

ZIPMANAGER

Portable traffic management system

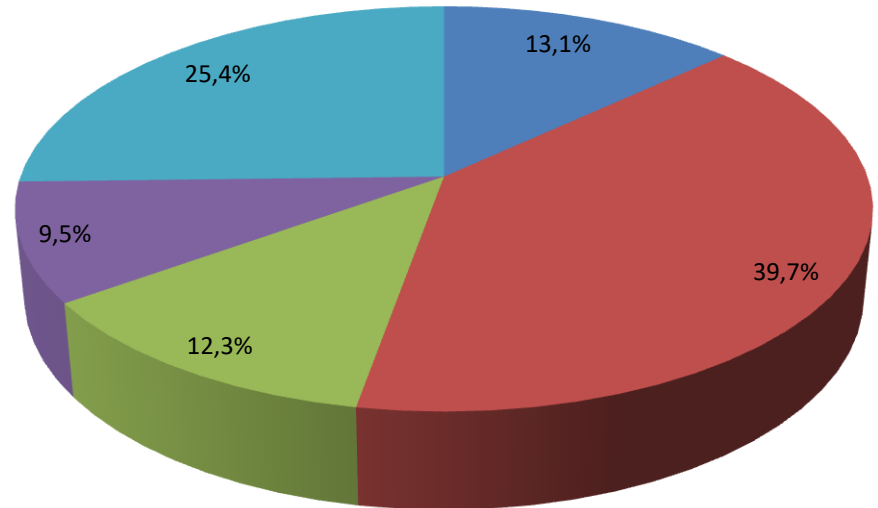
Martin Bambušek

CAUSE OF CONGESTIONS ON HIGHWAYS



CAUSE OF CONGESTIONS ON HIGHWAYS

Long term workzone: 39,7%
Short term workzone: 12,3%
Accidents in workzones: 9,5%
Accidents: 13,1%
Other reasons: 25,4%



ZIPMANAGER SYSTEM

TRAFFIC RELATED ASPECTS

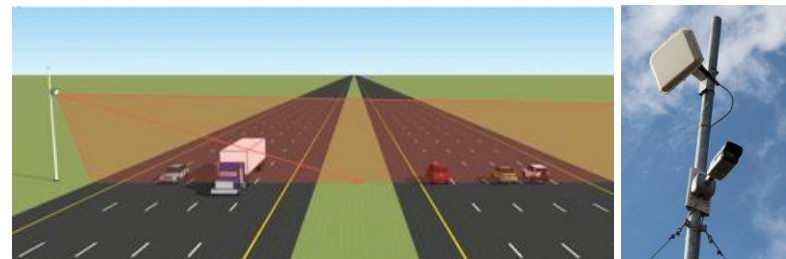
- DECREASE nr. of ACCIDENTS
- DECREASE TRAVEL TIMES
- INFORM DRIVERS and OPERATORS

TECHNICAL ASPECTS:

- PORTABLE, EASY TO INSTALL TELEMATIC SYSTEM
- USER DEFINED FUNCTIONS AND ALGORITHMS
- CONSIST OF HIGH VISIBILITY TRAFFIC LED SIGNS
- INDEPENDENT POWER SUPPLY
- DYNAMIC DATA-DRIVEN REMOTE CONTROL FROM SERVER APPLICATION
- USING BIG DATA – FCD FOR WORKZONE TRAFFIC FLOW MONITORING



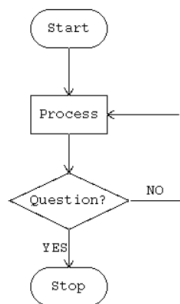
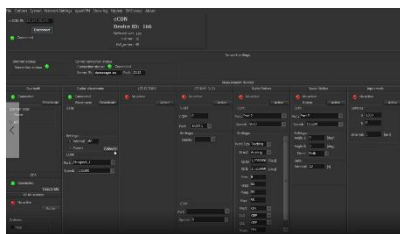
DETECTION



COMMUNICATION



EVALUATION



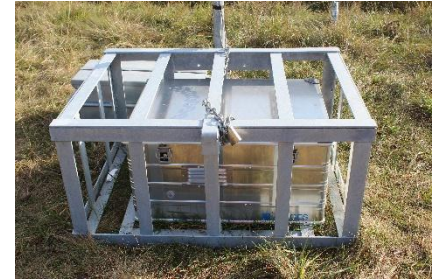
| I2 | A1B1 | A1B2 | A1B3 | A2B1 | A2B2 | A2B3 | A3B1 | A3B2 | A3B3 |
|------|------|------|------|------|------|------|-------|------|-------|
| C1D1 | K | k | k | k | k | k | K, PB | k | K, PC |
| C1D2 | K | k | k | k | k | k | K, PB | k | K, PC |
| C1D3 | K | k | k | k | k | k | K, PB | k | K, PC |
| C2D1 | k | k | k | k | k | k | K, PB | k | k |
| C2D2 | P | P | P | p | n | n | P, PB | r | r |
| C2D3 | P | P | P | p | n | n | P, PB | r | r |
| C3D1 | k | k | k | k | k | k | K, PB | k | K, PD |
| C3D2 | P | P | P | p | n | n | P, PB | r | r |
| C3D3 | P | P | P | p | n | n | P, PB | r | r |



DISPLAYS / VMS



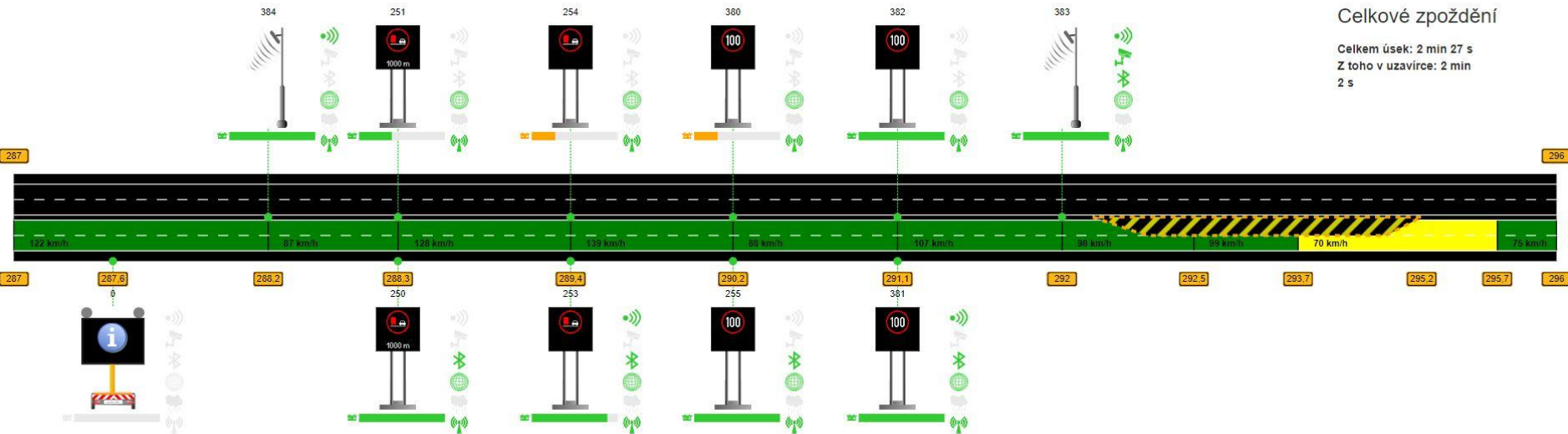
POWER SUPPLY



35 Rekonstrukce vozovky D35 km 292,8 - 294,9

Celkové zpoždění

Celkem úsek: 2 min 27 s
 Z toho v uzavírc: 2 min
 2 s


 náhled kamer detailní profilová data

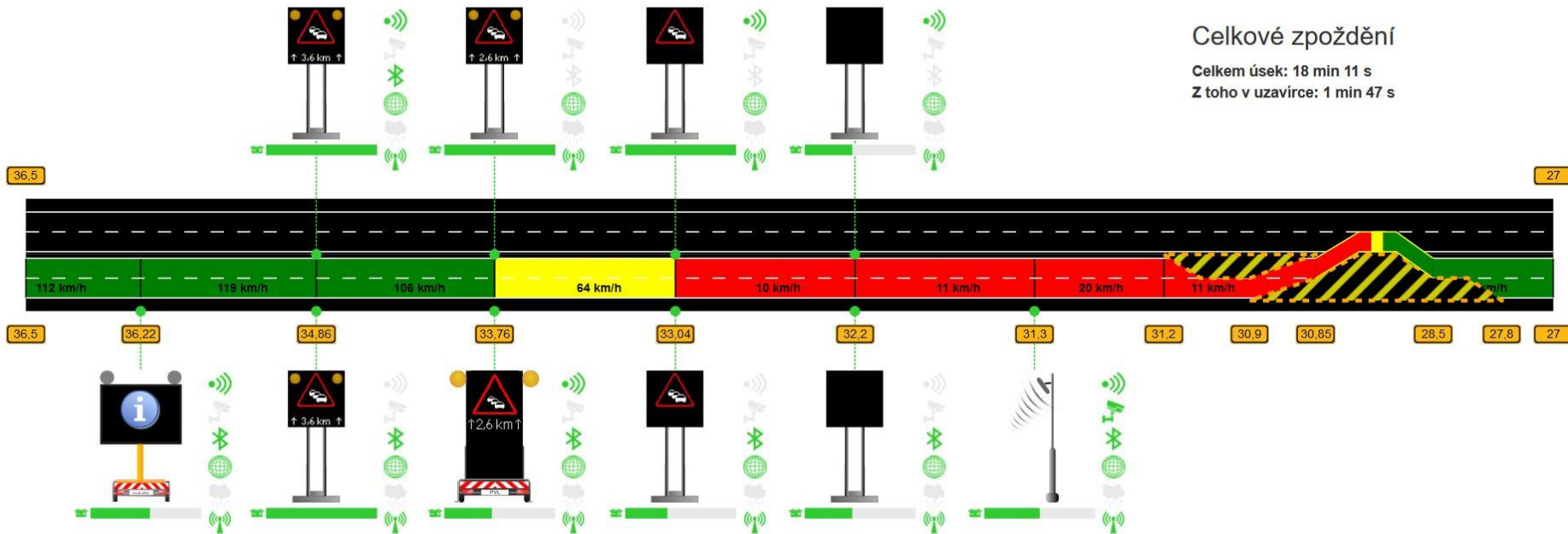

5 "Pilot" 36,5-27 km

Mapa Export

Aktivní

Celkové zpoždění

Celkem úsek: 18 min 11 s
Z toho v uzavírc: 1 min 47 s



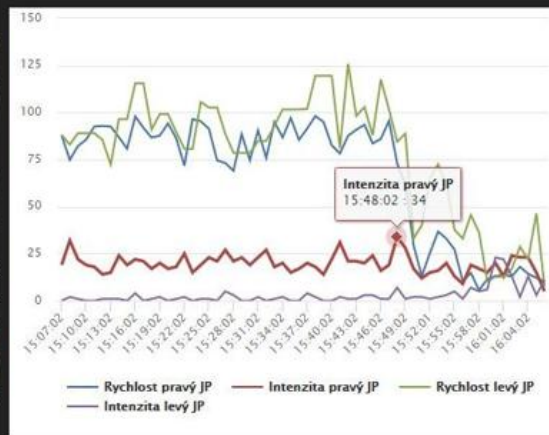
Řez Detekce, stanice P

Status Průběh **Kamera**



Řez Detekce, stanice P

Status **Průběh** Kamera Ostatní



| Čas | Rychlost pravý JP | Intenzita pravý JP | Rychlost levý JP | Intenzita levý JP |
|----------|-------------------|--------------------|------------------|-------------------|
| 15:07:02 | 87,84 | 19 | 88,117 | 0 |
| 15:08:02 | 74,859 | 32 | 82,898 | 2 |
| 15:09:02 | 82,207 | 22 | 89,047 | 1 |
| 15:10:02 | 85,555 | 19 | 89,047 | 0 |
| 15:11:02 | 92,582 | 18 | 89,047 | 0 |
| 15:12:02 | 92,863 | 14 | 85,41 | 1 |
| 15:13:02 | 92,52 | 15 | 72,34 | 1 |
| 15:14:02 | 86,875 | 24 | 96,398 | 1 |
| 15:15:02 | 80,801 | 19 | 96,398 | 0 |
| 15:16:02 | 97,914 | 22 | 115,516 | 4 |

Řez Profil_1, stanice P

Status Průběh Ostatní

Rychlost: 99 km/h
Intenzita: 17
Baterie: 12,3 V
GPS: 49,85660325,
13,8759229333333
Rychlost pravý JP: 84 km/h
Intenzita pravý JP: 8
Rychlost levý JP: 114 km/h
Intenzita levý JP: 9
Rychlost protisměr levý JP: 126 km/h
Intenzita protisměr levý JP: 10
Rychlost protisměr pravý JP: 101 km/h
Intenzita protisměr pravý JP: 10





6TH WARMIAN & MAZURIAN ROAD FORUM, Mikolajki, 22.09.2019 - 24.09.2019

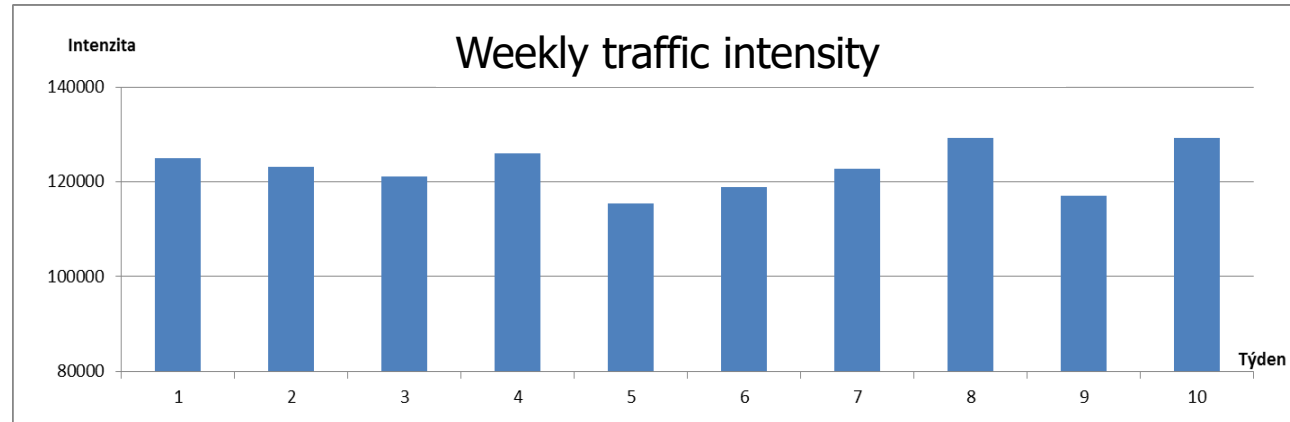


TRAFFIC INTENSITY

In all phases the traffic intensity was comparable

Average daily intensities:

| | |
|------------|--------|
| Monday: | 18 026 |
| Tuesday: | 17 286 |
| Wednesday: | 17 645 |
| Thursday: | 23 211 |
| Friday: | 25 841 |
| Saturday: | 16 215 |
| Sunday: | 13 512 |



PILOT TEST EVALUATION – congestion time

| Congestions in a days of week | | | |
|-------------------------------|-----------------|--------------------|---------------|
| Phase | Data collection | Congestion warning | Harmonization |
| Mon | 11,5% | 8,0% | 5,5% |
| Tue | 17,0% | 6,0% | 11,0% |
| Wed | 23,5% | 32,5% | 8,5% |
| Thu | 35,0% | 31,0% | 33,0% |
| Fri | 44,0% | 37,0% | 25,0% |
| Sat | 11,0% | 4,5% | 0,0% |
| Sun | 22,0% | 9,0% | 6,0% |
| Total | 23,4% | 18,3% | 12,7% |



CONCLUSIONS

- System has big potential for **decreasing of external losses from congestion** in workzones and **increasing the traffic safety**
- **Dynamic mobility model and the control algorithms** is ready to be tested and integrated into the dynamic Use case for **C-ITS**
- The modularity of system is ready for **any workzones layout**, even the **short-term Workzones**
- System is ready to **integrate any other ITS equipment** (detectors, portable traffic Lights, standard trailers etc.)
- From the technical point of view – system has been modified and been proved as **reliable** and it is ready to use **in commercial applications**
- System has very **positive CBA index** (investment of **0,5-1,5%** of the total **budget for reconstructed part of highway**)



Thank you for your attention

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