



Satellite terminals: a local solution to hub congestion?

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Abstract

Transport hubs are important generators of freight traffic both between and within metropolitan areas. The concentration of traffic places pressure on the terminals to expand their sites to cope with the business. At the same time the spatial spread of flows is becoming more extensive, impacting ever more severely on local communities. This paper explores some of the questions involving the need for terminals to continue expanding sites that are often in zones of intense environmental and land use conflict. It goes on to consider an alternative comprising satellite facilities, with the consequential dispersal of some transfer functions to sites that may be some distance from the main hubs themselves.

Section snippets

Hubbing and congestion

For the carriers, be they shipping lines, airlines or railroads, a hub network has become the most desirable form of service configuration today O'Kelly and Miller, 1994, Kanafani and Ghobrial, 1985, Hayuth, 1981. This type of network allows commodity handling and sorting to be centralised and flows consolidated, thereby maximising traffic volumes. In addition, market coverage can be extended with fewer links which reduces distribution costs. The advantages of hubbing extend beyond network...

An alternative

Since redevelopment of existing sites is a solution with limited long-term possibilities, pressures to provide other solutions to problems of terminal capacity are beginning to mount. It is clear that in most cases new site development is impossible. For airports, the areas required to operate are so immense (1000 ha at least), that useful sites for new terminal exploitation are extremely limited or even impossible in most major markets. Although seaport sites are less extensive than airports...

Satellite facilities in practice

There is some evidence that satellite facilities are being developed in an ad hoc fashion. In field work undertaken as part of an on-going project, a survey of truck movements from rail and port intermodal facilities has been completed. In all the surveys an unexpected number of indirect movements were recorded, trips that did not go straight from the terminal to the customer or vice versa. A varying percentage of trips involved intermediate locations, facilities operated by the truckers...

Implications

The Rotterdam and Los Angeles examples indicate that in satellite development the need for good access to the main terminal is paramount. The Dutch government is financing the construction of a freight only rail connection with the port of Rotterdam, the Betuwe Line, in order to facilitate access, and part of the funding for the Alameda corridor is derived from the federal Intermodal Surface Transportation Efficiency Act. On the other hand, most of the North American satellites that have been...

Conclusion

This paper has argued that satellite terminals, performing some of the functions of major hub facilities, may be a means of ensuring that the major transport terminals can cope with traffic expansion without having to undergo major site expansion. Although there are some examples of satellites being built specifically for this purpose, most appear to be developed completely independently. It is suspected that the haphazard patterns that are emerging as a result are not in the best interests of...

Acknowledgements

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...By redefining the criteria (for instance not limiting to the nearest suitable loading station but making it more flexible), the current imbalance between main intermodal terminals (such as Verona Quadrante Europa, which is close to saturation) and minor terminals (such as Trento Roncafort, which is constantly losing demand) would be partially overcome and a better use of the capacity could be guaranteed. This would be a similar approach to the satellite scheme proposed by Slack (1999), which would guarantee a more balanced territorial development in mountainous areas, where the topography is peculiar and requires the adoption of specific solutions. The contextual adoption of integrative economic and technical measures, such as the introduction of road vehicles powered by alternative fuels (Cavallaro et al., 2018) or the integration of freight and passenger transport (Bruzzone et al., 2021) could further increase the shift towards rail....

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