

This report is a critique of the ‘Central Business District (CBD) Tolling Program Environmental Assessment’ published in 2022 by the U.S. Department of Transportation, Federal Highway Administration (FHWA), U.S. Department of Transportation, Federal Highway Administration (FHWA) Triborough Bridge and Tunnel Authority (TBTA), New York State Department of Transportation (NYSDOT), and New York City Department of Transportation (NYCDOT).

Executive Summary:

Congestion pricing of motor vehicles is a policy prescription most often used in cities, for combatting both traffic congestion and vehicular emissions by surcharging drivers who travel within a designated zone usually during peak day time hours. With the varying stated goals of raising governmental transportation funds, increasing the speed and use of public transport, and improving public service vehicle response times (Parks, 2019). Using a similar scheme of congestion pricing that was implemented in London, Stockholm, Singapore, etc. The Metropolitan Transit Authority (MTA) of New York is planning on implementing a congestion pricing scheme to enact these stated goals in and around New York City. This policy report examines and evaluates the MTA’s congestion pricing (CBD-TP) plan and the various limitations and strengths of the proposal within a Cost-Benefit Analysis framework using information from the MTA’s CBD-TP Final Environmental Assessment (EA) published in April 2023.

Section 1 of this policy report covers the outline of all policy alternatives presented in the EA and the steps the MTA will take to implement the scheme, such as: the planned

location of the CBD-TP boundary, the stated objectives of the program, and information on how the broader region interacts with Manhattan's CBD.

Section 2 covers the specifics of the analysis used in the MTA's Final EA through a Cost Benefit Analysis framework. Specifically, it discusses the no-build and build alternatives, the costs of implementing the program (surcharges and future raised revenue) and their respective build alternatives' lower VMT, decreased traffic, and higher public transport funding benefits. The report also discusses the proposed mitigation techniques taken by the MTA, such as price discrimination scheme and proposed hours of operation and the discounting effects over time.

Section 3 will critique the Final EA, of which the key findings are: that the CBD-TP excludes New Jersey commuters from using the raised funds, suggesting political motives behind the evaluation of benefits and therefore uneven disruption across the New York region. Moreover, another finding is that New York has key differences from other congestion pricing schemes such as in Stockholm, London, and Singapore in regard to parking, exceptions and tolling avoidance schemes, and alternative motor routes, suggesting that the CBD-TP can both potentially raise very high revenue, but also do little to diminish congestion within the CBD-TP area which may lead to an increase in congestion and pollution in other key choke points across the region. Furthermore the final key finding is that the MTA may end up taxing private buses and lower income commuters while at the same time making driving more advantageous for the Manhattanites and the region's wealthiest residents.

Overall the success of previous congestion pricing schemes to curb traffic and pollution and raise funds for transportation should not dissuade the quest to implement the

MTA's CBD-TP, but rather this report highlights the key imbalances that may unintentionally privilege certain economic and geographic groups over others.

Main Report:

Introduction:

In April 2023, the U.S. Department of Transportation, Federal Highway Administration (FHWA) in conjunction with New York State Department of Transportation (NYSDOT), New York City Department of Transportation (NYCDOT), and the Metropolitan Transit Authority's (MTA) affiliate: Triborough Bridge and Tunnel Authority (TBTA) published the Final Environmental Assessment (EA) for the Central Business District Tolling Program (CBD-TP) in Manhattan, New York City (FHWA, 2023). This comes exactly four years after the New York State Legislature passed MTA Reform and Traffic Mobility Act which had the doubly stated goal of reducing both traffic congestion within the CBD of Manhattan and allowing for a new revenue generating scheme for the MTA's current and future capital programs.

This CBD-TP, as outlined by the state legislature, federal, state and local Departments of Transportation, is a currently proposed policy in which traffic camera technology would be used in Manhattan's CBD to charge automobile drivers a congestion surcharge throughout peak hours of the day. The origins of this policy originates in Singapore, but has since been adopted in London, Stockholm and other cities around the globe to combat vehicle congestion usually within a city center (Parks, 2019). Given the growing air pollution and congestion predicted by the No-Action Alternative (NAA) of the Final EA for Manhattan in the coming years, the various governmental agencies in conjunction with the state legislature

and Governor of New York have planned to adopt this policy for Manhattan's CBD via the CBD-TP scheme.

Section 1:

The MTA plans to implement the CBD-TP policy by selecting from a variety of potential alternatives to alleviate congestion. These include 11 Build Alternatives and 1 No-Action Alternative (FHWA, 2023). Of the 11 Build Alternatives, they were:

- NTP-1: Parking pricing strategies
- T-1: Pricing on full roadways: Raise tolls or implement variable tolls on existing toll facilities
- T-2: Pricing on full roadways: Toll East and Harlem River bridges
- T-3: High-occupancy toll (HOT) lanes
- T-4: Zone-based pricing: CBD Tolling Program
- O-1: Parking pricing: Reduce government-issued parking permits
- O-2: Provide additional taxi stands to reduce cruising
- O-3: Create incentives for teleworking
- O-4: Ration license plates
- O-5: Mandatory carpooling
- O-6: Truck time-of-day restrictions

The FHWA recommend the selection of T-4: CBD-TP as the preferred alternative as it is the only alternative that satisfies the triple mandate of:

- Objective 1: "Reduce daily vehicle-miles traveled (VMT) within the Manhattan CBD."
- Objective 2: "Reduce the number of vehicles entering the Manhattan CBD daily."

- Objective 3: Create a funding source for capital improvements and generate sufficient annual net revenues to fund \$15 billion for capital projects for the MTA Capital Program.

From this triple mandate, the environmental analysis defines Objective 1 as a 5% reduction in VMT relative to the NAA, and Objective 2 as a 10% reduction in vehicles relative to the NAA respectively. The Final EA also identifies T-4 as the only alternative to satisfy all three objectives (FHWA, 2023). Therefore, unlike the other alternatives, the selection of the preferred alternative (T-4) means the MTA has to plan a definition of the CBD area within Manhattan. This is chosen in accordance to how it is described by the MTA Reform and Traffic Mobility Act:

“The borough of Manhattan south of and inclusive of 60th Street to the extent practicable but shall not include the FDR Drive and New York State Route 9A/West Side Highway, including the Battery Park underpass and any surface roadway portion of the Hugh L. Carey Tunnel connecting to West Street” (FHWA, 2023).

This amounts to an area of roughly 9 square miles, and is home to 617 thousand residents and 1.5 million jobs in a greater region of over 22.2 million people and 10.7 million jobs (FHWA, 2023). Therefore, Manhattan’s CBD contains 2.8% of the region’s population, but more importantly for congestion, 14% of the region’s jobs.

Section 2:

In order to understand the preferred T-4 alternative it is important to understand the T-4 congestion pricing scenarios, which will allow us to examine any sort of discounting (EPA, 2010) present and whether the benefits are substantial in both relative and absolute

terms. Each scenario accounts for four different variables: peak hours, credit, vehicle type and price. First, are the differences between peak hours and off-peak hours of pricing based on time of day for both weekdays and weekends. Second, each scenario includes or excludes credits based on whether someone entered Manhattan's CBD via a tolled or untolled road. Third, are the included exemptions based on vehicle type such as: private cars, taxis, trucks, buses, and FHV's (For Hire Vehicles). Fourth, are the approximate toll rates for peak, off-peak, and overnight travel. This is all laid out in the following Table (from Final EA):

Table ES-2. Tolling Scenarios Evaluated for the CBD Tolling Alternative

PARAMETER ¹	SCENARIO A Base Plan	SCENARIO B Base Plan with Caps and Exemptions	SCENARIO C Low Crossing Credits for Vehicles Using Tunnels to Access the CBD, with Some Caps and Exemptions	SCENARIO D High Crossing Credits for Vehicles Using Tunnels to Access the CBD	SCENARIO E High Crossing Credits for Vehicles Using Tunnels to Access the CBD, with Some Caps and Exemptions	SCENARIO F High Crossing Credits for Vehicles Using Manhattan Bridges and Tunnels to Access the CBD, with Some Caps and Exemptions	SCENARIO G Base Plan with Same Tolls for All Vehicle Classes
Time Periods²							
Peak: Weekdays	6 a.m. to 8 p.m.	6 a.m. to 8 p.m.	6 a.m. to 8 p.m.	6 a.m. to 8 p.m.	6 a.m. to 8 p.m.	6 a.m. to 10 a.m.; 4 p.m. to 8 p.m.	6 a.m. to 8 p.m.
Peak: Weekends	10 a.m. to 10 p.m.	10 a.m. to 10 p.m.	10 a.m. to 10 p.m.	10 a.m. to 10 p.m.	10 a.m. to 10 p.m.	10 a.m. to 10 p.m.	10 a.m. to 10 p.m.
Off Peak: Weekdays	8 p.m. to 10 p.m.	8 p.m. to 10 p.m.	8 p.m. to 10 p.m.	8 p.m. to 10 p.m.	8 p.m. to 10 p.m.	10 a.m. to 4 p.m.	8 p.m. to 10 p.m.
Overnight: Weekdays	10 p.m. to 6 a.m.	10 p.m. to 6 a.m.	10 p.m. to 6 a.m.	10 p.m. to 6 a.m.	10 p.m. to 6 a.m.	8 p.m. to 6 a.m.	10 p.m. to 6 a.m.
Overnight: Weekends	10 p.m. to 10 a.m.	10 p.m. to 10 a.m.	10 p.m. to 10 a.m.	10 p.m. to 10 a.m.	10 p.m. to 10 a.m.	10 p.m. to 10 a.m.	10 p.m. to 10 a.m.
Potential Crossing Credits							
Credit Toward the CBD Toll for Tolls Paid at the Queens-Midtown, Hugh L. Carey, Lincoln, Holland Tunnels	No	No	Yes	Yes	Yes	Yes	No
Credit Toward the CBD Toll for Tolls Paid at the Robert F. Kennedy, Henry Hudson, George Washington Bridges	No	No	No	No	No	Yes	No
Potential Exemptions and Limits (Caps) on Number of Tolls per Day							
Cars, motorcycles, commercial vans	Once per day	Once per day	Once per day	Once per day	Once per day	Once per day	Once per day
Taxis	No cap	Once per day	Exempt	No cap	Exempt	Once per day	No cap
FHV's	No cap	Once per day	Three times per day	No cap	Three times per day	Once per day	No cap
Small and large trucks	No cap	Twice per day	No cap	No cap	No cap	Once per day	No cap
Buses	No cap	Exempt	No cap	No cap	Transit buses-Exempt No cap on others	Exempt	No cap
Approximate Toll Rate Assumed³							
Peak	\$9	\$10	\$14	\$19	\$23	\$23	\$12
Off Peak	\$7	\$8	\$11	\$14	\$17	\$17	\$9
Overnight	\$5	\$5	\$7	\$10	\$12	\$12	\$7

These are the valued daily costs of the program based on the entrance of any particular vehicle into the CBD by time of day, entrance road, vehicle type, and price. What is notable is that buses pay in the base plan (Scenario A) as well as Scenarios C, part of D, and G, which means that public transport vehicles do not get priority over private transport in these scenarios, although the cost per user would be lower in a high-occupancy vehicle like a bus. Nevertheless, this table represents the valued costs per vehicle of the CBD-TP.

As mentioned the valued benefits of the program were Objectives 1, 2, and 3 that allowed for the selection of the preferred alternative being the T-4 alternative. The Final EA summarizes the range of valued benefits based on the difference in the scenarios presented in the T-4 alternative, they are as follows:

- 7.1% to 9.2% decrease (2023) and a 6.0% to 8.7% decrease (2045) in daily VMT in the CBD below the NAA
- 15.4% to 19.9% decrease (2023) and a 13.7% to 18.7% decrease (2045) in daily vehicles into the CBD below the NAA
- \$1.02 billion to \$1.48 billion net annual revenue increase to MTA's Capital Program (2023-2045)

These are in line with the benefits outlined in Objectives 1, 2, and 3 respectively. What is important to note is that these valued benefits are relative to the NAA. Given that, there is a discounting in the relative reduction of VMT as the 2045 percent reduction is lower than the 2023 estimates (7.1-9.2% reduces to 6.0-8.7%). This suggests that the policy without mitigation strategies, may in the short term decrease VMT (Davidson, 2023), but in the long term still converge to higher VMT travel levels within the CBD like it did in London (TfL, 2022). Likewise, a similar discounting of benefits occurs when looking at the percentage decrease of vehicles entering the CBD from 15.4-19.9% relative reduction in 2023 down to only a 13.7-18.7% reduction by 2045. This highlights that while Objectives 1, 2, and 3 are maintained by 2045, diminishing returns on Objectives 1, 2, with agnostic returns towards Objective 3 should be expected. To assess Objective 3, the NAA congestion by 2045 will be assessed first.

Looking at the NAA, I've calculated the following effects as expected to occur from baseline of 2023 to 2045 by measuring the difference between the 2023-2045 numbers, they are:

- 4.9% increase in daily VMT in the CBD (2023-2045)
- 4.8% increase in daily vehicles into the CBD (2023-2045)
- No net revenue from congestion pricing

Therefore, it can be seen from the NAA that congestion is expected to increase between 2023-2045 anyway. From this, calculating in purely absolute terms (not relative to the NAAA 2045 forecast), the following is illuminated:

- 1.4% to 4.3% decrease in daily VMT in the CBD below the 2023 NAA levels by 2045
- 9.2% to 14.8% decrease in daily vehicles into the CBD below the 2023 NAA levels by 2045

This shows that in regard to the 2023 existing congestion, there will only be minor reductions in VMT in the CBD by 2045, and more modest decreases in absolute terms of daily vehicles entering the CBD if only the 2023 existing levels are compared and not the forecasted further growth in vehicles that was used in the Final EA. The much minor decrease in daily VMT in the CBD by 2045 (only 1.4-4.3% decrease over 2023 levels by 2045) when compared to similarly higher maintained levels in the decrease in vehicles entering the CBD (only a reduction to 9.2-14.8% decrease by 2045) highlights a key issue in the Final EA for the CBDTP program, congestion will most likely fill from within the CBD travel, and will result in more travel outside the CBD (FHWA, 2023) like it did in London (Prud'homme et al. 2005). Therefore, the lack of other mandated mitigation strategies and the nature of induced demand due to the political nature of the reports mandated alternatives will be explained and extrapolated on in the next section. Moreover, while these results have lower effects in

absolute terms in regard to Objectives 1 and 2, it does mean a sustained revenue for the MTA of roughly 1-1.5 billion a year, and if toll prices increase with inflation like they do already in the New York region (MTA, 2023), then there will be no real terms discounting in regard to revenue for Objective 3, even if there is for Objectives 1 and 2, further highlighting the more political aspects of this policy proposal. Likewise, while satisfying Objectives 1, 2 and 3 were mandated for the selection of a preferred alternative, Objective 4, “Establish a tolling program consistent with the purposes underlying the New York State legislation entitled the “MTA Reform and Traffic Mobility Act” (FHWA, 2023) was not used for the selection of the preferred alternative but nevertheless T-4 happened to satisfy this alternative which gives credence to the political nature of the policy proposal, which will also be extrapolated on as well in the next section, via assessing the policy’s origin and funding plan.

Section 3:

As has been shown, there is a discounting in regard to congestion reduction at the baseline 2023 levels, and past 2045 it can be expected congestion to continue to grow back to 2023 levels without mitigation strategies. This is most likely attributed to induced demand. Induced demand, while not explicitly mentioned in the Final EA, is a growing topic within economics and traffic studies (Schneider, 2018). Essentially, because there is an increased barrier to entry (the tolling scheme) traffic in the near term would decrease within the CBD, but the capacity improvements within the CBD proper (less daily VMT) would induce more Manhattan residents (who do not pay the surcharge) and those wealthy enough outside the CBD (who pay the surcharge) to drive more in the CBD given the new decrease in travel times (Lee et al., 1999).

While the valued benefits would increase funding for the MTA, in terms of achieving Objective 1 and 2 in absolute instead of relative terms, the CBD-TP does not reverse the trend of Manhattan congestion. Incorporating other mitigation techniques seems vital to inducing both public transit ridership and relieving congestion, and involves tackling the core problem of congestion: private vehicles.

Curiously, two of the alternatives that were not selected as the preferred alternatives were NTP-1 and O-1 both of which sought to clamp down on parking. Reading their footnotes on why they were not selected, the following is stated:

- “For NTP-1: VMT reduction was estimated at substantially less than 1 percent. Further, there is no law or agreement in place between the City of New York and MTA that would direct the revenue generated from this alternative to MTA to support the Capital Program.”
- “For O-1: Earlier studies concluded that reducing parking placards issued to government employees would reduce VMT south of 86th Street by 0.1 to 0.3 percent... this alternative also would not reduce the number of vehicles entering the Manhattan CBD enough to meet the Project objective.”

Here, the political nature of the selection of preferred alternative (T-4), Alternative NTP-1 was not in accordance with the mandate of the MTA Reform and Traffic Mobility Act and Alternative O-1 only considers government issued parking placards. Yet, it is known from induced traffic demand, congestion will increase when capacity improvements are made (Lee et al., 1999). Therefore, it is important to conclude that, for perhaps a variety of political reasons, the mitigation of removal of free street parking was not considered even though it was vital to the success of other congestion minimizing schemes, and affects the overall evaluation (Manuel, 2020). When looking at the London congestion zone, one notices the

lack of parking in London due to parking within the CBD also being charged (Leape, 2006) while much of Manhattan's streets maintain the free parking under the proposed CBD-TP. This highlights the fundamental contradiction of achieving the CBD-TP's Objectives 1 and 2, as a typical 1-way street in Manhattan not only allows free parking on one side, but on both sides of a one way street, meaning around 50-66% (including smaller bike lanes) of the street is dedicated to parking (Milton, 2023). Therefore, so long as people are willing to drive solely in the congestion zone Manhattanites (who are among the wealthiest inhabitants of the region) (Plitt, 2019) will get an economic free ride by reaping the valued benefits of lower congestion but none of costs of the CBD-TP, and as long as it is convenient and free to park in Manhattan this relationship will persist, and induce further congestion predicted by analysis of the 2045 number discrepancy. This brings us to my next point: the inequality in costs versus benefits from the CBD-TP.

Amongst the scenarios for Alternative T-4, Scenarios A, B, and G do not offer Crossing Credits (CC), Scenarios C, D, and E offer partial CC, and Scenario F offers full CC. The accounting of Crossing Credits occurs because several tunnels and bridges into Manhattan's CBD already have tolls. Broken down, there are the Holland (HT) & Lincoln Tunnels (LT) from New Jersey, the Brooklyn (BB), Manhattan (MB) & Williamsburg Bridges (WB) and the Hugh L. Carey Tunnel (HLCT) from Brooklyn and the Ed Koch Queensboro Bridge (EKQB) & Queens-Midtown Tunnel (QMT) from Queens. Currently, of these 8 crossings the HT & LT from New Jersey are both tolled, the HLCT from Brooklyn is tolled, and the QMT is also tolled (FWHA, 2023). This leaves the remaining toll-free options for Brooklyn and Queens drivers with no toll-free crossings from New Jersey. Therefore, under the base plan of Scenario A, and Scenarios B & G, New Jersey drivers would effectively be double charged (existing tunnel toll & CBD-TP) while Brooklyn and Queens drivers who

choose to take the untolled East River crossings into Manhattan would only be charged once (this is also true for Bronx, Upstate New York, and Connecticut drivers who take local streets and enter through the 60th street CBD-TP boundary). Likewise, diversions for New Jersey drivers into Manhattan's CBD, such as via the George Washington or Verrazano Narrows Bridges via upper Manhattan and Staten Island respectively, are also tolled. This shows that these scenarios of T-4 Alternative create a hierarchy of drivers not based on socio-economic conditions but on geographical exclusion, causing severe negative financial externalities to New Jersey commuters exclusively, and increased congestion and air pollution on diversion roads through poorer areas of the city, such as along the Cross Bronx Expressway in the Bronx due to predicted increased truck usage from the CBD-TP (FWHA, 2023).

Moreover, if Scenarios C, D, E, and F are selected then all entryways would be tolled at once eliminating free entry into Manhattan during peak hours by all routes. However, Scenarios C, D, and E would all not provide exemption for buses (state-owned or otherwise) this would therefore increase public transit fares as the costs would be passed on to the rider for private "jitney" bus operators and public non-MTA bus companies, while the MTA would be fare change exempt as bus fares are already equal to and provide free transfer to the NYC Subway currently (NYC 311, 2023). Given that a majority of private jitney bus ridership comes from New Jersey via the LT (FWHA, 2023), Scenarios C, D, E still shift the CBD-TP costs to New Jersey commuters, however this time it also includes public transit riders. The Final EA states: "To the extent buses are charged full or discounted tolls under the tolling scenarios, the cost of the toll would be expected to be absorbed into overall operating costs... For non-subsidized service, increased operating costs would be expected to be passed on to the passenger or could result in reduced services" (FWHA, 2023). This would therefore lead to what the Green Book defines as unintended consequences

of Economic Appraisal (HM Treasury, 2022), as the cost burden of the CBD-TP to not just NJ drivers but also the poorest communities who rely on jitney bus operations (FWHA, 2023) and public transit access from New Jersey to New York in general (Lee et al., 2020).

Therefore, that leaves Scenario F, which offers tolling exemptions for buses and credits to all tolled road users. However, it is tied with Scenario E for the highest toll surcharges per single entry into the CBD, and still would contribute more congestion and pollution on main and local roads in areas such as the Bronx and Staten Island (FWHA, 2023). Ultimately, save for the Scenario F, the CCs would disproportionately lead to higher cost burdens for New Jersey drivers, and also lead to more congestion as more credits are given out (FWHA, 2023), this problem would be more equalized if the benefits were also delivered more fairly via funding.

Finally, looking at Objective 3, it has been established that the costs of the program would disproportionately go on a per driver basis to New Jersey commuters/vehicles, while the funding from the CBD-TP would go exclusively to the MTA. Currently, transport across the New York Metropolitan area goes through 3 main public agencies:

- The MTA: operator of the Subway, Long Island Railroad, Metro North Railroad, and NYC buses, and several bridges and roads in New York State and Connecticut.
- Port Authority of New York and New Jersey: operator of the PATH subway, various bridges and roads, and the sea & airports of New Jersey and New York City.
- NJ Transit: operator of NJT Commuter Rail, Light Rail, and New Jersey Buses across New Jersey.

The CBD-TP would only fund the MTA despite NJ Transit and the Port Authority experiencing increased ridership and strain on their already crowded systems due to the program (FWHA, 2023). This is most likely because the Final EA uses the Best Practice Model (BPM) suggested by the New York Metropolitan Transportation Council (NYMTC)

which operates exclusively in New York City, Long Island and Westchester, Rockland, and Putnam counties, following the jurisdiction of the MTA (NYMTC, 2017). While they do use a mixture of stated (future modeling) and revealed preference (current model) surveys to develop the BPM for the whole region, including surveying New Jersey (NYMTC & NJTPA, 2013), The CBD-TP funding would go exclusively to the billion dollar structural deficit for the MTA (FHWA, 2023) and its capital expenditures. Hereafter, all of this is to say, that while the BPM used for the Final EA accounts for New Jersey commuters in their model, the urgency and structural problems in the MTA lead to a non-proportional use of the CBD-TP funding going exclusively to the MTA despite people from all over the region paying for the tolls and using other transit agencies to get to Manhattan, mostly from New Jersey.

Conclusion:

This policy report examines the CBD-TP alternatives through a Cost Benefit Analysis Framework of only the quantitative stated costs and benefits to identify key areas of concern that may affect the values of the projected costs and benefits as well as the distribution of those said benefits amongst both residents and agencies across the New York City metropolitan area. It identifies that given the CBD-TP was enacted in conjunction with only New York, and federal agencies, at the exclusion of the state of New Jersey, which means that the reported benefits skew towards the New York side of the Metropolitan area, leaving the costs to mostly be borne by New Jersey residents (~33% of the metropolitan area population) while benefits skew towards New York residents and intra-New York public transit exclusively. Likewise, the Final EA overstates the benefits of the CBD-TP scheme by using analysis based on the Swedish and London models of congestion pricing, and hiding the absolute VMT and motor vehicle entry reductions by only defining Objectives 1 and 2 in

relative terms to the No-Action Alternative which predicts increased traffic by 2045 anyway. Furthermore, the stated benefits for Manhattan's CBD, based on the BPM, and the London and Stockholm models, differs greatly from the CBD of Manhattan which is more residential in nature (Prud'homme et al., 2005), and has a plethora of free parking available, suggesting that the benefits in congestion relief for Manhattan's CBD will be discounted overtime without mitigation. Overall the CBD-TP policy implementation will most likely achieve several of its stated goals, however this report illuminates concerns about the ability to actually decrease long-term congestion and the unequal distribution of benefits and costs across the region.

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