Transdisciplinary Science and Engineering
Graduate of Advanced Science and Engineering

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SIMULATING PRIVATE SHUTTLE – PUBLIC BUS SERVICE SCENARIOS IN HIGASHIHIROSHIMA: ACCESSIBILITY AND TRAVEL PATTERN IMPACT

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STUDY CONTEXT

- Integration : Private Shuttle and Public Bus
- Tool : MATSim
- Focus : Accessibility impact and travel pattern change

PREVIOUS RESULT

29 Januari 2026

MATSim Output (100 ITER)

No	Metric	Baseline	Scenario 1	Change
General PT Metrics				
1.	Transit Lines	155	156	1 (+0.6%)
2.	Transit Routes	535	544	9 (+1.7%)
3.	PT Trips per Day	9,929	10,214	285 (+2.9%)
PT Ridership				
4.	PT Boardings	13,555	13,888	333 (+2.5%)
5.	PT Allightings	13,555	13,888	333 (+2.5%)
6.	PT Legs	13,162	13,501	339 (+2.6%)
7.	Unique PT Users	6,424	6,565	141 (+2.2)
PT Travel Time				
8.	Avg Travel Time	19.46 min	19.36 min	-0.10 min (-0.5%)
9.	Avg Waiting Time	10.39 min	10.26 min	-0.13 min (-1.3%)

Baseline : As-Is System

Scenario 1: Open Shuttle Access (Serving the public)

Scenario

- Baseline : As-Is System
- Scenario 1 : Open shuttle access → *The Latest Data*
- Scenario 1A :
  - Open shuttle with additional bus stop and route extension
  - Adjusted population synthesis
- Scenario 1B :
  - Additional private shuttle operations
  - Adjusted population synthesis

RESULT

MATSim Output (100 ITER)

No	Metric	Baseline	Scenario 1	Change
General PT Metrics				
1.	Transit Lines	144	145	1 (+0.7%)
2.	Transit Routes	529	538	9 (+1.7%)
3.	PT Trips per Day	15,272	14,958	-314 (-2,1%)
PT Ridership				
4.	PT Boardings	21,150	20,816	-334 (-1,6%)
5.	PT Allightings	21,150	20,770	-380 (-1,8%)
6.	PT Legs	21,150	20,816	-334 (-1,6%)
7.	Unique PT Users	10,429	10,270	-159 (-1,5%)
PT Travel Time				
8.	Avg Travel Time	89.9 min	90.5 min	0.60 min (0.7%)
9.	Avg Waiting Time	13.67 min	13.74 min	0.07 min (0.5%)

- Transit Lines = Line “11”

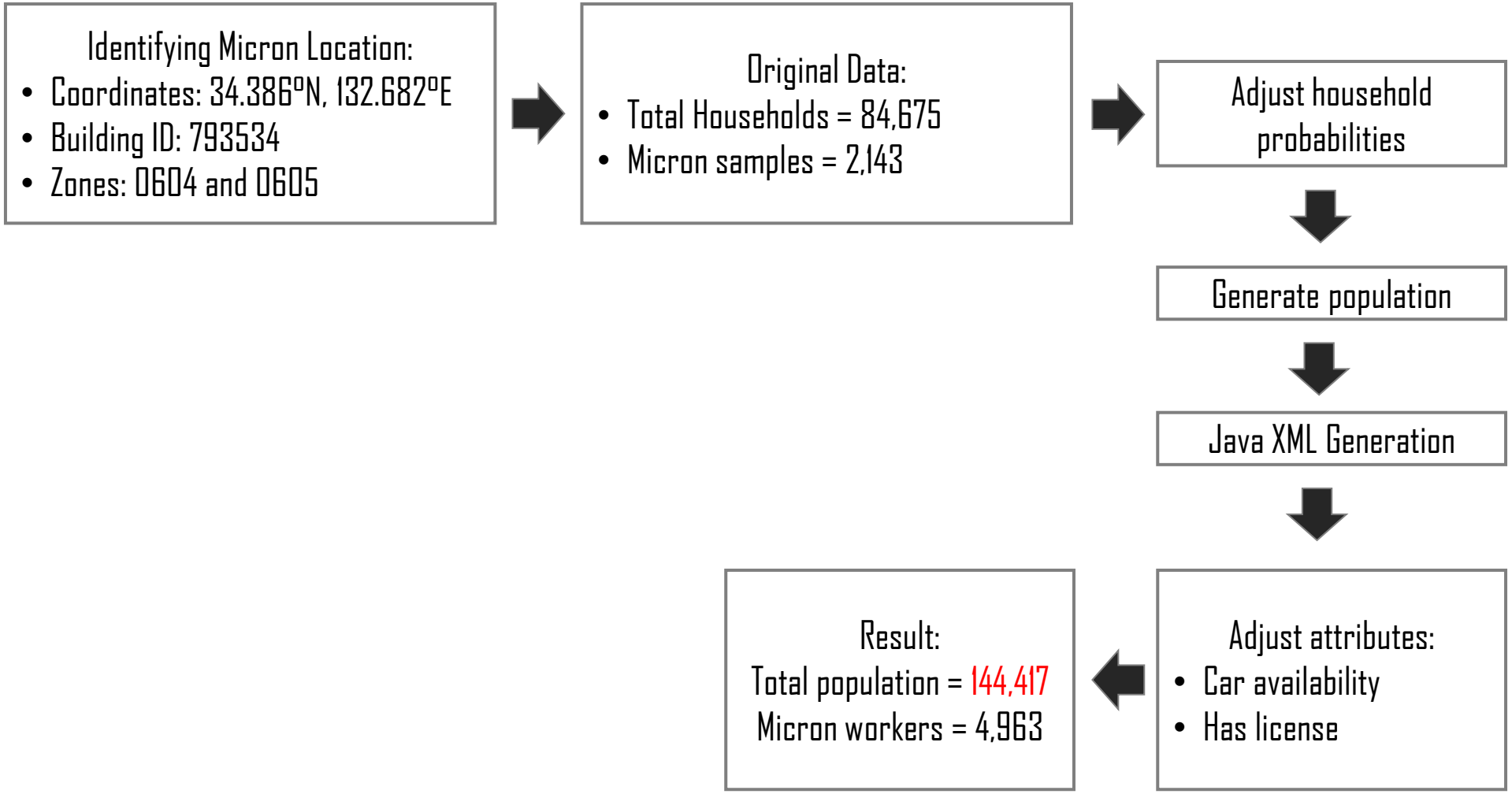
```
<transitLine id="11" name="">
```

- Transit Routes

Route	Schedule	System	Direction
1平日_06時40分_系統111001	06:40	系統111	Inbound
1平日_06時55分_系統111002	06:55	系統111	Inbound
1平日_07時55分_系統111002	07:55	系統111	Inbound
1平日_08時25分_系統111003	08:25	系統111	Inbound
1平日_16時00分_系統112003	16:00	系統112	Outbound
1平日_17時40分_系統112002	17:40	系統112	Outbound
1平日_17時55分_系統112001	17:55	系統112	Outbound
1平日_19時10分_系統112002	19:10	系統112	Outbound
1平日_19時55分_系統112001	19:55	系統112	Outbound

Population Synthesis

Goal : To modify the population composition by increasing the number of Micron workers, while maintaining a constant total population



RESULT

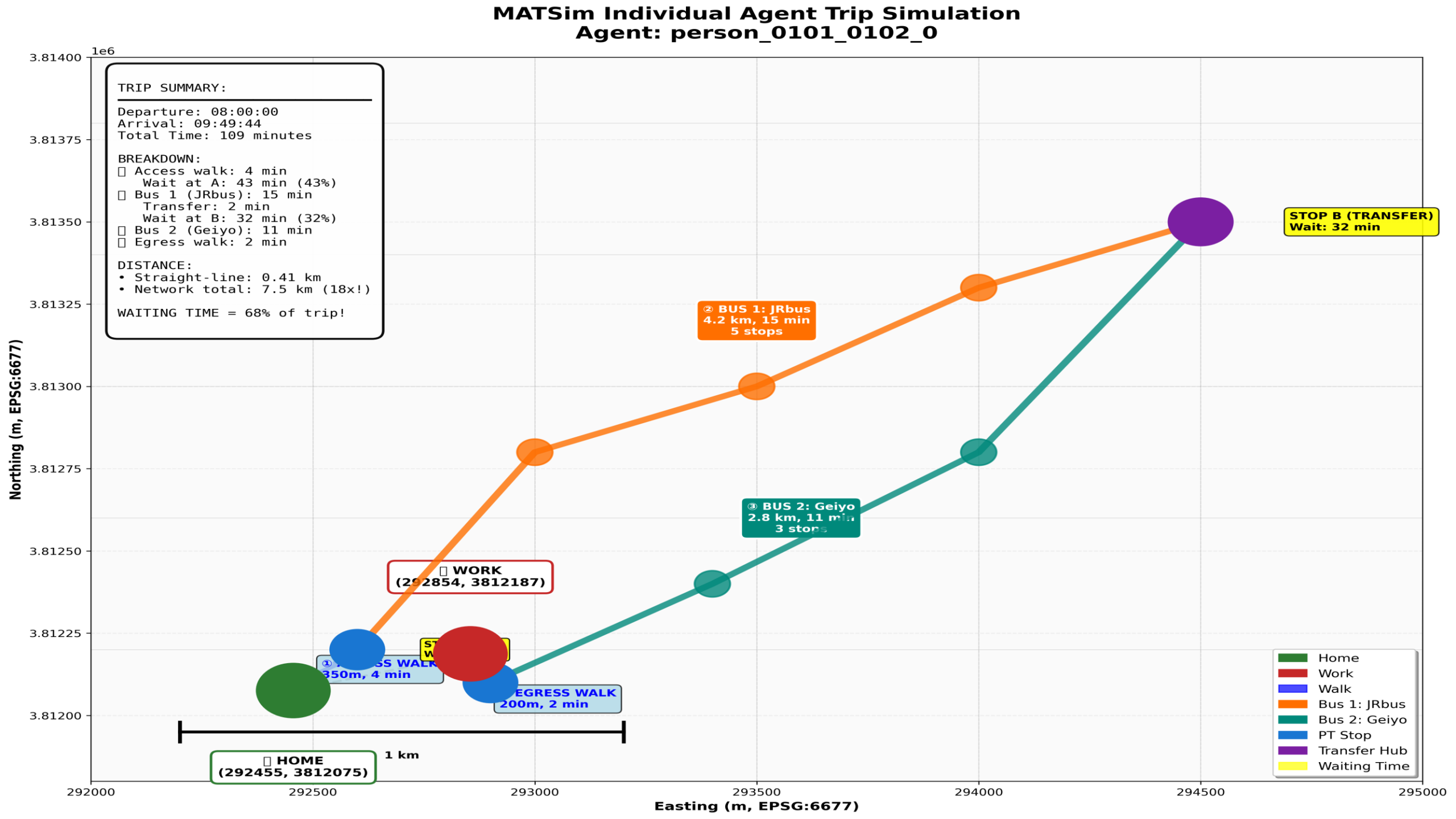
MATSim Output (100 ITER)

No	Metric	Baseline	Scenario 1A	Scenario 1B
General PT Metrics				
1.	Transit Lines		145	151
2.	Transit Routes		538	553
3.	PT Trips per Day		14,782	14,801
PT Ridership				
4.	PT Boardings		23,025	22,978
5.	PT Allightings		23,025	22,978
6.	PT Legs		23,025	22,978
7.	Unique PT Users		9,479	9,458
PT Travel Time				
8.	Avg Travel Time		115.5 min	116.1 min
9.	Avg Waiting Time		18.16 min	17.28 min

THANK YOU

Input Data

- Network
  - higashi-hiroshima-v0.3-feb25/2024/brt/network/network-mapped.xml.gz
- GTFS for Public Bus
  - higashi-hiroshima-v0.3-feb25/2024/brt/transit
- Population
  - higashi-hiroshima-v0.2-feb24/population-with-trips.xml.gz
  - to better represent travel behavior, population attributes were adjusted:
    - carAvail
    - hasLicense
- GTFS for Private Shuttle
  - GTFS_from_VL/GTFS[マイクロン送迎バス]_240603


MATSim Individual Agent Trip Simulation
Agent: person_0101_0102_0
TRIP SUMMARY:
Departure: 08:00:00
Arrival: 09:49:44
Total Time: 109 minutes
BREAKDOWN:
Access walk: 4 min
Wait at A: 43 min (43%)
Bus 1 (JRbus): 15 min
Transfer: 2 min
Wait at B: 32 min (32%)
Bus 2 (Geiyo): 11 min
Egress walk: 2 min
DISTANCE:
• Straight-line: 0.41 km
• Network total: 7.5 km (18x!)
WAITING TIME = 68% of trip!
STOP B (TRANSFER)
Wait: 32 min
② BUS 1: JRbus
4.2 km, 15 min
5 stops
③ BUS 2: Geiyo
2.8 km, 11 min
3 stops
WORK
(292854, 3812187)
EGRESS WALK
200m, 2 min
HOME
(292455, 3812075)
1 km
Home
Work
Walk
Bus 1: JRbus
Bus 2: Geiyo
PT Stop
Transfer Hub
Waiting Time
Northing (m, EPSG:6677)
Easting (m, EPSG:6677)
1e6
3.81400
3.81375
3.81350
3.81325
3.81300
3.81275
3.81250
3.81225
3.81200
292000
292500
293000
293500
294000
294500
295000

No	Population	
	Baseline and Scenario 1	Scenario 1A and Scenario 1B
1.	240,675	144,417