Measuring Equity in Transit-Oriented Development: Application to Affordable Housing

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Abstract

The purpose of this research is to find out how Transit-Oriented Development (TOD) can be measured, with a focus on affordable housing. TOD is characterized by higher density, mixed use and compact development within a walking distance from a transit station (ITDP, 2015). More specifically, this method of development includes: residential, commercial, retail, and recreational space, and is designed to create connections between transit, bicycles, and pedestrians as it radiates within a quarter to half a mile walking distance from its anchoring rail station (Ibid). However, like any other successful urban development initiative, TOD projects tend to cause an increase in land value leading to gentrification and displacement. As a result, prioritizing social equity as a key component of TOD implementation is an essential pathway for achieving equitable solutions to such projects. This in turn enhances the resiliency, safety, and inclusivity of cities as stated in goal 11 of the Sustainable Development Goals by the United Nations. This paper therefore conducts research on monitoring and evaluating affordable housing as an equitable aspect of TOD in hopes of developing a monitoring and evaluation framework that can be applied by multiple organizations that possess an interest in measuring the impact of TOD projects.
1.0 Introduction

Transit Oriented Development, commonly known as TOD, is not just development near transit facilities, rather it is a philosophy of development that also minimizes the negative impacts of traffic, increases location efficiency, and creates a sense of community and place (Reconnecting America, 2007). TOD offers the provision of convenient transit option by encouraging non-motorized transit\(^1\), balancing approach to accommodating growth, enhancing local economic growth, increasing land value and public safety, and above all it promotes sustainable infrastructure through compact development and green infrastructure\(^2\).

TOD is characterized by higher density, mixed use and compact development within walking distance from a transit station (ITDP, 2015). Such development includes: residential, commercial, retail, and recreational space, and it is designed to create connections between transit, bicycles, and pedestrians: TOD development radiates within quarter a mile to half a mile or less that ten minutes walking distance from its anchoring rail station (ITDP, 2015) (CMAP, 2014).

The TOD concept was codified in 1980 by Peter Calthrope but only became a fixture of modern planning when the “Next American Metropolis”\(^3\) was published in 1993 (Carlton, 2007). Due to this, it is still considered a new concept that is currently being adopted by several governments. TOD has gained popularity and continues to do so in the developed countries, some of the implemented projects include: the Downtown Arlington Heights, Canton Centre Station, and EmeryStation Plaza in the U.S.A\(^4\); Spina 2 PRI, Fiumara, and City life in Italy; Allermöhe, ...

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\(^1\) Non-motorized transit includes walking and bicycling, and variants such as small-wheeled transport (skates, skateboards, push scooters and hand carts) and wheelchair travel. http://www.vtpi.org/tdm/tdm25.htm
\(^3\) The Next American Metropolis, is a book by Peter Calthrope — an innovative San Francisco-based architect, urban designer, land use planner and one of the leading proponents of what is being called the "New Urbanism" — which sets forth the principles of building good neighborhoods and communities.
\(^4\) Ibid.
Möhringen in Germany. Within developing countries, it is slowly gaining popularity in the developing world as countries such as Ethiopia, South Africa, and Nigeria begin to adopt the concept.

In essence, TOD as an initiative should be able to benefit the community as a whole by improving people’s lives and offering easy access to transit stations and other amenities. However, it has been established that, like any other successful development, TOD initiatives tend to cause an increase in land and housing values near transit areas (GAO, 2009). This in turn leads to gentrification and displacement of the current residents within the area (Cappellano, 2014) thereby making most of these initiatives unequitable. Additionally, the displacement leads to low transit ridership as the captive riders, who in most cases are low-income residents forced out of such areas near the transit (Pollack, 2010).

Achieving equitable TOD is a challenge as such projects are complex to execute and face more obstacles than traditional urban development projects. Some of the obstacles include; escalating land values as transit is completed, financing that requires a mix of funding sources, longer timelines than traditional projects, higher density, and mixed use that is difficult to achieve due to conflicting land use and zoning laws (Carlton, 2014). According to Fleissig (2009), most TOD projects rely heavily on subsidies to make them more competitive; this is reinforced by MZ Strategies (2013), in the report Unlocking MAP-21’s Potential to Fund Equitable Transit-Oriented Development, which states that Equitable TOD is difficult to fund as available federal

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5 Lessons learned from five case studies of Italian and German Transit-Oriented Developments by Michelle DeRobertis: http://www.westernite.org/annualmeetings/sanfran10/Papers/Session%206_Papers/ITE%20Paper_6C-DeRobertis.pdf.
6 Gentrification is a general term for the arrival of wealthier people in an existing urban district, a related increase in rents and property values, and changes in the district’s character and culture. Gentrification usually leads to the displacement of poor communities by rich outsiders.
7 Captive riders are those who use transit by necessity.
8 MAP-21 is formally entitled “Moving Ahead for Progress in the 21st Century”.
funds have experienced cuts. The report further states that, obtaining risk tolerant capital is also a challenge as most TOD projects are expensive to implement, yet, they have low returns.

Despite all the obstacles, it is important to note that, equitable TOD can be achieved by prioritizing social equity and community participation in the planning process. There are a few initiatives that have successfully incorporated the concept, a common example is Fruitvale Transit Village in Oakland, California, which prioritized community participation planning processes leading to a thriving community with low-income residents remaining in the central city neighborhood. Despite the few successes, the lack of adequate financing for TOD projects continuous to be a problem. This causes a raise in land value thereby causing displacement of low income households away from transit areas. Due to this, affordable\textsuperscript{9} housing remains only an illusion that needs urgent attention.

The issue of unaffordable housing does not only occur in US TOD projects; it is a wide phenomenon experienced throughout the world. In addition, the habitable standard of such housing has to be considered. Woetzel (2014) states that, affordable housing must be in a habitable condition with basic amenities. The housing should also allow access to vital services such as healthcare institutions, transportation, and schools. This is also reinforced by article 25 of The Universal Declaration of Human Rights that states, everyone has a right to standard of living for the well-being of himself and his family, including food, clothing, and housing amongst others (United Nations, 2015). As observed, decent, affordable housing is fundamental to the health and

\textsuperscript{9} Affordability is when the rent or mortgage, plus utilities, is no more than 30% of a household’s gross income. Such housing should provide access to employment and services as well as environmental benefits (National Housing Trust, 2010).
well-being of the people and to the smooth functioning of economies, yet around the world, in developing and advanced economies alike, cities are struggling to meet that need (Woetzel, 2014).

It is estimated that 330 million urban households around the world live in substandard\textsuperscript{10} housing and 200 million households in developing world live in the slums (Woetzel, 2014). Within the United States, Japan, European Union, and Australia, it is estimated that 60 million households are financially stretched by the housing costs (Ibid). “In the United States, 95 million people, [equivalent to] one third of the nation, experiences [sic] housing problems including rental or mortgage payments that are too large as a percentage of their income, overcrowding, poor quality shelter, and homelessness,” (Kennedy, 2008).

Affordable housing is therefore one challenge that should be urgently mitigated by all cities alike. Most specifically, TOD initiatives should prioritize social equity as a key component of its implementation (Pollack, 2013) to benefit the community.

This is therefore, a research-based, monitoring and evaluation linked capstone developed from a monitoring and evaluation framework created during my practicum session. The practicum paper originally focused on developing a number of equity related indicators based on the following characteristics of TOD: mixed land use\textsuperscript{11}, local economic development, compact development\textsuperscript{12}, density\textsuperscript{13}, affordable housing, public transport, public spaces, green space, non-

\textsuperscript{10} Housing units that have one or more major and/or critical structural defects, but can still be repaired for a reasonable amount: Hobart and William Smith Colleges.

\textsuperscript{11} A range of land uses including residential, commercial, and light industrial to be co-located in an integrated way that supports sustainable forms of transport such as public transport, walking, cycling, thereby increasing neighborhood amenity. Web: \url{http://www.healthyplaces.org.au/userfiles/file/Mixed%20Land%20Use%20June09.pdf}

\textsuperscript{12} Compact development means that buildings, parking areas, streets, driveways, and public spaces are developed in a way that shortens trips, and lessens dependence on the automobile. Web: \url{http://www.oregon.gov/lcd/docs/publications/commmixedusecode.pdf}.

\textsuperscript{13} The greater the intensity of residential and office development, the greater the levels of transit ridership. Web: \url{http://www.crcog.org/publications/CommDevDocs/TCSP/Ch05_FactSheet_TOD.pdf}. 
motorized transport, community participation, and community identity. Appendix I illustrates the M&E framework.

As described above, affordable housing is a great challenge for all cities alike, this paper therefore, focuses on monitoring and evaluating affordable housing as an equity related aspect of TOD. The paper is divided into four parts as follows: part one highlights the purpose and the methodology of the research paper in trying to answer the question, ‘How can equitable TOD be effectively measured?’ The section also gives an overview of a survey and interviews conducted to inform the research; part two presents a literature review, both thematic and technical. It defines equitable TOD and gives justification for measuring equitable TOD. The section also describes the present situation of affordable housing with a focus on Fort Totten metro area being a developing TOD initiative. The findings from this section and their effect on the monitoring and evaluating framework on affordable housing are then discussed; part three develops the monitoring and evaluation product based on the literature review and the survey conducted. The monitoring and evaluation product covers the purpose and scope of the evaluation, stakeholder’s analysis, and the indicators for measuring both the standard and equitable TOD, the approach to evaluation, and the methodology by which an evaluation should be conducted. Lastly, the section discusses the factors to consider for sustainability and conclusions are made; part four covers a personal reflection in the development of this capstone, this section links the contents of different courses within the semester with a focus on monitoring and evaluation and how the courses have greatly contributed to the development of the paper.
1.2 Purpose and Methods of the Research

1.2.1 Purpose of the Research

Equitable TOD prioritizes social equity as a key component of TOD implementation. However, achieving equity in TOD remains a challenge. On one hand, there are a number of projects that claim to have achieved equitable TOD, but on the other hand, the extent to which equity has been achieved is not clear. Due to this, it is very important that indicators are developed to assess the extent to which equitable solutions have been achieved. Whilst focusing on affordable housing, the researcher, therefore, identifies the main question of the research to be:

*How can equitable TOD be effectively measured?*

More specifically the researcher used the indicators\textsuperscript{14} below to focus on equitable objectives:

i) Assess the Affordability of residential houses in relation to the Area Median Income within half a mile radius from the Metro Station.

ii) Determine the subsidies available and their applicability within this area.

iii) Assess the accessibility from homes to facilities such as hospitals, schools and grocery stores.

iv) Assess the accessibility to the metro station from housing located within the half a mile radius of the metro station.

v) Determine the usage of the metro line by the local residents.

vi) Assess lessons learned and potential good practices, with a focus on how the M&E framework can be further developed for successful implementation.

\textsuperscript{14} This indicators were developed the from the different literature reviews, survey and the analysis and synthesis of the data collected by the researcher.
These objectives further enhanced the efficiency and effectiveness of the indicators developed, thereby leading to their further review for a more effective evaluation.

### 1.2.2 Methods of the Research

Two approaches were used during the research. The first approach was conducting a thematic and technical desk review, whereby, equitable TOD was defined in detail while highlighting the obstacles and recommendations proposed by other practitioners. Further research was conducted on available/relevant approaches to measuring equity and its applicability to TOD initiatives.

The second approach tested the existing indicators on affordable housing within a TOD initiative to establish their validity, efficiency and relevance. Using the Fort Totten metro station area case, the researcher tested the indicators. Fort Totten metro station area was purposely selected to test these indicators because it is a development near a metro rail that is rapidly developing and it is characterized by upcoming residential, commercial, and industrial developments. The area is located in the Northeastern quadrant of Washington D.C. and the station serves the red line which runs from Glenmont to Shady Grove, the station also acts as a transfer point between the red, green and yellow line (WMATA, 2010).

In order to test these indicators, questionnaires were developed for both the policy makers and the residents of Fort Totten metro station area. These questionnaires were administered to 26 people consisting of 14 male and 12 female; out of these, only 14 (8 male, 6 female) of them were residents of Fort Totten metro area. All the people surveyed were within the age range of 26 to 64 years. Interview questions were prepared for policy makers or organizations that influence policies such as The Washington Metropolitan Area Transit Authority, DC Department of Housing and Community Development, DC Department of general Services, and Deputy Mayor for Planning
and Economic Development; out of these, only the DC Department for Housing and Community Development (DCHCD) responded. The survey prepared for residents were administered in-person by interviews whilst the questions for the policy makers were sent over mail. Appendices II and III shows the evaluation questions administered to both the residents and the policy makers respectively.

The findings from these approaches are discussed in part III of the paper highlighting their effects on the proposed monitoring and evaluation indicators for further development of the M&E framework.

1.2.3 Limitations and Recommendations

Based on the two approaches, the researcher was not able to collect as much information from the policy makers due to time constraints and lack of timely response from the respondents. If this had been successful, the information would have strengthened the validity of the information as well as helped compare the different housing institutions. Additionally, the sample size from the in-person surveys wasn’t as large or comprehensive as expected. Had the sample size been large enough, the findings could have been easily generalized. There was also lack of adequate information on measuring equitable TOD initiatives, as most of the literature available is heavily based on health projects. Lastly, most literature available on equitable TOD is heavily focused on developed nations with an emphasis on the United States making it difficult to generalize most of the findings globally, especially in developing countries.

Despite these limitations, the researcher managed to conduct the literature review from a number of sources which made up for the gaps, especially with the lack of response from the policy makers. With regards to most information being heavily based in the U.S, the researcher feels that most of
the findings can easily be adapted to different contexts. This is also true for information on measuring equity which can easily be adapted to various projects.

The researcher therefore recommends that, an evaluator must set aside realistic timelines that resonates with the project to ensure that a proper evaluation can be conducted based on an in-depth data collection and analysis. It is also recommended that the evaluator gains a deeper understanding of the context of the location of the project; this will aid the researcher to tailor the indicators within the context, in order to enhance its applicability and validity.

2.0 Thematic and Technical Research: Literature Review

This section is divided into four sections as follows: section one discusses a literature review on equitable TOD and the importance of evaluating such initiatives; section two conducts a literature review measuring equity, how it is informed by the transformative paradigm, and approaches to evaluating equity; and section three provides an overview of affordable housing in Washington, DC with a focus on Fort Totten metro station area; and section four discusses the findings from both the literature review and the survey conducted and its effects on the M&E framework. The findings from these section greatly contribute to the development of the monitoring and evaluation framework in part three of the main paper, entitled “The product”.

2.1 What is Equitable TOD?

As discussed earlier, TOD has been defined as a development that is characterized by higher density, mixed use (including residential, commercial, retail, and recreational space), and compact development within a walking distance, usually half a mile, from its anchoring rail station (ITDP, 2015). The development is designed to create connections between transit, bicycles, and pedestrians (CMAP, 2014) by minimizing the negative impacts of traffic, increasing location efficiency, and creating a sense of community and place (Reconnecting America, 2007). Despite
these benefits expected from TOD initiatives, displacement due to high land and housing prices still occur which mainly affects lower income households. This trend therefore emphasizes the need to prioritize equity as a key component of TOD implementation to ensure that all the community members benefit equally without marginalizing low income earners.

The lack of affordable housing plays a large role in making TOD inequitable. Within the U.S. - where the most literature on the topic is available - the San Francisco’s Bay Area, is one example where a TOD initiative has catered to high income residents, with the low income residents forced to move farther away due to the increased cost of living\(^\text{15}\). Other similar initiatives include the Denver region which is engaged in a multi-billion dollar expansion of its fixed gateway transit, yet, there are already concerns that the private housing market won’t be able to meet the long term affordable housing demand near the transit; and the City of Atlanta which has embarked on a 25 year initiative that began in 2005, to create a new light rail system (BeltLine) that incorporates TOD, however to date, the increase of property values is already evident within the lower income communities located on the Southside of the BeltLine (Pollack, 2013). Despite these failures, the cities are making some efforts in trying to incorporate affordable housing in TOD, an initiative that will hopefully adopted to all other projects within the cities.

Due to the fact that unaffordability continues to be a challenge within TOD projects, various articles suggest ways in which these projects can be equitable. They include: establishing specific funding tools to support TOD planning, acquisition of land, and implementation; exercising maximum use of joint development opportunities; developing regional performance measures in support of TOD projects; and utilizing existing Metropolitan Planning Organizations (MPO) and state authority to flex eligible funding (MZ Strategies, 2013). Most importantly, there

\(^{15}\) Advancing Equitable transit oriented Development: http://sustainablecommunitiesleadershipacademy.org/resource_files/documents/Bay-Area-TOD.pdf
is need to move beyond individual project financing in which investors require greater evidence on the reduced risk and performance of TOD projects (Zimmerman, 2013) to a more collaborated effort whereby various actors (state, transit agencies, philanthropies, developers amongst others) are involved as partners (Zimmerman, 2013).

These partnerships should help fund projects that prioritize social equity as a key component of development (Pollack, 2013) by aligning the project with the broader community needs and sustainable initiatives to enhance the livable benefits (Flessig, 2009). Such alignment would encourage local economic growth, boost transit ridership, improve environmental quality, ensure safety, achieve full accessibility, and most importantly prevent displacement (Pollack, 2006).

A number of places are working to strengthen their regional economies as well as improve quality of life through coordinated investments in transit, housing, and business development. Such areas include; Boston, Dallas, Salt Lake City, and Seattle (Zimmerman, 2013).

Other initiatives that have successfully managed to achieve equitable aspects of TOD include the Mission Meridian Village in Los Angeles that solicited input of residents to build a high density TOD project, and the Fairmount Boston, where the Community Development Corporation (CDC) collaborated to build mixed use development within the Fairmount commuter rail to ensure gentrification did not displace current residents (Reconnecting America, 2009).

Based on these examples, it is evident that equitable TOD can be achieved. One of the most successful best practices is the implementation of zoning and land use policies that require a percentage of new units to be affordable, some of the examples include: Arlington County, VA permits 25% density bonus for affordable units which led to the development of 25 affordable units within Quincy development in 2006; California’s 20% tax increment financing for affordable units.
housing led to the development of 114 low-income senior apartments in Sacramento; Los Angeles
trust fund for affordable housing led to the development of 225 affordable units within TOD in
2008; and New Jersey legislation enacted in 2008 that stipulated that for every new development
20% of the units should be for low income earners (U.S Government Accountability Office, 2009).

Other successful best practices include: the formation and coordination of a centralized
management organization to coordinate purchase of land and conduct the master planning;
securing a steady source of public capital to be used as seed money to influence larger sources of
private capital (University of Texas School of Law, 2014), early incorporation of market
assessments into all planning activities, formulation of a site evaluation checklist for potential
equitable sites, and consideration of “market-readiness” during equitable TOD site selection
(Carlton, 2014).

According to an article Racial Equity: New Cornerstone of Transit Oriented Development
by Saldana (2012), the following principles should be observed to inform planning and policies
around TOD:

i) ‘Existing residents should benefit and thrive from TOD investment.

ii) Quality jobs should be created to ensure sustainability.

iii) Affordable housing should be developed to include units large enough to house
children and multigenerational families.

iv) Community serving institutions and businesses should be established to stabilize the
existing low-income communities of color as gentrification occurs’ (Saldana, 2012).
The article further states that history has shown that as communities organize and speak out, the more influence they have on outcomes; this can be achieved when traditional forces of development are replaced by the brighter promise of racial and economic equity (Ibid).

It is therefore evident that for TOD initiatives to succeed, a number of factors (policies, planning, and funding) have to be considered, but above all, for equitable TOD initiatives to succeed, community participation is paramount. This is because the community members are moist familiar and better understand the problems they face, hence would give better insight into what solutions would be viable for them, this will not only enhance community cohesion but will also prevent displacement which is one of the major challenges of TOD initiatives. Once the concept of equitable TOD has been formulated, the question that begs to be answered is: How then can equitable TOD initiatives be measured?

### 2.2 Monitoring and Evaluating Equity

Equity is an ethical concept that eludes precise definition as it means different things to different people. According to a report by UNICEF (2012) pro-equity interventions prioritize worst-off groups with the aim of achieving universal rights. The article further states that, the aim of equity-focused policies is not to eliminate the differences between the marginalized and the privileged, but to eliminate the unfair and unavoidable circumstances that deprive the worst off their rights. However, equity should not be confused with equality; inequities are inequalities that are unfair, unacceptable, and avoidable (WHO, 1998). Hence, measuring equity is very critical in determining the degree of inequality between groups, as well as, how much unequal treatment is needed to bring the disadvantaged to the level ground (Wang, 2012). This is emphasized by the WHO’s (1998) report that states, monitoring equity assess the status of different social groups,

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16 Worst Off groups referees to the population suffering the most due to inequity. UNICEF
thereby serving as an early warning system to indicate whether combined effects of policies influencing equity are headed in the right direction.

Equity-focused evaluations are made up of relevance, effectiveness, efficiency, impact, and sustainability of policies, programs or projects to achieve equitable development results (UNICEF, 2012). These kinds of evaluations are very critical as they: enhance accountability by use of evidence-based evaluation; improve organizational learning by providing critical input into major decisions to be taken to improve equity focused intervention; contribute to knowledge management by understanding what works and what doesn’t improve efficiency and effectiveness; and empower the worst-off groups by involving them in the evaluation via the facilitation of meetings between the worst off groups and policy makers (Ibid). More specifically, measuring equity in TOD initiatives ensures social justice as informed by the transformative paradigm which envisions that people of all ages, incomes, races and ethnicities regardless of where they live, have access to facilities such as school, hospitals, parks, healthy food, affordable quality housing, and transportation to improve their quality of life.

2.2.1 Transformative Paradigm in Monitoring and Evaluating Equity

This paradigm arose during the 1980s and 1990s due to dissatisfaction with the existing research paradigms in adequately addressing issues of social justice and the marginalized people (Mackenzie, 2006). It provides a framework which provides guidance that aligns human rights mission to approach and it is applicable to people who experience discrimination and oppression (UNICEF, 2012). As stated before, decent, affordable housing is fundamental to the health and well-being of the people and to the smooth functioning of economies, yet around the world, in developing and advanced economies alike, cities are struggling to meet that need (Woetzel, 2014).
This is similar to TOD initiatives as they struggle to meet the needs for affordable housing due to a variety of reasons driven by the economy.

This paradigm therefore calls for social inclusive evaluations and recognizes that realities are shaped by social, political, cultural, economic, and racial/ethnic values indicating that power and privilege are important determinants of which reality is formed (Mertens, 2009). This emphasizes the fact that power must be addressed at every stage of the evaluation (Ibid). This paradigm builds on four sets of philosophical assumptions as stipulated by Guba and Lincoln (2005) which include: the axiological question which incorporates the nature of ethics; the ontological question which incorporates the nature of reality; epistemological questions which incorporate the nature of knowledge including the relationship between the knower and would be known; and the methodological question, which answers the question of how the knower can collect data (Sage, 2010).

Based on these philosophical assumptions, the paradigm alerts the evaluators on the existence of multiple versions of realities that are not equal, hence evaluators should challenge versions of realities that sustain oppressive systems and make visible versions that have potential to further human rights and social inclusion (Kosheleva, n.d). Additionally, it recognizes that knowledge is constructed in a complex cultural context of power and privilege hence evaluators must understand the realities of communities of the social groups they work with thereby establishing interactive and trusting relations with the communities involved (Ibid).

The paradigm emphasizes a combination of both qualitative and quantitative methods in conducting research, this is because the qualitative dimension gathers community perspectives while the quantitative dimension provides opportunity to demonstrate credible outcomes for scholars and community members (Mertens, 2009). Figure I shows a cyclical transformative
research model highlighting the importance of community participation for social justice throughout the study, the model also indicates that understanding the power differences and privileges is important in order to achieve sustainable change.

Figure I: Cyclical Transformative Research Model for Policy Transformation

Source: Adapted and Modified from the Journal of Mixed Methods Research (2009).
2.2.2 Approaches to Monitoring and Evaluating Equity

A number of articles have explained the approaches to how equity can be monitored. However, such articles are heavily focused on health projects. The World Health Organization (WHO) is one organization that has clearly defined how equity can be measured by highlighting an eight step policy oriented process as shown below.

**Figure II: Eight Steps in Policy Oriented Monitoring of Equity in Health**

- **Step 1:** Identify the social groups of a priori concern. Consult key informants from all social sectors and civil society.
- **Step 2:** Identify major concerns regarding avoidable health disparities among social groups, and identify information gaps. Consult informants from all social sectors and civil society.
- **Step 3:** Identify sources of data on the groups and issues of concern.
- **Step 4:** Develop and set in motion a strategic plan for policy implementation, monitoring, and research. Re-initiate the cycle.
- **Step 5:** Identify indicators of health and its determinants (including but not limited to health care) that are particularly suitable for assessing avoidable gaps between more and less advantaged social groups.
- **Step 6:** Generate an inclusive process of considering the policy implications of the patterns and trends. Involve civil society as well as policy-makers and professionals from all social sectors.
- **Step 7:** Describe current patterns of social disparities in health and its determinants (including health care).
- **Step 8:** Describe trends over time in the patterns.

The assumption underlying this process is that better data and methods are needed to monitor equity; however, far more could be done with the existing data and technical strategy for monitoring equity and must be placed within context of a broader strategy (WHO, 1998).

A report by UNICEF (2014) in Monitoring Results for Equity System (MoRES) indicates two approaches to the evaluation; theory-based and the case study approach. The report further states; theory based approach enables conceptual questions to be addressed thereby allowing for reflection in terms of relevance to equity. Such questions include the examination of concepts underpinning the MoRES system, its elements, and the articulation of the theory of change. The case study approach then tests the theory of change against the field evidence in line with the following criteria: the relevance, efficiency, effectiveness, sustainability, and potential impact of MoRES (Ibid). This criteria is very important as it is also emphasized by WHO (1998), however other requirements also include: simplicity to enable local personnel to perform the function, affordability of resources, and sustainability of an entire process.

In addition to these approaches, a journal on equity-oriented monitoring suggests a gap or a whole spectrum approach. The gap approach considers the health differences between subgroups and can be applied to express inequality using dimensions that have only two categories (the privileged and the worst off groups). The approach also demonstrates disparity between these extreme groups. On the other hand, the whole spectrum approach applies to dimensions of inequality that contain multiple subgroups, and considers the situation across the entire population (Hosseinpoor, 2014). Equitable realizations requires an equity-oriented approach to monitoring whereby, the evaluators are unified in proposing a technical sound platform that is easy to understand and communicate (Ibid).
Based on the discussed approaches, it is evident that equitable evaluation tries to bridge the gap between the different social groups while at the same time observing the power and political structures within the context. The articles also emphasize the importance of community participation for a successful and sustainable evaluation. Despite these approaches being heavily focused on health, they can easily be adapted to equitable evaluation in different fields including TOD initiatives as discussed in part three under the step by step evaluation process.

To determine how equitable TOD can be measured, the researcher used the indicators developed earlier to apply to Fort Totten Metro Area to test its validity in order to further develop a framework that can be applied to TOD projects. The below therefore gives a brief overview of affordable housing in Washington D.C with a focus on Fort Totten metro station area.

2.3 Overview of Affordable Housing in Washington D.C

Affordability in the U.S. is defined as, when the rent or mortgage, plus utilities, is no more than 30% of household gross income (National Housing Trust, 2010). This is emphasized by the U.S Department of Housing and Urban Development (2015) which states that families that pay more than 30% of their income for housing are cost burdened and have difficulties affording other necessities such as food, clothing, medical care, and transportation. However, calculating affordable housing based on every individual’s income is inconceivable, hence affordable housing is calculated in relation to the Area Median Income (AMI) whereby households that earn; 80% or less of the median income of the area are referred to as low income, less than 50% as very low-income, and less than 30% of the median income as extremely low income (HUD.GOV, 2015).

Based on these definition, Washington D.C’s housing costs ranked the least affordable in United States in the year 2013, with housing purchase almost 17 times the Area Median Income (Washington Lawyers’ Committee, 2014). There has also been a substantial loss of low-cost rental
housing with little growth in wages for many residents (Rivers, 2015). Washington has lost more than half its low cost housing since 2000, with almost half the renters and more than 40% of residents suffering from house cost burden (Washington Lawyers’ Committee, 2014). Figure III below shows the sharp decline of affordable units while figure IV shows the relationship between the rentals and the income in Washington, D.C.

Figure III deduces the growth of rental market from 2005 to 2012 by 12,500 apartments; however the number of low cost housing has steadily decreased. Similar to the Washington Lawyers Committee report, the Urban Land Institute indicates a drop from 65,000 low cost units in 2005 to 34,000 units in 2012, pegged at the equivalent of $ 800 in the year 2012 (Urban Land Institute, 2012). Due to all these, the very low income households have felt the greatest pinch with most spending more than 64% of their income on rent and one third of moderate-income families with income up to USD 54,000 having severe house cost burdens (Fiscal Policy Institute, 2015).

**Figure III: Renter Occupied Housing Unit by Gross Rent (Constant 2012 USD)**

![Graph showing renter occupied housing units by gross rent](image)

Source: The Urban Land Institute (2012)
It is clear from the above illustration that the rents are increasing at a much higher rate than incomes, causing a severe strain on residents. The lack of affordable housing, other than just causing a strain on the residents also hinders economic growth as many businesses find it hard to retain employees (Ibid). This situation is even worse for TOD areas; as land prices raise, affordable housing drastically diminishes.

To mitigate the issue of unaffordable housing, the District of Columbia provides assistance to help families obtain safe, good-quality and affordable housing through three types of programs: Public Housing Program, Housing Choice Voucher Program and Moderate Rehabilitation Program. District of Columbia Housing Authority (DCHA) owns and manages 56 public housing properties that provide homes at reduced rents for very low-income families, seniors and persons with disabilities. The program requires tenants to pay only 30% of their income as rent (DCHA, 2015).
Most recently, in 2014, the mayor signed Bill 20-594 that states that a 30% affordable housing shall be set aside for projects that qualify as transit oriented development, and 20% for all other projects. The bill identifies affordability as 25% of units set aside for households earning up to 30% of the AMI and 75% of units for households earning up to 50% of AMI while developing rental units (Council District of Columbia, 2014).

### 2.3.1 Fort Totten Metro Area

As indicated earlier, Fort Totten metro station area is rapidly developing and is characterized by upcoming developments that are residential, commercial, and industrial. The station is accessible by bus, bike, car, and walking: There is a bicycle rack that enables riders to secure their bicycles; the metro bus stop is within walking distance from the metro station; the metro has also provided temporary and long term parking facilities (*Kiss and ride* which consists of 49 spaces, whereby the vehicles can park for a short amount of time as they drop off or pick up and the *Park and ride* which consists of 408 parking spaces where residents can park and use the Metro rail). These services help improve accessibility by reducing the number of hours residents have to walk to the station (Ibid). The below figure shows the Fort Totten metro station area within half a mile radius from the transit station.
A report by Washington Metropolitan Area Transit Authority, 2014 (WMATA) profiles areas around Fort Totten Metro station area as including low-density, single family detached homes on the East of South Dakota Avenue and North of Riggs Road as well as medium density apartments adjacent to metro stations. The report further states that planning and zoning regulations permit the residential, commercial, recreational, and light industrial development to a maximum lot capacity of 75% residential use, 20% public recreation and community center use.
The area also allows for density bonus\textsuperscript{17} provisions and medium density mixed-use development around the metro station.

According to the census conducted in 2010 and the Metropolitan Washington Council of Governments Round 8.2 2013 Cooperative Forecasts, the demographics of Fort Totten are summarized as below:

**Figure VI: Demographics of Fort Totten**

<table>
<thead>
<tr>
<th></th>
<th>Fort Totten Station</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1-Mile Radius</td>
</tr>
<tr>
<td>Population</td>
<td>31,213</td>
</tr>
<tr>
<td>Households (HH)</td>
<td>12,698</td>
</tr>
<tr>
<td>Average Persons per HH</td>
<td>2.34</td>
</tr>
<tr>
<td>Average HH Income</td>
<td>$63,815</td>
</tr>
<tr>
<td>Median HH Income</td>
<td>$52,128</td>
</tr>
<tr>
<td>Employment</td>
<td>9,421</td>
</tr>
</tbody>
</table>

Source: Joint development Solicitation 2014-04 (Fort Totten Metro Area) by WMATA.

Based on the definition of low-income households, an extremely low income household would earn approximately $15,640, a very-low income household earning $26,064 and a low income household earning $41,702 annually within the one mile radius. This translates to the fact that affordable housing within Fort Totten area should cost at most $391 to $1042 monthly. However, this is not the case, as the AMI of Washington, D.C is $103,500 (DC.Gov, 2015) for a

\textsuperscript{17} A density bonus is an incentive-based tool that permits developers to increase the maximum allowable development on a property in exchange for helping the community achieve public policy goals. Web: https://www.uwsp.edu/cnr-ap/clue/Documents/PlanImplementation/Density_Bonus.pdf
family of four, this translates to the fact that the extremely low income household should earn $31,050 annually and should pay no more than $776 monthly for rent. This figure is unaffordable to the extremely low income households at Fort Totten Metro station area because, realistically, they earn approximately half ($15,640) of what is stipulated by the department of housing and community development ($31,050).

Fort Totten is also known to be the one of the areas with the lowest AMI within the Redline according to a publication by the Washington Post (2015) on, *How Income Varies by Subway Line in Washington DC*. The average AMI within the red line is $91,921 and amongst the bottom three is Fort Totten, Brookland and Rhode Island, whereas the top three include friendship heights, Bethesda, and Medical Centre. The figure below illustrates the Area Median Income (AMI) along the red line by station. Within the metro rail, the orange line has the highest AMI of $97,236, followed by the silver line with AMI of $92,205 then the red line. The metro line with the least AMI is the green line amounting to $65,619. Appendix V indicates the different lines.

**Figure VII: Area Median Income along the Red Line**
2.4 Discussions and findings

It is evident from the literature above that affordable housing is elusive especially within TOD initiatives. From both the desk research and the survey conducted at Fort Totten metro area, the below findings as they affect the monitoring and evaluation framework of TOD initiative were noted. In-depth data findings from Fort Totten is annexed V.

i) Policies on affordable housing

It is important for an evaluator to determine if there are any policies enacted that support affordable housing. For instance within Washington D.C, the policy enacted in 2014 stipulates that; the residential houses within TOD projects should set aside 30% of the units for the low income households. An evaluator should then identify whether the policies enacted are being implemented and if there are any consequences for violators. Different agencies in D.C are responsible for creating affordable housing and each has its own internal and legislative mandate that govern their activities. It is further noted that these programs are not sufficient, hence, Mr. Chris of DCHDC suggested that, the reduction of market rate housing, the increase income for the low income households in terms of wages and the increase of subsidies would help bridge the gap.

As an evaluator, this kind of information is crucial to note that as it helps to understand the perspective of the policy makers.

ii) Funding TOD Initiatives

The desk review highlights funding as one of the major hindrances to equitable TOD. An evaluator should therefore seek to find out the types of funding available for the initiative in the area. This can be achieved by convening a meeting with government officials to identify the major
funding institutions and developers in order to understand how the funds are being utilized and if they can be spend in a way that would enhance equitable TOD.

iii) Programs on affordable housing

It is important for an evaluator to identify the programs available based on the policies enacted. It is then crucial to establish if the residents within the TOD initiative are aware of and have accessibility to such programs. The survey conducted Fort Totten metro station area indicated that only 43% of the residents were aware of such programs, however none of them had access to them, despite the fact that some of them needed access to the programs.

**Figure VIII: Knowledge of affordable Housing program amongst Fort Totten Residents**

![Pie chart showing 43% Yes and 57% No]

*Source: Oranga (2015) – Survey Conducted at Fort Totten Metro Area*

An evaluator, in line with the transformative paradigm for social justice that advocates for mixed methods approach, has to probe further to collect more qualitative data explaining the lack of access to these programs. This will in turn help make informed conclusions and decisions at the end of the evaluation.

iv) Affordable housing in relation to the area median income

Median income tends to accurately represent what people make within an area, hence a median household income refers to the income level earned by a given household where half of
the homes in the area earn more and half earn less (Lander, 2015). This indicator is therefore very important in calculating affordability as any affordable housing should not cost more than 30% of the area median income. Within this indicator, an evaluator should find out the number of affordable units within a housing complex and its occupancy to cross check whether it is really being rented out to low income households. As stipulated by Saldana (2012), it is also important that there are varied sized affordable housing to house children and multigenerational families.

v) Affordable housing should be considered holistically

Affordable housing is not just the ability to be able to spend less than 30% of your income on housing but it actually entails various other aspects. Accessibility is an important aspect of affordable housing, this is because the house has to be accessible from transit stations as well other facilities such as schools, hospitals, and commercial areas. With accessibility, safety is paramount as the residents should be able to feel comfortable and safe while accessing their houses. There should be low crime rate within the area and both the pedestrian walk and bike lanes should be properly demarcated to enhance safety and reduce the number of accidents. The survey conducted at Fort Totten established that 50% of the residents walk to the metro station, this is a good indication because the low income earners do not have to bear the cost of using a car or a bus to the station which in turn affects affordability due to the extra amount spent. However, it emphasizes the need for the evaluator to then collect data on the effectiveness of the pedestrian walk to ensure that pedestrians are comfortable.
In addition to accessibility, job opportunities should be prioritized, this is because equitable TOD should be able to enhance thriving communities as stipulated in the desk research. Job opportunities should include both skilled and unskilled positions to cater to diverse groups, hence it is important for an evaluator to identify what percentage of such jobs are held by the local residents in comparison to nonresidents. From the Fort Totten survey, out of the 100% of the total working persons surveyed, only 33% were residents while the rest, 67%, were nonresidents working in the area. Most of the nonresidents resided in either Virginia or Maryland. Due to this findings, the researcher then asked the residents on the perception of availability of the job and the figure below shows the results.
It is therefore important for an evaluator to source more information to enhance one’s understanding. From the above figure it is evident that the residents of Fort Totten believe that there are minimal job opportunities within the area, hence it is important for the evaluator to figure out whether these perceptions are accurate.

vi) Participatory approach to measuring equity

According to the transformative paradigm, to achieve social justice, it is very important that community participation is integrated into the evaluation process. This kind of approach is referred to as participatory monitoring and evaluation (PM&E) and is defined as a process of self-assessment, knowledge generation, and collective action in which stakeholders in a program or intervention collaboratively define the evaluation issues, collect and analyze data, and take action as a result of what they learn through this process (Jackson & Kassam, 1998). Participatory approach is hence the most preferred as the marginalized group understand best what challenges
they face and how these challenges can be addressed. The process of this approach is further discussed in section three under participatory approach to evaluation.

vii) Awareness of power differences

Affordable housing as an equitable aspect of TOD is elusive due to a number of reasons including policies and funding. It is therefore very important for the evaluator to understand the stakeholders involved and the power they hold. According to the transformative paradigm, realities are shaped by social, political, cultural, economic, and racial/ethnic values indicating that power and privilege are important determinates of reality (Mertens, 2009). The WHO (1998) equity evaluation process emphasizes the need to include civil society (advocates for the rights of the marginalized) and the policy makers throughout the process. By acknowledging the different stakeholders in relation to their roles, the evaluator will be able to present the right kind of information to the right audience.

viii) Mixed methods as an approach to collecting and analyzing data

Due to the complexity of TOD projects, mixed methods is the most ideal as it enables an evaluator to collect both the qualitative and quantitative data which helps in the full analysis of the situation. On one hand, the quantitative approach helps analyze the data with the use of numbers and on the other hand, the qualitative research understands the perspective of the people affected. The inclusion of the community participation is important to the evaluation as the participants will have an in-depth understanding of the context and the concerns they face, however the evaluator must be careful to fully make sure that the participants understand the purpose of the evaluation as it is very easy to collect non required data based on the open ended approach of collecting evaluation data.
These findings were very important in further informing the monitoring and evaluation framework. The review on measuring equity further informed the monitoring and evaluation framework whilst the survey greatly informed the development of the indicators. The below framework was further developed from the discussed findings.

3.0: The Product: Refined Monitoring and Evaluation Framework

The below framework has further been developed from my practicum session by the incorporation of the findings from desk research and survey of Fort Totten metro station area to create a standalone product that can be used by various institutions to monitor and evaluate affordable housing as a measure of equitable TOD.
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3.1 Introduction:

Transit Oriented Development, commonly known as TOD, is not just development near transit facilities, rather it is a philosophy of development that also minimizes the negative impacts of traffic, increases location efficiency, and creates a sense of community and place (Reconnecting America, 2007). TOD is characterized by higher density, mixed use and compact development within walking distance from a transit station (ITDP, 2015). Such development includes: residential, commercial, retail, and recreational space, and it is designed to create connections between transit, bicycles, and pedestrians: TOD development radiates within quarter a mile to half a mile or less than ten minutes walking distance from its anchoring rail station (ITDP, 2015) (CMAP, 2014).

However, it has been established that, like any other successful development, TOD initiatives tend to cause an increase in land and housing values near transit areas (GAO, 2009). This in turn leads to gentrification and displacement\(^\text{18}\) of the current residents within the area (Cappellano, 2014) thereby making most of these initiatives unequitable. Additionally, the displacement leads to low transit ridership as the captive riders\(^\text{19}\), who in most cases are low income residents forced out of such areas near the transit (Pollack, 2010).

Equitable TOD should prioritize social equity as an important aspect of its implementation to ensure that as gentrification occurs, displacement does not occur. Measuring equity is therefore, very critical in determining the degree of inequality between groups, as well as, how much unequal treatment is needed to bring the disadvantaged to the level ground (Wang, 2012). Pro-equity

\(^{18}\) Gentrification is a general term for the arrival of wealthier people in an existing urban district, a related increase in rents and property values, and changes in the district's character and culture. Gentrification usually leads to the displacement of poor communities by rich outsiders.

\(^{19}\) Captive riders are those who use transit by necessity.
interventions, prioritizes worst-off\textsuperscript{20} groups with the aim of achieving universal rights by eliminating the unfair and unavoidable circumstances that deprive the worst off their rights.

The below framework has been developed to be used by various institution to measure equitable TOD with a focus on affordable housing. It covers the purpose and scope of the evaluation, stakeholder’s analysis, and the indicators for measuring both the standard and equitable TOD, the approach to evaluation, and the methodology by which an evaluation should be conducted. Lastly it discusses the factors to consider for sustainability.

### 3.2 Purpose of the evaluation

As indicated above, TOD has a number of benefits, however, displacement still occurs which mainly affects the low income households. This emphasizes the need to prioritize equity as a key component of TOD implementation to ensure that all the community benefits equally without marginalizing the low income earners.

On one hand, there are a number of projects that claim to have achieved equitable TOD, but on the other hand, the extent to which equity has been achieved is not clear. Due to this, it is very important that indicators are developed to assess the extent to which equitable solutions have been achieved.

The purpose of the evaluation is to conduct a process evaluation\textsuperscript{21} of affordable housing as an equitable measure to TOD developments. Process evaluation is the most preferred because development is an ongoing process, hence trends and patterns of concerns over time would be able to establish the best cause of action to minimize the concerns for social justice. The goal of this

\textsuperscript{20} Worst Off groups referees to the population suffering the most due to inequity. UNICEF

\textsuperscript{21} Process evaluation looks at how program activities are delivered. It helps practitioners determine the degree to which an intervention was implemented as planned and the extent to which it reached the targeted participants. Web: https://captus.samhsa.gov/access-resources/using-process-evaluation-monitor-program-implementation
evaluation would be to achieve equitable measures of TOD by providing affordable housing to the low income incomes to prevent displacement hence enhancing community development. The process evaluation would then beg to answer the question: *How can affordable housing as a component of equitable TOD be achieved?*

This evaluation can be conducted by a number of organizations, institutions, donors, and/or governments involved in the planning, implementation, or creation of policies that affect TOD initiatives, hence stakeholders’ analysis is very important.

### 3.3 Stakeholders Analysis

A number of stakeholders should be involved in this process to ensure successful implementation of the findings from the evaluation. These stakeholders could include but are not limited to the below:

i) **The Main stakeholders**: These are the main beneficiaries of the evaluation, they include: extremely low income households, very low income households, and low income households. Other residents of the area and future residents are the secondary beneficiaries.

ii) **Developers**: The developers are involved in building the homes, hence partnership with the governments in ensuring affordable homes are available to the residents is necessary.

iii) **The implementing organization**: this could be the area transport authority or any other organization that manages the transport system of the area.

iv) **The local government**: The local government is highly involved with planning and allocation of such housing.

v) **The central government**: It has the need to address and resolve the issue at the macro
level. Therefore, it supports the project because it helps to implement central and national government policies on housing for the poor.

It is important for evaluators to note that the stakeholders involved will be dependent on a number of factors including the time the evaluation is conducted and the location of the project hence the number of stakeholders involved may vary from time to time.

### 3.4 Indicators

An indicator is a specific, observable and measurable characteristic that can be used to show changes or progress a program is making toward achieving a specific outcome. The indicators are usually valid, reliable, precise, measurable and timely\(^{22}\), the below framework consists of detailed indicators (both standard and equitable indicators) for collecting data, means of verification as a data sourcing approach, and the assumptions and risks expected should these assumptions not materialize. An evaluator should realize that some of these indicators can be re-stated or adjusted to fit the context being evaluated.

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<table>
<thead>
<tr>
<th>Expected Outcome</th>
<th>Definition of affordable housing</th>
<th>Standard indicators</th>
<th>Equitable and specific indicators</th>
<th>Means of Verification: Data Sourcing and Type</th>
<th>Assumptions and Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>The extent to which a TOD development has incorporated affordable housing</td>
<td><strong>Standard Definition</strong>&lt;br&gt;Housing which costs a family less than 30% percent of its annual income. It should provide access to employment and services as well as have environmental benefits.</td>
<td>Presence of policies for affordable housing. Whether the policy is implemented or operationalized. Whether there are consequences for defaulters</td>
<td>The type of policies for affordable housing. Whether the policy has changed over time in line with development of the area. Types of programs available under these policies. The extent to which the residents are aware of such programs. The extent of accessibility of such programs by the residents. Adequacy of such programs for the low income households within the area. The percentage of houses subsidized within the area due to such programs.</td>
<td>Documentation of the policy in place from government offices. Documentation of number of programs available due to such policies. Documentation of the number of low income households in relation to the programs available. Quantitative and quantitative survey on availability and accessibility of these programs to the residents.</td>
<td>It is assumed that the government officials will be corporative and fast at disseminating information, otherwise it will delay the evaluation process. It is assumed there will be cooperation from the property managers on issuing data, otherwise, it will be more difficult to survey all residents within an area hence will be more difficult to generalize the data. It is also assumed the residents would be honest otherwise, the data may be distorted.</td>
</tr>
<tr>
<td><strong>Equitable Definition</strong>&lt;br&gt;Equitable affordable housing ensures that there is mixed house designs and sizes to cater for children and multigenerational families. It also ensures availability of jobs and accessibility to facilities.</td>
<td></td>
<td></td>
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<p>| Presence of affordable units. The cost of renting or buying a house. | Documentation of the amount of the Area median Income (AMI). The amount of rent or mortgage for affordable housing as a percentage of the AMI. The ratio of high income to low income occupancy within the area. Types of subsidies based on policies and programs available for developers and residents. Ratio of subsidized to non-subsidized housing in the area. % of affordable housing within a residential building. % of occupancy of such housing by the low income households. | Documentation of the AMI from government offices or survey conducted by organizations. Documentation of rentals from the property management offices. Documentation of number of affordable housing in relation to the rest of the market-rate housing within the complex from the property management offices. Documentations on the types of subsidies available for such housing. Quantitative survey of the rentals or monthly installments from the residents. | It is assumed that information on the most recent AMI will be available, otherwise, it will be difficult to define what affordable is within the area. It is assumed there will be cooperation from the property managers on issuing data, otherwise, it will be more difficult to survey all residents within an area hence will be more difficult to generalize the data. It is assumed that the government officials will be cooperative and fast at disseminating information, otherwise, it will delay the evaluation process. It is also assumed the residents would be honest, otherwise, the data may be distorted. |
| Presence of different sized affordable housing. | % of the different sized affordable types of housing in relation to market-rate types of housing within the area. Types of such varied sized houses: studios, one bedroomed, two bedroomed etc. | Complex floor plans indicating the different subsidized apartment complex from the property managers or developers | It is assumed there will be corporation from the property managers, otherwise, it will be more difficult to survey all residents within an area hence will be more difficult to generalize the data. |
| Presence of such sized facilities within half a mile radius from the housing. Equal accessibility to such facilities by all residents. The distance of such facilities from the affordable housing. Presence of proper pedestrian paths usable in all weather. Methods by which residents commute to such facilities. Walking -Presence of adequate pedestrian walks. -Presence of well demarcated pedestrian walks. -Designs of the pedestrian walk to cater for all walks of people | Presence of maps to identify the location of the facilities, accessibility and distance from the city planners. Observation and taking of pictures. Quantitative and qualitative survey of the pedestrians, bikers and users of such facilities. | It is assumed that most recent plans will be available and accessible, otherwise, it will require a little of time to map this out. It is assumed the people collecting the data will be able to cover most of the area under study in order to generalize the data. It is assumed the user will be willing to engage with the evaluation team in order to answer these questions on their perceptions of the available facilities. |</p>
<table>
<thead>
<tr>
<th><strong>Measuring Equity in Transit-Oriented Development: Application to Affordable Housing</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Including</strong></td>
</tr>
<tr>
<td>- Presence of well-designed pedestrian walks with aligned paving blocks to minimize accidents, well lit at night, well shaded by trees.</td>
</tr>
<tr>
<td>- The perception of residents when using such walks (feel of safety).</td>
</tr>
</tbody>
</table>

**Biking** |
- Presence of adequate biking lanes. |
- Presence of well demarcated biking lanes. |
- Presence of well-designed biking lanes for the safety of users. |
- Perception of the users of the lanes in terms of safety, both at night and from general use. |
- Provision of bike parking space especially within the metro and other facilities. |
- Safety of such provisions to prevent theft. |

**Metro** |
- Presence of metro stops near affordable housing. |
- Frequency of such buses. |
<table>
<thead>
<tr>
<th>Availability of jobs within the area for economic development</th>
<th>Presence of mixed-use development.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Availability of jobs with the commercial and industrial sector.</td>
</tr>
<tr>
<td></td>
<td>Ratio of varied job categories (Skilled and Unskilled).</td>
</tr>
<tr>
<td></td>
<td>Ratio of the local residents employed to such job vs nonresidents.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Charges of using the metro bus and if affordable to the low income households.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locations of the bus stops for the safety of its users both at night and daytime.</td>
</tr>
<tr>
<td>Presence of well-designed bus stop to provide shelter and well lit especially at night.</td>
</tr>
<tr>
<td>Perceptions of the users of the bus stop (Feel of safety).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Floor plans of the buildings from the developers of city planners.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation of the area.</td>
</tr>
<tr>
<td>Survey of the managers and the employees on the types of jobs and ratio of the local employees to nonresidents.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>It is assumed that most recent plans will be available and accessible, if this isn't the case, it will require a little of time to map this out.</th>
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<tr>
<td>It is assumed the people collecting the data will be able to cover most of the area under study in order to generalize the data.</td>
</tr>
<tr>
<td>It is assumed the managers and employees will be corporative to enable collect accurate data.</td>
</tr>
</tbody>
</table>
3.4.1 Discussion of the framework:

The above indicators are very vital in critically assessing equitable affordable housing within TOD initiatives. As earlier indicated, measuring equity is difficult. A detailed approach to the evaluation is necessary to enhance clarity and the decision making process. The indicators on the presence of policies for affordable housing bring to light any policies that are in place. Based on such policies, it is important to identify the types of subsidized programs available and the awareness and accessibility of such programs by the residents. This information not only ensures the availability of the programs, but the information answers the question of whether such programs are accessible and if not, an evaluator must find out the reason by collecting more qualitative data.

The cost of renting or mortgaging such housing is another important indicator that enables an evaluator to assess the affordability of such houses. The area median income plays a very important role, as it is a standard measure used to calculate the affordability of housing within different areas. With the presence of affordable housing, it is important for the evaluator to find out whether such housing is actually being occupied by lower income households. Equitable affordable housing does not only mean provision of housing but also catering to different family types including both nuclear and extended families, hence it is good to establish that these different needs are provided.

Most importantly, housing must be located with access to different facilities: as an evaluator, one must find out that there is equal access to such facilities. In addition it is important to establish that pedestrians and bikers alike have properly demarcated and safe pathways to access such facilities at all times. Most importantly, TOD initiatives advocate for mixed use development to enhance the economical capacity of the area, thereby creating a complete society. Presence of
jobs is one such aspect that is highly regarded, and the accessibility of these jobs to the residents in order to limit the travel time which enhances time saved. These jobs should be equitable in such a way that they cater to both unskilled and skilled professionals.

### 3.5 Approach to Monitoring and Evaluation

#### 3.5.1 Participatory Approach

Techniques for evaluating equitable solutions for TOD initiatives should mainly apply a participatory approach to enable the evaluator to directly engage the community, especially low income households that are affected by such initiatives. These low-income households will be able to give valuable insights into the problems faced and experienced by them.

Participatory evaluation follows four principles: *participation*, which includes the most affected; *negotiation* on what should be monitored and evaluated, how data will be analyzed and findings shared; *learning*, which is the basis for subsequent improvement and corrective actions and *flexibility* to take care of changes over time as the role and skills of the stakeholders is ever-changing (Mvula Trust, 1998).

**Figure X: Participatory Framework in PM&E**

Measuring Equity in Transit-Oriented Development: Application to Affordable Housing

As shown in the diagram above, the participation of the community should be included throughout the process. There is usually a misconception as most evaluators do not understand the extent of community participation hence restricting it to data collection as opposed to the whole process. The involvement of the community is important to ensure ownership of the evaluation process hence sustainability of the initiative, however while applying this process, it is important to be sensitive to socio-economic and political situation whereby PM&P can be used without further increasing the vulnerabilities of the already marginalized groups (Gregory, 2000).

While using a participatory approach to evaluation, evaluators must follow the below principles as stipulated on the transformative paradigm to ensure social justice (Kosheleva, n.d)

- “Evaluators should identify and respect cultural norms that support human rights and social justice;
- Evaluators should identify and challenge cultural norms that sustain social oppression;
- Evaluators should not just extract information and data from the communities, they should also give back to the community in a meaningful way;
- Evaluators should recognize and validate the knowledge, expertise, and strengths in the communities they work with;
- Evaluators should facilitate enabling conditions so that actions to enhance social justice and human rights will continue after the evaluator leaves the community;
- Evaluators should recognize and properly communicate their limitations” (Kosheleva, pg.2).

Additionally, the evaluator must understand the philosophical assumptions guiding the transformative paradigm which include: the axiological question which incorporates the nature of ethics; the ontological question which incorporates the nature of reality; epistemological questions
which incorporates the nature of knowledge including the relationship between the knower and would be known; and the methodological question, which answers the question of how the knower can collect data (Sage, 2010).

These assumptions alert the evaluators on the existence of multiple versions of realities that are not equal; evaluators should challenge versions of realities that sustain oppressive systems and make visible versions that have potential to further human rights and social inclusion (Kosheleva, n.d). Incorporating the transformative paradigm within participatory approach to evaluation, not only ensures social justice by giving a voice to the marginalized, but it also enhances communications and transparency which enhances the quality of the evaluation results.

3.6 Methodology of Collecting and Analyzing Data

A mixed method approach should be applied in monitoring and evaluation of these kind of initiatives. This methodology for conducting research involves collecting, analyzing and integrating both quantitative and qualitative data collection and analysis; the integration provides a better understanding of the research problem as each approach compliments the weakness of the other. The research method enables the researcher to gain in breadth and depth of understanding and corroboration, while offsetting the weaknesses inherent to using each approach by itself, aiding in triangulations as a means to verify information (Resource Centre, 2015).

However, before conducting an evaluation, is it important for an evaluator to ensure reliability and validity, by conducting a pilot survey, where the evaluation question will be

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25 Reliability is the extent to which an "experiment, test, or any measuring procedure yields the same results on repeated trials: Understanding Validity and reliability, University of Texas.

26 Validity is the extent to which the construct measures what it says it is measuring, Ibid.
tested. This should be administered to a randomly selected population and feedback from administering this survey will help the evaluators adjust the evaluation questions to ensure the instruments are relevant, valid, and reliable. The indicators provided in the framework above can be easily adapted to different areas and situations to ensure that the data captured is useful for that specific area. If it important that after data collection and analysis, the findings should also be shared with the community for their inputs before being presented to policy makers for their action. The presentation of data should be tailored to its receipts but most importantly the use of both graphics and prose form is important to show both the relationships of the different variables as well as the explanations for the causations of such relations.

3.7 Data Sourcing

The evaluation will require varied data from different sources. Some of the data such as the policies in place and programs available can be obtained from desk reviews, however to understand the depth of such policies, government officials should be surveyed. Property managers of different complexes would be very useful in identifying affordable housing and the number of low income households within the property, this data will be an addition to the data collected through a survey of the residents giving a detailed bigger picture. Observation is also one important aspect of data collection methods; the evaluators should be able to observe and take pictures of streets, pedestrian walks, and bus stops. Most importantly, surveying the residents would give an in-depth understanding of the context.

A combination of these approaches is very important for obtaining different data as well as triangulation. An evaluator has to work on the assumptions that the different stakeholders involved will be corporative and honest. Lack of these virtues will lead to distorted data and the evaluation may take longer than anticipated which is a risk. It is therefore very important for everyone
involved to understand the timelines in place as well as the evaluation context for the benefit of society therefore honesty is highly regarded.

3.8 Step by step evaluation process

The below diagram indicates the relationship between the approach to evaluation, the transformative paradigm, and the methodology while at the same time giving a step by step process by which equitable affordable housing can be measured within TOD initiatives.

Figure XI: Eight Steps in Policy-Oriented Monitoring of Equity

Source: Adapted and modified from WHO's Eight Steps in Policy-Oriented Monitoring of Equity in Health (1998)
Based on this model, affordable housing can be monitored by identifying the social groups of concern, especially the low income households. An evaluator should be able to identify the subgroups within low income households, for examples the difference between the three types of the low income: the extremely low income households earning 30% of the AMI, the very low income households earning 50% of the AMI, and the low income households earning 80% of the AMI.

Thereafter, gaps can be identified with regards to affordable housing in consultation with informants from different social sectors and civil society. Most importantly the low income households and their representatives must be involved as they would give an in-depth understanding of both the context and the gaps. The evaluator should then identify sources of data, such as the government offices, published articles, and surveys of residents and property managers of TOD neighborhoods. This data will help the evaluator to understand what has been done before and what exactly the problem is. For example, a policy on affordable housing can be enacted but not enforced, this will help the evaluator to understand exactly the kind of information to collect as well as avoid recollecting already available data.

The data available will then help identify the indicators for evaluating the gaps between the privileged and the low income households. The indicators must be specific, measurable, achievable, relevant, and time bound. Most importantly, all involved stakeholders must understand exactly what these indicators will measure and why they have been used. The indicators must be specific enough to collect required data and some flexibility should be left in order to collect some qualitative data to explain the quantitative data.

As stipulated within the transformative paradigm, mixed method approach should be used in both collecting and analyzing data. As described above, both qualitative and quantitative data
should be used to collect data as they help compliment the weaknesses that each possess thereby giving an in-depth perspective of an issue. Additionally, they help triangulate data which enhances its validity and level of variance (North West Nazarene University, 2015).

The data analysis will then help identify the current patterns and the trends over time as well as their causes, these patterns should then be clearly presented and communicated to the relevant authorities. Two questions to be considered as stipulated in WHO (1998) report include: “Is the situation reflected by patterns and trends as equitable as it can be?” “What could be done to reduce inequalities, in the short-medium and in the long-term?”

WHO (1998) states that the evaluator should make sure that an assessment of both how well each group is doing with respect to selected indicators in absolute terms and magnitude of the gaps between the groups is done (pg 24). Assessing current trends should include: a focus on social inequalities; an assessment of absolute well-being, relative gaps, changes over time, and the current patterns; a consideration of changes in the size of the disadvantaged groups; and an assessment of equitable/inequitable resource allocation and utilization (pg. 25).

The trends from the data analysis should then be presented in a way that is easy to understand, some of the ways stipulated by WHO (1998) is the use of mapping to show where policy and programmatic responses should be directed as well as bar charts to demonstrate the patterns at a point in time and compare the different sub groups (pg. 28).

The information would be very useful in generating an inclusive process. At this step it is vital to include the different stakeholders such as the policy makers, local and national government officials, civil society groups, and the community itself. These groups of people in consultation with each other would then help set in motions the strategic plan for policy implementation, monitoring and research. This step should consider the political will to achieve greater equity so
that realistic strategies can be set to overcome political and technical obstacles. This is a continuous process that is highly desirable in a process evaluation to ensure equitable solutions.

3.9 Sustainability:

Monitoring and evaluating a project is one way to ensure that a project is sustainable (by monitoring its progress and outcomes), however involving the community in the process and encouraging them to take ownership of the process enhances the sustainability of a project. Being that, housing is a human right, it is very important that TOD initiatives ensure that existing community members benefit from the project; even as gentrification occurs, displacement should not occur. Most recently, the United Nations has coined the Sustainable Development Goals building upon the Millennium Development Goals to converge with 2015 development agenda. This has been a big step for cities as it has been recognized in goal 11: “make cities and human settlements inclusive, safe, resilient and sustainable” (United Nations, 2015).

The cities’ SDG is very important in informing all future projects and improving the existing projects. This only emphasizes the fact that it is very important to measure equity in all the TOD projects to enhance inclusivity. Most specifically affordable housing as an aspect of TOD should be highly encouraged as it definitely contributes to an inclusive, safe, resilient and sustainable neighborhoods hence cities.

3.10 Conclusion

Based on the fact that TOD initiatives are usually an ongoing process, process evaluation for equitable solutions is highly recommended to ensure that many community members benefit from such developments thereby improving their lifestyles. It is important for an evaluator to note that the timelines and the budget of such evaluation will be dependent on the scope of the
evaluation, hence an evaluator has to put into consideration all the aspects of the evaluation to come up with a realistic budget and time line to which the evaluation can be conducted.

Participatory evaluation is a very important aspect of equitable TOD because it ensures that the voices of community members are heard as they are the ones most affected by such initiatives and they are better placed at understanding the context and what would be beneficial to them. This will enhance in-depth understanding of the situation and minimize the social justice inequalities. While evaluating affordable housing as an equitable aspect of TOD, it is important to consider the political context and the power dynamics of different stakeholders: this encourages proper planning will would in turn lead to good outcomes in ensuring social justice and inclusive cities in line with the sustainable development goals.

### 4.0 Assessments and Lessons Learnt

The development of this paper has made me realize that all courses we took till now were interconnected and very instrumental for both my personal and professional goal. The monitoring and evaluation coursework specifically has played a very big role in my capstone. I still remember when I was new to school and we were supposed to make a choice on what track we would major in, I was very confused as I had no understanding on what would align better with my background. At the end, I figured out since I had a background on project planning and management, monitoring and evaluation was a better choice for me. To date, I know that I made the best decision for my career as well as personal development.

In the fall, the objectives of the program monitoring class was as follows:

- “Understand the difference between research and evaluation; evaluative functions and monitoring functions, and concepts related to evaluative thinking;
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- Understand and use the basic concepts and terminology of program evaluation within the development sector;
- Gain skill in development of an M&E Framework and a Theory of Change;
- Understand the roles of in-house and independent evaluators and standards of ethics in evaluation” (Jersild, 2014).

By then I had no understanding of what these objectives meant and with time and exposure to class work, I learned to conceptualize the application of monitoring and evaluation. Urban issues is another aspect that I had wanted to nurture, and I was lucky to go to India in January for a field course whereby, we developed an inception report for a local organization handling shelter for the low income households. This combination was very instrumental in my development as I got involved in a ‘live’ project while applying the concepts learnt in class to come up with a product. This was one of my proud moments because it affirmed that I made the right choice.

I also got to do my practicum with the World Resources Institute under the Urban Development practice area. The practicum exposed me to different aspects of urbanization issues including climate change, energy, transportation, and development, however my main focus was to develop a monitoring and evaluation framework for measuring equitable transit oriented development commonly known as TOD. This was a tough task but very enlightening, I worked closely with my professor Amy Jersild for guidance as I was struggling with the structure of the paper. In the end it worked out well and WRI was impressed by my work which made me proud once again. They then asked me to stay and extended my practicum which led to my Capstone.

The capstone focuses on measuring equitable TOD with emphasis on affordable housing narrowed down from my practicum product. This has been a very challenging but rewarding task: I was able to connect all the previous course work including the advanced M&E coursework
completed this summer. Now I understand why the course had been designed in this manner, as I have gradually enhanced my knowledge from each class and now I can say with authority that I can conduct an evaluation or create and evaluation framework. I do understand that I am not perfect, but I also know with practice, and in time, I will be an expert like my professor Amy Jersild.

My most rewarding part of doing this assignment was the incorporation of the transformative paradigm for social justice as well as the development of the indicators. I realized that to achieve social justice, affordable housing can not only be viewed as an issue of housing but it has to be evaluated more holistically by looking at other indicators such as accessibility to facilities, safety, and employment opportunities amongst other issues. This section of my capstone tied in so well with the current summer course on Issues of Sustainable Development taught by Dr. Davina Durgana on human security. The displacement of residents forces them to move to unsafe place places thereby endangering their lives, however should equitable solutions be achieved, displacement will not occur.

Despite all these learnings and successes, I have had some challenges during the development of this paper. The most challenging concern was to synchronize all the information I had to make the paper easy to read and understand, working closely with my professor Amy Jersild, I reformatted the different sections of this paper three times before I finally got it right. Initially it was difficult for me to focus on measuring affordable housing as an aspect of equitable TOD, instead I was focusing on affordable housing in general without relating it to equitable TOD. I am grateful I had some guidance and now I feel like I have a better understanding of my paper than I did before. Additionally, conducting the survey at Fort Totten metro station area was very challenging considering the time constraints. It was difficult to get a considerable sample
population of the residents during the day because out of the 26 people interviewed, only 14 were from the area. This made me learn that, for one conduct a successful survey, adequate time has to be allotted, additionally, it is important to be strategic and conduct the survey on different times of the days as well as weekends. For instance, a survey on a weekend may have yielded more Fort Totten metro station area residents as opposed to a weekday as conducted by me.

Another major issue was the sudden departure of Tapan, the writing tutor. I always worked closely with Tapan in structuring all my papers but he left so sudden before I had a chance to complete my paper for his review, I am glad Joyce was given the task so she could assist us.

On a personal note and in general, I feel like coming to this school was the best decision I ever made up to this point of my life. I have been exposed to different kinds of teachings, a wide variety of cultures from the different students and the faculty which have all made me a better person. I have become calmer and more tolerant of other people’s ideas and ways of dealing with different situations. I have become more aware of my surrounding in wanting to do good for the community as opposed to just getting a good job and making money. Now I know for sure, I would like to be involved in a project that benefits the humanity.

In conclusion, developing the framework for measuring equity has made me more aware of the issues faced by the marginalized as they go about their day to day activities and I would like to really make a difference in their lives. I am aware now, with certainty, that, this is the path I wish to take for my career and personal fulfillment. I want to fight for a cause that personally makes me a better person while enriching someone else’s life.
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27 MAP-21 is formally entitled “Moving Ahead for Progress in the 21st Century”.
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Appendix I: Initial M&E framework

WORLD RESOURCES INSTITUTE

EQUITABLE TRANSIT ORIENTED DEVELOPMENT (ETOD):
A PRELIMINARY REVIEW OF ETOD WITH A MONITORING AND EVALUATION MODEL.

BERYL ORANGA
APRIL, 2015
Abstract:
Equitable Transit Oriented Development prioritizes social equity as part of development. This paper, therefore, carries out a preliminary analysis of the literature available on equitable TOD thereby highlighting the different principles and developing a monitoring and evaluation model to measure such initiatives. This paper acts to inform further research on the subject matter.
1.0 Introduction
Transit Oriented Development, famously known as TOD, is not just development near transit, rather it is a development that also minimizes the impacts of traffic, increases location efficiency, and creates a sense of community and place (Reconnecting America, 2007). TOD has varied definitions as illustrated below from different major organizations.

“Transit-oriented development (TOD) is compact, higher density, mixed-use, walkable development that is centered within a half mile of a transit station. TOD generally includes: residential, commercial, retail and recreational space, and is designed to create connections between transit, bicycles and pedestrians” (ITDP, 2015).

“Transit-oriented development is often defined as higher-density mixed-use development within walking distance – or a half mile – of transit stations” (CTOD, 2015).

“Transit-oriented development, or TOD, is a type of community development that includes a mixture of housing, office, retail and/or other amenities integrated into a walkable neighborhood and located within a half-mile of quality public transportation” (Reconnecting America, 2015).

It is evident that TOD as an initiative should be able to improve people’s lives and offer easy access to transit stations and other amenities. However, it has been established that, like any other successful development, TOD initiatives tend to cause an increase in land and housing values near transit areas (GAO, 2009) which leads to gentrification and displacement of the current residents within the area (Cappellano, 2014).

Due to these displacements, it is therefore important to ensure that TOD initiatives have an equity aspect to them for social inclusion. Equitable TOD prioritizes social equity as a key component of TOD implementation (Pollack, 2013). It fosters healthy and prosperous communities, whereby diverse groups of people, including the poor, have greater mobility choices and access to opportunities (Wood, 2009) such as jobs, good living wages, health clinics, fresh food markets, human services, economic growth, healthier lifestyles, schools and childcare centers (Pollack, 2013). Equitable TOD should also prioritize affordable housing near transit, and, if done right, it can have a range of social, environmental, and economic benefits for people and communities. Most importantly, with increased ridership there are reductions in greenhouse gas emissions (Wood, 2009).

2.0 Justification of the Paper
Achieving equity in TOD projects is very elusive; there is a plethora of literature on equitable TOD initiatives with highlighted case studies of projects that have achieved some aspect of equity such as provision of affordable housing and/or community participation. However, these characteristics are not adequate to justify a TOD initiative as equitable. Equitable TOD has a wide range of characteristics which include: density, compactness, mixed land use, local economic development, affordable housing, safe and integrated public transport, non-motorized transportation, green space/TOD, community participations, and preservation of community identity during development.

Evaluating social impacts of TOD remains a challenge, as most projects are evaluated simply on design. A well-known and used report is the “TOD standard” from the Institute of Transportation

28 “The TOD Standard is a powerful tool to help shape and assess urban development. It focuses on maximizing the benefits of public transit and non-motorized mobility while placing the emphasis firmly back on the users”: https://www.itdp.org/tod-standard/.
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and Development Policy which highlights the principles of urban development for transport as: developing neighborhoods that promote walking; prioritizing non-motorized transport networks, creating dense networks of streets and paths; locating development near high quality public transport; plan for mix use; optimizing density and transit capacity; creating regions with short communities; and increase mobility by regulating parking and road use.

This paper therefore seeks to contribute to the subject of TOD with a focus on measuring equity by developing a monitoring and evaluation framework to help inform TOD initiatives, thereby making them more socially inclusive. To achieve this, the paper carries out a preliminary analysis of literature available on equitable TOD initiatives subdivided into finance and governance, thereafter it identifies the recurrent themes/principles. The themes are then organized and analyzed, thereafter; a monitoring and evaluation model is developed whilst highlighting successful case studies. The monitoring and evaluation model will be tested to inform further research in which findings will identify best practices thereby informing future projects in ways to make TOD initiatives more equitable.

3.0 Literature Review

3.1 Finance


Towards Achieving Equitable TOD Financing

The authors distinguish between three levels of TOD as follows:

i) TOD 1.0: as focused on federal funding formulas that are disconnected from real estate market forces.

ii) TOD 2.0: as more integrated transit and real estate funding strategy conceived and coordinated on a corridor scale.

iii) TOD 3.0: as an emerging model that aligns itself with the broader community needs and sustainable initiatives for livability benefits.

The authors offer further suggestions for transitioning from TOD 1.0 to 3.0 by implementing a more market focused financing structure. They describe TOD 1.0 as heavily relying on subsidies to remain competitive, despite the minimal subsidies for a finite number of projects. Due to this, a new strategy is needed. On the other hand, TOD 2.0 relies heavily on an implementation advocate for existing and future TOD districts in early stages of process, hence overcome jurisdictional competition for new development. Lastly the authors state that TOD 3.0 focuses on livable benefits which are the ultimate goal of TOD: livable benefits involve the positive community impacts on development or services along the corridor. TOD 3.0 emphasizes on integrated financial strategy supporting expanded livability benefits as opposed to focusing on transit efficiency (TOD 1.0) or enhancing revenue through more dense vertical real estate development (TOD 2.0).

Retrieved on 8th April, 2015 from: http://www.hud.gov/offices/cpd/about/conplan/pdf/Fostering_Equitable_and_Sustainable_TOD.pdf

29 Livability benefits include improved access to emerging employment centers, accessible job training and educations facilities, affordable and workforce housing, increased water space and watershed areas and enhanced metropolitan sustainability.
Funding Equitable TOD Initiatives

This is a white paper focused on strategic approach and the roadmap of MAP 21. The authors describe TOD as providing housing and transportation options for everyone to access facilities such as healthcare, education, and employment; however, they also state that lack of equitable TOD affects the poor due to higher transportation costs and lack of easy accessibility to transit areas. Equitable TOD is difficult to fund as available federal funds have experienced cuts; the paper therefore considers three major themes as follows to provide clarity on eligible uses of federal transportation funds.

i) Main finance challenges:
   a) Funding needs to support planning activities.
   b) Pre-development costs (land assembly and site remediation).
   c) Station area infrastructure costs.
   d) Development costs (unique to affordable housing and mixed use development).

ii) Map 21 tools to support equitable TOD by use of the following principles:
   a) Economic vitality (including housing).
   b) Safety.
   c) Security.
   d) Accessibility and mobility.
   e) Protect environment, promote energy conservation, and improve quality of life.
   f) System management and operations.
   g) System preservation.

iii) Policy recommendations that can support equitable TOD which include:
   a) Explicitly recognizing TOD as a transportation purpose through administrative or legislative actions.
   b) Developing regional performance measures in support of TOD investment.
   c) Utilizing existing Metropolitan Planning Organizations (MPO) and state authority to flex eligible funding.
   d) Establishing specific funding tools to support TOD planning, acquisition, and implementation.
   e) Exercising maximum use of joint development opportunities.

In conclusion, the author states that achieving equitable TOD requires the involvement of private, nonprofit, and public sectors partners working at all levels of the government; on the other hand funding equitable TOD requires greater innovation, flexibility and partnership by MPOs to meet growing market pressures.

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30 MAP-21 is formally entitled “Moving Ahead for Progress in the 21st Century”.

**The Challenges and Potential Solutions in Equitable TOD Financing**

Pollack and Prater examine the issue of equitable transit-oriented development (TOD) by identifying social equity as the key component of TOD implementation. They focus on lessons learnt from Atlanta, Denver, the San Francisco Bay Area, and the Twin Cities (namely, Minneapolis, MN and St. Paul, MN). The authors believe that equitable TOD requires cross-disciplinary interaction amongst land use, economic development, and community development; hence they review the existing equitable TOD financing tools by identifying the financing roles of the state, transit agencies, philanthropies, and developers (amongst others) as partners in equitable TOD process. They also state that regions differ in the following critical variables:

i) Strength of economies.
ii) Level of political will.
iii) Level of capacity amongst stakeholders.
iv) Nature of transit system.

While addressing potential solutions and opportunities, Pollack and Prater address the following challenges:

i) Scale, complexity, and land assembly.
ii) Mixed use practice.
iii) Obtaining risk tolerant capital.
iv) Identifying infrastructure and remediation financing sources.
v) Reliance on exceptional funding.
vi) Desired rent levels.

In conclusion, Pollack and Prater recommend knowledge sharing, policy changes, and the use of demonstration programs from lessons learnt from the areas of focus to aid enhance equity in TOD.


**Ways to address Equitable TOD Financing Gap**

Zimmerman states that there’s indeed a silver lining to the challenging financial environment. She proceeds to give examples of cities such as Boston, Dallas, Salt Lake City, and Seattle that are working to strengthen their regional economies and improve quality of life through coordinated investment in transit, housing, and business development.

She emphasizes the fact that TOD projects are more complex given the higher land value near emerging transit; she highlights the following key components of equitable TOD financing gap:

i) “The importance of financing for acquisition, pre-development, and remediation for which a number of philanthropic and public resources are being developed.

ii) The growing gap in infrastructure funding – not only for transit, but also for sewer, water, sidewalks, and street connectivity.
iii) The importance of access to debt and equity financing during construction, and permanent financing phases.

iv) The need to move beyond individual project financing, in which investors require greater evidence on the reduced risk and performance of TOD projects”.

In conclusion, the blog states that there are promising solutions expanding the collaborative partnership across sectors in transportation, housing, and real estate by engaging such decision makers to unlock financial resources within their control.


3.2 Governance


The Importance of Involving Communities in the Planning of TOD

The authors examine issues of social equity in TOD projects by conducting a case study on different types of Private Public Partnerships in Italy (Europe) and Oakland (California, USA). The authors identify the following principles that embody TOD initiatives:

i) Mixed land use.

ii) Compact building design.

iii) Housing opportunities and choices.

iv) Distinctive and attractive communities with strong sense of place.

v) Preservations of open space, farmland and critical environmental areas.

vi) Strengthen development towards existing community.

vii) Variety of transport choices.

viii) Fair and cost-effective development decisions.

ix) Community and stakeholder collaboration.

They also point out that TOD is characterized by three commonly agreed factors: high-quality walking environment, mix of land uses, and higher density development within a designated area surrounding transit area.

Based on the case studies, they state that Community Based Corporations (CBC) are very vital in any Public Private Partnership to ensure a successful mixed framework implementation. The involvement of CBC enables the members to contribute to the main roles of characterizing the improvements that benefit them based on their needs.


Common Challenges of TOD Projects

Fleming et al. identified the following four common challenges faced in past efforts to create inclusive TOD:
i) Aligning project goals with community needs.
ii) Retaining low income residents as prices rise.
iii) Matching new services to local needs.
iv) Financing more equitable TOD.

Based on these challenges, projects such as Fruitvale Transit Village, Oakland; H Street Maketto Market, Washington D.C.; and Market Creek, San Diego have been deemed as successful due to their intensive public engagement process. The upcoming TOD project, Martin Luther King located in Austin, is trying to plan for these challenges to ensure that the current community is integrated in the planning and the implementation stage. In conclusion, Fleming et al. state that many other similar potential initiatives should also learn from these successful projects and plan to resolve these challenges ahead of time to ensure equitable TOD.

Retrieved on 20th February, 2014 from:


Steps to Avoid Stalled Equitable TOD Projects
The authors describe TOD as a development that contributes to creating a healthy regional economy, promising to reduce commutes, produce vibrant mixed use places, and provide housing with easier access to jobs and services. On the other hand, equitable TOD is described as optimizing housing and transportation affordability, and locating mid-skill jobs and critical services like childcare and health facilities near transit stops.

The report further states that equitable TOD initiatives are complex to execute and face more obstacles than the traditional urban development; such challenges include escalating land value, financing that requires mix of funding sources, long timelines, provision of specific land uses, high density development and mixed use buildings. The authors therefore list the following lessons as common causes of TOD stall and failure:

i) Equitable TOD costs are high and financial returns are low compared to standard development.
ii) Upstream planning decisions are not aligned with downstream real estate goals.
iii) Conventional feasibility studies routinely miscalculate TOD viability.
iv) Infrastructure investment is critical to TOD.
v) The key role of market-rate development is often overlooked.
vi) Early planning for TOD inflates land costs long before construction begins.
vii) Gap funding is often necessary to solve common TOD roadblocks.

The authors further identify readiness\textsuperscript{31} factors and the unexpected costs and hurdles equitable TOD sponsors should expect. In conclusion, they offer the following recommendations towards successful equitable TOD:

i) Incorporate market assessments into all planning activities early.
ii) Use a transit corridor approach.
iii) Formulate a TOD planning checklist.
iv) Consider “market-readiness” during equitable TOD site selection.

\textsuperscript{31}Factors that could signal weather a site/project is “ripe” for development.
v) Formulate a site evaluation checklist for potential equitable sites and projects.

Retrieved on 7th April 2015, from: https://www.livingcities.org/resources/259-steps-to-avoid-stalled-equitable-tod-projects


The Importance of Involving Communities in the Planning of TOD
Martucci explores various developments along the Twin Cities’ green lines while highlighting the community’s involvement that led to the success of such projects. These developments include:

i) Little Mekong Plaza: the community was involved in sketching out the vision for the new plaza. The initiative created a space that strengthened the existing community and reflected its empowerment.

ii) Western U plaza: the community collaborated while respecting the historic significance of the existing buildings to create broad based economic opportunities for residents. The project is due for completion in the fall of 2015 and its goal is to build long term wealth amongst current residents while addressing poverty.

iii) Preserve Frogtown: the community in collaboration with other partners acquires, rehabilitates, and markets existing houses at modest prices. Preserve Frogtown relies on affirmative marketing of the local residents to reach first time owners who lack familiarity with real estate market.

iv) Cedar Cultural Centre: the local residents and two Somali entrepreneurs collaborated to transform the center. The Plaza’s long time function and appearance will depend on the wants of the community which is majorly dominated by Somalis.


Addressing the Challenges of TOD
The author focuses on the density, diversity and design while quoting that “TOD should not be an end in itself but rather a means to a set of ends.” He further labels these ends as:

i) Bringing people and business close enough to transportation to make transit vital.

ii) Creating a tool to catalyze urbanism at its most intimate locations.

The author then details these challenges as follows:

i) Negotiating the Density: as developers negotiate flexible and market sensitive approaches to density, they should find creative density solutions that are site specific, pedestrian friendly, and specific to individual taste and needs.

ii) Negotiating the Diversity: TOD must be considered in terms of neighborhood as a whole containing a robust of mixed uses and price points to avoid mono-cultures.

iii) Negotiating the Design: the goal is to provide the envelope within which a community may flourish.
He further lists the below points as important:

i) Transit should be visible.

ii) The transit design should fit seamlessly into surrounding development.

iii) Create street and public spaces that add to the feeling of the community.

iv) Put parking in its place to avoid it being a visually dominant element.

v) Pay attention to product innovation and differentiation of the products and location.


Best Practices and Opportunities for Enhancing Equitable TOD

Whilst focusing on Massachusetts’ TOD, Pollack emphasizes the importance of aligning public policy to the below principles to make it equitable for the community’s benefit.

i) Ensure community benefit.

ii) Maintain affordability.

iii) Prevent displacement.

iv) Encourage community controlled housing.

v) Improve environmental quality and just.

vi) Achieve full accessibility.

vii) Boost transit use.

viii) Plan for transit growth.

ix) Encourage local economic development.

x) Understand local context.

The author further identifies six steps that advance equitable TOD (with a focus on the best practices and opportunities) to enable communities share the benefits. The steps include:

i) Applying equitable development criteria to all TOD.

ii) Building more affordable housing in TOD throughout.

iii) Revitalizing neighborhoods without displacing residents and businesses though TOD investments.

iv) Fostering community health and environmental justice through TOD.

v) Demonstrating equitable TOD through model projects.

vi) Incorporating equitable TOD into long-range planning.


Racial Equity in TOD

Saldana and Wykoski examine the racial equity of Rainier Valley’s light rail development, whereby, threats of displacement crisis were feared with evidence of gentrification; property value had risen due to new developments. The authors’ further note, beyond community inclusion, historical disenfranchisement and institutional barriers can be broken by the incorporation of racial
equity framework in TOD planning and policy to aid propensity. The following principles were then suggested to inform planning and policies around TOD:

v) Existing residents should benefit and thrive from TOD investment.
vi) Quality jobs should be created to ensure sustainability.

vii) Affordable housing development which should include units large enough to house children and multigenerational families.

viii) Community serving institutions and businesses should be established to stabilize the existing low-income communities of color as gentrification occurs.
ix) TOD planning should be driven by racial equity outcomes not racial diversity goals.

In conclusion, the article states that history has shown that as communities organize and speak out, the more influence they have on outcomes; this can be achieved when traditional forces of development are replaced by the brighter promise of racial and economic equity.


**Best Practices for Equitable TOD**

While focusing on the vision of Austin’s Project Connect, the authors state that, “when cities put affordability at the heart of their transit oriented development; they add an “e” to “TOD” which comprises of:

i) Mixed use.
ii) Dense development that serves households with a wide range of income.
iii) A development that is inclusive of low income households.

The authors identify the following core best practices that have been used by other cities to achieve successful equitable TOD:

i) Zoning and land use policies that require a percentage of new units to be affordable.
ii) Centralized management organization (i.e. PPP) to coordinate purchase of land and master planning.
iii) A steady source of public capital to be used as seed money to influence larger sources of private capital.

The following case studies indicate the applicability of the above factors to ensure equitable TOD:

i) Fairfax County’s land use and zoning policies put affordable housing development at the heart of its planning efforts.
ii) Denver partnered with private and non-profit entities to create Urban Land Conservancy which is a model of integrated project coordination.
iii) Dallas, Texas has shown how Tax Increment Financing Districts provides much needed capital to support affordable housing preservation and creation.

Retrieved on 2nd March, 2015 from:
4.0 Summary of the Findings from the Literature Review

TOD projects should be able to benefit the community as a whole; however, lack of equitable TOD affects the poor due to high transportation costs, lack of accessibility, and lack of affordable housing which leads to displacement. TOD projects are complex to execute and face more obstacles than traditional urban development. The challenges include high land values, financing, long timelines, high density, and mixed use amongst others (Carlton, 2014). According to Fleissig (2009), most TOD projects rely heavily on subsidies to make them more competitive; this is reinforced by MZ Strategies (2013), on the report “Unlocking MAP-21’s Potential to Fund Equitable Transit-Oriented Development”, which states that Equitable TOD is difficult to fund as available federal funds have experienced cuts. Obtaining risk tolerant capital is also a challenge as most TOD projects are expensive to implement yet, they have low returns. Due to this, financing remains one of the most elusive challenges that needs immediate attention.

Establishing specific funding tools to support TOD planning, acquisition, and implementation; exercising maximum use of joint development opportunities; developing regional performance measures in support of TOD projects; and utilizing existing Metropolitan Planning Organizations (MPO) and state authority to flex eligible funding have been listed as some of the means in addressing the challenges of financing. Most importantly there is need to move beyond individual project financing in which investors require greater evidence on the reduced risk and performance of TOD projects (Zimmerman, 2013) to a more collaborated effort whereby various actors (state, transit agencies, philanthropies, developers amongst others) are involved as partners. The partnership should help fund projects that prioritize social equity as the key component to development (Pollack, 2013) by aligning itself with the broader community needs and sustainable initiatives for livable benefits (Flessig, 2009). Such alignment would encourage local economic growth, boost transit ridership, prevent displacement, improve environmental quality, ensure safety, and achieve full accessibility (Pollack, 2006). The authors are in consensus that, to achieve equitable TOD, community participation is key; this is because the community understands better what their needs are hence, they should help shape the planning and implementations process. Some of the best practices that have proven to be successful include: the implementation of zoning and land use policies that require a percentage of new units to be affordable, the formation and coordination of centralized management organization to coordinate purchase of land and master planning, a steady source of public capital to be used as seed money to influence larger sources of private capital, the incorporation of market assessments into all planning activities early, formulate site evaluation checklist for potential equitable sites, and consideration of “market-readiness” during equitable TOD site selection.

5.0 Monitoring and Evaluation

5.1 Introduction

Monitoring and evaluating projects are very important because they foster learning, knowledge generation and strengthen the basis for managing results. Equally, it is important to measure both the social and design impacts of TOD projects; the information from such an evaluation will be very instrumental in informing future projects. This section therefore develops a monitoring

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32 MAP-21 is formally entitled “Moving Ahead for Progress in the 21st Century”.
33 Ibid
and evaluation model to determine the effectiveness, efficiency, and sustainability of TOD projects and its outcomes, with the aim of informing potential projects for replication. More specifically the evaluation will focus on the below objectives:

i) Assess the efficiency of TOD projects.
ii) Assess the extent to which a TOD project achieves its stated objectives (both design and equity), outcomes, and impact level by identifying the supporting factors as well as the constraints.
iii) Identify lessons learned and potential good practices, with a focus on successful initiatives that can be applied further;

viii) Provide recommendations to project stakeholders to support the implementation of more equitable initiatives.

5.2 The Approach to Evaluation

The two most commonly used evaluation approaches are the conventional methods and the Participatory Monitoring and Evaluation (PM&E). However, unlike conventional approaches whereby monitoring and evaluation involves outside experts measuring against preset indicators and using standardized methods, PM&E promotes sustainable relationship between involvements of stakeholders and community ownership of projects.

The below table highlights the difference and similarities of the conventional and PM&E approaches:

<table>
<thead>
<tr>
<th>Table 1. Conventional M&amp;E vs. Participatory M&amp;E</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Who Initiates?</strong></td>
</tr>
<tr>
<td>Donor</td>
</tr>
<tr>
<td><strong>Purpose?</strong></td>
</tr>
<tr>
<td><strong>Who Evaluates?</strong></td>
</tr>
<tr>
<td><strong>Terms of Reference</strong></td>
</tr>
<tr>
<td><strong>Methods</strong></td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
</tr>
</tbody>
</table>

Source: Coupal, Francoise, July 2001. Results-based Participatory Monitoring & Evaluation

5.3 Rationale of the Approach
Based on the table above, it is evident that the approaches are very different; however for the purposes of this evaluation, a combination of both will be used as the projects will need the strengths of both approaches to achieve its purpose. Conventional methods tend to collect mainly quantitative data while PM&E tends to collect mainly qualitative data\textsuperscript{39}, combing these two types of data will help understand the specifics of quantities as well as the perception of the community members. The combination of these approaches will help gather information that will benefit both the donors, community based organizations, and the community in general; this is because social inclusion is key to equitable TOD.

\textsuperscript{39} Ibid.
### 5.4 Monitoring and Evaluation Model

<table>
<thead>
<tr>
<th>Themes</th>
<th>Elements/ Value</th>
<th>Standard indicators</th>
<th>Equitable indicators</th>
<th>Sourcing of data/approach</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mixed land use</td>
<td>A range of land uses including residential, commercial, and light industrial to be co-located in an integrated way that supports sustainable forms of transport such as public transport, walking, cycling, thereby increasing neighborhood amenity.</td>
<td>• Presence of a policy for the mixed land use. • Whether the policy is implemented or operationalized (If not why). • Presence of public spaces available for use. • Presence of commercial buildings. • Presence of residential houses. • Availability of jobs. • Presence of affordable units.</td>
<td>• Presence of Subsidies for lower income earners to access housing. • Types of subsidies available. • Are the subsidies being implemented successfully? • Ratio of commercial spaces to residential houses. • Extent of variation of commercial sized entities. • Extent of varied sized housing. • % of affordable housing within a residential building. • Accessibility to the same building</td>
<td>• Documentation of policies in place. • Qualitative data from surveying the community. • Mapping/design documents to establish the ratio of commercial to residential housing. • Design documents/observation to identify ratio of parks in relation to residential housing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Curitiba, Brazil has successfully adopted high density, mixed use development. (The process begun in the year 1943 to 2000). • Atlanta- Lindberg station area is a successful example of a complex, integrated mixed use development with modest level of affordability. (The project begun in the year 2000 and it still has 7 acres yet to be developed). • The Bridges Calgary Canada is home to diverse of condos, shops, services and parks. (The project was started in 2000 and completed 2011).</td>
</tr>
</tbody>
</table>

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43 Filling the Financing Gap for Equitable TOD.

44 Lindbergh center station: TOD. Web: http://www.itsmarta.com/uploadedFiles/About_MARTA/Planning_and_Projects/TOD_and_Real_Estate/Lindbergh%20Station%20Profile(1).pdf

| 2 | Local economic Development (mixed income level and mixed job skills) | Local economic development (LED) is the creation of wealth that seeks to improve the economic well-being and quality of life for a community by creating and/or retaining jobs and supporting or growing incomes and the tax base.**46** Equitable LED: Making it equitable includes involving the local community in decision making to participate in the process and outcome of economic growth and to create income opportunities for more people, especially the poor.**47** It should also ensure there are mixed skills/mixed quality of jobs to ensure mixed income. | facilities (not to segregate).  
- Ratio of public spaces available for use in relation to housing.  
- % of people employed from the local area. | Number of employees in these areas. | Quantitative data from survey of residents, employees and business owners.  
- Qualitative data from community members.  
- Documentation of type of development changes from developers/management. | H Street Maketto Market (D.C) - Community goals were aligned with project outcomes which primarily focused on economic development-commercial revitalization and historic preservation.**48**(Duration of project 2010 -2013)**49**. |

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**48** Creating inclusive Transit-Oriented Development: the Martin Luther King, Jr. TOD in Austin Texas. *Project did not address the housing consequences of the revitalization.  
**49** Ibid.
Measuring Equity in Transit-Oriented Development: Application to Affordable Housing

| 3 | Compact | Compact development means that buildings, parking areas, streets, driveways, and public spaces are developed in a way that shortens trips, and lessens dependence on the automobile, thereby reducing levels of land consumption, energy use, and air pollution.\(^{50}\) **Equitable compact building** design ensures that the development is safe and accessible to people of all ages, the elderly, and the physically disabled. It also breaks down the superblocks for hospitable walking and biking environment. | Presence of policy to enhance compactness.  
- Whether the policy is implemented or operationalized (If not why).  
- The distance between the residential and commercial areas.  
- Proximity of affordable housing and accessibility to jobs, transit, retail and other services.  
- The feel of safety by the people. | Average walking distance to transit stations.  
- Average walking distance to facilities and amenities.  
- Presence of design features to cater for the disabled.  
- Extent the design caters for the physically disabled.  
- Extent to which women, men and children feel safe (crime and accidents). | Documentation of policies in place.  
- Designs used for construction.  
- Quantitative data from the design features for the physically disabled.  
- Qualitative and quantitative survey from the users. | Rosslyn- Ballston corridor\(^{51}\).  
- Dallas area is home to compact, urban developments, with mixed-use in both new construction and adaptive re-use - Mockingbird Station, along the Dallas Area Rapid Transit (DART) Red and Blue lines, about four miles north of downtown\(^{52}\) (The project opened in 2001).  
- Mountain View, San Francisco has small compact houses ranging from 11 units per acre to 70 units per acre\(^{53}\).  
- Portland, Oregon implemented zoning regulations to minimize parking, result was increased density and mixed income. |

| 4 | Density | The greater the intensity of residential and office development, the greater the levels of transit ridership\(^{54}\). The absolute minimum residential density required to support any form of regular, on-street bus service is about 6 to 8 units per acre. | Presence of policies in place to construct density.  
- Whether the policy is implemented or operationalized. | The number of residential buildings per acre.  
- The number of commercial buildings per acre. | Documentation of policies in place.  
- Designs used for construction. | Portland, Oregon implemented zoning regulations to minimize parking, result was increased density and mixed income. |

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\(^{53}\) Ibid.  
### Measuring Equity in Transit-Oriented Development: Application to Affordable Housing

| 5 | Affordable housing | Housing which costs a family less than 30% percent of its annual income. It should provide access to employment and services as well as have environmental benefits.\(^5^6\). | • Presence of policy for lower income earners.  
• Whether the policy is implemented or operationalized.  
• Presence of affordable units. | • Presence of Subsidies for lower income earners to access housing.  
• Types of subsidies available for developers and individuals. | • Policy in place.  
• Documentation from the property management offices.  
• Qualitative data obtained | • Arlington county permits 25% density bonus to affordable units (Quincy plaza has 25 units – project developed in 2006).  
• California’s 20% tax increment financing for affordable housing |

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| | children and multigenerational families. It also ensures availability of jobs. | • The cost of renting a house.  
• The cost of buying houses.  
• Presence of different sized affordable housing.  
• Proximity of affordable housing and accessibility to jobs, transit, retail and other services. | • Are the subsidies being implemented successfully?  
• % of affordable housing within a residential building.  
• The ratio of high income to low income occupancy.  
• Extent of variation of house types.  
• Accessibility to the same building facilities (not to segregate).  
• The average distance of housing from amenities and jobs.  
• Ratio of varied job categories (high skill to low skilled jobs). | from survey of residents.  
• Presence of mapping to identify accessibility and distances. | (Sacramento supported 114 low-income senior apartments).  
• Los Angeles trust fund for affordable housing (225 affordable units in TOD – project developed in 2008).  
• New Jersey legislation (enacted 2008) that stipulates for every new development 20% should be for low income earners;  
• Finance Linked Individual Subsidy Program (FLISP), to enable sustainable and affordable first time home owners opportunities to South African citizens.*  
• The Nuevo Usme Macro project (Bogota) - land prices were frozen to control price increase as projects take long to be completed. The development involves affordable housing with mixed land use. |

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|   | Public transport | The provision by states, private owners, and corporations of modes of motorized transport that could be enjoyed by the broader populace\(^{63}\). | Equitable public transport ensures integration of the system. Integration implies the opportunity to use the entire public transport system across a local or regional area (e.g. city, conurbation) independent of the presence of different modes of transport. | - Presence of different modes of transport.  
- Presence of well-coordinated different means of transport.  
- Increase in public transport ridership.  
- Reduction in transport fares.  
- Presence of subsidies policies.  
- Proximity of routes to affordable housing, jobs, retail and other services. | - % of integration and coordination of the transport sector.  
- % of increase of transport ridership.  
- Presence of subsidies to the riders.  
- Types of these subsidies.  
- % reduction of prices. | - Government/city documents on transport.  
- Observation and testing of the public transport.  
- Quantitative data from survey of commuters. | - The constellation Plan in Singapore with high capacity, high performance system that connects the urban core to network of new towns\(^ {66}\).  
- Copenhagen finger plan (Ibid). (Duration of project 1947-2009)\(^ {67}\). |

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Measuring Equity in Transit-Oriented Development: Application to Affordable Housing

| 7 | Public Spaces | Public plazas, pedestrian malls, decorative gardens, or other public spaces that allow for public congregation should be physically connected to the transit station and nearby shopping areas. Parks serve as a counter-balance to the higher-density pattern of development, thereby adding character, popularity, and marketability of station areas. Equitable public spaces includes designing these centers to enhance mixed use by both low and high income communities. | • Presence of parks/plazas.  
• The size of the parks/plaza.  
• Presence of proper facilities within the parks such as benches.  
• Presence of a good ambience.  
• Presence of compatibility to ease accessibility.  
• Proximity of the parks to the people. | • Presence of subsidies to access the parks.  
• Ratio of public spaces available for use in relation to housing.  
• The size of the park in relation to the population.  
• Presence of both low and high income earners in these parks/plazas.  
• The % of the low income earners.  
• Qualitative data from observation.  
• Quantitative data from survey of the users.  
• Building designs.  
• Mapping proximity by different demographics if data is available. | • South Park avenue improvement project (Tuscon - Arizona) implemented with community’s participations.  
• Church Square, South Africa was re-paved, trees introduced and a memorial to the square’s origins as a slave market was unveiled in 2008. Widely used by pedestrians, performance |

<table>
<thead>
<tr>
<th>#</th>
<th>Category</th>
<th>Description</th>
<th>Commentary</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Green Space/ Green TOD</td>
<td>Green space is land that is partly or completely covered with grass, trees, shrubs, or other vegetation, it includes parks, community gardens, and cemeteries. It is also related to green TOD(^7), which involves the implementation of green space.</td>
<td>Well connected green corridors.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>% of green space in relation to available public spaces.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Accessibility to the green parks by all including the low income earners, elderly people and the disabled.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Qualitative survey from observation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Qualitative data from landscaping designs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hong Kong recaptured the value-added form rail investments to help finance not only transit infrastructure but also open spaces, sidewalks, and green corridor(^7).</td>
</tr>
</tbody>
</table>


| Page | Non-Motorized Transport (High quality walking/biking environment for safety) | This involves sidewalk-oriented buildings, strong pedestrian linkages, and attractive streetscapes that link the transit station to the neighborhood, while creating a comfortable and safe environment for walking. Bike lanes encourage and support biking as a means of local circulation. Bike lockers and racks at the station, public institutions, parks, and shopping districts further encourage bicycle use. Full accessibility by all (including the disabled) to jobs, health centers and schools should be fostered. | • Presence of well-designed (width and building material based on location) sidewalks.  
• Presence of bike lanes.  
• Presence of bike lockers and racks near stations.  
• Presence of integrated paths to enhance accessibility.  
• Feel of safety by the pedestrians and cyclists.  
• % of amenities accessible by a network of bike lanes and sidewalks.  
• % of integration of dedicated bike lanes for accessibility.  
• Number of bicycle racks and lockers per transit station.  
• % of the integration of pedestrian paths for accessibility.  
• Extent to which men, women and children feel safe when using the paths.  
• Quantitative data from observation.  
• Building designs from the municipalities council.  
• Qualitative data from survey conducted on pedestrians and cyclists.  
• Mapping of the area to establish accessibility.  
• Cranford Crossing, New Jersey chose to focus on streetscape improvements and promotions. (1980s)  
• Foreshore Pedestrianisation Program (South Africa) initiated, end 2001, to assess and upgrade the main pedestrian routes on the foreshore of Cape Town’s City Centre, with the aim of making routes safer and more attractive. | • Rieselfeld, Germany: Gardens replaced surface parking.  
• Kogarah Town Square in Sydney, Australia. |
|---|---|---|---|---|
| 9 | Community Participation | The involvement of community in decision making is very vital as they understand better their needs. | • Participation of local community in decision-making.  
• % of the extent of community’s participation in decision making.  
• Building designs/pictures of before, during and after. | • Fruitvale Transit Village  
• Longfellow station (Minneapolis) used Community Benefits. |


Page | 93
<table>
<thead>
<tr>
<th>Page</th>
<th>Community Identity</th>
<th>needs and what would benefit them(^77).</th>
<th>Diversity represented among participating community members. Action taken based on the participating member’s ideas.</th>
<th>Ratio of diversity presented between the participating members vs the total population.</th>
<th>% of development done as a result of community member’s ideas.</th>
<th>Quantitative and qualitative data of survey of community members.</th>
<th>Agreement (CBA), whereby a private and legally binding contract between a developer and a community coalition codifies the commitment the developer has made regarding how the project will benefit the community(^79). Market creek (San Diego) utilized artistic traditions and honored the cultural heritage of the area residents hence heavily involving the residents(^80). From 1995 through 1999, the Tucson Department of Transportation (TDOT) worked with residents and businesses in the South Park neighborhood to plan and implement a series of improvements(^81).</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td></td>
<td>This ensures the new development is compatible with and builds off the unique character of surrounding areas(^82).</td>
<td>The change in design of the area before and after development.</td>
<td>% of extent to which the original important aspects</td>
<td>Quantitative and qualitative data of survey of the</td>
<td>Western U plaza; the community collaborated while respecting the historic significance of</td>
<td></td>
</tr>
</tbody>
</table>


\(^80\) Creating Inclusive Transit-Oriented development: The Martin Luther King Jr. *Overtime it faltered in matching services with local needs, business were undermined."


\(^82\) Ibid.
### Measuring Equity in Transit-Oriented Development: Application to Affordable Housing

<table>
<thead>
<tr>
<th>Making it equitable ensures that the community members are not forced out by increase in land pricing.</th>
<th>• The retention of community members within the area after development.</th>
<th>• % of the community members who have been retained even after development.</th>
<th>community members.</th>
<th>the existing buildings to create broad based economic opportunities for residents(^{83}). (Expected to open Fall 2015).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Maintaining or improving the characteristics that existed in the area.</td>
<td>• Quantitative data from building management of new vs old residents.</td>
<td></td>
<td>• The Market Creek Plaza I San Diego, (CA) case study demonstrates that TODs can be more successful by utilizing artistic traditions and by honoring the unique cultural heritage of area residents (1998-2012)(^{84}).</td>
</tr>
</tbody>
</table>

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\(^{83}\) Martucci, B. Equity, and empowerment: How community-driven TOD is transforming green line neighborhoods.

6.0 Conclusion and Recommendations:
This section will highlight the conclusion and recommendations based on the research.

6.1 Conclusion:
Equitable TOD remains a challenge; many sources equate this to inadequate financing, the nature of the projects, and the planning. Subsidies for these kinds of projects have been oversubscribed, yet it is very expensive for the projects to be implemented. There seem to be a consensus in the articles stating that, to ensure success, TOD projects should have a steady source of funding and most importantly there should be community participation in the planning process. TOD projects seem to be an initiative rapidly being adopted in African countries; Tanzania, Ethiopia and Nigeria have installed light rail with plans to graduate to TOD projects, Kenya is also in the planning process of installing a BRT. However, very little literature exists on TOD in these countries with most literature heavily based on developed countries; despite this, it is good to note that the characteristics that define equitable TOD are very adaptive and can easily be aligned to fit the different contexts in different countries. That notwithstanding, it is also important to note that most countries/states will differ in the strength of economies, level of political will, level of capacity amongst stakeholders, and nature of transit system (Pollack, 2013) hence affecting the planning and implementation process of TOD. The preliminary analysis herein is very useful in informing further research to test the monitoring and evaluation model thereby being a great tool for measuring impact of such projects.

6.2: Recommendations:

i) Further Survey should be done on the Monitoring and evaluation model to ensure reliability and validity.

ii) TOD projects should incorporate the community both in the planning and implementation process.

iii) TOD projects should conduct long range planning that factor gentrification without causing displacement.

iv) Governments and/or States should adapt zoning regulations that ensure affordability of spaces around transit area.
Appendix II: Policy Makers Survey Instruments

**Policy Makers and Institutions that Influence Housing Policies**

<table>
<thead>
<tr>
<th>Survey Instrument No:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background:</strong></td>
<td></td>
</tr>
</tbody>
</table>

1. Name of Respondent and Institution:
   ...........................................................................................................................................

2. Contact Details: ...............................................................................................................

3. Okay to cite name or how would s/he prefer to be referred to?
   ...........................................................................................................................................

Signature validating this selection and participation in survey:


1. **Main Questions:** What policies are applied in Washington, DC with regards to affordable housing? Are they federal or local policies, and if they involve funds, are they federal or local funding sources?
   ...........................................................................................................................................
   ...........................................................................................................................................
   ...........................................................................................................................................
   - Are they federal or local policies, and if they involve funds, are they federal or local funding sources?
   ...........................................................................................................................................
   ...........................................................................................................................................

2. When were these policies enacted and by whom? How did they emerge?
   ...........................................................................................................................................
   ...........................................................................................................................................

3. Are the policies being enforced?
   ...........................................................................................................................................
   ...........................................................................................................................................
   - Has this changed over time?
   ...........................................................................................................................................
   ...........................................................................................................................................

4. Who ensures the policies are enforced?
5. Are there consequences for those not in compliance? If so, what?

6. What percentage of residential housing units are practicing such policies?

7. If this number isn’t available, can you provide an estimate of a smaller area (say, a specific block, or new units being built, or existing units as of a recent date)?

8. Are these policies adequate for the low income earners? If no, what could be done to bridge this gap? More specifically: Is the supply adequate? The prices affordable?

   - Are the locations practical for needed services in the question above?

   Do you think it important to locate these people near high quality public transportation? If so, are there policies in place that help to locate affordable housing near public transit?
### Appendix III: Fort Totten Residents Survey Instrument

<table>
<thead>
<tr>
<th>Survey Instrument No:</th>
<th>Residents Survey</th>
<th>Date completed:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Background:</td>
<td></td>
</tr>
<tr>
<td>4. Gender</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>5. Age Group</td>
<td>15 to 25</td>
<td>26-40</td>
</tr>
<tr>
<td>6. Are you a resident of Fort Totten?</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>7. If not, what brings you here?</td>
<td>………………………………………………………………………………………………………………</td>
<td></td>
</tr>
<tr>
<td>8. What is the size of the apt/house where you live?</td>
<td>Studio</td>
<td>One B/Rm</td>
</tr>
<tr>
<td>9. How Long have you lived here?</td>
<td>………………………………………………………………………………………………………………</td>
<td></td>
</tr>
<tr>
<td>10. How many family members live with you?</td>
<td>1</td>
<td>2-3</td>
</tr>
</tbody>
</table>

#### Main Questions:

1. Are you aware of any programs that aid people in paying rent or buying a house?
   - Yes
   - No
   a) Which kind of programs are these?
      ………………………………………………………………………………………………………………
      ………………………………………………………………………………………………………………
   b) Do you have access to them?
      Yes
      No
   c) Do you think these programs are adequate?
      Very Adequate
      Adequate
      Not Adequate
      Why? ………………………………………………………………………………………………………………
2. Is the house/apt you are living in adequate for your family size?
   - Yes  - No
   a) Are you aware of houses/apartments that better meet the needs of your family?
      - Yes  - No
   b) If yes, what is the reason for living in your current dwelling?
      …………………………………………………………………………………………………
      …………………………………………………………………………………………………

3. Do you own or rent the house? ……………………………………………………………
   a) Is it your choice to own or rent a house?
      - Yes  - No
   b) Why? ………………………………………………………………………………………
   c) How much rent/installment do you pay per month? ………………………………

4. What facilities are offered within and outside the building in the neighborhood?
   …………………………………………………………………………………………………
   a) Are these facilities accessible by you?
      - Yes  - No
   b) Are there facilities such as healthcare, schools, and grocery stores within the neighborhood?
      - Yes  - No
   c) How far are these facilities from your house?
      - Very Far  - Far  - Not Far
   d) Do you use the metro? For what purpose?
      ……………………………………………………………………………………………
      ……………………………………………………………………………………………
   e) If not, why not? What alternative form of transportation do you use?
      ……………………………………………………………………………………………
Measuring Equity in Transit-Oriented Development: Application to Affordable Housing

f) How do you get to the Metro?
☐ Bike  ☐ Walking  ☐ Bus  ☐ Car

g) Do you think there are adequate bicycle paths/pedestrian walks within the neighborhood?
☐ Very Adequate  ☐ Adequate  ☐ Not Adequate

h) Do you feel safe/comfortable using these facilities at all times and in all weather conditions? (Personal safety and weather conditions)
☐ Very Safe  ☐ Safe  ☐ Not Safe

5. Are there jobs in this neighborhood? ..............................................................
a) Where is your job located? Has this location changed over time?
..............................................................................................................................
..............................................................................................................................

b) What kind of job do you have?
☐ Skilled  ☐ Unskilled

6. Given a chance, would you still live in this neighborhood? Why or why not? ..............................................................................................................................
..............................................................................................................................
..............................................................................................................................

7. Has this neighborhood changed over time? When and how?
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8. Do you have anything else you would like to share about this neighborhood and how it is changing? (Maybe directly: do you see the changes happening here as good or bad? How will they affect you?)
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Appendix IV: Metro Lines in D.C from the Highest to the Least AMI
Appendix V: Discussions and Findings of Fort Totten
1.0 Introduction:

This section discusses the findings of Fort Totten survey while giving recommendations for further research.

2.0 Overview of the Survey:

The survey was administered to 26 people consisting of 14 male and 12 female; out of these, only 14 (8 male, 6 female) of them were residents of Fort Totten. All the people surveyed were within the age range of 26 to 64 years. A different survey was administered to policy makers or organizations that influence policies such as The Washington Metropolitan Area Transit Authority, DC Department of Housing and Community Development, DC Department of general Services, Deputy Mayor for Planning and Economic Development; out of these, only DC Department for Housing and Community Development (DCHCD) responded. The below discussion is based on the administered survey instruments.

2.1 Policies on Affordable Housing in Washington D.C:

According to Mr. Chris of DCHCD, there are various policies on affordable housing enacted by either the federal, the district government, or the agencies if only internal approval is required. The agencies responsible for creating affordable housing in the District of Columbia, include: The Department of Housing and Community Development (DHCD), the DC Housing Authority (DCHA), the Housing Finance Agency, the Deputy Mayor for Planning and Economic Development, and the Zoning Commission. Each agency has its own internal and legislative mandate that govern their activities.
Despite having these policies in place and a number of agencies focusing on affordable housing, the funding for these kind of house is inadequate to address the affordable housing needs of the low income households. According to Mr. Chris some way of bridging these gaps include:

i) Reducing the market rate of houses.

ii) Increase the income of the low income households through policies such as minimum wage, earned income tax credit, increased school quality, and other education, income redistribution or job training programs.

iii) Increase subsidies for affordable housing by the implementation of new taxes, or shifting money from other programs into affordable housing which could be handles at the federal or local level.

2.2 Programs on Affordable Housing in Fort Totten

Out of the Fort Totten residents surveyed, only 43% of the residents were aware of the affordable housing programs with the majority having no knowledge of such programs. The figure below gives a visual of the data analysis. Unfortunately, out of the residents who had knowledge of these programs, none of them had access to such programs and if asked why that was so, they claimed the process is tiring yet they had no assurance of benefitting from such programs. This confirmed the fact that these programs are not adequate to the needs of the low income households as stipulated by Mr. Chris of DCHCD.
On the other hand, it was also evident that about 43% of Fort Totten residents own homes hence don’t have to pay rent. Most of these homes were paid for by their grandparents and cleared by their parents. Of the people renting, only one resident seemed comfortable with the rent, this is he rents a room for USD 450 in a three bedroom house, the rest of the resident’s rentals on average, a two bedroomed house which, costs between 1400 to 2200 depending on the location and view of the house. The smallest apartment being a studio costs more than USD 1,000 which is way above what the low income households can afford.

2.3 Access to facilities

100% of the surveyed residents claimed to have access to facilities such as hospitals, schools, parks and convenient stores, despite the access some residents complained of the distance to such facilities. The figure below highlights this analysis.
It is clear from the graph that more than half (57%) of the surveyed residents perceive the distance as not far hence manageable. There were however complaints that the area lacks big stores and most residents have to go out of the area (i.e: Columbia Heights) to do their monthly and sometimes weekly shopping. With regards to eateries, restaurants are also in deficient and the available ones mainly sell fast food items hence lacking healthy options. One of the residents complained that, although there are parks available, they are not well maintained as most dog owners using the place as a “poop site” without picking after their pets. She emphasized the fact that these parks are underutilized due to lack of proper maintenance.

2.4 Access to the Metro

All the residents surveyed use the Metro to conduct their day to day errands and/or visit friends and family.
Figure III: Modes of Transportation to the Metro

From the survey it is very evident that majority of the residents walk and bike to the metro stop, despite this, the residents complained that there were no adequate biking lanes and most times cyclists have to compete with vehicles thus making it dangerous for the riders; the residents mentioned there has been a number of accidents related to this. On the other hand, the residents seemed content with the pedestrian walk; 92% were in agreement that the facilities are adequate and well sheltered by trees from the sun in hot weather. However they complained that the pavement slabs are not well levelled which causes users to trip on numerous occasions.
Figure IV: Indicating the pedestrian walks at Fort Totten

The image on the right shows the misalignment of the paving blocks on the walkway

With regards to the feel of safety in relation to crime, it was evident that most male respondents feel very safe while the female respondents said they felt unsafe walking from the metro at night. A number of residents mentioned that there has been incidents of crime previously and although this has improved, they still do not wish to risk themselves. Due to this, most female residents use the metro bus at night because the bus stops are nearer as compared to the metro rail.

2.5 The Economic situation of Fort Totten Area

Out of the residents surveyed, only 32% were in agreement about the availability of jobs in the area. 43% claimed jobs were not available while the other 21% were not sure as they said they worked elsewhere. Of the 32% who were employed only 20% was skilled jobs, the rest were unskilled.
However, of the nonresidents interviewed, 83% worked in the area while the other 17% were just connecting the metro bus from the metro rail. Out of the 100% of the total working persons surveyed, only 33% are residents while the rest, 67% are nonresidents working at Fort Totten. Most of the nonresidents reside in either Virginia or Maryland.

It was also evident that there are no big commercial centers within the half a mile radius of the area. Most of the ones available are salons, eateries, dry cleaning shops, gas station, convenient stores, and tire centers amongst others. A new development is however upcoming, we were informed that it will contain a big commercial space.
When questioned about the change in the neighborhood, they all seemed to agree that, the area has developed over time and it is still developing which is great for the neighborhood and hopefully it will create more jobs. However on the other side, everyone showed concerns about the rising market value of houses, they mentioned that renting a house has become so much more expensive, especially with the new upcoming housing complexes, the pricing is too high with no subsidized units within the complexes.

3.0 Summary of Findings

Based on the survey, if it evident that affordable housing is a major issue in Fort Totten Metro area. Rents as compared to the area median income are completely unaffordable. The AMI within a mile of Fort Totten metro area is USD 52,128 which translates to a monthly income of $15,640 for the extremely low income households (30% of AMI) and $41,702 for the low income households (80% of AMI), based on this the rentals should cost between $391 to $1,042 monthly. As observed this is not the case at all especially for families as the cheapest unit, being a studio, costs $1,000 and yet it is too small to host a family.
It is also unfortunate that most residents are not aware of the subsidized programs, and if they do know, they have no access to them. There is a probability that there is gap on the information the residents have about such programs, would be important for a further research to be done to further understand the context. Lack of adequate employment opportunities is also a problem with most residents working as non-skilled employees. It is important to understand why this is the trend, however due to time limitations the researcher was unable to collect any additional information.

Bike lanes are non-existent making it difficult for cyclists to use the main road as they have to compete with motorized vehicles endangering their lives. In addition the pedestrian walk are not properly levelled hence causing many accidents from tripping. The local government should take to task these responsibilities to ensure that both the cyclists and the pedestrian are comfortable since it is clear from the research that most residents use this form of transportation with 50% being pedestrian while 21% are cyclists.

Despite these problems, Fort Totten area seems to have adequate transportation as the metro bus runs frequently within the whole area. Well sheltered pedestrian walks are available in most of the paths hence enhancing the comfortability of the residents.

Development is usually seen as positive in any area, the residents of Fort Totten are happy with the developments that are ongoing and they hope that such developments will create more employment opportunities for them due to the upcoming commercial center. The also feel that the development will enhance the physical architecture of the place as well as safety within the region. However, some are skeptical about these developments as they feel with the development, they will no longer be able to afford housing hence get displaced as gentrification occurs. Due to this
reason, it is very important that these trends be further investigated to try and mitigate the displacement of the current residents.

4.0 Conclusion and Recommendations

Measuring equity is very important and it highlights the present concerns thereby helping in structuring solutions for the problems. Fort Totten metro area is developing hence making the community attractive. Unfortunately, like any other development, the land and housing prices are rising causing displacement as gentrification occurs. Despite the fact, there are programs that aid the low income households, displacement still occurs meaning that such programs are not adequate. It is therefore important for the government to find other way of mitigating this concerns to reduce the marginalization of the low income earners.

This research was conducted within half a mile radius of the metro station, however it was conducted within a very short timeframe hence would be not easy to generalize this information to the rest of the Fort Totten area. The researcher there recommends the below for further investigation.

i) The research area should be expanded to one mile radius from the fort Totten metro area. This will not only give the perspective of TOD initiatives but will also inform on how TOD projects affect its neighboring areas.

ii) An in depth study on the processes of allocating and informing residents of the subsidized programs available should be conducted. This will help understand why most residents are not aware of such programs as well as give an in depth understanding of why they are skeptical about applying for such programs should they have knowledge of the programs.