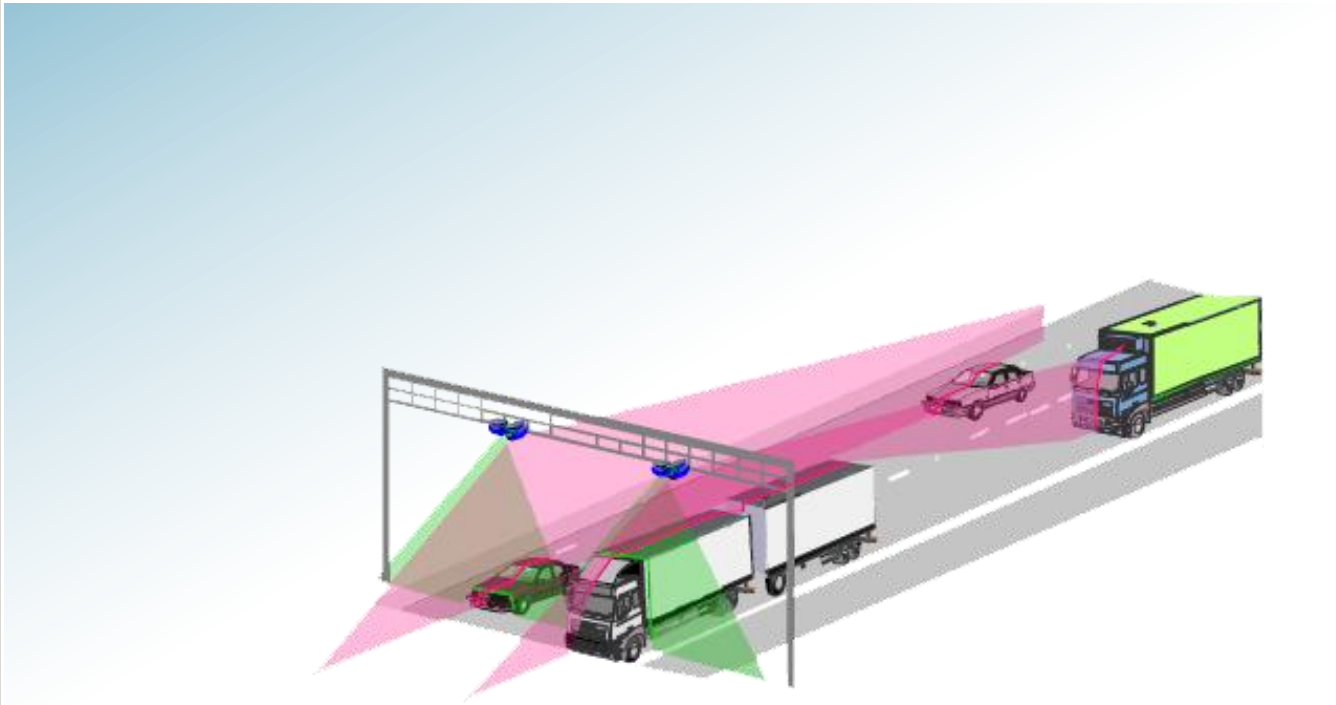
Complete system: Vehicle classification-TIC, weight in motion-WIM, plates recognize and dangerous goods plates watch, electronic toll collection-ETC

SYSTEM INFORMATION



GETCS3.0

GETCS3.0 Overview

The System includes:

1. TIC - Classification
2. WIM - Weight In Motion
3. Signs for dangerous goods recognizing
4. Recognize of vehicle plates
5. ETC - Electronic Toll Collection
6. Meteostation, LED Info Display
7. GPS module, Combined Power supply
8. GPRS module

Description:

GETCS3.0 is a system for classification of vehicles, measuring their weight while in motion, face plates recognizing, placards for dangerous goods watch and electronic toll verification

Task:

GETCS3.0 task is to create a complete profile, gathering data for vehicles on highway and first class roads in the country. The system is equipped with a GPS receiver, GPRS communication module, combined power supply (solar panels, batteries, rectifier unit), a 2D infrared camera, tracking registration numbers and dangerous goods plates, TIC system for classification of vehicles, ETC - electronic toll system using RFID technology for automatic toll collection, WIM - system for measuring the weight of vehicles in motion (by measuring axle load), information LED display and weather station. Information on all vehicles, their exact coordinates and statistics in real time are sent to regional or national control center.

GETCS3.0 Overview

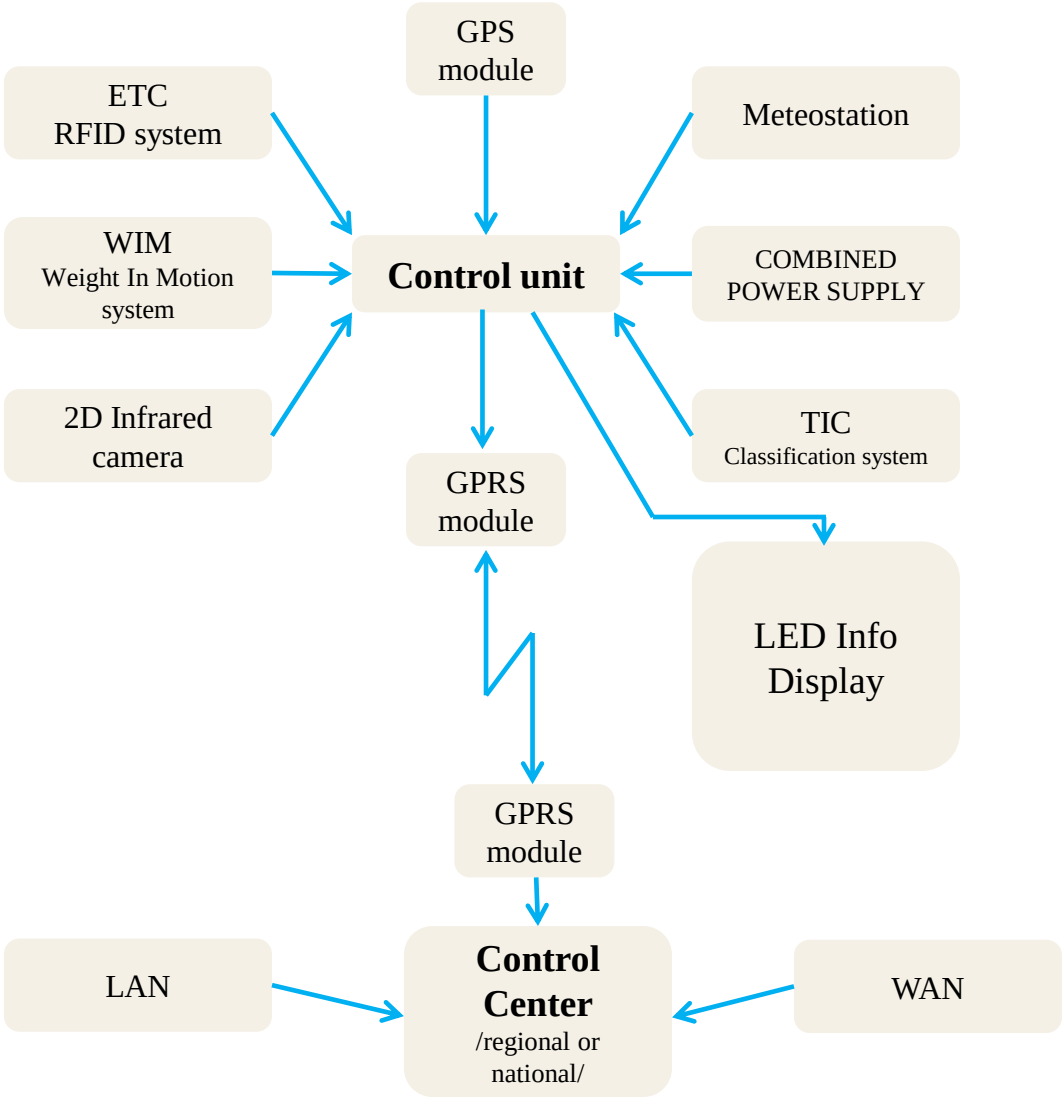


Table 1.1

- An European standard classification table

ECTN 28	ECTN 15	Swiss 10	TLS 8+1	Name	Description	Symbol
000	000	0	6	Unknown	Detectable, but not classifiable vehicle.	
110	110	2	10	Bike	Motorbike or scooter (without bicycle or moped).	
210	210	3	7	Car	Car (up to 9 seats, ≤3.5t total weight[1]).	
211	211	4	2	Car with trailer	Car with trailer (up to 9 seats, ≤3.5t total weight[1]).	
310	310	5	11	Van	Van with tapered front, superstructure at least as high as the cabin (including mini trucks and moving van, 2.8t to 3.5t weight [2]).	
311	311	6	2	Van with trailer	Van with trailer (2.8t to 3.5t weight [2]).	
320	310	5	11	Pickup van	Pickup-style van with no or small loading. (Cabin in the front, no superstructure, weight ≤3.5t [2]).	
321	311	6	2	Pickup van with trailer	Pickup-style van with no or small loading, with trailer. (Cabin in the front, no superstructure, weight ≤3.5t [2]).	
330	330	5	11	Caravan	Motor-home, (cubical size, rooftop with extension (e.g. bunk), weight ≤3.5t [2]).	
331	331	6	2	Caravan with trailer	Motor-home with trailer, (cubical size, rooftop with extension (e.g. bunk), weight ≤3.5t [2]).	
340	340	7	9	Semitrailer van	Semi-trailer van (weight ≤3.5t[2]).	
410	410	8	3	Truck	Truck with superstructure (up to 12m length, weight >3.5t).	
411	411	9	8	Truck with trailer	Truck with superstructure and trailer. (Up to 18.75m length, weight >3.5t).	
420	410	8	3	Dumper truck	Dumper truck with empty or nearly empty dumper. (Up to 12m length, weight >3.5t).	
421	411	9	8	Dumper truck with trailer	Dumper truck with empty or nearly empty dumper, with trailer. (Up to 18.75m length, weight >3.5t).	
430	410	8	3	Tank truck	Tank track for transport of fluids. (oval cross-section, up to 12m length, weight > 3.5t)	
431	411	9	8	Tank truck with trailer	Tank track for transport of fluids, with trailer. (oval cross-section, up to 18.75m length, weight > 3.5t)	
440	410	8	3	Low loaded truck	Truck without superstructure or with low cargo (cargo lower than cabin, up to 12m length, weight > 3.5t)	
441	411	9	8	Low loaded truck with trailer	Truck without superstructure or with low cargo, with trailer (cargo lower than cabin, up to 18.75m length, weight > 3.5t)	
450	411	9	8	Vehicle transporter (loaded)	Vehicle transporter truck, loaded, with trailer (2 loading platforms, up to 21.5 m length, weight > 3.5t)	
451	411	9	8	Vehicle transporter (empty)	Vehicle transporter, empty, with trailer (2 loading platforms, up to 21.5 m length, weight > 3.5t)	
510	510	10	9	Semitrailer truck	Semi-trailer truck (loaded, up to 16.5m length, weight > 3.5t)	
520	510	10	9	Semitrailer dumper truck	Semi-trailer dumper truck with empty or nearly empty dumper. (up to 16.5m length, weight > 3.5t)	
530	510	10	9	Semitrailer tank truck	Semi-trailer tank truck (oval cross-section, up to 16.5m length, weight > 3.5t)	
540	510	10	9	Low loaded semitrailer truck	Semi-trailer truck, unloaded or with low loading (up to 16.5m length, weight > 3.5t)	
590	590	8	3	Tractor truck	Semi-trailer's tractor truck, without semi-trailer.	
610	610	1	5	Bus	Bus for the transport of a bigger number of people. (coach, overland bus, > 9 seats)	
611	611	1	5	Bus with trailer	Bus for the transport of a larger number of people, with trailer. (coach, overland bus, > 9 seats)	

Figure 1.1

Figure 1.2

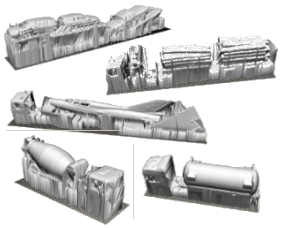
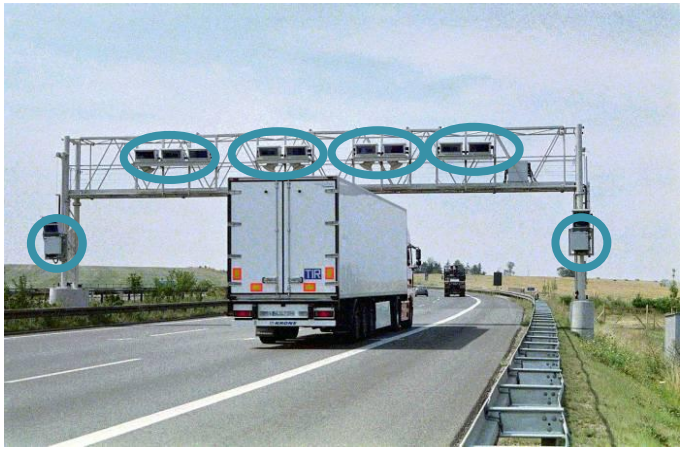
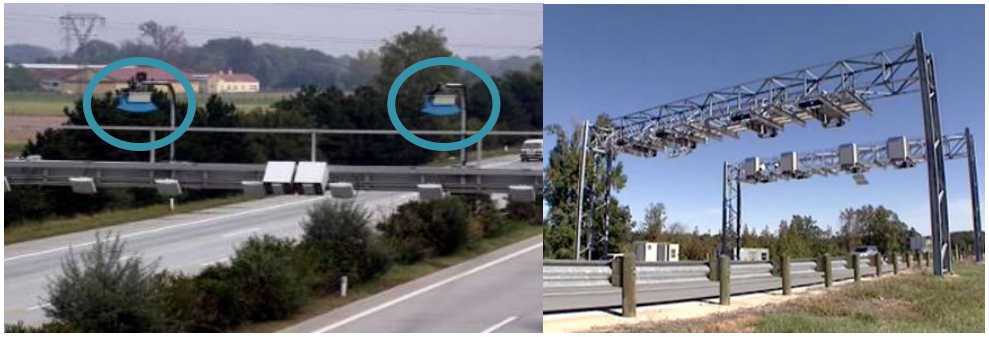


Figure 2.1



Typical classification of vehicles and toll collection system in Germany

Figure 2.2



The “free flow” systems in Switzerland and Texas

Figure 3.1

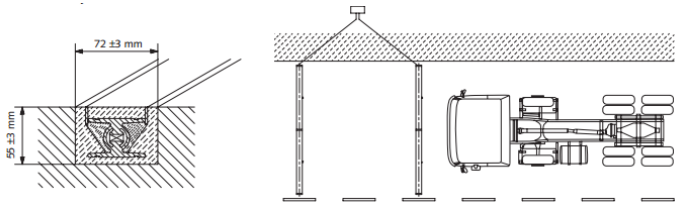
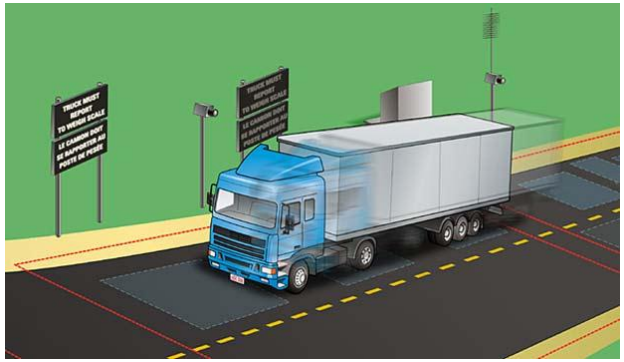


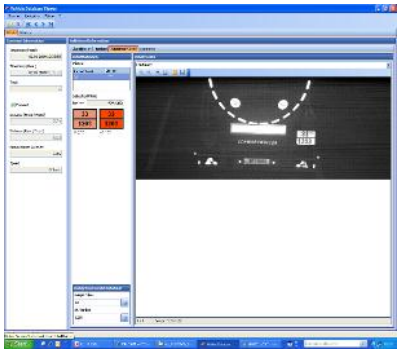
Figure 3.3

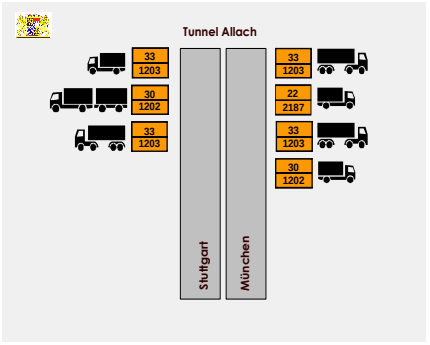
Figure 3.2



The system uses a quartz sensor to measure the wheel- and axle loads and to determine the vehicle gross weight under rolling traffic conditions. Excellent long-term stability; Huge measuring range: from slow to fast freeway speed; Very high natural frequency and signal dynamic

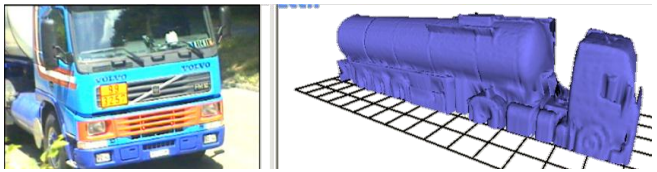
Figure 4.1





-Combination of 2D infrared camera with OCR algorithm for reading plates and LMS111/511 for finding corresponding vehicle and shape and speed prediction.
-Enables operators to know how many dangerous goods are in tunnel and what kind of

Figure 4.2-4.3



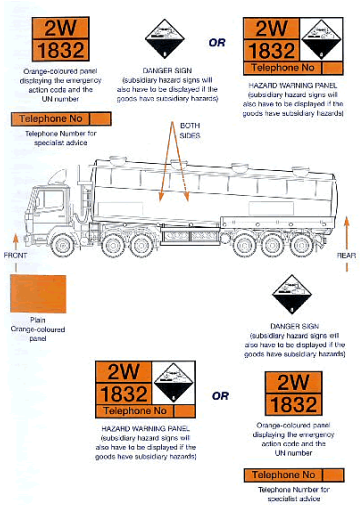


Figure 4.1

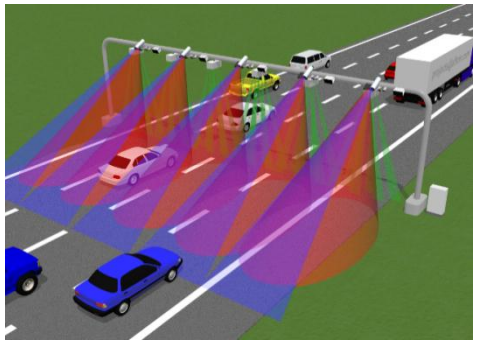


Figure 4.2

Figure 4.3

The system uses RFID technology. The process is called "Electronic toll collection." Data from the vehicle shall be taken contactless, all done in motion. The system serves as an easy, complete manager for the traffic infrastructure, and for an instrument for accurate statistics.

Figure 5.1

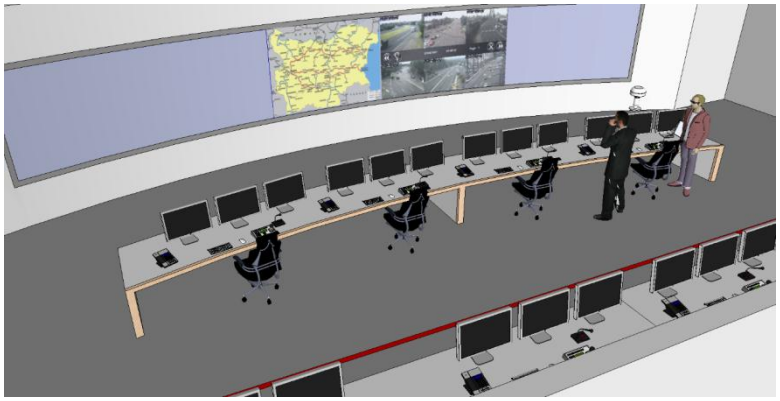


Figure 5.2

"The data gathered is used to generate comprehensive traffic information and aid informed management decisions to improve the traffic situation in Bulgaria."

GETCS3.0

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