

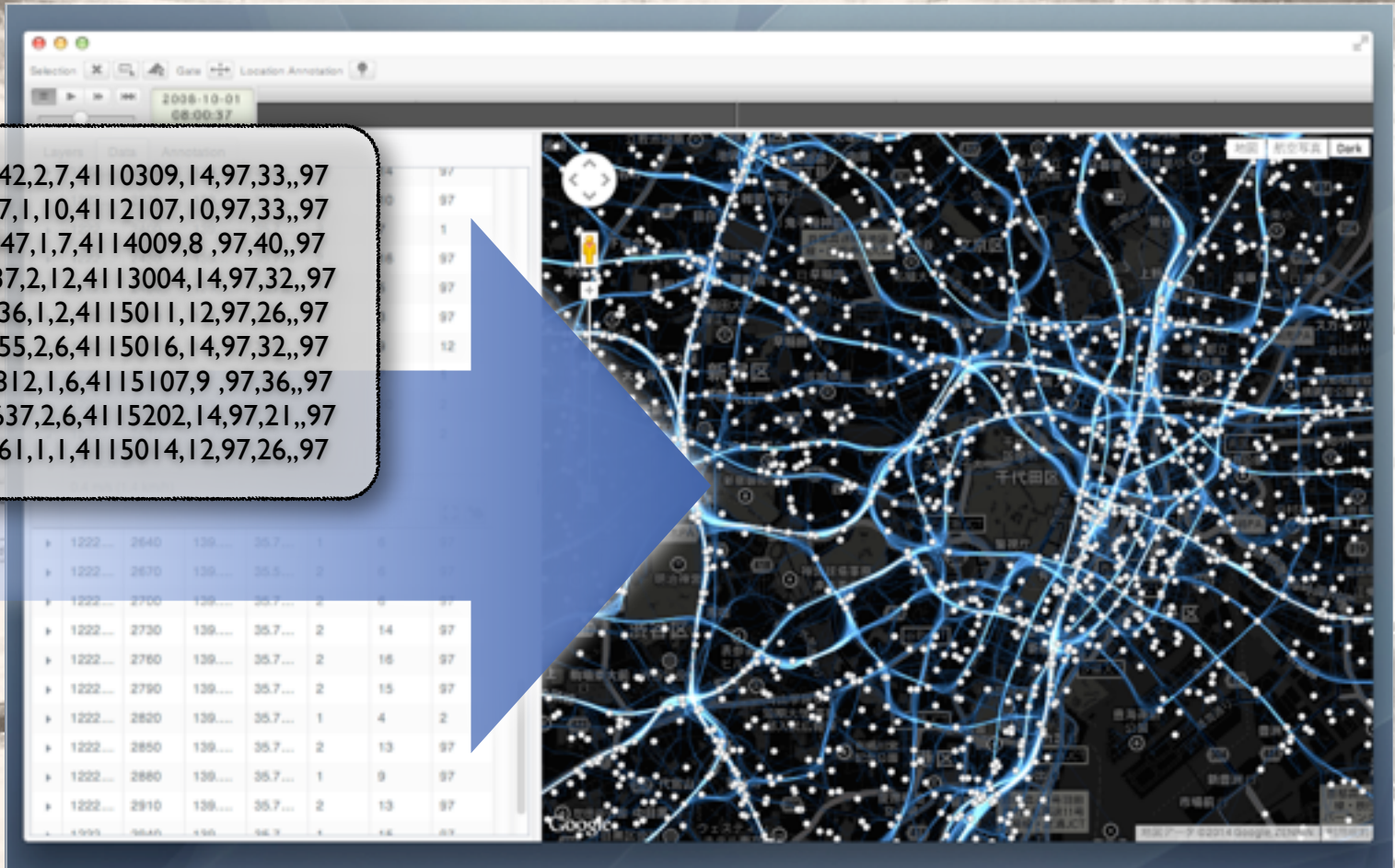
Visualizing Mass Movement Data

Satoshi Ueyama



Overview of the mobmap

1500,1,1,1998/10/01 06:00:00,139.9249985549,35.7318406842,2,7,4110309,14,97,33,,97
3700,1,1,1998/10/01 06:00:00,139.9123053021,35.753511987,1,10,4112107,10,97,33,,97
7300,1,1,1998/10/01 06:00:00,139.9132597066,35.7134959947,1,7,4114009,8,97,40,,97
5500,1,1,1998/10/01 06:00:00,139.9374260851,35.7387718937,2,12,4113004,14,97,32,,97
9500,1,1,1998/10/01 06:00:00,139.9268670539,35.6868715236,1,2,4115011,12,97,26,,97
9700,1,1,1998/10/01 06:00:00,139.9238668934,35.6892555155,2,6,4115016,14,97,32,,97
11400,1,1,1998/10/01 06:00:00,139.9293917865,35.6808909812,1,6,4115107,9,97,36,,97
11800,1,1,1998/10/01 06:00:00,139.9077829215,35.6792209637,2,6,4115202,14,97,21,,97
10100,1,1,1998/10/01 06:00:00,139.9298447577,35.684551261,1,1,4115014,12,97,26,,97



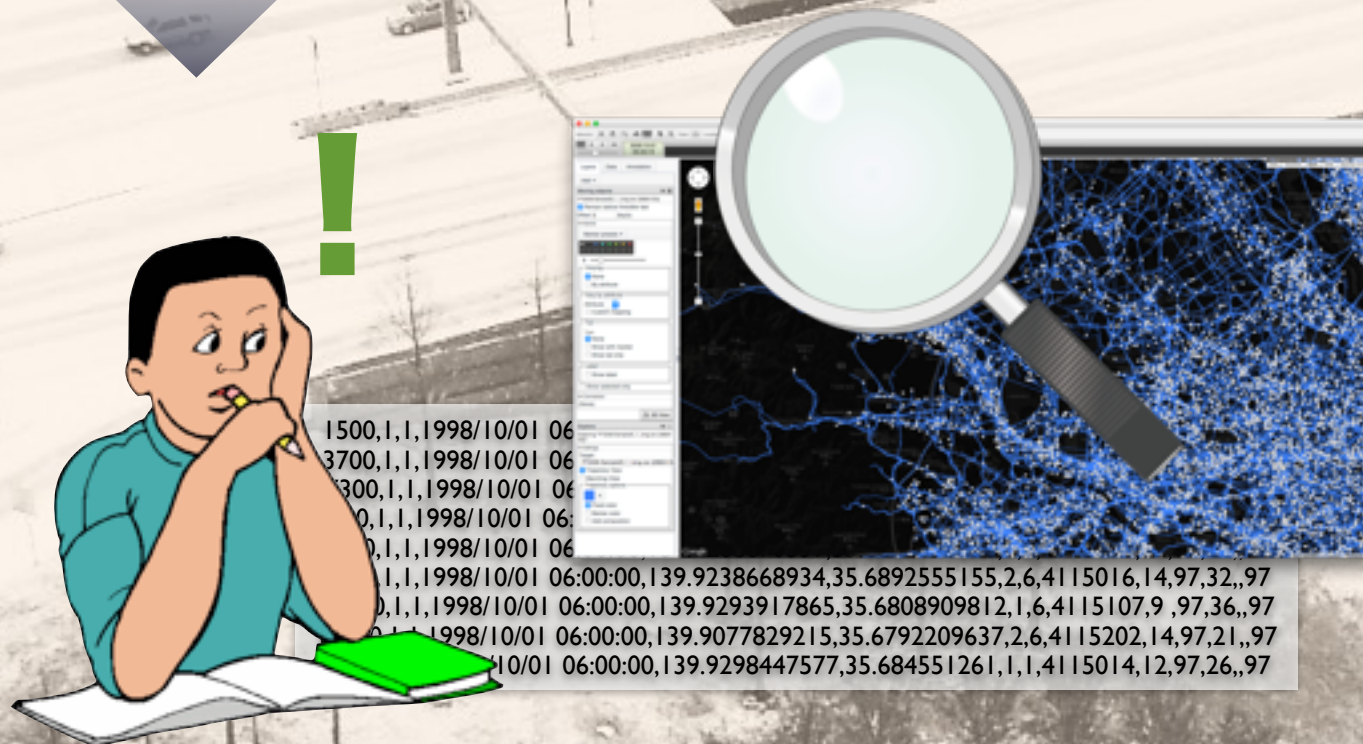
- Specialized tool for mass moving data
- Implements special renderer on Google Maps
- Base map is ready to use

“Look first” moving data analysis



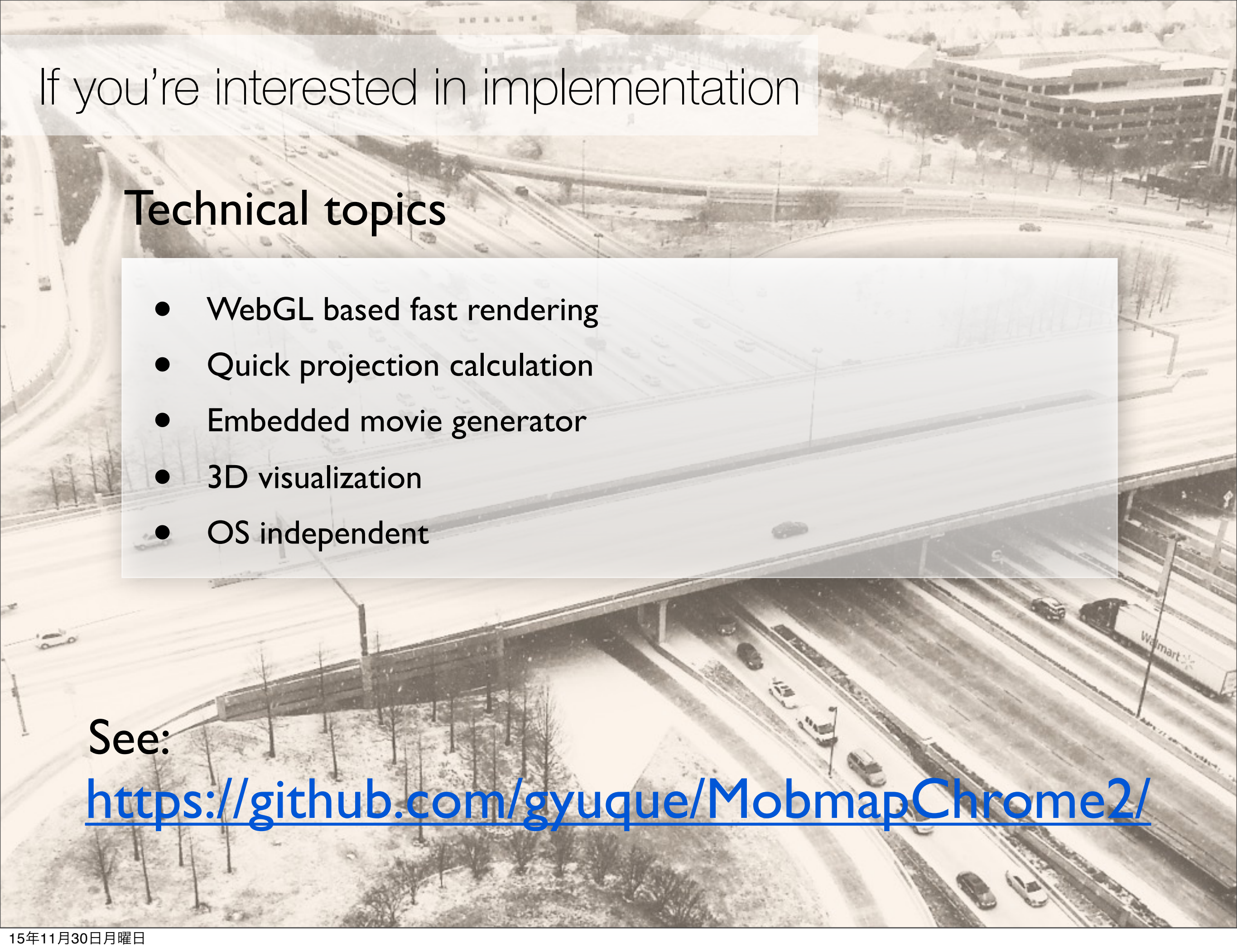
5500,1,1,1998/10/01 06:00:00,139.9374260851,35.7387718937,2,12,4113004,14,97,32,,97
9500,1,1,1998/10/01 06:00:00,139.9268670539,35.6868715236,1,2,4115011,12,97,26,,97
9700,1,1,1998/10/01 06:00:00,139.9238668934,35.6892555155,2,6,4115016,14,97,32,,97

User of movement data may not be familiar with its content.



→ analysis
→ visualization

Look the data first. Then think what to do.

An aerial photograph of a multi-lane highway interchange with several overpasses. A semi-transparent white rectangular box is positioned in the upper left corner, containing text. The background shows cars moving along the roads and some urban buildings in the distance.

If you're interested in implementation

Technical topics

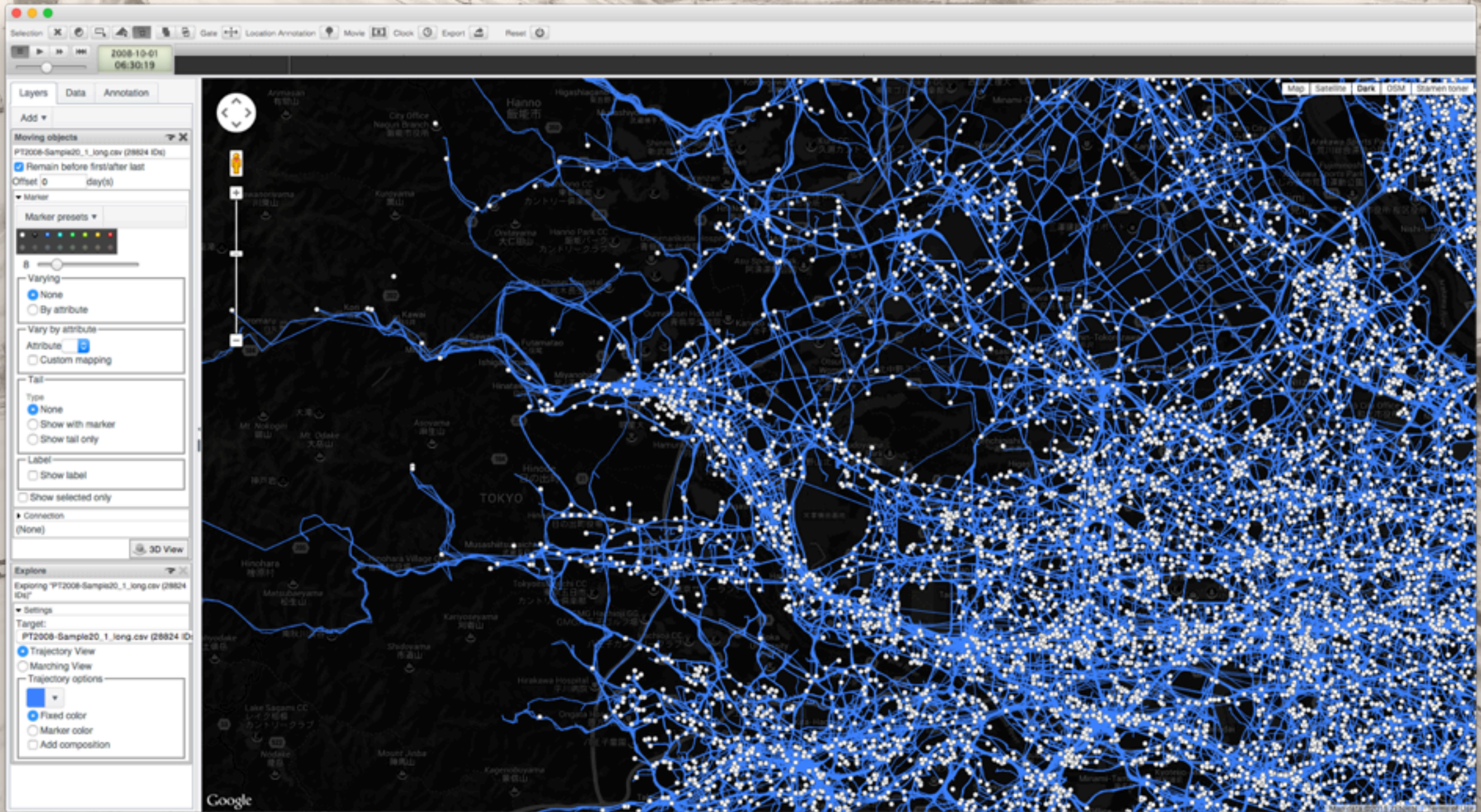
- WebGL based fast rendering
- Quick projection calculation
- Embedded movie generator
- 3D visualization
- OS independent

See:

<https://github.com/gyuque/MobmapChrome2/>

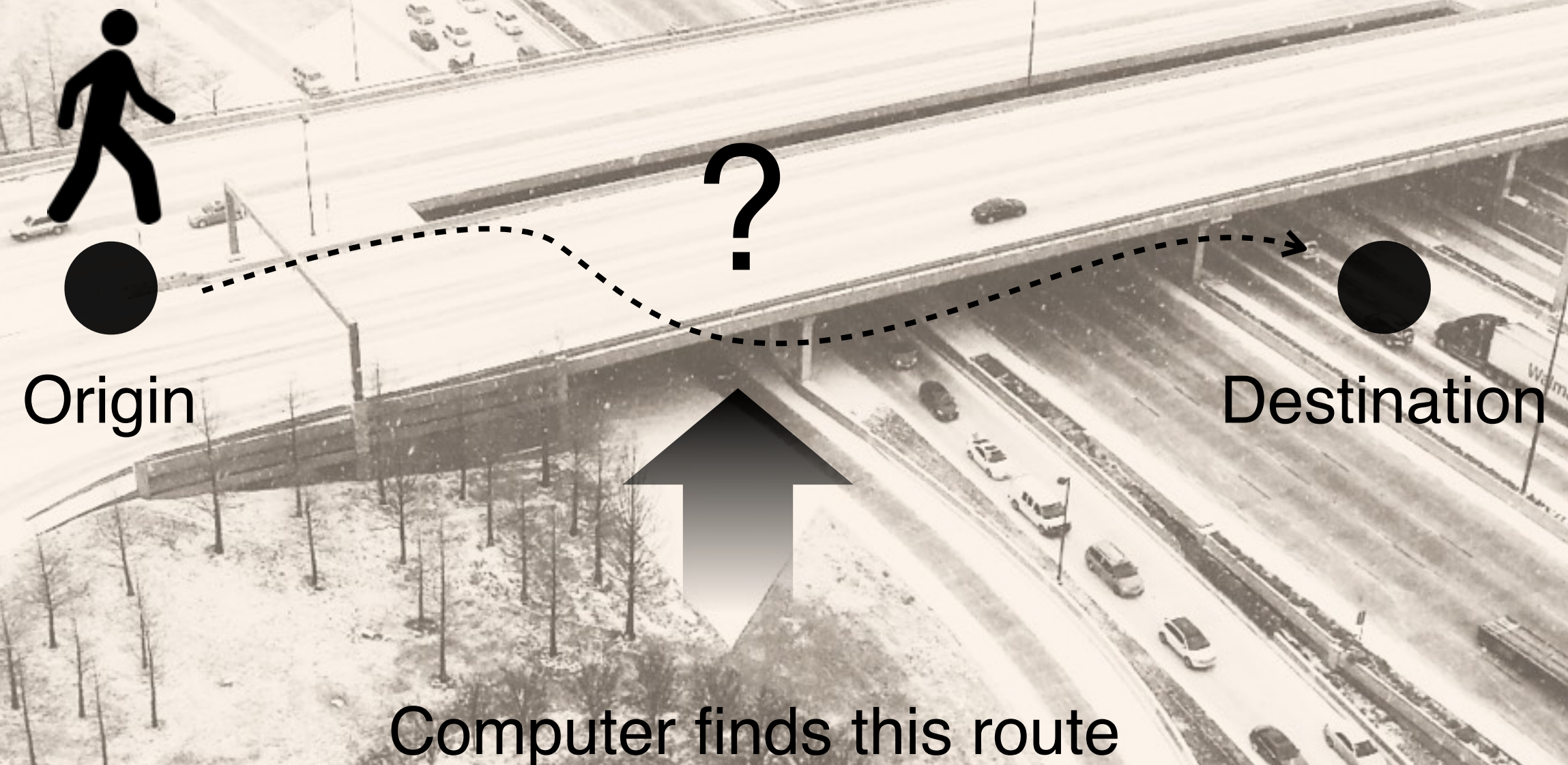
Example

PT on mobmap



About interpolated person trip

- PT originally has no route information.
- Infer route from origin to destination.



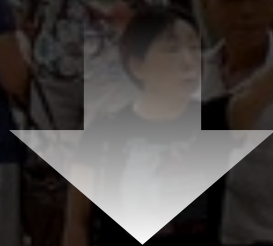
行先 Destination	番線 Track	記事 Remarks	列車名 Train	番号 Train No.	時刻 Time	行先 Destination	番線 Track	記事 Remarks
02 八戸・秋田	20番線	16両編成	Maxたにがわ	417号	15:58	越後湯沢	1番線	2階建て8両
14 仙台・山形・新庄	20番線	15両編成	Maxとき	333号	16:18	新潟	2番線	7両
26 仙台	20番線	16両編成	あさま	531				

3 CONDITIONS

TIME: FROM 5:00 AM TO 10:00 AM

ATTR: TRANSPORTATION MODE=TRAIN

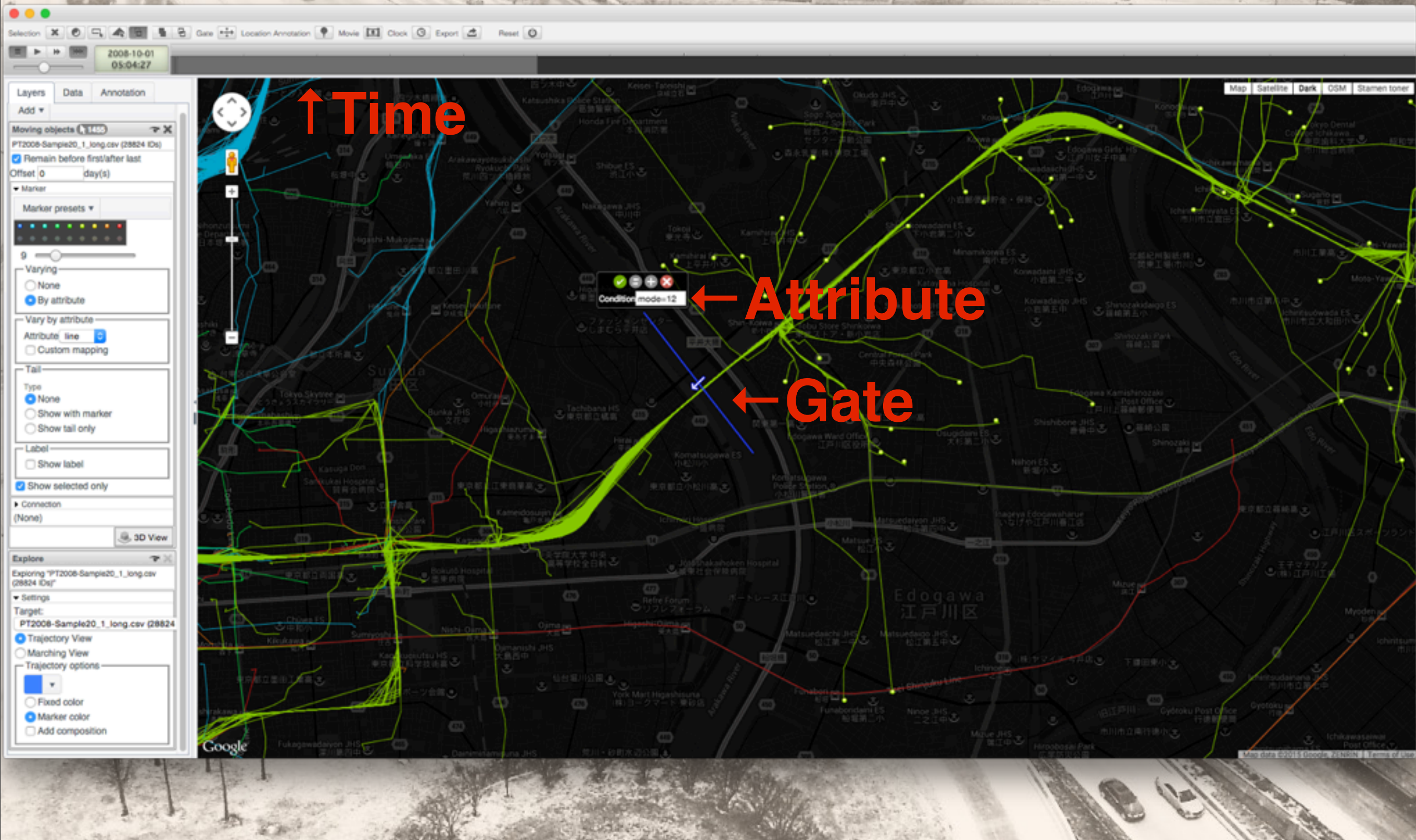
SPATIAL: GATE, DIRECTION=INBOUD



PEOPLE WHO USE THE TRAIN TO GO TO THEIR WORK PLACE

Photo from <https://flic.kr/p/99G8kP>

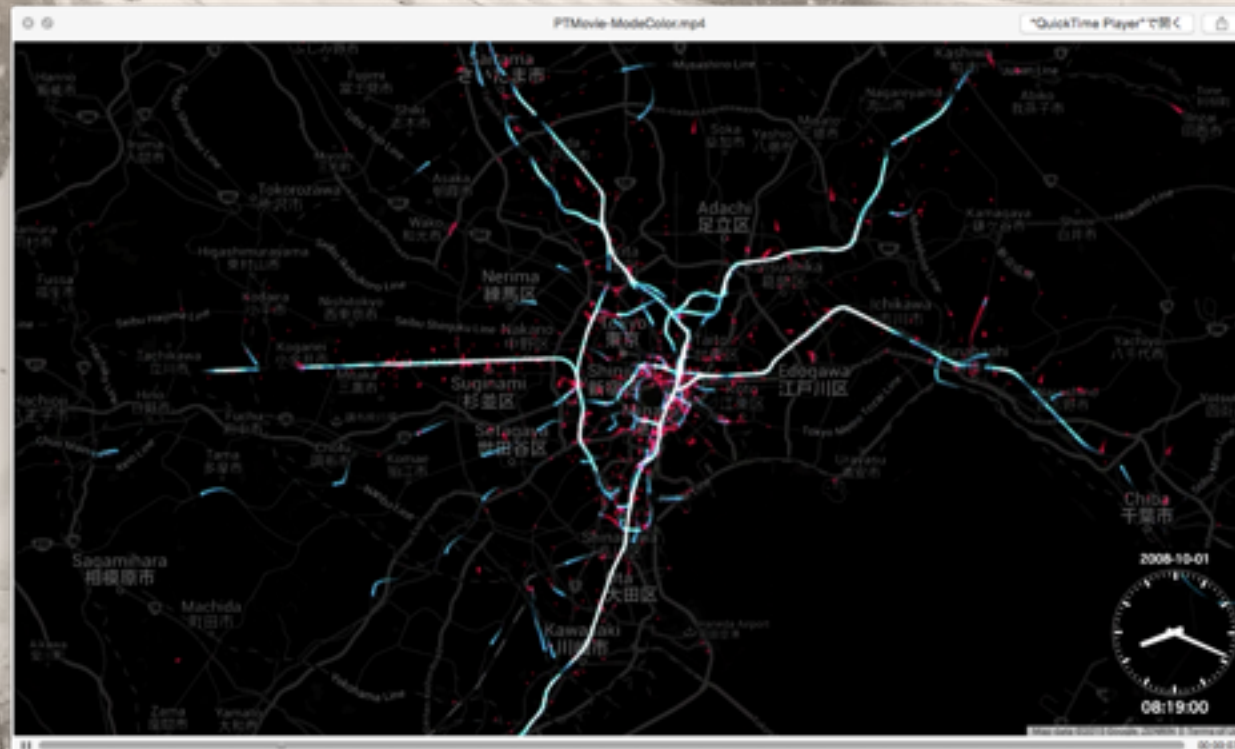
Select features



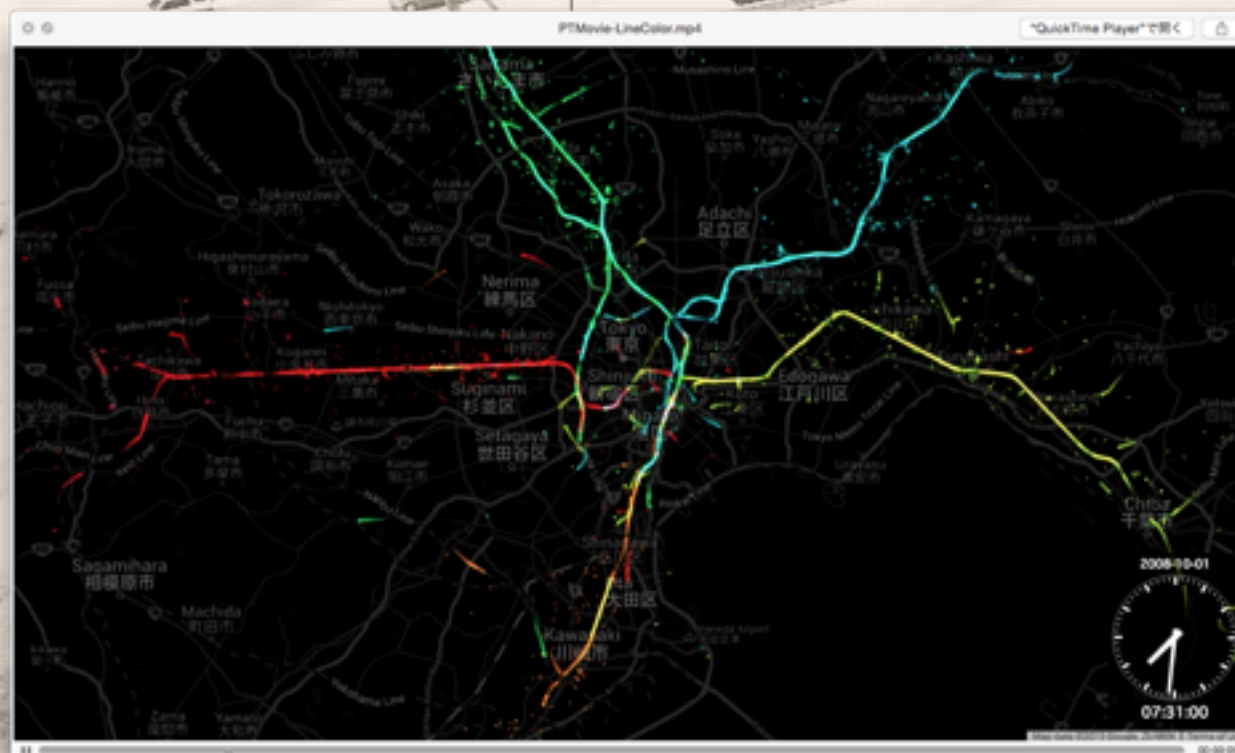


EXTRACTED PASSENGERS OF 5 MAJOR COMMUTER TRAIN ROUTES

Exported movies (samples)



**Visualized
Transportation modes**



**Visualized
Commuter train routes**

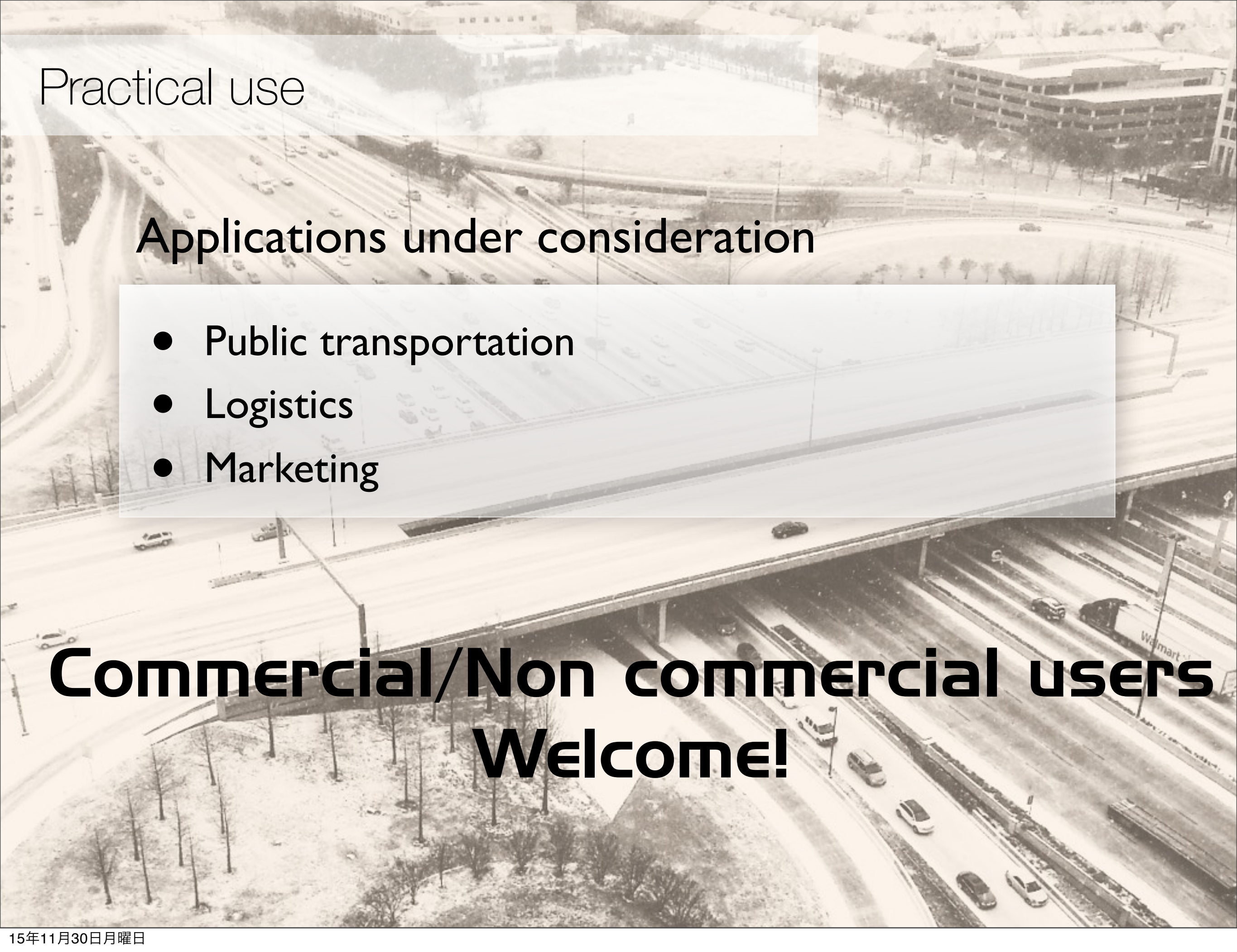
Practical use

Will traffic jam be eliminated in 2020?



http://txbiz.tv-tokyo.co.jp/wbs/news/post_99511/

Using mobmap to visualizing car probe data
(To find slow-down point)



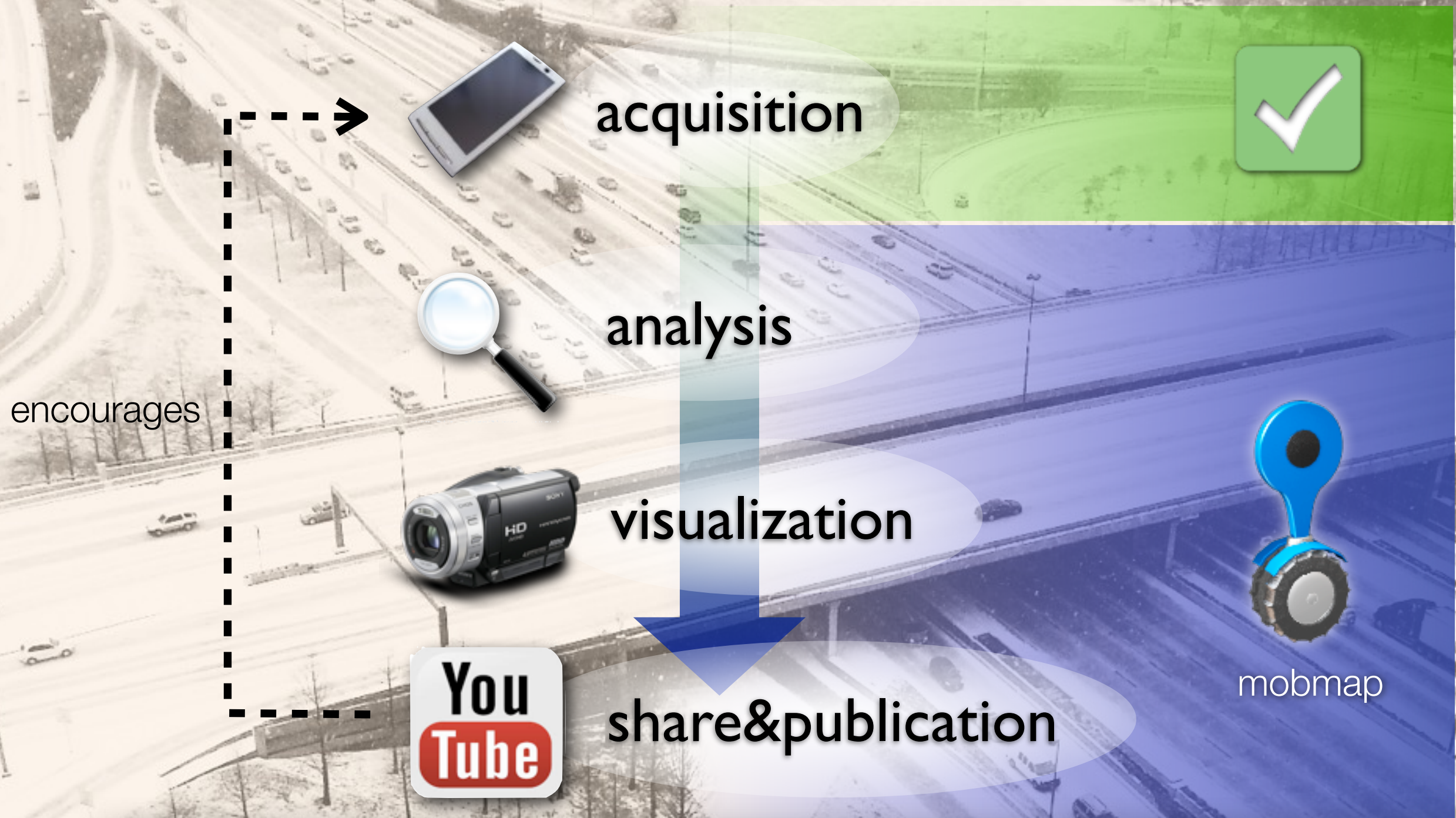
Practical use

Applications under consideration

- Public transportation
- Logistics
- Marketing

**Commercial/Non commercial users
Welcome!**

“Movement” Information Society



- Acquisition is the first step for movement information society
- Mobmap will provide second, third... steps

Thank you