

COMPASS

Ilustracija Sistema



COMPASS

- ◆ Predstavlja sinonim za **Ontario's freeway traffic management system** (nije skracenica)

SADRZAJ – KRATAK PREGLED

- ◆ Zasto I kako se COMPASS koristi?
- ◆ Kako COMPASS funkcionise?
- ◆ COMPASS tehnologija
- ◆ Gde je COMPASS u primeni?
- ◆ Pravac razvoja COMPASS-a za buducnosti?

Zasto i kako se COMPASS koristi?

- ◆ COMPASS je projektovan da maksimizuje bezbednost saobracaja (najvaznija komponenta), efikasnost i performance autoputeva kao i putne mreze u celini
- ◆ Ontario poseduje putnu mrezu sa jedinim od najopterećenijih punih pravaca na svetu (drugi u Severnoj Americi). Highway 401 AADT >435,000 (12% komercijalni saobraćaj – teska teretna vozila)
- ◆ Putna mreza, njen razvoj i performance su vitalna komponenta za ekonomski prosperitet Ontaria.
- ◆ Expansija puteva u smislu rekonstrukcija ili izgradnja novih puteva je veoma limitirana (ograniceni fondovi i obezbedjenje koridora – cena otkupa zemljišta)





Kako COMPASS funkcioniše?

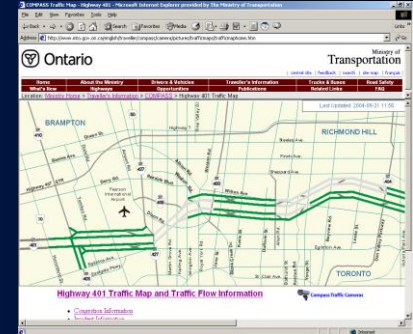
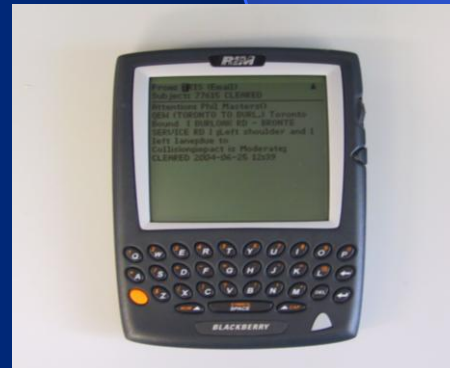
- ◆ **Stalni Nadzor i Pracenje** saobračajnih tokova I pravovremeno detektovanje saobračajnih nezgoda i incidenata koristeći ugradjene detektore, izvestaje on strane saobračajne policije sa terena, brojnih ekipa za održavanje ili konstrukciju puteva i analize istih koristeći automatski incident detekcioni algoritam
- ◆ **Potvrda Nezgoda - Incidenta**, koristeći zoom CCTV, razne detektore, etc
- ◆ **Incident Management** putem MTO AMC (Automatic Management Centre) saradnja I koordination sa urgentnim sluzbama (hitna med. pomoc, vatrogasci, saobračajna policija, I sl.



Kako COMPASS funkcioniše?

nastavak

- ◆ Odsiljanje poruke ucesnicima u saobracaju putem koriscenja variable message signs, TRIS and COMPASS website (stvarno vreme)
- ◆ Management saobracajnog toka kroz aktivni management “zagusenja” saobracaja, “objave” vremena putovanja i striktnu kontrolu saobracajnih tokova.



COMPASS

Kako COMPASS funkcioniše?

Management “zagusenja” saobraćaja

- ◆ Potpuno automatizovan sistem integrisan u COMPASS, baziran na informacijama “dobivenim” sa detektora, koji poruku potvrđuju / menjaju svakih 20 sekundi
- ◆ Na “alternativnim” putnim pravcima sistem “balansuje” informacije između dva ili više putnih pravaca.
- ◆ Na pojedinačnim putnim pravcima sistem obezbeđuje informacije o tačnoj lokaciji “zagusenja” kao i stvarno vreme putovanja između odredjenih, pre-definisanih lokacija

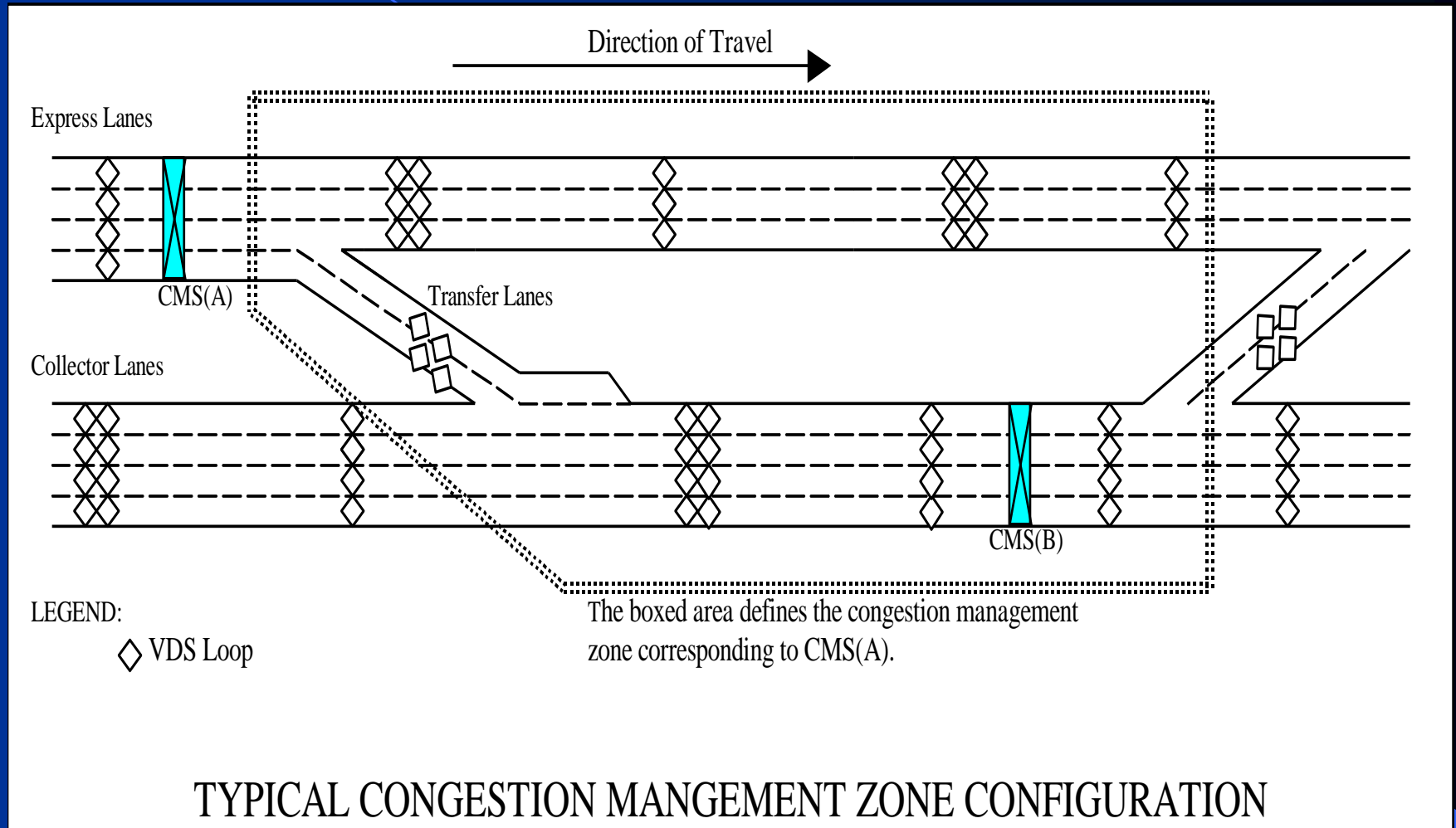
Kako COMPASS funkcionise?

Management “zagusenja” saobracaja



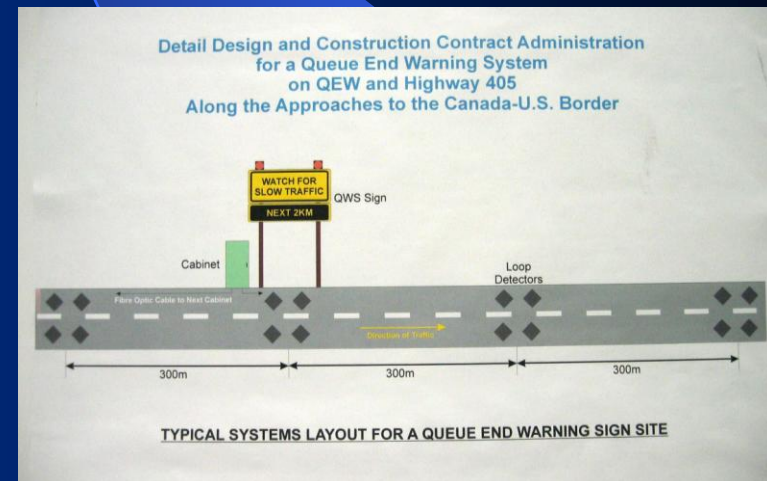
Management “zagusenja” saobraćaja

nastavak



Kako COMPASS funkcioniše?

- ◆ Sistem za upozoravanja na “zagusenje” tačna lokacija zaustavljene kolone vozila na (primer..) granicnim prelazima sa ciljem da poboljša bezbednost saobraćaja putem automatskog detektovanja duzine zaustavljene kolone (zadnjeg vozila) i automatski obavestavanja motorista na uslove voznje “ispred” i mogućnost “naletanja”



Kako COMPASS funkcioniše?

nastavak

- ◆ Dodatni – Pojedinačni **Variable Message Signs** na kritičnim lokacijama / raskrsnicama (petljama) sa ciljem omogućavanja učesnicima saobraćaja da promene pravac u slučaju “nezgode napred” ili privremenog zatvaranja puta (ili dela puta).



Kako COMPASS funkcioniše?

Udes / Incident Management - Procedura

- ◆ **Udes / Incident Detekcija / Potvrda Incidenta**
 - ❖ Policija
 - ❖ CCTV
 - ❖ AID (Automatska Incident detekcija), itd
- ◆ **Generacija Akcije / Odgovora**
 - ❖ Unosenje podataka u bazu podataka
 - ❖ Akcija / Odgovor, automatski generisan on strane sistem ili manuelno “naredjen”
 - ❖ Controlisanje funkcionisanja opreme na terenu
 - ❖ “Prosledjivanje Informacije / poruke ucesnicima u saobracaju

Kako COMPASS funkcioniše?

Organizacijske prednosti u poboljšanju efikasnosti

- ◆ **Znacajno poboljšanje u koordinaciji i medjusobnoj saradnji i dopunjavanju od strane urgentnih službi**
- ◆ **Znacajno poboljšanje u percepciji javnosti o aktivnostima službe i agencije**
- ◆ **Znacajno umanjene vozačkih frustracija**
- ◆ **Znacajno povećanje efikasnosti pružene hitne zdravstvene pomoći povredjenima.**

Kako COMPASS funkcionise?

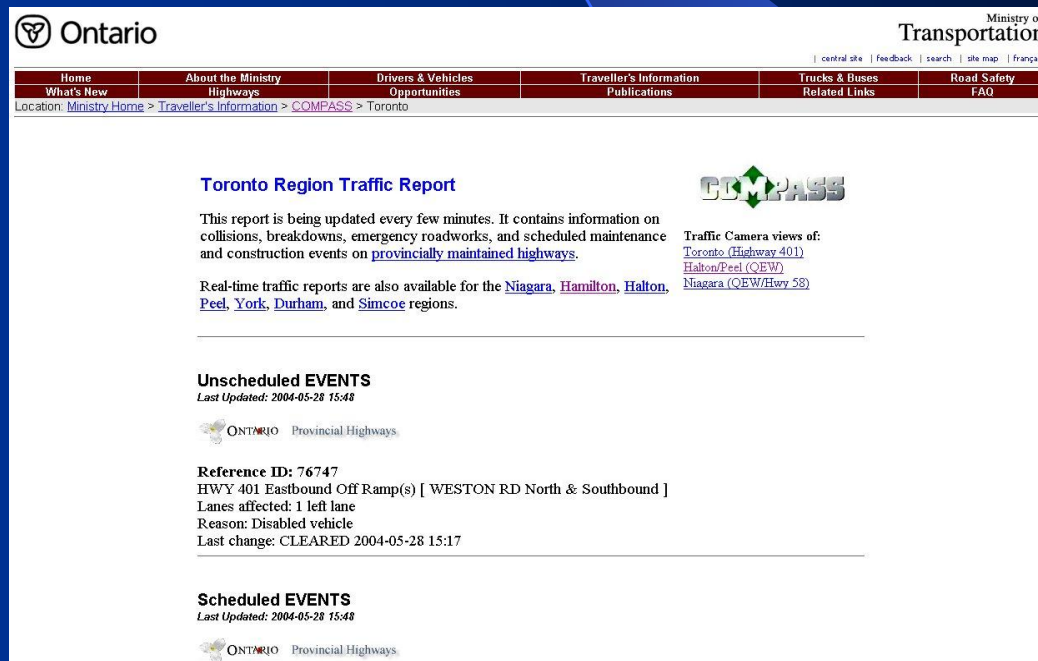
Znacaj Alarmnog Sistema i Menadgment

- ◆ Da omoguci operatoru & sistem menadjeru totalnu kontrolu nad kompletnim sistemom, dogadjajima I preduzetim merama
- ◆ Da omoguci potpunu sliku, sa svim detaljima, o problematicnom dogadjaju I omoguci pravovremenu – adekvatnu akciju
- ◆ Svi alarmi su kodirani (druge boje) po utvdjenim prioritetima I predstavljaju razkicite nivoe kompleksnosti udesa ili faze delovanja akcije I agencije.

Kako COMPASS funkcionise?

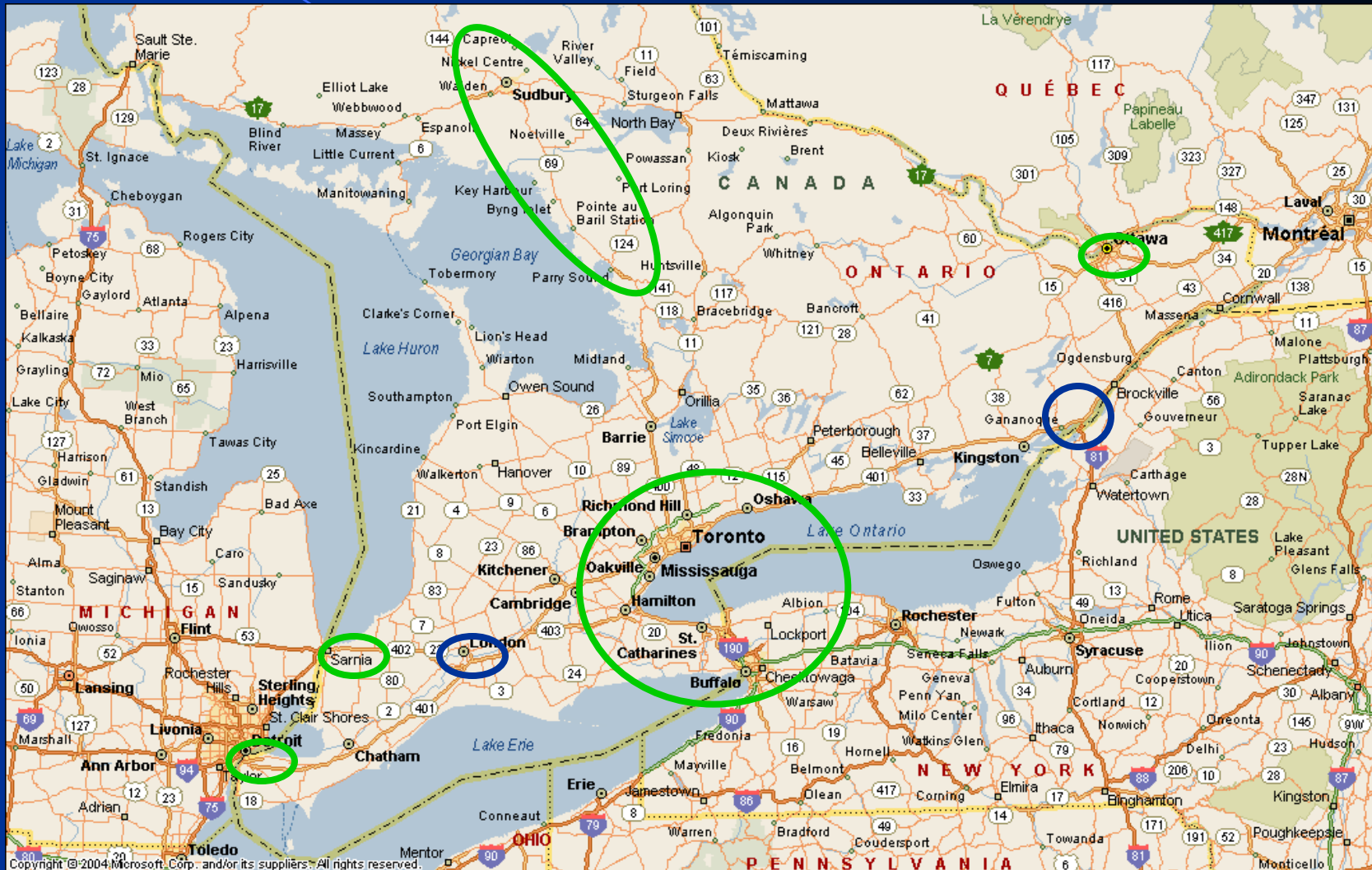
Dodatno koriscenje informacija

- ◆ Traffic and Road Information System (TRIS) automatski prosledi informaciju o incidentu/ "dogadjaju" medijskim outletima i web site, koristeći automatizovane fax-ove ili e-mail adrese (baza podataka / utvrđjena lista)



The screenshot shows the Ontario Ministry of Transportation website. The header includes the Ontario logo and the text "Ontario" and "Ministry of Transportation". A navigation menu is visible with links for Home, What's New, About the Ministry, Highways, Drivers & Vehicles, Opportunities, Traveller's Information, Publications, Trucks & Buses, Related Links, Road Safety, and FAQ. The main content area is titled "Toronto Region Traffic Report" and features the COMPASS logo. The text states that the report is updated every few minutes and contains information on collisions, breakdowns, emergency roadworks, and scheduled maintenance events on provincially maintained highways. It also mentions that real-time traffic reports are available for the Niagara, Hamilton, Halton, Peel, York, Durham, and Simcoe regions. Below this, there are sections for "Unscheduled EVENTS" and "Scheduled EVENTS", both with a "Last Updated: 2004-05-28 15:48" timestamp. The "Unscheduled EVENTS" section shows a reference ID of 76747 for HWY 401 Eastbound Off Ramp(s) [WESTON RD North & Southbound], with 1 left lane affected due to a disabled vehicle, cleared on 2004-05-28 15:17. The "Scheduled EVENTS" section is currently empty.

Gde je COMPASS u primeni (za sada)?






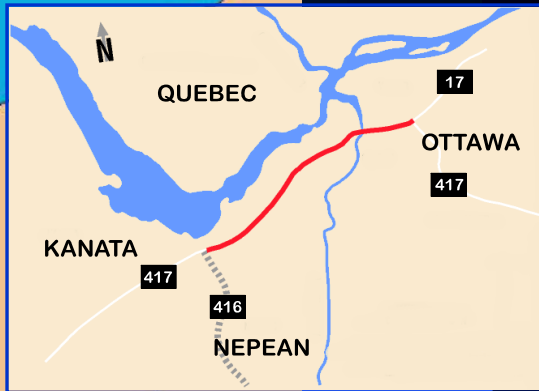
Trenutni Sadržaj COMPASS Sistema

	Highway 401	QEW	Ottawa Queensway
Putni Pravač-Limit	Hwy 407 to Westney Rd.	Thorold Stone to Hwy 406 Millen Rd. to Third Line Royal Windsor to Hwy 427	Regional Road 174 to Hwy 416
Duzina Sistem	125 km	80 km	20 km
Auto Detectors	3022	1016	0
CCTV-Kamere	99	74	11
Full Size VMS	41	12	0
Portable VMS	11	15	10
Ramp Meters	0	11	0
Control Area	Toronto, York, Durham,	Peel, Halton, Hamilton, Niagara, Simcoe	Eastern Region

Trenutni COMPASS SISTEM

Legend

-  - Full System
-  - CCTV or Queue End only
-  - Toronto RESCU





Ottawa

COMPASS

Legend

- CCTV or Queue End only
- Toronto
- ★ - Open



Burlington
COMPASS



OTTAWA

COMPASS

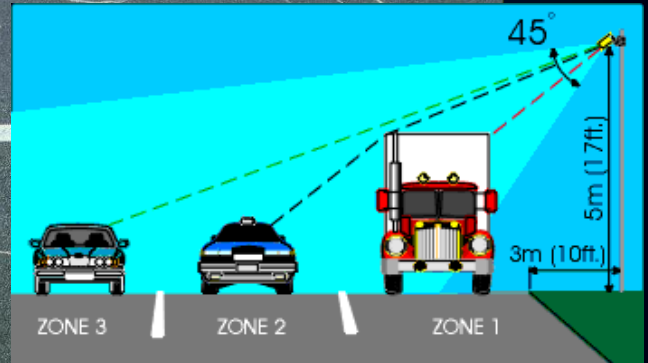
COMPASS Tehnologija

Oprema i Senzori na Terenu

- ◆ VMS
- ◆ Prismatic Signs
- ◆ Lane Control Signals
- ◆ Speed Control Signs
- ◆ Vehicle Detectors
- ◆ CCTVs
- ◆ Emergency Telephone
- ◆ Traffic Signals
- ◆ Pavement Lighting
- ◆ Barriers & Gates
- ◆ AID Systems
- ◆ Over-height Detectors
- ◆ Environmental Sensors
- ◆ Solar Sensors
- ◆ Power Circuits
- ◆ Switches
- ◆ Master Clocks
- ◆ Fire Alarms & Equipment
- ◆ Graphic Video Walls
- ◆ SCADA

COMPASS Tehnologija

◆ Detektori koji se koriste u COMPASS Sistemu



COMPASS Tehnologija

nastavak

◆ CCTV Kamere

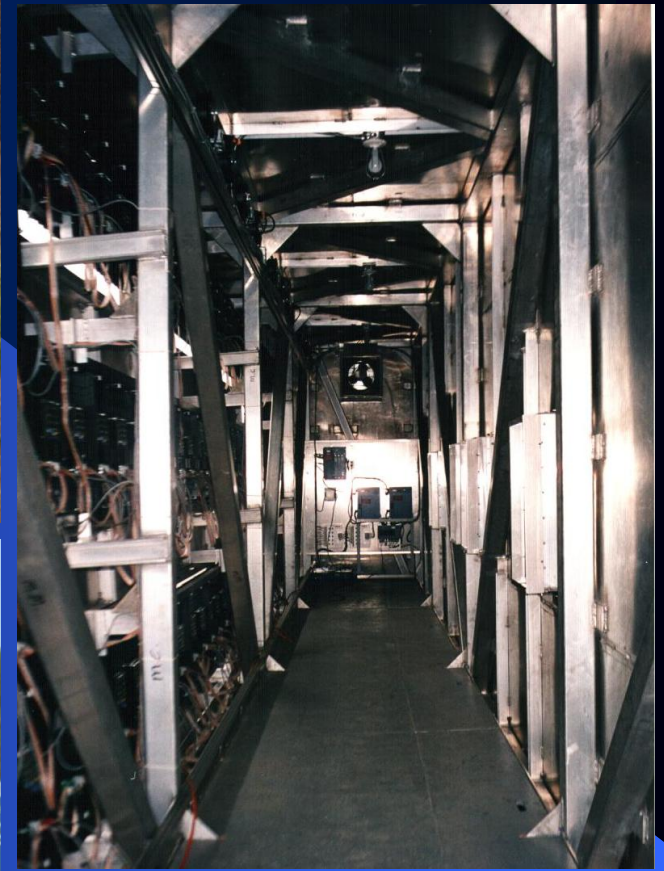


COMPASS Tehnologija

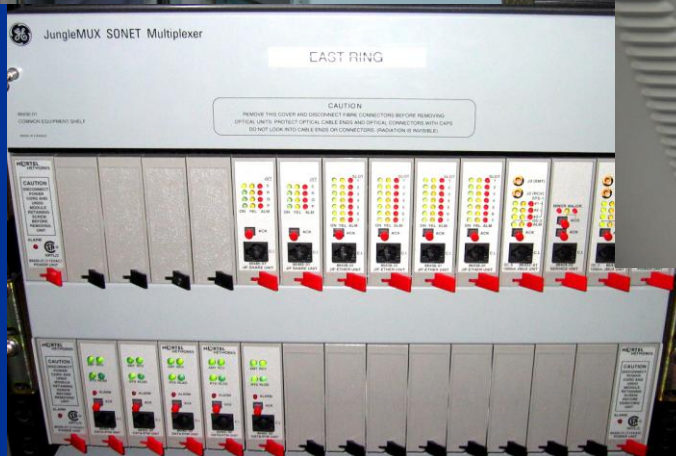
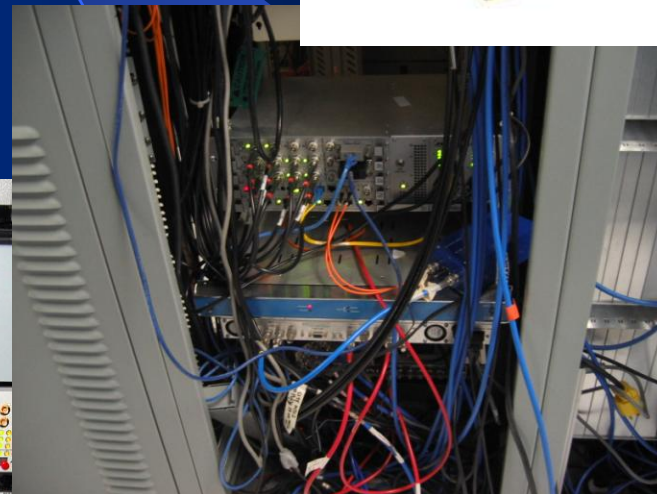
continued



◆ VMS



◆ Fibre Optic Komunikacija



Buduci pravac razvoja?

- ◆ Novi COMPASS software
 - ❖ Fokus na proširenju pokrivenosti putne mreže i poboljšanju povezivanja komunikacionih i komandnih centara
- ◆ Sistem za zamenu, poboljšanje i održavanje
 - ❖ Unapređivanje i zamena stare opreme e.g. VMS
 - ❖ Otvaranje novih kontrolnih centara
- ◆ Strategijsko proširenje aktivnosti - pokrivenosti
 - ❖ Granicni prelazi – automatizovan nadzor
 - ❖ Strategijsko povezivanje postojećih sistema i podrška stvaranju umreženih, većih sistema

COMPASS

Pitanja?



Utvrdjivanje Pravca za
Sigurnu i Efikasnu
Putnu Mrežu

CAMPASS - Ostvarene Beneficije

- ◆ Quick detection and removal of incidents reduces exposure time for secondary collisions
 - ❖ COMPASS decreases average incident duration by 65%
 - ❖ COMPASS reduces secondary collisions by 30 to 60%
- ◆ Advance warning from Variable Message Signs makes drivers more prepared for problems and reduces collisions
 - ❖ 12% reduction in collisions measured on Highway 401

What benefits have we measured?

continued

- ◆ Congestion Management improves balance between express and collector, maximizing use of available capacity and reduces congestion
 - ❖ Increase in average speeds 7 to 18%
 - ❖ Increase in MOVING WELL condition up to 45%



Management neplaniranih događaja

- ◆ “Dogadaj” detektovan automatski od strane sistema, od strane deurnog operatora I potvrđenog od Policije, detektora... (CCTV, OPP)
- ◆ Operator “obezbedi” detalje udesa / incidenta systemu , popunjavanjem upitnika / algoritma
- ◆ Na basi “obezbedjenih” detalja / specificnosti, sistem “preporuci” akcioni plan za Variable Message znake na bazi pre-determinisane raspolozive baze poruka.
- ◆ Operator “potvrdi” akcioni plan /poruku ili modifikije da odgovori svim specificnostima realnog stanja
- ◆ System posalje “poruku za potoriste” da se “objavi” na znaku I proveriti da li je adekvatna/izabrana poruka I “objavljena/prokazana”

Management neplaniranih dogadjaja

Central Region Real-Time System

Logout Password Phone list TRIS Memo CMS Library CMLDG Help

RELY ?
E BACK

*PLEASE KEEP A SAFE GAP
*FROM VEHICLE AHEAD

*SIGNAL LANE CHANGES
*AND MERGE SAFELY

*PLEASE KEEP A SAFE GAP
*FROM VEHICLE AHEAD

AVENUE ROAD

General Panel Incident Management

Event Pane
2004-12-01 11:
2004-12-01 11:

Incident Location:

VDS ID: 401DE0090DWC

Sub Zone ID: WE02M WE02D RE04B

Comments:

Incident Detail:

Detection Time: 11:21:43 Implemented Plan: 0

Source: Operator

Incident Type: Other

Blockage Pattern: L 1 2 3 4 5 R

Conditions: Partial Blockage

Apply Close

Alarm Panel

Management planiranih događaja

- ◆ Planiran događaj (npr. zatvaranje dela puta/jedne trake za saobraćaj) se prvo “upise” u sistem I I sistemsku database
- ◆ System izvrši bazicnu proveru za moguće konflikte sa drugim događajem na istoj/sličnoj lokaciji (predodređena pravila “ponasanja”)
- ◆ Kada se “događaj” počne sprovoditi, contractor se javi Centru a operator proveri da li je “događaj” odobren, lokaciju u uslove
- ◆ U ovom trenutku, ova radnja je “manuelna” ali se u bliskoj budućnosti biti “automatizovana” I bice integrisana u COMPASS

Management planiranih događaja

Oracle Application Server Forms Services - Microsoft Internet Explorer

Address: http://142.107.231.155/forms90/90servlet?form=tris_cmlog_rsu_menu_web.fmx

Construction & Maintenance Log - Add Approved Closure Permit

Recordid: 20041201113141501 TRISID: 82666 Contract/MP: TEST123 Seq.No: 1

Highway: Test Road Direction: Eastbound From: Test Intersection 2 To: Test Intersection 1

Section: TRANS Section Name: Collector to Express TRIS Comment for Public: This is a test event

Start Date: 2004-12-15 00:00 End Date: 2004-12-20 06:00 CMLLOG Comments: This is test event

Closure: Nightly Category: Maintenance

Permit: Closure Permit Road Closed: All Lanes: LS: Left: 0 Centre: 0 Right: 0 RS:

Contractor: Test Contract Approved By: COMPASS Permit Denial: No

AREA: TestArea App. Carried Forward: No

Classification: Construction

Notification Date & Time (yyyy-mm-dd hh:mm): 2004-12-01 11:00

Advance Signing: No

Violation: No

Total Cancellation: No

Total Cancel. Time: No

Completed By: Contractor Test Phone: (789)456-1230 Cell: No

Construction & Maintenance Detail Log

Scheduled Closing Time	Scheduled Opening Time
2004-12-15 00:00,WED	2004-12-15 06:00,WED
2004-12-16 00:00,THU	2004-12-16 06:00,THU
2004-12-17 00:00,FRI	2004-12-17 06:00,FRI
2004-12-18 00:00,SAT	2004-12-18 06:00,SAT
2004-12-19 00:00,SUN	2004-12-19 06:00,SUN
2004-12-20 00:00,MON	2004-12-20 06:00,MON

Buttons: Preview, Cancel, Save, Exit

OracleAS