Cordon Pricing Holds Promise for U.S. Cities

Lessons Learned from Congestion Zones Abroad and What Is Next

Applicable Criteria

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Related Research

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Managed Lanes: A Framework for Prudent Pricing (An Analysis of the Risks Posed by Price Caps and Free Access Policies) (October 2018)

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Cordon Pricing Reduces Congestion

Cordon pricing (CP) is a form of congestion pricing involving a congestion zone that charges motorists to cross into and sometimes out of its boundaries. CP is effective at quickly and materially reducing congestion and vehicle trips while increasing transit usage in major urban centers with extensive transit systems.

Transit Investments Are Critical

CP in isolation may not work from a public policy perspective without substantial up-front investment in the region's transit system, which is the path successful CP systems have taken. CP rollouts with ill-prepared transit systems risk failing to achieve congestion-reduction objectives, angering transit customers and damaging local businesses, culminating in political blowback.

Communications and Political Risks

Although CP results in a variety of benefits, they are often not well understood until after implementation, while the costs are clear from early planning stages. It is therefore important policymakers clearly communicate their vision for the congestion zone early in the planning process, including community benefits and ways in which costs will be mitigated.

Exemptions should Be Limited

For CP to work most effectively, exemptions should be limited to ensure the project remains operationally feasible. While politically popular, expansive exemptions can result in congestion remaining high and inequitably high rates on non-exempt vehicles. For success, the independence of all pricing decisions from politics cannot be understated.

American Cities Require Tailored Solutions

Many American cities were built in the age of the automobile, are spread out with wide dispersions of origins and destinations, and do not contain a single central business district or urban core, which are common in cities with CP. U.S. cities may require more than one congestion zone with a variety of congestion-pricing methods, such as dynamically priced parking meters and managed lanes.

Traffic Growth May Be Limited

Traffic in congestion zones may not rise as intended, unlike traditional toll roads, where traffic typically grows with surrounding population and employment growth. For example, traffic within London's congestion zone and Manhattan's central business district (CBD) have declined for well over a decade.

The Benefits of CP

CP is a method of controlling and reducing congestion and traffic by means of levying a charge on vehicles that cross into, and sometimes out of, defined congestion zones. This technique of congestion control, while effective, has significant political implications, which is likely why it is used sparingly and in jurisdictions with few alternatives to alleviate congestion, whether due to technical, financial or regulatory obstacles.

A Brief History of CP

CP was first used in downtown Singapore in the 1970s, subsequently changed to an electronic road pricing system in the 1990s, and was in part a response to the island nation's small geographic footprint, high population density and resultant traffic congestion. It was not until decades later that other cities implemented their own CP systems, including London, Stockholm and Milan. Although CP has yet to cross the Atlantic, New York City plans to implement a CP system in 2021, and several West Coast cities are studying implementation, including Los Angeles; Portland, OR; San Francisco; and Seattle.

The experience from cities that implemented CP suggests it carries material benefits spread across a broad group of stakeholders. Key benefits are noted below.

Traffic and Congestion Reduction

Data from London, Stockholm and Milan show rapid and marked reductions of traffic volumes following implementation of CP, ranging from 18% to 30%, and even larger declines in congestion. In the cases of Stockholm and Milan, there were temporary periods when the CP systems were lifted, resulting in traffic and congestion spikes, thus confirming both the establishment and removal of CP have rapid and material effects.

Improved Driving, Living Experience

Those willing to pay a congestion charge will find it takes less time to reach their destination, with greater reliability, and less traffic and congestion. Residents living within congestion zones likewise will benefit from a more peaceful environment, often with congestion revenues allocated to various local infrastructure improvements that make inner cities more attractive. In London and Stockholm, congestion levels fell roughly 30% and 22%, respectively, while airborne pollution fell over 10%. Reflective of these benefits, one study showed homes within London's congestion zone increased in value by 3% compared with those outside it.

Increased Public Transit, Biking

Public transit usage in Stockholm and Milan increased 7%–12% in the short term and London achieved a 70% increase in bus ridership and a doubling of bike ridership over a longer period. These transit and bike gains were achieved not only by discouraging motorists from entering the congestion zones, but also by making significant up-front investments in transit infrastructure, and subsequently investing CP revenues into continuous transit and bike infrastructure to make alternative modes of travel more viable and appealing. These gains for public transit bode well for the U.S., where transit ridership has been in decline for years across most major cities.

Decreased Pollution

CP is effective at reducing air pollution due to its ability to materially reduce vehicle usage while increasing transit and biking. Airborne pollution was estimated to have fallen 10%–14% in Stockholm's inner city following implementation of its congestion zone, resulting in 20–25 fewer premature deaths per year. London's CP zone carbon dioxide and nitrogen oxide pollution fell 16% and 13%, respectively. CP systems that target congested urban centers may be more effective than broad-based fees, such as gas taxes, because airborne pollutants are concentrated in areas of high traffic congestion.

New Source of Transportation Revenues

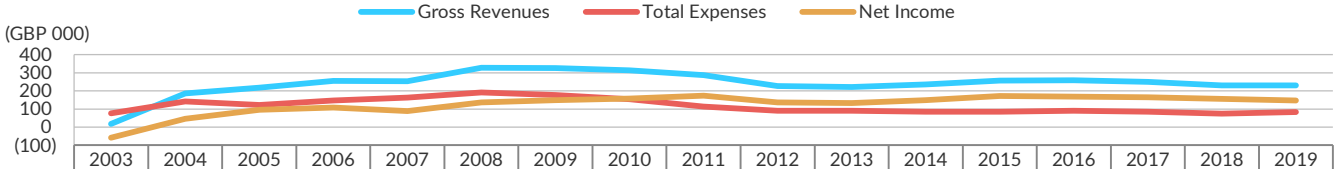
CP systems generated large income streams, from USD94 million per year in Stockholm to GBP230 million in London (fiscal 2019 gross revenues). New York City projects the CP system due to roll out there will generate USD800 million–USD1.1 billion annually. Due to the rising inadequacy of gas taxes, CP systems hold promise as a new funding source to help fill the gap between regional infrastructure needs and governments' ability to fund them.

Important Considerations

Traffic May Stagnate Over Time

The primary goal of most CP systems is to reduce automotive congestion, and thus congestion pricing in the long run, from a traffic growth perspective, could fall victim to its own success. For example, Fitch estimates tolled traffic in London's congestion zone fell 37% in 2019 compared with 2006. Revenues over the same period declined 9.5% to GBP229.9 million from GBP254.1 million,

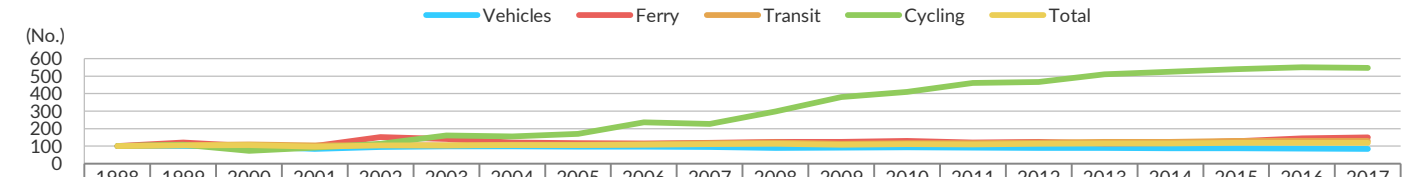
London CP System Financial Performance
(Fiscals 2003–2019)



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Gross Revenues	19	187	218	254	252	328	326	313	287	227	222	235	257	258	250	230	230
Total Expenses	77	141	122	147	163	191	177	155	113	90	90	85	85	90	86	74	83
Net Income	(58)	45	96	107	89	137	149	158	174	137	132	149	173	168	164	156	147

CP – Cordon Pricing. Note: Expenses include a component of depreciation that was not broken out from administrative and support costs.
Source: Transport for London Annual Reports, 2004–2019.

Travel into Manhattan's CBD by Transportation Type



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Vehicles	100	100	99	83	95	99	98	96	96	94	90	91	92	91	89	89	87	87	85	84
Ferry	100	121	100	100	152	140	120	118	114	119	124	124	129	120	125	115	116	128	145	149
Transit	100	106	110	104	106	104	107	108	112	117	120	113	116	116	120	123	124	130	130	129
Cycling	100	107	73	90	112	161	156	171	237	227	298	380	410	461	466	510	524	539	551	546
Total	100	105	107	96	105	104	105	105	108	111	112	108	111	110	113	114	115	119	119	119

CBD – Central business district. Note: 100=1998 baseline. No ferry data available in 2001, presumed to be held constant from prior year.
Source: New York City Department of Transportation's Mobility Report, August 2019.

respectively. Revenues fell less than traffic due to a substantial 43.8% rate hike to GBP11.5 from GBP8.0 over the same period.

London's experience with declining traffic is not unique or unexpected given the goal of improved mobility. Average daily vehicular travel into Manhattan's CBD in 2017 was 705,000, reflecting a 16% decline from 1998, when traffic peaked at 842,000.

There are several factors that help explain long-term declining traffic trends in London and Manhattan.

Increased Transit Usage

Both London and New York pursued policies resulting in long-term increases in transit share while vehicular trips fell. Ferry and transit usage in Manhattan's CBD increased 49% and 29%, respectively, from 1998 to 2017. Although cycling reflects just a small percentage of total trips, its growth has been by far the highest, increasing 446% during the same period. From 2000 to 2017, bus ridership in London grew 70% while bike trips more than doubled.

Road Diets

A portion of London's CP revenues has been used not only to beef up transit, but also to finance its road diet, in which it has repurposed swathes of roadway to create added pedestrian space and bicycle superhighways. New York City is implementing a similar road diet in Manhattan. Although road diets serve important public policy objectives, the reduced supply of road capacity increases automotive congestion, lowers the amount of vehicles that can be accommodated by the road network, diminishes the value proposition of CP to motorists and makes alternative forms of transport relatively more attractive. For example, today's congestion within the London congestion zone is similar to 2002, while traffic is roughly halved.

The Uber Effect

For most of its history, the London CP system excluded taxis and transportation network companies (TNCs) such as Uber and Lyft from congestion pricing. As TNCs have become more popular, their prevalence within the zone increased substantially, a partial cause of congestion returning to pre-CP system levels. The TNC exclusion was eliminated as of April 2019, and Transport for London predicts it will cut TNCs entering the zone by 45% but TNC traffic will fall by a much lower 6%, suggesting vehicles already within the congestion zone tend to circulate longer.

Manhattan, which also saw substantial increases in TNCs, imposed a surcharge of USD2.75 beginning in 2019. It is unclear whether this charge will be sufficiently high to materially lower TNC traffic and it may need to be revisited if elasticity of demand proves to be too low to achieve policy objectives.

Telecommuting

The prevalence of telecommuting in the U.S. rose 115% over the past 10 years to about 3% of the total workforce. Telecommuting is one of many alternatives commuters may exercise when faced with long, expensive or congested commutes.

Elasticity of Demand

In the first year of the congestion charge, originally priced at GBP5, traffic circulating within the London congestion zone fell 15%. Two subsequent rate hikes led to additional traffic declines, but not of the same magnitude as the initial program rollout. It is important that the starting rate be sufficiently high to generate visible benefits, while not so high as to make the program unfeasible from the outset. Once in place, CP programs tend to rise in popularity, which could give policymakers more room to consider further measured rate hikes based on CP system performance and policy objectives.

Although long-term traffic data for London's congestion zone and Manhattan's CBD are negative, Fitch believes traffic levels will ultimately stabilize and rate increases may provide a long-term avenue for revenue growth. Further, some degree of traffic losses are linked to discretionary measures, such as road diets, and if a CP system were to be debt funded, bondholders may demand special legal protections expressly linking rate covenants to targeted congestion levels and resulting optimized revenues, and protections that put a floor on policy measures that have a material adverse impact on the ability to service debt.

Strong Initial Political Push-Back

Although well-designed CP systems come with a litany of benefits, they are not without their drawbacks. Perhaps the greatest obstacle is fundamentally political. CP systems are much less popular prior to implementation than after because the costs are easily understood and quantifiable, while the benefits can seem elusive. Policymakers looking to implement congestion pricing

must be prepared for a period of substantial political push-back and should consider educational outreach to constituents to ensure a more balanced analysis of costs and benefits.

In a study of five European cities that implemented CP, National Public Radio found public approval increased sharply by an average of 15% after implementation. Public approval was highest and increased most sharply for the two largest and most densely populated cities, London and Stockholm. The three smaller cities also saw increased support, but total approval levels did not exceed 50% at the time of polling. Urban density and congestion may need to hit a critical threshold for perceived benefits to outweigh costs and to achieve a majority of public support in the immediate period after implementation.

Where public support was highest after implementation, in London, an attempt to substantially expand the original congestion zone to the west was ultimately unsuccessful, with the extended zone eliminated four years after its 2007 opening. The experience suggests major political risks exist, even in urban areas otherwise well suited to CP systems, and policymakers must exercise caution when trying to build off the success of an existing congestion zone.

Popularity Rises After CP Implementation

(%)	London, U.K.[a]	Stockholm, Sweden	Oslo, Norway	Gothenburg, Sweden	Trondheim, Norway
Approval Before Implementation	40	30	30	29	26
Approval Post Implementation	59	52	41	42	37
Approval Swing	19	22	11	13	11

[a]Initial congestion zone only. Excludes Western Extension. CP – Cordon pricing.
Source: National Public Radio.

There may only be one opportunity to implement the plan, so the initial decision may need to be more far reaching. These programs tend to evolve over many years, and getting political buy-in from varied officials and successive administrations over time has proven to be rife with risks and potential for program failure. If implementation needs to be done in phases, then the decision to do so may well be better made at the outset by elected officials then handed off to the technical and financial experts.

Upfront Transit Investments Critical

Cities must consider the capital costs of the CP system itself and costs required to expand the transit system to accommodate motorists who switch their mode of transportation. London and Stockholm acquired approximately 300 and 200 new buses prior to implementing their CP systems, respectively. Fixed guideway transit fleet improvements and expansions can be time consuming and expensive. Meaningful interim investments using bus routes or rail are consequently essential. These transit investments need to be tied in with transportation policies, such as expanded bus lanes, or select bus-only avenues and streets during peak periods that facilitate faster transit for these buses. A CP system roll-out without sufficient transit capacity could fail to achieve many of the benefits noted above and result in significant political backlash.

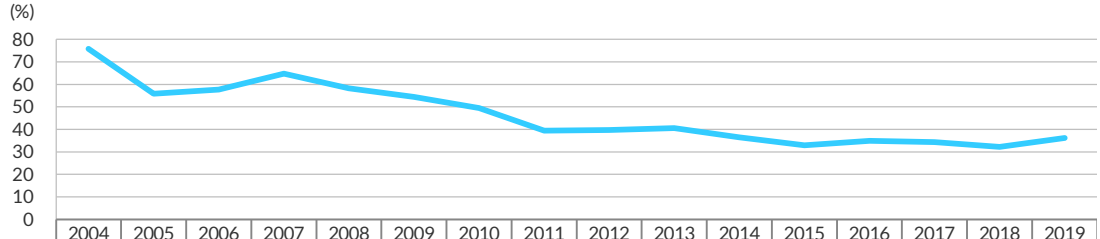
Robust Estimation of Opex Costs Important

If a CP system is to succeed from a public policy perspective, it must channel sufficient net revenues into effective transit and infrastructure programs to provide motorists a viable transportation alternative and to benefit residents within the zone itself. However, high operating costs can siphon funds away from these purposes. The London CP system experienced costs in excess of 50% of gross revenues in its first six years, in part a reflection of initial implementation costs and possibly also due to its pioneering status as one of the first CP systems with operational lessons yet to be learned. Over time, the program was successful at reducing costs, which fell to 36% of revenues by fiscal 2019. By comparison, the average tolling system's costs equal roughly 15% of gross revenues.

The London system's costs are higher than other large CP systems, with some attributing the disparity to its partly manual charging system, compared with the fully automated systems used elsewhere. London's experience is similar to Sweden's, which administers two CP systems. Sweden's Gothenburg CP system includes a discount program for multiple passages, necessitating partly manual collection. This manual element results in costs 24% higher than the Stockholm CP system, which does not include a multipassage discount program and is automated. When structuring discount programs, policymakers should consider not only the direct impact to revenues, but also the costs of administration, which can vary significantly.

The success of London's congestion zone is in spite of its higher operating costs and suggests policymakers looking to implement congestion charges should develop cost-efficient systems and program characteristics if politically feasible, which may result in higher up-front capital costs.

Operating Expediture as % of Gross Revenues



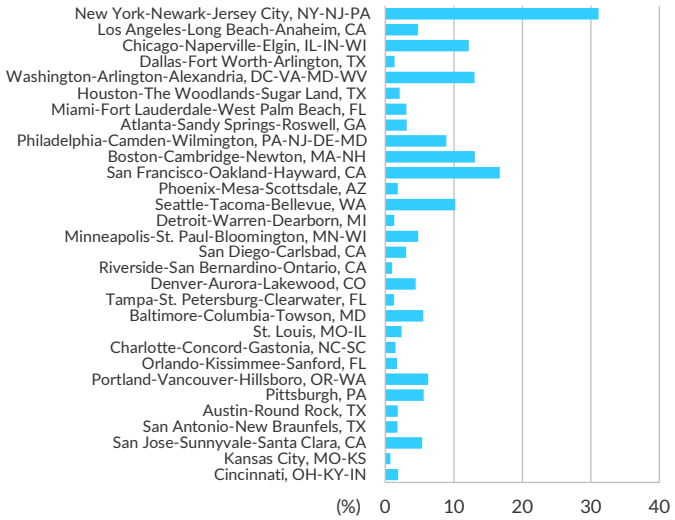
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Operating Expenditure as % of Gross Revenues	76	56	58	65	58	54	49	39	40	40	36	33	35	34	32	36

Note: O&M includes a component of depreciation that was not broken out from administrative and support costs.
Source: Transport for London Annual Reports, 2004–2019.

Unique Challenges in the U.S.

Unlike Asian and European cities that implemented CP systems, American cities are more likely to be lower density, with less public transit alternatives and more diffused O&D traffic patterns. Only 0.8% of Americans commute regularly via transit for work, and two-thirds of transit trips occur in just five regions, even though they collectively account for just 17% of total employment. These characteristics do not necessarily rule out CP systems as an effective congestion management system, but they suggest the pool of suitable cities in America is lower than in more densely populated regions of Europe and Asia. American cities may need to deploy a varied combination of congestion-management mechanisms to achieve optimal levels of mobility.

Most American MSAs Have Low Transit Usage



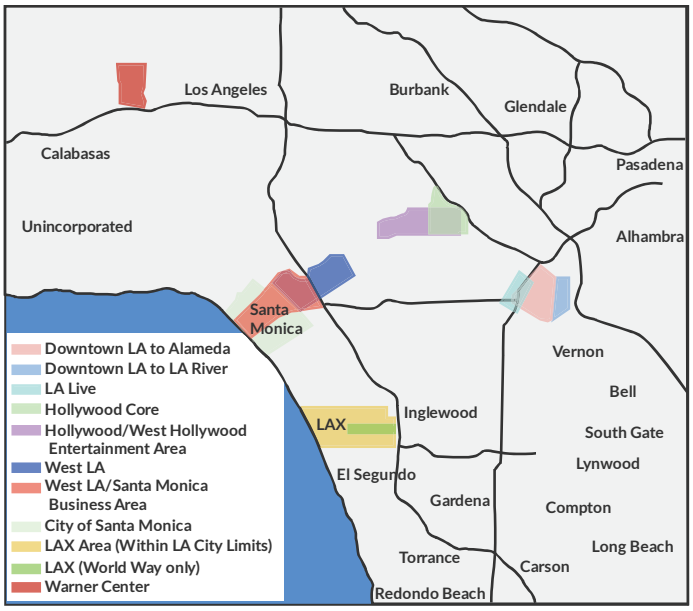
Note: MSAs sorted by size of trip counts.
Source: U.S. Census Bureau, American Commuter Survey.

Los Angeles

One such example is Los Angeles, which recently underwent a congestion pricing study led by the Southern California Association of Governments (SCAG). In recognition of L.A.'s scattered O&D profile, the study considered not one but multiple congestion zones in the region, as seen in the diagram at right. Although the study ultimately narrowed to a single proof-of-concept CP zone coined Westside, the initial consideration of 12 congestion zones suggests sprawling regions, such as Southern California may need to consider creating multiple areas, each with its own customized strategy.

SCAG considered five forms of congestion pricing over and above CP, including area pricing, variable parking pricing, parking sales taxes, parking levies and ticket surcharges. Because each congestion zone exhibits different transit usage and availability, O&D profiles and other characteristics, Fitch views SCAG's tailored strategy as prudent and necessary.

Preliminary Geographic Areas



Source: Southern California Association of Governments, Mobility Go Zone & Pricing Feasibility Study Final Report (March 2019).

The Westside CP zone, straddling L.A. and Santa Monica, was ultimately chosen due to its very high jobs-to-housing ratio, major employment centers served by highly congested freeways that converge near the zone and extremely high congestion levels on local arterials. The CP zone is assumed to charge USD4, with various low-income and resident discounts, and is projected to generate 2020 traffic and gross revenues of 22.7 million transactions and USD86.5 million, respectively.

Over the following 15 years, traffic and revenues are projected to grow by CAGRs of 0.5% and 3.0%, respectively. In light of the London and Manhattan CBD experiences, the assumption of long-term transaction growth may be somewhat optimistic, especially if policymakers pursue road diets in the congestion zone, as has been the case elsewhere within the L.A. region. Although the rate of growth in the CP charge — about 2.5% — is higher than Fitch's inflation outlook, it is roughly in line with median household income growth over the past decade, and may therefore be supported by rate hikes alone if traffic levels remain flat over time.

From a congestion standpoint, the CP zone is projected to lower congestion by 24% and 10%, as measured by vehicle hours traveled at peak hours and all day, respectively. The degree of congestion reduction is at the low end of findings from Europe, which is not surprising in light of lower transit usage in L.A. — just 5% of overall trips for the region. Transit usage, biking and walking are projected to rise 7%–9% with an overall program benefit-to-cost ratio of 3:1. Initial capital costs are projected at USD41.9 million, including USD14.7 million for revenue collection infrastructure and USD24 million for 48 new buses to accommodate increased transit users. These costs seem reasonable compared with first-year net revenues projected at USD44.1 million. Fitch views as prudent the assumption of significant up-front transit improvements to ensure added capacity for motorists seeking alternative transportation options.

New York City

A second American example of a CP zone is New York City's Manhattan, south of 60th Street. Unlike other American cities, Manhattan shares characteristics with London and Stockholm that make it an ideal candidate for CP. These include a very dense, congested and well-defined employment area served by a massive transit system used by a high proportion of commuters. While the New York-Newark-Jersey City metro area makes up 7% of the country's employment, its share of national transit usage is far higher at 41%. The next 14 largest American commuter cities combined are roughly equal to New York's share.

The city's sprawling transit system gives drivers a viable transportation alternative and is therefore more likely to achieve its public policy goals of reducing congestion, while remaining traffic should remain sufficiently robust to generate substantial annual revenues to invest back into transit. Although the region's transit system is large and well utilized, it has funding infusions to resolve. Although CP is unlikely to solve the funding gap on its own, it represents a significant and new funding source not previously accessible.

What may be more challenging is finding sufficient resources to enhance system capacity and reliability prior to the CP system roll-out if the city is to avoid a failed system launch. A failed launch could be characterized by widespread and insufficient transit capacity to meet the needs of a sudden demand surge beginning on day one of the CP system roll-out. This could lead to low initial elasticity of demand with modest congestion alleviation, frustrated transit customers and damage to local businesses culminating in political blowback, which could leave the future of the CP system in question. Unlike London, most transit users in Manhattan use the subway instead of buses. Given the much higher capital expenses and longer lead times involved with subway improvements, the Manhattan CP system faces unique pre-implementation challenges.

Although the New York state legislature approved Manhattan CP to take effect in 2021, details have yet been be finalized. Initial estimates peg CP charges at USD12–USD14 per car, and are expected to raise USD800 million–USD1.1 billion annually. Proceeds would be used 80% on city transit improvements and 20% on suburban commuter trains.

Vehicles entering Manhattan's central business district fell an average of 0.9% annually since hitting a peak of 842,000 daily trips in 1998 and 1999, while transit, cyclist and ferry trips consistently grew, as shown in the table below. The history of declining traffic performance suggests policymakers should be wary of counting on growing traffic levels for long-term budgetary or debt-financing purposes. It will also be important for New York City to coordinate its policies for bus lane expansions, lane/street closures for quality of life purposes with the administrators of the CP program.

Auto Traffic Into Manhattan's CBD Is Not Keeping Up

(000 Average Daily Trips by Type)

Year	Vehicles	Ferry	Transit	Cycling	Total
1998	842	85	2,294	4.1	3,225
1999	842	103	2,431	4.4	3,380
2000	835	85	2,517	3.0	3,440
2001	700	N.A.	2,390	3.7	3,094
2002	797	129	2,441	4.6	3,372
2003	832	119	2,392	6.6	3,350
2004	825	102	2,454	6.4	3,387
2005	810	100	2,472	7	3,389
2006	806	97	2,566	9.7	3,479
2007	795	101	2,683	9.3	3,588
2008	759	105	2,743	12.2	3,619
2009	770	105	2,586	15.6	3,477
2010	776	110	2,662	16.8	3,565
2011	764	102	2,662	18.9	3,547
2012	751	106	2,762	19.1	3,638
2013	747	98	2,826	20.9	3,692
2014	731	99	2,852	21.5	3,704
2015	731	109	2,983	22.1	3,845
2016	717	123	2,981	22.6	3,844
2017	705	127	2,970	22.4	3,824

N.A. – Not available.
Source: New York City Department of Transportation's Mobility Report, August 2019.

Key Credit Implications

The evidence of CP systems to date show they can work from a public policy and revenue generation standpoint, and they do so ideally when introduced in the right setting with proper system conditions. From a bondholder perspective, there are additional credit implications to consider.

Road Network Changes

A degree of traffic losses in major international gateway cities, such as London and New York, were linked to discretionary measures, such as road diets. To the extent a CP system were to be debt funded, bondholders may demand special legal protections, such as compensation provisions linked to changes in the road network that materially and adversely affect CP system revenues or rate hikes above critical thresholds on connecting facilities, such as major feeder bridges and tunnels into the congestion zone.

Political Risks

Incoming administrations can sometimes reverse the policy direction of outgoing administrations, as was the case when a newly elected mayor of London led the dissolution of the newly created Western Extension of London's CP system. As is typical amongst public private partnership (P3) legal provisions, bondholders will need compensation provisions that protect against the elimination or reduction of a CP zone or system, and other adverse changes in law.

Rate Covenants and Liquidity

There is a relatively small number of CP systems globally, and even these provide little in the way of continuing disclosures, as they are mostly folded into a larger transportation enterprise or government. The resulting lack of data supports stronger rate covenants and liquidity than typical toll roads until such time that the sector's performance is supported by a sufficient amount of historical operational and financial data. Liquidity is especially important, as both opening year and long-term traffic performance are uncertain. These risks can be mitigated with the use of conservative cash flow projections in conjunction with adequately sized ramp-up reserves, debt service reserves, equity lock-up triggers, etc.

Rate Adjustments Warrant Caution

Operators, whether governmental or private, should be wary of aggressive rate-setting policies on CP systems. While toll rates can be set relatively low initially with a high elasticity of demand, evidence from the London and Stockholm CP systems shows subsequent rate hikes are accompanied by substantially lower elasticity. Elasticity tends to fall because the most price sensitive motorists switch transport modes early on, leaving more price inelastic motorists as rates rise.

For instance, a Stockholm study found rate increases were associated with a significant rise in the proportion of company-owned cars, in which the employer pays the charge, while company cars nationwide held constant. Low elasticity conditions accompanied by large rate hikes may impose economic hardship among users accompanied by limited positive effects on congestion and airborne pollutants, leading to potentially significant political consequences. Important economic indices need to be benchmarks and act as a governor on rates having adverse implications for local businesses and reducing the competitiveness of the local economy.

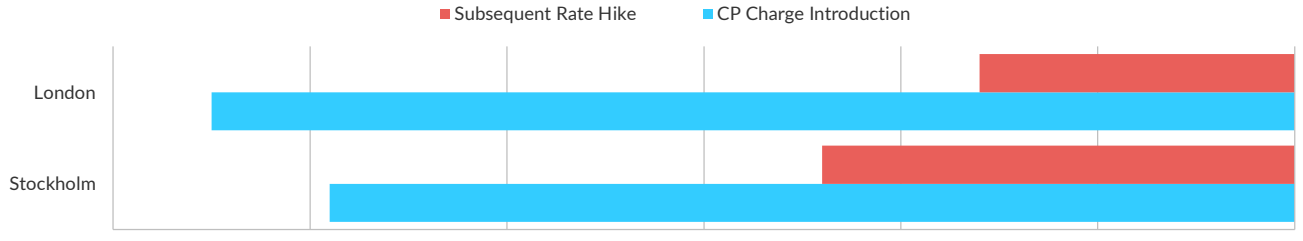
Clearly Delineated Capex Responsibilities

If a CP system is procured via a P3, any major capex responsibilities, such as system expansions or tolling system replacements, should be clearly delineated as to their scope, timing and funding requirements, with responsibilities clearly directed to the applicable party. It is also important for public systems to have a well-defined capex plan. However, there tends to be more timing buffer, as governments rarely have a concession to lose in the event capex or maintenance are temporarily deferred. Of greater concern is the long-term accumulation of deferred maintenance leading to deteriorating asset conditions, leading either to massive required funding infusions and increased leverage to ultimately resolve or a diminished user experience leading to traffic reductions.

Parking Facilities Likely to Be Affected

Parking facilities located within congestion zones are likely to be negatively and significantly affected by lower vehicle traffic (for more information on technology and parking facilities see *The Effect of Autonomous Vehicles on Parking*). However, parking facilities located outside and near congestion zone perimeters could benefit from park-and-ride commuters if they are served by nearby public transportation connecting to the city center. Some privately owned parking concessions may contain compensation provisions if their facilities would be located within a newly formed congestion zone, thus insulating bondholders.

Elasticity of Demand Diminishes as Rates Rise



	Stockholm	London
Subsequent Rate Hike	(0.24)	(0.16)
CP Charge Introduction	(0.49)	(0.55)

P – Cordon pricing. Notes: Elasticity of demand shows the change in traffic expected in relation to a rate increase (e.g. [0.5] indicates a 0.5% traffic loss for a 1.0% increase in rates).
Source: Transport for London Policy Analysis Division, Centre for Transport Studies Stockholm.