formation into a pedestrian-interactive thoroughfare. All will have front
aces onto Euclid, and the ground floor uses will be either retail or university-
services. In addition, the new buildings help Euclid Avenue by replacing either
dactive, uninviting existing buildings or surface parking with a more pedestrian-
y streetscape. Also, because the station architecture is transparent, the
as feel safe and welcoming. As cited in (Breakthrough Technologies Institute,
CSU's Vice President for Business Affairs believes that the median bus way
create a more pedestrian friendly environment by making the street feel
and easier to cross (City of Cleaveland, Ohio, 2011)

The CSU expansion Master Plan has a north-south orientation. The plan shows new private
development along the opposite side of Euclid, creating a unified campus around Euclid. The
Master Plan calls for using the BRT stops at E. 19th St. and E. 24th St. as transit anchors for two
north-south spines through the expanded campus.

(Courtesy CSU)

University Circle Development

University Circle is home to a number of major academic, medical and cultural
stitutions. There are efforts underway to introduce more residential and retail options
in this area and turn it into a thriving urban village. Because of the number of
stitutional buildings, there is not as much available land here as in MidTown. The area
is also quite congested, increasing the interest in TOD projects (University Circle Master Plan, As Cited in (Breakthrough Technologies Institute, 2008). Cleveland Clinic, University Visitor Center, are some featured of this area.

The Cleveland Clinic is a world-renowned medical facility located at the western edge of University Circle. It is the largest employer in the city and the second largest in Ohio (Cleveland Clinic, 2011). It occupies 140 acres and 37 buildings, including a hospital, an outpatient clinic, cancer center, eye institute, research institute and supporting labs and facilities. When the Euclid Corridor BRT planning process began, the Clinic had little interest in the BRT and objected to siting a BRT station in front of the new Heart Center. After a change in Clinic leadership, with a new attitude, the BRT was embraced and the promenade leading to the new heart center was redesigned to integrate with the BRT station. Moreover, RTA developed an agreement with the Clinic that will make the area more pedestrian and transit friendly and the Clinic is contributing $5 million to this effort (Breakthrough Technologies Institute, 2008) (City Planning Commission, Cleveland, 2010). In another sign of the Clinic’s dedication to the BRT, it partnered with nearby University Hospitals to acquire 25 year naming rights at a cost of $6 million. The BRT will now be called the Healthline (Cleveland Planning Commission, 2010).

2.2.4 The Path To Success

The government strategic planning for a major development initiated with the Euclid Avenue is the first identified success of the TOD complex. The government has identified the basic infrastructure facilities which are needed to implement a TOD; i.e. a road, land for development. The next support

Fig - Creating a thriving urban areas with more pedestrian friendly activities with compacted living was the essence of the Euclid Corridor Development Project.
has been given by the developers; who have correctly identified and interpreted the development and its potentials (for example the East 4th Street).

On the other hand, the micro level master plans; such as the Cleveland State University Development have changed their proposals supporting the new development towards making a successful TOD.

2.3 Brisbane, Australia

2.3.1 Introduction

Southeast Queensland is the fastest growing region in Australia. By 2026, the region will grow from 2.6 million inhabitants to 3.7 million, with most of the growth occurring in metropolitan Brisbane (One of the 11 regional and city coun. In 2004, Brisbane had a population of roughly one million, or 36 percent of the regional population (Brisbane City Council, 2011). Like other cities in developed countries, Brisbane experienced a rapid decline in public transportation usage in the post war period.

Despite an extensive rail network, the proportion of public transport trips in the city declined from roughly 40 percent in the 1960’s to less than 7 percent by 2000 (Breakthrough Technologies Institute, 2008) (Brisbane City Council, 2011). Despite an extensive rail network, the proportion of public transport trips in the city declined from roughly 40 percent in the 1960’s to less than 7 percent by 2000 (Minister for infrastructure and planning in accordance with the integrated planning act of 1997, 2008). It further states that the introduction of the busway system arrested the decline of public transport usage in the city.
The regional bus way network currently is composed of four distinct segments. It is depicted from the figure below.

All busway infrastructure and services are controlled by TransLink (formerly Queensland Transport), an agency of the Queensland Government. TransLink contracts with various bus operators to provide service on the busways. (Brisbane City Council, 2011), (Breakthrough Technologies Institute, 2008).

TOD around the Brisbane busway network can be characterized into three general types.

First, because the busways are relatively new, they are being used to serve existing structures and communities that previously exhibited many TOD characteristics, but lacked a dedicated transit connection. This is apparent at a number of stations, such as the Cultural Centre, Upper Mt. Gravatt, and the Queensland University, St. Lucia campus stations. Second, the busways are serving as a catalyst for new, green field development near stations. Finally, the busways are catalyzing urban infill.

2.3.2 Infrastructure and Institutional Framework

Since Brisbane belongs to the South East Queensland, the state government reviewed the South East Queensland Regional Plan 2005-2026 (SEQ Regional Plan 2005) to determine the appropriate action to address emerging regional growth management issues—continued high population growth, housing affordability, transport congestion, climate change and employment generation. Therefore, this is basic facilitator for implementation of a successful TOD.

The SEQ Regional Plan seeks to proactively manage the population growth by identifying a preferred settlement pattern for the region and encouraging more compact development by taking advantage of areas with existing services and infrastructure. Also, an increased proportion of the region’s population will be accommodated in the Western Corridor around Ipswich, reducing growth pressures on the coast (Minister for infrastructure and planning in accordance with the integrated planning act of 1997, 2008).

Future residential growth will be accommodated through a combination of redevelopment, undeveloped broad hectare sites and limited rural living. A strong focus of the SEQ Regional Plan is looking at better ways to use under-utilized land. Notably, the plan sets local government targets for the additional dwellings that
will be required in SEQ by 2031. Nearly half are to be built in established urban areas through infill and redevelopment. The SEQ Regional Plan protects 85 per cent of the region from large-scale and inappropriate urban development by restricting this development outside the Urban Footprint and identifying areas within the Urban Footprint for future urban growth. (Department of Local Government and Planning, 2011). With this intention, a noted feature of the SEQ Regional plan is the implementation of Air Rights Development1.

It is noted that whole development of the region is based on the four segments of bus way network; namely South-East, Inner-Northern Bus way, Eastern Bus way, and Boggo Road Bus way.

2.3.3 Developers’ Perspective

2.3.3.1 Land Use Planning and Usage

Under the Integrated Planning Act of 1997, land use planning in Southeast Queensland is governed by the Queensland State Government, not local governments, and is based upon a performance-based planning methodology. The Plan also seeks to promote integrated transport and land use planning, stating that “transit-oriented development principles should be applied in the detailed planning of all regional activity centers in close proximity to high-capacity public transport nodes and corridors.” (Minister for infrastructure and planning in accordance with the integrated planning act of 1997, 2008). Within this scope, the whole development took place with no distinction between rail services and bus services in terms of their appropriateness as an anchor for TOD.

According to the act, local governments must prepare Local Growth Management Strategies (LGMS) to implement the Regional Plan. The LGMS must, among other things, nominate potential TOD sites for inclusion in the Plan. Brisbane has released a draft LGMS that is awaiting approval from the Queensland Government. In addition, the Queensland State Government; through the Department of Infrastructure, can identify state development zones. In these zones, the state government, not the local government, is responsible for site planning and development. Five state development zones have been designated in Queensland, including the Boggo Road Gaol site, the redevelopment of a government printing facility adjacent to the Woolloongabba station on the South East Busway.

1 A type of development right in real estate, referring to the empty space above a property (US Government, 2008).
2.3.3.2 Identified TOD Friendly Features

**Queen Street Mall and the Myer Center - Developed under South East Busway Development**

![Map and image of Queen Street Mall and Myer Centre]

The Queen Street Mall is a pedestrian-only street that runs for three blocks along Queen Street. It is lined with street-level shops and restaurants with commercial spaces located on the upper floors. The Myer Centre is a six-level shopping mall on the Queen Street Mall in downtown Brisbane. The Centre was built in 1988 with a bus interchange integrated into the bottom floor of the building.

Although the Myer Centre and the underground bus station were built prior to the South East Busway, they now serve as the terminus for the busway in the CBD. Vehicles enter a tunnel under the mall where they serve bus platforms, turn around, and depart for return runs to the south.

The Queen Street station is one of the most heavily used stations on the busway network. The 111-bus service, which operates as the trunk service on the South East Busway terminating at the Queen Street station, is the most heavily used service on the busway.
Moreover, for trips where the main purpose is shopping, the Queen Street station is the most popular destination. The Myer Centre includes prominent signage directing customers to the location of the Queen Street station (Breakthrough Technologies Institute, 2008) (Tomorrow’s Queensland - Queensland Government, 2011).

**Matter Hill Hospital - Developed under South East Bus way Development**

One of the most interesting TODs in Brisbane is located at the Mater Hill Hospital, where the air rights above the Mater Hill station were sold to accommodate the expansion of the hospital. This transaction enabled the construction of a new hospital building as well as an elevated link between the new building and an existing building. The link structure contains the hospital’s surgical wing, with operating theaters located on the lowest level closest to the bus way.

Initially, the hospital strongly opposed the bus way, arguing among other things that hospital workers and visitors would not use the bus.
way but rather would access the facility by car. The hospital also proposed installing columns in the bus way station to support the elevated link and allowing only minimal clearance between the bottom of the structure and the top of the busway station. TransLink insisted that columns would harm the function and aesthetic of the station. To support the link structure without impeding station flow, a column was instead placed in the retaining wall adjacent to the existing hospital building (Breakthrough Technologies Institute, 2008).

TransLink also insisted that there should be at least three stories of clearance between the link structure and the bus way station to allow sunlight to filter into the bus way station. The link structure ultimately was built with this clearance, providing the station with an open feel even though it is located beneath the hospital surgical wing. The station also includes a specialty coffee shop, where bus way users can relax prior to boarding bus way services.

**Eight Mile Plains - Developed under South East Bus way Development**

Eight Mile Plains is the southern terminus of the South East Bus way. It is characterized by two park-and-ride facilities of approximately 400 spaces each and a significant amount of green space to the east of the bus way station. Immediately west of the bus way station is the Pacific Motorway.

Centrus is a new, master-planned community under construction directly across Miles artists Road from the Eight Mile Plains bus way station. When complete, Centrus will include (Breakthrough Technologies Institute, 2008) (centrus, 2010):

- 86 energy efficient townhomes, each with a 3,000 liter rainwater tank;
- A retail center with a café and convenience store;
• A child care facility;
• A recreation facility with a lap pool, gym, and barbecue area;
• Two condominium buildings; and
• A recreational park with natural vegetation.

King George Square and Roma Street Stations - Developed under Inner Northern Busway Development

The King George Square and Roma Street stations are infill stations located on the new section that connects the South East Busway with the existing Inner Northern Busway. Both are located in the heart of the CBD near City Hall and are surrounded by existing high-rise development. The stations are under construction and expected to open in May 2008. Given their location in an existing, high density CBD, neither station is likely to attract significant new TOD. However, each serves existing high-density development and contains interesting features that are worth noting (Breakthrough Technologies Institute, 2008).

The King George Square station is located underground directly in front of City Hall. It was created by removing over 400 spaces from an existing underground parking garage, thus substituting bus way capacity for car access to the City Hall area. Moreover, the station includes an indoor bicycle parking facility, with racks for 420 bicycles, shower facilities, and lockers. The Roma Street station is several hundred meters northwest of the King George Square station. It serves as a major transfer station for the Brisbane rail network, with the busway and rail serving opposite sides of a shared platform.

Kelvin Grove Urban Village - Developed under Inner Northern Busway Development

The Kelvin Grove Urban Village is an infill development mixing residential, commercial, retail, educational, and community uses. It is located two km from the CBD on a 15.37-hectare site that formerly served as an army barracks for the federal government. The Village is adjacent to the Queensland University of Technology and is served by both the Kelvin Grove station on the Inner Northern Busway and by high frequency arterial bus routes. There also are plans (Breakthrough
The village includes more than 1,000 residential units, ranging from premium apartments and townhomes to affordable units and accommodations for students and seniors. The village also includes restaurants, bars, and shops, commercial space for small and medium-sized businesses, and parks, pedestrian paths, and bikeways. The village was designed to demonstrate best practices in sustainability, including solar water heating, cross-ventilation to reduce air conditioning needs, and energy efficient appliances. It has won 11 state and national awards for its sustainable design (Kelvin Grove Village, 2010).

The Kelvin Grove Urban Village and the Inner Northern Bus way were developed roughly simultaneously (Breakthrough Technologies Institute, 2008). However, the Kelvin Grove bus way station is not located in the village, but rather several hundred meters away on the Queensland University of Technology campus. The walk from the station to the urban village was fast and pleasant and therefore did not appear to pose much of a deterrent regarding use of the bus way to access the village. This is particularly true given Brisbane’s climate, which is generally warm and subtropical throughout the year.

2.3.4 The Path To Success

Implementation of a government base strong institutional framework with existing infrastructure is the key path to success. On the other hand, the significant air rights development has been taken by the developers in a more effective manner.