EXCEL TECHNOLOGY Group

An innovator in the development of intelligent vehicle highway solutions.

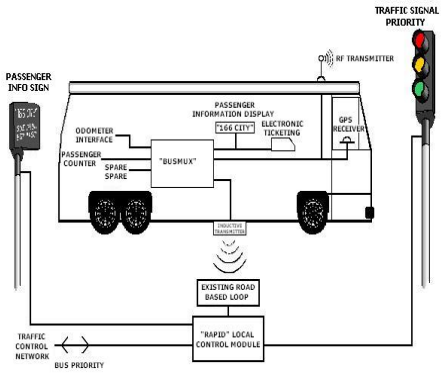
Automatic Vehicle Location (AVL)

Advanced Road Transportation Systems for High Occupancy Vehicles (HOV)

Excel Technology Group (ETG) has developed an integrated vehicle identification and on-board vehicle data processing transponder system. The ETG transponder system transfers data to the traffic control system in real time either by propagated radio wave or inductive detector loop coupling technology. The combination of preset identification and variable journey / trip data generated on the vehicle enables real time dynamic allocation of priority on the public road network. The allocation of HOV priority is primarily dependent on the "Lateness" of the vehicle, route classification and passenger load capacity. The vehicle identification component may be used for tracking vehicle movement on the public road network.

Transport Priority Transportation Systems

- Public transport & emergency vehicle priority
- Traffic system performance monitoring
- Hazardous goods journey monitoring
- Roadside public transport information systems
- Onboard passenger information systems
- Contra flow bus lane control systems
- Bus corridor monitoring and control systems
- Fleet management
- AVL journey prediction monitoring
- Queue jumping facilities



Roadside Technology

- Radio transceiver
- Existing in roadway loops
- Inductive loop receiver
- Intersection monitor
- Interface to traffic controller
- Interface to traffic controller network
- Interface to passenger information displays
- Passenger information displays

Onboard Vehicle Systems

- Data consolidator and computer module
- 4 Ddgital I/O
- 6 serial ports (RS422 & RS232)
- Data logging to compact flash module
- Transponder (400 Khz)
- GPS positional receiver
- GPRS radio transceiver OR
- DSRC type radio facility

Designed and manufactured by Excel Technology Group Pty Ltd
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Data message configuration Transponder and GPRS transceiver operation

1	Owner 2-3	Bus number 4-6	Separator ,	Service Number	Start time 12-14	Route Number	Priority
B	**BT**	**1234**	**,**	**146**	**0605**	**123**	**4**

The dynamic nature of the data message provides critical information relevant to the 'on-time' nature of this bus, operating on this service, at this time of day.

AIR GAP SPECIFICATION -

Operational Frequency 400 Khz
PCM operation at 4800 baud
'1' No frequency transmission
'0' Frequency transmission
5 millisecond frequency ON transmitter/receiver synchronisation - immediately precedes data transfer from transponder TAG
* Operating as an unlicensed transmitter under the Radio Communications Act 1983 - Amended 1991 Schedule 3 Section 8.1 Item 5 .325 to .415 Mhz at less than 42dBuV/m at 30 metres
Unlicensed operation U.S.A - FCC Part 15

The following tabulation of VID data transfer across the AIR GAP has been verified by Queensland Department of Main Roads.

Vehicle Speed KM/HR	45	50	55	60	70	80	90	100
Loop Size (Longitudinal)	Number of characters transferred across the AIR GAP							
1.5mts	30	27	25	23	19	17	15	14
2.0mts	40	36	33	30	26	23	20	18
2.5mts	50	45	41	38	32	28	25	23
3.0mts	60	54	49	45	39	34	30	27
4.0mts	80	72	65	60	51	45	40	36

* A 16 character message will be transferred and received twice on a two metre loop when the vehicle is travelling at 45 km per hour.

VID Receiver Options

/S This version VID receiver enables interconnection with a SCATS / TRAFF based traffic controller within the TSC port designated for ANTTS.
/M The /M version VID receiver includes additional serial ports to enable connection to another three VID receivers. The multiplexer function which facilitates 4 up to 32 channels at one site.
/D The /D version VID receiver is used where the host system can not effectively transfer VID message packets, or preference for 'selected TSC input' actuation priority has been nominated. The /D version incorporates an output interface which is connected to a traffic signal controller detector input.

GPRS Communications

A GPRS modem may be connected to the BUSMUX on board computer. The GPRS modem transfers a data message 'encapsulated' in TCPIP protocol into the radio network. This data message incorporates the TCPIP destination address which is configured into the BUSMUX.

Transponder technology, GPS and GPRS working together to overcome the limitations of each technology while utilising the advantages of each technology

The Brisbane HOV management system rollout began in 1994. As the system evolved through a city wide implementation, BCC recognised that the ideal HOV system was a combination of technologies rather than any specific core technology hence the title '*intelligent use of technology systems'*. BCC use GPS and now GPRS radio communications for servicing outer areas where there was less opportunity to receive data through traffic lights, and the use of transponder technology on inner roads where congestion is a significant factor in determining journey time, and high intervention polling rate is required.