THE CONCEPT OF TRANSIT ORIENTED DEVELOPMENT

1.1 “Automobile Dependency” and its after-math

During the early 20th century, people of the urban communities of industrialized countries were used to move away from the polluted cities to newly created suburbs. Transport networks such as railway, street-car, and busses provided the linkage between the urban core and sub-urban areas.

However, the interdependence between housing, jobs, and transit inherent to the early streetcar suburbs was broken apart by the automobile. Starting in the 1930s, roads, including highways, became the preferred transportation infrastructure in both developed and developing countries. Development was no longer dependent on transit, the link between transit and development was severed, and developers got out of the business of building transportation systems (Belzer & Autler, 2002).

Professors Peter Newman and Jeff Kenworthy (Kenworthy & Newman, 1990) have coined this phenomenon as “Automobile Dependency”. They further reveal that when it comes to automobile use, there is a spiraling effect where congestion produces the ‘demand’ for more and bigger roads and removal of ‘impediments’ to traffic flow, such as pedestrians, signalized crossings, traffic lights, cyclists, and various forms of street-based public transit such as streetcars (trams).

This makes the emergence of wider roads which guarantees pleasurable and advantageous automobile usage at the expense of other modes of transport; however on the other hand, would create more and more traffic volume. Additionally, the urban design of cities adjusts to the needs of automobiles in terms of movement and space. Buildings are replaced by parking lots. Open air shopping streets are replaced by enclosed shopping mall. Walk-in banks and fast-food stores are replaced by drive-in versions of themselves that are inconveniently located for pedestrians. Town centers with a mixture of commercial, retail and entertainment functions are replaced by single-function business parks, ‘category-killer’ retail boxes and ‘multiplex’ entertainment complexes, each surrounded by large tracts of parking. According to (Kenworthy & Newman, 1990) this results in congestion, and the cycle above continues. Roads get ever bigger, consuming ever greater tracts of land previously used for housing, manufacturing and other socially useful purposes. Therefore, the
public transit becomes less and less viable and socially stigmatized, eventually becoming a minority form of transportation. People’s choices and freedoms to live functional lives without the use of the car are greatly reduced. Such cities are automobile dependent.

Automobile dependency is seen primarily as an issue of environmental sustainability due non-renewable resource consumption and the production of greenhouse gases responsible for global warming. It is also an issue of social and cultural sustainability. By creating gated communities, the private automobile produces physical separation between people and reduces the opportunities for unstructured social encounter that is a significant aspect of social capital formation and maintenance in urban environments (Arbury, 2005) (Mierzejewski et al., 2002).

During the 1980s and 1990s, issues associated with automobile dependence and urban sprawl, such as environmental impacts and social dislocation, led to the emergence of new movements in planning theory such as ‘Responsive Environments’ in England and ‘New Urbanism’ in North America. In 1993 Peter Calthorpe, defined ‘transit oriented development’ in his publication The Next American Metropolis and practices (Calthorpe, 1993) that could be applied in Greenfield, Brownfield and infill situations. These drew on earlier ‘garden city’ planning concepts from the United Kingdom, such as the self-contained ‘urban village’ and ‘traditional neighborhood development’, but were presented in a contemporary way.

1.2 Concept of Transit-Oriented-Development (TOD)

1.2.1 Attempts of defining the concept

Transit oriented development is a planning concept that promotes the creation of a network of well-designed, Human-scale urban communities focused around transit stations (Tomorrow’s Queensland - Queensland Government, 2011). (Wikipedia, 2011) defines the term as a mixed-use residential or commercial area designed to maximize access to public transport, and often incorporates features to encourage transit ridership.

According to (Mierzejewski et al., 2002) TOD involves a mix of land uses, including commercial/retail, business, residential housing (various types and prices), and community amenities, such as childcare centers, schools, libraries, public services,
local government offices, and community parks. Quite often a transit station is central to TOD with high-density development surrounding the stations while getting progressively less dense as it spreads outward. The development is compact, and the streets are built in an interconnected urban grid pattern. Auto-oriented land uses, such as gas stations or restaurants with drive-through windows, are discouraged.

(Tomorrow's Queensland - Queensland Government, 2011) further elaborates the concept as a development activity located along or within walking distance to transit routes that “mixes residential, retail, office, and public uses in a walkable environment, making it convenient for residents and employees to travel by transit, bicycle, or foot.” The main purpose of TOD is enhancing mobility by decreasing reliance on the automobile and by encouraging use of alternate modes of transportation such as transit, walking, and biking.

In developing its first transit-oriented ‘village’ at Wellard in the burgeoning southern suburbs of Perth, Western Australia, Peet Limited has tried to implement a classic definition of Transit Oriented Development.

The transit village or TOD is a compact, mixed-use, walkable community, centered on the transit station that, by design, invites residents, workers, visitors, and shoppers to drive their cars less and ride mass transit more.

(transitvillages.org, n.d.) as cited in (Curtis et al., 2009, p.201)

(Cervero et al., 2004) describes the typical TOD in the following terms. The Transit village extends roughly 400 meters from a transit station, a distance that can be covered in about 5 minutes by foot; the centerpiece of the transit village is the transit station itself and the civic and public spaces that surround it; the transit station is what connects ‘village’ 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; and, 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.

As one can notice, TOD is being defined in various ways; as (Cervero et al., 2004) says; There is no universally accepted definition of TOD. (Cervero et al., 2004) further states that, some definitions relate to smart-growth and sustainability principles in general, although most focus on the design characteristics of transit-supportive
environments. Most definitions emphasize the importance of high-quality walking environments. However, in general, there is agreement within the professional transit community as to what constitutes a TOD; they are as follows (Cervero et al., 2004);

- A pattern of dense
- Diverse
- Pedestrian-Friendly land uses near transit nodes that, under the right conditions, translates into higher patronage.

Therefore, this research is based on a definition focused on design characteristics covering three constituents defined by (Cervero et al., 2004). Thus, a summary could be generated which preludes the key characteristics of a TOD as;

- A rapid and frequent transit service
- High accessibility to the transit station
- A mix of residential, retail, commercial and community uses
- High quality public spaces and streets, which are pedestrian and cyclist friendly
- Medium- to high-density development within 800 meters of the transit station (i.e. the TOD precinct)
- Reduced rates of private car parking.

A more concise working definition on the term is given by (Hale & Charles, 2006) as;

TOD is a vibrant, relatively dense and pedestrianised mixed-use development precinct, featuring quality public space and immediate access to high-frequency public transit.

(Hale & Charles, 2006)

(Hale & Charles, 2006)'s definition is further detailed under 1.3.
1.2.2 Key design features of a TOD

A key element of TOD is making streets attractive, convenient, and safe for pedestrians and bicyclists (Puget Sound Regional Council, June 1999) & (Victoria Transport Policy Institute, 2011). People are more likely to walk or bicycle in an attractive environment they feel comfortable and safe in. Streetscape enhancements used to make streets more attractive involve trees, lighting, benches, building awnings, weather protection, and other amenities. Added convenience is given to pedestrians by having smaller blocks, buildings that are located close to the street with entrances directly connected to the public walkway, retail located on the ground level with businesses and housing above, and easily accessible transit stops with comfortable waiting areas. Narrow streets with wide sidewalks, traffic calming measures such as speed bumps or roundabouts, cross walks, and continuous walking and bicycling routes create a safe environment for pedestrians and bicyclists.

To balance the needs of automobiles with the needs of other transportation modes, parking and access management is also an important component of TOD (Mierzejewski et al., 2002). Shared parking is utilized, and parking is placed on the street (on-street parking takes up much less land area than off-street parking), behind buildings, underground, and in carefully designed and located parking structures rather than large surface lots.

While these are the traditional TOD characteristics found in a general literature review, TOD approaches can differ significantly across regions due to various circumstances, such as differences in land development regulations and zoning ordinances, market factors, development/redevelopment opportunities, public transit services, resources, and the state of the present and future regional economy (Puget Sound Regional Council, June 1999).

Every TOD project may not incorporate all of the design characteristics described above, but some features may be critical depending on the particular goals of that development. For that reason, it is important that the particular goals to be achieved by the TOD be defined early in the development of the TOD (Mierzejewski et al., 2002).
1.2.3 Evolution

1.2.3.1 Early 20th Century

At those times, typically, the streetcar lines and their adjacent residential communities were developed by a single owner who built transit to add value to the residential development by providing a link between jobs in an urban center and housing at the periphery. Indeed, the phrase “development-oriented transit” more aptly describes these places than does “transit-oriented development,” since private developers built transit to serve their development rather than vice-versa (Belzer & Autler, 2002). As part of this formula, streetcar stops often had small retail clusters to serve commuters as well as local residents. These small commercial districts are, to some extent, the precursor of modern TOD and represent a good balance between place and node.

1.2.3.2 Post-War Era

During the post world-war-II era, a decline in transit use was evident since most of the rail road’s were dismantled or abandoned. However, transit was still in operation, but relied much more heavily on buses as the primary mode in most regions (Belzer & Autler, 2002). Bus systems were subservient to the automobile, using the same streets and experiencing the same congestion, and in most cases bus service had less influence on land-use patterns than fixed-rail transit. With the exception of some of the commuter suburbs around older cities such as Boston, New York, and Chicago, which continued to function reasonably well as transit-based communities, most transit had become a last resort rather than a reliable transportation option tied to development.

As congestion worsened, a new generation of transit systems was planned and built. The San Francisco Bay Area Rapid Transit (BART) system, MARTA in Atlanta, and Metro in the Washington, D.C. area were opened in the 1970s. These systems were built with an entirely different rationale than their predecessors. They were built primarily to relieve congestion, funding was provided entirely by the public sector, and little or no additional land was purchased by the transit agencies to ensure that there would be any link between current transit investments and future development patterns (San Francisco Bay Area Rapid Transit District, 2011), (Metropolitan Atlanta Rapid Transit Authority, 2009), (Belzer & Autler, 2002).

These systems were also designed explicitly to work with the automobile, with the assumption that most people would drive to suburban stations rather than
walking, biking, or riding feeder-bus systems (Belzer & Autler, 2002). In this case, these systems were viewed as primarily serving a regional purpose, and the stations were considered nodes within this larger system, with little regard for the local place where each station was located. Because of the philosophy with which they were built, many stations are now characterized by large amounts of entrenched parking rather than intimate connections to vibrant neighborhoods. Large expanses of surface parking or parking structures create barriers between the station and the surrounding community.

1.2.4 Modern Trends and Benefits pushing TOD forward.

Many of the reasons for the exodus of residents from city life years ago are issues no longer. New technologies allow architects, planners, engineers and builders to create an urban residential environment that offers a far better standard of living than that offered by the city of 100 years ago. This includes improved sanitation, noise buffering, stricter building codes, and better building materials. Since the beginning of the flight out of the city during the days of the streetcar, people now no longer burn coal, wood, and kerosene for light and heat. As a result, urban air quality has improved. Over the years, stricter federal standards on motor fuels and vehicles have reduced emissions. With the exception of carbon dioxide, technology changes have more than offset the effects of degrading air quality from increasing vehicle miles traveled. In addition, new hope is on the horizon from promising new technologies, such as hydrogen fuel cells and hybrid vehicles.

In a report published by (Cervero & Duncan, 2001) has revealed four major trends which have pushed the TOD movement forward within the world community. They would be;

- Present day’s public policy environment has become more receptive to the integration of transportation and land use planning with laws.
- A shift in demographics; Young single adults, childless couples, “empty nesters” wanting smaller homes, and immigrants are emerging as new markets for transit-based housing.
- Due to the ever-increasing problem of traffic congestion, some people are choosing to live near transit to make their commutes easier.
- Companies are starting to relocate around transit station areas to provide
employees with additional commuting and housing choices.

It is widely believed that the benefits of transit oriented development accrue to the transit system, the local host government, society, and individuals who live and work there. More research is still needed to build supporting empirical evidence for this belief (Boarnet & Crane, 1995), (Cervero, 1996), (Crane, 1996). Nonetheless, many assert that TOD has significant benefits for transit, including more efficiency in transit service and increased transit ridership. Well-connected streets and destinations that are closer together can help achieve improved efficiency in the form of more direct routes and frequent service. According to one source, people living near a transit station are up to six times more likely to commute to work by transit than other people living in the same region (Puget Sound Regional Council, June 1999). Increased ridership will result in higher transit revenues.

It is believed that local governments benefit financially from TOD. First, compact development lowers the infrastructure costs associated with dispersed development, such as roads, parking facilities, schools, sewer and water lines, and fire stations. Second, properties close to transit stations and TOD often have increased property value. Higher property values, plus the increase in economic activity caused by TOD, create a larger tax base for local governments (Puget Sound Regional Council, June 1999).

It is believed that society benefits from TOD due to compact development, integrated land uses, and a pedestrian friendly environment that all contribute to a balanced transportation system. Clustering commercial, public, and recreational services near transit stations and within walking distance of where people live and work reduces the need to drive automobiles and shortens travel time and distances, reducing overall traffic congestion. For example, residential development near the Pleasant Hill BART station in suburban San Francisco generates 52 percent fewer peak period auto trips than typical residential development and office development generates 25 percent fewer trips than typical office development (Belzer & Autler, 2002). In addition, a reduction in automobile use by reducing the need to travel beyond the TOD community leads to decreased pollution and improved air quality.

Other goals include supporting local growth management objectives, maximizing use of existing transit service, and improving quality of life. These goals are societal goals—ones that appeal to the sensibilities of local government staff, whose job it is to guide development in a way that is best for society as a whole. Making TOD successful
will depend on how it can be effectively marketed to the individual homebuyer and business owner.

Lastly, many assert that individuals do benefit from TOD due to the increase in accessibility and transportation choice it provides to the businesses and residents within the TOD. While suburban residents might not perceive these as valuable benefits, increased transportation choice translates into more mobility; especially for low-income and transit-dependent people (Victoria Transport Policy Institute, 2011). **The benefit of increased accessibility is not limited to the area around the TOD.** Having transit facilities nearby connects residents and workers to the rest of the region. TOD may make having a car an option, not a necessity. Some households are able to reduce the number of cars owned as walking; bicycling and transit become effective means of travel, translating into significant savings in transportation costs. Additionally, **TOD typically reestablishes places that serve as town squares, where people can congregate and develop a sense of community.**

1.3 Identifying the success of a TOD: A performance criteria

(Hale & Charles, 2006) proposed that there are three essential success factors for TOD precincts. These are:

- High frequency, high capacity public transit linking the precinct to the wider metropolitan area and providing good access. The transit should be integrated sympathetically with the precinct.

- Mixed-use development with street-front retail. Longer opening hours are an indicator of success. Offices and workplaces provide a support base of customers. Residential accommodation provides additional patrons – who hold a stake in the liveability of the precinct. The development needs to be competitive and viable in the open property market.

- Public space provision that, while generous, is never too large that the space becomes empty and loses its lively character. Cafes and restaurants should intermingle with public space. Up-market design is required for public space.

Expanding (Hale & Charles, 2006) and the Definitions of (Belzer & Autler, 2002) lists six **performance criteria for use in evaluating project outcomes**, with relative importance of the criteria to be based on the major goals the TOD sets out to
accomplish. (Belzer & Autler, 2002) suggest that, while physical characteristics are a “necessary element,” focusing instead on project outcomes as a benchmark of success allows a framework for tradeoffs that most projects must make (Belzer & Autler, 2002) (Mierzejewski et al., 2002). These six criteria are summarized below.

1.3.1 Location Efficiency

Ample evidence demonstrates that, on average, residents of denser urban neighborhoods own fewer cars, drive less, and walk and ride transit more than residents of suburban areas (Belzer & Autler, 2002). This is true even when controlling for income. This suggests that reduced auto dependency will result from an effective blending of convenient and efficient transportation links (node functions) with enhancements of the ability to carry out most everyday tasks close to home (place functions).

This connection can be captured in the concept of location efficiency. Simply put, location efficiency converts driving from a necessity into an option. This permits households that take advantage of the characteristics of the neighborhood to spend less on transportation by driving less or even by owning fewer cars. The concept of location efficiency has been incorporated into the location-efficient mortgage program, which allows homebuyers who spend less on transportation by choosing a location-efficient neighborhood to borrow more money than they would qualify for under conventional mortgage lending practice.

According to (Rodrigue et al., 2006), synchronizing commercial activities with transport systems would be much beneficial for both passengers and merchants since ease of access; thus was the spontaneous way of creating business districts. This therefore creates an unbreakable link between transportation and commercial activities.

Location efficiency therefore requires neighborhoods that provide high-quality transit, a mix of uses, and pedestrian-friendly design. Proximity to transit is just one of several key variables that determine the location efficiency of a neighborhood. Other critical factors include net residential density, transit frequency and quality, access to community amenities, and a good quality pedestrian environment (good sidewalks, safety, reasonable topography). Location efficiency can be enhanced by the introduction of additional mobility choices such as car sharing, which makes it even more feasible for residents not to own a car.
Even with all these features, however, it is probably not realistic to expect suburban residents to **develop the same travel patterns as urban residents** no matter what type of neighborhood they live in. Although there has been little comprehensive research on the ability of location-efficient design to affect overall travel behavior, a number of studies have focused on retail behavior. These studies make clear that not all residents of location-efficient neighborhoods will own fewer cars per family or give up car ownership entirely. Not all will work within walking distance of home or do all their shopping locally.

### 1.3.2 Value Recapture

The benefits of location efficiency result in direct savings for individuals and households, such as fewer automobile and parking expenses. This would be of greatest benefit to low and middle-income households. Savings would also be realized on a regional and national level, through the need to build fewer roads, parking facilities, and other related infrastructure. The capture of these savings by households, developers, and local governments could result in measurable outcomes, such as increased homeownership rates (first-time homebuyers using more location efficient mortgages) or more adequate housing stock, and reduced individual and community spending on transportation, which means greater discretionary spending.

**These savings from reduced parking costs** (whether in residential units or other development) can be captured by households, developers, and local governments. They can be invested in assets, like housing, that appreciate in value over time and allow for individual household wealth accumulation. Collectively, they can be **investment in better design and place-making amenities, parks, and other elements that improve the quality of development and the built environment overall.**

This is why the overall, residents of denser, more transit-rich metropolitan areas pay less for transportation than their counterparts in auto-dependent metropolitan regions – even when the cost of public investments in transit is included in the calculation (Mierzejewski et al., 2002). (Belzer & Autler, 2002) further identifies some measurable outcomes associated with value recapture including:

- Increased homeownership rates or more adequate housing, especially among borderline income groups. This can be accomplished through:
  
  - Increased use of location efficient mortgages.
Creation of housing units with lower-than-average parking ratios where the cost savings from parking reductions are passed on to consumers.

- Reduced individual and community spending on transportation and therefore greater discretionary individual and community spending. This can include spending a portion of the collective savings on enhanced public amenities such as streetscaping, parks, or better transit.

1.3.3 Livability

At its core, transit-oriented development strives to make places work well for people. While to some livability may conjure up the idea of vague and unimportant concepts irrelevant to such “nuts and bolts” issues as prosperity, in fact livability and quality of life are increasingly viewed as closely connected to economic development. Moreover, much evidence indicates that many people are increasingly frustrated with air pollution, long commutes, traffic congestion, and the difficulty of running errands. Quality of life has emerged as a critical concern for its own sake (Belzer & Autler, 2002).

Livability is subjective and defies easy definition. No definition can be completely “objective” or value free. Nevertheless, it is possible to arrive at a definition of livability that is based on collective subjectivity rather than the values of a particular individual. Numerous attempts have been made to define, measure, and track the livability of places over time using indexes defined by citizens on the basis of what they feel is important. These indexes focus on livability or quality of life generally rather than TOD specifically. Nevertheless, they usually contain a variety of criteria that are directly or closely related to land use and transportation issues.

Therefore, it can be coined that TOD-related measures of livability listed by (Mierzejewski et al., 2002) include better regional air quality, lower gas consumption, increased mobility choices, less congestion, personal time savings through shorter commutes, improved pedestrian access (to retail, public services, recreation, culture, and public parks), improved public health and safety, and better economic health.

According to (Belzer & Autler, 2002), the Measures of livability that relate directly or
indirectly to transit-oriented development include the following:

- Improved air quality and gasoline consumption.
- Increased mobility choices (pedestrian friendliness, access to public transportation).
- Decreased congestion/commute burden.
- Improved access to retail, services, recreational, and cultural opportunities (including opportunities for youth to get involved in extracurricular activities within the neighborhood).
- Improved access to public spaces, including parks and plazas.
- Better health and public safety (pollution-related illnesses, traffic accidents).
- Better economic health (income, employment).

1.3.4 Financial Return of Investment

TOD projects must be financially feasible to become a reality and be successful. Financial goals include a larger tax base for local governments due to increased property values, increased retail sales, and a larger number of taxpayers as a result of more property owners living in denser development. Other financial goals include higher transit revenues from fare boxes and ground leases, higher return on investment for the developer, shorter commute times and easier employee access for employers. The estimation of financial return is often the deciding factor whether or not to proceed with TOD. However, the use of a community-wide planning approach with all the necessary stakeholders represented at the negotiation table encourages TOD evaluation not only on its financial return but also on other important criteria.

1.3.5 Choice

TOD should provide people with a greater diversity of types and price ranges of housing to choose from, a large range of retail and commercial businesses within walking distance, and a balance of transportation options. One of the basic core problems of suburban style development is the lack of options it provides residents. This is most limiting to low and middle income residents.
1.3.6 Efficient Regional Land Use patterns

Transit-oriented development can foster much more efficient patterns and cut down on traffic generation. For example, near the Pleasant Hill BART station in suburban San Francisco, residential development generates 52 percent fewer peak period auto trips than ITE Trip Generation Manual projections of typical residential development. Equally importantly, those trips are shorter since services are immediately at hand and the station is located immediately adjacent to a regional freeway. Office development at the station generates 25 percent fewer trips than typical office development (Belzer & Autler, 2002). Thus, it includes. Results of efficient regional land use include less loss of farmland and open space, a better balance between jobs and housing, shorter commutes, less congestion and pollution, and more efficient delivery of essential community services.

1.4 Challenges

While TOD has gained popularity over the last decade, it is still not commonly practiced. For example, New Urban News reported that, for every one dollar spent in TOD, over $1,400 is invested in conventional suburban development (Puget Sound Regional Council, June 1999). With so many benefits believed to be associated with TOD, why hasn’t it become a more common form of development? A review of the literature and contact with local planning and transit agencies identified several challenges faced.

1.4.1 Financial Risk to Developer

Although TOD is gradually gaining more acceptances in the development community, it is still often hard to convince developers and financiers that TOD can be profitable (Belzer & Autler, 2002). Many developers and investors believe that TOD involves higher risks and costs than other types of development. Some conservative lending institutions require the facilities they invest in to have automobile oriented design features because they believe it will ensure a higher financial return (Puget Sound Regional Council, June 1999).

1.4.2 High initial Public Investment Costs

It is widely viewed that TOD can lower infrastructure costs in the long run but the initial TOD infrastructure needs can be considerable and can require extensive public investment. There is no single source of funds for TOD; instead, a number of funding
sources are needed. Other municipal infrastructure development often competes with TOD for the same funding sources.

1.4.3 Unsupportive Regulatory Frameworks

One of the biggest challenges is that the regulatory framework of most municipalities is not supportive of TOD. It is common for cities to have zoning ordinances and land development codes designed for automobile oriented, single-purpose, suburban-scale development (Belzer & Autler, 2002). The physical requirements of zoning ordinances often restrict the necessary development density for TOD, through such provisions as maximums on floor area ratio (building floor area divided by lot area), height limitations, and minimum front setback of buildings, landscaping requirements, lot coverage maximums, and minimum parking requirements. An incentive to use transit is removed when high minimum parking requirements create conditions where parking is plentiful. Many zoning districts require one stall per 200-250 square feet of commercial space and 1.5-2 stalls per housing unit (Puget Sound Regional Council, June 1999). Land use restrictions in established suburban communities commonly segregate land use into single use districts, preventing the mix of land uses integral to TOD. In many cases, the segregation of land uses also prohibits offering a full range of housing types, such as apartments and townhouses, in addition to detached single-family units. All of these provisions prevent or discourage TOD and have contributed to the existing land use patterns that are not transit friendly.

1.4.4 Community Resistance

Resistance from the local neighborhood can pose a challenge to the implementation of TOD. Such resistance comes from residents of existing neighborhoods that may be targeted for transit improvements. Residents often have concerns that TOD will take away from the character of the neighborhood, create localized traffic congestion or lower property values (Belzer & Autler, 2002). The resistance also comes from new residents, as expressed by choices made to buy homes in the suburbs rather than in TOD.

1.5 A Summary

With the above findings, it could be coined some important steps which should be performed prior starting a TOD project for a selected area;

Step 1 - Feasibility Study (Primarily based on (Belzer & Autler,
2002)'s Performance Criteria).

Step 2 - Implementation Strategies (Basic incentives on overcoming challenges)

Therefore, these two steps would provide the basis to perform the analysis of Case examples.