COMMUNITY ASSET DATA EXCHANGE – A CASE STUDY – THE QUEENSLAND ROAD ALLIANCE

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The Queensland road system consists of approximately 177,000kms of roads administered by 73 local governments and the Queensland Department of Main Roads. Obtaining an assessment of the extent and condition and the future investment needs of this vast road network has not been possible to date because of the widespread use of disparate systems and methodologies. With the establishment of the Queensland Roads Alliance in 2002, one of its prime objectives has been to achieve this overall view of the Queensland road network. This paper presents the approach adopted by the Queensland Roads Alliance for the exchange of community based asset data. The Roads Alliance has been fostering the development of asset management and sustainable road investment programs for the 18 Regional Road Groups throughout Queensland, Australia. The Alliance has provided funding, support, and training for asset management, programme development and joint purchase and resource sharing. All members of the Road Alliance adhere to agreed standard asset data definitions, road referencing and segmentation systems and a data exchange system based on a simple flat file format. Members are free to use whatever system they desire provided that their adopted system can import and export data in the agreed format. The Road Alliance has established a web based hub for the exchange of data across all Alliance members. This hub, allows for the construction of a State wide view of the extent, condition and future investment needs of the Queensland road system.

Key Words: Road Alliance, Community Assets, Data Exchange

1. BACKGROUND ON COMMUNITY ASSETS DATA EXCHANGE

Exchange of community based asset data (in a digital form) is a relatively new concept. Three models have evolved to facilitate the exchange of community based asset data information between agencies: a minimum common data approach, a common system approach and a common standard approach (Reference 1). The Queensland Road Alliance (Reference 2) has implemented a common standard model for the exchange of road data between road authorities in Queensland, Australia.

2. EVOLUTION OFTHE QUEENSLAND ROAD ALLIANCE

The Queensland Roads system consists of approximately 177,000kms of roads administered by 73 local governments and the Queensland Department of Main Roads. Obtaining an assessment of the extent and condition and the future investment needs of this vast road network has not been possible to date because of the widespread use of disparate systems and methodologies. The Queensland Roads Alliance is a joint initiative of the Department

of Main Roads and the Local Government Association of Queensland to jointly manage 32,000km of roads across Queensland (References 3, 4 and 5). The establishment of the Road Alliance was a response to the need to achieve more with the limited resources available. It is recognised that the travelling public does not differentiate between state and local roads and a joint management approach was appropriate.

One of the prime drivers for the Roads Alliance is to achieve an overall view of the Queensland road network. The Alliance promotes the strategic development of the Queensland road network which is vitally important in a vast and decentralised area such as Queensland.

The Roads Alliance has been fostering the development of asset management and sustainable road investment programs for the 18 Regional Road Groups throughout Queensland, Australia. The Alliance has provided funding, support, and training for asset management, programme development and joint purchase and resource sharing.

3. ALLIANCE OBJECTIVES

Key Alliance objectives are to:

- Maximise economic development and benefits through targeted funding;
- Achieve efficiencies through a combined approach to planning and scheduling; and
- Invest in improved road management and delivery capability (asset management, program development and joint management and resource sharing.

4. ASSET MANAGEMENT FRAMEWORK

The Road Alliance has adopted a common standard approach for the collection and exchange of asset management data. Key elements of this approach for all members include:

- A common road classification system;
- The same type of data collected across the whole road network – i.e. minimum common data sets;
- Agreed data definitions;
- The same methodology used to collect data for roads and structures;
- Standardised data transfer specifications; and
- Standardised reporting templates.

The Roads Alliance is collecting data across the programme management cycle based on the adopted framework. (Figure 1.0).
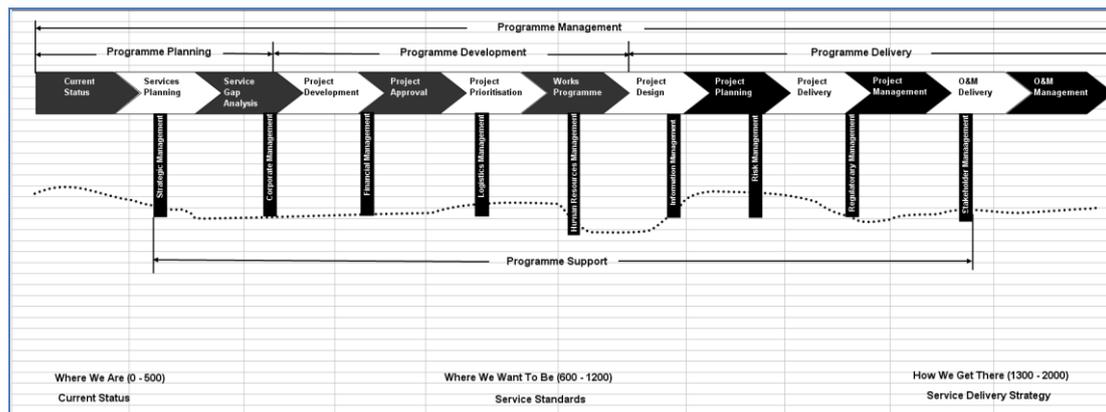

Figure 1 – Programme Management Cycle

The programme management cycle has a number of phases:

- Programme planning;
- Programme development;
- Programme delivery; and
- Programme support.

To date, the main focus of the Road Alliance has been on programme development phase. Programme planning, programme delivery and programme support are provided by the individual RRG members. As the Road Alliance matures, the Alliance is expected to take on more overall programme management responsibilities for the network.

5. ROAD ALLIANCE HUB

To facilitate information collection and exchange across Queensland, the Road Alliance has established a web based information system. The Road Alliance Hub has been developed to support the receipt, storage, aggregation, and reporting of road information from all Queensland Councils and the Department of Main Roads. The Road Alliance has specified a Minimum Common Dataset (MCD) and a Desirable Dataset (DDS) for capture information on the current configuration and condition of the road network. The Hub provides a convenient and secure location for this data.

The Road Alliance Hub is a priority initiative of the Road Alliance and has the following objectives to support a common basis for:

- The collection of an accurate record of the location, inventory, condition and performance of roads within the State;
- A regional approach to asset management, investment planning and prioritisation;
- Developing road link vision, service and infrastructure requirements;
- The calculation of long term road funding requirements based on the gap between the current road status and the road link vision; and
- Developing and recording of a 5 Year Works Programme for the network.

The first stage of the Road Alliance Hub was completed in 2007. The future development strategy for the Hub is to extend its strategic asset management capabilities to include:

- Extended data sets for location, inventory, condition and performance;
- Improved reporting and data analysis capabilities;
- Easier data uploading and downloading;
- GIS/Mapping capability;
- Link Vision, Function, Service and Infrastructure targets;
- Link investment strategies;
- Service Gap Analysis;
- Long Term Link Funding;
- 5 Year Works Programme; and
- Works Programme Management.

6. ROAD ALLIANCE DATA MODEL

The data series and data sets developed for the Road Alliance have been designed to align with an evolving National Class Model which will facilitate national sharing, comparison and aggregation of road data. The fundamental building block of the Road Alliance Data Model is built on the concept of a management unit called a segment. There are two types of segments, roads and structures segments. Segments are related to sections, roads and road links. The relationship of segments to these other entities' is shown in Figure 2.0.
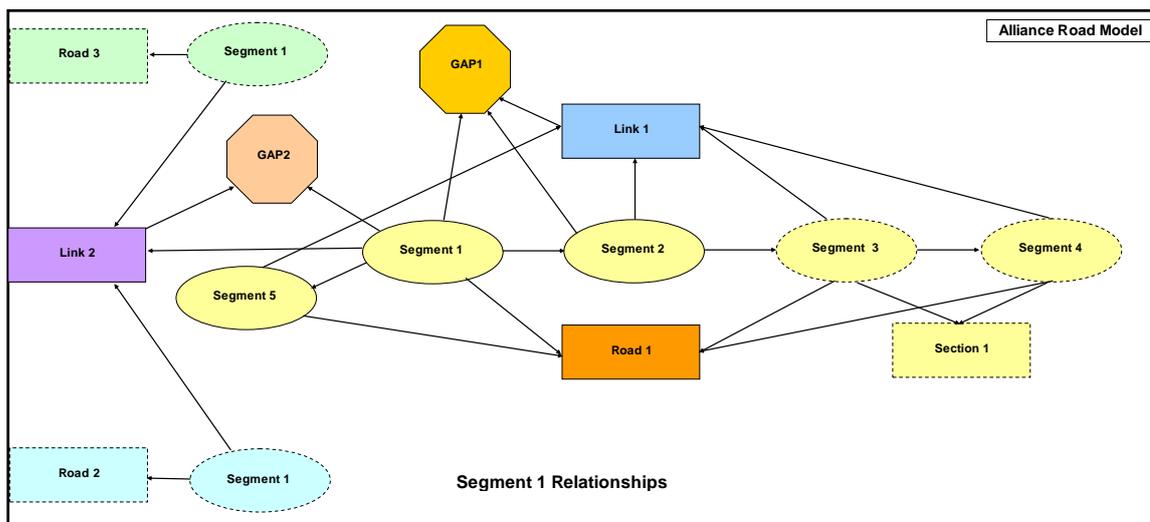
Figure 2 – Road Alliance Data Model

7. ROAD ALLIANCE DATA SERIES AND DATASETS

The Road Alliance Asset Management Framework includes standards data series and data sets to support a strategic asset management approach. The data series and data sets used are described in Table 1.0.

Data Series and Data Sets	Purpose
000-500 Where Are We Road and Structures Segment Data	To describe the configuration, condition and performance of the current road system (including structures).
600-800 Where We Want To Be Road Link Data	To describe the vision, and service standards of the future road system.
900-1200 How We Get There	To describe catalogues of asset requirements to achieve the vision and to deliver the services.
1300-1800 Treatment Cost Data	To describe treatment costs for gaps.
1900-2000 Programme Funding Data	To describe RRG and Road Authority funding.
2100-2200 Programme Development Data	To describe project scoring, project details and project funding for the 5 year works program.
2300-2400 Programme Delivery Data	To describe the delivery of the works programme.

Table 1 – Road Alliance Data Series and Datasets

8. ROAD ALLIANCE PROGRAMME DEVELOPMENT

The Road Alliance is promoting a "Top Down" approach to programme development as illustrated in Figure 3.0.
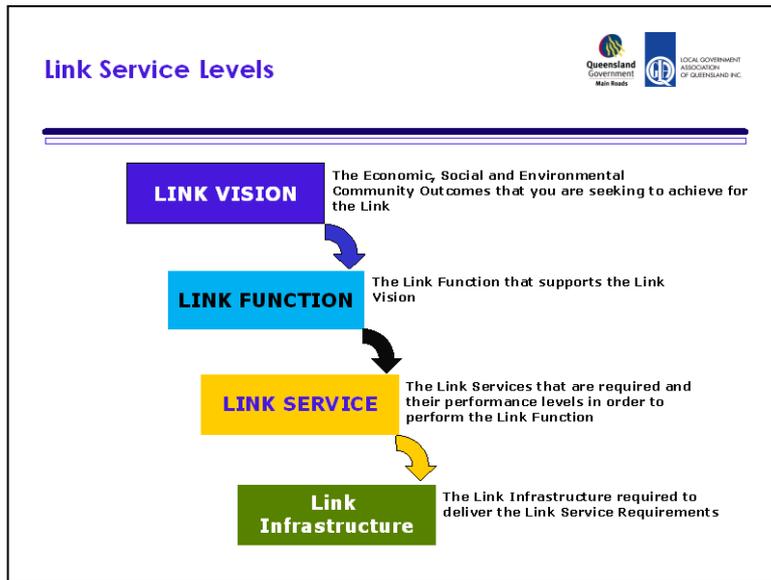

Figure 3 – Road Alliance Programme Development

Strategic road links are identified in the network. For each of the links, the road authority adopts a vision which encapsulates the economic, social and environmental objectives for the road link. This determines the major link function and the services required from the link. The infrastructure specification required to deliver the services is then identified.

This functionality will be achieved by extending the Hub to include for each road link, the capture 20 year targets for the road link vision, function, services and standards and the road investment strategy proposed to achieve these targets both in the short and longer term. This information is being documented for each road link as a Statement of Intent for each road link as part of the Road Alliance programme development process and is uploaded to the Hub.

A Service Gap Analysis is undertaken between the vision standards for the link and the current configuration and condition of each road segment. New and upgrade gaps are identified when the existing parameter (e.g. road width) is less than the target and below the intervention level. By comparing these targets to data collected on the existing configuration of each road (or part of a road) comprising each road link, gaps in service and infrastructure will be identified. This concept is illustrated in Figure 4.0.
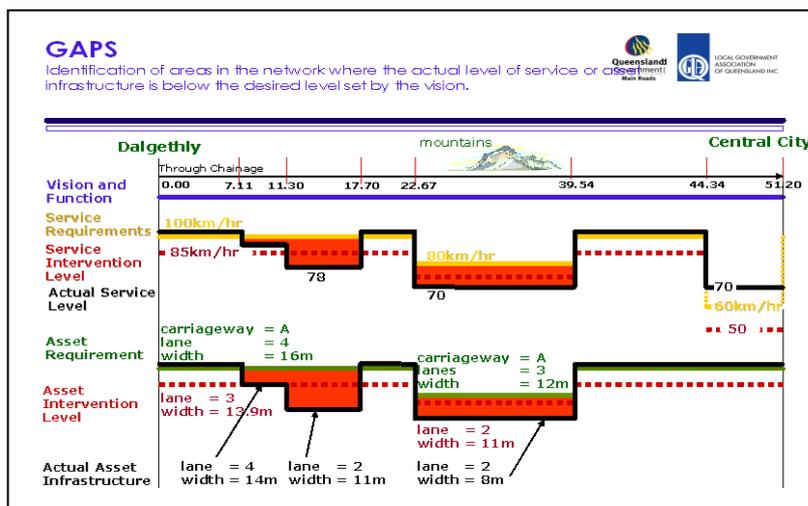

Figure 4 – Road Alliance Service Gap Analysis

Treatments are applied to these gaps to determine the projected costs. These gaps are then reported as potential treatments for an estimated 20 year improvement works programme as per Figure 5.0.
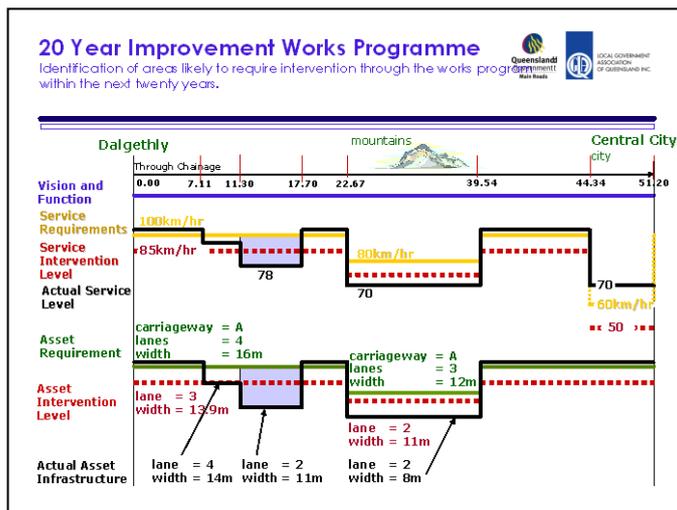

Figure 5 – Road Alliance 20 Year Investment Programme

9. CONCLUSIONS

The Queensland Roads Alliance was established in 2002 as a joint initiative of the Queensland Department of Main Roads and the Local Government Association of Queensland to jointly manage over 32,000 km of roads in Queensland. The establishment of the Road Alliance was a response to the need to achieve more with the limited resources available. The Roads Alliance is fostering the development of asset management and sustainable road investment programs for the 18 Regional Road Groups throughout Queensland, Australia.

The Road Alliance is a working example of a successful community based asset data exchange system. The Road Alliance has adopted a common standard approach for asset management and has established a web based repository for asset data called the Road Alliance Hub. The Road Alliance Hub has been developed to support the receipt, storage, aggregation, and reporting of road information from all Queensland Councils and the Department of Main Roads. The Road Alliance has specified a datasets for the capture of information on the current configuration and condition of the road network and is currently extending the Hub to include vision standards for road links. These datasets are used to determine service gaps which in turn are used to calculate 20 year investment strategies for each road link.

5. REFERENCES

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5. ACKNOWLEDGEMENTS