



Raelor Capital



Executive Summary

The On-demand Transportation Solution
PRT is a Potential \$31-58 Billion
Investment Gain Opportunity

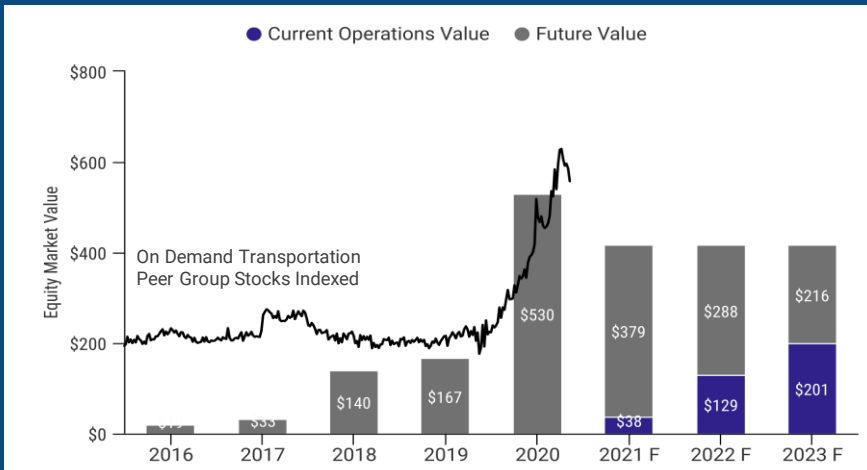
Personal Rapid Transit (PRT) Research

INTRODUCTION TO THE PRT VALUE OPPORTUNITY/GAP

Investors are paying increasing attention to, and investing in, the emerging mobility ecosystem. This domain includes the traditional OEM, autonomous driving, battery, AV mapping, sensor and EV (electric vehicle) charging segments. Over 1000 early-stage mobility companies have received ~\$200 m (million) investment since 2010.

On-demand transportation is a part of this mobility ecosystem and one of the best-performing segments in transportation investing. This includes ride-hailing app providers like Uber and Lyft, multi-mode majors like BYD, on-demand logistics like LaLamove and EasyVan and micromobility providers like urban bike and scooter rentals (e.g. Lime). Potential entrants include Apple, GM (Cruise) and Alphabet (Waymo).

Figure 1) On-demand Transportation Peers Indexed Equity Market Performance and Current Value vs. Future Value



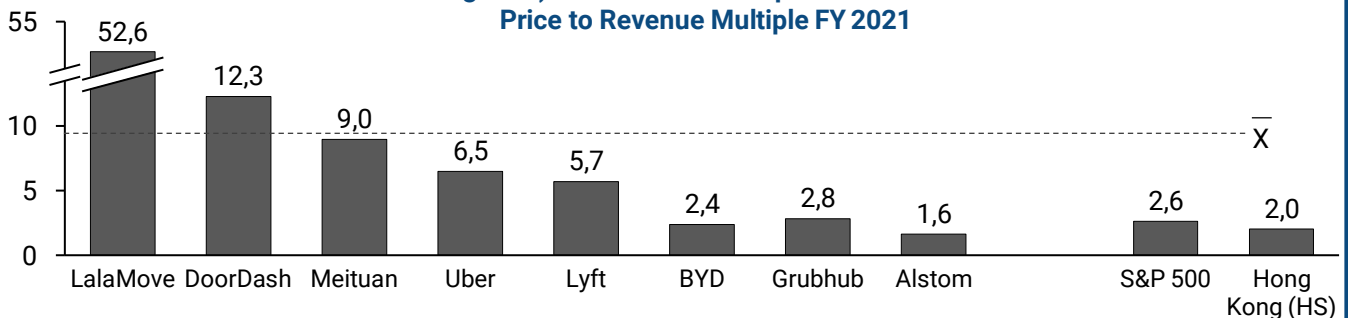
The group of market listed on-demand transport providers has performed well from 2016 to 2021 and produced a ~275% stock market return in comparison with the S&P 500's ~116% return (Figure 1).

This group's adjusted public stock valuations of \$420 bn is entirely based on future growth potential currently since these firms are in aggregate unprofitable. These valuations reflect high expectations.

Note: Praetor removed non-transport divisions from BYD and Meituan and pro-rated market capitalization

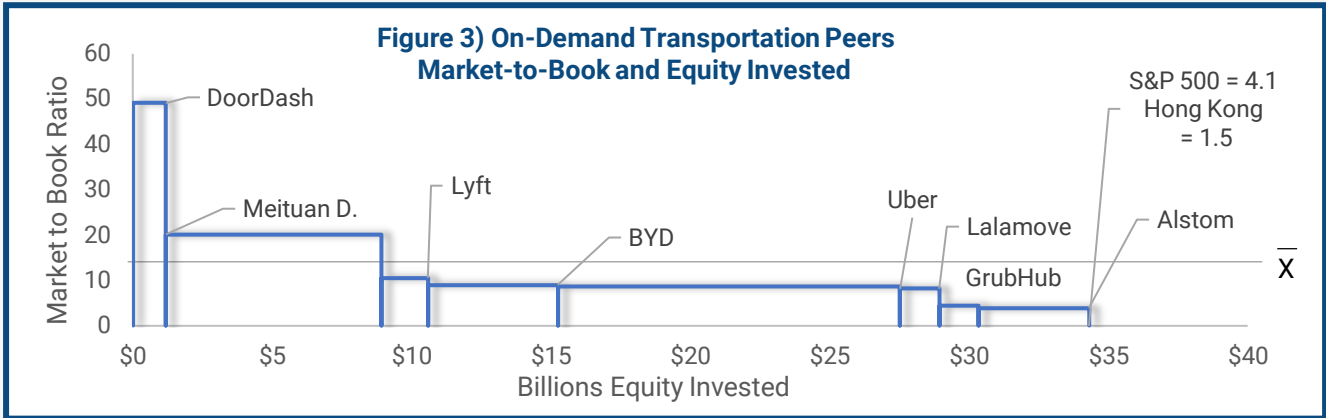
The Price-to-Revenue multiple is an effective gauge of early-stage company value that doesn't rely on free cash flow and profit and hence fits this peer group. The high market expectation for growth and profitability of this group are also reflected in the average price-to-revenue multiple of 9.7x, illustrated in Figure 2.

Figure 2) On-Demand Transportation Peers* Price to Revenue Multiple FY 2021



The Market-to-Book ratio of the on-demand transportation peers illustrates a similarly high expectation or premium valuation position (Figure 3). A ratio value of 1 indicates the market value of equity matches the equity capital invested.

*Note that Tesla was intentionally excluded from this group because it's an auto major and because of its large size. Its financial characteristics would have, in effect, overwhelmed the rest of the group. If Tesla was included, these valuation metrics would be higher



An average peer value of ~14 reflects significant value creation, well above the S&P 500 of ~4.1 and Hong Kong's Hang Seng Index value of ~1.5. The adjusted book equity capital of this group – excluding prior loss write-downs - is ~\$34 billion.

In contrast to early stage on-demand transportation peers, Personal Rapid Transit (PRT) firms – part of the SAEV on-demand category - have yet to attract a billion dollars of investment several decades into PRT's technology development with functional PRT tracks on three continents.

PRT Companies have attracted approximately one 1/50th of the investment in public on-demand transportation firms (Figure 4; the X scale is 1/10th of the above Figure 3). The average PRT firm valuation* (market-to-book) is under half of their on-demand transportation peers (~7 vs. ~14). Several of these companies are undercapitalized and plan to raise equity capital in 2021, of which 3 are raising capital currently^.



There are two possibilities relating to both low PRT investment and firm valuations: Either PRT is unattractive as a solution and investment. Or PRT is a significant investment opportunity?

PRAETOR CAPITAL RESEARCH FINDING:

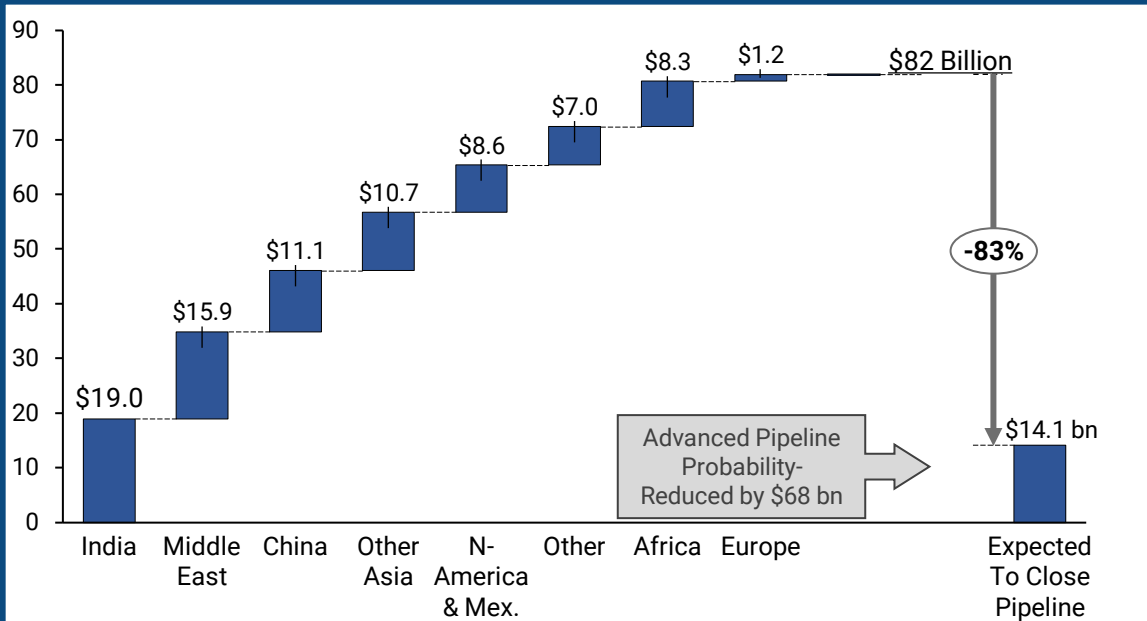
Once a large PRT project demonstrates its attractive features, PRT will be a potential \$31-58 bn investment gain opportunity (midpoint ~\$45 bn)

Disclosure: The author has investments in PRT early-stage firms and serves as Vuba Corp's CFO. His work has made him a believer in PRT's promise and the recipient of this research should keep this in mind.

*All the PRT companies are privately held. If their valuations haven't been provided to Praetor Capital, they have been estimated.

^ ModuTram, Vuba and Futran are raising capital currently. Request specifics directly from Praetor - they are not disclosed in this research. Further, this research is not endorsing any individual companies as investments – the prediction is that the PRT industry will succeed, not necessarily all the incumbent firms.

Figure 5) Advanced PRT Project Pipeline & Reduced to Expected-to-Close PRT Pipeline
In USD Billions



Praetor has held discussions with most active PRT CEOs to develop the perspectives of the research*, (this document is an Executive Summary of the 50-page PRT Praetor Capital report) including the estimate of the Advanced PRT Project Pipeline and Expected to Close Pipeline, indicated in Figure 5.

The Advanced PRT Project Pipeline (Figure 5) totals \$82 bn of revenue, spread over the 3-4 years it takes to build a PRT system. The plurality of projects are in India, the Middle East, China and Africa. This PRT pipeline has been developing steadily under the investment media’s radar and unknown to many infrastructure and on-demand transportation investors.

Praetor reduces the \$82 bn pipeline to the \$14 bn Expected to Close PRT Pipeline to conservatively estimate the number of projects that will likely break ground in the coming 3-5 years. This probability adjustment lower is made at the project level considering several factors including PRT company financial position, the project’s current status, the location and the views of industry executives.

This \$14 bn estimate is neither fiction nor wishful thinking: it includes 13 PRT projects that are contracted or already under construction globally. Some examples are Chengdu Tianfu Airport (China, Ultra MTS), Amsterdam Park & Ride (Netherlands, 2getthere), and Las Vegas Loop (USA, Boring Company). These 13 represent ~240 km of PRT track. In addition, there are 5 projects under bid in India totaling ~206 km. Put differently, we know the likely composition of 18 of the expected ~45 projects of the \$14 bn group.

Together these 18 potential PRT networks constitute ~446 km, ~\$3.7+ bn of transportation infrastructure CAPEX, and an estimated \$210 million of operating profit for early-stage PRT firms.

The Praetor Capital research demonstrates that the \$14 bn of expected near-term projects translates into attractive financials for PRT firms and the related infrastructure projects.

* Note Praetor has made all efforts to vet this private company group’s sales pipeline. However, SkyTran and The Boring Company did not respond to requests for comment, and we are likely underestimating their collective pipeline by \$5+ bn.

ASIDE: WHAT IS PRT, AND WHY DOES IT HAVE AN \$82 BN PIPELINE OF PROJECTS?

Personal Rapid Transit (PRT) is a transport mode that originated in the 1970s featuring small, automated vehicles operating on dedicated guideways. PRT is also known as Automated Transit Networks (ATN) or simply as podcar networks. There are several PRT-like systems operating worldwide.

PRT Has unique defining characteristics:

P: Personal because PRT utilizes small vehicles or pods with the capacity for 1 to 8 passengers. Families and small groups can travel together in these autonomous vehicles.

R: Rapid because the time taken for a PRT trip can be shorter than other urban transport modes. Several attributes make PRT Rapid:

First, the pods can travel at speed (currently up to 70km/h) on dedicated guideway structures (grade-separated). The self-driving vehicles are safely routed by a central control system.

Second, the small vehicles are summoned on-demand with little waiting time and can load and unload passengers quickly.

Third, on-demand transport doesn't have fixed routes and schedules: the passengers specify their destination and can be routed there directly without stopping or slowing down. Pods bypass offline stations where they are not required to stop.

T: Transit because the vehicles can carry passengers and goods across a city (or a region) from any point to any point like a taxi, 24/7 moving passenger volumes of 7,000+ per hour per direction historically and forecast to increase this to 20,000+ with current technologies.

PRT's has attractive attributes that can't be matched by traditional transit modes like bus, personal cars, light rail and subways:

- PRT's low capital cost (<\$10 mill per km) and low operating costs can combine to make mid-sized and large PRT urban networks profitable at affordable fare levels. Many current PRT proposals have IRRs of 20%+
- PRT systems can use road right of ways to provide any-point-to-any-point urban networks that are reliable and have the passenger volume capacity of 6 road lanes
- The PRT autonomous control systems are the first to deliver the promise of self-driving vehicles: high speeds, smart routing and completely safe
- PRT can lower traffic congestion by an estimated 20% for a city-wide system
- The elevated guideway networks of PRT can free up urban surface area space for other uses like parks, promenades or bike lanes
- PRT networks with solar panels can become clean energy producing urban grids (~1 MW per mile), with suitable investment cases
- Solar-based PRT networks in a city can provide it with significant progress towards attaining its climate goals. The climate benefit is from a reduction in urban traffic. This eliminates approximately 8 million tonnes of CO2 from the atmosphere, which is the equivalent sequestration of planting a 46 km² forest.

Because of these multiple competitive advantages that PRT has over other urban transportation modes, it is an ideal solution for the urban transportation crisis.

Praetor's research demonstrates that the global market for PRT is \$1,5 trillion, or over 200+ new transit project opportunities every year. A very small market share will be a large industry.

The above characteristics are why PRT provides such an attractive investment opportunity and is set to grow rapidly once one large project demonstrates its attributes

Operational PRT Systems

ULTRA HEATHROW



2GETTHERE MASDAR UAE



Suspended PRT Systems

VUBA



FUTRAN



Station Functioning

MODUTRAM



Click images for video

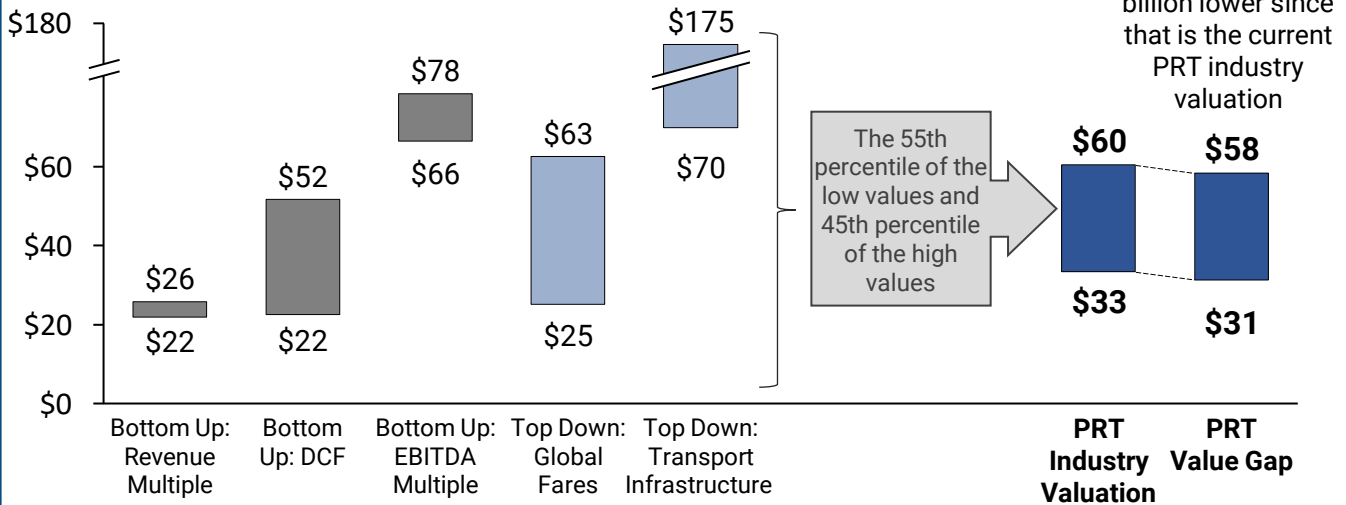
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For PRT provider firms, the financials are expected to be better in terms of profitability and cash flow than the current on-demand transportation firms. And without the years of early-stage losses that characterizes this segment as it grows to scale. Put simply: these firms earn profits as soon as they begin to build and operate PRT systems.

These attractive financials, combined with the enormous transit market opportunity (\$ 1,5 trillion per annum), implies the PRT provider industry should be valued at \$33 to \$60 bn, well above its current level of <\$2.5 bn.

Figure 6) PRT Value Opportunity / Gap in USD Billions



The calculation of the value opportunity is illustrated in Figure 6.

The multiples are derived from the public on-demand transportation firm set. The market sizings are separate analyses, but those figures are discounted at the *cost of capital* to reflect it will take a decade to get to the potential 0.5% to 1.25% share of spend per annum. It's notable that a driver of the valuation is the time it takes for the \$14 bn of CAPEX to begin. Even if it takes 5-10 years, the value opportunity remains significant.

PRT hence provides an enormous investment gain opportunity and substantial potential new revenue stream for several categories of private and public companies:

- Infrastructure investment funds (all stages)
- Private equity firms like Blackstone, the Carlyle Group and Apollo Global Management.
- The current on-demand transportation peer group, including: BYD, Uber, Lyft, GrubHub and Meituan
- Electric vehicle and autonomous driving firms like Tesla, Amazon (ZOOX), Apple, Alphabet (Waymo), GM (Cruise) and VW
- Train and track engineering firms like Alstom, CRCC, Siemens, ABB and Kawasaki
- Renewable energy firms - attracted by PRT's large solar arrays- like BP LightSource, AES and First Solar

Investors in PRT firms at this stage of industry growth can potentially reap shareholder returns in the thousands of percent.

There are two potential PRT entry points for these firms and potentially individual investors:

First, several of the PRT provider firms like Ultra PRT, Futran, Vuba, BeemCar and ModuTram are raising equity capital in 2021. These firms are vertically integrated and provide products and services related to the development, management and operations of urban PRT networks. They typically have their own vehicle, fixed guideway and control system designs and technologies. The Praetor Capital research profiles these privately held PRT firms, their capabilities and their individual project pipelines.

Second, the PRT transportation network infrastructure projects that are typically structured as public private partnerships (PPPs) using special purpose vehicle (SPV) entities. In the cases of mid-sized and large PRT networks, these are expected to produce returns (IRRs of 10-40%) and debt service coverage ratios that are higher than the norms and benchmarks for energy and transportation infrastructure projects.

When selecting between PRT provider firms, several strategic capabilities are crucial at this early stage of industry development:

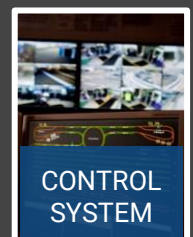
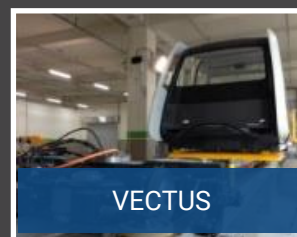
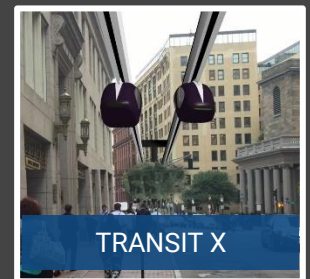
- **Vertical Integration** to develop the complete integrated PRT system.
- **Top Engineering Talent** because the best and most efficient G2 PRT systems will prevail
- **World Class Control System** because this capability drives passenger volumes, trip speed and waiting times
- **Solar Energy Option** for city and state customers to provide a clean energy solution
- **True Partnerships** since the PRT networks are long-term partnerships with the city or state in question
- **Capital** because it costs ~\$15 million to launch and develop the PRT system technologies

As is typical for this early stage of the industry cycle, some PRT companies will succeed, and others will fail. Yet others will successfully enter the industry. Within the predicted \$14 bn of projects will be some churn.

The risks inherent to PRT beyond company risk are political in that every PRT system needs a public city or state partner, operational in developing these systems at scale, and business-economic in delivering the attractive financials of mid-sized and large networks. Operational and financial risk instruments (e.g. credit guarantees or sovereign guarantees) will play an important role in this regard.

Hence, we expect one large urban PRT project (of which there are 6 candidates currently, two contracted) to pave the way for the entire sector's growth.

PRT Industry Images



Thanks

This research wouldn't have been possible without the cooperation and contributions of the PRT Industry. Praetor Capital is grateful for the support from:

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About the Author



Jan Pretorius of Praetor Capital holds a B-Econ and MBA cum laude from Stellenbosch University. He is South African born and resides in Park City, USA. Jan is a former investment banker and New York-based strategy consultant who has served Wall Street firms and leading corporations like Goldman Sachs, Citibank, PwC, Google, Amazon, Calpine, Sun Capital, Siemens and Verizon.

His experience includes six years at publishing giant Elsevier where he was Head of M&A and VP Strategy. He's an experienced 'quant' financial markets trader and is Series C Certified (NFA, commercial derivatives trading).

Jan has advised several PRT firms in the USA, Africa and Asia since 2018. His introduction to PRT was with Strategy Consulting Firm Booz Allen Hamilton in 2009 when he led the Booz team on a PRT commercialization engagement.

He currently serves as Vuba Corp's CFO in addition to his Praetor work.

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DISCLAIMER: Jan Pretorius of Praetor Capital has investments in PRT companies listed in this report: Vuba Corp and a Futran technology. Mr. Pretorius is also the Vuba Corp CFO.

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