Key Issues in Integrating New Town Development into Urban Transportation Planning

Heng Wei*, Abdollah Mogharabi

* 792 Rhodes Hall, P.O. Box 210071, University of Cincinnati, Cincinnati, OH 45211-0071, U.S.A
b Principal, Meyer, Mohaddes Associates / Iteris, Inc., 1515 S. Manchester Ave., Anaheim, CA 92802. U.S.A.

Abstract

It has long been observed that the development of many new towns or satellite cities has been accomplished. However, such development does not consider significant transportation system planning efforts which have been integrated with the surrounding or adjacent metropolitan areas’ transportation network. As a result, it has mostly lead to a future of traffic congestion and uncoordinated urban sprawl in the new towns development. Since the late 1990s, some cities in European countries have pursued a policy of integrated town and traffic planning. Past lessons and experiences have proven the integration of new town development and transportation to be a key step for creating a livable community and a city with quality of life within a sustainable community. Such integration aims at reducing car traffic while maintaining a good level of accessibility related to compact and mixed urban developments with building satellite new towns. Integration of new town development and transportation planning has drawn more and more interest from public and governmental authorities. This paper discusses major principles applicable to both integrated transportation planning related to accessibility of existing central urban areas and the new town transportation systems. Finally, a case of integrated urban planning and transportation system that has been conducted in Copenhagen and the “new town” Ørestad, Denmark, is briefly introduced as a successful example.

Keywords: New Town Development; Planning Integration; Liveable Community; Sustainable Community

1. Introduction

In late 1985, the Iran Ministry of Housing and Urban Development proposed and secured the approval of establishing new towns in the vicinity of major populated cities in Iran. This proposal was aimed to improve urban population settlements with a number of primary and secondary objectives including reducing traffic between the “mother” cities and industrial zones in the suburbia, alleviating the recurring inner city traffic jams
and reducing traffic within the mother city (Iran). Despite Government’s good intentions for transport, there have been many developments of new towns or satellite cities, such as those already built or under construction in Iran, that have come about without a significant consideration for integrating transportation system planning with nearby metropolitan areas’ transportation systems. As a result, this has led to a future of traffic congestion and sprawling development of new towns. On the other hand, such new towns are actually getting the go-ahead on greenfield sites and in places which are difficult to reach without a car, resulting in isolation for those who cannot drive and eroding the beauty of the countryside at the same time. Some research reports (United Kingdom, 1999; Netherlands, 2004) disclose that out-of-town development have fuelled a 40 percent increase in the length of car journeys in just 10 years. The countryside has borne the brunt of the impact and traffic on rural roads has increased at three times the rate of urban areas as a result. Besides environmental impairment suffering from pollution caused by the rapidly growing use of cars, the city’s quality of life and the accessibility of central urban areas is negatively affected. These trends are expected to continue unless local and national governments get strict on the causes of sprawl and rising traffic.

In the late 1990s, several European cities pursued a policy of integrated town and traffic planning. The integrated travel management policy aims at reducing car traffic while maintaining a good level of accessibility related to concepts of compact and mixed urban developments with building new satellite towns (Netherlands, 2004). This coordination of town planning and transportation policy led to outstanding results toward improving the quality of life in new towns while reducing the opportunities for traffic congestions. Multimodal planning and bus rapid transit (BRT) (FTA, 2003) have been considered during the past decades in the United States and European countries as strategies for reducing mobility-related environmental pollution and improving accessibility of central urban areas for commuting and freight needs. Integration of new town development and transportation planning has drawn more interest from the public and governmental authorities (Iran, United Kingdom, Netherlands, New Town-Definition, 2004).

2. Goals of Transportation Planning Integration

A new town, which is often called a planned community or planned city, is a city, town, or community that is designed from scratch, and grows more or less following the plan (New Town-Definition, 2004). In some countries declining satisfaction with the urban environment causes continuing migration to smaller towns and rural areas. A successful urban planning integrated with solid transportation planning can bring benefits to both the existing urban regions and a much larger surrounding area where a new town is being developed. This will help to reduce both congestion along the transportation routes and the wastage of energy implied by excessive commuting. Integrating new town development and transportation planning is generally defined to have a two-fold goal:

- Easy accessibility - An efficient circulation and traffic system is a necessity for the economy of the new town and is particularly relevant for a nearby existing mother city or urban area as a regional center.
- Quality of new town’s urban life – It is vital to restrict car traffic and to stimulate public transport and bicycles as environmentally friendly means of transportation to achieve this goal.

The above goals imply a direction to build healthy communities (Burden, 2001). Great towns and cities in all parts of the world are based on simple, easily understood principles, which are compliant with the above goals. Once we understand these principles, we know what kind of streets and other transportation modes should be provided in the transportation planning process.

3. Principles of Intercity Transportation Link Planning

3.1. Principle 1 - Integration of New Town Local and Regional Transportation Networks
There are potentially great benefits to be obtained by improving the integration and interoperability between the new town local and regional or metropolitan transportation systems. This would allow for more direct passenger services between new town areas and central regional cities, and in a number of cases this would also require the improvement of cross-border connections which, in turn, would require the solution of additional technical, institutional and organizational problems. Multiple agencies need to work together on this integration. The most effective way to plan for transportation integration is to start with town-transport balance (Fig. 1), i.e., to integrate the regional multimodal transportation systems into the new town, by factoring in the economy, urban design, highway and street network design, housing and land use, social conditions, equity, and the environment (Radulovich, 2004). Once we understand the desired physical form and growth pattern of the new town and the regional area, as well as the optimal balance among transport modes, we can more effectively plan the transportation networks and individual transportation facilities.

![Fig. 1. Concept of Transportation Network Integration](image)

### 3.2. Principle 2 - Multiple Route Choice

Planning of multiple corridors connecting the “mother” urban area and the newly built town provides flexibility and opportunities to develop a friendly multiple-choice routing system. It lays out a foundation to support traffic diversion and emergency strategies. Multiple route choice strategy also includes the development of accesses to roads connecting “mother” urban attractive areas, urban center and its bypasses, roadways to principle arterials within the new town. This principle is sensitive to land-use plans, zoning, and new town growth boundary on real estate development and the location of households and commercial districts (Waddell et al., 2001).

### 3.3. Principle 3 - Integrated Bus Rapid Transit Systems

As the daily traffic jams reach epic proportions across mother cities, planners and developers are looking to combine new-town neighborhoods and the central regional cities with new transit systems to create transit villages, which provides for an integrated transit system (Kunz, 2004). The integrated transit system combines...
the disciplines of urban design, transportation, and market economics and "it is partly about creating a built form that encourages people to ride transit more often. However, equally important, it embraces goals related to neighborhood cohesion, social diversity, conservation, public safety, and community revitalization.” (Bernick and Cervero, 2004)

![Fast Intraurban Transit Links](image)

**Fig. 2. Concept of Intra-urban Transit Link via BRT (Courtesy of UW)**

Bus rapid transit (BRT) is defined as “a rapid mode of transportation that can combine the quality of rail transit and the flexibility of buses.” BRT systems (Levinsion, et.al, 2003; Mogharabi, 2003) combine “stations, vehicles, services, running ways, and intelligent transportation system (ITS) elements into an integrated system.” BRT systems have grown in popularity in recent year reflecting concerns arising from environmental protection to the desire for alternatives to clogged highways and urban sprawl. These concerns have prompted many transit agencies to re-examine existing technologies and to embrace creative ways of improving quality of transit services in a cost-effective manner. As one option to the systems, various BRT systems have been built throughout the world in recent years. BRT systems offer operational flexibility, and can be built quickly, incrementally, and economically.

BRT systems can be applied to providing fast transit links between new towns and central regional cities, international or regional airports, as well as serving feeder-distributor systems as major high-speed ground lines along major regional corridors. Such new systems of fast line-haul links, called intra-urban links in some studies (University of Washington, 2003), will be essential in the development of new or renewed satellite communities. They are viewed as the only means to provide the focal points for future metropolitan development patterns as alternative to a continued regional sprawl.

As shown by Fig. 2 in investigations conducted by University of Washington in the new systems study (13), BRT systems can be designed to be quieter, smaller, and to take less land minimizing adverse impacts on areas adjacent to the rights-of-way. Guideway dimensions, turning radii, and support structure requirements for the BRT systems are such that fast transit links could be installed in the medians or along the edges of existing freeways. Rail rights-of-way could be converted to BRT facilities in many instances. One example of an intermediate speed intra-urban link in the study (University of Washington, 2003) would carry 80-seated passengers per vehicle, for a system capacity of 16,000 passengers per hour. Another could carry 20 passengers per vehicle and would be able to move 6,000 passengers per hour in conditions approaching the convenience, comfort, and privacy of the automobile. Higher and lower capacities could be attained through changes in vehicle types or train lengths and headways.

3.4. Principle 4 – “Green Belt” between New Towns and Central Urban Areas
A “green belt” should be built along highways or transit routes between a new town and the central urban area, or among the satellite cities, as shown by Fig. 3. Building such green corridors is important to a new town development, due to the following reasons:

- Highways contribute to local and regional character when cultural and natural features, scenic views, and community identity are preserved and emphasized.
- Highway landscape and aesthetics projects can improve safety by reducing glare, providing separation of oncoming traffic, improving way finding, and providing predictable yet engaging driving environments.
- Highway vegetation can enhance environmental health by accommodating wildlife crossings, reducing erosion and runoff, and protecting native plant communities.

![Fig. 3. Sample “Green Belt” in New Zealand](image1)

![Fig. 4. Concept of Traffic Information via Highway Advisory Radio](image2)

A Landscape and aesthetics master plan is suggested to be developed for integrating the highway system planning with a new town development. The primary purpose of the master plan is to ensure that landscape and aesthetics are consistently considered and applied throughout the lifecycle of the highway from planning and design through construction, operations and maintenance; and to provide a landscape and aesthetics design framework for planning and design.

3.5. **Principle 5 - Intelligent Transportation System Gateway**

Recognizing the need to make travel seamless along highways which run between a new town and the central urban areas or through multiple cities, an ITS gateway is needed to exchange real-time traffic congestion information among multiple cities. The result of this effort is the development of the information exchange network which would provide information about traffic accidents and congestion to responsible agencies to better manage traffic on streets and highways, and to commuters via electronic message signs, highway advisory radio and the Internet to allow them to make alternative transportation mode, route or time choices (Fig. 4).

4. **Principles of Transportation Planning Within the New Town Area**

4.1. **Principle 1 - Trip Forecast**

Travel demand forecasting is a systematic process, usually involving the use of a computerized travel-demand model, for predicting future traffic volumes and the distribution of future traffic volumes on the circulation system in a defined geographic area. Such a model allows the testing of numerous transportation alternatives and provides decision-makers with quantitative information about the consequences of their alternatives to enable making decisions on the type, location, timing and prioritizing of transportation improvements. This process is viewed as one of the fundamental requirements to developing recommendations that guide short-term and long-term design of new town land use and transportation models.
4.2. Principle 2 - Multiple Linkages

Towns and portions of towns need many links for connectivity while on the other hand street blocks need to be kept short so that multiple modes of transportation such as pedestrians, bicycling, and transit can be easily planned (Burden, 2001). Generally, most new streets should be kept 200 to 800 m long. Where defunct and non-operational street patterns are already in place, new linkages can be created by making use of natural land features, utility corridors, waterways and other open spaces to create walking and bicycling trails. These linkages make it possible and practical for people to walk or bicycle to parks, school, libraries and commercial centers instead of using their automobiles, as illustrated by an exemplary multimodal intersection in Fig. 5.

4.3. Principle 3 - Multiple Uses of Streets

In addition to being used for moving vehicles and parking, streets also perform other functions like traditional cultural activities as shown by Fig. 6 (Burden, 2001). Both main streets and neighbourhood roads serve as “outdoor living rooms.” Well-constructed streets elicit appropriate behaviour, increasing neighbourliness, association, and sense of belonging, acceptance, pride and opportunities for play. Well-designed streets provide for safe and efficient movement of all vehicles, while also providing for sanitation, utilities and timely emergency response.

4.4. Principle 4 – Appropriate Bicycle Paths and Sidewalks

Urban areas, which no longer rely on walking and bicycling as feasible and/or practical travel choices, are becoming unfit and unhealthy (Burden, 2001). Along with the new town’s development and planning, it is necessary to develop a bikeway element within the new town’s transportation plan. The primary goal of the bikeway plan is to create an interconnected network that makes bicycle travel a safe alternative transportation mode to the automobile by avoiding or minimizing bicycle-vehicular-pedestrian conflicts to the extent possible. To accomplish this goal, the system should be designed, at a minimum, to connect municipal centers with one another. Pedestrian walkways and bike paths/lanes should be incorporated into future roadways.

Bicycle facilities represent improvements and provisions made by public agencies and the private sector to accommodate or encourage bicycling, including parking facilities, mapping all bikeways (Fig. 7), and shared roadways not specifically designated for bicycle use. Although most bike paths and lanes (Fig. 8) are public facilities, other bicycle facilities such as parking (bicycle racks), and paths within subdivisions and developments may be built and maintained by the private sector. Educational aspects of bicycle programs may also be taken up by the private sector.
Bicycle facilities typically fall into the following three categories. (a) “Bike Lane” is a portion of a roadway that has been designated by striping, signing, and pavement marking for the preferential or exclusive use of bicyclists. (b) “Bike Path” is a bikeway that is physically separated from motorized vehicular traffic by an open space or barrier and is either within the highway right-of-way or within an independent and separate right-of-way. (c) “Bike Route” is referred to a segment of a system of bikeways designated by the jurisdiction having authority with appropriate directional and informational markers, with or without a specific bicycle route number.

Inclusion of a closed, safe, and comfortable network of bicycle paths and sidewalks are desirable in the new town transportation plan. A clearly defined pedestrian crosswalk should have no visual crowding, nice large trees in the median, a consistent neighborhood image, and adequate lighting (Workshop, 2002). A “Bikeway” can represent any road, path, or way that in some manner is specifically designated as being open to bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes. A “Shared Roadway” could be any roadway upon which a bicycle lane is not designated and which may be legally used by bicycles regardless of whether such facility is specifically designated as a bikeway. The majority of roads can be classified as shared roadways.

4.5. Principle 5 - Low Traffic Dispersion and Speed Management within New Town Areas

This principle specifically aims at slowing traffic to speeds in central city or business areas that are safe for pedestrian and bicyclists so they can equally share the use of the public right-of-way. This is a very desirable feature of a liveable and walkable new town center. Generally, traffic speed increases on long, wide stretches of streets with few intersections. Therefore, “traffic calming” techniques, a family of street design strategies, are implemented to narrow the real or perceived width of travel lanes, introduce changes in vertical and horizontal alignment, and provide frequent, but safe interruptions in the pathway of motorists where pedestrians are to have the principal use of the right-of-way. Fig. 9 and Fig. 10 illustrate examples of using trees in traffic calming development. Some simple methods that are being employed in town centers and neighbourhoods throughout the country include (Jones and Goulding, 2003; Mogharabi and Sutaria, 1992):
- Narrowing standard vehicle travel lanes from twelve feet to ten feet
- Decreasing the block size of the street grid, in combination with frequent stop signs or traffic signals
- Placing street trees near the street to narrow the perceived width of the street corridor
- On-street parking
- Raised “speed tables” placed at mid-block or pedestrian crossings
- Using traffic circles at major intersections
- Installing traffic islands or diverters in the center of local streets

Above techniques should be tailored and customized to different local conditions including type of land use and traffic circulation.

4.6. Principle 6 - Green Street Planning

Pedestrians and bicyclists have a great need for green space, shade and ambiance. Motorists, too, are affected by the presence or absence of streets trees (Burden, 2001). In general, motorists use urban trees to help assess and gauge their speeds. Landscaping is now considered a primary component of traffic calming. Street trees are a major measure to convert and reduce impacts of harmful auto emissions, and to increase the beauty of a new town, although in many cases they become expensive to maintain.

4.7. Principle 7 – Keep Traffic Moving Safely

It is commonly understood that motorists are less bothered by the speed at which they travel than the number of times they must stop and wait. A proliferation of stop signs, traffic signals and other delays, due to lack of access management and other reasons has led to high levels of frustration for motorists in motion. One of the most powerful tools for keeping traffic in motion is the roundabout (Burden, 2001). A roundabout is a circular intersection joining two or more streets (Fig. 11). The streets that connect to a roundabout feed traffic into a “circulatory roadway” that surrounds a central island. The traffic on the circulatory roadway flows in a counter-clockwise direction in the US. All turns and lane changes that drivers make when entering, while within, and when leaving a roundabout are right turns. This helps drivers make all manoeuvres through the roundabout with more ease, efficiency, and safety. Roundabouts may be suitable for the following situations:

- Intersections with a history of accidents;
- Intersections where vehicle queues need to be minimized;
- Intersections with irregular approach geometry (multiple legs, diagonal approaches);
- Intersections in need of less expensive traffic control operations (as opposed to a traffic signal);
• Intersections with a high proportion of U-turns; and/or
• Intersections with abundant right-of-way

4.8. Principle 8 – Build More Public Space

Public space is where, as shown by Fig. 12, we celebrate life as part of a community; share holidays, anniversaries and pleasant days with parents, children, friends or strangers; and assemble for neighbourhood or town festivals. Public space creates essential visual symbols and mental images of our neighbourhood and town, and serves as a depository for the fondest memories of people and a town (Burden, 2001). Public space is the glue that holds society together. The challenge and importance of building and maintaining good public space is critical to the success of a neighbourhood or downtown, and to civic life and ownership of responsibility. Therefore, building public spaces must be taken in consideration in the transportation planning for a new town development. Most central city streets should be built and maintained as public places. For instance, the highest rated liveable city in the world, Melbourne, Australia, requires all homes to be within 1/8th mile of a public park. Such treatment can also create the necessary ambiance, low traffic noise, and easy street access for a community.

4.9. Principle 9 - Foundation for New Town Public Transportation Systems

As discussed earlier, an integrated transit system, or intra-urban transit link between a new urbanism town and the central regional areas has proven to be a solution to the urban sprawl. As a consequence, an inner transit system for the new town is needed to incorporate with such intra-urban transit links (Fig. 13). The BRT systems are quickly proving to be one of the practical solutions for this purpose. Coordinating with the metropolitan regional transportation planning, foundations for public transportation, including right of way for bus-ways, BRT and/or light rail transit (LRT) should be included in the new town highway and street plans, as shown by Fig. 14. That is one of the important strategies for creating a livable and sustainable community.

A key to the success of town transit systems is the creation of a high-quality pedestrian environment by using good design and the inclusion of pedestrian amenities (Waddell, et.al, 2001). Buildings with ground-level retail shops should front the sidewalks and contain businesses such as cafes, small grocery stores, and dry cleaners that are useful to the residents of the community. Weather protected benches and bike racks should be located at transit stations and/or stops along the transit lines. Another important ingredient for success is fast, easy connections between systems with little or no waiting or annoyance. Additionally, higher bus-routing densities are important for the success of both BRT and town transit systems. According to Bernick, et.al’s (2004) recommendations and Dittmar, et. al’s studies (2004), main criteria for a “transit-oriented development” of a new town are set forth as follows:
• The transit service extends roughly a quarter mile from a transit station, a distance that can be covered in about five minutes by foot.
The centerpiece of the transit systems is the station itself and the civic and public spaces that surround it. The transit station connects town residents and workers to the rest of the region, providing convenient and ready access to downtown, major activity centers like a sports stadium, and other popular destinations. The surrounding public spaces or open grounds serve the important function of being a community gathering spot, a site for special events, and a place for celebrations. The combination of the new town and reliable transit systems may create places with a higher quality lifestyle, and also frequently result in situations where the properties around stations command higher real estate prices (Waddell, et.al, 2001).

5. Case Study: Copenhagen and “New Town” Ørestad – All for Urban Planning and Traffic

Copenhagen is Denmark's only large city and has therefore a double role to play. Firstly, it must act as the nation's capital and center of the Danish-Swedish Øresund Region, and secondly, it must be an attractive place to live and work. In addition, the city is currently experiencing one of its most dynamic periods including: the creation of a completely new urban area, the transformation of harbors, military and industrial areas, the face-lifting of inner city districts, urban renewal and an extensive development of the infrastructure, making Copenhagen an exciting city to live in - and an ideal subject of a case study.

The Ørestad Development Corporation’s task is to build a new Metro in Copenhagen (Fig. 15), and the new Ørestad urban district on Amager. The two activities are directly related to each other, as the sale of the land in the new urban district must be used to help finance the building of the Metro. Ørestad is a "new town", a completely new urban district 310 hectares in size, which has recently grown from open fields close to the historical center of Copenhagen. Ørestad will be a green district, with water and countryside surroundings, with 10,000 homes, businesses and public institutions, providing altogether 65-75,000 jobs. Within the next 30 years, this district will develop into a modern counterpart to Copenhagen's old, but fully intact city center.

A primary goal of city development planning is to develop a sustainable urban and transport pattern so that traffic development incorporates as much public transport use as possible. Copenhagen has many years of experience in laying cycle paths and routes as well as low-speed roads, and also restricting road traffic in

---

Fig. 15. Extended New Metro System Connecting Copenhagen and Surrounding Towns with New Driverless Metro in Ørestad

Fig. 16 Bridge Linking Copenhagen, Ørestad and Demark Malmö in Sweden
residential areas. As early as the 1960s, the pedestrian street, Stroget, in Copenhagen was a model for urban design, and since then considerable experience has been gained by regulating the relationship between the different types of road-uses in the city. Since the 1990s, Copenhagen has seen a major increase in transportation projects. Denmark's capital city provides an easily accessible gateway to Scandinavia and the Baltic region and for this reason the region has attracted many multinational companies to set up offices in and around the city. The Ørestad Development Corporation was formed in 1993 to oversee a major city development region, called Ørestad, in the south of the city. An extensive new driverless metro system connecting the region to the city center and beyond in an east–west direction was also proposed and the first phase of this project came on-stream in 2000. Additional major development included the construction of the Øresund motorway and railway bridge linking Copenhagen, Ørestad and Malmö in Sweden (Fig. 16); an expansion of Copenhagen International Airport with a new train line linking it with the city center; an upgrade of the existing motorway system in the Greater Copenhagen Area; and various other railway expansions both within the city and the region.

In 2000, a completely new metro system began service in Copenhagen, speeding up travel across the city and taking the burden off the existing over-stretched S-Tog heavy rail commuter network. The metro runs 24 hours a day at 1½-minute intervals between departures during the rush hours. The route runs from Vanløse in eastern Copenhagen, passing through Frederiksberg and Nørrepor before continuing on to Christianshavn. At Ved Stadsgraven the city rail splits into two. One leg goes to the Ørestad development on West Amager and the other to East Amager and onwards to Copenhagen International Airport. To avoid dividing the Ørestad district into two, part of the West Amager section is built as a high viaduct allowing traffic to pass under the railway.

6. Conclusion and Recommendations

An efficient traffic system is a necessity for the economy of the new town and particularly relevant for a nearby existing “mother city” or urban area as a regional center. To build an environmentally favorable city, transportation planning integration plays a vital role in the new town development. It is critically important to restrict and/or reduce car traffic to the extent possible and to stimulate public transport as environmentally friendly means of transportation. This paper addresses issues in the integration of a new town development and transportation system planning and key principles necessary for such integration. Despite some uncertainties in institutional, political and technological factors that are associated with the applications of those principles, the paper provide key points to better understand the integration issues for a new town’s planning process.

References

Iran New Towns: Accessed at http://www.NTOIR.gov.IR.
The Countryside Agency, United Kingdom. (1999). The State of the Countryside Reports. Available at http://www.countryside.gov.uk/EvidenceAndAnalysis/state_of_the_countryside_reports/
City of Groningen, Netherlands. (2004). Groningen-Integrated Town Planning and Traffic Policy, White Paper. Available at http://www.caue.de/winswd/95.htm
Federal Transit Administration. (2003). Bus Rapid Transit Offers Communities a Flexible Mass Transit Option. Report No. GAI-030729T.
Online Encyclopedia of WorldIQ.com. (2004). Definition of New Town, Available at http://www.wordiq.com/definition/New_town
Dan Burden. (2001). Building Communities with Transportation. Distinguished Lecture Presentation at 2001 Transportation Research Board Annual Meeting.
Tom Radulovich. (2004). On the Level: Improving Regional Transportation Planning, Policy Paper. Available at http://www.spur.org/documents/030901_article_03.shtml
P. Waddell, E. L. Schroer, and M Outwater. (2001). Land Use and Travel Demand Forecasting Models: Assessment of Model Requirements, Final report, June 2001.
Andy Kunz. (2004). The New Town Paper - Transit Village, White Paper. Available at http://www.tndtownpaper.com/Volume3/transit_villages.htm
Michael Bernick and Robert Cervero. (2004). Transit Villages in the 21st Century.
Levinson, H.S, S. Zimmerman, and J. Clinger. (2003). Bus Rapid Transit Synthesis of Case Studies. Pre-print on 2003 Transportation Research Board Annual Meeting.
Mogharabi, A.. (2003). BRT: Bus Rapid Transit, Is it the Next Big Thing? Presented at the First International Civil Engineers Conference, May 2003 Tehran, Iran.
University of Washington. (2003). Tomorrow's Transportation: New Systems for the Urban Future, White Paper. Available at http://faculty.washington.edu/jbs/itrans/tomtrans.htm
Community Visualization and Photo Simulation Workshop Summary. (2002). Accessed at http://www.jointventure.org/resources/photosims/workshop.html
Jordan, Jones & Goulding. (2003). Envision Duluth Livable Centers Initiative Report. Section 5: Linking Land Use and Transportation. Available at http://www.atlantaregional.com/qualitygrowth/duluth_SEC5_TRANSPORTATION.PDF
Mogharabi and T.C. Sutaria. (1992). Circulation Issues and Impact, Corridor Redevelopment, ASCE National Conference, Chicago.
Hank Dittmar & Gloria Ohland. (2004). The New Transit Town: Best Practices in Transit-Oriented Development. Book News, Inc.
Transit Oriented Development (TOD). (2004). TOD: Designing a Better Feature, White Paper. Available at http://www.transitorienteddevelopment.org/pages/1/index.htm