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2 **TCRP Research Problem Statement Form**  
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4 **Title:**

5 Transit Fare Evasion—Measurement, Prevention, Economics, and Societal Factors  
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7 **Submitted by:**

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11 This statement has been peer-reviewed by members and friends of TRB Public Transportation  
12 Marketing and Fare Policy Committee (AP030) and is being submitted on behalf of the Committee.  
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14 *\* Lexcie Lu is a Metro-North Railroad employee. Opinions expressed herein are the authors' and do not necessarily reflect  
15 official policy or positions of the Metropolitan Transportation Authority State of New York, Metro-North Railroad, or any  
16 other organizations.*  
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18 **Scope:**

19 Fare evasion can be a problem in public transit systems—depriving systems of needed revenues and  
20 contributing to reduced public confidence in the system, potentially making it harder to justify new  
21 funding and implement service improvements. While there is growing industry experience and statistics  
22 on this topic, resources are often obscure, considered an adjunct to research in law enforcement,  
23 security, fare collection, sociology, or financial audits; information isn't easily accessible nor widely  
24 disseminated.  
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26 *TCRP Synthesis 96* offers a state-of-practice overview of Proof-of-Payment (POP) fare collection  
27 systems and discusses fare evasion and enforcement issues in the POP context. Barrier-based payment  
28 systems fell outside its scope; it doesn't cover wider societal and public safety implications of fare  
29 evasion, nor does it provide statistical guidance on how to monitor evasion rates, and determine cost-  
30 effectiveness of enforcement strategies. Proposed project will cover parts of "Suggestions for  
31 Additional Research" scope, and other issues identified by industry representatives.  
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33 Synthesis to provide a comprehensive, issue-centric guidance for practitioners on how evasion can be  
34 measured, monitored, and minimized under an assortment of different fare policies, fare collection  
35 methodologies, and operations. Available comparative statistics will be compiled, including data on  
36 different modes, and economic relationships not addressed in *Syn. 96*. Project will identify relationship  
37 between fare evasion rates and contributing factors, including inspection/ticket collection rates,  
38 penalty/on-board surcharge amounts, probability of getting cited or arrested, but also demographic  
39 factors (age, income, etc.), geography, and transportation fares. Further analysis will identify  
40 relationships between evasion rates and overall crime rates, and effectiveness of communications  
41 strategies to influence public perception and compliance. A decision guide to help officials weigh  
42 enforcement costs with revenue recovery through fines and reduced evasion. Discuss experience with  
43 different countermeasures, surveillance, and prevention strategies. Examine extent to which transit  
44 systems have policy levers and operational strategies to control evasion. Ancillary security benefits of  
45 evasion crackdowns will be evaluated quantitatively where possible. Alternative adjudication processes  
46 now in operation would be assessed.  
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2 **Tasks:**  
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- 4 1. **Literature Review.** Provide a literature review of fare evasion issues and related research.
- 5 2. **Update and Expand Syn. 96 Fare Evasion Dataset.** Gather data on the extent of fare evasion,  
6 including additional data from operations or modes not using POP fare collection, and an update  
7 to data sources in Syn. 96 where available. What are benchmark evasion rates in POP, barrier,  
8 and near-100% inspection environments? Compile available comparative statistics, including  
9 data on different modes (bus, subway, commuter rail, ferry).
- 10 3. **Provide Statistical Guidance and Synthesize Best Practices in Evasion Data Collection.**  
11 Define sampling methods for measuring fare evasion and a common definition. Statistical  
12 analysis must ensure reasonable levels of accuracy (i.e., samples counts, inspection techniques,  
13 approaches to ensure representativeness, disaggregation levels, and frequency). Enumerate best  
14 practices for determining rates, including forms, data collection labour forces, accuracy, and  
15 independent verifiability. Provide guidance on how evasion can be measured and monitored  
16 under different fare policies (distance-, trip-, time-based—including out-of-zone and incorrect-  
17 time riding), fare collection methodologies (onboard, turnstiles, gates, etc.), and operations.  
18 Measurement methods shall include and clearly distinguish “unintentional” evasion where fare  
19 collection equipment is malfunctioning.
- 20 4. **Develop Economic Model of Fare Evasion.** Recommend methods for determining  
21 relationships among evasion rate, inspection/ticket collection rates, penalty/on-board surcharge  
22 amounts, probability of getting cited/arrested, user income level, enforcement cost, and  
23 feasibility/cost of collecting fines. Provide guidance in estimating revenue losses due to evasion,  
24 and how much additional revenue could be captured with changes in enforcement strategies.  
25 Using game theory, make recommendations for setting financial penalties, inspection rates,  
26 timing, strategies, etc. to effectively influence evasion rates. Derive analytic models relating  
27 fares, penalties, inspection rates, user income, and other economic variables driving evasion  
28 rates. What are “natural” or “reasonable” rates?
- 29 5. **Policy Levers and Operational Strategies to Combat Evasion.** Examine transit systems  
30 policy levers and operational strategies to control fare evasion, including optimal enforcement  
31 times, inspection/ticket collection rates, legal frameworks, anti-evasion awareness and marketing  
32 programs, and agency internal strategies like reduction in fare equipment malfunction to reduce  
33 unintentional nonpayment, etc. Enumerate enforcement costs/impacts, penalty collections,  
34 improved fare equipment reliability, and fraud (i.e. hacking). Quantify effect of penalties and  
35 inspections on curbing evasion. How much discretion is tolerable when issuing warnings, and  
36 what influence do warnings have? Experience with different countermeasures, surveillance,  
37 prevention strategies, enforcement, design changes to fare policy and fare media will be  
38 reviewed. Discuss effectiveness of specific communications and awareness campaigns in  
39 strengthening social norms to prompt behavioral change.
- 40 6. **Evaluate Ancillary Benefits of Evasion Crackdowns.** Ancillary transit security and external  
41 benefits (e.g. general lowering of crime rates, organized crime prevention, arrest of persons with  
42 outstanding warrants, quality of life issues, random controlled-materiel arrests, fare systems  
43 vandalism, etc.) will be evaluated quantitatively (i.e. with economic value estimates) where  
44 possible. Consider the importance of perception and discuss the negative and positive effects on  
45 paying customers, including increased acceptance of fare increases.
- 46 7. **Alternative Adjudication Processes and Cost-Effectiveness.** Are the local agency processes  
47 more cost-effective than the court-oriented approaches? An evaluation of alternative adjudication  
48 processes now in operation would confirm advantages, disadvantages, costs, and benefits. The  
49 evaluation would include details of administrative processes, associated costs and revenue return

1 to the operator, and the effectiveness in discouraging repeat fare evasion offenses, e.g. transit  
2 courts, collection agencies, and preventing scofflaws from renewing drivers' licences.

3 8. **Socio-Economic and Societal Factors.** Enumerate influence of underlying socio-economic  
4 factors driving fare evasion such as evader demographic data (income, age, language barriers,  
5 motivation, travel patterns, trip purpose, recidivism, casual versus habitual, students, culture of  
6 compliance) and external factors (e.g. weather, regional economic conditions, transportation  
7 fares, special events, time-of-day, day-of-week, etc.)

8 9. **Final Report.** Research to be distilled into a final report, with references pointing to further  
9 resources where available. Quality of existing data, research, and measurement/prevention  
10 strategies will be evaluated. Recommendation to identify areas requiring further study.

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