



27th Australasian Transport Research Forum, Adelaide, 29 September – 1 October 2004

Paper title: Land use policy for the primary freight network in Perth

Author(s) name(s): B Imre Szito

Organisation(s): Department for Planning and Infrastructure,
Integrated Planning Division

Contact details:

Postal address: 469 Wellington Street, PERTH WA 6000

Telephone: (08) 9264 7725

Facsimile: (08) 9264 7566

email: Imre.Szito@dpi.wa.gov.au

Abstract (200 words):

This paper presents an overview of using land use planning processes and policy for addressing potential conflicts between freight operations and urban development. Public policies in relation to freight typically address logistics improvements, competition, influencing modal balance, improving vehicle efficiencies, transport networks and nodes. In response to community concerns the Western Australian Government requested the Department for Planning and Infrastructure to develop a land use policy to guide urban development along the primary freight infrastructure, including freight railways, for reducing the conflict between the need for the operation of freight infrastructure and its negative impacts on the immediately surrounding community. The key policy objectives are:

- protect the designated freight network from avoidable encroachment by any incompatible or sensitive land development with the potential to compromise freight handling and/or transport operations;
- minimise adverse environmental and social impacts associated with the handling and movement of freight on sensitive development, such as housing; and
- facilitate the development and operation of an efficient freight network, based on strategic co-location of freight handling facilities serviced by an integrated network of freight transport facilities.

The policy aims to assist transport and land use integration and balances urban liveability and development objectives with the need for efficient and safe freight services. The policy is under development and the final version may differ from the draft presented in this paper.

2 Land use policy for the primary freight network in Perth

Introduction

Establishing a planning framework for efficient freight movements has been a priority for the Western Australian Government. In the past decades community expectations increased for better control of the impacts of freight operations, such as noise, pollution, traffic safety, community severance and property devaluation. The Department for Planning and Infrastructure (DPI) undertook development of the Metropolitan Freight Network Policy for the Western Australian Planning Commission (WAPC) to guide urban development along the primary freight infrastructure. The Policy aims to manage the conflict between the operation of freight infrastructure and its impacts on the immediately surrounding community and the environment. Increasingly stringent community expectations in urban amenity could lead to reduced efficiency in some aspects of freight operations and could jeopardise the implementation long-planned freight infrastructure when it is needed.

The key principles guiding this policy are:

- Protection of strategic freight infrastructure from encroachment of incompatible urban development; and
- Minimising the impact of freight transport on existing and future communities

This Policy focuses on land use planning aspects of freight, recognising that freight operational and logistic aspects fall outside the jurisdiction of the Western Australian land use planning statutory framework. In addition to this policy development, the Western Australian Government initiated a combination of operational and policy measures, which identify improvements in transport, network management and rail/road modal share. These include improvements in freight logistics and operations, and capital works to improve traffic management around areas worst affected by freight operations. These measures go beyond the land use planning legislation, but elements of this work will increase the effectiveness of the land use policy response along freight corridors.

This paper does not offer new research material in a traditional sense. It, however, provides an overview of some of the main issues facing the integration of freight transport with land use. If successful over time, these land use policy measures will establish a framework for the coexistence of urban amenity with freight infrastructure operations. This policy is trying to apply a practical approach within the limitations of the planning legislation framework, balancing financial constraints and social acceptance. The Metropolitan Freight Network Policy defines the primary freight network, including freight railways, within Perth and investigates the area of influence freight activity exerts along primary freight routes. This paper does not replicate nor based on the text of the draft policy, as the land development statutory and legislative framework could be vastly different between each jurisdiction, it aims to illustrate a possible land use policy development process.

Freight movements in Perth

The Government's Freight Master Plan (DPI, 2002) concluded that the metropolitan freight task is expected to grow significantly in the future, both in the volume of freight and the number of freight transport movements. Growth in the economy of Western Australia is largely sustained through the export of commodities and primary produce, therefore any increase in economic activity will increase freight output through the major freight nodes such as ports and intermodal terminals. Industrial activities related to the mining and petroleum

sectors add to transport demand. Most freight within Perth is carried on road due to its convenient door-to-door and on-time delivery characteristics. Freight demand appears to increase over time at a higher proportion than other economic indicators.

Historical data shows that car travel demand in Perth has grown at a higher rate than the population. Road freight transport demand has grown even more rapidly. As Perth's population is expected to grow significantly in the future, these trends will result in increasing general traffic movements and freight demand. Figure 1 demonstrates current trends between the growth of population, economic activity and traffic. There is no obvious prospect for "decoupling" the disproportionate growth in freight from the growth of GDP or population in Western Australia thus far.

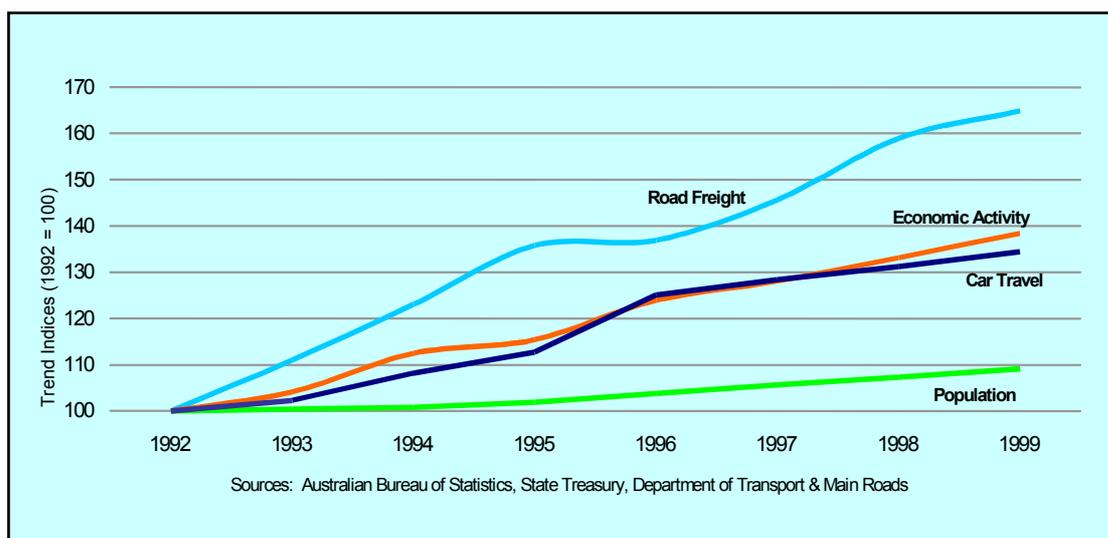


Figure 1: Population Growth, Economic Activity and Road Freight Trends 1992 – 1999

Source: MRWA, 2001, Published in the Freight Network Master Plan (2002, P 39)

The size of the freight task in Western Australia is huge, likely due to the strong resources industry sector and the vast size of the State. 33% of the total tonne-kilometres travelled in Australia were originated in this State. In interstate freight movements the mode share of rail for freight destined for WA was the highest of the States, 79% of all tonne-kilometres. (ABS, 2001). Within Perth, however, the share of rail could be increased to reduce the impacts of road freight transport. Roads carry 97% of container trade to and from Fremantle Port (Freight Network Review 2002). The Government established a long-term target of 30% container trade to be carried by rail to the port.

Freight networks

Perth is a relatively young city and it has a comprehensive, well-planned network of arterial roads and rail infrastructure. These provide a framework for efficient movement of goods and freight handling. Having a high standard primary road network protects sensitive land uses from the negative effects of freight movements, by attracting most freight movements away

4 Land use policy for the primary freight network in Perth

from local roads. For maximising efficiency, Main Roads Western Australia (MRWA) identified several freight networks for specific modes of freight. These are summarised in Table 1 below.

Table 1. Freight networks in Perth

	Custodian	Network elements	Guiding principle for inclusion
Designated Freight Routes	Main Roads WA (MRWA)	Primary and Secondary networks	Most Primary Distributors and District Distributor Category A and selected Category B roads
Dangerous Goods Routes	Dept of Industry and Resources (DOIR)	Category 1 and 2	Most Primary Distributors and District Distributor Categories A and B
Long Vehicle and Road Train Network	MRWA	Double Road Train Long Vehicle and B Double permit routes	Designated Main Roads and Highways leading into Perth from the regions and selected District Distributors Category A, also includes some industrial roads
4.6 m High Routes	MRWA	Approved routes through permits	Selection based on origin/destination needs and geometric route assessment
Freight Railway Network	Public Transport Authority (PTA)	Standard, Narrow and Dual Gauge freight lines	Linking strategic freight nodes and interstate destinations Reserved and protected by legislation

These networks are graphically presented in the following tables for comparison over the same geographic area, representing the inner suburbs of Perth.



Figure 2: Designated freight road networks (primary and secondary)

Designated Freight Roads comprise two tiers of freight routes, primary and secondary, based on the respective roles of each and shown on Figure 2. Primary Designated Freight Routes cater for through freight movements between metropolitan centers and major freight nodes. The secondary designated network links the primary through routes with pick up or delivery points. This classification of the road network intends to guide the movements of general access freight vehicles away from local roads. General access, or as-of-right vehicles are allowed to use any public road in Western Australia. These vehicles range from light trucks to semi trailers and carry most of the metropolitan freight task both in terms of tonnage and vehicle kilometres. The largest such vehicle, a semi trailer, could have a maximum length of 19 metres and mass limit of 42.5 tonnes.

Main Roads has also identified other networks to address the needs of specific components of the freight task, such as Dangerous Goods Routes (Figure 3), Long Vehicle and Road Train Routes (Figure 4) and High Clearance (4.6 m) Routes on Figure 5.

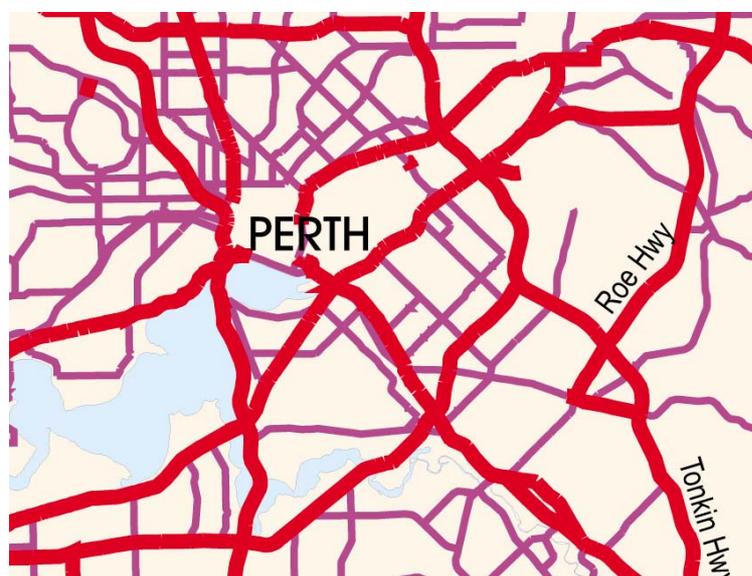


Figure 3: Dangerous goods routes (category 1 and 2)

Transport of dangerous goods should, whenever practical, should avoid heavily populated or environmentally sensitive areas, congested intersections, tunnels, narrow streets and sites where may be a concentration of people (Department of Industry and Resources 1999). Category 1 roads are mostly primary distributors and should be used whenever that option is available. Category 2 routes are district distributors, most of them Category A. Category 2 routes are preferred to local roads for the delivery and distribution of dangerous goods.

6 Land use policy for the primary freight network in Perth



Figure 4: Long vehicles and road train routes

Long Vehicles and Road Trains are required to use sections the above network guided by their permit conditions.



Figure 5: High clearance (4.6 m) routes

The ability to carry high and wide loads between industrial areas, ports and regional destinations is high economic imperative. These routes are based on the need for the transport of large loads and satisfy certain geometric requirements. High and wide traffic volumes are

very low and normally occur outside peak hours. The land use impact of the high and wide load corridors is minimal.

The rail freight network in Perth links the ports, major industrial areas and inter-modal terminals with intrastate origins and destinations of major commodities and also links the State with the eastern seaboard. Railway is more suited to long haul movement of goods and intermodal sites need to be integrated with the network of primary freight roads. It should be noted that the operation and maintenance of the freight rail network is leased to commercial operators and this is limiting the options of the government for controlling the impacts of railway freight. The Western Australian Government has made it a priority to increase the freight modal split towards the more environmentally sustainable rail transport mode. Each section of the railway network is protected by land reservations in statutory schemes and also protected by legislation, in the forms of railway enabling and discontinuance acts of Parliament.

The policy development first had to reconcile the above networks and define a common Primary Freight Roads and Freight Rail Routes Network for the purpose of this policy. Many of the road links are common to two or more of the above freight networks. The need for land use planning protection is largely justified for the Designated Primary Freight Routes, which carry most of the general freight task. The limited documentation of the Dangerous Goods Network has been a challenge. Unfortunately little is known about the volume and the quantities of Dangerous Goods carried in Perth and the lack of risk assessment across the network made it difficult to assess which nodes of the network are justified for inclusion in the Freight Policy.

The above networks were superimposed on a composite map. This highlighted the common network elements and differences. Then the primary network elements were identified specifically for this policy. The Designated Freight Roads Network (MRWA, 2000) provided the most important guidance for inclusion in the policy's network on the basis that these roads generate the most significant freight impact on adjoining urban development. The resulting Primary Freight Roads and Freight Rail Routes network is shown on Figure 6.

8 Land use policy for the primary freight network in Perth



Figure 6: Primary freight roads and freight railway network for the Perth metropolitan freight network policy

Land use policy framework

The Western Australian land use planning legislation is centralised when compared to other Australian jurisdictions. The present planning legislation is based on three primary Acts: the *Western Australian Planning Commission Act 1985*, the *Metropolitan Region Town Planning Scheme Act 1959* and the *Town Planning and Development Act 1928*. It is generally acknowledged that the planning system in Western Australia as embodied in these Acts has worked well (Department for Planning and Infrastructure 2002). The Western Australian Planning Commission (WAPC) is a statutory authority with vested powers under the *Town Planning and Development Act 1928*. It is responsible for assessing all subdivision and some development applications in the State, guide the development of Perth through the Metropolitan Region Scheme, prepare and implement a State Planning Strategy and selected country region schemes, and monitoring and forecasting land supply throughout the State.

The proposed Metropolitan Freight Network Policy is developed in the form of the Statements of Planning Policies. These are prepared and adopted by the Western Australian Planning Commission under statutory procedures. The Western Australian Planning Commission (WAPC) and local governments must have 'due regard' to the provisions of Statements of Planning Policy when preparing or amending town planning schemes and when making decisions on planning matters. The Town Planning Appeal Tribunal is also required to take account of Statements of Planning Policy when determining appeals.

The primary purpose of the Metropolitan Freight Network Policy is to provide guidance on land use planning matters around the important metropolitan freight network links and nodes. Through policy measures it will influence land use development within the area of influence of freight activities over time. The main vehicle for policy implementation is the Town Planning Scheme review process. Local Government Authorities are required to prepare and regularly update Town Planning Schemes for their jurisdiction. Town Planning Schemes provide detailed land use zones and these are the main vehicles for the implementation of the Metropolitan Freight Network Policy.

This policy is directly linked to a number of existing and planned WAPC policies, namely the Industrial Buffer Policy, draft Transport Noise Policy, Land Use Planning in the Vicinity of Perth Airport and selected Development Control Policies. These policies support and were cross-referenced during the preparation of the draft Metropolitan Freight Network Policy. The planned Transport Noise Policy is particularly important, as it will identify the noise levels triggering land use and operational intervention along the freight network and therefore these two policies are developed concurrently. DPI will undertake traffic noise modelling along the full extent of the identified primary freight network as part of the policy development process. This will be validated through acoustic measurements and calibration. This data is expected to provide empirical support for the definition of noise criteria set by the Transport Noise Policy. Practical guidelines will be created to assist developers, town planners and local government officers in the implementation of the policy. They will be able to apply the most efficient and appropriate land use controls for individual new developments, including possible noise insulation of dwellings, without the need to carry out acoustic assessments on most occasions. The main issue for the Metropolitan Freight Network Policy is controlling new urban development adjacent to existing and planned freight infrastructure.

Impacts of freight from a land use policy perspective

Public perceptions consider noise, vibration, dust, odours and potential risk as the main adverse emissions from freight activity. Each of these emissions has some impact on surrounding land use, however, their inclusion in a policy document has to be considered carefully. Even though a statement of planning policy is not law, the inclusion of such impacts, which are difficult to quantify, could bring uncertainty into the planning system. The policy needs to be defensible through the planning process, especially in town planning appeals.

Transport noise is well researched and methodologies to measure its effects are generally agreed. Noise impacts are also suited for computer simulation. The same, however, cannot be said about other emissions. Odour and dust were not considered for inclusion in the policy. Vibration was also precluded from land use policy considerations due to limited local knowledge and practice available of its propagation and possible attenuation measures. There has been some investigation of social and property impacts of vibration from railway noise. Standards, such as AS/NZS 2670.2, DIN 4150 are used to establish criteria for vibration level values generated by passing future passenger trains and their impact on sensitive land uses. (PTA, 2004). However, railway track materials and maintenance standards within the railway reserve could significantly reduce vibration levels and therefore vibration impacts do not justify long-term land use planning intervention outside of the reserve.

Noise is the main concern of the population affected by traffic impacts and therefore noise became the main consideration for the draft Metropolitan Freight Network Policy. Methodology may improve in the future to allow us to better qualify social impacts and quantify other emission factors. Emerging empirical data and better modelling may enable the consideration of vibration, odour and dust for inclusion in the policy in the future. Even at present the environmental approval requirements embedded in the planning process may consider these impacts on the individual development or subdivision level but not necessarily across the metropolitan area on a network level. Western Australian legislation also allows continued monitoring of environmental impacts. For major transport projects, under sections 48(1) and 47(2) of the *Environmental Protection Act (1986)*, the Environmental Protection Authority is empowered to audit the compliance of the proponent with the statement made at the project approval stage receives environmental management plans, related to the commitments contained in the environmental statement (Public Transport Authority, Bulletin 1102, Perth 2003).

The last impact on the list, road safety, is extensively addressed across all levels of the development approval process and therefore it was not practical to duplicate these provisions in the Metropolitan Freight Network Policy. As a result of the above considerations, the Metropolitan Freight Network Policy development process is focusing on transport noise.

Freight network policy objectives

This Policy recognises the importance of providing efficient and safe freight services across the metropolitan area, balanced with urban liveability and development objectives set out in the State Planning Strategy and other relevant strategies and policies.

The key policy objectives are:

- protect the designated freight network from avoidable encroachment by any incompatible or sensitive development with the potential to compromise transport operations and/or freight handling;
- minimise adverse environmental and social impacts associated with the handling and movement of freight on sensitive development, such as housing; and
- facilitate the development and operation of an efficient freight network, based on strategic co-location of freight handling facilities serviced by an integrated network of freight transport facilities.

Application of the policy

The Policy applies to the designated Primary Freight Roads and Freight Rail Routes as shown on Figure 6 and covers land development within associated areas of influence of the designated freight routes. It also promotes the development of freight handling facilities in close relation to designated freight routes.

In the absence of site-specific modelling of noise impacts, the area of influence associated with the designated Primary Freight Roads or Rail Freight Routes is defined as the lesser of the followings:

- a distance of 200 metres measured from the closest edge of the existing or planned carriageway or rail line as the case may be, and the boundary of the particular development site; or
- the farther boundary of those lots which face or adjoin the particular road or rail reserve. This measure could reduce the area of influence to 30 or 50 metres in some instances depending on the size of the property abutting the transport reserve. However, the first row of houses is expected to provide certain reduction in noise impact over the dwellings behind. Noise modelling and calibration by the Department (DPI) should validate this approach.

The 200 metre separation distance may be reduced based on site specific noise measurements and/or modelling of future impact associated with the forecast volume of traffic on the particular route.

The Policy is relevant when:

- existing freight infrastructure abuts future urban development,
- future freight infrastructure abuts an existing noise-sensitive development,
- future freight infrastructure abuts future urban development.

Where existing primary freight corridors abutting existing residential development the opportunity may arise to apply this policy along these corridors if and when redevelopment of individual properties is proposed. The policy is not retrospective, recognising difficulties and financial constraints in retrofitting historical freight corridors in established urban areas. The Metropolitan Freight Network Policy does not limit the continuation of sensitive land uses within the area of influence. Used effectively, it will encourage complimentary redevelopment of existing nonconforming land.

12 Land use policy for the primary freight network in Perth

Development should not be prohibited within areas of freight influence. Compatible land uses such as light industry and certain commercial developments may be encouraged in the area of influence. Sensitive land uses such as residential housing may be permitted subject to conditions that ameliorate the impacts of freight.

In the draft Transport Noise Policy relevant government agencies generally agreed to use the following external noise criteria for urban residential development within the area of influence:

Table 2 Proposed external noise criteria for urban residential development

Noise level	Day (L_{eq16h})	Night (L_{eq8h})	La Max (dba) (for railway)	
Best practice	<50	<45	75	Quiet residential, uncompromised amenity, no need for noise attenuation
Low (Acceptable)	50-55	45-50	75-80	Promote low impact attenuation measures
Moderate (Conditional)	55-60	50-55	80-85	Extensive noise attenuation measures are required, high density allowed
High (Generally unacceptable)	60+	55+	85+	Subject to individual noise assessment, heavy acoustic treatment compulsory

Low noise exposure is generally compatible with residential development. Some low level, inexpensive noise attenuation still required. This could be combined with sensitive design of the noise sensitive areas of the residence. Use of lightweight construction materials, such as timber, fibrous cement or metal cladding is not allowed.

Moderate noise levels require significant modifications to generally used housing structures to achieve allowed internal noise levels. This could include fixed windows and mechanical air ventilation. Planning schemes should promote multi-storey residential and mixed land use shielding the residential areas further behind. Property titles should indicate high noise levels. Areas with high noise exposure levels should attract more appropriate land uses such as commercial and office development. Residential development is discouraged. Any proposal for noise sensitive development should be supported with noise assessment and detailed attenuation treatment. Outdoor living areas may not be allowed. Property titles should indicate high noise levels.

Practical guidelines will assist the definition of efficient noise attenuation options at the design and planning approval stages of housing developments to achieve acceptable internal noise exposure levels.

Policy measures

A number of land use and operational policy measures have been identified to both protect the freight network and encourage compatible land development along the network. These include:

Location of freight handling facilities

Freight handling facilities such as sea ports, air ports, land based freight storage and freight interchanges, should be strategically located and sited so as to minimise the overall demand for movement of goods, maximise the efficiency of transport and minimise the adverse impacts on existing and future communities.

Development control within freight route or freight handling areas of influence

Developments within the areas of influence should be controlled to minimise the potential conflicts caused by noise and traffic. External noise exposure criteria set by the Transport Noise Policy will decide the need for noise amelioration in case of conditional land development categories such as urban residential. Local town planning schemes should be amended to restrict or control future industrial and freight related development that is inconsistent with the policy. Planning controls may be applied to limit, modify or prohibit development likely to give rise to unacceptable impacts, or which is inconsistent with the objects of the scheme in relation to the desired pattern of development.

Outside the areas designated for major freight operations industrial development may be controlled through the imposition of conditions relating to such matters as the scale, nature of goods handled, times of operation, numbers and types of vehicles permitted to access the premises, provision for vehicular manoeuvring and parking, lighting, signage, fencing, noise barriers, landscaping and road up-grading.

Amelioration of impacts on sensitive land uses

Amelioration measures could be required as a condition of planning approval. Noise level criteria thresholds, set in the Transport Noise Policy, could trigger planning intervention. This may include use of noise insulation materials in dwellings, location of noise sensitive areas away from the source noise, noise barriers, noise insulation and landscaping etc.

Notification to prospective purchasers of property

Notification on certificate of title should be provided to prospective purchasers advising of the potential for nuisance and other impacts associated with the operation of freight handling facilities.

Statutory planning implementation

Implementation of these policy measures will require cooperation between state and local government authorities. Statutory planning control methods, such as Town Planning Schemes (TPS) and Development Control (DC) policies are considered to be key instruments to implementation.

Decision making authorities could implement consistently the above listed policy measures through different phases of the statutory planning process:

- land use zoning and special control areas;
- long term structure planning, subdivision and strata subdivision control;
- notification and advice; and
- freight network operational and infrastructure measures.

Complementary actions should be taken by infrastructure agencies, including assessment of future planned freight routes and future freight railway lines to identify sections in which there are significant adverse impacts associated with freight transport.

Zoning and special control areas

Areas of influence associated with Primary Freight Routes (existing and future), could be included as either Special Control Areas or Special Use Zones in order to facilitate appropriate control of development. The Department for Planning and Infrastructure should assist the identification of areas of influence in consultation with state and local government and relevant infrastructure agencies and freight operational bodies. Standard provisions for special control areas are contained in the Model Scheme Text and Town Planning Schemes Manual (WAPC). Special Control Area provisions can be used to restrict uses that would otherwise be permissible in a zone, and to apply specific performance standards and design measures for conditional land uses to attenuate noise impacts.

Local government should undertake a review of zoning and development control provisions under the local town-planning scheme to ensure there is adequate control of future development to implement relevant policy measures. When preparing town planning schemes and amendments, local governments should consider the potential for land use conflict between freight and sensitive land uses. When reviewing zonings and permissible uses in the zones adjoining primary freight routes or established freight nodes it should be ensured that the land is developed for uses that are compatible with freight operations.

The Western Australian Planning Commission developed a manual to manage the impact of aircraft noise on built-up areas (WAPC, Aircraft Noise Insulation for Residential Development in the Vicinity of Perth Airport, Perth 2004). The manual identified the effectiveness of noise insulation measures commonly used in construction of building structures. The guide lists attenuation values for different glazing, insulation, doors used etc. As mentioned before, similar tool will be developed to assist local governments to identify the actual noise control measures imposed on noise sensitive urban development within the influence of freight activities. Rather than preclude noise sensitive development along the entire freight network, it is more practical to reduce noise to acceptable levels for each development category by mitigation if possible. Locating less noise sensitive development along freight routes is also an effective option to buffer more sensitive development from the

effects of freight activities. Physical separation of land uses, such as using extensive buffer exclusion zones, is a very ineffective noise attenuation response and contradicts with urban design and efficient land use planning principles.

Subdivision control

The Policy will guide the Western Australian Planning Commission (WAPC) and local government authorities in the preparation and approval of structure plans and in the assessment of applications for subdivision and strata subdivision, with reference to such matters as lot size, road alignments, vehicular access, utilities, open space and memorials on title.

Notification and advice

This includes provision for advice to developers, future landowners and residents of the potential for nuisance and/or reduced levels of amenity from nearby freight uses. The notification could be enacted through memorials on property titles or on-site signage. In response to property inquiries or the transfer of land the relevant state and local governments should give written advice to prospective purchasers.

Freight network operational and infrastructure measures

Measures should be taken to limit the impact of freight operations on adjacent developments. These may include noise barriers, landscaping or quiet carriageway surfaces or the construction of road and rail infrastructure on an alternative alignment bypassing the sensitive areas. These infrastructure and other operational measures are outside the jurisdiction of the land use planning legislation. However, the Western Australian Government identified priority actions for strategic transport planning and implementation agencies, such as Main Roads WA, Fremantle Port Authority and Public Transport Authority for the resolution of freight conflicts. Operational, freight network management and logistic improvements to freight activities in Perth will assist viable community living with freight.

Consultation

Important stakeholders for the policy were identified for ongoing consultation. The group includes representatives from the WA Local Government Association, Main Roads WA, Fremantle Port, Public Transport Authority as the freight rail regulator, the Department of Industry and Resources, Department of Environmental Protection, rail and road freight operators and internal DPI stakeholders responsible for different policy, statutory land use and transport planning functions. The group comments on the emerging working drafts of the policy, particularly on the policy implementation details. The group identified directions for further review and clarification, based on agency priorities and the diverse interests of stakeholders. They also reviewed the Primary Freight Roads and Freight Rail Routes network. As the draft Metropolitan Freight Network Policy and the draft Transport Noise Policy will be progressed concurrently, all stakeholders will review the texts of both policies to ensure compatibility. State and Local Government agencies should be able to defend the

proposed policy measures in front of community representatives and the general public. This will be assisted by basic modelling of present and future noise levels across the entire primary freight network as mentioned before. This noise model will be calibrated and represented in graphical form for preliminary identification of the most affected areas. An agreed final draft policy will be presented to all thirty-one metropolitan local government authorities for discussion. State government agencies will also have an opportunity for final comments before the adoption of any of the listed possible policy actions.

Case studies

A recent example where development conditions were used for noise treatment was Town Planning Scheme No 7 by the City of Bunbury. A Special Use Zone was declared around the heavy freight access road to Bunbury Port. The scheme imposed conditions on residential buildings to achieve an internal noise standard of $35\text{dB}_{(A)\text{Leq}}$ at night. Conditions include: bedrooms preferably placed away from the road, all walls to be constructed of double brick, all roof materials should be either clay or concrete tiles, acoustic insulation to windows and doors, ceiling to be insulated and 19 mm plasterboard to be used in ceilings, provision of mechanical ventilation in the bedrooms.

A second example of using noise assessment in the land use planning process is the present investigation of the joint road and railway freight access corridor to Esperance Port. Community concerns were raised about ongoing road train and freight train operations in Esperance, a picturesque small town on the south coast of Western Australia. DPI commissioned acoustic engineers to carry out noise measurements, establish noise contours along the port access corridor through the city centre. These investigations will assist DPI and the Shire of Esperance to review its Town Planning Scheme and establish measures to reduce noise impacts on the community. These will include the combination of statutory planning instruments outlined in this paper. The Scheme may consider incentives to encourage re-development of conditionally acceptable uses within designated areas of influence with a view to ameliorating impacts.

Both of the above examples are outside of the Perth metropolitan area. It is the role of the Metropolitan Freight Network Policy to provide a framework for implementing similar comprehensive land use treatments along primary freight routes in Perth.

Conclusions

The Western Australian Government's determination for long-term resolution of conflicts caused by increasing freight activities in urban areas has created a climate in which the diverse components involved are addressed simultaneously. This is expected to realise effective and efficient resolution of issues, closer to an optimum compromise between diverse community aspirations than otherwise it would have been possible.

The Metropolitan Freight Network Policy is part of the solution and it will assist transport and land use integration and balancing the objectives of providing efficient and safe freight services with urban liveability and land development goals. The policy will not be prescriptive, instead provides a framework for individual local governments to develop the most appropriate combination of actions within their locality. Coupled with the government's

operational and logistical improvements the transport planning and policy processes will deliver more liveable and sustainable urban growth in Perth.

ACKNOWLEDGMENTS

The author thanks the Department for Planning and Infrastructure (Western Australia), in particular Julie N. Stewart and John Chortis; and consultants Chris O'Neill and Associates, and Lloyd Acoustics for their valued assistance. This paper lists selected policy measures, implementation directions and quotes from the preliminary draft text of the Metropolitan Freight Network Policy. Many individuals and organisations contributed to the development of this text through stakeholder consultation. The development of the Metropolitan Freight Network Policy is ongoing. The information provided in this paper was accurate at the time it was researched but the final policy text may include different outcomes or policy measures. The views expressed in this paper remain those of the author and are not necessarily shared by any of the above organisations, including state and local government authorities.

References

Australian Bureau of Statistics (2001) *Freight Movements* 9220.0

Department of Industry and Resources (1999) Guidance Note T117, *Recommendations for route selection for the transport of dangerous goods in the Perth Metropolitan area*

Department for Planning and Infrastructure (2002) *Freight Network Review Second Congress Master Plan*.

Department for Planning and Infrastructure (2002) *Freight Network Review Second Congress Strategy to increase the use of rail for the transport of containers to and from Fremantle Port*

Department for Planning and Infrastructure (2002) *Position paper: consolidation and streamlining of planning legislation*

Department for Planning and Infrastructure (2004) *Local Impact Committee Technical Reports, unpublished*

Department of Transport (2000) *Perth Metropolitan Freight Transport Strategy*

Main Roads WA (1998) *Guidelines for Managing Truck Movements in Urban Areas* (MRWA: Perth)

Main Roads WA (2001) *Designated Freight Roads*

Ogden (1992) *Urban Goods Movement: A Guide to Policy and Planning*, Vermont: Ashgate Publishing USA

Public Transport Authority (2003) Bulletin 1102, *South West Metropolitan Railway Environmental Conditions*

18 *Land use policy for the primary freight network in Perth*

WAPC (1997) *Industrial Buffer Policy SPP No 4.1*

WAPC (1999) *Model Scheme Text, Planning Bulletins No 32 and 35.*

WAPC (various dates between 1998 and 2003) *Development Control Policy Manual*

WAPC (2002) *Residential Design Codes SPP No 3.1*

WAPC (2004) *Land Use Planning in the Vicinity of Perth Airport SPP No 5.1*

WAPC (2004) *Aircraft Noise Insulation for Residential Development in the Vicinity of Perth Airport*

WAPC (2004) *draft Transport Noise Policy (unpublished)*

WAPC (2004) *Draft Metropolitan Freight Network Policy*