLC (VA)	North Tarrant Express Mobility Partners (Segments 1 and 2, TX)	LBJ Infrastructure Group LLC (TX)	Plenary Roads Denver, LLC (US 36 MLs Phases I and 2 and I-25 MLs, CO)	Riverside County Transp. Commission (SR 91, CA)	Texas Department of Transportation (IH-35E MLs, TX)
Owner/Operator	Orange County Transportation Authority (OCTA)	Transurban	Cintra/Meridiam/Dallas Police and Fire Pension System	Cintra/Meridiam/APG/Dallas Police and Fire Pension System	Plenary Group (Canada), Ltd. (Plenary Group)	Riverside County Transportation Commission (RCTC)	Texas Department of Transportation
Opening Date	December 1995	December 2014	October 2014	September 2015	March 2016	March 2017	May 2017
Configuration	2 ML/5 GPL in each direction	2-3 ML (reversible)/4 GPL in each direction	NTE 1: 2 ML/2 GPL/2 frontage NTE 2: 2 ML/3 GPL, 2 frontage in each direction	2-3 ML/4 GPL/2-3 frontage in each direction	1ML/2GPL in each direction on US36. 2ML (reversible)/3GPL I-25	2 ML/5 GPL in each direction	2 MLs (reversible)/ 3-4 GPLs in each direction
Length	10 miles	28 miles	13.3 miles	13.25 miles	US36 Phase 1:10 miles; US36 Phase 2: 5 miles, I-25: 7.7 miles	8 miles on SR 91; 2 miles on I-15	18 miles
Lane Miles	40 miles	70 miles	53.2 miles	60 miles	45.4 miles	32 miles	36 miles
Access	Single	Multiple	Multiple but pay by segment	Multiple but pay by segment	Multiple	Single	Multiple
Pricing	Variable time of day	Dynamic	Dynamic pricing with a soft cap on toll rates of \$0.75 (2009 \$) per mile	Dynamic pricing with a soft cap on toll rates of \$0.75 (2009 \$) per mile	Variable. Requirement that peak-period toll rates are no less than the RTD express bus fare	Variable time of day	Dynamic pricing with a soft cap on toll rates of \$0.75 (2012 \$) per mile
Policy	50% discount for HOV 3+ (and zero emission) in peak, HOV 3+ free during off-peak	HOV 3+ free	50% peak period discount for HOV2+ until 2025, discount is fully subsidized by TxDOT; trucks pay higher toll, based on shape	50% peak period discount for HOV2+ until 2025, discount is fully subsidized by TxDOT; trucks pay higher toll, based on shape	HOV 3+ free (converted from HOV2 in Jan 2017)	50% discount for HOV 3+ in peak hours, HOV 3+ free during off-peak	50% discount for HOV 2+ in peak until 2018
Total Debt Outstanding, Excl. Accruals (\$ Mil.)	\$103.6	\$841 ^a	\$1,050	\$1,615	\$141.6	\$598	\$285
2017 Estimated Total Revenues (\$ Mil.)	\$57.8 (Fiscal 2017)	\$89	\$92	\$100	\$14	\$10 ^c	\$8.7 ^d
FRC FRUY Total Revenues (\$ Mil.)	N.A.	\$115 (2021) ^b	\$92 (2017)	\$92 (2018)	\$17.6 (2019)	\$29.5 (2021)	\$14.8 (2021)

^aTotal debt outstanding includes senior and subordinate debt for the I-395 extension. ^bFRC FRUY total revenues for 95 Express includes full ramp up for combined system on fiscal year basis. ^cBased on partial fiscal year ending June. ^dRevenues reflect first half of fiscal 2018 only, from June 1 to Nov. 30, 2017. FRC – Fitch's rating case. FRUY – Fully ramped up year. ML – Managed lane. GPL – General purpose lane. HOV – High occupancy vehicle. RTD – Regional transportation district. N.A. – Not applicable. Note: Orange County Transportation Authority's 2017 revenue figures are reported on fiscal-year basis, ending June 30. Unless otherwise noted, total revenues for other projects are presented on calendar-year basis. Source: Obligors, Fitch Ratings.

Appendix D (Continued)

Managed Lane Facilities Under Construction

	I-77 Mobility Partners LLC (NC)	BlueRidge Transportation Group (SH-288 MLs, TX)	High Performance Transportation Enterprise (HPTE, C-470 Express Lanes Project, CO)	I-66 Express Mobility Partners LLC (VA)	Riverside County Transportation Commission (I-15, CA)	North Tarrant Expressway (Segments 3 A and B; TX)^a
Owner/Operator	Cintra Infraestructuras, S.A. and Aberdeen Global Infrastructure II LLP	ACS ID, Shikun & Binui USA, InfraRed, Northleaf, Clal Insurance Group, Star America	Colorado High Performance Transportation Enterprise	Cintra, Meridiam, APG, John Laing	Riverside County Transportation Commission (RCTC)	North Tarrant Mobility Partners Segment 3 LLC (NY)
Opening Date	December 2018	December 2019	July 2019	November 2022	July 2020	September 2018 (3A). Segment 3B has been in operation since July 2017.
Configuration	1-2 ML/2-4 GPL in each direction	2 ML/3-4 GPL in each direction	EB: 1-ML/2GPL; WB: 1-2ML/2GPL	2 MLs/3 GPLs	1 or 2 MLs/3GPLs	2 MLs each direction/2-4 GPLs depending on segment and location/ 2 discontinuous frontage lanes
Length	26 miles	10.3 miles	11 miles	22 miles	14.5 miles	10.2 miles
Lane Miles	94.4 miles	41.2 miles	31.1 miles	88 miles	29 miles	40 miles
Access	Multiple	Multiple	Multiple	Multiple	Multiple	Multiple
Pricing	Dynamic after first six months of operations	Fixed time-of-day schedule up to soft toll cap of \$0.75 (2012 \$) per mile (\$1.50 per mile on direct connectors)	Variable time of day	Dynamic tolling	Hybrid: variable time of day and dynamic	Initially fixed price for 180 days, fully dynamic thereafter with soft cap of \$0.75/mile (\$2010 prices), indexed to inflation
Policy	HOV 3+ free	No HOV discount or exemption from tolls	No HOV discount or exemption from tolls	HOV3+ free	HOV3+ at 50% discount	HOV2+ 50% discount during peak hours, reimbursed by TxDOT to operator. Discount expires in 2025.
Total Debt Outstanding, Excl. Accruals (\$ Mil.)	\$289	\$630	\$269	\$1.9	\$152.2	\$805
FRC FRUY Total Revenues (\$ Mil.)	\$24.9 (2023)	\$30.9 (2025)	\$13.4 (2022)	\$135.8 (2025)	\$13.4 (2023)	\$46.8 (2021)

^aOnly segment 3A is still under construction. Segment 3B was completed in July 2017. FRC – Fitch's rating case. FRUY – Fully ramped up year. TxDOT – Texas Department of Transportation. Note: Total revenues are presented on fiscal-year basis for each facility.
Source: Obligors, Fitch Ratings.

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New York

33 Whitehall Street
New York, NY 10004
+1 212 908 0500
+1 800 75 FITCH

London

30 North Colonnade
Canary Wharf
London E14 5GN
+44 20 3530 1000