Target Setting for Transit in Japanese Experience

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• Target setting for transit performance measures
  – Which indicators are developed and how to set the target?
  – What is the current problem in Japanese cases

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3. Three ways to set target of transit performance
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1. Performance Based Mgt of Public Transit by National Gov.

- **ICE**: Index of Comfortable and Easeful public transportation
  - Started from 2004
  - Sought other measures than congestion rate, which used from 1970’s
  - Major railway co. and bus operators have to report their performances to the government every year

- 49 Performance Measures (4 categories)
  - Easeful, Comforts, Intelligibility, Safety
  - 11 measures had first priority
  - 9 are reported annually, the others are not used
ICE: Index of Comfortable and Easeful public transportation

- **Easeful**
  - Congestion rate during peak time
  - % of stations have barrier-free route
  - % of low floor vehicles (bus fleets without steps)

- **Comforts**
  - % of air-conditioned vehicles
ICE: Index of Comfortable and Easeful public transportation (cont.)

• **Intelligibility**
  - % of platforms have LED (Light-Emitting Diode) display
  - % of stations have LED display
  - % of vehicles have LED display

• **Safety**
  - % of platforms have sta. staff or emergency call u.
  - % of vehicles have emergency call unit
Case: Isezaki line of Tobu Railway Co.

Congestion rate 142% 139% 143% 145% 141% 140% 140% 135% 136%
Target setting

- Congestion rate (target = 150%)
  - Getting improved

- The other PMs (target may be 100%)
  - Motivates operators investment

- PMs are not related to funding
  - Monitoring and accountability
2. Safety Performance Measures for Railway Stations (Platforms)

- **Background:** Railway safety
- **431 accidents (person involved) in 2011**
- **208 accidents (29 fatalities) related to platform**
  - Passenger falls from the platform and has a collision with a train.

- **Focus on stations (platform).**
  - Station structure,
  - Station equipment,
  - Train operation,
  - Users.
Safety Performance Measures

Platform structure

1. Narrow part
2. Gap between platform & train
3. Platform arrangement
4. Area of platform
5. Platform curving in the middle
6. Crowding on the platform
7. Crossing of passenger flows
8. Passenger flow outside of white line
9. Crowding at stairs & elevators
10. Number of passing & stopping trains
11. Visual announcement about approaching train
12. Audio announcement about approaching train
13. Clarity of train approach direction
14. Number of drunken passengers
15. Number of visually impaired passengers
16. Number of elderly passengers

On-site survey
Data & Statistics

Passenger flow

Train operation

Passenger profile
Safety Performance Measures (detail)

• #1: The length of narrow part

2pt, \( L \leq 7.3 \)
1pt, \( 7.3 < L \leq 19.5 \)
0pt, \( 19.5 < L \leq 29 \)
-1pt, \( 29 < L \leq 37 \)
-2pt, \( 37 < L \) (m)
• #2: The gap btw platform and train

2pt, \( L \leq 11 \)
1pt, \( 11 < L \leq 13 \)
0pt, \( 13 < L \leq 16.2 \)
-1pt, \( 16.2 < L \leq 18.6 \)
-2pt, \( 18.6 < L \) (cm)
Safety Performance Measures (detail)

• #5: Platform curving in the middle

2pt, strait
1pt,
0pt, concave
-1pt,
-2pt, convex

Convex curve
Safety Performance Measures (detail)

• #6: Level of crowding on platform

2pt, \( P \leq 62 \)
1pt, \( 62 < P \leq 97 \)
0pt, \( 97 < P \leq 114 \)
-1pt, \( 114 < P \leq 195 \)
-2pt, \( 195 < P \)
(daily passengers/ m\(^2\))
Case Study

• 28 platforms on 10 stations
  – Commuter rail in Tokyo Met Area
  – 0 - 7 accidents in eight years

• Data
  – Weight of Safety Assessment Factors
    • AHP questionnaire survey from passengers.
  – Safety Performance Score
    • On-site survey
    • Statistics
Weight of Safety Assessment Factors

1. Narrow part
2. Gap between platform & train
3. Platform arrangement
4. Area of platform
5. Platform curving in the middle
6. Crowding on the platform
7. Crossing of passenger flows
8. Passenger flow outside of white line
9. Crowding at stairs & elevators
10. # of trains passing & stopping
11. Visual announcement of approaching train
12. Audio announcement of approaching train
13. Clarity of train approach direction
14. # of drunken passengers
15. # of visually impaired passengers
**Case Study**

**Weighted Scores (track #1 of station A)**

1. Narrow part
2. Gap between platform & train
3. Platform arrangement
4. Area of platform
5. Platform curving in the middle
6. Crowding on the platform
7. Crossing of passenger flows
8. Passenger flow outside of white line
9. Crowding at stairs & elevators
10. # of trains passing & stopping
11. Visual announcement of approaching...
12. Audio announcement of approaching...
13. Clarity of train approach direction
14. # of drunken passengers
15. # of visually impaired passengers
16. # of elderly passengers

**Weighted safety score [point]**

-0.3 -0.25 -0.2 -0.15 -0.1 -0.05 0 0.05 0.1 0.15

Better
Comparison of Safety Score of Each Track

Case Study

i) Stations where 7 accidents occurred
Station A, Platform 1
Station A, Platform 2

ii) Stations where 2 accidents occurred
Station B, Platform 3
Station B, Platform 5
Station C, Platform 1
Station C, Platform 2
Station D, Platform 1
Station D, Platform 2
Station D, Platform 3
Station D, Platform 4
Station E, Platform 1
Station E, Platform 2
Station E, Platform 3
Station E, Platform 4

iii) Stations where 1 accident occurred
Station F, Platform 1
Station F, Platform 2
Station F, Platform 3
Station F, Platform 4
Station G, Platform 1
Station G, Platform 2
Station H, Platform 1
Station H, Platform 2

iv) Stations where 0 accidents occurred
Station I, Platform 1
Station I, Platform 2
Station J, Platform 1
Station J, Platform 2
Station J, Platform 3
Station J, Platform 4

High safety score = low accidents

Comprehensive safety score [point]

Better
Comparison of Before and After Safety Improvements

- If “platform gates” and “movable steps” are introduced,
  - #1: Narrow part
  - #2: Gap between platform & train
  - #4: Area of platform
  - #8: Passenger flow outside of white line

Safety score: -0.7 ➤ +0.2

Safety investment can be prioritized by this score.
3. Three ways to set target of transit performance

(1) Top-down by strong leadership
(2) Target should be achieved asap
(3) Target improved thru investment
(1) Top-down with strong leadership

- Leader of organization declares the target
  - Sometime without warrant
  - Target setting encourages employee

- No case are observed in Japanese transit
(2) Target should be achieved asap

- **Safety and accident related**
  - Most important PMs for transit
  - **Zero** = everyone can understand

- **Difficult to maintain zero**
  - Passengers and pedestrians have also responsible not to fail.
(3) Target improved thru investment

• Service & facility related
  – Trains, stations, ...
  – Good service needs money.

• Each target depends on the planned investment.
  – “Target will be completed within ten years.”
4. Lessons & Summary

- Small # of measurements are important and sustainable.
  - Road bureau did not continue to report road PMs (local gov) after 2007.
  - Reporting is not the goal but the process.

- PMs should not owe to only transit operators.
  - Government and passengers are also responsible.
  - Funding, regulation, behavior, and mass media
4. Lessons & Summary (cont.)

• Most transit targets are set by compromise.
  - Between ideals and available resources.
  - Target is not the goal.

• More efforts are needed.
  - We can do better with performance-based management.
  - Transparency, Accountability, Motivation…
Thank you
Current Status of Performance Mgt

• It is included in “Policy evaluation”.
  – Policy check-up of the ministry (most 2007-)
    • Covering all fields of the ministry
    • 233 PMs (13 policy goals) for MLIT
      – 11 for road transportation
      – 20 for public transit
    • Output measures also included.

• “Vital few” (“Vital small”?)
• Unitary format
• No regional cooperation
100% 150% 180% 200% 250%

定員乗車（座席にまか、吊革につかまるか、ドア付近の柱）
広げて楽に新聞を読める。
折りたたむなど無理をすれば新聞を読める。
電車がゆれるたびに体が傾いて身動きできない。
体がふれあい相当圧迫感があるが、週刊誌程度なら何故か動ける。

（東京圏の目標）