TRB WEBINAR:
HIGHWAY PERFORMANCE MONITORING SYSTEM TRAVEL TIME DATA PROCESSING

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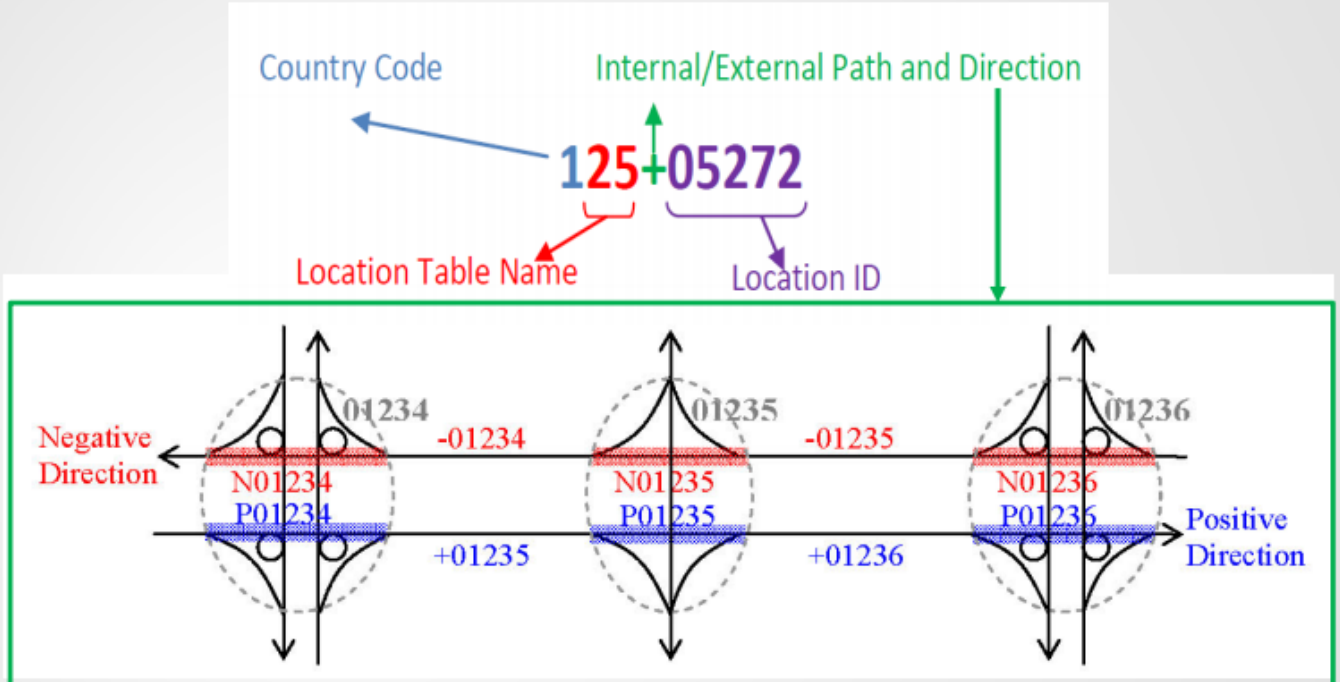
Moderated by Dan Seedah, PhD, PE

WEBINAR OUTLINE

- Describe NPMRDS
- Getting NPMRDS travel time data
- Quality of Travel Time Data : Local comparison
- NPMRDS TMC’s & LRS
- NPMRDS Local Repository
- HPMS Export Data Items Generation
- Travel Time Visualizations

TRAFFIC MESSAGE CHANNEL (TMC)

Traffic Message Channel (TMC) Code



"P" = Northbound or Westbound, internal segments
"N" = Southbound or Eastbound, internal segments
"+" = Northbound or Westbound, external segments
"-" = Southbound or Eastbound, external segments

U.S. Department of Transportation
Federal Highway Administration
Office of Highway Policy Information

NPMRDS - NATIONAL PERFORMANCE MANAGEMENT RESEARCH DATASET

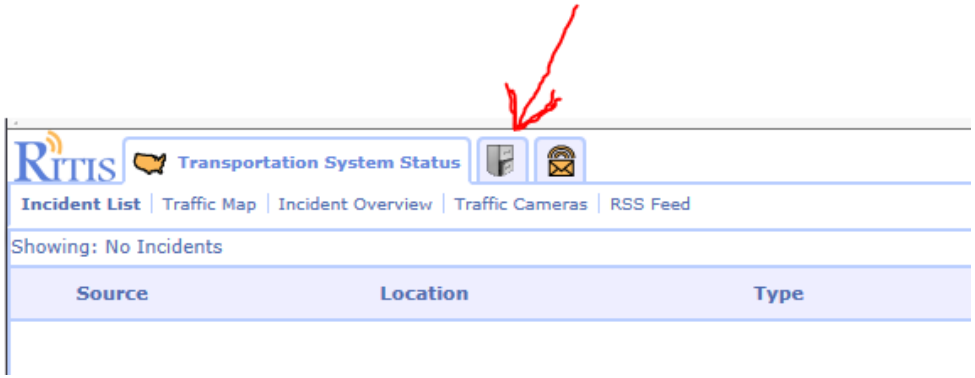
- Archived travel time and speed
- **5 Minute Interval**
- **Covers the NHS**
- **Two Vehicle Types : Truck and Passenger**

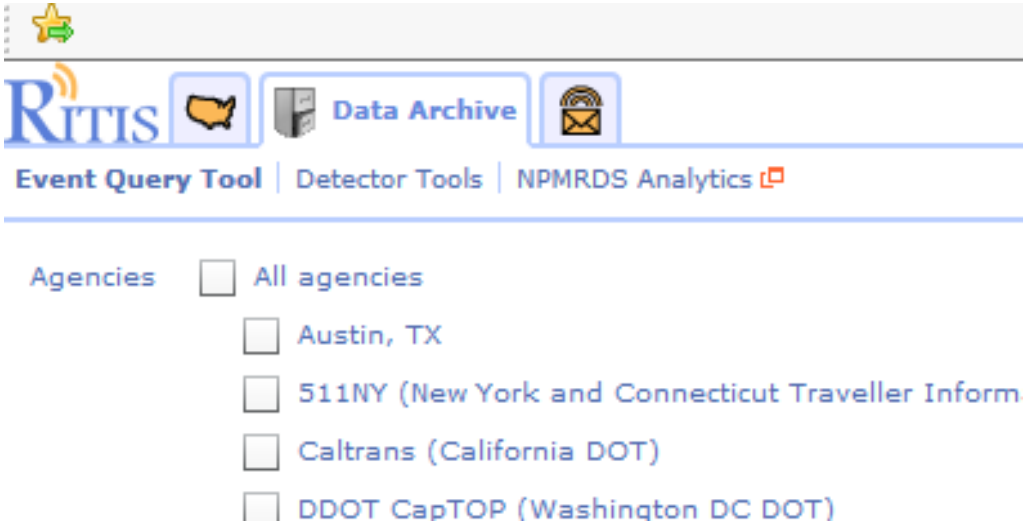
NPMRDS - NATIONAL PERFORMANCE MANAGEMENT RESEARCH DATASET

- TMC Shapefile available at https://npmrds.ritis.org
- TMC Identification table (.csv)
- Speed/travel time data table (.csv)

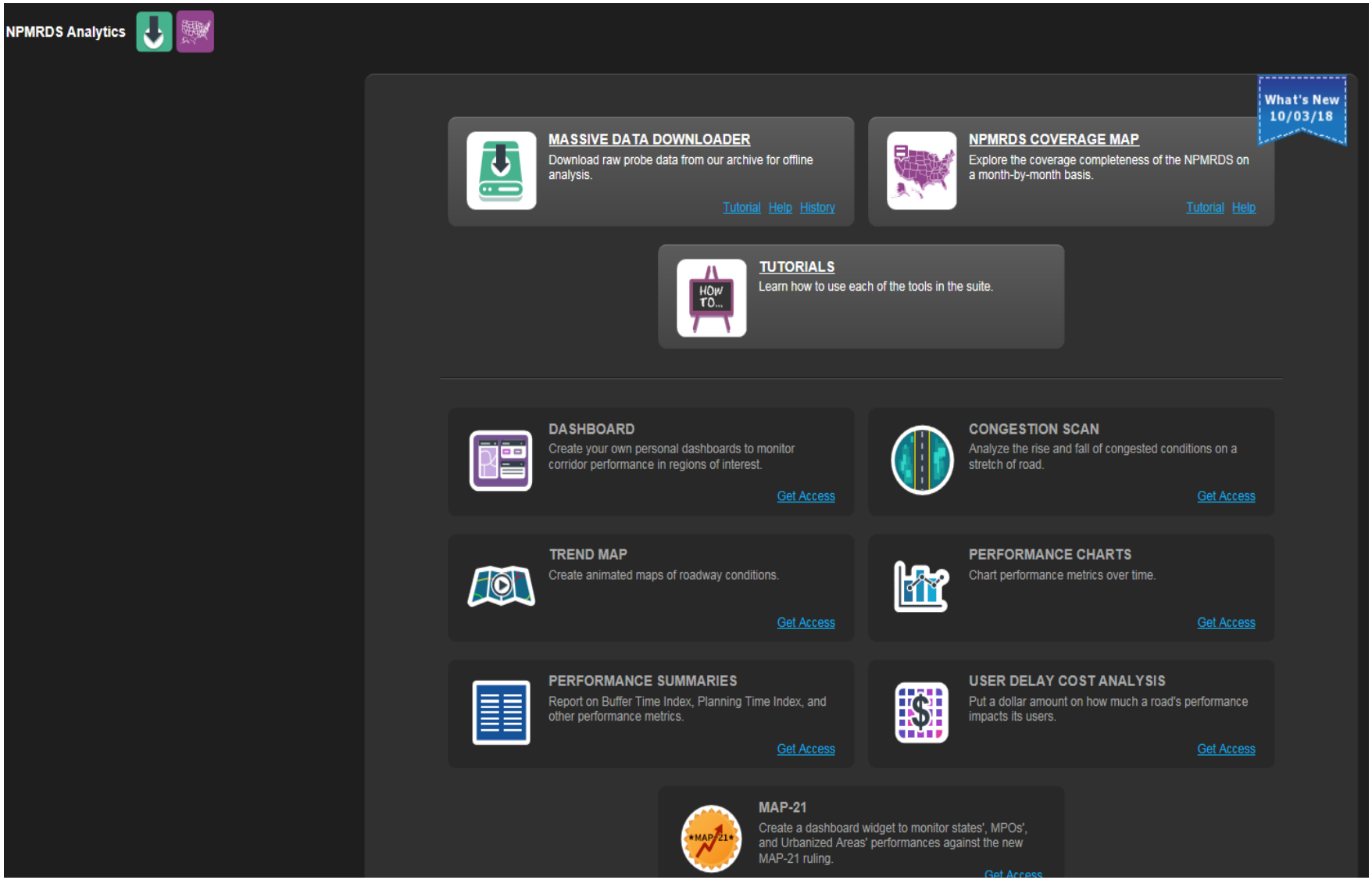
GETTING NPMRDS DATA

- **Sign up for an account at npmrds.ritis.org**

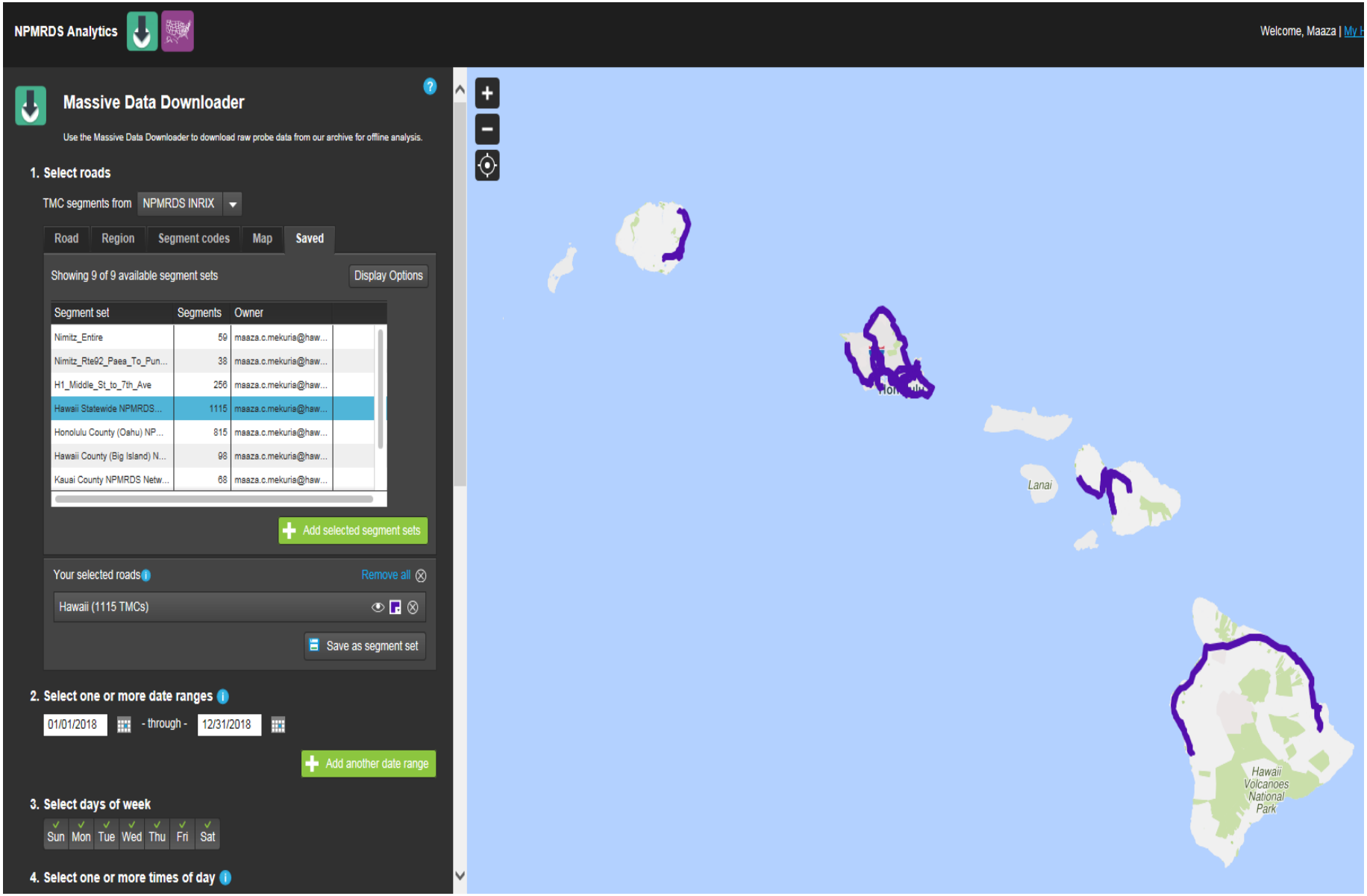




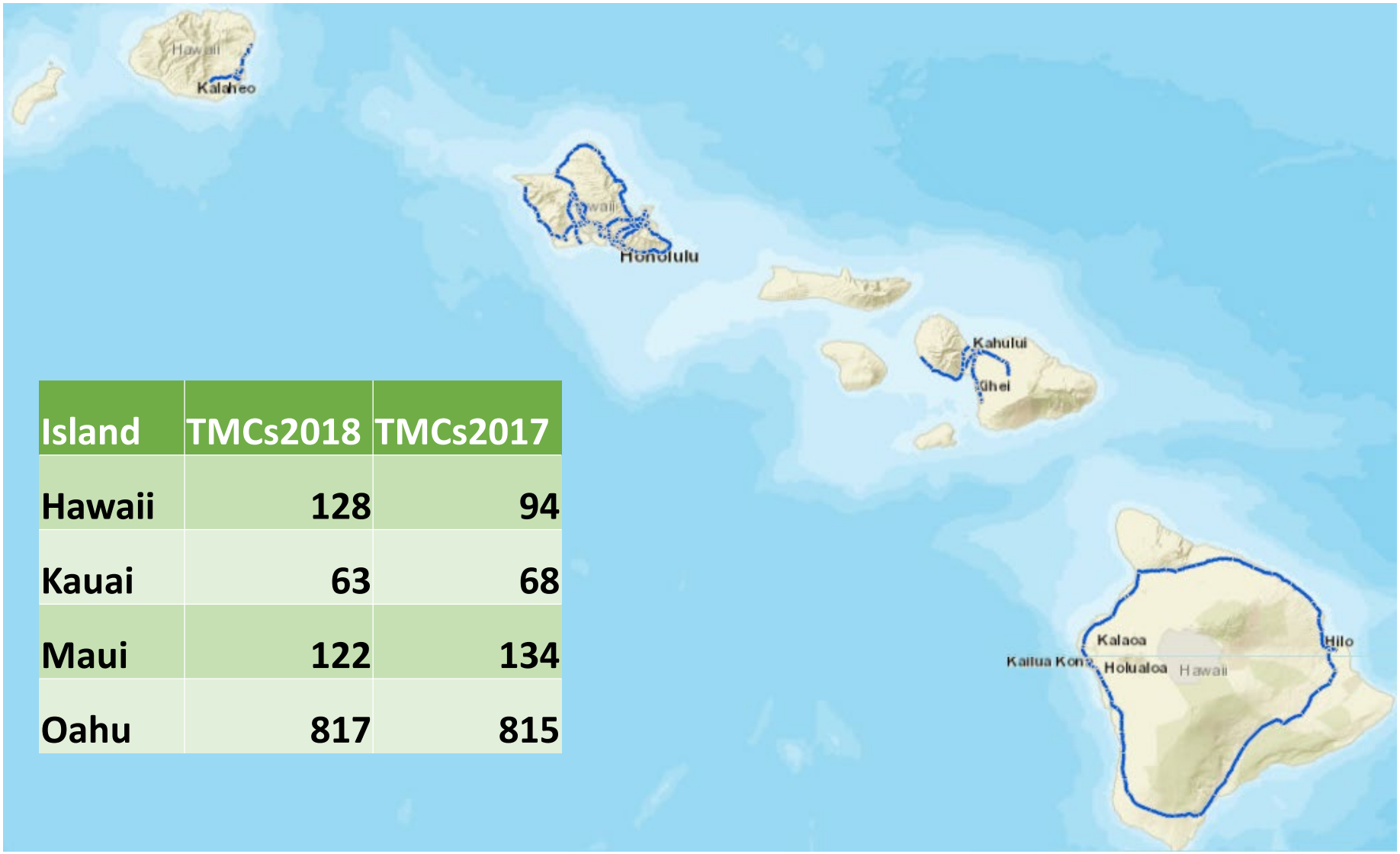
NPMRDS MASSIVE DATA DOWNLOADER



HAWAII NPMRDS COVERAGE MAP



HAWAIIAN ISLANDS NPMRDS COVERAGE MAP TMC COUNTS



Island	TMCs2018	TMCs2017
Hawaii	128	94
Kauai	63	68
Maui	122	134
Oahu	817	815

HIGHWAY PERFORMANCE MONITORING SYSTEM (HPMS) AND TRAFFIC MESSAGE CHANNEL (TMC) LINK FILE

No.	TMC Fields	No.	HPMS Fields
1	tmc	20	f_system
2	road	21	urban_code
3	direction	22	faciltype
4	intersection	23	structype
5	state	24	thrulanes
6	county	25	route_numb
7	zip	26	route_sign
8	start_latitude	27	route_qual
9	start_longitude	28	altrtename
10	end_latitude	29	aadt
11	end_longitude	30	aadt_singl
12	miles	31	aadt_combi
13	road_order	32	nhs
14	timezone_name	33	nhs_pct[1]
15	type	34	strhnt_typ
16	country	35	strhnt_pct[1]
17	tmclinear	36	truck
18	frc	37	isprimary[1]
19	border_set[1]	38	active_start_date[1]
		39	active_end_date[1]

[Ref. FHWA]

SPEED/TRAVEL TIME DATA FILE

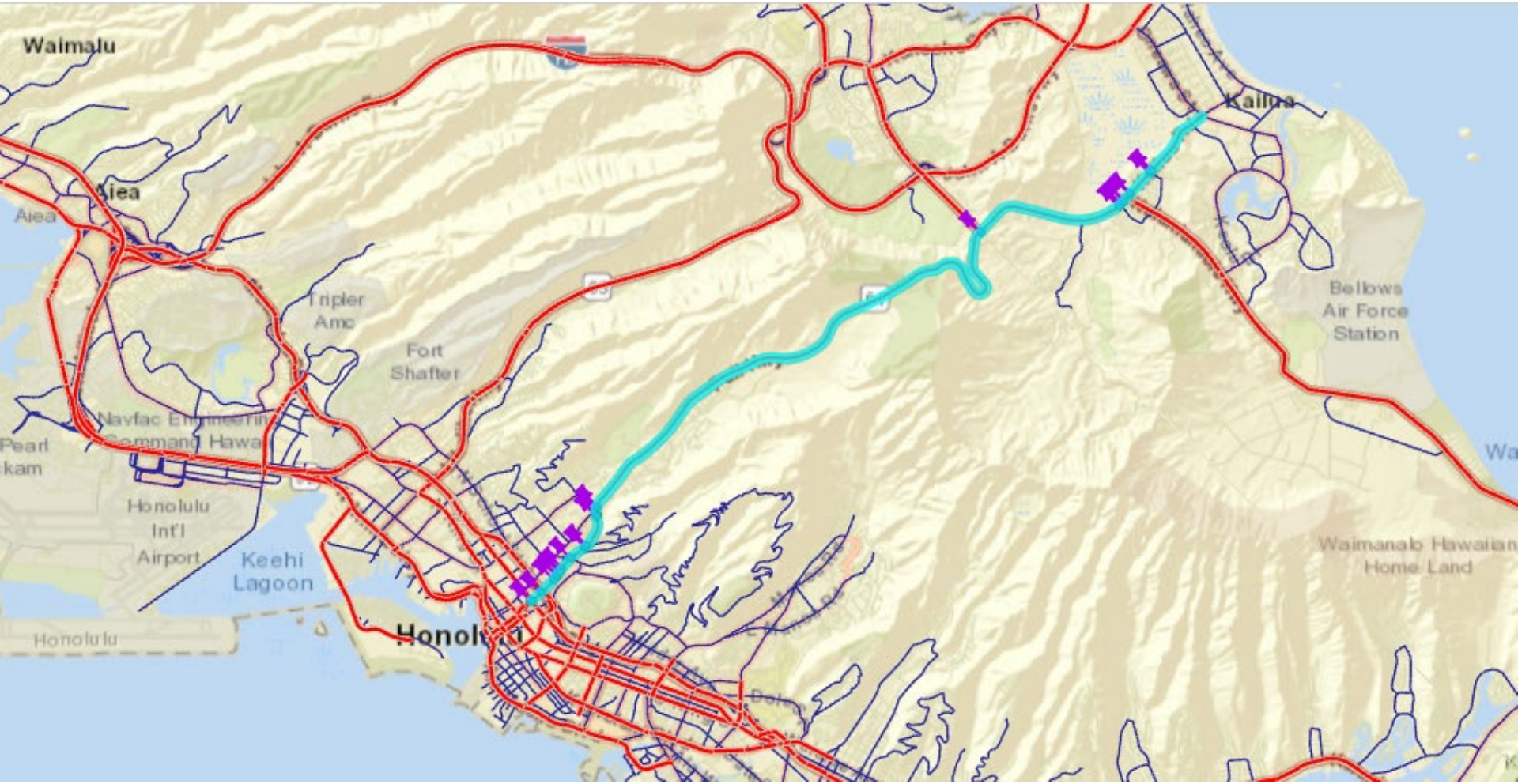
Field Name	Description
datasource	Indicates all vehicles, passenger vehicles, or trucks.
tmc_code	The unique 9-digit value identifying the TMC segment.
measurement_tstamp	Date and time of data recorded
speed	Observed average speed in mph for a time interval
average_speed	The historical average speed for the roadway segment for that hour of the day and day of the week in miles per hour.
reference_speed	The calculated "free flow" mean speed for the roadway segment in miles per hour. This attribute is calculated based upon the 85th-percentile point of the observed speeds on that segment for all time periods.
travel_time	Corresponds to the “speed” field; in minutes (or seconds)
data_density	Data density indicator, where: A = 1 to 4 reporting vehicles , B = 5 to 9 reporting vehicles, C = 10 or more reporting vehicles

[Ref. FHWA]

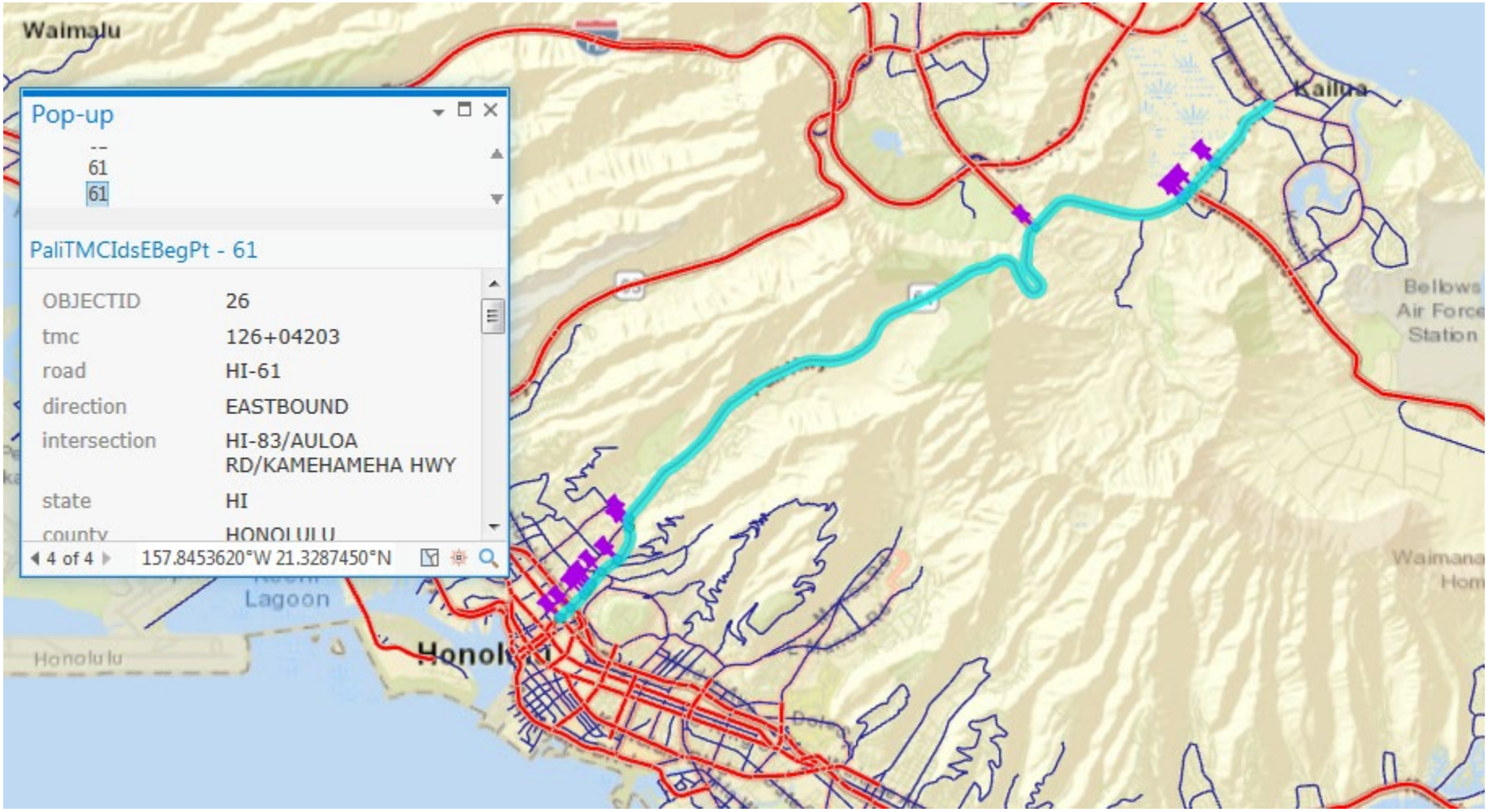
TRAFFIC MESSAGE CHANNEL (TMC)

tmc	road	direction	intersection	state	county	zip	start_latitude	start_longitude	end_latitude
126-04198	HI-61	SOUTHBOUND	HI-98/S VINEYARD BLVD	HI	HONOLULU	96813	21.314350	-157.854940	21.312960
126-04198	HI-61	WESTBOUND	HI-98/S VINEYARD BLVD	HI	HONOLULU	96813	21.314205	-157.855045	21.312972
126-04199	HI-61	SOUTHBOUND	I-H1/LUNALILO FWY	HI	HONOLULU	96813	21.317600	-157.851980	21.316270
126-04199	HI-61	WESTBOUND	I-H1/LUNALILO FWY	HI	HONOLULU	96813	21.317743	-157.851846	21.316651
126-04200	HI-61	SOUTHBOUND	PACIFIC HEIGHTS RD/S KUAKINI ST	HI	HONOLULU	96813	21.318360	-157.851360	21.317890
126-04200	HI-61	WESTBOUND	PACIFIC HEIGHTS RD/S KUAKINI ST	HI	HONOLULU	96813	21.320002	-157.849991	21.317859
126-04201	HI-61	SOUTHBOUND	PAUOA RD	HI	HONOLULU	96813	21.326010	-157.845360	21.319880
126-04201	HI-61	WESTBOUND	PAUOA RD	HI	HONOLULU	96813	21.325651	-157.845343	21.320059
126-04202	HI-61	SOUTHBOUND	NUUANU AVE/WYLLIE ST	HI	HONOLULU	96817	21.374270	-157.781530	21.328720
126-04202	HI-61	WESTBOUND	NUUANU AVE/WYLLIE ST	HI	HONOLULU	96817	21.374204	-157.781560	21.328653
126-04203	HI-61	SOUTHBOUND	HI-83/AULOA RD/KAMEHAMEHA HWY	HI	HONOLULU	96734	21.379630	-157.757310	21.375740
126-04203	HI-61	WESTBOUND	HI-83/AULOA RD/KAMEHAMEHA HWY	HI	HONOLULU	96734	21.379454	-157.757572	21.375552
126+04199	HI-61	NORTHBOUND	I-H1/LUNALILO FWY	HI	HONOLULU	96813	21.312810	-157.856380	21.314270
126+04199	HI-61	EASTBOUND	I-H1/LUNALILO FWY	HI	HONOLULU	96813	21.312818	-157.856356	21.314295
126+04200	HI-61	NORTHBOUND	PACIFIC HEIGHTS RD/S KUAKINI ST	HI	HONOLULU	96813	21.316440	-157.852720	21.317080
126+04200	HI-61	EASTBOUND	PACIFIC HEIGHTS RD/S KUAKINI ST	HI	HONOLULU	96813	21.316432	-157.852701	21.317163
126+04201	HI-61	NORTHBOUND	PAUOA RD	HI	HONOLULU	96813	21.317780	-157.851700	21.318300
126+04201	HI-61	EASTBOUND	PAUOA RD	HI	HONOLULU	96813	21.317776	-157.851642	21.320012
126+04202	HI-61	NORTHBOUND	NUUANU AVE/WYLLIE ST	HI	HONOLULU	96813	21.321870	-157.847440	21.327330
126+04202	HI-61	EASTBOUND	NUUANU AVE/WYLLIE ST	HI	HONOLULU	96813	21.322072	-157.847135	21.327093
126+04203	HI-61	NORTHBOUND	HI-83/AULOA RD/KAMEHAMEHA HWY	HI	HONOLULU	96817	21.328680	-157.845400	21.374910
126+04203	HI-61	EASTBOUND	HI-83/AULOA RD/KAMEHAMEHA HWY	HI	HONOLULU	96817	21.328745	-157.845362	21.374874
126+04204	HI-61	NORTHBOUND	ULUHALA ST	HI	HONOLULU	96734	21.374910	-157.780740	21.379560
126+04204	HI-61	EASTBOUND	ULUHALA ST	HI	HONOLULU	96734	21.374964	-157.780707	21.379380
126+04205	HI-61	NORTHBOUND	HI-72/KALANIANAOLE HWY/ULUKAHIKI ST	HI	HONOLULU	96734	21.379560	-157.757230	21.380140

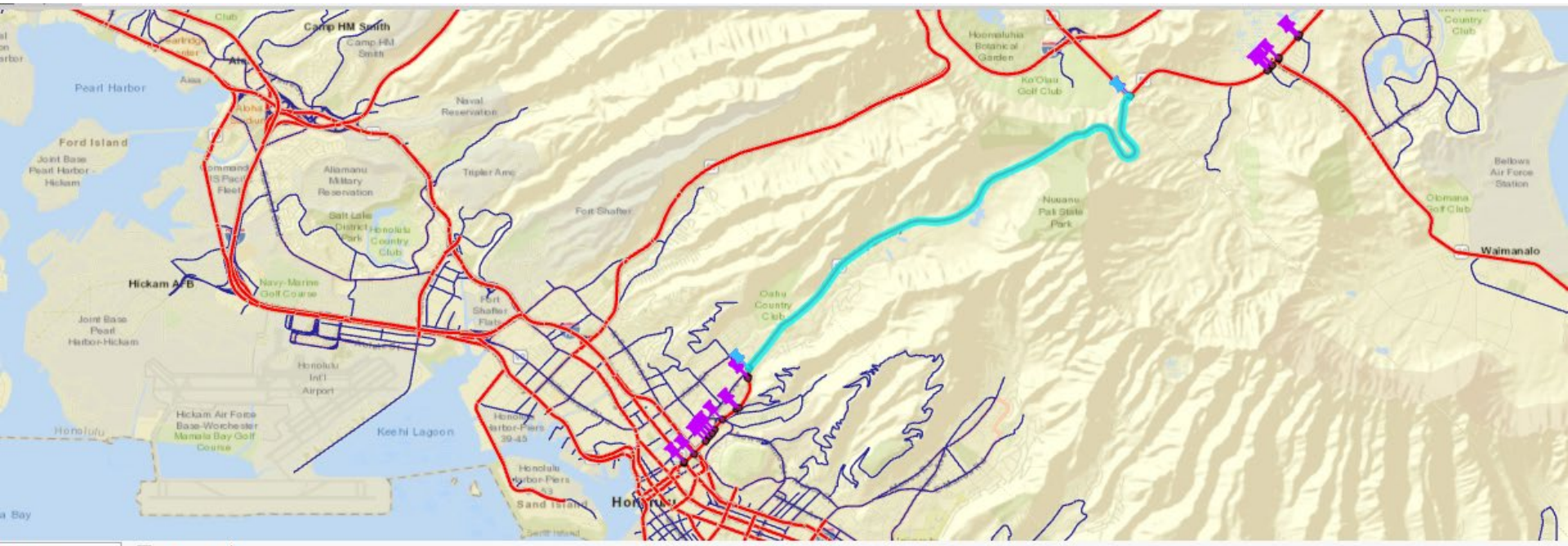
TRAFFIC MESSAGE CHANNEL (TMC) & LINEAR REFERENCING



TRAFFIC MESSAGE CHANNEL (TMC) & LINEAR REFERENCING



TRAFFIC MESSAGE CHANNEL (TMC) & LINEAR REFERENCING



Hawaii | TMC_IdsEBegPt | PaliTMCIdsEBegPt | PaliTMCIdsEBegPtLrs | PaliTMCIdsEBegPtLrsEvt

Field: Add Delete Calculate | Selection: Zoom To Switch Clear Delete Copy | Highlighted: Unselect Reselect Zoom To Switch Clear Delete

OBJECTID	Route	MPost	Distance	tmc	road	direction	intersection	state	county	zip	start_latitude	start
93	61	1.374761	-0.000027	126+04203	HI-61	EASTBOUND	HI-83/AULOA RD/KA...	HI	HONOLULU	96817	21.328745	-
91	61	7.660064	-0.000024	126P04203	HI-61	EASTBOUND	HI-83/AULOA RD/KA...	HI	HONOLULU	96734	21.374874	

R - PROCESSING

CONNECT TO DATABASE

```
# R Helper functions ==========================================================
# Install and load all packages provided from a character vector
load_pkgs = function(pkgs) {
  new_pkgs = pkgs[!(pkgs %in% installed.packages()[ , 'Package'])]
  if (length(new_pkgs) > 0) install.packages(new_pkgs)
  invisible(lapply(pkgs, function(x)
    suppressMessages(library(x, character.only = TRUE)))
)
}
```

[Adapted from FHWA - CPI Manual 2001]

CONNECT TO DATABASE

- # list of helpful packages to load
- libs <- c("rgdal","spatial","MASS","dplyr","tidyr","cluster","ggmap","tmap","shiny","data.table","lubridate","RSQLite","maptools","sp","spatial","DBI","RODBC")

[Adapted from FHWA - CPI Manual 2001]

CONNECT TO DATABASE AND READ NPMRDS DATA

- dbCon <- dbConnect(SQLite(), dbname = "HPMS/Traffic/NPMRDS/rnpmrds.sqlite", loadable.extensions = TRUE, cache_size = NULL, synchronous = "off",flags = SQLITE_RW, vfs = NULL)
- paliebwdpre2pospm <- as.data.table(dbReadTable(dbCon, "paliebwdpre2pospm", row.names=NULL, check.names = TRUE))

[Adapted from FHWA - CPI Manual 2001]

PERIOD LEVEL TRAVEL TIME DATA

 # Generate the period level travel time data

- Select the HPMS distinct period data using the time stamp (TStamp Field) for trucks and all vehicles.

 # Weekday AM

- ttam17 <- NPMRDSTT[(wday(TStamp)>1 & wday(TStamp)<7) & (hour(TStamp) >= 6 & hour(TStamp) <10)]
- ttrkam17 <- NPMRDSTTRK[(wday(TStamp)>1 & wday(TStamp)<7) & (hour(TStamp) >= 6 & hour(TStamp) <10)]

 # Weekday Midday

- ttmid17 <- NPMRDSTT[(wday(TStamp)>1 & wday(TStamp)<7) & (hour(TStamp) >= 10 & hour(TStamp) <16)]
- trkmid17 <- NPMRDSTTRK[(wday(TStamp)>1 & wday(TStamp)<7) & (hour(TStamp) >= 10 & hour(TStamp) <16)]

[Adapted from FHWA - CPI Manual 2001]

PERIOD LEVEL TRAVEL TIME DATA

 # Generate the period level travel time data

 # Weekday PM

- ttpm17 <- NPMRDSTT[(wday(TStamp)>1 & wday(TStamp)<7) & (hour(TStamp) >= 16 & hour(TStamp) <20)]
- trkpm17 <- NPMRDSTTRK[(wday(TStamp)>1 & wday(TStamp)<7) & (hour(TStamp) >= 16 & hour(TStamp) <20)]

 # Weekend

- ttwkend17 <- NPMRDSTT[!(wday(TStamp)>1 & wday(TStamp)<7) & (hour(TStamp) >= 6 & hour(TStamp) <20)]
- trkwkend17 <- NPMRDSTTRK[!(wday(TStamp)>1 & wday(TStamp)<7) & (hour(TStamp) >= 6 & hour(TStamp) <20)]

 # Weekday Nite (Truck Only)

- trknite17 <- NPMRDSTTRK[(wday(TStamp)>1 & wday(TStamp)<7) & !(hour(TStamp) >= 6 & hour(TStamp) <20)]

[Adapted from FHWA - CPI Manual 2001]

GENERATE PERCENTILE VALUES IN R

 # Generate the 50th, 80th , 95th percentile speed and travel time summary data for each period by TMC

 # Weekday AM

- ttamq17 <- ttam17[,.(ttq50=quantile(TTSecs,probs=0.5), ttq80=quantile(TTSecs,probs=0.8), spq50=quantile(speed,probs=0.5), spq80=quantile(speed,probs=0.8), rspq50=quantile(RefSpd,probs=0.5,na.rm=TRUE)), by=tmc_code]
- trkamq17 <- trkam17[,.(ttq50=quantile(TTSecs,probs=0.5), ttq95=quantile(TTSecs,probs=0.95), spq50=quantile(speed,probs=0.5), spq95=quantile(speed,probs=0.95), rspq50=quantile(RefSpd,probs=0.5,na.rm=TRUE)), by=tmc_code]

[Adapted from FHWA - CPI Manual 2001]

CONNECT TO DATABASE IN R

 # Generate the 50th, 80th, 95th percentile speed and travel time summary data for each period by TMC

 # Weekday Midday

- ttmidq17 <- ttmid17[, .(ttq50=quantile(TTSecs,probs=0.5), ttq80=quantile(TTSecs,probs=0.8), spq50=quantile(speed,probs=0.5), spq80=quantile(speed,probs=0.8), rspq50=quantile(RefSpd,probs=0.5,na.rm=TRUE)), by=tmc_code]
- trkmidq17 <- trkmid17[, .(ttq50=quantile(TTSecs,probs=0.5), ttq95=quantile(TTSecs,probs=0.95), spq50=quantile(speed,probs=0.5), spq95=quantile(speed,probs=0.95), rspq50=quantile(RefSpd,probs=0.5,na.rm=TRUE)), by=tmc_code]

[Adapted from FHWA - CPI Manual 2001]

TRAVEL TIME PROCESSING IN R

 # Weekday PM

- ttpmq17 <- ttpm17[, .(ttq50=quantile(TTSecs,probs=0.5), ttq80=quantile(TTSecs,probs=0.8),spq50=quantile(speed,probs=0.5), spq80=quantile(speed,probs=0.8), rspq50=quantile(RefSpd,probs=0.5,na.rm=TRUE)), by=tmc_code]
- trkpmq17 <- ttpm17[, .(ttq50=quantile(TTSecs,probs=0.5), ttq95=quantile(TTSecs,probs=0.95),spq50=quantile(speed,probs=0.5), spq95=quantile(speed,probs=0.95), rspq50=quantile(RefSpd,probs=0.5,na.rm=TRUE)), by=tmc_code]

TRAVEL TIME PROCESSING IN R

 # Weekend

- ttwkendq17 <- ttwkend17 [, .(ttq50 = quantile(TTSecs,probs=0.5), ttq80=quantile(TTSecs,probs=0.8), spq50=quantile(speed,probs=0.5), spq80=quantile(speed,probs=0.8), rspq50=quantile(RefSpd,probs=0.5,na.rm=TRUE)), by=tmc_code]
- trkwkendq17 <- trkwkend17 [, .(ttq50 = quantile(TTSecs,probs=0.5), ttq95=quantile(TTSecs,probs=0.95), spq50=quantile(speed,probs=0.5), spq95=quantile(speed,probs=0.95), rspq50=quantile(RefSpd,probs=0.5,na.rm=TRUE)), by=tmc_code]

 # Weekday Nite (Truck Only)

- trkniteq17 <- trknite17[, .(ttq50=quantile(TTSecs,probs=0.5), ttq95=quantile(TTSecs,probs=0.95),spq50=quantile(speed,probs=0.5), spq95=quantile(speed,probs=0.95), rspq50=quantile(RefSpd,probs=0.5,na.rm=TRUE)), by=tmc_code]

WRITE TO SQLITE DATABASE FROM R

 # Write result tables into database

- dbWriteTable(dbCon,"HINPMRDSTTAMQ17", ttamq17)
- dbWriteTable(dbCon,"HINPMRDSTTMIDQ17", ttmidq17)
- dbWriteTable(dbCon,"HINPMRDSTTPMQ17", ttpmq17)
- dbWriteTable(dbCon,"HINPMRDSTRKAMQ17", trkamq17)
- dbWriteTable(dbCon,"HINPMRDSTRKMIDQ17", trkmidq17)
- dbWriteTable(dbCon,"HINPMRDSTRKPMIDQ17", trkpmq17)

DATABASE PM3 MEASURE GENERATION

NPMRDS' FOUR PM3 MEASURES

Reliability

- Percent of person-miles traveled on the Interstate that are reliable
- Percent of person-miles traveled on the non-Interstate NHS that are reliable

Freight

- Truck Travel Time Reliability (TTTR) Index

CMAQ Peak Hour Excessive Delay (PHED)

- Annual Hours of PHED Per Capita

SUMMARY OF PM3 TRAVEL TIME BASED MEASURES

Summary of Travel Time Based 4 Measures

Measure	Applicability	If NPMRDS Used	Metrics to HPMS by 6/15/2018	State to Set Targets by 5/20/2018
Reliability – Interstate	Mainline Interstate	"All Vehicle", 15-minute	LOTTR (=80th TT/50th TT)	2-year, 4 -year
Reliability – Non-Interstate NHS	Mainline non-Interstate NHS	"All Vehicle", 15-minute	LOTTR (=80th TT/50th TT)	4-year
Freight	Mainline Interstate	"Truck" (use "All Vehicle" if "Truck" not available), 15-minute	TTTR = (95th TT/50th TT)	2-year, 4 -year
PHED	Mainline NHS in applicable Urbanized Area	"All Vehicle", 15-minute	Total PHED in person-hours	4-year

U.S. Department of Transportation
Federal Highway Administration
Office of Highway Policy Information

NPMRDS LINK TABLE AND PM3 RESULT TABLES

- **Create table HINPMRDS2017AMPK as**
- SELECT t1.tmc_code, t1.ttq50 TT_AMP50PCT , t1.ttq80 TT_AMP80PCT , round(t1.ttq80/(t1.ttq50),2) LOTTR_AMP , t2.Tmc, t2.TmcType, t2.RoadNumber, t2.RoadName, t2.IsPrimary, t2.FirstName, t2.TmcLinear, t2.Country, t2.State, t2.County, t2.Zip, t2.Direction, t2.StartLat, t2.StartLong, t2.EndLat, t2.EndLong, t2.Miles, t2.FRC, t2.Border_Set, t2.Funsystem, t2.Urban_Code, t2.FacilType, t2.StrucType, t2.ThruLanes, t2.Route_Numb, t2.Route_Sign, t2.Route_Qual, t2.AltRteName, t2.AADT, t2.AADTSing, t2.AADTComb, t2.NHS, t2.NHS_Pct, t2.STRHNETYPE, t2.STRHNETPCT, t2.Truck, t2.Shape
- FROM HINPMRDSTTAMQ17 t1 , HINPMRDS2017 t2
- where t1.TMC_Code = t2.TMC
- ORDER BY t2.AltRteName , t1.tmc_Code;

NPMRDS LINK TABLE AND PM3 RESULT TABLES

- **Create table HINPMRDS2017Miday** as
- SELECT t1.tmc_code, t1.ttq50 TT_MIDD50PCT , t1.ttq80 TT_MIDD80PCT , round(t1.ttq80/(t1.ttq50),2) LOTTR_MIDD , t2.Tmc, t2.TmcType, t2.RoadNumber, t2.RoadName, t2.IsPrimary, t2.FirstName, t2.TmcLinear, t2.Country, t2.State, t2.County, t2.Zip, t2.Direction, t2.StartLat, t2.StartLong, t2.EndLat, t2.EndLong, t2.Miles, t2.FRC, t2.Border_Set, t2.Funsystem, t2.Urban_Code, t2.FacilType, t2.StrucType, t2.ThruLanes, t2.Route_Numb, t2.Route_Sign, t2.Route_Qual, t2.AltRteName, t2.AADT, t2.AADTSing, t2.AADTComb, t2.NHS, t2.NHS_Pct, t2.STRHNETYPE, t2.STRHNETPCT, t2.Truck, t2.Shape
- FROM HINPMRDSTTMIDQ17 t1 , HINPMRDS2017 t2
- where t1.TMC_Code = t2.TMC
- ORDER BY t2.AltRteName , t1.tmc_Code;

NPMRDS LINK TABLE AND PM3 RESULT TABLES

- **Create table HINPMRDS2017PMPK as**
- SELECT t1.tmc_code, t1.ttq50 TT_PMP50PCT , t1.ttq80 TT_PMP80PCT , round(t1.ttq80/(t1.ttq50),2) LOTTR_PMP , t2.Tmc, t2.TmcType, t2.RoadNumber, t2.RoadName, t2.IsPrimary, t2.FirstName, t2.TmcLinear, t2.Country, t2.State, t2.County, t2.Zip, t2.Direction, t2.StartLat, t2.StartLong, t2.EndLat, t2.EndLong, t2.Miles, t2.FRC, t2.Border_Set, t2.Funsystem, t2.Urban_Code, t2.FacilType, t2.StrucType, t2.ThruLanes, t2.Route_Numb, t2.Route_Sign, t2.Route_Qual, t2.AltRteName, t2.AADT, t2.AADTSing, t2.AADTComb, t2.NHS, t2.NHS_Pct, t2.STRHNETYPE, t2.STRHNETPCT, t2.Truck, t2.Shape
- FROM HINPMRDSTTPMQ17 t1 , HINPMRDS2017 t2
- where t1.TMC_Code = t2.TMC
- ORDER BY t2.AltRteName , t1.tmc_Code;

NPMRDS LINK TABLE AND PM3 RESULT TABLES

- **Create table HINPMRDS2017WKEND as**
- SELECT t1.tmc_code, t1.ttq50 TT_WE50PCT , t1.ttq80 TT_WE80PCT , round(t1.ttq80/(t1.ttq50),2) LOTTR_WE , t2.Tmc, t2.TmcType, t2.RoadNumber, t2.RoadName, t2.IsPrimary, t2.FirstName, t2.TmcLinear, t2.Country, t2.State, t2.County, t2.Zip, t2.Direction, t2.StartLat, t2.StartLong, t2.EndLat, t2.EndLong, t2.Miles, t2.FRC, t2.Border_Set, t2.Funsystem, t2.Urban_Code, t2.FacilType, t2.StrucType, t2.ThruLanes, t2.Route_Numb, t2.Route_Sign, t2.Route_Qual, t2.AltRteName, t2.AADT, t2.AADTSing, t2.AADTComb, t2.NHS, t2.NHS_Pct, t2.STRHNETYPE, t2.STRHNETPCT, t2.Truck, t2.Shape
- FROM HINPMRDSTTWKENDQ17 t1 , HINPMRDS2017 t2 where t1.TMC_Code = t2.TMC
- ORDER BY t2.AltRteName , t1.tmc_Code;

NPMRDS LINK ALLDAY PM3 RESULT TABLES

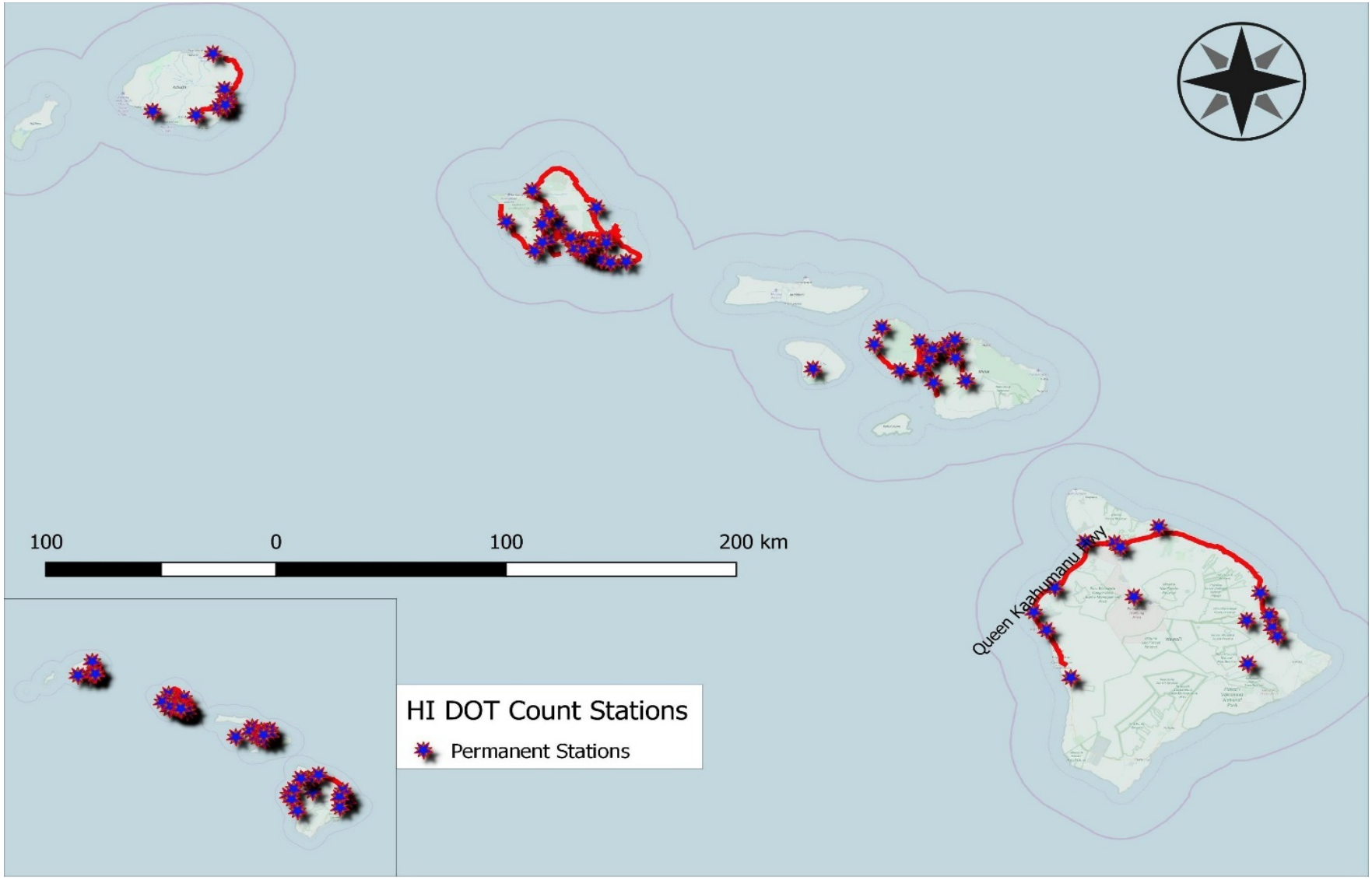
- **create View VWHINPMRDS2017TTPM3 as**
- SELECT 2017 yr, t0.Tmc, t0.TmcType, t0.RoadNumber, t0.RoadName, t0.IsPrimary, t0.FirstName, t0.TmcLinear, t0.Country, t0.State, t0.County, t0.Zip, t0.Direction, t0.StartLat, t0.StartLong, t0.EndLat, t0.EndLong, t0.Miles, t0.FRC, t0.Border_Set, t0.Funsystem, t0.Urban_Code, t0.FacilType, t0.StrucType, t0.ThruLanes, t0.Route_Numb, t0.Route_Sign, t0.Route_Qual, t0.AltRteName, t0.AADT, t0.AADTSing, t0.AADTComb, t0.NHS, t0.NHS_Pct, t0.STRHNETYPE, t0.STRHNETPCT, t0.Truck, (t0.MILES*t0.AADT *365) VMT, t0.Shape, round(t1.ttq50) TT_AMP50PCT , round(t1.ttq80) TT_AMP80PCT , round(t1.ttq80/(nullif(t1.ttq50,0)),2) LOTTR_AMP , round(t1.spq50) TTAMSP50 , round(t1.spq80) TTAMSP80 , round(t1.rspq50) TTAMRSP50, round(t2.ttq50) TT_MIDD50PCT , round(t2.ttq80) TT_MIDD80PCT , round(t2.ttq80/(nullif(t2.ttq50,0)),2) LOTTR_MIDD , round(t2.spq50) TTMISPD50 , round(t2.spq80) TTMISPD80 , round(t2.rspq50) TTMIRSPD50, round(t3.ttq50) TT_PMP50PCT , round(t3.ttq80) TT_PMP80PCT , round(t3.ttq80/(nullif(t3.ttq50,0)),2) LOTTR_PMP, round(t3.spq50) TTPMSPD50 , round(t3.spq80) TTPMPSPD80 , round(t3.rspq50) TTPMRSPD50, round(t5.ttq50) TT_WE50PCT , round(t5.ttq80) TT_WE80PCT , round(t5.ttq80/(nullif(t5.ttq50,0)),2) LOTTR_WE, round(t5.spq50) TTWESPD50 , round(t5.spq80) TTWESPD80 , round(t5.rspq50) TTWERSPD50
- FROM HINPMRDS2017 t0, HINPMRDSTTAMQ17 t1, HINPMRDSTTMIDQ17 t2, HINPMRDSTTPMQ17 t3, HINPMRDSTTWKENDQ17 t5
- where t0.tmc = t1.tmc_code(+) and t1.tmc_code = t2.tmc_code(+) and t2.tmc_code = t3.tmc_code(+) and t3.tmc_code = t5.tmc_code(+)
- ORDER BY t0.AltRteName , t0.tmc;

FINAL HPMS EXPORT NPMRDS PM3 RESULT TABLE

- Create Table HINPMRDS2017TTPM3 as
- SELECT 2017 yr, t0.Tmc, t0.TmcType, t0.RoadNumber, t0.RoadName, t0.IsPrimary, t0.FirstName, t0.TmcLinear, t0.Country, t0.State, t0.County, t0.Zip, t0.Direction, t0.StartLat, t0.StartLong, t0.EndLat, t0.EndLong, t0.Miles, t0.FRC, t0.Border_Set, t0.Funsystem, t0.Urban_Code, t0.FacilType, t0.StrucType, t0.ThruLanes, t0.Route_Numb, t0.Route_Sign, t0.Route_Qual, t0.AltRteName, t0.AADT, t0.AADTSing, t0.AADTComb, t0.NHS, t0.NHS_Pct, t0.STRHNETYPE, t0.STRHNETPCT, t0.Truck, t0.Shape, t0.TT_AMP50PCT , t0.TT_AMP80PCT , t0.LOTTR_AMP , t0.TTAMSP50 , t0.TTAMSP80 , t0.TTAMRSP50, t0.TT_MIDD50PCT , t0.TT_MIDD80PCT , t0.LOTTR_MIDD , t0.TTMISPD50 , t0.TTMISPD80 , t0.TTMIRSPD50, t0.TT_PMP50PCT , t0.TT_PMP80PCT , t0.LOTTR_PMP, t0.TTPMSPD50 , t0.TTPMPSPD80 , t0.TTPMRSPD50, t0.TT_WE50PCT , t0.TT_WE80PCT , t0.LOTTR_WE, t0.TTWESPD50 , t0.TTWESPD80 , t0.TTWERSPD50
- FROM VWHINPMRDS2017TTPM3 t0
- ORDER BY t0.AltRteName , t0.tmc;

NPMRDS SPEED DATA COMPARISON

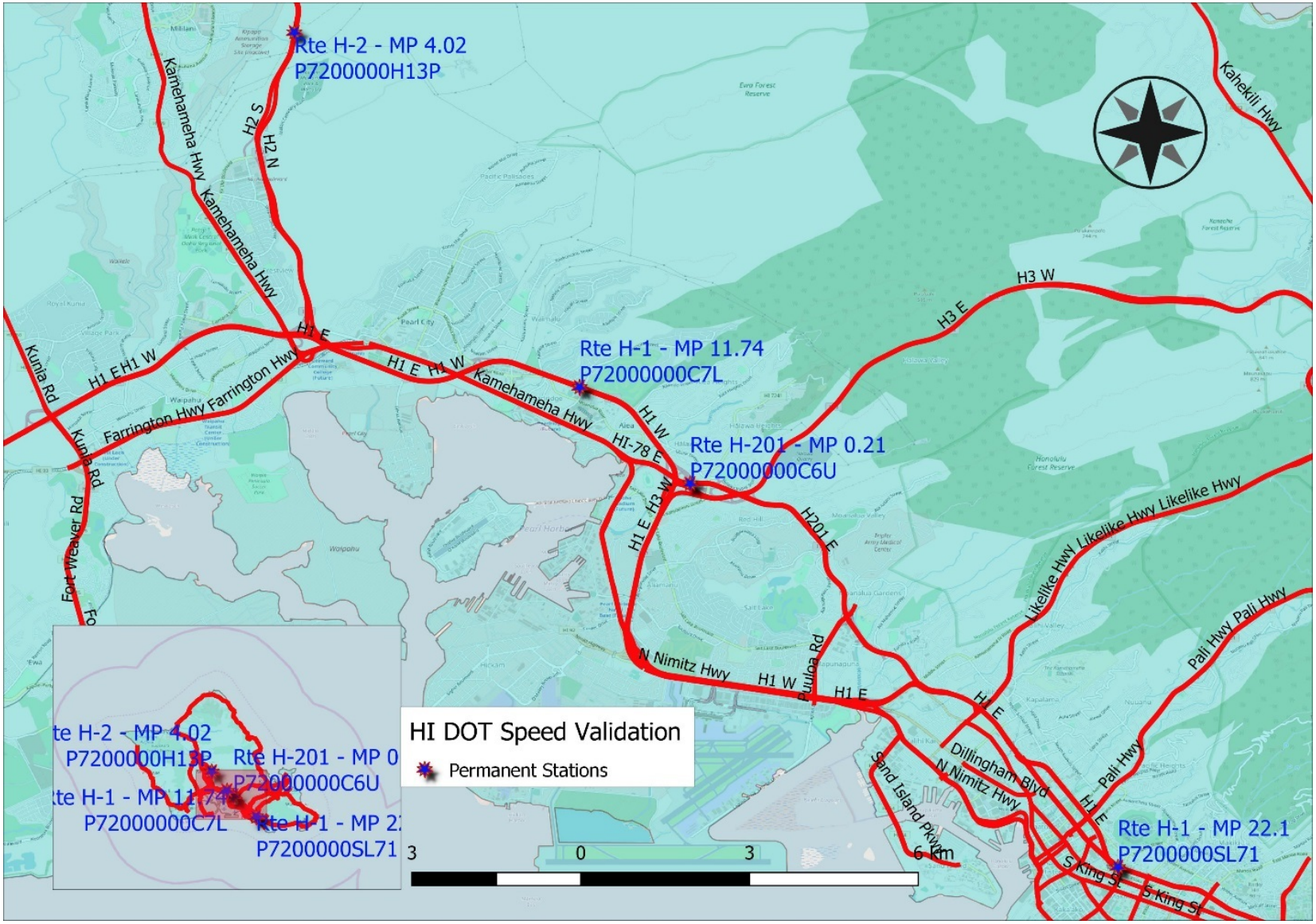
HAWAII DOT COUNT STATIONS



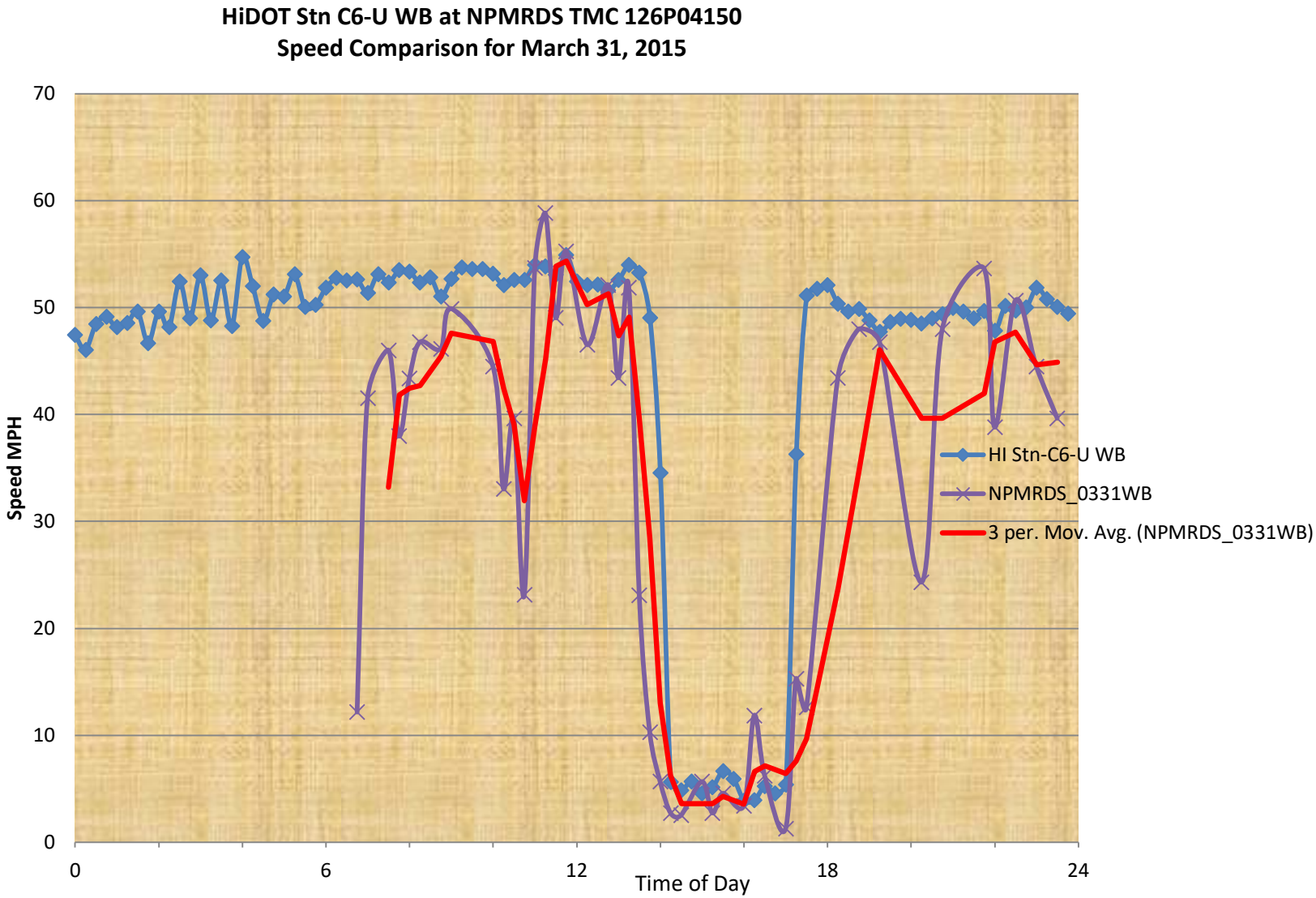
PERMANENT STATIONS SPEED COMPARISON

- Station H13P – on Interstate H-2 at mile point 4.02
- Station C7L – on Interstate H-1 at mile point 11.74
- Station SL71 – on Interstate H-1 at Ward Avenue exit at mile point 22.1
- Station C6U – on Interstate H-201 at mile point 0.21

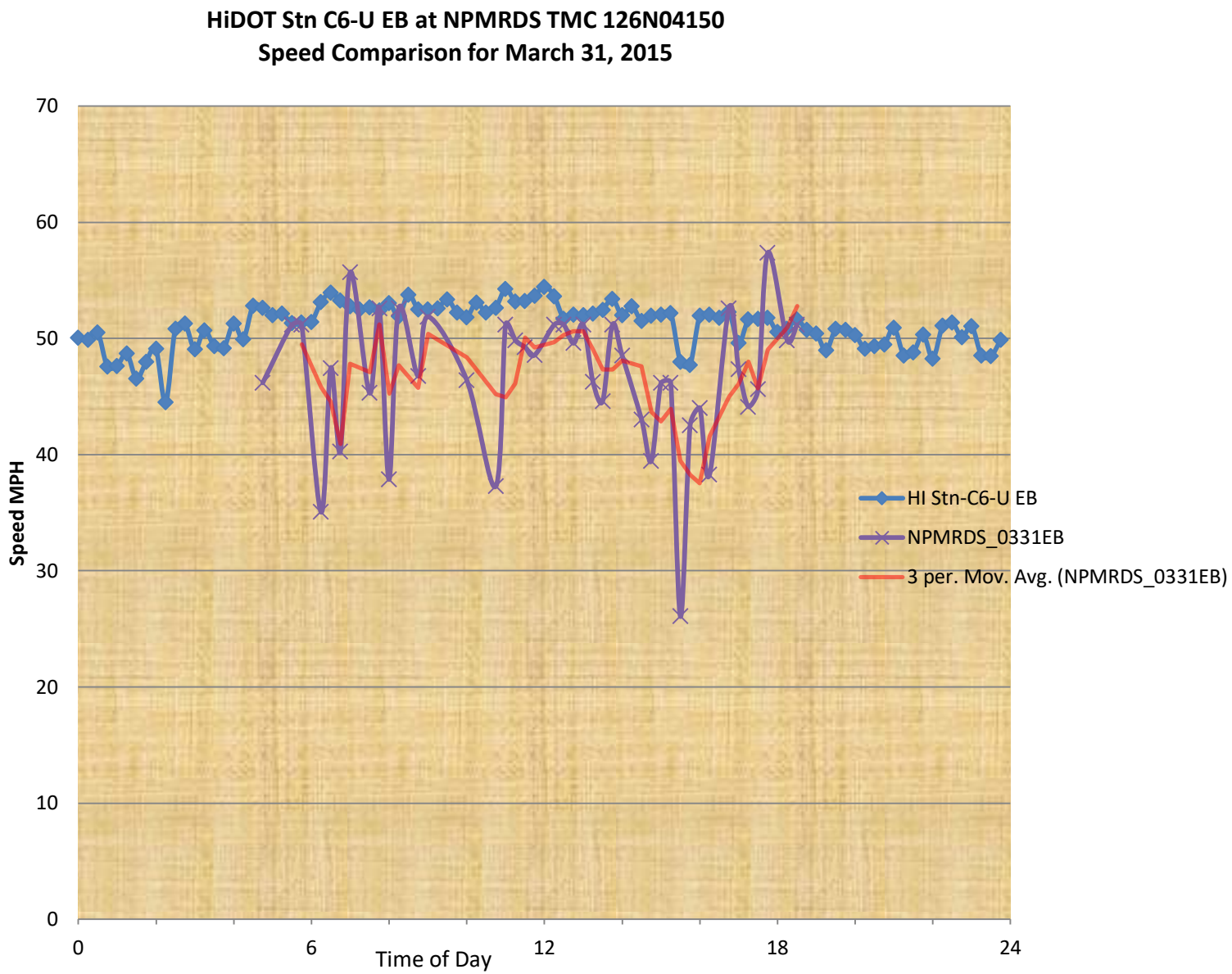
PERMANENT STATIONS SPEED COMPARISON



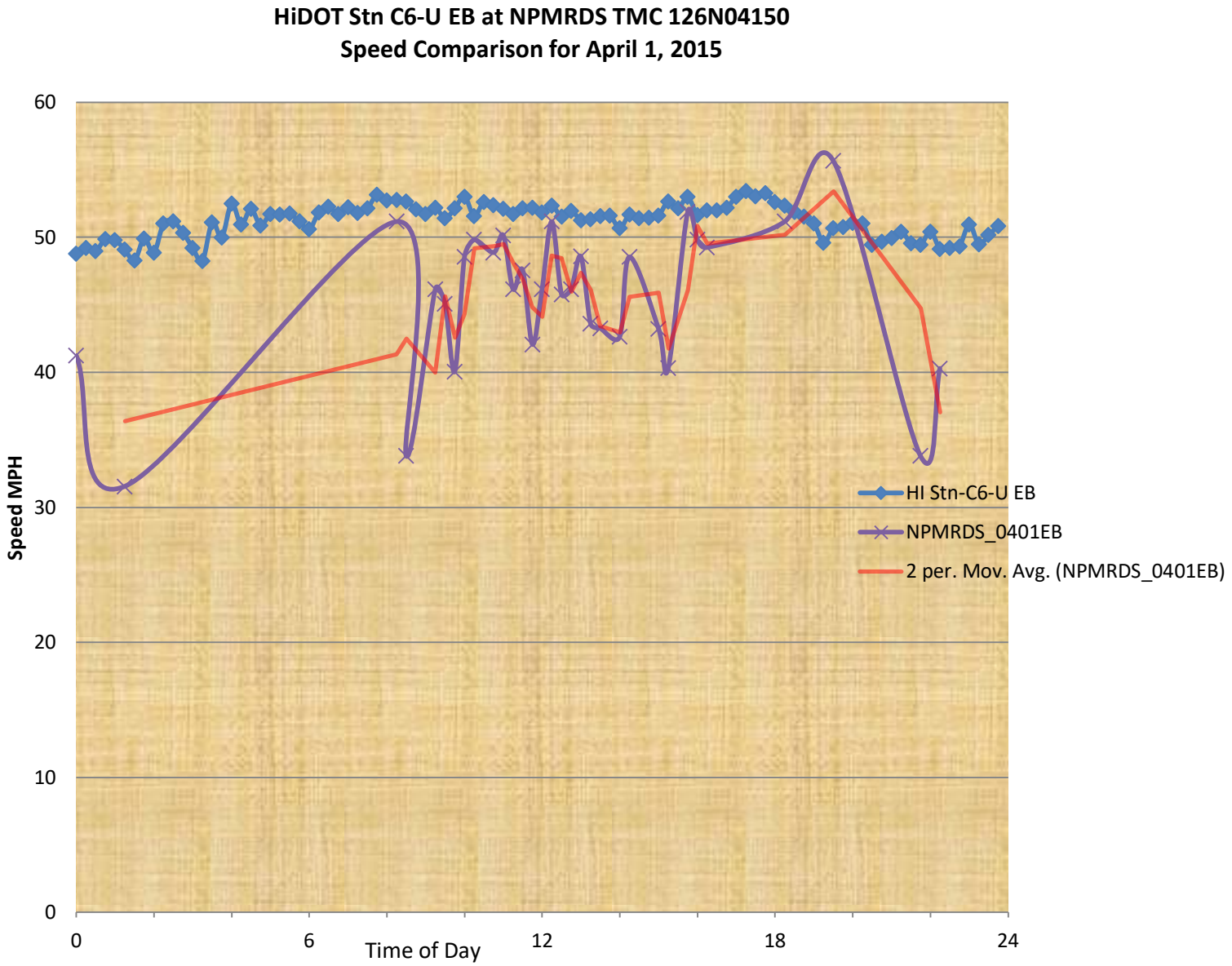
NPMRDS AND COUNT STATION SPEED PROFILES



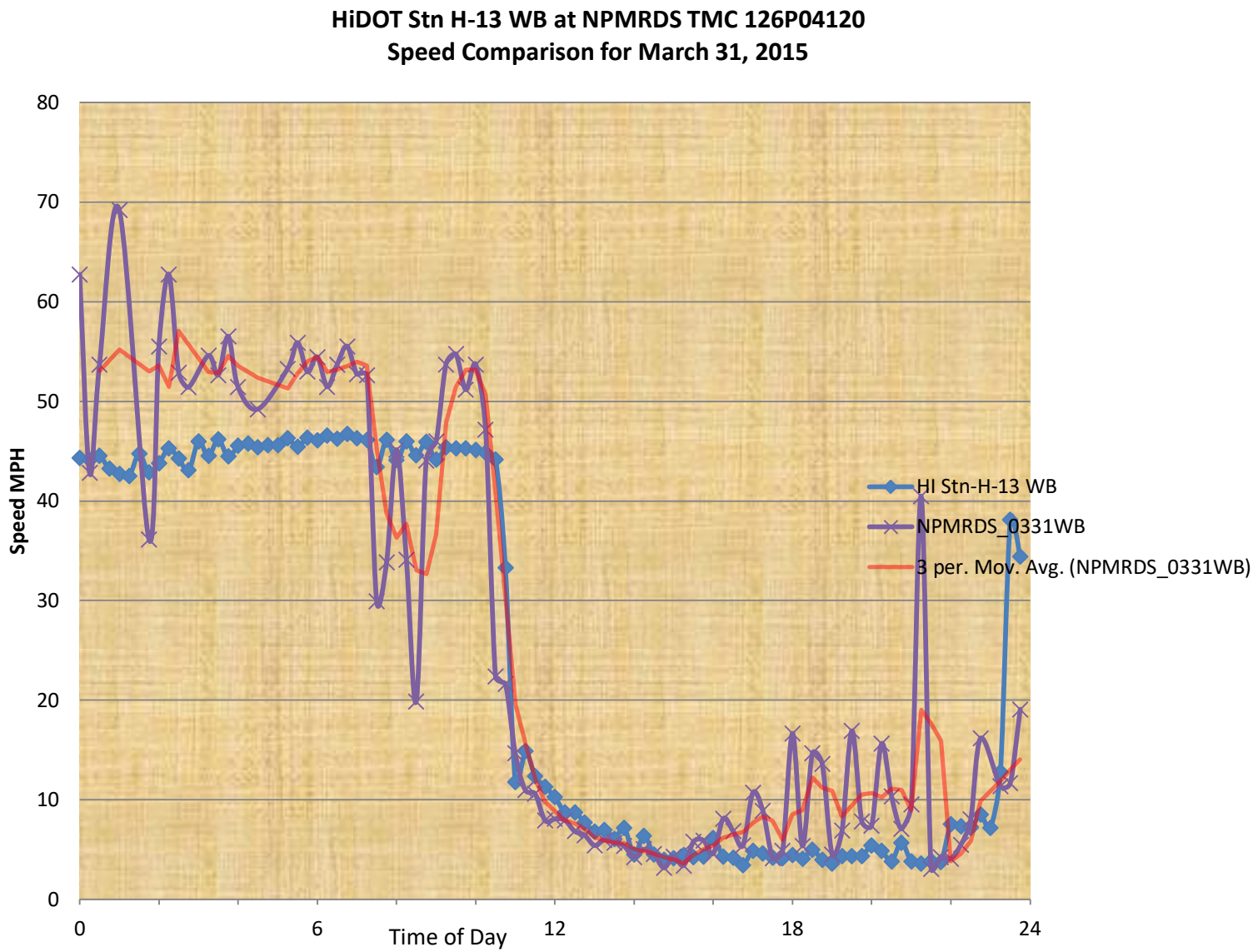
NPMRDS AND COUNT STATION SPEED PROFILES



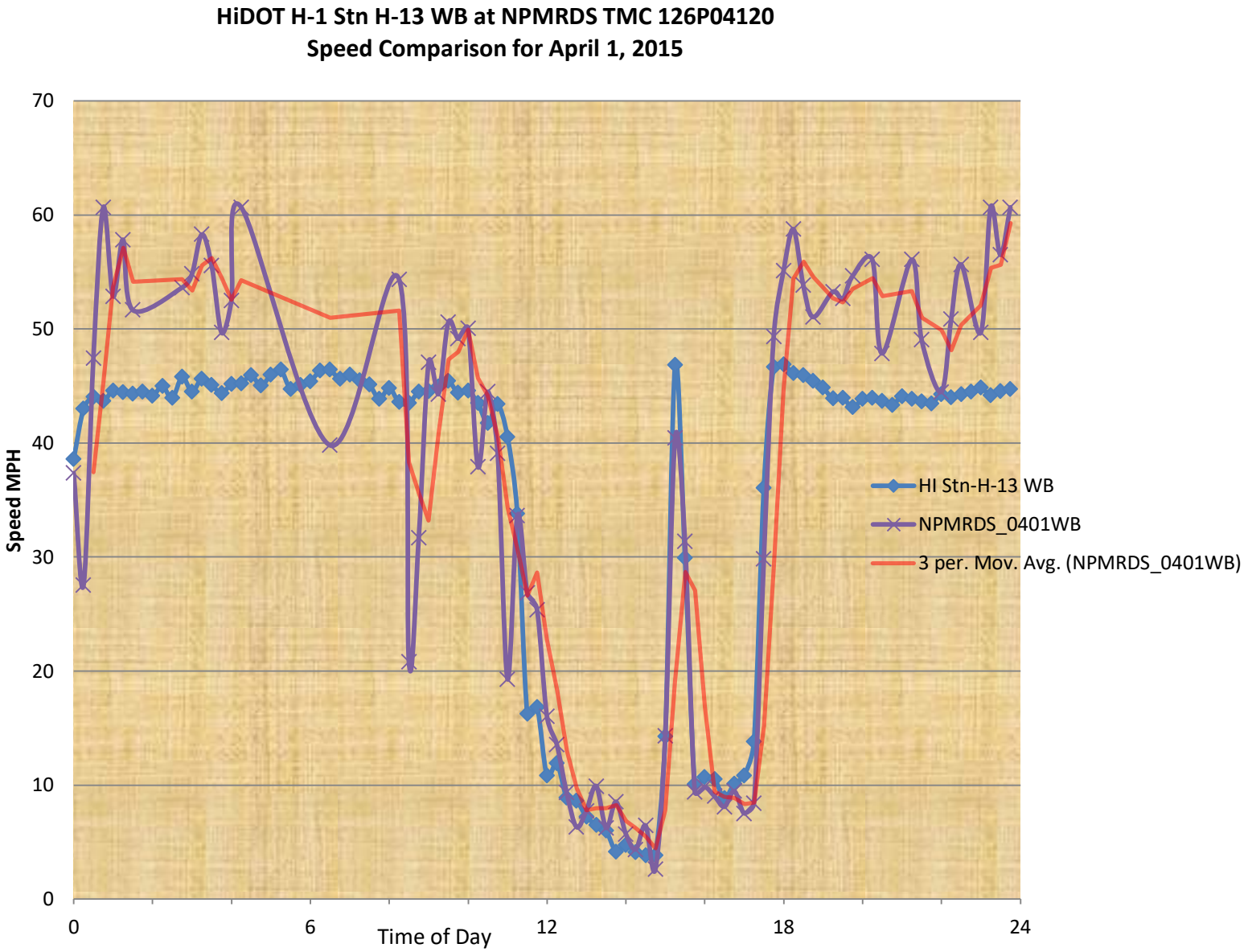
NPMRDS AND COUNT STATION SPEED PROFILES



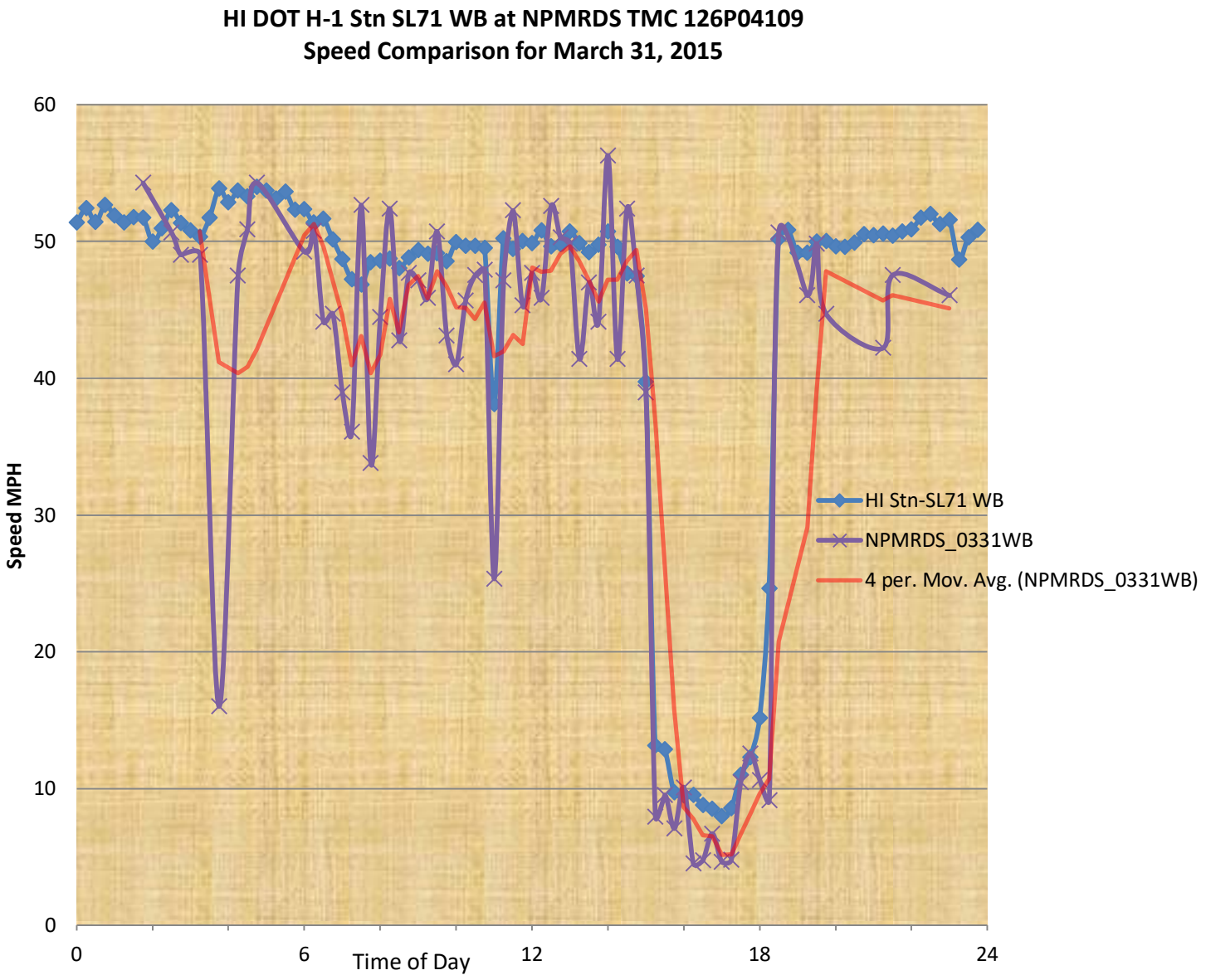
NPMRDS AND COUNT STATION SPEED PROFILES



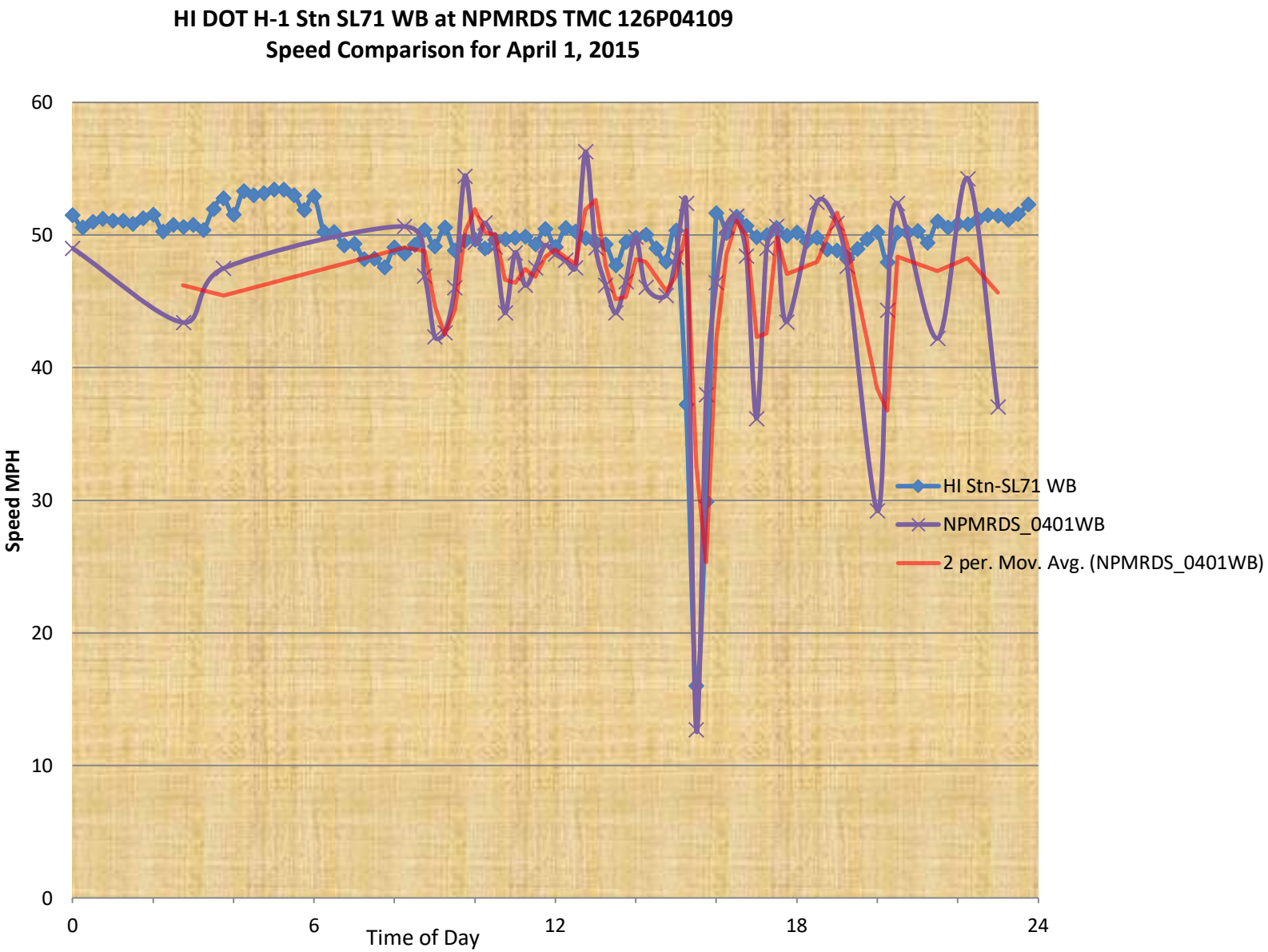
NPMRDS AND COUNT STATION SPEED PROFILES



NPMRDS AND COUNT STATION SPEED PROFILES



NPMRDS AND COUNT STATION SPEED PROFILES

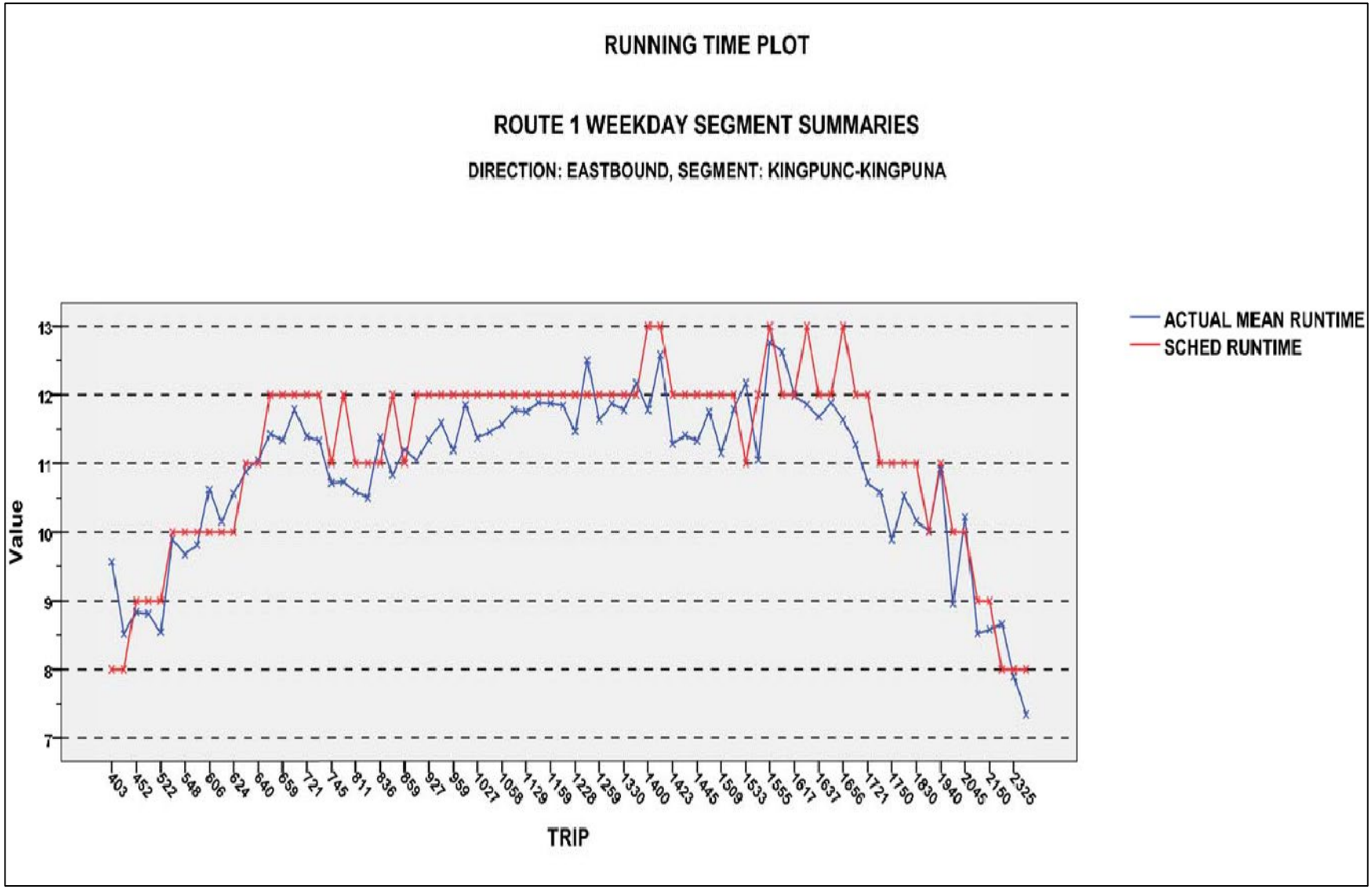


BEFORE AND AFTER STUDEIS

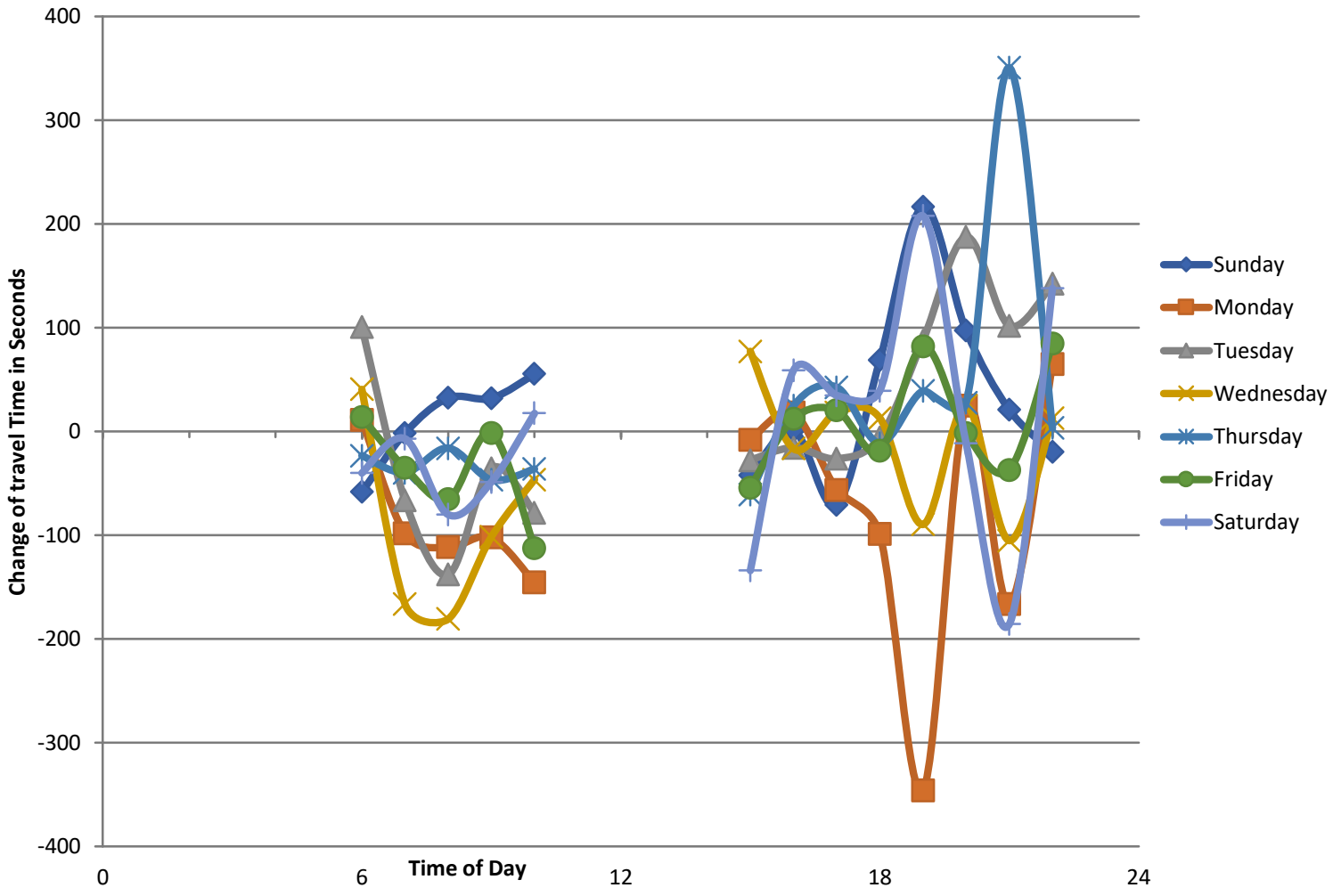
KING STREET BEFORE LANE CONVERSION

KING STREET AFTER LANE CONVERSION

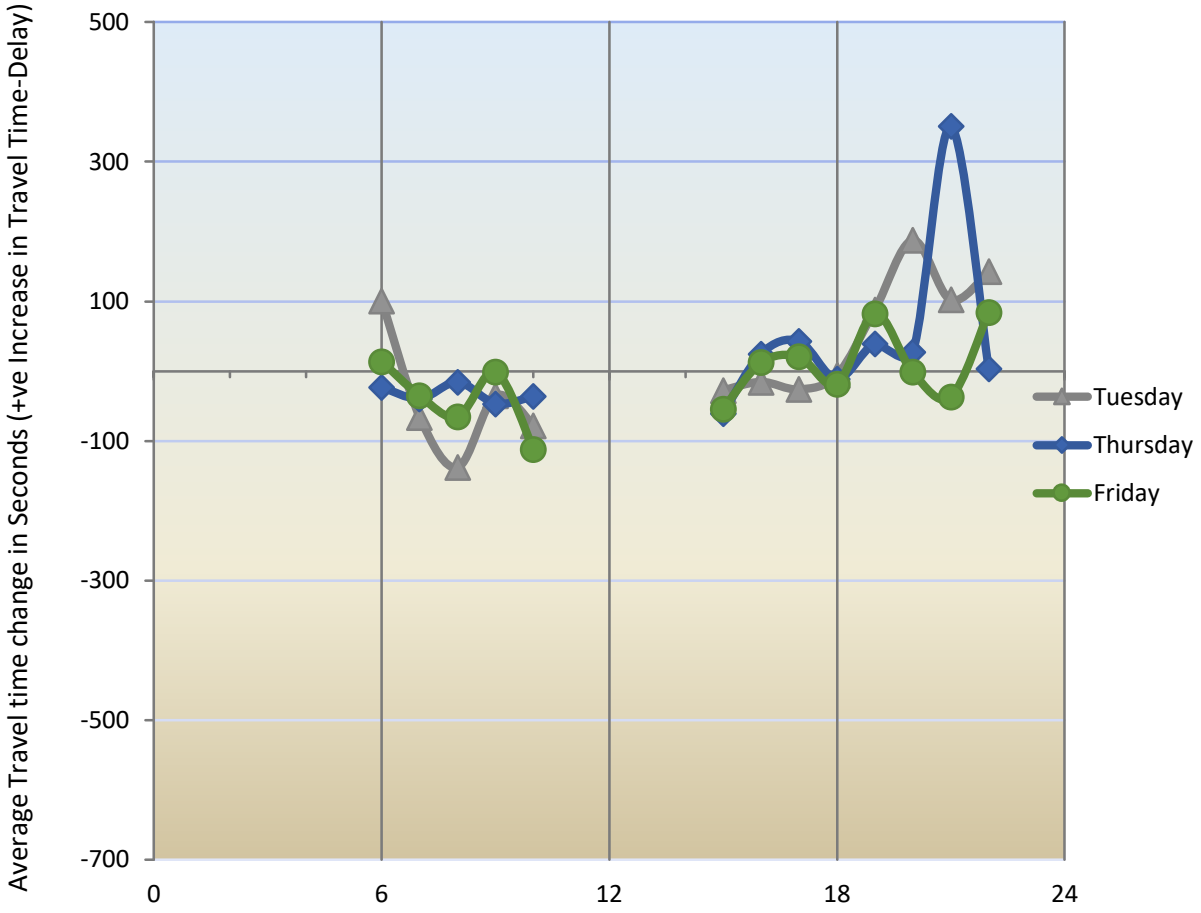
TRANSIT TRAVEL TIME IMPACT



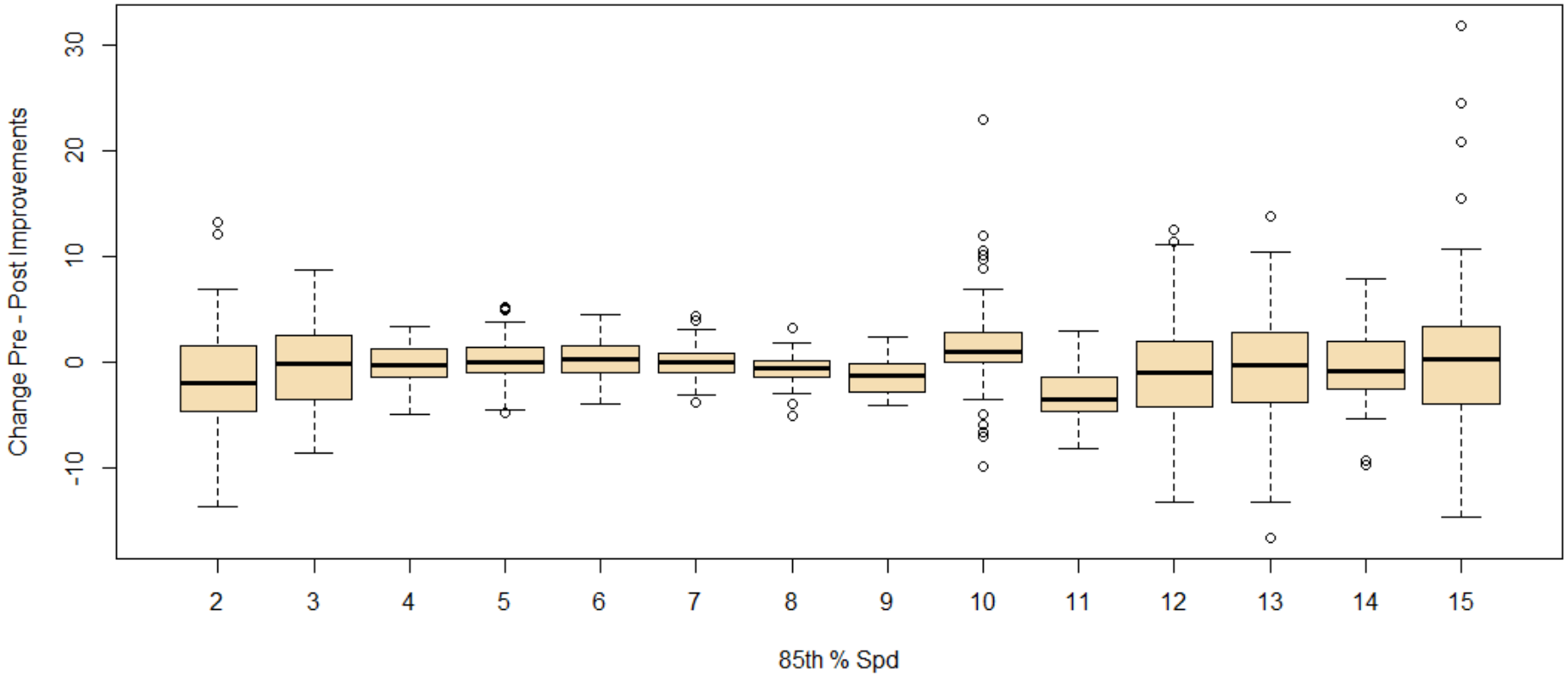
TRANSIT TRAVEL TIME IMPACT



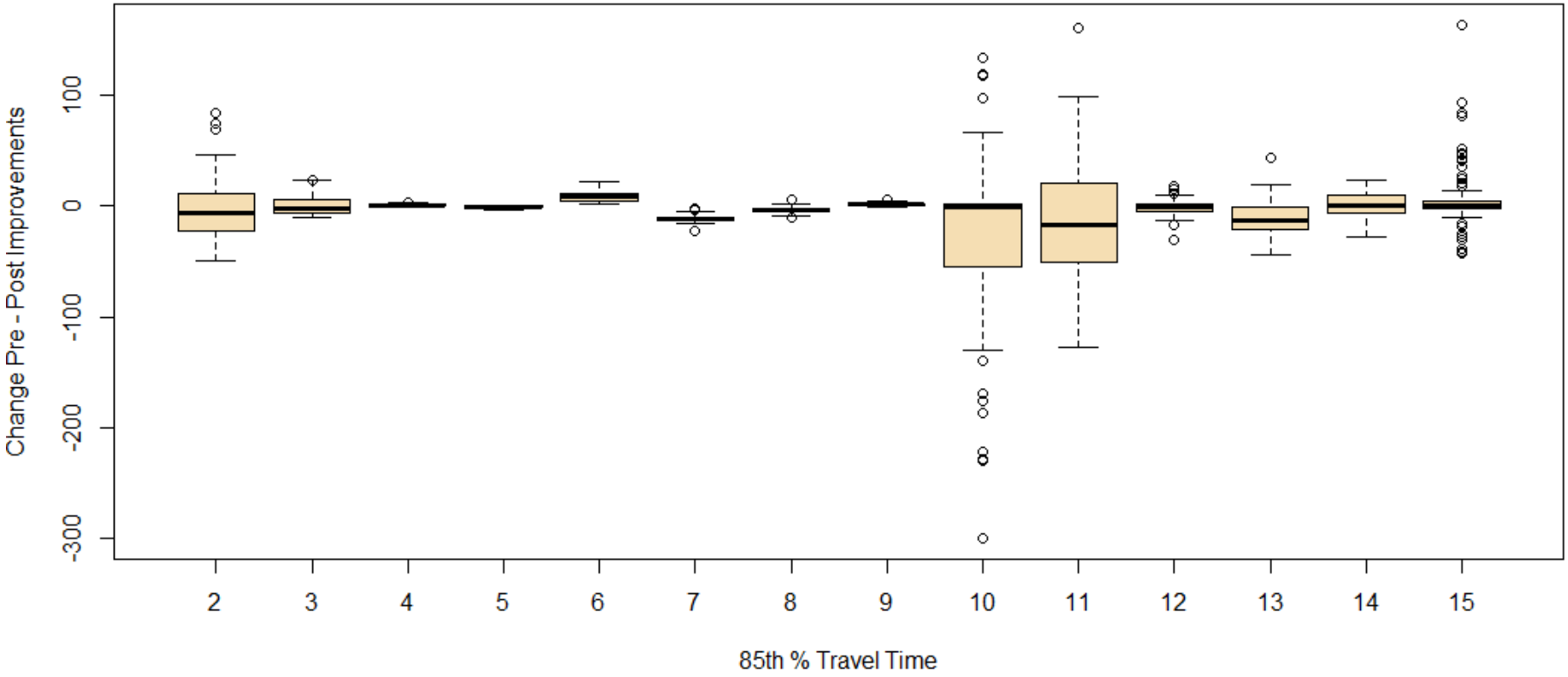
TRANSIT TRAVEL TIME IMPACT



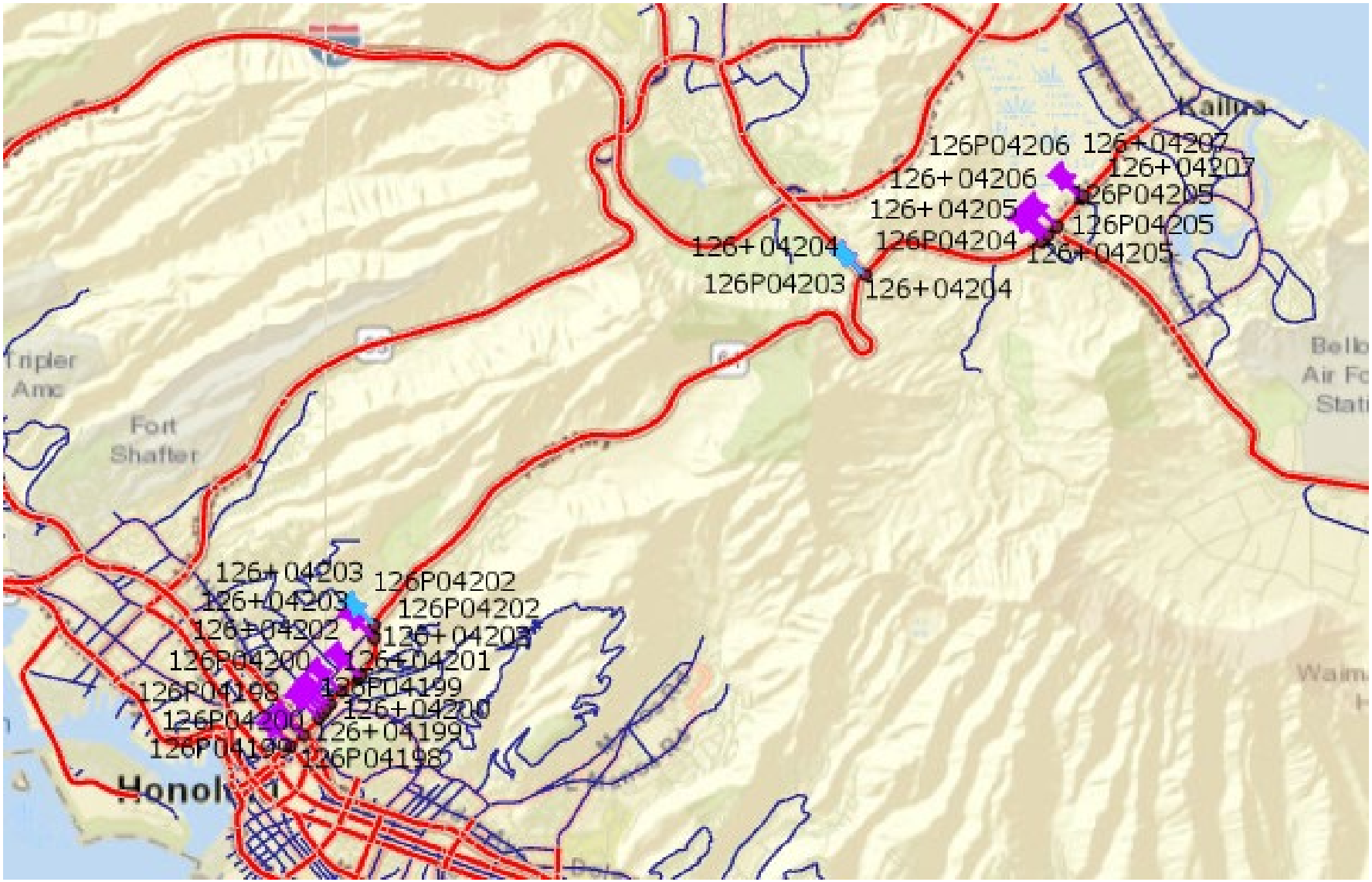
PALI HIGHWAY SPEED CHANGE BEFORE AND AFTER IMPROVEMENTS



PALI HIGHWAY TRAVEL TIME CHANGE BEFORE AND AFTER IMPROVEMENTS

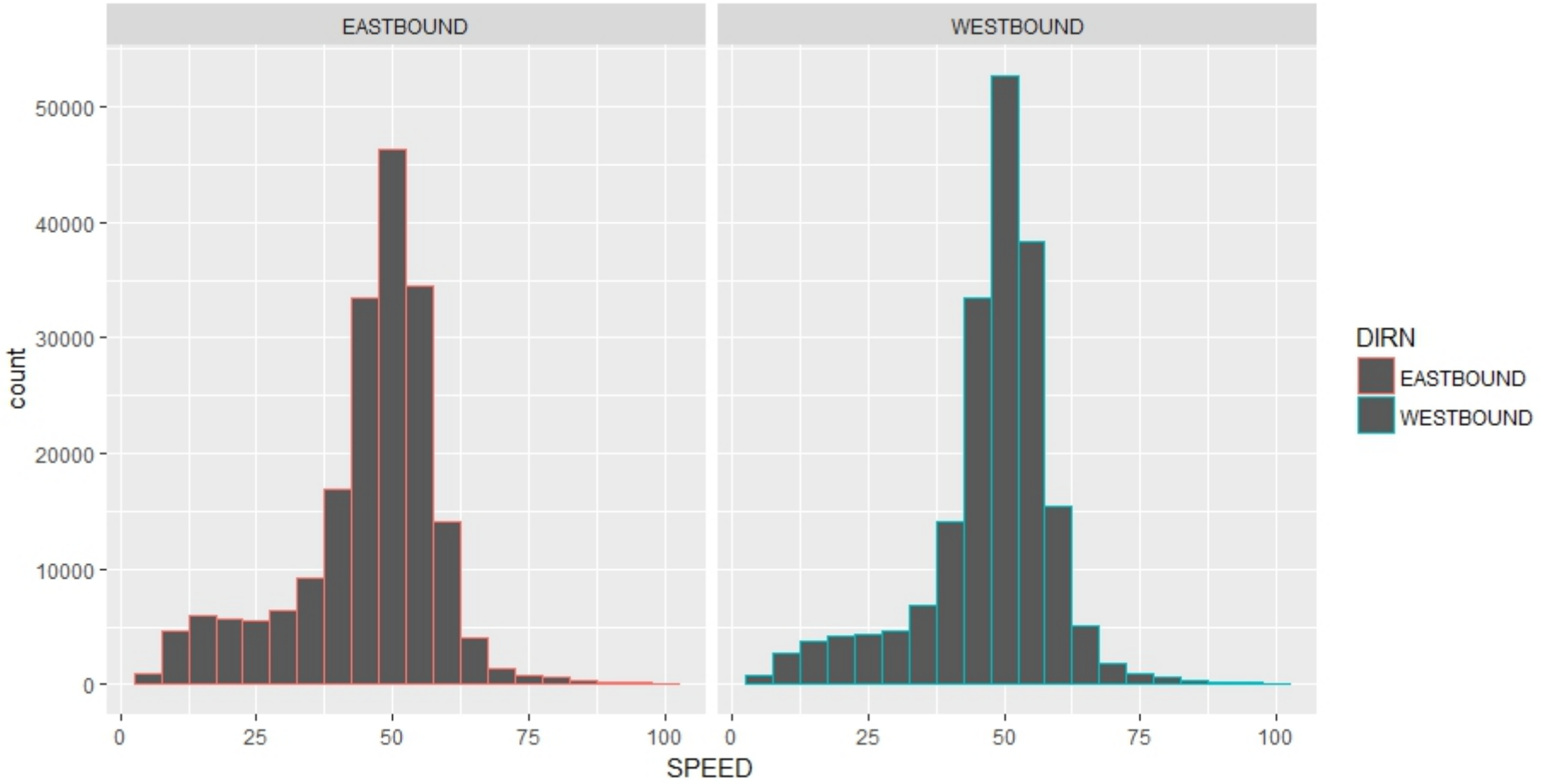


TRAVEL TIME BETWEEN TMC'S



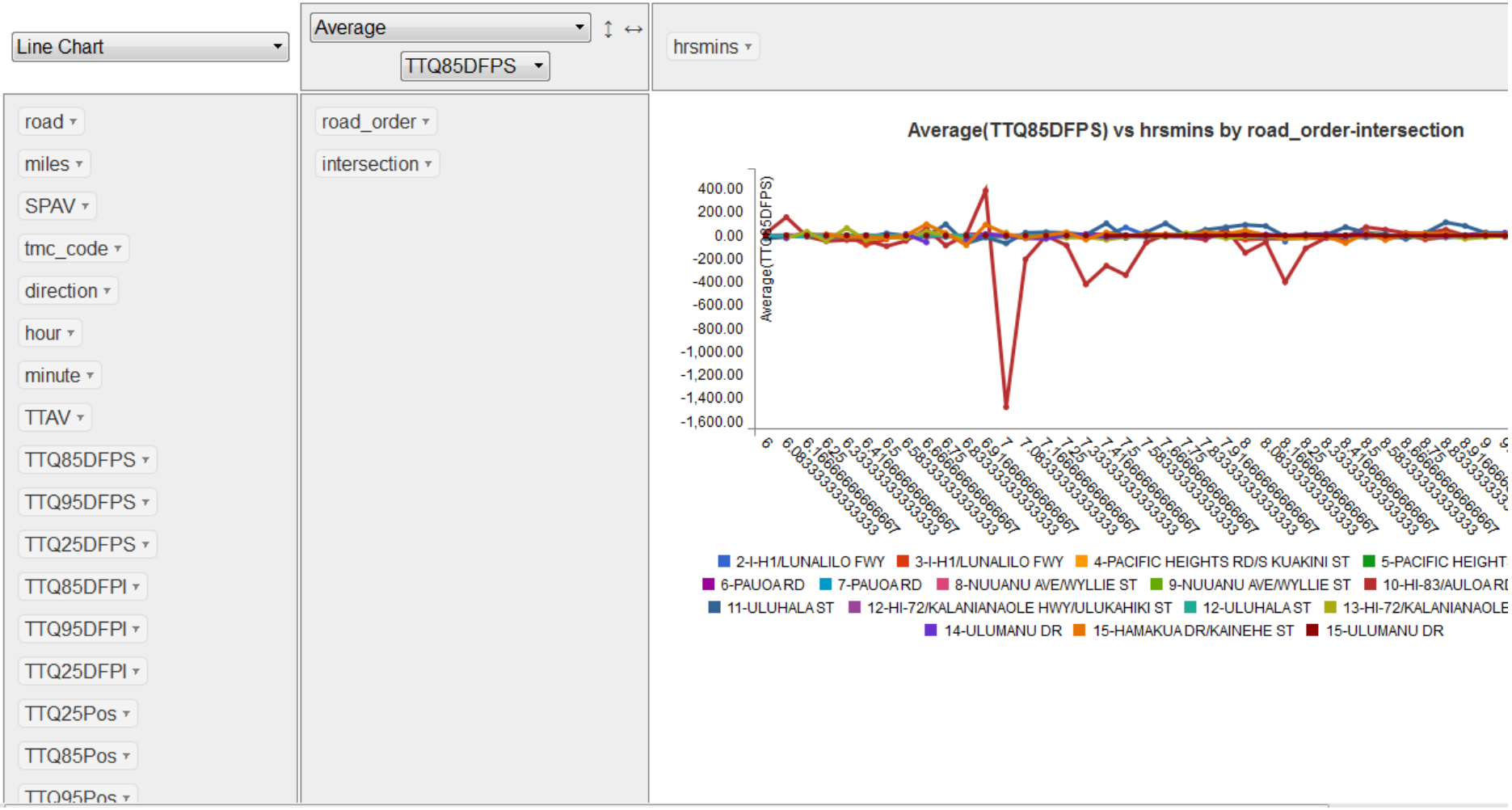
PALI HIGHWAY TRAVEL TIME (SECS) BETWEEN TMC'S

SPEED PROFILE

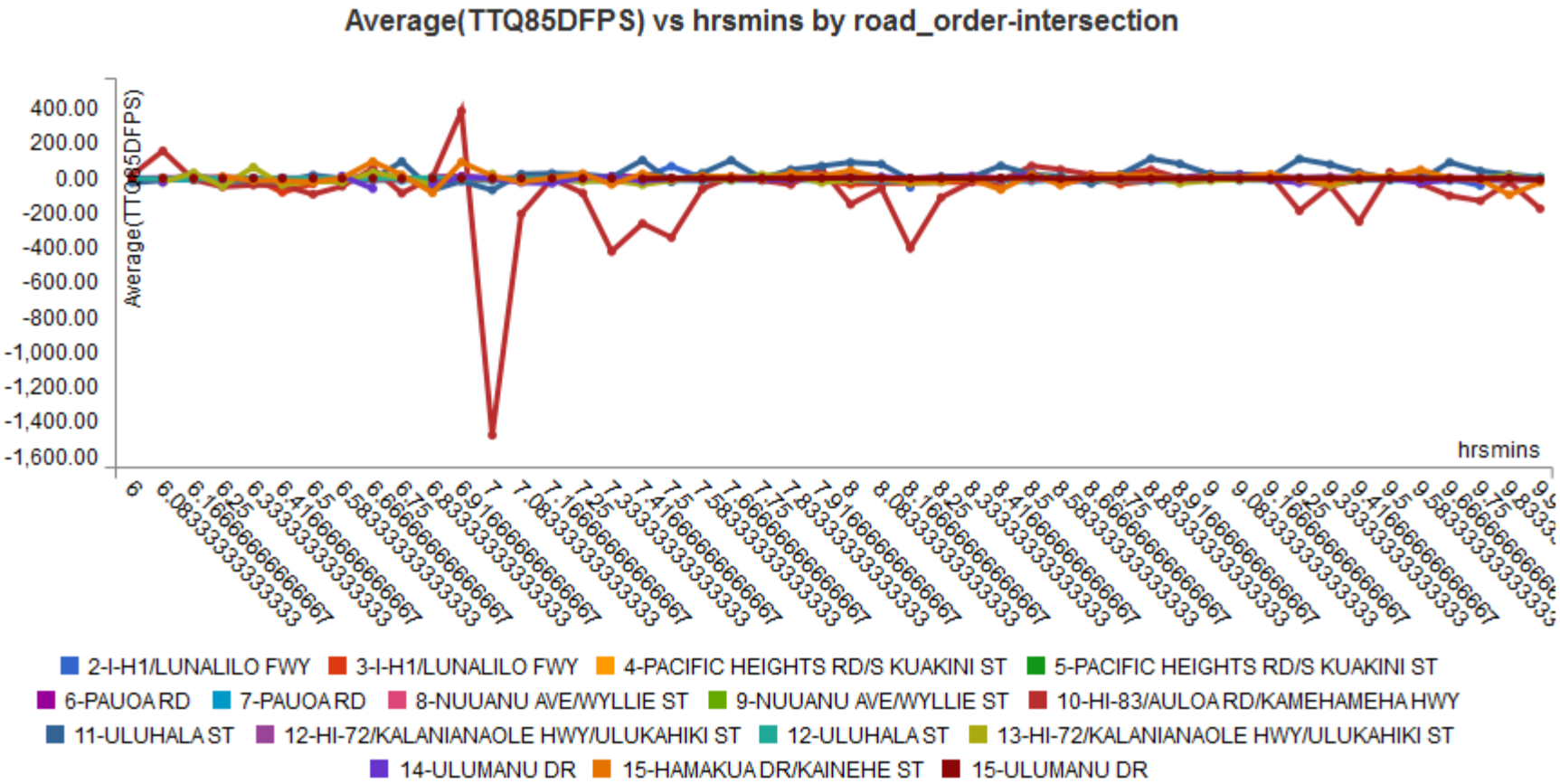


EXPLORATORY ANALYSIS

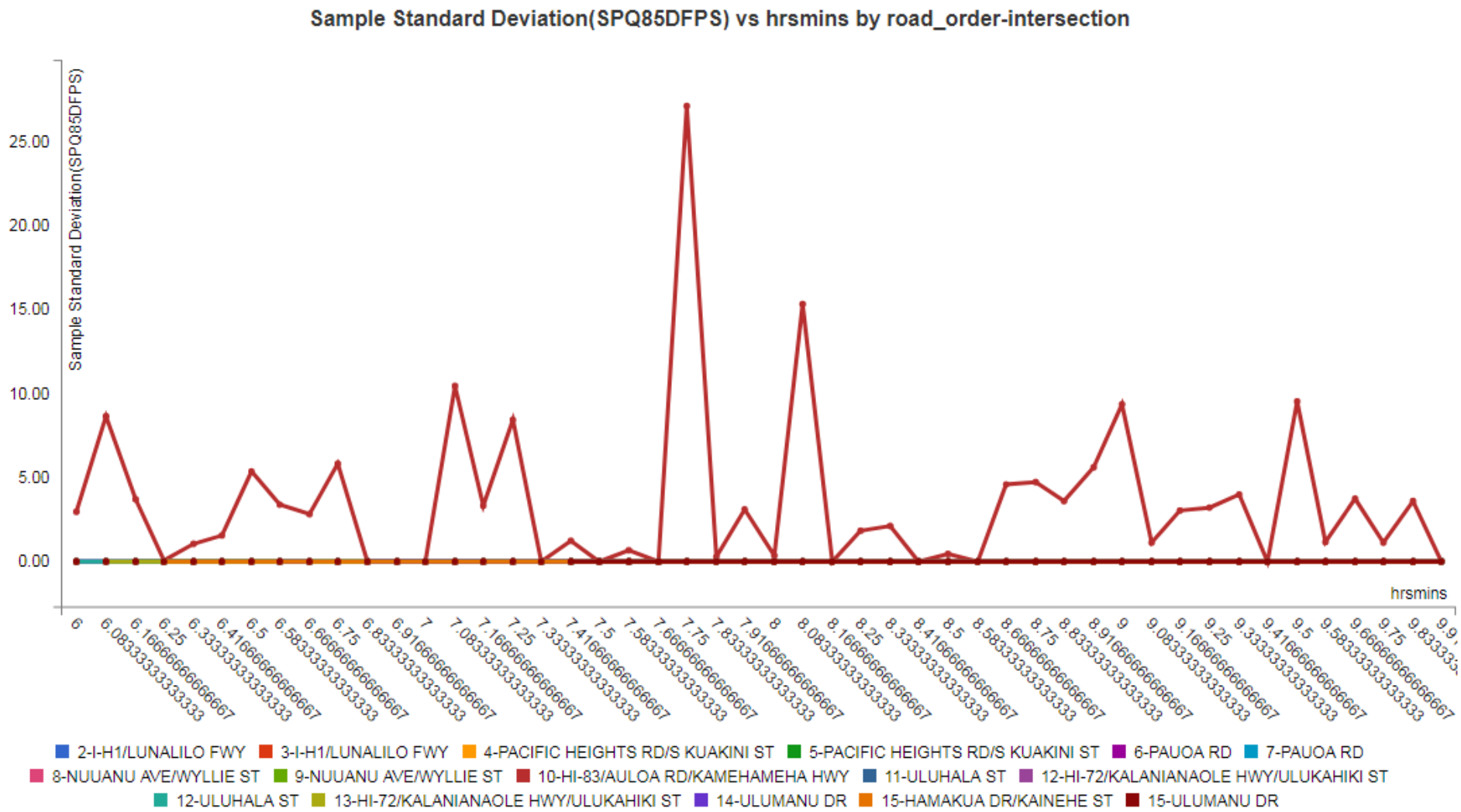
rpivotTable(vwpaliebwdpre2posamdf,rows=c("road_order","intersection"),cols="hrsmins")



TRAVEL TIME DIFFERENCE AM PEAK PERIOD



SPEED STANDARD DEVIATION AM PEAK



REFERENCES

- HPMS 2016 Field Manual and supplemental travel time manual
- Understanding NPMRDS Usage for Certain Performance Data Needs, Wenjing Pu, HIS, Nov. 15, 2017, Washington, DC

CONTACT INFORMATION

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