

Performance Comparison between our system and RADAR

Nearly one order of magnitude improvement over Radar is achieved:
from 14%~24% error rates by Radar to 2%~6% by our system.

Table 26 (US-1, Existing Quality)	Our VA System	RTMS (RADAR)
MAPE (Near Side Traffic)	2.1	14.5
MAPE (Far Side Traffic)	4.6	15.6

Table 27 (US-1, Medium Quality)	Our VA System	RTMS (RADAR)
MAPE (Near Side Traffic)	3.1	20.4
MAPE (Far Side Traffic)	2.7	20.2

Table 28 (US-1, Highest Quality)	Our VA System	RTMS (RADAR)
MAPE (Near Side Traffic)	2.6	23.5
MAPE (Far Side Traffic)	5.9	24.0

Table 29 (I-80 @ I-287)	Our VA System
MAPE (Near Side Traffic)	5.2
MAPE (Far Side Traffic)	9.5

Table 30 (I-280 @ Prospect Ave.)	Our VA System
MAPE (Near Side Traffic)	9.0
MAPE (Far Side Traffic)	4.8

Table 31 (I-280 @ Laurel Ave.)	Our VA System
MAPE (Near Side Traffic)	5.9
MAPE (Far Side Traffic)	3.3

Results & Demos:

cs.njit.edu/~liu/NJDOT/DEMOS.html

User Name: frvp

Password: demos123

See the formulas on pages 2 & 3

Table 26: Traffic count results - Normal and daytime conditions (Existing Quality, October 15, 2016)

MAPE (Mean Absolute Percent Error) for the Near and Far side traffic, respectively:

$$2.1202 = (\text{abs}(395-383)/395 + \text{abs}(404-407)/404 + \text{abs}(537-527)/537 + \text{abs}(493-491)/493 + \text{abs}(453-441)/453 + \text{abs}(511-515)/511 + \text{abs}(488-502)/488 + \text{abs}(542-517)/542) / 8 * 100$$

$$4.6184 = (\text{abs}(426-406)/426 + \text{abs}(477-461)/477 + \text{abs}(520-483)/520 + \text{abs}(467-443)/467 + \text{abs}(555-524)/555 + \text{abs}(477-457)/477 + \text{abs}(529-518)/529 + \text{abs}(606-577)/606) / 8 * 100$$

Comparison with RTMS

MAPE (Mean Absolute Percent Error) for the Near and Far side traffic, respectively:

$$14.5154 = (\text{abs}(395-348)/395 + \text{abs}(404-349)/404 + \text{abs}(537-439)/537 + \text{abs}(493-440)/493 + \text{abs}(453-366)/453 + \text{abs}(511-431)/511 + \text{abs}(488-452)/488 + \text{abs}(542-437)/542) / 8 * 100$$

$$15.6052 = (\text{abs}(426-391)/426 + \text{abs}(477-401)/477 + \text{abs}(520-407)/520 + \text{abs}(467-428)/467 + \text{abs}(555-409)/555 + \text{abs}(477-440)/477 + \text{abs}(529-457)/529 + \text{abs}(606-467)/606) / 8 * 100$$

Table 27: Traffic count results - Normal and daytime conditions (Medium Quality, October 11, 2016)

MAPE (Mean Absolute Percent Error) for the Near and Far side traffic, respectively:

$$3.0946 = (\text{abs}(756-757)/756 + \text{abs}(814-783)/814 + \text{abs}(836-824)/836 + \text{abs}(800-752)/800 + \text{abs}(628-613)/628 + \text{abs}(590-566)/590 + \text{abs}(508-518)/508 + \text{abs}(565-537)/565) / 8 * 100$$

$$2.7432 = (\text{abs}(716-763)/716 + \text{abs}(662-679)/662 + \text{abs}(714-694)/714 + \text{abs}(745-705)/745 + \text{abs}(638-633)/638 + \text{abs}(609-616)/609 + \text{abs}(593-606)/593 + \text{abs}(579-582)/579) / 8 * 100$$

Comparison with RTMS

MAPE (Mean Absolute Percent Error) for the Near and Far side traffic, respectively:

$$20.3566 = (\text{abs}(756-582)/756 + \text{abs}(814-658)/814 + \text{abs}(836-637)/836 + \text{abs}(800-644)/800 + \text{abs}(628-510)/628 + \text{abs}(590-474)/590 + \text{abs}(508-411)/508 + \text{abs}(565-453)/565) / 8 * 100$$

$$20.2346 = (\text{abs}(716-599)/716 + \text{abs}(662-517)/662 + \text{abs}(714-554)/714 + \text{abs}(745-569)/745 + \text{abs}(638-541)/638 + \text{abs}(609-498)/609 + \text{abs}(593-455)/593 + \text{abs}(579-458)/579) / 8 * 100$$

Results & Demos:

[See the formulas on pages 2 & 3](#)

cs.njit.edu/~liu/NJDOT/DEMOS.html

User Name: frvp

Password: demos123

Table 28: Traffic count results - Normal and daytime conditions (Highest Quality, October 13, 2016)

MAPE (Mean Absolute Percent Error) for the Near and Far side traffic, respectively:

$$2.5710 = (\text{abs}(590-557)/590 + \text{abs}(550-574)/550 + \text{abs}(681-675)/681 + \text{abs}(727-713)/727 + \text{abs}(792-790)/792 + \text{abs}(765-712)/765 + \text{abs}(825-822)/825 + \text{abs}(770-772)/770) / 8 * 100$$

$$5.8702 = (\text{abs}(645-657)/645 + \text{abs}(620-643)/620 + \text{abs}(708-688)/708 + \text{abs}(785-712)/785 + \text{abs}(858-787)/858 + \text{abs}(808-722)/808 + \text{abs}(925-900)/925 + \text{abs}(824-761)/824) / 8 * 100$$

Comparison with RTMS

MAPE (Mean Absolute Percent Error) for the Near and Far side traffic, respectively:

$$23.4730 = (\text{abs}(590-418)/590 + \text{abs}(550-494)/550 + \text{abs}(681-535)/681 + \text{abs}(727-510)/727 + \text{abs}(792-558)/792 + \text{abs}(765-574)/765 + \text{abs}(825-651)/825 + \text{abs}(770-604)/770) / 8 * 100$$

$$23.9628 = (\text{abs}(645-413)/645 + \text{abs}(620-554)/620 + \text{abs}(708-509)/708 + \text{abs}(785-613)/785 + \text{abs}(858-632)/858 + \text{abs}(808-611)/808 + \text{abs}(925-700)/925 + \text{abs}(824-659)/824) / 8 * 100$$

Table 29: Traffic count results with live video feeds (I-80 @ I-287)

MAPE for the Near and Far side traffic, respectively:

$$5.2294 = (\text{abs}(905-905)/905 + \text{abs}(836-837)/836 + \text{abs}(886-790)/886 + \text{abs}(803-723)/803) / 4 * 100$$

$$9.5137 = (\text{abs}(603-610)/603 + \text{abs}(558-547)/558 + \text{abs}(1152-965)/1152 + \text{abs}(1145-931)/1145) / 4 * 100$$

Table 30: Traffic count results with live video feeds (I-280 @ Prospect Ave)

MAPE for the Near and Far side traffic, respectively:

$$9.0217 = (\text{abs}(1220-1079)/1220 + \text{abs}(1089-973)/1089 + \text{abs}(881-805)/881 + \text{abs}(857-812)/857) / 4 * 100$$

$$4.8298 = (\text{abs}(966-943)/966 + \text{abs}(962-881)/962 + \text{abs}(1002-959)/1002 + \text{abs}(899-861)/899) / 4 * 100$$

Table 31: Traffic count results with live video feeds (I-280 @ Laurel Ave)

MAPE for the Near and Far side traffic, respectively:

$$5.9475 = (\text{abs}(515-492)/515 + \text{abs}(685-664)/685 + \text{abs}(396-337)/396 + \text{abs}(222-219)/222) / 4 * 100$$

$$3.3350 = (\text{abs}(565-559)/565 + \text{abs}(748-730)/748 + \text{abs}(315-335)/315 + \text{abs}(284-274)/284) / 4 * 100$$

Results & Demos:

See the formulas on pages 2 & 3

cs.njit.edu/~liu/NJDOT/DEMOS.html

User Name: frvp

Password: demos123