Plot of estimated danger zone and heavy braking point within CommunityRoad by utilizing Big Probe Data
Case of Saitama Prefecture, Japan

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Introduction

- Estimate the Dangerous zone, utilization of “Near miss cases” point data.
- Analysis of the Dangerous zone focus on the community road.
- Find out the Dangerous zone near the primary school.
- By analyzing the “BIG DATA” will find out the unprecedented factor of traffic accidents.

[Near miss cases data (Heavy braking)]

- 3,000,000 point data in Total.
- USER : driver hit the brake more than 0.3G (10.58km/h/s).
- DATA COLLECTION PERIOD : 1 Year (1/1/2010~12/31/2010).
- DATA COLLECTION AREA : all of Japan.

Method

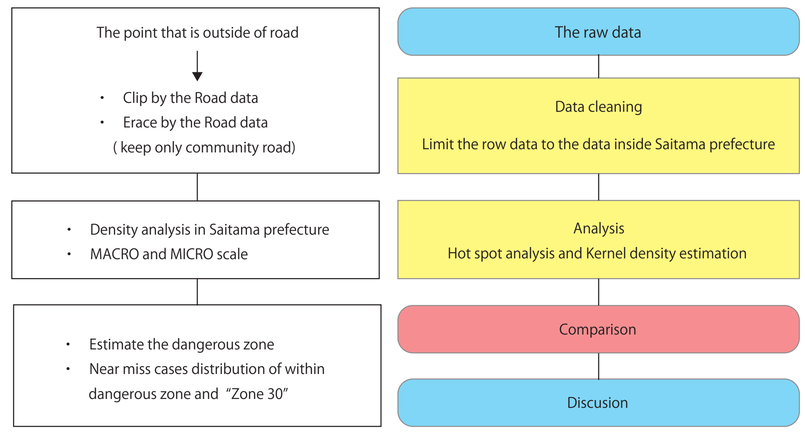
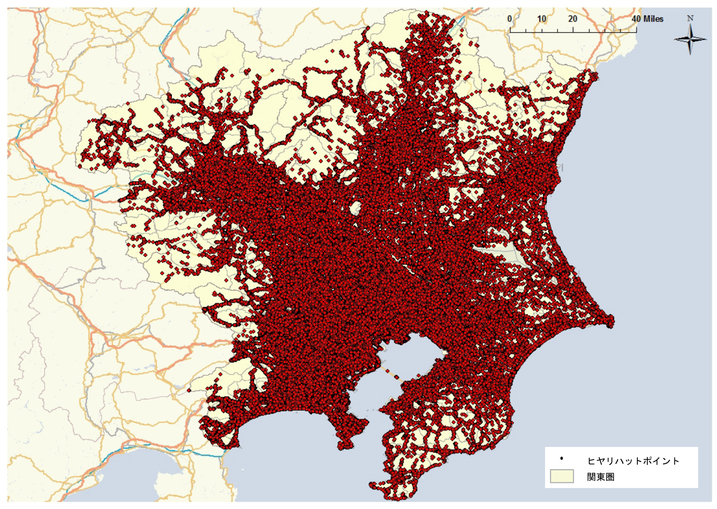


Fig.1 Method Flow

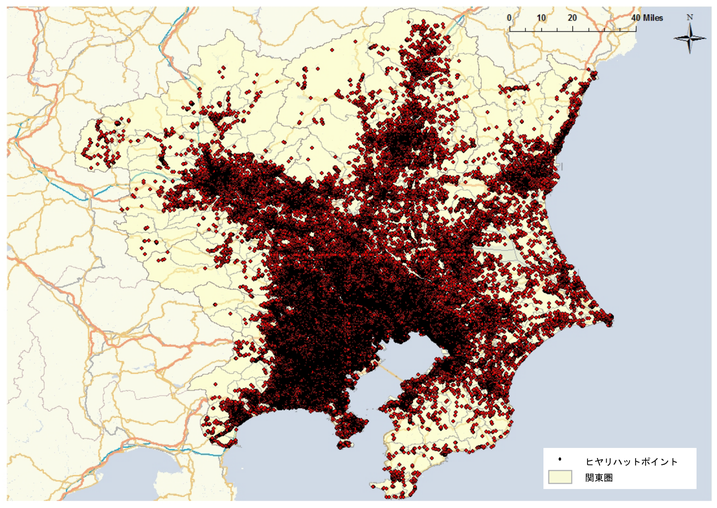
Data

Before data cleansing (Kanto area) : 1,210,000



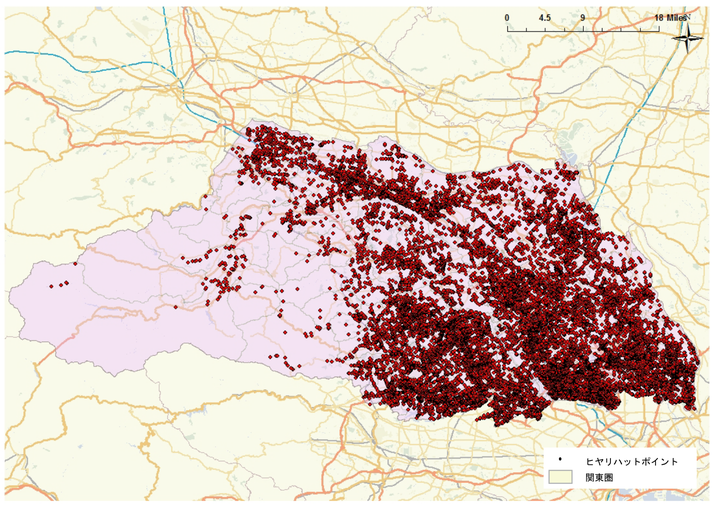
- Japan – Kanto area

Atfter data cleansing (Kanto area) : 390,000



- Erase points that is out of road and an accidental error of GPS
- Focus on the community road (excepting the highway, a national road, a prefectural road)

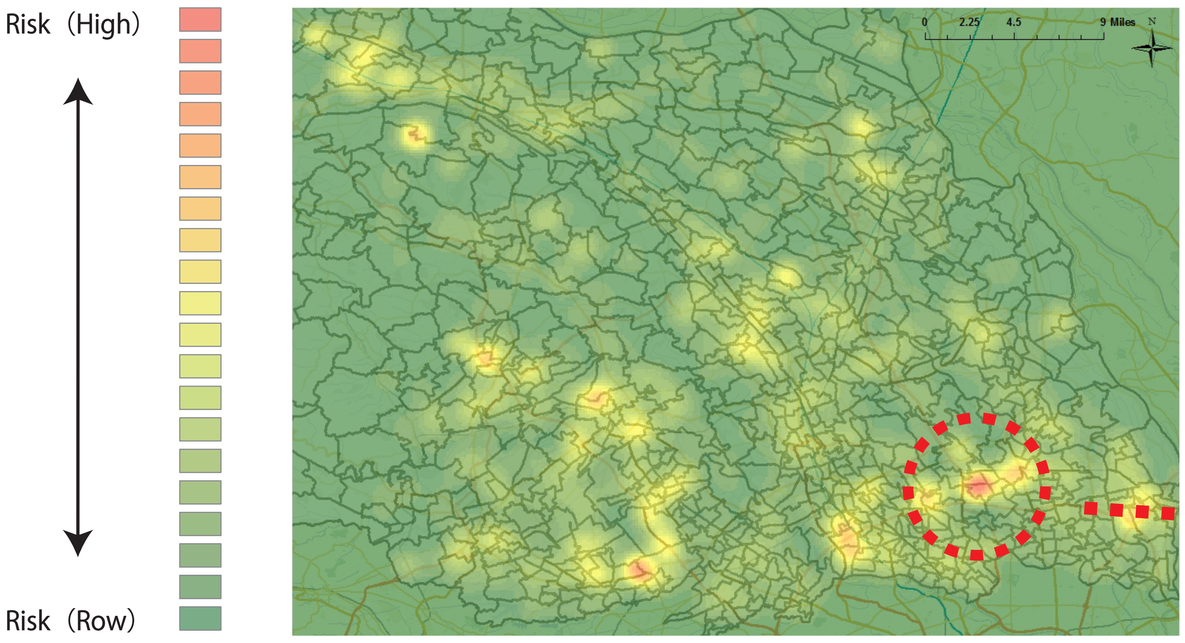
Atfter data cleansing (Saitama-pre area) : 90,000



- Kanto area – Saitama prefecture
- Saitama-pre has implemented many devise a countermeasure, so Verify the effects.

Results

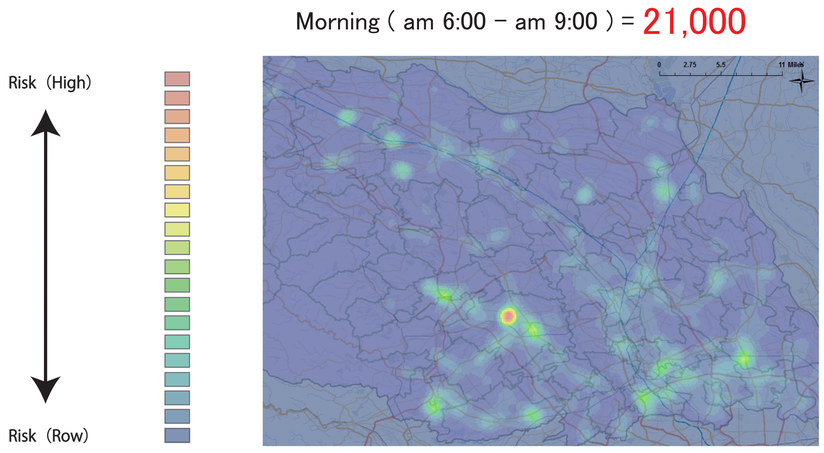
Kernel Density Estimation in the Saitama prefecture (School District)



- A cause is ″By-Pass Traffic″ in the area enclosered the traffic accidents.
- Heavy braking point was frequent on the high speed traffic road within the “Zone 30” .
- Need the accident preventive measures near the elementary school.

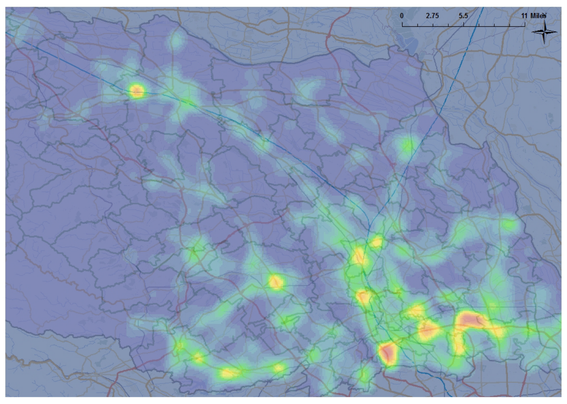
Analysis of Time zone

Morning (am 6:00 – am 9:00) = 21,000



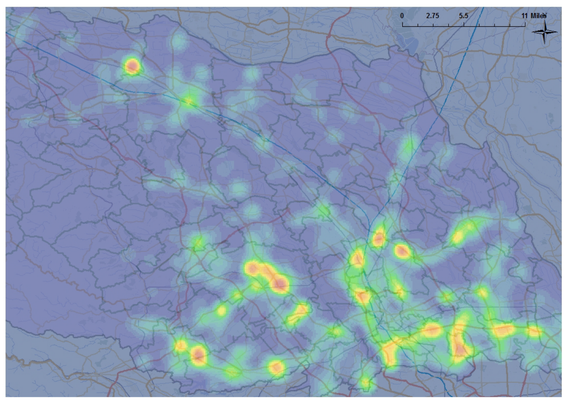
- Low in density for high frequency of points

Noon (am 11:00 – pm 1:00) = 14,000



- Concentrated in inner-city area

Night (pm 9:00 – am 0:00) = 12,000



- High in density for low frequency of points
- Concentrated in highway area

Discussion

- It is possible to estimate the dangerous zone in the community road.
- It can use the evaluation for the preventive measure, “zone30” and “community zone” etc.
- Use as standard evaluation for zone 30 and others are possible.
- The use of Probe Data is adaptable for all area within Japan.

[Further study]

- Use of all Probe Data.
- Statistical processing of cause of Near miss cases.
- Analysis of based on Bayesian Network.

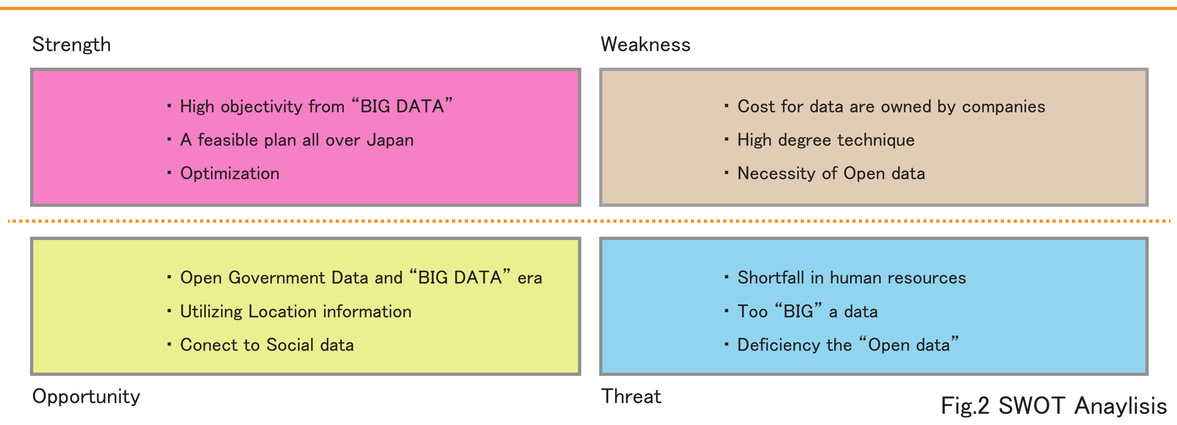


Fig.2 SWOT Anaylisis